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Foreword

Henri Malosse
President
European Economic and Social Committee

Europe has been hit harder than almost any other part of the world by the financial and economic crisis of the last decade. Today it also faces a social and political crisis that threatens the very foundations of its existence. The EU now has to regain the trust of its citizens by revitalising its economy.

We therefore need to invest in priority policies that have a direct impact on employment, which is the main concern of all Europeans and a lever for boosting domestic demand.

The utmost priority is to revitalise European industry. The European Economic and Social Committee, of which I am president, sees this as a way of securing jobs at the local level and of combating the desertification that threatens many European regions. By stating that industry should account for 20% of European GDP, Jean-Claude Juncker, president of the next European Commission, is moving in the right direction.

We must also invest in the future. To be competitive, Europe must support its innovative companies, encourage its researchers to stay and promote the development of high-potential sectors. But it must also invest in another asset – its young, educated workforce – by encouraging Member States to make their education and training systems competitive. Learning is therefore an avenue worth exploring more intensively. As regards the Youth Guarantee, this will only be fully effective if it proves its worth on the ground.

If the EU is to regain the qualities that made European integration so strong in its early days, it must build on the solidarity that exists between Member States. It must end tax dumping, develop common policies in areas of strategic importance, such as energy, by drawing strength from collective action, and protect the interests of all 28 Member States and not just a few. Europe is first and foremost about creating a common area that is able to hold its own in an increasingly competitive world. Where external relations are concerned, the European Union must make its voice heard in a way that is distinct and faithful to its values, rather than making free trade its sole priority.

This European solidarity is also what links all Europeans. Social Europe must become a reality to ensure that European identity becomes an integral part of people's lives. Let us end the social dumping that creates pockets of poverty and becomes a source of xenophobia.

Of course, these ambitious priorities will not have the desired impact unless they are carried out on the basis of continual consultation with civil society. Let us pursue the approach started by the Lisbon Treaty. There has never been a greater need for such a process, as the challenge is formidable: to encourage Europeans to turn to Europe once again. This is the key issue for the next European Commission: to embody the courage and willingness to work together to build a common future of prosperity for all. ∎

Lisa Carnwell
Publisher

Laura Evans
Editor

Introduction

Welcome to the August edition of Adjacent Government. In this summer issue we focus on an array of topics that are high on the agenda within government. Changes are afoot within the European Commission, with a new President confirmed for the next 5 years – Jean-Claude Junker.

The new President has pledged his support for economic growth in order to "kick Europe out of an unemployment crisis." Throughout Europe, economic growth and development is a key area that has been debated by many experts and government officials.

In line with this we commence with a Foreword from the President of the European Economic and Social Committee, Henri Malosse. Mr Malosse gives thought to how Europe must invest in the future, and invest in priority policies in order to have a direct impact on employment and boost growth and demand.

Elsewhere in the publication we turn our attention to the marine industry. In a special focus, an article from Maria Damanaki, European Commission for Marine Affairs and Fisheries outlines the Blue Growth strategy. The importance of the industry is also highlighted in an article from the European Maritime Safety Agency.

The health and social care section takes a closer look at healthcare innovation. Vice-President of the European Commission Neelie Kroes, Commissioner for Digital Agenda discusses e-health and its benefits for efficiency in healthcare. Wound care innovation is another topic we shine the spotlight on, with contributions from the European Wound Management Association, and the Wound Healing Research Unit at Cardiff University.

The built environment is a key area that we remain focussed on at Adjacent Government, and editorial features in this edition discuss the urban environment, and the importance of developing sustainable cities throughout Europe. Articles from Johannes Hahn, EU Commissioner for Regional Policy, and Dr Barbara Hendricks, German Minister for the Environment lead the discussions in this area.

Hot topics also in this edition include asset management, continuous improvement, volunteering, agriculture, carbon capture and storage, and cardiology.

In what seems to be a key year for Europe and its leaders, I do hope you enjoy the articles within, and as always welcome any thoughts you may have.

CONTENTS

THE BUILT ENVIRONMENT

HOUSING

HEALTH AND SAFETY

ENVIRONMENT

AGRICULTURE

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SPECIAL FOCUS:
MARINE

ENERGY

EDUCATION AND TRAINING

HEALTH

SOCIAL CARE

HEALTHCARE INNOVATION

HEALTH RESEARCH

HUMAN RESOURCES

FINANCE AND GROWTH

INFRASTRUCTURE ASSET MANAGEMENT

ICT

DEFENCE

INDEX

236

Vienna: Planning for Change

Maria Vassilakou, Deputy Mayor of Vienna, gives an overview of the Vienna Urban Development Plan STEP 2025...

Vienna is immediately associated with culture, heritage and high quality of life, but this first impression is incomplete. The Vienna metropolitan region has seen an era of dynamic development since the political changes of the 1990s. With a population approaching 3 million, it has become a pivotal hub in Central and Eastern Europe. Urban development planning for this region is quite evidently, a challenge. The overall strategy for this important field of development is called STEP 2025, the Vienna Urban Development Plan, and was recently adopted by the Vienna City Council.

Like most successful metropolitan areas, the Vienna region attracts a large number of people, which of course leads to population growth and increasing diversity. These factors alone result in various demands on infrastructure, housing and job creation. Our strategies for meeting the demands should be intelligent, sustainable and compatible with limited financial and spatial resources. This is what we invariably keep in mind when taking urban development decisions. We aim to overcome borders by cooperating closely with our neighbours within the metropolitan region. This is a chance to further improve the way our region is organised.

STEP 2025 addresses a multitude of development tasks, and many of them have a highly complex technical background. For example, I would like to highlight 2 central aspects that demonstrate the principles of our urban development strategy.

Vienna is a city of social equity, and we are committed to keeping it this way, based on a concept of public services and social cooperation. We have defined a number of key goals for urban planning so living in Vienna remains attractive for all population groups.

Public spaces are to be adapted to new requirements, taking into account various user groups and interests, ranging from children to senior citizens and from sports to general leisure activities. We are further expanding our network of green spaces to supplement the many recreation areas and pockets of natural environment Vienna already has. Our housing policy concentrates on continuing the model of subsidised social housing, while at the same time promoting new housing developments to make sure there will always be enough homes as the population keeps growing dynamically. This is to prevent price hikes in the rental sector. Moreover, we support walking, cycling and public transport as eco-friendly, healthy and generally affordable ways of getting around in Vienna.

The second major aspect I would like to address is our commitment to sustainable urban development. We constantly ask ourselves how life in the city can be planned and organised with the limited resources that are available to us in the long term. This goal inevitably influences our urban planning strategy: new urban neighbourhoods are planned in a compact manner, existing areas are regenerated and, where possible, housing density is increased while maintaining high quality standards. This approach goes hand in hand with the mobility strategy outlined above. A smoothly functioning public transport system in combination with cycling, attractive footpaths and new mobility options ensures people can get around perfectly well without having to buy their own car. ∎

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Forms of living

If we talk today about our cities, or in particular about the urban environment we live in, we can use statistics to show how we behave within our environment. We explain our living behaviour using graphs to measure our intentions, or we use diagrams to show how our urban behaviors relate to each other. While we might have given quantatative data to our behavior, we don't research the formal understanding of our human environment. While cities are made out of buildings, streets, parks, and public spaces we hardly talk about its forms. What we neglected to ask ourselves is about the quality of the form we want to live in.

The intention of the institute of urban design (ioud) is to develop an expertise on the formal understanding of our urban environment within metropolitan areas as well as our countryside. What we investigate is the architectural knowledge of our human environment, which gives form to our quantitative data. We call our research 'a research by design', with the intention to investigate new architectural forms of living environments. After all, there is no content without a form.

History

If we look into the history of urban design and planning, especially in Europe during the 19th and 20th Century, and more recently into the 1st decade of the 21st Century, two essential aspects of urban design and development belonged to each other. One was the understanding of our spatial behavior through statistics, and the other was to give form to it. When our cities grew during the 19th Century, the grid became its model of urban expansion, and the urban block gave it architectural form. We can see the variation of such urban blocks throughout our cities based on the various cultural differences of land ownership and housing typologies.

Within the beginning of the 20th Century – on a free piece of land mainly owned by the city itself – the single standing slab building emerged. This architectural type became the model of our urban settlement before and after the 2nd World War. Both urban forms were highly influenced by the involvement of city and state governments to increase the quality of our living environment.

Through late capitalism and definitely within the last 20 years, urban developments are executed by project next to project, development next to development. The question of form became replaced by the problem of where investment is needed. Cities have given away the formal control of their cities. What we witness today is what was historically known as the liberal urbanism of the 19th Century, an urban development without formal consciousness. What we need is a research of forms under which our cities evolve. It is the form in which we live in, not its data.

Urban living

Recently published statistic on the behavior of the Austrian population within their urban environments, by APA/Statistik Austria, shows tendencies became visualised. This can be found nearly anywhere within the European landscape of historically developed modes of inhabitation.

While many cities in Austria grew immensely – from 14.1% as in the city of Eisenstadt, 12.9% in Graz to 9.3% in the metropolitan city like Vienna and 8.4% in Innsbruck the city of the alps – small size villages or cities within the immediate distance also exploded in terms of population by up to 30%.

There is an enormous magnetic tendency, which attracts people towards large urban metropolitan areas, while at the same time historically established villages on the countryside empty out.

This tendency is similar throughout Europe and even globally; while in Central Europe, within the area of the Alps, this tendency took on a particular form. The villages decreased by twofold: not only did these villages decrease in size and population, but at the same time, their population changed from permanent inhabitants (those that both lived and worked in the village), to temporary inhabitants, like tourists, (second home citizens and weekend dwellers which work or study during the week in metropolitan areas and spend their weekends in the village). It can be argued that the village is not sustainable anymore, neither socially nor economically, or even spatially. It's form as we know it will eventually die.

The Hotel as a model of urbanisation

At the same time a new architectural form has emerged within the tourist areas of the Alps, namely the high-rise building. The high-rise emerged as a particular form within densely populated environments like Chicago and New York. The reason for the emergence of high rise buildings was not only its potential to increase the density, but to gain maximum profit for the increasing land values within metropolitan areas.

The urban hotel

Today it seems that the architectural form of the high-rise has lost its context. Emerging from alpine areas so its real quality can be seen – namely the idea of the high rise building as a hotel containing all the facilities of a city. The high-rise can be seen therefore as a form of a city, a building that contains the life of a city.

One of our recent research projects has been the investigation of the possible merge of a village and the hotel as a model of urbanisation. Our research mainly developed forms of high-dense living environments on the base of a one family house. While villages are constituted by a large number of single family houses spread along roads, the design challenge was to keep the individual home alive while reducing the related outdoor space and the form of access. Such a design investigation has happened many times throughout the history of urban design, and has its precursors in Le Corbusier Villa-Immeubles from 1925 and many research projects within northern European countries during the 1950s to the 1970s, as well as recent projects in Asia, (especially Japan).

The intention of the research is to understand urban transformation as a problem of form. The forms that are investigated are high dense urban fabrics. These fabrics are not only intended to reintroduce aesthetics into the political consideration when planning our cities, but they are the only primary architectural forms that can solve problems of sustainability. In order to live socially, economically, and materially sustainable we need to live in dense urban environments.

The investigation of such forms is what we as an institute of design have developed as our expertise.

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The EU Urban Agenda

European Commissioner for Regional and Urban Policy, Johannes Hahn explains why an EU Urban Agenda is needed and invites you to contribute to the public consultation just launched by the European Commission...

Nowadays the majority of the European population live in urban areas. Cities form the backbone of our economy and society. Cities are where the economy grows, where jobs are created, where we can best fight climate change and where scarce resources can be used more efficiently. Without cities we will not reach the ambitious goals we have set ourselves on tackling pollution, unemployment and creating more prosperity for people through Europe2020 objectives.

As Commissioner for Regional and Urban Policy I have championed the cause of cities and urban development. I believe that we have already made progress as we have a new Cohesion Policy with a much stronger urban dimension. We expect that more than half of our Cohesion Policy budget for 2014-2020 will be invested in cities. We will also continue to work with URBACT, who provide a platform for exchange of

experience and work on integrated strategies and action plans in the various fields of cooperation between European cities. We also expect to provide around €330m in particular innovative actions in sustainable urban development exploring new solutions to today and tomorrow's urban challenges.

But we can do more. We have to make sure that the many EU policies that impact on cities are well coordinated and that the European, national, regional and local levels work with and support each other. For this I believe an EU Urban Agenda is the way forward.

Although many EU policy areas already have an urban dimension, not everything works as it should: urban realities and cities' needs are not always reflected in our priority setting and policies that intervene and are implemented in cities are not always well coordinated. If we continue to consider sectors like the environment

and transport separately, we will never get the best results, and we will fail to exploit the potential of cities to address our major societal challenges. An EU Urban Agenda could help us to adopt a more joined-up approach, and bring together the efforts of different levels of governance: EU, national and regional, and of course, at city level too.

The development of an EU Urban Agenda has to take place in a coherent framework which allows different actors to take on different roles with commonly agreed objectives. An EU Urban Agenda will depend both on strong national agendas as well as on the contribution of EU Member States to wider EU agenda setting. It is crucial that the Agenda is not seen as the EU pushing aside governments on the national level but strengthening and developing the urban agenda process within the different initiatives on urban development at Member State level.

The voices of cities need to be heard more clearly, because the best mayors and local administrations are closest to citizens, because local authorities have wide responsibilities that influence citizens' everyday lives. They are key for Europe and some would argue all the more so in the current context of socio-economic crisis, and wavering confidence in public administration and political institutions. The recent European elections have reminded us too that we need to stay close to our citizens, the involvement of cities in our policy making is one way to do that. This initiative is not an exclusive one: many live outside cities but are affected by them. They too can benefit from an Urban Agenda and should be involved in the debate.

We need to involve all stakeholders at every stage of the process to ensure a smooth implementation of an EU Urban Agenda. This means also that cooperation between all levels of government and within the European Commission should be enhanced. While respecting the principles of subsidiarity, more concerted action at EU level can help to ensure that policies that impact on cities or where cities are the key implementing partner are coherent, and conceived with urban areas and the needs of the people that live there in mind.

The aim of an EU Urban Agenda is not to make European cities less unique. Diversity is a valuable asset. Different cities have different potentials and face different challenges. The Urban Agenda should promote exchanges of best practice and the sharing of experience to ensure the best possible development.

In my view the Urban Agenda should provide a working method to tackle key challenges. The EU Urban Agenda would strengthen the urban dimension of EU policies, improve their quality and coherence and give Europe's cities a more representative role as partners of the EU. I believe that bringing towns and cities into policy-making, the EU will respond more effectively to the real changes and challenges facing our urban areas.

I very much hope that our recent communication: "The Urban Dimension of EU Policies" and public consultation will stimulate discussion and bring valuable feedback. Everybody is welcome to contribute to the public consultation on the Urban Agenda (which closes on the 26th of September)[1]. It should gather ideas from stakeholders to further clarify the need for an EU Urban Agenda, the objectives it should include and how it could function.

I invite you to have your say, make your views known and contribute to the public consultation – and help us to put cities higher up on the political agenda across the EU. ∎

[1] http://ec.europa.eu/yourvoice/consultations/index_en.htm

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Johannes Hahn
Commissioner for Regional and Urban Policy
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http://ec.europa.eu/commission_2010-2014/hahn
http://ec.europa.eu/regional_policy

Reinventing the City
Building on Creativity

Creativity, innovation and a strong focus on sustainable and attractive growth are at the very heart of the vision for the City of Varberg to become the Swedish West Coast's Creative Hot Spot by 2025. The municipality is growing quickly and has a population of more than 60,000 residents, mainly due to its location between two expanding regions – Göteborg (the West Sweden region) and Malmö (the Öresund region). Varberg is a stronghold for culture and tourism, and is especially renowned for its 13th Century fortress, long stretches of beautiful beaches and inland deciduous woodland with plenty of small lakes. It is also well known among surfers from all across northern Europe as one of the best places in Scandinavia for all kinds of surfing.

The City of Varberg is focusing strongly on sustainable development and has been acknowledged for its success in bridging the gap between public service and the diverse interests of various partners in society (e.g. commerce, business, industry, development, conservation, culture, etc.). The municipality has a sharp focus on the way ahead, and a portfolio full of solid strategies. In our vision for the future, the City of

Varberg has unique opportunities and we are acting on them. We are building a city converging around means of public transportation in a rapidly expanding region. The railroad, which has long created a barrier between the seaside and the city centre, will now be relocated into a tunnel underneath the city. To expand on this opportunity we are moving the harbour in order to further free up land for letting the city reclaim its position as a seaside town. In total, the project will result in more than 500,000 m² of land for development of our future city front. For people living, working or visiting the city of Varberg, the change will dramatically increase the freedom to experience the coastline. More places of residency, places for eating and meeting, places to shop and work, etc. – comes as a bonus.

In our vision for Varberg 2025 we are striving to be at the forefront of supporting social and cultural aspects of sustainability. The municipality is localised in the middle of a strong academic region. The University of Göteborg and Chalmers University of Technology, the University of Lund and Malmö, the University of Borås and the University of Halmstad are all located well within

Cityfront

comfortable commuting distance from Varberg. This is of great importance for our local business climate and for our young. We are focused on consolidating the relationship with our academic allies even stronger, strengthening the position of our own Campus Varberg. The same is true for cultural institutions. For our growth it is key to attract enterprises and institutions that share our idea of building a more sustainable future, in the heart of a progressive region. This means that we are especially on the lookout for academic and cultural institutions, and enterprises with profiles that fit our idea of a modern sustainable city and trying to attract them into investing in Varberg.

It is often stated that the place, and the people and lifestyle associated with it, is everything. If this is true, then the City of Varberg has everything to offer.

Come to Varberg. Share our vision.

The City of Varberg

www.varberg.se

Green Growth Requires Systemic Change

Finnish Minister of the Environment, Ville Niinistö explains how Finland is exploring different possibilities for sustainable economic growth...

Finland has a long history as a forest-based economy. It has been said that we live from our forests. Then, some years ago, we started discussing the concept "bio-economy". Nowadays we have found ourselves discussing more about a new but in reality old concept – "forest bio-economy". In Finland, we do not rush too fast into new businesses – but we really need to look at our economies with fresh eyes.

In recent years, the Finnish government has been extensively exploring different possibilities for economic growth and renewal. One core pillar of our work has been the strategies and programmes for sustainable growth enhancing well-being, though carried out in several separate projects. Our approach has been broad, touching several political sectors, and I feel that this kind of a broad approach to greener growth is crucial on the European level as well.

In short, taking a broad approach to green growth means that we need to understand the role of ecosystem services. Ecosystem services, including natural resources, processes and values, are not only a prerequisite for a green economy, but are also, by their very nature, an opportunity. We need to identify their value and use them wisely.

At the same time, one clear challenge to our economy is to increase added value. This can be done by processing the products further. We can also use intangible values such as design and brand management to produce higher value for customers and achieve competitive advantages that are difficult to imitate.

When doing this we need to remember that nature and the cultural values based on it do produce remarkable intangible values. Natural values support business activities, enhance the attractiveness of areas and create good living environments. Nature can improve well-being and, in and of itself, it contributes to health and welfare services. The benefits and business opportunities from these are already growing exponentially, but are not properly identified in policy discussions, or even in official statistics.

For this reason we need to draw attention to the opportunities for creating intangible values in all policy actions.

Moving towards a green economy is more than just adopting specific actions, rather it also needs a systemic change. For it to develop, it needs to be taken up by whole communities and societies.

**Ville Niinistö
Finnish Minister of the
Environment**

In the future, 80% of the global population will live in cities. The efficient use of water, materials, energy and space will be a necessity in areas with high population densities. We need sustainable solutions for meeting these needs. In cities and urban regions, a green economy will be developed through innovations, and linkages between the innovations and by dissemination of them. Interactions between cities and the surrounding countryside will be stepped up in order to derive more benefits from the economy, including local food, renewable energy production, and services for health and well-being.

Thus, we need to support an environment for long-term development that is built upon large investments in urban regions, in which we can experiment with, test and develop resource-effective solutions for a new generation of renewable energy, water supply and waste management, and new models for ecologically sustainable transport. In Finland, the existing cooperation platforms on research and development (SHOK Centres, INKA programme actors, research cooperation models) will be part of this cooperation with cities and sub-regions. Promoting green and sustainable growth in urban regions must also play a role in land use and urban planning.

The loss of biodiversity is a severe problem in Europe. Finland's ecosystems are also experiencing a decline in biodiversity, even though the loss of biodiversity has not been as high in forest ecosystems, partly because of advanced practices in forest management. Now we are looking at growth of the bio-economy, which will mean extensive use of forests and other renewable

resources. Thus, a real condition for green growth via bio-economy is the sustainable use of ecosystem services. Sustainability must be assessed and it must be secured.

In Finland we believe that the sustainability criteria we use must be generally accepted and updated when relevant, taking into account the changes in biomass use or the need for other ecosystem services, such as carbon sinks. To guarantee the sustainable use of forest biomass, sustainable forest management is a key factor.

Besides sustainably managed commercial forests, we also need forest reserves to protect biodiversity. For this purpose, there are several instruments in use[1] in Finland. Under all of these, the forest owner gets compensation for any major disadvantage, and this compensation is financed by the national budget. For a sustainable bio-economy, the protection of bio-diversity, including funding needs to be secured.

The transition from a fossil fuel economy to a low-carbon economy is inevitable, but we cannot rely too much on the bio-economy in achieving this. The reason is that the non-food biomass resources are too scarce to substitute for the massive use of coal and oil. Besides substitution, we need substantial efforts to save energy and resources on all levels of the economy. Still, the sustainably produced, advanced bio-based fuels are a better alternative to fossil fuel ones. Their introduction should be encouraged on the European level as well. ∎

[1] [Including strict nature reserves established under the Nature Conservation Act, protected wilderness and recreation areas, areas protected under the volunteer METSO programme, and protection agreements under the Forest Act. The Forest Biodiversity Programme METSO (2008–2016) aims to halt the ongoing decline in the biodiversity in Southern Finland's forest ecosystems.]

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A renaissance of cities – sustainable Germany

Dr Barbara Hendricks, Federal Minister for Environment, Nature Conservation, Building & Nuclear Safety in Germany gives an overview of how her country is making 'cities of the future'...

Compared to Tokyo, the world's largest metropolis with 36 million inhabitants, Germany's largest city Berlin, with a population of 3.5 million, seems downright "small". However, something both cities have in common is their almost non-stop growth over the last decades. This highlights the powerful attraction that cities have – even more so today than a thousand years ago. In newly industrialising and developing countries urbanisation is advancing at pace and is still on the rise in Germany. By 2030 the global urbanisation rate will have climbed to some 60% – around 5 billion people will then live in cities.

We are thus facing a "renaissance of cities". Increasingly, how our society develops will be determined in cities: In the future, 80% of global social, economic and ecological development will take place in cities. It should be self-evident that this development has to be sustainable, but up to now this has been nothing more than a goal.

Achieving this goal must be our spur for the future. Changes in the environment and climate, economy and society are magnified in our cities and urban communities. The main challenges of our time – climate action, transforming our energy systems, resource conservation, demographic change, civil participation, equal opportunities and economic development – are most tangible in urban areas. As large-scale consumers of natural resources and major emitters, cities have an ambivalent relationship to the environment. City dwellers more often bear the brunt of negative environmental impacts. However, the density of cities also promotes the creation of efficient structures and they are key players in sustainable development. Cities have long been seen as the cradle of new ideas and hubs of economic development.

We may be able to flesh out the idea of sustainable development in cities, but whether we can put it into practice and carry it forward to the future will also be determined in cities. What exactly do we understand by "sustainable urban development", and how do we make the "city of the future" liveable for as many inhabitants as possible?

Truly sustainable urban development calls for integrated urban development planning and coherent political action across a range of policy areas – both within the field of environment through coordinated policies on water, air quality, waste management and nature conservation, and beyond that through integrated urban policies on energy, transport, industry and infrastructure. Urban development is a long-term, joint project for all social forces from politics, administration, science and civil society.

Particularly with regard to Germany, it is important to recognise that the megatrend of urbanisation is not a general trend. Few of Germany's major cities are growing, while many smaller and medium-sized towns are even experiencing de-urbanisation processes which likewise bring many problems in their wake.

Thus there can be no blueprint for sustainable development – we must coordinate and develop solutions tailored to the individual case and to local conditions, working with and for local communities. However, cooperation at international, national, regional and municipal level is particularly important and this is reflected in the ongoing political debate. For instance, preparations for the United Nations Human Settlements Programme UN-Habitat are taking shape worldwide. At the Habitat III conference in 2016 a "New Urban

Dr Barbara Hendricks, Federal Minister for Environment, Nature Conservation, Building & Nuclear Safety

Agenda" is expected to be adopted for the next 20 years. Germany is actively engaging in these debates, also in close cooperation with its European partners.

At national government level the reorganisation of the ministry has brought environmental protection and nature conservation under one roof with the allegedly opposing fields of building and urban development. The broader base of the ministry allows it to reflect the entire spectrum of sustainable development, and to take the ecological, economic and social dimensions of sustainability into account. If policy is to be sustainable and successful in our everyday reality – and ultimately that means achieving sustained success – policymakers must take a more holistic approach, recognising and addressing conflicts of interest at an early stage.

In order to better coordinate ongoing programmes, establish networks between research projects at different levels and tap new fields of action for innovation and research, the ministry is currently working with other government departments, scientists and municipal administrators to develop a strategic research and innovation agenda as part of the National Platform for the City of the Future (Nationale Plattform Zukunftsstadt).

One topic under intensive discussion in this platform is municipal climate action – for it is only at municipal

level that concrete climate action can take place. More and more German cities, municipalities and districts are implementing measures to reduce their greenhouse gas emissions. The Federal Environment Ministry promotes municipal climate projects and supports the appointment of climate managers, for instance, or the elaboration of climate action plans which help municipalities to implement their climate targets. Of particular note in this context are the 19 "master plan municipalities", supported by the Federal Environment Ministry. They embody the ideal of a sustainable city. They have set themselves very ambitious targets – minus 95% greenhouse gas emissions and minus 50% energy consumption by 2050 compared to 1990 levels. These targets cannot be achieved solely through climate measures in the known relevant sectors. The master plans outlining the course up to 2050, which were adopted by the highest municipal body, must also provide for the adaptation of administrative structures and ensure the long-term involvement of all local players, from the regional business and financial sectors to associations, churches and the local population.

Other important aspects are recreational options close to people's homes and areas which enable nature to be experienced in the city as well. Attractive green spaces enhance quality of life, support biological diversity in the city and are beneficial for the climate. At the same time we need to ensure greater social justice and improve the living situation of those with a lower socio-economic status. For this reason, in future urban development policy must take urban nature conservation into greater account.

Our goal is to make an active contribution towards a sustainable, liveable future – and to ensure that the conditions needed for this are established in our cities. ∎

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Dr Barbara Hendricks
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Fresh air and thinking for cities

Teresa Gonzalez Rico, Future Cities Catapult project leader, and Han Pham, Experience Strategist for Intel, suggest how the challenge of air quality could uncover new ways to work together as part of the "Sensing London" project...

Air quality is one of our cities' biggest challenges which affects everyone. Air respects no political or geographical boundaries, and is a growing global issue that is at once pervasive and particular to the context of each city.

The impacts of air pollution can seem daunting on many levels. Financially, the costs of PM2.5 levels to the UK is in the range of £8-17bn per year according to the Policy Exchange report, "Something in the Air,"[1] and particulate matter is only one of the many air pollutants. From a health perspective, the World Health Organisation (WHO) has reported that over 7 million deaths around the world could be attributed to poor air quality in 2012.

Addressing the air quality issue is not simply an urban "problem", it's a question of how to address urban innovation in a way that is grounded but forward thinking as well as sustainable – environmentally, economically and socially. As part of our Sensing London project, we believe it's possible, and imperative, to think about innovation collaboratively.

Urban innovation needs collaborative innovation

How can we rethink how we monitor, measure and manage urban environments? How can we not only generate but share, learn about, and design with urban information in a way that it can create a more liveable, vibrant city?

"Sensing London aims to enable citizens to better understand issues of air quality, using distributed sensor networks to highlight and discuss the problem. It also generates data to better inform policy development by local authorities. In helping instrument and understand our cities, we support these discussions to sketch out a more sustainable mode for future cities", says Dan Hill, Executive Director of Futures and Best Practice for the Future Cities Catapult.

The Future Cities Catapult is one of 7 'Catapults' launched by the UK's Technology Strategy Board, with the aim to become a world-leading innovation centre focused on developing the solutions cities need if they are to have a strong economy, resilient environment and good quality of life for the people that live there.

The Sensing London project and the Future Cities Catapult (FCC), in collaboration with Intel Collaborative Research Institute (ICRI), The Royal Parks, ScienceScope, City Insights and others, will instrument the city with a low-cost, high-quality, open and replicable network of sensors able to measure a variety of environmental factors, starting with air quality, to help provide a foundation for evidence-based innovation that can help develop new products, services and business models that work for the long term benefit of our cities.

"One of the key tenets of our research is that we primarily position our work in field – if you're looking at designing for the urban environment, you have to be in it. You need to understand and design for the social, technological, environmental and political contexts of urban cities," says Dr. Duncan Wilson, Director of the Intel Collaborative Research Institute on Sustainable Connected Cities, a partnership between Intel, University College London and Imperial University (www.cities.io).

"What we have experienced, and learned from, in the past through placing our work in real world situations is that while some things have technical

challenges, it's also equal parts social, political, or environmental challenges that are equally as difficult or meaningful to address."

One of the aims of Sensing London is to make air quality – an invisible problem – a more tangible one by sensing air quality, increasing literacy and both sharing and designing with people tools that they can use to contribute to the solution(s).

"The Future Cities Catapult is one of 7 'Catapults' launched by the UK's Technology Strategy Board, with the aim to become a world-leading innovation centre focused on developing the solutions cities need if they are to have a strong economy, resilient environment and good quality of life for the people that live there."

Part of the project is to find new ways to trial and prototype innovations in a real city environment to build evidence of their performance in use. Over the long term, insights from data will provide a foundation for evidence-based solutions to help us support small/medium enterprises' (SMEs) to develop new urban services that meet the needs of the citizens and the city systems that affect, and are affected by, air quality.

Driving innovation in the real city: 3 insights

Issues like air quality are too big and complex to be addressed in isolation.

Our approach to designing these integrated solutions uses three core processes that inform and inspire the way we work:

1. Putting citizens at the heart of our work and our research.
Researchers and designers spend time in the field to carry out in-depth interviews to paint a picture of people's mental models, everyday practices, and understanding around air quality to highlight insights

and design interventions that work with, and for, people's lives.

By sharing these learnings with communities across London to help inspire new ways to raise awareness about air quality or address needs and interests of specific audiences, we can help turn an air quality "issue" into a chance to change the way we think about, create, and sustain the cities we live in.

2. Leading a multi stakeholder co-creation process.
Throughout the length of the project, Intel and Future Cities Catapult also work with city councils to understand the pressures and requirements that are asked of them in regards to air quality.

As part of the project, for example, in Enfield Borough Council, 100 air quality sensor nodes will be deployed across the borough in coordination with the council and community. The aim is to help catalyse more diverse ways of thinking by bringing together citizens to local business, and public authorities to academia to be part of the solution to investigate and design the next generation of sensing technology and city services together.

"Citizens have to be involved, because like all of us, we are the ones creating air pollution. So, we need to help people consider: how do you approach your travel? We all have social responsibility towards our environment. If we don't take that responsibility, things are never going to improve. What we probably need is a culture change. We're at the first step now of something that is really very different," raises Ned Johnson, Principal Environmental Health Officer at Enfield Council.

3. Prototyping and testing performance-in-use of innovative solutions
AQ sensor experts are part of the project to develop low cost sensing devices that provide data in real time. In addition, taking a design approach to prototyping, the team is integrating skills ranging from design to

anthropology or data science, to develop solutions that are inclusive and take into account people as well as city systems. Doing this in an open way strives to involve citizens in the process and this transparency inspires trust. The goal is to design technology that can be trusted, but also interventions that people will care about.

Greg Jackson, a design technologist at Intel, says, "One of the big challenges when working with sensors is quality of sensing. Sensors have different quality levels and different accuracies. Sensor data could be influenced by placing them at a different height, heat source or breeze – all of which could possibly skew sensor readings if they're not calibrated well. A core challenge in making these technologies more accessible and meaningful to the public occurs not only in providing sensors or data, but in how to help people look beneath it. So it's more than building technology that can give you data, it's building a culture of data literacy. It comes back to people, as well as the technology."

Innovating the way we live: How can urban data be relevant to our daily lives?

Sensing London is not only asking questions about how cities can approach 'fresh air' and fresh thinking better together, but is also considering how Sensing London can help citizens understand such questions as:

• **Innovating Policy:** Can designing cities collaboratively change how we govern?

• **Innovating Technology:** How do you build more transparent technologies?

• **Innovating Information:** In an already busy world, how do you design for information so that it's simple to understand and act upon, whether you're a citizen or leading the local government?

• **Innovating Collaborative Cities:** How do we get people to participate long-term and feel a sense of belonging and ownership of their future cities?

"One of the aims of Sensing London is to make air quality – an invisible problem – a more tangible one by sensing air quality, increasing literacy and both sharing and designing with people tools that they can use to contribute to the solution(s)."

Tim Brooke, a creative technologist with the FCC, suggests designing future cities is a shared learning process that is collaborative and iterative. "Bringing ideas to life early on in a project makes sense – you can quickly assess what works and what doesn't and learn from the process."

In sensing – and learning – about London, we welcome you join in us in considering: What would you sense about your city to help you create fresh thinking to city challenges? ∎

Share your ideas with us, or if you're working on something similar and would like to explore how you could work with ICRI-Cities or the Catapult, please contact: hello@cities.io and info@futurecities.catapult.org.uk.

[1] "Something in the Air", Policy Exchange, 2012

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Home Office Building on Marsham Street, Westminster

Public sector property management

Adjacent Government takes a look at how government departments such as the Department for Communities and Local Government (DCLG) manage their estates...

Managing public sector buildings is an arduous task. In line with budget cuts, a number of central government departments have streamlined their offices and created efficient fit for purpose estates that deliver value for money.

In 2012 the National Audit Office (NAO) published a report that looked at the efficiency of central government office property since 2004. The report found that departments had made good progress in improving efficiency of their office estate – but need to stop managing their estates in isolation from one another, in order to achieve best value.

£100m was raised by Ministers in 2012, by disposing of unwanted properties and renegotiating leases.

However, Cabinet Office Minister Francis Maude said that the government had "to make better use of space, and put an end to the days where government estate was bigger, inefficient and went without scrutiny."

He also said: "Government will always need property but it can only be right that the public see what property is held and how efficiently it is being used." [1]

The Government Property Unit (GPU) was put in place (in 2010) to create an effective and efficient government estate, which provides value for money for the taxpayer, reduces our environmental impact and enables improvements in the way we work. As well as, making savings by reducing the amount of locations used by government.

Eland House in Victoria the old home of DCLG

The NAO report found that since its establishment in 2010, the Unit has been slow to change the way government manages its estate. In its first year it concentrated on developing plans to transfer control over the estate to a central body, which it failed to gain support for.

"Government departments such as DCLG work with private sector bodies in order to create service delivery efficiencies relating to their property."

The Estates Professional Services Framework (EPS) agreement was created as part of the government's vision to create an efficient, fit-for-purpose and sustainable estate. The Framework runs for 4 years from April 2013 to 2017, and covers a wide range of property-related services which will help the majority of UK public sector bodies including central government departments – such as Department for Communities and Local Government (DCLG) and Department for Education (DfE), NHS bodies, local authorities, and emergency services.

Government departments such as DCLG work with private sector bodies in order to create service delivery efficiencies relating to their property. Framework agreements of this sort are crucial for central government departments looking for cost effective solutions to managing estate professional services.

Private sector partners such as GVA Grimley offer expert property services to government departments, and local authorities. As part of the framework agreement they work in partnerships with the public sector organisation and deliver cost effective services that are essential to that organisation.

In August this year, Ministers and staff at the Department for Communities and Local Government moved into offices with the Home Office. The NAO noted that the DCLG move will save taxpayers an estimated £220m over the remaining lifetime of the PFI contract.

The relocation from the Eland House office in Victoria to the Home Office building Marsham Street, Westminster, was ordered by Secretary of State for Communities and Local Government, Eric Pickles.

The Secretary of State said: "There is still immense inefficiency across the public sector. By sharing services and streamlining our own back office, we are practising what we preach to town halls by illustrating the scope to save even more taxpayers' money.

"And in waving goodbye to an old building which will be turned into new shops and offices, we are also doing our bit to support the existing regeneration of London's Victoria." [2] ∎

[1] http://www.bbc.co.uk/news/uk-politics-16534655

[2] https://www.gov.uk/government/news/eric-pickles-to-save-taxpayers-220-million-as-he-bunks-in-with-the-home-office

A supporter of the Crown Commercial Service EPS framework

GVA is one of the leading providers of estates professional services to Central Government and the wider Public Sector. The firm is also a strategic partner on the Crown Commercial Service framework RM928 through which it has been appointment on multiple direct awards on a national basis. We're:

• **Ranked No. 1** (by fees) by the Estate Gazette within our peer group in advising Central Government departments backed by the Government Transparency Agenda; and

• **Ranked No. 1** for favourability and repeat business by Public Sector respondents to the Sharps Brand Acritas Survey.

GVA has 12 UK offices providing multidisciplinary advice to the public and private sectors and our Client's include DIO, MoJ, DCLG, DfE, HM Land Registry and HMRC as well as Birmingham and Manchester City Councils and multiple London Boroughs amongst others.

At GVA our dedicated teams exploit options to enable property to contribute to business strategy. Savings here can have a direct impact on the bottom line and opportunities include:

1. Lease restructuring
Certain properties will be considered core to the business, even in a downturn. An early renewal should generate a rent free or capital contribution. Maximising your Public Sector covenant that suits your operational needs can generate a positive result.

2. Break options
These can be a very cost effective way of reducing cash burn. However, plan early for them because many breaks have onerous conditions, and landlords might fight hard to frustrate you exercising your break options. A looming break option has a depressing effect on a landlord's investment value. If the premises are core, consider 'selling' the break to the landlord for a rent free period or cash contribution.

3. Lease expiry
Exiting on lease expiries is an extremely cost effective way of reducing cash burn, but, again, plan well in advance in order to reduce the operational impact on your business. Dilapidation claims should be strongly challenged.

4. Surplus or underused assets
An accurate portfolio assessment will also allow you to properly assess the merits of potential deals on surplus space; be that assignment, subletting or surrender.

Co-locating together can have a positive effect on the overall cost saving that can be achieved. MOTOs can help provide flexibility and certainty for all parties.

5. Assets sales
It's important to have a realistic expectation of price, and knowing the local markets is essential. It's also worth considering a revised planning zoning/consent to enhance value depending on how 'time critical' the generation of a capital receipt might be.

Always consider the long term impact of such activity against the short term benefits of cash injection.

6. Property cost audit
Many organisations do not have a clear overview of their property costs because payments come from different budgets but the core areas are:

• **Rates –** Challenging the current assessment with a view to securing a rate refund and reduced future payments needs to be considered for every property, including checking transition relief calculations and other relief. Many occupiers employ GVA rating surveyors to negotiate reduced assessments and this is a great way of generating cash quickly at no net cost.

• **Forensic Rates Audit –** Reviewing historic information and payments in a forensic manner can often yield discrepancies that can be discussed. GVA has saved over £500m.

• **Service charges –** Thoroughly questioning budgets and reconciliations provided by landlords frequently yields

cash savings. That should include revisiting historic service charges to check for errors which may lead to cash reimbursement.

• **Energy/utility use audits –** Are your buildings and services running as efficiently as they should and are you paying the lowest price? Thinking, acting and 'going green' can and will save you money and minimise the impact of pending and future energy-related taxation/charging.

• **Portfolio analysis and data management –** Tactical decisions need to be informed by quality data and sound analysis of the relevant benefits when site by site tactics are being considered. Comprehensive property data is unfortunately often lacking. This forms the springboard for analysing the portfolio to identify savings.

• **Cost-in-use analysis –** A relative comparison of each of your facilities will quickly highlight those that are most expensive on a price per head, price per unit of production or any other business metric relevant to your organisation. This will demonstrate where the greatest savings can be achieved.

• **Space utilisation audit –** How efficiently you use your space – or remodel the business through any restructuring - will be key to freeing up more space for your own use (or that of the wider public sector) or for disposal. By clearly understanding your internal key drivers will either reduce your occupational running costs of generate a capital receipt for potential re-investment.

On the Crown Commercial Services framework RM928, GVA acts across all mandatory and non mandatory services without the need to sub contract. We are therefore able to provide a holistic and comprehensive service to existing and new clients particularly where GPU interaction is needed to reduce costs and further rationalise an estate to deliver efficiency savings and/or capital receipts.

For more information on how GVA can assist you, please contact us using the details below.

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Smarter Printing for Construction

By Rob Brown, OKI Business Manager for managed document services

The construction industry was hit hard by the recession as housing activity slumped and building projects were cancelled. Recent months have seen a recovery but as construction businesses emerge from the downturn, many are uncertain what approach to take to printing.

Construction companies need accessible printing that is dependable and of high graphical quality. Yet, many such firms remain reluctant to make large investments in new solutions. Instead they often just struggle on, wasting money through inefficient processes and ageing printers.

The construction sector would benefit from a third approach, which involves buying printing as a service which develops with their business. Managed print services is often the ideal solution here.

That is because, instead of requiring them to make an upfront investment in the latest technology, it enables them to buy printers, supplies, maintenance and support in one all-inclusive ongoing contract as operational rather than capital expenditure. And these are exactly the kinds of benefits that OKI can deliver to construction sector businesses through its managed print services and associated managed page solutions.

An OKI managed print services implementation typically begins with an audit of existing practices including output volumes and printing types. By gaining a transparent view across the print landscape, a business can see where budget is spent and where it is potentially being wasted.

The results will be used to design a long-term print solution tailored to the needs of that organisation, helping ensure that the right printers are being used for the right job.

This approach also establishes best practices such as setting double-sided and mono printing as default options to save costs and drive energy efficiencies. In addition, it means just one contract for all printing and documents needs. This makes it easier to monitor on-going costs, reduce capital investment and control budgets.

For businesses that need more granular control, OKI offers a comprehensive managed page services approach. This involves OKI working with its customer to establish their print and document requirements; recommending the right printing device and delivering a tailored all-inclusive printing plan that covers all consumables and servicing, thereby improving productivity. The right device together with the right printing plan and the implementation of print policies will ensure the company pays a flat monthly fee for what it prints, so it can control its costs.

Of course, in implementing such an approach, vendors need to provide printing solutions that drive added value for their construction sector clients. The new OKI C931 A3 colour printer is one such solution, delivering the outstanding print quality that construction sector businesses need to print maps, plans and diagrams while pushing the boundaries of media flexibility.

What many construction businesses are looking for today is an approach that allows them to manage and control their spending on printing while enabling them to unleash their creativity with outstanding print quality and superior media flexibility. And that is exactly what OKI's services and solutions for the sector enable them to do.

For further information about OKI's products and services, please visit the OKI website, http://cleverprinters.co.uk/

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A land banking myth

House builders have been battling against the myth of land banking for some time. The evidence provided here by Stewart Baseley, Executive Chairman at the Home Builders Federation explodes that myth...

Accusations of "land hoarding" or land banking have long been used as a stick with which to beat house builders.

To inform the debate, HBF recently undertook a major survey comprising results from 23 members who together build around almost 40% of all the new homes in Great Britain, and that have some 220,000 plots in their 'land banks'.

Of their plots just 4% were on sites with an implementable permission where work on site had not yet been started – an incredibly low figure that supports what we have been saying for years and totally debunks the accusations being made.

4%, equates to 8,300 out of over 220,000 plots that were 'oven ready', or what could be described accusatorially as a land bank and not underway. Even extrapolating this out to get a rough picture for the entire industry only gives us 22,000 plots – around the number of homes we need to be building each month to begin plugging the housing shortage.

The key statistic in my view was that over a quarter were plots with outline consent only. This is where the real focus should be, looking at how we speed up the planning system so that these plots can come forward. Our survey revealed nearly 60,000 plots stuck at outline stage and if you applied this figure on a proportional basis it implies the whole industry has over 150,000 homes in the planning system with an outline consent that is not yet implementable.

Of the rest, the vast majority, 63%, were on sites where work was already underway. Another 2% of plots were on sites that were not currently viable.

Housing development is a long and complex process. From initially identifying a potential land opportunity,

through to completion of the first homes can take years. As a result, home builders need to have an adequate supply of land in the pipeline to responsibly manage their building programmes. A more accurate, and certainly less emotive term for land banks would be "land in progress".

It is reasonable to ask how much "land in progress" a house builder needs. Experts who have studied this suggest it needs to be at least 3 years supply. Local authorities are required to have an identified 5 year land supply, so they should actually be able to identify land for around 600,000 homes at today's building rates, or well over a million homes if we are to meet future housing requirements, many of which should have some form of planning permission.

Looking at it logically, with Help to Buy driving demand, why on earth would house builders, who only realise profit if they develop housing, sit on land?

With buyers eager to buy new homes, all the evidence now shows that builders are building out existing sites more quickly and so want to get onto new ones sooner. Sitting on land in the hope that inflation might compensate for the impact such a decision would have on the builder's return on capital employed makes very little business sense.

Of course, our statistics only bear out what numerous other independent or official investigations have shown. Kate Barker, in her seminal review of housing supply 10 years ago, dismissed the proposition that builders land banked; as did the Calcutt Review in 2007. Then in 2008 as part of its exhaustive study of 'Home Building in the UK', the OFT said 'it could find no evidence that home builders hoard land', a view supported in more recent reports by Savills, and Molior. Yet despite the sizeable, and growing evidence base, the myth persists.

The statistics we compiled largely reflect those in reports issued regularly by the Local Government Association (LGA). However, the LGA's press statements, and indeed the subsequent media reporting, fail to distinguish between implementable and outline permissions, or the plots on sites already underway, with everything conveniently labelled 'land bank'.

Their report shows that 167,000 of the 323,000 plots they measure are on sites already under construction. On their measure, if you get planning permission for a site with 15,000 homes, until that last house is built and sold, all those 15,000 remain in the 'land bank'. So in reality, the figure they claim to be a 'land bank' contains thousands of homes that are not only built, but indeed have been sold and are being lived in.

Similarly their 'land bank' figure fails to differentiate between an outline and an implementable permission. So in many instances the site's developer is being accused of sitting on, or hoarding land which they cannot get onto as they are awaiting Reserved Matters to be approved, or for the local authority to discharge pre-commencement conditions.

When you look beyond the rhetoric and consider the realities, the facts are quite clear. House builders do not sit on land that has an implementable planning permission.

The challenge is to address the real problems that restrict the amount – and speed – of land coming through the planning system. With Help to Buy stimulating demand, now is the time to step up supply and the planning system needs to react accordingly if continued increases are to be sustained.

Rather than focus on the sites not being built, I would welcome the same passion and energy being devoted to a sensible discussion about how we tackle the long-entrenched problems in the planning system – and where we are going to build the homes the country desperately needs. ∎

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A proactive approach to homelessness

While some organisations are trying to deter rough sleepers, Wigan Council are undergoing actions to provide support services, here Councillor Chris Ready, Cabinet Member for Housing explains...

The recent row about metal spikes placed outside buildings to deter rough sleepers thrust the issue of homelessness into the headlines.

The practice caused outrage and a number of banks and shops, under pressure from the public, were forced to remove the spikes from outside their properties. It seemed to say something uncomfortable about modern Britain, that some of our most vulnerable people were being treated like pests. Has duty of care to the most in need – even basic human compassion – been lost in our new age of austerity?

I'm pleased to say that's not the case here in Wigan. While the row about metal spikes was brewing, our staff were working hard on a plan to achieve the government's gold standard in housing support. It follows an inspection by the National Practitioner Support Service earlier this year that found our approach to homelessness to be above the national benchmark and excellent in many areas.

While some organisations are putting spikes in the ground to keep rough sleepers from their premises, in Wigan we are demonstrating that even with the financial pressures all local authorities face, it is still possible to offer outstanding services to those in serious need of support.

Since 2010, we've seen our budget cut by 30% – one of the largest reductions faced by any local authority. Having already saved more than £64.8m, we've got to save another £41m over the next 3 years. Throughout this process, the council is committed to protecting services for the most vulnerable such as the homeless, or those at risk of becoming homeless.

So much so, we launched a new homeless strategy for the next 4 years. The strategy was developed at a time of unprecedented change in national policy and reductions in public expenditure in areas such as welfare and social housing. Our aim was to produce a strategy fit for our housing advice and homelessness services needs in the future.

The absolute focus is on a proactive and preventative approach to tackling the causes of homelessness and not just dealing with its effects. So, working with our partners in the public sector and other organisations such as the Citizens' Advice Bureau, we identify households most at risk of homelessness and make sure they get the best advice and support at the earliest possible stage.

For example, we noticed we were seeing more people with multiple debts coming to our prevention service. We now target households with high debt levels, giving them training and advice on managing their money. Our aim is to step in before someone finds themselves with a housing crisis.

This approach relies on working closely with our partners who we have a strong relationship with, something praised in the inspection earlier this year. A key element of our strategy is now tailored to address the impact of welfare reform, something identified as the greatest threat to future homeless-ness. With Wigan and Leigh Housing (WALH), who manage the council's housing stock, we've been looking at what can be done to prevent people becoming homeless. WALH now has a new arrears protocol for tenants, a new home finder service and has incentivised mutual housing exchanges.

We've also invested in our services, and now have a dedicated housing advice worker who specialises in cases of domestic abuse, providing advice and assis-tance to victims. Domestic abuse has been identified as another major cause of homelessness in Wigan.

Thankfully, the rate of homelessness is declining in the borough year on year – a major achievement at a time of economic depression. But we're continuing to seek improvement in our services. We want to end rough sleeping. Last year we had 13 individuals who regularly slept on the streets. Even in a borough of 320,000 people, that's 13 too many.

"The absolute focus is on a proactive and preventative approach to tackling the causes of homelessness and not just dealing with its effects."

Homelessness is a complex problem requiring complex solutions. At a time of diminishing budgets, councils have to be smart and sympathetic in dealing with the issue. We think by acting early and involving our partners, we can prevent people from becoming homeless in the first place.

I'm proud our service and strategy has been recognised as excellent. We've shown you can do something positive to help the homeless and those at risk of becoming homeless. And that certainly does not involve spikes. ■

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Councillor Chris Ready
Cabinet Member for Housing
Wigan Council
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Suppressing the fire

An effective sprinkler system can reduce a multitude of costs from fire and here, Steve Mills, BAFSA Fire & Service Co-ordinator provides the evidence...

Since the very first occasion that mankind used fire to cook and keep himself warm the phenomena of fire has been the proverbial 'double edged sword'. Humankind has been able to harness its power to amazing creative effect but has also felt the destructive force and human tragedy that fire has the potential to unleash. To know and feel that destructive element is perhaps everyone's worst nightmare.

It was in response to that fear, witnessed in some very dramatic and tragic fires, and of course the financial benefits of not losing all one's possessions, that some were determined in seeking a way of automatically dousing fire with water. Pioneering work came to a head, if you will excuse the pun, with the development of the world's first automatic fire sprinklers in the 19th century and, though one has to say that the basic premise has remained true, since that time the concept has been continually developed. This has been achieved through thorough testing and design development, mainly aimed at reducing the economic cost of fire. It has been in more recent years that the potential life safety benefits of sprinklers have been portrayed, but has all this work been effective?

There is an array of statistics, produced from a variety of sources to show how effective sprinklers (aka water based fire suppression systems) are, and these can be most useful in discovering the potential benefits sprinklers have in controlling fire. For instance, a quick web search of 'fire sprinkler facts' gave the following result:

- 99% of fires were controlled by sprinklers alone;

- 60% of fires were controlled by the spray from no more than 4 sprinklers;

- In New Zealand, where all fires have had to be reported for over 100 years, records show that sprinklers have been effective in 99.7% of cases.[1]

One has to say that these kind of statistics are very powerful but there is also other information which is not so unequivocal. Some of these have been produced in research documents over recent years which, whilst upholding the benefits of sprinklers have shown a more 'cautious' endorsement.

In addition, the information released by the DCLG (Department for Communities and Local Government) in their latest 2011-2012 fire statistics, as gathered from fire and rescue service reporting show that:

In 2010-11 there were 408 fires with the outcome where sprinklers were present in the room of origin. 43 fires were in dwellings and 365 fires were in other buildings. Of these, 172 (42%) were extinguished/contained/controlled, 29 (7%) did not contain/control the fire, and 207 (51%) were not known.

For the purposes of this article I will discount the other DCLG statistical information relating to sprinklers being on the same floor as the fire – not I feel an unreasonable premise – that for any suppression system to be effective, it has to be in the same room as the fire (room of origin).

As can be deduced from the above, it would appear that there are large differentials of how effective sprinklers actually are if we look at statistical evidence

only, especially as many sprinkler activations are believed to go unrecorded. What is perhaps needed is a broader view of the facts.

Seeking practical experience

As one with a fire & rescue service background, I am keen to understand and investigate the practical outworking of how sprinkler systems operate in real fire situations and how best to gather this information, and what information is likely to be of use.

Thanks to a growing network of people who diligently record information where sprinkler activations occur, a broader picture is emerging of their usefulness in controlling fire in a wide variety of building types. Since first collecting such information in 2010 two things have become clear:

1) In the incidents reported, sprinklers are shown to be extremely effective in controlling fire size;

2) The level of interest shown in sprinkler incidents each year is growing;

   2011: 32 incidents reported

   2012: 60 incidents reported

   2013: 63 incidents reported.

Since the introduction to this country of fire sprinklers into the residential and domestic arena, there have been a number of recorded sprinkler 'saves' in the home environment. However, the majority of recorded incidents appear to occur in commercial and industrial premises and this may be for a variety of reasons possibly relating to insurance claims, resetting of systems being seen as more of a priority for large premises, or a reticence to call the fire and rescue services to a controlled fire situation.

My figures for the past 2 years show the following breakdown of premise types where sprinkler actuations have been notified.

	2012	2013
Factories	25	23
Warehouses	5	3
Retail/Entertainment	16	11
Schools	2	6
Dom/Res	7	11
Hotel	2	2
PPS	2	3
Recycling		3

For the vast majority of these cases, the outcome has been very successful in terms of the low number of systems that were actually triggered and the amount of fire damage caused to the property concerned. The most notable 'failures' of sprinkler systems occur where the system has been turned off or decommissioned, and at least three commercial incidents have been recorded where this has happened and the building concerned has been totally lost.

Two fires: different outcomes

It is often said that one picture can paint a thousand words and one of the most interesting aspects of the appraisal of sprinkler effectiveness can occur when photographs of incidents turn up from time to time. These really help to put the amount of fire damage into perspective. For instance, it is widely believed that sprinklers are ineffective at controlling kitchen fires, especially those involving burning oil or fat products.

It is generally understood that up to 60% of all household fires occur in the kitchen or are cooking related, so can sprinklers make a difference? Many of the 'domestic' incidents related to me seem to involve such fires and it is surprising to see how effective sprinklers are in such circumstances.

Courtesy of West Midlands Fire service

Below are 2 fire outcomes, the first following a cooker fire in a HMO in Birmingham.

As you can see from the photograph (above), the fire was intense enough to strip the plaster from the walls and incinerate most of the contents of the room. Fortunately no one was hurt but the roof was lost and several other tenants in the building had to be re-homed. The cost of repairs ran into several thousands of pounds and took several months to undertake, during which time all revenue from tenants was lost.

The second fire occurred in Brighton and this too involved a fat pan fire. The outcome, as can be seen from the photograph (opposite), is completely different, and the contrast stark.

As the fire became hot enough, a single ceiling mounted sprinkler head nearest to the cooker activated (this is normally at about 70ºC) and prevented the fire from taking hold. The occupant, a person known to be vulnerable from fire, was able to stay in her flat following the clean-up operations.

It is at this point worth mentioning that the fire service advice is never to throw water onto a fat pan fire as this is extremely dangerous and will cause the fire to dramatically flare up with potentially life-threatening consequences. This advice remains sound. Never throw water on to a fat pan fire or try to move a flaming pan of oil. While it is true that sprinklers do apply water to the fire, the way they do it, in small droplet form, allows heat to be far more rapidly absorbed and this aids suppression of the fire.

How do sprinklers suppress fire?

Fire spreads by conduction through solid matter, radiation and convection through the gaseous products of combustion. It is a 3 dimensional effect meaning that a fire can get rapidly out of hand. Sprinklers have been shown to be very effective in controlling fire spread and this is borne out in my data and from fire testing.

Courtesy of East Sussex Fire and Rescue Service

"Thanks to a growing network of people who diligently record information where sprinkler activations occur, a broader picture is emerging of their usefulness in controlling fire in a wide variety of building types."

other countries, especially in the residential and domestic field where sprinkler systems have been in use for a much longer period.

While this article reflects just a snapshot of all the sprinkler activations that are occurring, it does contain a common thread to show that where a correctly designed, installed and maintained sprinkler system is activated by fire, the outcomes show reduced fire damage, increased resilience and reduced costs from fire, improved business continuity and less environmental damage.

I leave you to draw your own conclusions. ■

[1] Fire Sprinkler Information and Discussion Forum

Firstly the water from the sprinkler head(s) introduces cooling/wetting to the fire area. This helps to control all three types of fire spread.

Fire gases are rapidly cooled and this is effective in preventing 'flashover', where flame propagation in the room is uncontrolled and everything is consumed by fire.

In addition, as water from the sprinkler wets the items surrounding the fire, this makes it more difficult for radiation to set fire to nearby objects such as furniture.

There is also strong evidence to suggest that as the water droplets pass through the fire gases, a certain amount of 'scrubbing' takes place, reducing the toxicity of the products of combustion.

What is the conclusion?

Evidence from sprinklers activated in fires within the United Kingdom is beginning to match that from

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The fire safety competency challenge

The fire sector has responded to questions raised by Brandon Lewis, former Fire Minister, at a recent conference. Here, Graham Ellicott, CEO of the Fire Industry Association (FIA) provides an overview of the discussions...

The opening address at a recent 'fire event' in the Palace of Westminster was given by Brandon Lewis, Department for Communities and Local Government (DCLG) former Under Secretary of State (aka the 'Fire Minister') with responsibilities that include fire. He laid emphasis on the fact that prevention and protection are now the front line for the Fire and Rescue Services.

The evidence of this is there for all to see, as over the last 10 years there has been a 35% reduction in domestic fatalities so this approach, in conjunction with the efforts from other fire stakeholders is paying dividends. Brandon threw down 2 challenges to all in the fire sector, namely:

• How can we keep up this reduction in fire fatalities?

• How can competency become the norm for all in the fire sector?

Other speakers at the event addressed the issues highlighted by Brandon. For example, a senior fire engineer commented that competency is required from all involved with fire safety whether their buildings be 'code compliant' or fire engineered. He went on to say

that it should be remembered that however good the fire design of a building, it can be 'undone' by poor construction and maintenance. A discussion ensued as to whether all fire engineering is value engineering as there had been some comments about this earlier on, most of it being anecdotal with no hard evidence.

The competency theme was built upon by a representative from a fire research facility who asked why Building Regulations 7 (materials and workmanship) and 38 (provision of fire safety information to the responsible person) aren't adhered to so that the building is 'safe' and its subsequent occupiers are fully informed of its fire protection systems. To supplement these comments it should be appreciated that Approved Document B (the fire guidance document to the Building Regulations) says:

"Building Control Bodies may accept the certification of the installation or maintenance of products, components, materials or structures as evidence of compliance with the relevant standard. Nonetheless, a Building Control Body will wish to establish, in advance of the work, that any such scheme is adequate for the purpose of the Building Regulations."

In part this answers Brandon's competency challenge, as if the Materials and initial workmanship are dealt with by certification schemes and then if the appropriate paperwork and associated information are passed on to the responsible person, then they can ensure that the building is kept 'fire safe'. However, Brandon could bring influence to bear by ensuring that only competent people (those that are members of suitable schemes) are used on all buildings or as a minimum on those that employ the use of taxpayers' money.

A National Social Housing Fire Strategy Group representative echoed the previous speaker's views by arguing that there is a real need to sort out Building Regulation 38 and the way that it is implemented and enforced. Indeed, one has to ask the question as to who has heard of Regulation 38 and my bet is that few hands would go up in any room; so if nobody's heard of it then it's a fair bet to say that it's enforcement is likely to be negligible as well. The Fire Sector isn't happy with this state of affairs as information supplied under the auspices of Regulation 38 provides a very good basis for the 'production' of a good fire risk assessment for the building in question. In order to address this situation a working group has been set up to report the Fire Sector Federation's Technical Guidance Workstream. It is expected that this working group will report back later in 2014, so we may be able to discuss more of that in the future.

A thoughtful presentation from the Fire Protection Association posed the question as to why the government won't legislate to protect:

- The most vulnerable in society from fire;

- Those people affected by others over whom they have no control when it comes to fire;

- Very large premises from the ravages of fire which can cause loss of life, property damage and reduced levels of employment.

In particular, the comment concerning the most vulnerable in society would drive down fire deaths in this demographic group. Such legislation would include the provision of the appropriate fire protection systems (fire detection, suppression etc.) at the change of a tenancy. Indeed, past Westminster events have included presentations on the level of fire deaths in rental accommodation, and in particular those properties where there is no working smoke detection. A similar piece of legislation applies in Scotland under the 'Repairing Obligations' so one must ask why the English rental property is not treated in the same way? Hopefully Brandon is now listening as government announced on 20 November 2013 that it would be carrying out a review as to whether new rules are required for carbon monoxide and smoke detectors in private accommodation. This Rented Sector Review closed on 28 March 2014 and the results of this have not yet been issued.

The government's own champion for fire safety in rental accommodation gave a presentation concerning Firemark, which is a training and advice tool for all of those involved with fire safety in rental accommodation. He indicated that when he asked Brandon's predecessor Bob Neill about the implementation of Firemark, he was told 'you don't get it do you, just get on with it'.

Now, that last comment is a pragmatic attitude that could be applied to all of us in the fire sector including the Minister, and only time will tell if he takes note of the answers from the fire sector to the questions that he posed – only time will tell. ■

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Asbestos in schools: time for better management?

The latest Health and Safety Executive advice is that schools should identify, protect and manage asbestos-containing materials. Planning and Building Control Today assesses the current thinking...

In 2013, the Committee on Carcinogenicity (CoC) confirmed that children are more vulnerable to asbestos exposure than adults, as they have a longer time for an asbestos disease to develop. Figures suggest that the lifetime risk of developing mesothelioma for a 5 year old child is about 5 times greater than an adult aged 30.

In light of the findings from the CoC, the Department for Education (DfE) pledged to review its policy by launching the consultation: Asbestos management in schools: DfE policy review.

The consultation sought to hear from those involved in the day-to-day management of asbestos in schools about how effective current guidance is, how asbestos is being managed, what the barriers are to effective management, and how it can better support schools.

Around 75% of UK state schools contain asbestos and more than 140 school teachers have died from the asbestos cancer mesothelioma in the past 10 years.

Campaigners such as the Joint Union Asbestos Committee (JUAC) have been calling for a full audit of the schools estate to establish the condition of asbestos-containing materials. They also want to see a programme to remove completely all asbestos. As Julie Winn, Chair of JUAC said in the April edition of Planning and Building Control Today:

"The only long-term solution to preventing exposure to asbestos in schools is a strategic national plan for the phased removal of asbestos with priority being given to the most dangerous asbestos. Other countries have recognised the problem of asbestos in public buildings and have committed to a long term

policy of phased removal. We believe that a phased removal of asbestos from schools should be adopted as national policy in the UK and if this action is not taken, then asbestos will remain a problem in schools indefinitely."

Current government policy however, based on Health and Safety Executive (HSE) advice is that schools should identify, protect and manage asbestos-containing materials (ACMs), rather than remove them (the findings are outlined below). It is thought that the cost alone of removing all asbestos from schools prevents the government from taking action.

Speaking at the time of the CoC's finding last year, chair of the Asbestos in Schools campaign group Annette Brooke MP, said:

"The Department for Education must publish a strategic plan involving an audit of school buildings and an assessment of the risks. Over a period of time the plan must aim for the removal of the most dangerous asbestos materials."

As we finalise this issue of Adjacent Government, the DfE are yet to publish the results of the consultation, however, in June, the Health and Safety Executive (HSE) announced their results of asbestos management in schools inspections which took place between April 2013 and January 2014. The randomly selected sample of 153 non-local authority schools also included independent, voluntary aided and foundation schools, free schools and academies.

The aim of the initiative was to assess the level of compliance with The Control of Asbestos Regulations 2012 (CAR) which places duties on those who have

responsibilities for the maintenance of work premises, including schools, to manage the risk from asbestos.

Overall, the HSE found the duty holders' awareness of their legal responsibilities was 9% higher than the level found in the 2010/11 inspection programme, with 95% of schools having a full or broad understanding of the requirements.

The majority of schools that were inspected (71%) required either no further action or were given straightforward advice. However, 44 schools (29%) received written advice, with enforcement action taken in 20 of these schools (13%) – an Improvement Notice was served on each of these 20 schools. In 2010/11, HSE served 41 Improvement Notices on 28 schools (17% of the schools visited).

Geoff Cox, the Head of HSE's Public Services Sector, said:

"Over the last few years there has been a lot of work by stakeholders across the school sector to raise awareness of the duty to manage asbestos. It is really encouraging to see that awareness of the requirements has increased since our previous inspection initiative.

"That said, schools should not be under any illusion – managing asbestos requires ongoing attention. Schools now have access to a wealth of guidance setting out clear and straightforward steps to achieve and maintain compliance.

"Where duty holders fall below acceptable standards, HSE has taken, and will continue to take, enforcement action".

Key findings

The results of these inspections should make clear to schools that managing asbestos requires ongoing attention.

The HSE say that schools should focus particular attention on the following issues:

Schools should make sure that their records are up to date. The management survey is an essential part of these records – its purpose is to locate ACMs that could be damaged or disturbed by normal activities, by foreseeable maintenance, or when installing new equipment.

Schools must have an asbestos management plan. Where the status of a school changes from local authority control, the management team needs to be fully conversant with the plan and should satisfy itself that local knowledge has been incorporated.

Schools must ensure that in-house operatives undertaking building and maintenance work have received adequate asbestos training. Equally, dutyholders should ensure that they only use contractors that are trained to a sufficient standard.

Schools must have a system to inform anyone who may disturb ACMs of the presence of asbestos. Methods commonly used include permit-to-work systems, labelling ACMs clearly, and providing a plan with the locations of all ACMs marked on it.

The HSE results clearly leave the emphasis on the requirements for managing asbestos in line with compliance with CAR. I am sure I'm not alone in eagerly awaiting the outcome of the DfE consultation which may yet pave the way for a strategic national plan for the phased removal of asbestos. ■

A full list of schools inspected by the HSE and the results of the inspection is available online at: http://www.hse.gov.uk/services/education/asbestos-management-1314.htm

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Climate action in the North

In a speech at the Ny-Ålesund Symposium in May, Minister for Climate and Environment in Norway, Tine Sundtoft highlights how Norway is a front-runner of international efforts to tackle climate change in arctic regions…

"Nor-way" actually means "the way to the North" in the Old Norwegian language, and this really is the High North, as the next stop is the North Pole.

Norwegians claim that Ny-Ålesund is the permanent settlement closest to the North Pole. Some Canadians and Greenlanders make the same claim about other places. But I dare say: Try to find a café, a post office or an airport anywhere else at 79 degrees north.

Let me try to illustrate how far north you are: I am from Lillesand in the south of Norway. If I travel the same distance from there, but go south instead of north, I would end up in Tunis in North Africa. From here to the North Pole is only half the distance as from here to Oslo.

No wonder many North Pole expeditions have started from Ny-Ålesund. (Most of them were not successful, but that is another story). The size of Bangladesh, Svalbard has about 2,500 inhabitants. "Svalbard found" is a statement in Viking Sagas from 1194. It is believed Norwegians travelled here from that time to hunt and fish.

In 1596 William Barents rediscovered Svalbard – or Spitsbergen as he called it – on his search for the North-east Passage. It then became the scene for the first race for oil in the Arctic, whale oil. Later, coal mining became the main source of income, and in Ny-Ålesund, the Kings Bay company operated the mine.

Today, things have changed. Research and tourism is more and more taking over the role of mining. There are now more than 40 nationalities present in Svalbard There is no better place to witness the large international presence than here in Ny-Ålesund:

Ny-Ålesund is a platform for international cooperation on polar research. Researchers from 11 different countries in addition to those from Norway are here in the summer. Outside, you can see 2 lions protecting the Chinese research station.

Climate action is at a stalemate. There are many important plans and proposals, but we are not moving fast enough, and the process needs help. Each and every one of you are here because we consider you to be an important player. Private businesses often come up with innovations for a low-emission future. They need a stable horizon and public support to enable a green growth shift.

Scientists can get the grave message out to the public by the media. We need more cooperation and coordination, as we are at risk of pushing our climate system toward irreversible changes. The sooner we act, the lower the risk and cost. This was summed up well in the latest report from the IPCC.

Nowhere do we see the impacts of climate change more evident than here in the Arctic. The region is warming 2 times faster than the global mean. The Arctic summer sea ice has shrunk by 14% per decade since 1979. Ice-free summers in the Arctic Ocean are "very likely" by mid-Century.

We can see the effects right out the window. This fjord, "Kongsfjorden", or "Kings Bay", used to be an Arctic fjord covered by ice till early summer. Here, polar bears were trying to catch seal at their breathing holes. Not anymore, as today Kongsfjorden, like most fjords at the western coast of Svalbard, is almost completely open year round. These are poor conditions for ice-seals and polar bears.

Hardly any ringed-seal pups survive their first years in

Tine Sundtoft, Minister of Climate & Environment

these waters anymore. I actually hesitate to talk about the polar bear in international meetings. The effects of climate change are worse in other parts of the world, where extreme weather threatens the livelihood and food security in many countries.

But the melting of the Arctic is not only a problem for polar bears – it is a global concern. The white Arctic sea ice is a good sun reflector, but the dark sea surface is less reflective. So when the ice disappears and the open waters absorb the sun's heat, global warming is amplified.

As a result of this, the melting of the Greenland ice sheet is also accelerating. That might lead to a rise in sea level with global consequences. The melting of Arctic sea ice also opens up economic opportunities, for example new shipping routes and new areas for commercial fishing. There is also discussion about oil and gas exploration up to the ice cap.

The risks and consequences of ice melting count more than these opportunities. I strongly believe in having a generation perspective and not only a perspective that lasts to the next election.

Norway will be a front-runner in the battle against climate change. Domestically, through policy incentives that drive innovation for a low-emission economy. And internationally, as a global leader for a strong international agreement in 2015:

• With mitigation numbers in Paris;

• With a support architecture that delivers results;

• A transformative agreement – building on green growth and climate resilience.

Norway will remain a front-runner in international efforts to combat deforestation. Sustainable land use can deliver at least 20% and as much as 60% of the emission cuts needed by 2030 to stay below the 2 degree target.

In addition, we will continue to create renewable energy in developing countries. We will combat short lived climate pollutants such as black carbon, a particular threat here in the Artic.

Norway will continue to work for a right price on carbon, and the other side of that coin is subsidies on fossil fuels. Polluters should pay, not receive subsidies.

Last October, I became a cabinet minister. Since then, my agenda has been extremely busy. It is therefore a privilege to focus on 1 issue for two whole days. Even better, with leading experts from research, government, private sector and media. Better still, in a place where my cell phone will not work!

My hope is that taking off your shoes and shaking you all together here in Ny-Ålesund will create a good environment for common thinking. Across disciplines. To discuss what are the best ideas, and how we can put them into practice.

Former American president Mr. Abraham Lincoln once said; "If we fail to prepare – we prepare to fail". Failing to meet the climate challenge is not an option – so let us start preparing! ∎

This is a speech that was given by the Minister at the Ny-Ålesund Symposium on 26 May 2014 – http://www.regjeringen.no/en/dep/kld/Whats-new/speeches-and-articles/the-ministers-speeches-and-articles/2014/Opening-statement-Breaking-the-Climate-Stalemate.html?id=761061

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Tine Sundtoft
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The Arctic Basin – a challenging shipping lane

The central parts of the Arctic Basin (the waters at and around the North Pole) may, in a few decades, be nearly ice-free during the warmest months of the year. This provides new possibilities for transport routes by water. However, thinner sea ice may provide new challenges for shipping in the Arctic due to increased variation from year to year in the extent of the sea ice.

The expected growth in traffic will increase the risk of long-term damage to marine flora and fauna. As of today, the international regulatory framework is not in place to meet this challenge. Neither is the necessary capacity for rescue operations. At the Fram Centre in Tromsø, Norway, a Flagship Research Programme, headed by the Norwegian Polar Institute, addresses these challenges and opportunities.

The German ship *Beluga Fraternity* was in 2009 the first non-Russian ship to pass through the North-East Passage (partly along the Russian coastline) on its way from South Korea to Western Europe. This was a milestone in international shipping which provided an idea of the possibilities that lie ahead in an ice-free Arctic Basin.

Polar nations are not yet ready to fully handle such a new shipping lane between the continents, Norway included, but the likelihood that the Arctic Basin will be navigable for ships during parts of the year, for the next 10 to 20 years, is so big that finding solutions to the challenges of increased traffic is much needed. These challenges are both many and complicated. Safety, search and rescue are vital issues, as well as mitigating damages to the environment due to accidents. These issues are of crucial importance to all the 5 nations that border the Arctic Basin. More oil and gas installations may be constructed in the Barents Sea and in north-west Russia during the years to come, and this business activity will lead to increased navigation.

Person on a pressure ridge in the Arctic Ocean

Photo: Nick Cobbing, Norwegian Polar Institute

Pancacke ice in the Arctic Ocean (thin ice formed in rough seas)

Photo: Paul Dodd, Norwegian Polar Institute

In addition, less ice in these waters will attract more cruise-liners and lead to more scientific cruises and fishing. Traffic will be further increased as container ships and freighters make use of the new intercontinental shipping lanes across the Arctic Ocean.

The Svalbard archipelago (with Spitsbergen as the main island) is the Arctic Basin's northern-most outpost of civilization. Due to its strategic geographical position it is easy to imagine the archipelago as a future base for monitoring, safety, search and rescue and oil pollution services.

The issue of varying ice conditions between summers provides a special challenge. The thickness of the sea ice is now typically 2m, whereas is used to be up to 3.5m only few years ago. This thinner ice is to a greater extent driven by weather conditions. Hence, the weather will play a more important role in determining the ice conditions, meaning that there may be a practically ice-free Arctic Basin one season, while there will be a substantial ice cover the next. The years 2012 and 2013 were good examples of this; while September 2012 was an all-time low for known ice extent, there was an increase of 50% in September 2013. It may seem like a paradox, but this shows that with less sea ice in the Arctic, the need for ice prediction and knowledge about sea ice is growing.

This means that the need for further climate research and technology development is increasing. The Norwegian Polar Institute has monitored the thickness of the sea ice between Greenland and the Svalbard Archipelago for 24 years. Starting in January 2015, the Institute's vessel Lance will be frozen into the ice north of the archipelago to serve as a floating platform for climate research. Scientist from Norway, Russia, UK, Germany, France, South Korea, USA and Japan will be on board with their projects. This will provide new and important knowledge about climate conditions and physical processes in the Arctic sea ice.

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A Warning to the World

Dr Jan-Gunnar Winther, Director of the Norwegian Polar Institute gives an overview of the environmental challenges facing the polar regions...

Scientific information from the Polar Regions boosts our knowledge of the environmental issues facing the world and is vital in order to grasp the challenges facing us, be it climate change, sea level rise or pollutants.

Climate change

"Time flies" is a saying which seems to become increasingly relevant, at least when it comes to climate change and mitigation. As Thomas Stocker, of the UN's Intergovernmental Panel on Climate Change (IPCC), said: "Continued greenhouse gas emissions cause further climate change and constitute multi-century commitment in the future". The atmosphere is our common resource, and it should not be used as a dump for greenhouse gases all over the world.

The IPCC has concluded that human influence on the climate system is clear. For the first time there are global and regional maps of climate change prognoses. The climate models have improved with better technology and tools. Hence, they give us a better notion of what may happen, although we still do not fully comprehend the system.

There is still time to act. Measures taken by the year 2030 will be of great importance, as the need for actions beyond that year will be much more urgent and extensive, according to the panel.

Sea level rise

White surfaces on the Earth (ice and snow cover) reflect 80-90% of the solar energy (heat). Darker

surfaces (open seas, land areas not covered by snow) reflect only 10-15%. As the extent of the Arctic sea ice diminishes and the Northern Hemisphere snow cover retreats, more open sea and vegetation will absorb more energy. This leads to a feedback loop of warming in the seas and over land.

As the ocean warms up, it expands, as warmer water take up more space. This is one of the main reasons for the current sea level rise. The other is melting glaciers on land. The Greenland ice sheet, for example, is now losing mass at a rate which is 6 times higher than 10 years ago. Further, Antarctica has now a negative mass balance and Greenland and Antarctica combined influence global sea level more than all the rest of the world's glaciers. The exact contribution of melting glaciers to sea level rise in the future remains uncertain but will be significant. Sea level rise is a major concern not just for island states in the Pacific. Combined with more extreme weather, there is a threat to coastal states all around the world. We must expect more than half a meter sea level rise at the end of this century. Due to persistent circulation patterns in the atmosphere and the ocean, sea level rise will be distributed unevenly around the globe.

Ocean acidification

Acidification of the world's oceans has become an important issue in the Arctic. There is a decline of pH in the water as a result of increasing carbon dioxide (CO_2) in the atmosphere. The ocean absorbs more CO_2, which in turn disturbs the balance of the marine ecosystem. Ocean acidification is of particular interest to Arctic countries, as the region is dependent upon fisheries. Ecosystems have adjusted to changes in the past, but now the changes are taking place at a rate which makes it impossible for many plants and animals to adapt. Scientists working on a project affiliated with the Fram Centre in Arctic Tromsø, Norway – for the Arctic Council's working group Arctic Monitoring and Assessment Programme (AMAP) – have found that the Arctic Ocean is particularly vulnerable as CO_2 is absorbed more quickly in cold water, and increasing quantities of freshwater entering the Arctic from rivers and melting ice are reducing the ocean's capacity to neutralise acidification.

Pollution: plastic waste

Another warning to the world has come through an international project to fight plastic waste in the seas. The Great Pacific Garbage Patch – approximately 3 times the size of Spain and Portugal – is one of several swirling garbage zones in the oceans.

Tiny pieces of broken-down plastics, so-called micro-plastics, are a serious threat to millions of marine birds, sea turtles, fish and other organisms in the sea. They block the sunlight for algae and plankton, and many animals that mistake these and larger pieces of plastic for food end up dying with bellies full of indigestible material. The plastics may also contain hazardous substances. It has been estimated that 1 million seabirds worldwide die of plastic waste every year.

In 2009, the UN released a report saying there may be as much as 6.4 billion tons of garbage added to the seas every year. Over the past 14 years the Norwegian Polar Institute's staff and colleagues have gathered 1500 tons of garbage on the beaches of the Arctic archipelago of Svalbard, for a project initiated by the Governor of Svalbard. A study recently published in the US has shown that there are also micro-plastics in Arctic sea ice. Melting of the sea ice may therefore contribute to even higher concentrations of micro-plastics in the sea. Studies in Svalbard in the 1980s showed that 30% of northern fulmars had plastic in their stomachs. In 2013 it affected as many as 90% of the northern fulmars in Svalbard. In the 1980s the plastic mostly originated from industrial activities, whereas the main source now is consumer related.

A plastic bottle may last for 450 years in the ocean before it fully degrades. Consumers are not aware of this problem. It is, however, a clear message which most people in coastal regions can relate to, our experience shows. It is therefore all the more important to help sharing this knowledge. ■

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Adapting to a changing Arctic

Glen Peters, Senior Research Fellow at the Center for International Climate & Environmental Research in Oslo (CICERO) sheds light on changes in the Arctic and surrounding areas...

A vast and rapid transformation of the Arctic and surrounding areas is taking place. There is a limited understanding of how climate, environmental, and socio-economic drivers interact in the Arctic or how those interactions will change in the future. Some interactions may amplify existing pressures, while others may bring new opportunities. As a consequence, decision making in a rapidly changing Arctic is difficult and uncertain

To respond to these challenges and opportunities, the Arctic Council initiated the flagship project "Adaptation Actions for a Changing Arctic" (AACA). The project is conducted under the auspices of the Arctic Monitoring and Assessment Programme (AMAP) and has an overall objective to enable more informed, timely and responsive decision making in a rapidly changing Arctic.

Current changes

Changes in the Arctic are occurring at unprecedented rates. The Arctic has been warming at approximately twice the global rate. The Arctic seas are projected to become nearly ice-free in summer within this century, and as early as mid-century. The duration, extent and depth of snow cover are changing, with some areas having increases and others decreases. Permafrost temperatures have increased by up to 2 degrees, potentially leading to surface destabilisation and releases of methane.

These changes affect populations living in and outside of the Arctic. Livelihoods of indigenous peoples in the Arctic have already been altered by climate change, through impacts on food security and traditional livelihoods. Polar amplification, the stronger climatic response in the Polar Regions, may result in unexpected changes in weather patterns at lower latitudes.

The rapid changes in the Arctic, particularly the declining sea ice, have placed increased attention on Arctic resources. The Arctic is home to significant untapped petroleum and mineral resources. The shorter travel distances between Europe and Asia have caught the attention of the shipping industry. As the sea ice further declines, there is likely to be increased external pressure to exploit these opportunities.

Integration

Conventional assessments of climate, environmental and socio-economic issues in the Arctic have mostly focused on single drivers: climate, acidification, health, oil and gas exploration and development, to name just a few. These assessments have provided valuable information, but there is currently little understanding on how these (and other) drivers of change may interact.

In the Arctic, it is becoming understood that climate change is interconnected with environmental and socio-economic changes (demography, culture, development). It is the interactions that ultimately determine the physical, biological, and socioeconomic consequences of change. The combined rates of change may be faster than natural and social systems can adapt.

Thawing permafrost and changing precipitation patterns may affect infrastructure, and this may be compounded by increased economic activities. Impacts on the natural and social environment may make traditional livelihoods hard to sustain. Some marine species will shift their ranges in response to changing ocean and sea ice conditions. Existing vulnerabilities of terrestrial ecosystems will be increased. An influx of economic activity may bring new opportunities, but may also place unexpected pressures on existing natural and social systems.

**Boundaries have not
yet been finalised**

Responding

An understanding of the interactions of these multiple drivers is necessary to inform stakeholders and decision makers as they respond to a changing Arctic. Adaptation actions are generally applied at the local level and AACA will focus on three regions: 1) Barents Region, 2) Baffin Bay and Davis Strait Region, and 3) Bering, Beaufort, and Chukchi Region. All three regions will include both marine and terrestrial areas.

The Barents region (Norway, Sweden, Finland, and Northwest Russia) is the most populated with significant existing economic activities. Baffin Bay and Davis Straight (Greenland and eastern Canada) has significant resources, but low population and expansive natural environments. The Bering, Beaufort, and Chukchi Region (Northeast Russia, USA/Alaska and most of Northern Canada) has extensive remote natural environments and low population. A pan-Arctic report will integrate the potentially contrasting findings from these three regions and conduct a parallel pan-Arctic assessment linking to the global interest in the Arctic.

An innovative feature of the reports will be a forward looking perspective. A focus on current interactions in the Arctic improves the knowledge base, but does not meet the needs of future challenges. Adaptations depend on global and regional socio-economic developments, in addition to persistent uncertainties in predicting the future Arctic climate. The AACA project will explore the consequences of key climate, environmental, and socio-economic uncertainties, covering short-, medium-, and long-terms.

Summary

The AACA project will break new ground by integrating knowledge from many different fields of expertise, and across regions with large cultural diversity, multiple users of local resources, and uncertain development plans. Capturing a comprehensive understanding of how the drivers of the rapidly changing Arctic are likely to interact will provide decision makers with the knowledge they need to respond to the challenges, and to prudently take advantage of opportunities.

The AACA project will draw on and extend existing scientific knowledge to develop the assessment with the final reports released during late 2016 and early 2017. Further information available at the AMAP website (AACA). ■

Glen P. Peters [1,2], Jon L. Fuglestad [3]

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Weathering climate change

Adjacent Government looks at recent weather events and considers if there is a connection between it and climate change...

Across the globe, the first 6 weeks of 2014 saw an unusual amount of extreme weather, according to the UN's World Meteorological Organisation (WMO). In their 'Extreme Weather in Parts of the World' report, the WMO said: "The UK has seen its wettest December-January period on record, with severe, widespread and prolonged flooding. A combination of strong winds, storms and high tides caused damage and flooding in other coastal areas of Europe."[1]

The report continued: "For the United Kingdom, in particular, the series of winter storms has been exceptional in its duration, and led to the wettest December to January period in the UK since records began. Heavy rains combined with strong winds and high waves led to widespread flooding, coastal damage and disruption."

Some scientists believe the recent weather phenomena is linked to the changing climate, but some argue there is nothing unusual in winter global temperature extremes. However, while most of the UK experienced high temperatures in July, the south of the UK experienced flash flooding, with 43mm of rainfall in an hour.

Omar Baddour, chief of the WMO data division, said the recent phenomena are almost certainly interlinked, with new computer models suggesting increased evidence of climate change.[2]

"We need more time to assess whether this is unusual (on a global level) but if you look at the events in individual regions, like the heatwave in Australia or the cold in the US, it looks very unusual indeed," Baddour said.

A report issued in March by the Intergovernmental Panel on Climate Change (IPCC) suggested the effects of climate change are already being felt across the globe. Moreover, the report warned that numerous nations are ill-prepared for the risks that could occur as a result.

A number of countries have already seen heavy floods, extreme heatwaves and torrential rain, which could all be attributed to the ever changing climate.

The report by the IPCC 'Climate Change 2014: Impacts, Adaptation, and Vulnerability' details the impact of climate change, which has already affected agriculture, human health, ecosystems on land, and the oceans. According to the report, responding to climate change involves making choices about risks in a changing world. The report stated: "The nature of risks of climate change is increasingly clear, though climate change will also continue to produce surprises." It found that risk from a changing climate comes from vulnerability (lack of preparedness) and exposure (people or assets in harm's way) overlapping with hazards.

Chris Field, Co-chair of Working Group II, who penned the report believes that adaptation to reduce the risks from a changing climate is now starting to occur, but the focus seems to be on past events rather than preparing for future challenges.

"Climate-change adaptation is not an exotic agenda that has never been tried. Governments, firms, and communities around the world are building experience with adaption," he said. "This experience forms a starting point for bolder, more ambitious adaptations that will be important as climate and society continue to change."[3] ∎

[1] http://www.wmo.int/pages/mediacentre/news/ExtremeWeatherinpartsoftheworld.html

[2] http://www.theguardian.com/environment/2014/feb/25/world-2014-extreme-weather-events

[3] http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_PressRelease.pdf

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Unravelling chaos

Dynamical systems are mathematical models for everything that moves in time. Simple examples are springs and pendulum clocks. More complicated examples are the atmosphere producing the everyday weather and the solar system. These systems are deterministic in the sense that the present state of the system completely determines its future. In other words, probability does not play a role.

Since the seminal work of the mathematician and meteorologist E.N. Lorenz in the 1960s it is well known that even deterministic systems can be very unpredictable: small perturbations in the initial state may lead to large differences in later states. This phenomenon, which is colloquially known as chaos, hampers long-term weather forecasts and stimulated the development of mathematical research on nonlinear dynamics and chaos theory.

Chaos is one of the most intriguing features observed in many nonlinear deterministic systems. A key question is how chaos can be distinguished from other types of dynamics. For example, a quasi-periodic time series produced by a periodically forced pendulum can already look very complicated, but unlike chaotic evolutions, quasi-periodic evolutions are not sensitive to changes in the initial condition. Another important question is how chaotic behaviour can arise by changing system parameters modelling external influences.
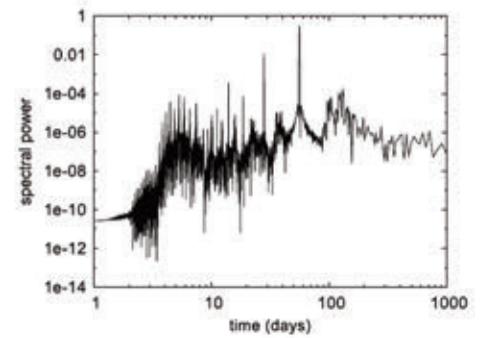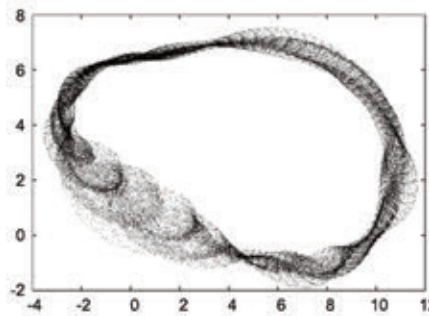
A strange attractor detected in an atmospheric model and its power spectrum. The spectrum shows distinct peaks, which is typical for quasi-periodicity, and broadband spectrum, which is typical for chaos. For more information see: A.E. Sterk et al., "New nonlinear mechanisms of midlatitude atmospheric low-frequency variability", Physica D 239 (2010), 702-718.

The Johann Bernoulli Institute for Mathematics and Computer Science, based at the University of Groningen, has a longstanding tradition in the study of nonlinear deterministic systems. We develop and implement computational tools, such as power spectra, Lyapunov exponents, entropies, and fractal dimensions. These tools help to distinguish different types of dynamical behaviour.

Our research is strongly interdisciplinary. We collaborate with biologists, meteorologists, physicists, and engineers to help them understand complex and unpredictable behaviour in their models. In very different models one can observe similar behaviour. This is an indication for the existence of universal properties which are shared by many systems. The Johann Bernoulli Institute is one of the key players in unravelling the mechanisms behind chaos.

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Reducing the radioactive risk

Journalist Tony Hall, highlights the dangers to human health when radioactive substances are not disposed of effectively...

After a century that has seen the widespread use of radioactive materials in industrial processes, and its subsequent disposal in landfill sites, the hazards to human health from land contaminated by radioactive material – known as radionuclides – is an issue that has only recently been addressed by government. Through the Department for Environment, Food and Rural Affairs (Defra), its executive body the Environment Agency, the Scottish Environment Protection Agency (SEPA), and the Northern Ireland Environment Agency (NIEA), the UK has now established a legal framework and practical guidelines to remedy and assign liability for this most dangerous and long-lasting type of pollution.

These new powers have been introduced as a result of the need to comply with EU Directive 96/29/EURATOM which in 1996 addressed the dangers of radiation exposure from man-made sources by establishing strict new safety standards. The Directive was introduced to provide greater protection to workers, but the UK statutory response has also introduced new environmental protection measures. Work preparing the regulations revealed just how little information there was on the extent of the problem. The new legal framework had to be comprehensive enough to cover the potential risk to health from all types of radioactive land, but beyond the acknowledged sources of contamination such as nuclear plants, waste facilities and MoD sites, no one could even estimate how many sites there were across the country.

For most of the 20th Century the hazards caused by the use and disposal of radioactive materials were not thoroughly understood, and were of little interest to government. It was not until the Radioactive Substances Act came into force in 1963 that the risks of contamination began to be addressed, and it was

not until the first decade the 21st Century that a study was commissioned by Defra, the Environment Agency, and the Welsh Assembly to establish how much damage had already been done, and where the sources of that pollution might lie.

'Indicators for Land Contamination' was an independent report published in 2005.[1] It estimated that the number of contaminated sites was between 150 and 250, with an upper limit of anything up to 1000. While the report could only identify where the most likely areas of the most serious risk would be – such as former metal processing works and uranium mines – it did specify precisely the method by which the risks to health from the polluted land were to be identified.

"For most of the 20th Century the hazards caused by the use and disposal of radioactive materials were not thoroughly understood, and were of little interest to government."

The report established that it is not enough for the land itself to show evidence of radioactivity. To be officially classified as contaminated land the source of the radiation has to cause harm, or pose a significant risk of harm to human health by way of a pollutant link known as a pathway. The report cites examples of pathways such as eating food grown on an irradiated site, breathing in airborne dust, and drinking from contaminated groundwater.

In practical terms this means that the specialists cleaning up radioactive pollution have to be able to carefully identify and monitor the treatment of the pathways, not just provide the safe disposal of all the radioactive source material, because not all the radioactive material on a site, such as polluted soil, may be classified as a contaminating risk to health.

The legal framework and guidelines that the government finally introduced between 2007 and 2012 makes this targeted treatment regime fundamental to any clean-up process.[2] To ensure this, and that plans for remedial work are cost effective, technically appropriate, and occur over a reasonable period of time without unreasonable social or environmental cost, Defra's Environment Agency has been given complete control as the enforcing authority.

Once land has been identified as contaminated, which is the responsibility of the appropriate local authority, it is for the Environment Agency to specify what remedial treatments have to be undertaken, and who is liable for the cost. The Agency is legally bound to mitigate all the risks involved in the remedial work that may lead to exposure to radioactivity. For example the removal of soil may create a new pollutant pathway by releasing contaminated dust into the air. Given the existence of such a risk the Agency will ensure that the area of land to be treated has been clearly identified and demarcated, its access regulated, and a system of regular monitoring has been established to ensure that impact of the treatment is minimised.

To ensure these procedures are justified and optimised to provide the maximum benefit with the least detriment – which includes potential damage to land or blight to property, the Agency will take advice from experienced practitioners. The Agency though, has the right to change the scope and focus of the remediation work if new information becomes available or the situation on the site changes. Given the Environment Agency's complete authority, it is not enough for a practitioner to be able to technically solve a contamination problem, it must also have the resources to adapt and meet the Environment Agency's stringent legally enforceable requirements. ∎

[1] 'Indicators for Land Contamination' Environment Agency SC030039/SR Appendix A. www.gov.uk/government/uploads/system/uploads/attachment_data/file/290711/scho0805bjmd-e-e.pdf

[2] To enable this Part 2A of the Environmental Protection Act 1990 was extended in 2006-7, with additional statutory Guidelines published in 2012.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48325/4472-draft-statutory-guidance-covering-radioactive-cont.pdf

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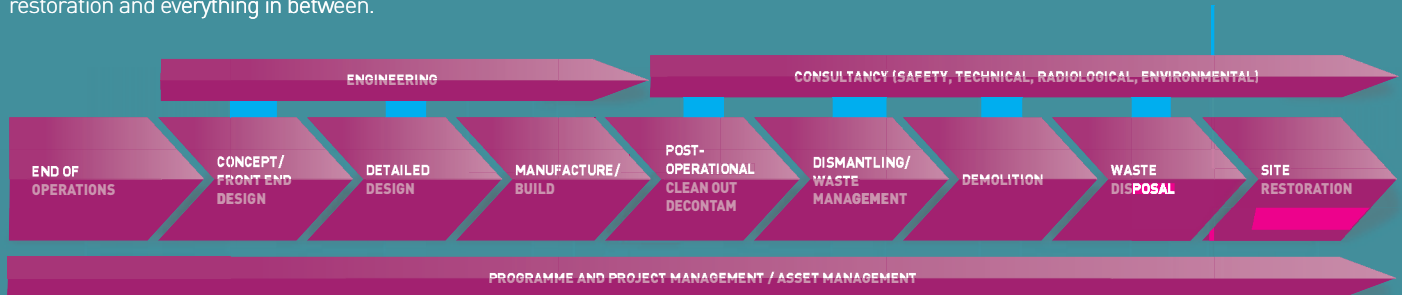
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- Major multi-year integrated support frameworks
- Consultancy support to Nuclear Decommissioning Authority (NDA) and in-country regulators
- Environmental remediation and restoration (UK / US government)
- World-class science and research
- Decommissioning Sellafield, the most complex nuclear site in the world

Image: Bohunice Power Station, Slovakia

A biosecurity and disease control partnership

The Department of Agriculture and Rural Development (DARD) in Northern Ireland sheds light on how government and the poultry industry are working together to help reduce epizootic diseases...

Poultry diseases greatly reduce the efficiency of food production, both in developed and Third World countries. Governments regulate certain diseases where it is in the public interest to do so. Examples include epizootic diseases which cause major outbreaks throughout the world, and also some diseases which can spread to humans, known as zoonotic diseases, one example of which is Salmonellosis.

If we consider epizootic disease first: An example of a major epizootic disease is Avian Influenza, which has major cost implications for the world wide poultry industry, as well as its effect on human health. One outbreak in Hong Kong in 1997 is estimated to have cost US$100s of millions, including knock on effects.

Closer to home, there was a major outbreak in Holland in 2003 and there have been a number of smaller scale outbreaks in the UK over the last decade.

Epizootic disease generally results in direct losses due to the death and culling of poultry and the disruption to the food chain; other associated losses can be as a result of reduced consumer demand, loss of income to farmers and retailers, lost genetic potential within the breeding pyramid and its effect on international trade.

Poultry producers and government have a common interest in keeping out epizootic disease. The poultry industry in Northern Ireland (NI) is highly integrated and the Department of Agriculture and Rural Development

(DARD) holds regular stakeholder meetings where matters of common concern are discussed including biosecurity and the level of risk posed by epizootic disease. They are also involved in contingency planning procedures and exercises for epizootic disease in NI. In the case of Avian Influenza which is also a zoonotic disease, the public health organisations are also involved. Because of this close co-operation, regulatory controls can be kept to a minimum, and where government controls are necessary, they have industry support.

DARD provides biosecurity advice to the industry by leaflet, on their website, and when it has staff on the flockowner's premises. The poultry organisations also provide training and advice to their employees and their growers. This means that poultry workers are well educated and motivated.

"Epizootic disease generally results in direct losses due to the death and culling of poultry and the disruption to the food chain; other associated losses can be as a result of reduced consumer demand, loss of income to farmers and retailers, lost genetic potential within the breeding pyramid and its effect on international trade."

The principles of disease control are simple – prevent it coming in, and if it does get in, prevent it spreading, and eradicate it quickly. These principles apply at both state and farm level, so both government and poultry producers have their role to play.

Government's responsibility is to ensure that only safe produce enters NI, which it does by enforcing the import regulations. We are fortunate that we are part of an island with a common disease status and similar disease control strategies, and this helps to regulate the importation of live poultry and food. These controls are enforced by veterinary service checks at the ports and airports. These checks include both commercial consignments of poultry as well as personal imports of food by travellers from high risk third countries.

At the farm level, there is a mirror image of controls where the flockowner ensures that he controls the risks of diseases going onto the premises. While these biosecurity controls are necessary to control epizootic disease, they also control many of the production diseases of poultry. In effect, a farmer's poultry premises is his "fortress" and he controls all movements of personnel, equipment, feed, and poultry onto his premises.

There is also a requirement to report the presence of suspect cases of notifiable diseases. This is required in legislation and forms part of our disease surveillance, an early warning of the possible appearance of an epizootic disease outbreak. This benefits from having well educated and motivated poultry workers.

However, in relation to other disease controls including zoonotic diseases, there is a regulatory requirement to sample poultry for salmonella under the National Control Programme which requires sampling on farms by the poultry operators as well as separately by the Department. These samples not only ensure flock health is monitored but also provide a food safety assurance to the public. There is a code of practice in place to which the poultry industry have contributed, and this provides an assurance to the public and also to DARD that good biosecurity standards are being maintained by the industry itself. This in turn reduces the level of enforcement required by DARD.

The good relationship between the Department and the poultry industry in NI is evidence that where stakeholders recognise the need to control disease, it reduces the need for direct government enforcement of biosecurity on poultry farms. The common government-industry interest in prevention, and if necessary, the prompt eradication of epizootic disease helps maintain a vibrant poultry sector in NI. ∎

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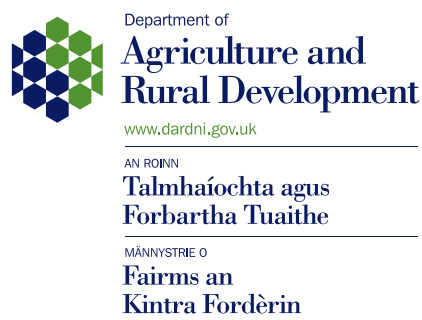
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A Bio-secure future for poultry farms

Biosecurity is an integral part of poultry farming to ensure a high level of health and welfare is achieved, here the European Rural Poultry Association (ERPA) explains why...

European Rural Poultry Association (ERPA) was created in May 2007 to defend, support and develop the production of rural poultry in the European Union.

ERPAs members are producers' organisations and breeders from Belgium, Spain, France, Greece, Hungary, Italy, Czech Republic and Romania.

Rural poultry is highly diverse in nature and varies according to the country:

• Family poultry;

• Young stock sold alive directly or at markets;

• Poultry sold with national quality certification (like Label Rouge in France), under PGI or PDO, or reared organically;

• Free range poultry produced by organised outlets, etc.

They concern 2 distinct sectors of production: poultry for meat and eggs.

All of the types of rural poultry are reared extensively, in accordance with animal welfare, and are from coloured rustic breeds with low growth rate. Slow growth and low stock density are important advantages that ensure poultry is better adopted to natural environments and increased resistance to diseases. Scientific works clearly show it.

For example, according to Cesare Castellini from the Faculty of Agraria di Perugia who spoke at the General Assembly of ERPA in 2013, a correlation has been demonstrated between the influence of growth rate and the immunity of animals.

Organic poultry production, with the use of rustic breeds, small farms, low stock density, and a high level of welfare, is a very good example of a rural poultry production system that promotes healthy

poultry. ERPA is also providing a significant support to organic production, with clear rules of differentiation of the method of production, but adapted to the specificities of farms, as well as to market constraints. In health terms, this production is strictly legislated and as well as conventional production, with rules of biosecurity and control on farms and at slaughterhouses.

"ERPA works in general to improve health, welfare and food safety in rural poultry farms, so as to entirely answer to consumers who expect products of high safety and taste."

In addition to these characteristics of rural poultry production, it is very important for poultry producers to implement biosecurity measures that can limit disease on farms. The farm economy depends directly on it.

Europe is the area where health regulation is the strictest in the world. This regulation will also be strengthened with the future EU animal health law.

Between Member States, more precise rules are being applied, with the objective of limiting the spread of diseases. Some examples of actions in Member States are:

• In Belgium, in 2011 the Wallonia formalised a decree defining the minimum differentiated quality criteria in poultry production. It defines rules relatives to methods of production – using for example coloured rustic breeds reared for a longer period – to environmental and health aspects, as well as to the principle of family farming;

• In Spain, guides of good hygiene practices of rearing poultry have been defined, including rural poultry;

• In Italy guides of good hygiene practices of rearing poultry have also been defined, and the total traceability, from production to slaughter, has been established for 2 years;

• In France, the legislation specifies the recognised poultry farming methods, and defines the conditions, for example sanitary conditions, for the use of the term "traditional" corresponding to rural poultry. And technical specifications approved by the Ministry of Agriculture defines the criteria for Label Rouge poultry production – a part of rural poultry production.

ERPA works in general to improve health, welfare and food safety in rural poultry farms, so as to entirely answer to consumers who expect products of high safety and taste.

ERPA is an important forum of discussion on these issues for its members, to propose to the European authorities the principles to apply that ensure farms are well managed. In particular ERPA defends: use of rustic breeds; extensive farming with low stocking rate; respect of animal welfare; simple and easily accessible poultry houses for cleaning and, disinfecting correctly.

Each member of ERPA defends these positions in his country, and can work with research institutes on these issues, for example by organising exchanges and technical seminars on these topics. ∎

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Added value to animal nutrition

The need for the world's food products from animal origin, like meat, milk or eggs, will continue to grow in the coming decades. The main reasons are population growth and an increase in the numbers of people who can afford valuable food, like the fast growing middle-classes in China and India.

The feed sector is an essential partner of the European food industry – supplying sufficient, safe, high quality and healthy foods like meat or milk. The feed and feed production technologies also need to help the livestock sector – addressing the challenges of sustainability and resilience. Most of the challenges have a clear feed dimension as reported recently by the European Feed Manufacturers' Federation (FEFAC):

• Improve the resource efficiency (in other words produce more with less)

• Contribution to animal health

• Socially responsible livestock farming (how to minimize the negative impact of livestock farming on the environment)

Fefac targets 2030
- 30% feed conversion rate
- Reduction of use for antibiotics
- 20% greenhouse gas production
- 40% Nitrogen and Phosporus excretion

Broiler Performance

Daily Weight Gain (g)

Feed Conversion Rate (at 1,500g)

56.4	57.4	1.45	1.39
CONTROL	AGOLIN	CONTROL	AGOLIN
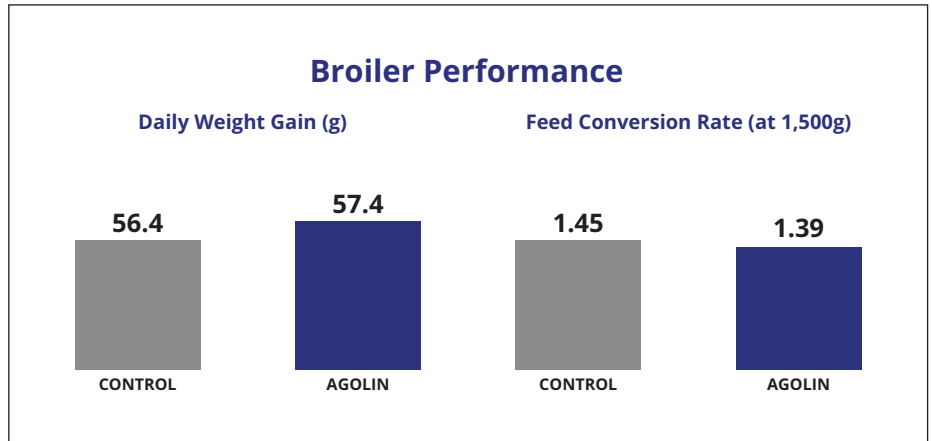
The Swiss based company AGOLIN SA is serving the feed industry with innovative products based on plant extracts. Many years of research has resulted in specific blends of components for different species with clear benefits to the animals, the farmers and the environment. A contribution to reach the challenging targets of the feed sector.

Feed conversion rate

Different plant active ingredients are selected for the AGOLIN products.

AGOLIN POULTRY contains pungent substances from pepper, which supports gut health as well as essential oils with effects on pathogens.

Proof of the concept is the performance achieved in a German field trial of 40,000 birds (Ross). They were fed with a commercial feed and split in two groups (with and without the supplementation of AGOLIN). The birds fed with the AGOLIN supplement did grow 2% faster and the feed conversion rate was improved by 4.2%. (FCR = kg feed intake / kg weight gain)

Influence on Clostridium Perfringens
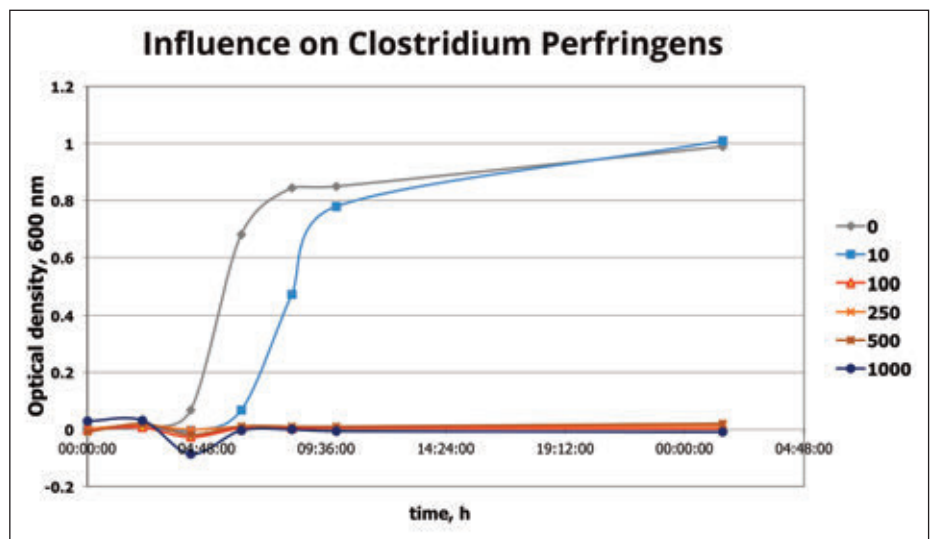
One of the researchers' focus when developing AGOLIN was the effect on Clostridia. Clostridia are organisms present in the digestive tract of mono-gastric animals and are one of the main reasons for growth depression.

In vitro research carried out by top class Universities demonstrated a slow-down of the growth of Clostridium Perfringens when components of AGOLIN were present in low concentrations.

AGOLIN was also the first company launching a product with coated tannins. AGOLIN TANNIN is a unique, coated chestnut extract, which contains hydrolysable tannins. The product is designed to maintain a high level of feed intake and animal performance by using the special effects of chestnut extracts on the digestive system, with the main effect of improved litter quality as demonstrated in different institutes, like in the well known AVIFORMUM in Switzerland.

Influence on Litter Quality
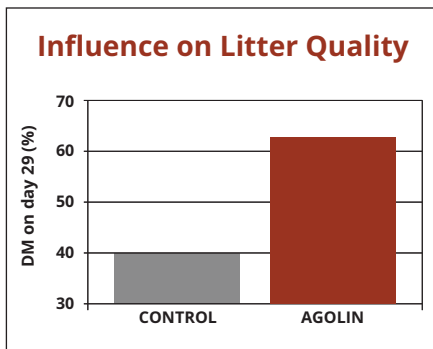
Wet litter is a sign of an unbalanced gut ecosystem, and can be the reason for footpad lesions in meat poultry too.

Greenhouse gas reduction

A trial at INRA (Institut de Recherche Agricole, France) confirms the significant effect of AGOLIN RUMINANT to reduce the production of the green house gas methane in ruminants.

Methane, l/day

410.6 CONTROL

281.8 -32% AGOLIN
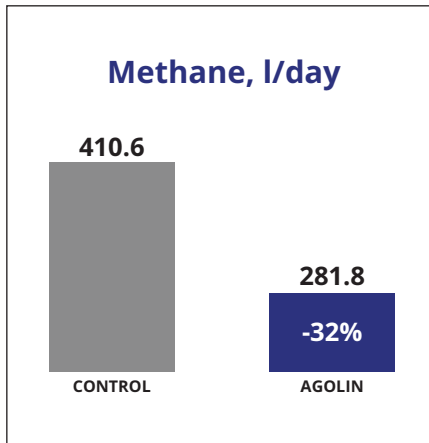
In research trials AGOLIN RUMINANT did show methane mitigating effects of at least 15-20%. By adding this supplement to the ration of all 23 million dairy cows in the EU-28 a decrease of over 500,000 tons of methane or about 10 million tons of CO_2 equivalent, which represents 1% of the total CO_2 output of the EU.

Methane production is a natural process of rumen fermentation and represents an energy loss for the cow. Therefore mitigating the methane production has not only a positive effect on the environment but also on the performance. One example is the research trial carried out with 600 high yielding dairy cows by the University of California. The main finding was a significantly improved feed efficiency. With the same amount of feed, the Holstein animals fed with AGOLIN produced 3.2kg more milk as shown on the graphic below.

Milk yield, kg
(from 27kg feed dry matter)

47 CONTROL

50.2 +6.8% AGOLIN
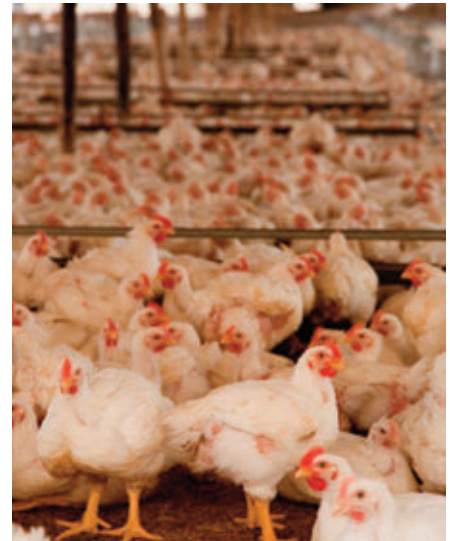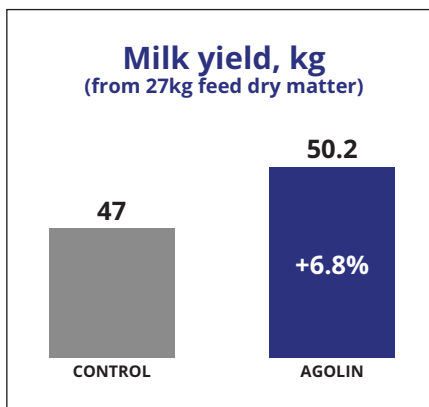
Founded in 2006, **AGOLIN SA** develops, produces and markets innovative feed additives, based on botanical compounds, which are effective, easy to use and safe. These best-in-class products have been successfully introduced into Europe, Asia and the US.

AGOLIN's quality management system (FAMI-QS) ensures safety and guarantees traceability.

The company is a member of FEFANA, the Association of European feed additives and premixtures operators.

AGOLIN's first took part in an EU research project in 2010 – SMEthane, a technologigal platform developing nutritional additives to reduce methane (FP7).

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Managing the forests of Switzerland

Forests play a pivotal role in the environment, here Adjacent Government assesses how Switzerland's forests are maintained...

Forests not only act as places of tranquillity and recreation, but also play a major role in providing essential services and resources for people, plants and animals. Across the globe, forests contribute substantially to the conservation of landscape diversity, as well as contributing to the greenhouse gas balance.

Over the past few decades forest cover has increased in the EU. In Switzerland, approximately one third (over 75%) is covered in forest, with around one third of that located in the Alps. According to the Federal Office for the Environment (FOEN) in Switzerland, forests have 422 million m³ of growing stock in the country, and of this 33% is represented by deciduous trees and 67% by coniferous trees. [1]

Between 2007 and 2011, Switzerland's forest area increased by 2.5%, which is due to the reclamation of agricultural and alpine pasture areas in the Alpine region and the Southern Alps. According to the FOEN the standing volume of the forests continued to increase by roughly 1.4% between 2007 and 2011.

The total forest area in Switzerland is increasing, but changes occurring in the forest can vary significantly from region to region, with the biggest increase being seen in the Alps.

The FOEN plays a major role in monitoring the country's forests and ensuring natural resources are used sustainably. In line with the sustainability strategy of the Federal Department of the Environment, Transport, Energy and Communications (DETEC), the central goals of the FOEN are:

• Long-term preservation and sustainable use of natural resources (land, water, forests, air, climate,

biological and landscape diversity) and elimination of existing damage;

• Protection of the public against excessive pollution (noise, harmful organisms and substances, non-ironizing radiation, wastes, contaminated land and major incidents);

• Protection of people and significant assets against hydrological and geological hazards (flooding earthquakes, avalanches, landslides, erosion and rockfalls).[2]

In accordance with these goals, the FOEN has the responsibility for the environmental monitoring to provide a sound basis for the management of resources. Due to air pollution, Switzerland's forests are under huge pressure, and are becoming more sensitive to acute events such as drought, storms, diseases and pests.

The most important protection measure is the Federal government's ban on deforestation, as part of the government's Forest Policy 2020. The Policy creates effective conditions for sustainable, efficient, and innovative forest management and ensures that forests can carry out their various functions.

The government aims to tap the sustainable, utilisable potential of wood, and the Wood Action Plan implements the government's wood resource policy. The action plan initiates and supported projects between 2009 and 2016 that pertain to wood as a raw material and its exploitation. The Forest Policy 2020 is also used to conserve biodiversity by supporting forest reserves and conserving priority habitats such as forest edges and wooded pastures.

Forest areas are very important for species diversity, and its management plays a key role in biodiversity and the stability of the forests. ∎

[1] http://www.bafu.admin.ch/wald/01198/01199/index.html?lang=en
[2] http://www.bafu.admin.ch/org/ziele/index.html?lang=en

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Forest engineering, the backbone of timber and fiber supply

Forests and some of the services they provide have been prominently on the international agenda, gaining considerable public attention: conservation, biodiversity, carbon storage, recreation or wilderness are the most notable issues thereof. Although those services only came on the public agenda from the 1960s, they have dominated the set of positive perceptions that people have of forests. On the other hand, their perception of harvesting wood and fiber has become critical or even negative – amplified by ongoing deforestation – which is often attributed to forestry although it is mainly in effect of land conservation.

This change in perception is contrary to the fact that the world consumption of forest products is about 0.5m³ per capita per year, with an upper limit of about 1m³ per capita per year in industrialised countries. This situation is creating a paradox that industrialised societies have been developing quite critical attitudes towards harvesting of natural resources, while positively perceiving immaterial services of forests.

The present contribution aims to provide a quantity structure of the wood and fiber use, to argue that forest engineering is a main driver in improving the effectiveness and efficiency of forest resource use, and to outline some challenges that we are facing in making the supply of water and fiber more efficient and more environmentally sound.

The worldwide wood production is about 3.5 billion m³ per year, which corresponds to about 0.5m³ per capita per year. This figure splits between about 1.6 billion m³ industrial roundwood and about 1.9 billion m³ which is fuel. According to the FAO statistics the largest producers are: the European Union with about 430 million m³ per year, followed by China with about 335 million m³, the United States of America with about 325 million m³, Brazil with about 270 million m³, and the Russian Federation with about 175 million m³. Those figures illustrate the important role forest engineering – the science to design the infrastructure systems for wood transportation, to layout and deploy

harvest operations that are physically effective, economically viable, environmentally sound, and institutionally acceptable.

In industrialised countries, fully mechanised harvesting systems have been the backbone of timber supply, whereas manual and motor-manual systems are still dominating in developing countries. The most sophisticated production systems rely on mathematical models that support and optimise the design, layout, and control decisions of harvesting operations.

The public perception of harvesting operations is often 'romanticised',

following the imagination that crafts-men are doing a hard and dangerous job to fell trees, to delimb them, and to extract the logs with the use of gravity and animal power. Lay persons have been perceiving mechanised harvesting systems as 'far from nature' and as threatening, although they reduced the occupational accident rate dramatically, improve economic efficiency, and are continu-ously improving the environmental soundness of operations. This lack of acceptance is most prominent in urbanised areas, where people think that large machines are bad and that manual work is good, neglecting the fact that the educational accident rate of manual forest work is among the highest of all sectors. This change of public perception resulted in a loss of reputation of forest work and of the occupational status of forest workers. In industrialised countries, it has become more and more difficult to recruit talented people who are willing to spend their career as a forest worker or machine operator.

We can see the same on the level of higher education, where many pro-grams in forest engineering, or areas of specialisation, respectively, have been disappearing. Australia is the most prominent example, where there is no longer any university program in forest engineering, and where industry has great difficulty to find forest engineering specialists with a sound educational background.

Our previous thoughts focused on forest engineering and its core busi-ness, harvesting. Harvesting activities rely on a resource base, which is limited. Nowadays, one inhabitant of the European Union relies on an aver-age living space of about 1.2 soccer fields per capita, of which 35% are covered with forest, and which 25% is forest dedicated for wood production. Considering that the population will still be slightly increasing, and that a considerable part of the forest area is removed for biodiversity, nature reserves or wilderness, we are facing the big challenge 'to make more out of less forest area'. Additionally, there are several policy streams that are competing for the same forest area: (1) wood and fiber use, (2) bioenergy use, (3) carbon storage, (4) biodiver-sity, (5) quality-of-life services, such as protection, recreation, or leisure, and (6) the 'dream of wilderness'.

The 'food and fiber use' policy stream does not seem to have political advo-cates, which are bearing the risk that wood production will further decline. Traditionally, well-ordered forestry has its roots in the overuse of forests in the 17th and 18th Century, when strategies and rules were introduced to follow a 'sustained yield forestry' philosophy. This overuse phenomenon, known as 'tragedy of the Commons', in recent years turned into the opposite in many European countries, and economists termed it 'tragedy of the anti-Commons'.

The tragedy of the anti-Commons occurs, if a forest owner formally has the right to use his forest land, but is facing several agents who have a veto right to prevent his harvesting. The equilibrium for such an arrangement is always on a lower harvesting level than in a non-veto-right regime.

Our rough analysis of the problems and challenges that forest engineering is facing is raising the question, what courses of action could improve the situation? In our point of view, there are four areas of action.

First, there is a need to decouple the six policy streams – wood and fiber use, bioenergy use, carbon storage, biodiversity, quality-of-life services, 'dream of wilderness' – by questioning the multi-functionality concept and by exploring segmentation strategies.

Second, the 'tragedy of the anti-Commons' problem has to be addressed by exploring institutional arrangements that overcome the dilution of property rights (user rights and meet the rights are allocated to considerable number of agents).

Third, a concerted, cross-national action is required to re-establish capacity building, particularly on a university level, where forest engineering programs have been continuously disappearing.

Fourth, novel land-use concepts are required to 'make more out of less', among which precision land-use concepts are offering opportunities to concurrently control biological, tech-nical and administrative processes in real-time for a whole supply network.

ETH zürich

Getting beyond the surface of blue growth potential

Describing the benefits of blue growth within Europe, Maria Damanaki, European Commissioner for Marine Affairs and Fisheries details the importance of acting now to build on existing progress…

The "blue economy" is already creating new jobs in Europe. But we have only just scratched the surface of its potential. We have been thinking about how to build on existing progress and how we can benefit from new research insights to ensure that this maritime economy can continue to generate jobs across Europe.

As the European and global economies continue to navigate themselves out of dangerous waters, the world has to face up to twin challenges. How do we provide the economic opportunities to lift people out of poverty bearing in mind that there will be at least another billion of us on the planet in the next decade or so? And how do we address environmental risks that, if left unmitigated, could lead to a catastrophe in which we do not have the resources to provide the energy or food we need to live?

Both questions need to be tackled without delay if we are to ward off disaster for the next generation. So unsurprisingly the European Union's focus is on supporting those areas which can address both the need for economic growth and the need to preserve our planet.

This is why we are turning to the blue economy. Our recently adopted EU strategy on Blue Growth is where these twin challenges meet – it is all about prioritising the use of ocean resources sustainably as a driver for growth and jobs in Europe.

Every year half the planet's sunlight falls on seas and oceans and half the organic matter is created there. The wind, the tides and waves offer energy that does not contribute to global warming. Every year a higher proportion of new wind farms are already built offshore whilst fish and shellfish, increasingly from fish farms, are the fastest growing source of animal protein worldwide.

The blue economy is already creating new jobs in Europe but we have only scratched the surface of its potential. We have been thinking about how to build on existing progress and how we can benefit from new research insights to ensure that this blue economy can continue to generate jobs across Europe.

This year's European Maritime Day Conference, held in Bremen, Germany in May, was a big part of that thinking. Over 2 days ministers, industry experts, policy makers, and many others debated and swapped ideas as to how the different sectors in the maritime economy can work together catalyse the investment and innovation needed for sustained growth. Participants concluded that:

• There is a vast potential for jobs and sustainable growth in the maritime economy. To exploit it we need to invest more in knowledge and innovation and focus on placing sustainability at the heart of Blue Growth.

• The issues related to seas and oceans can only be addressed at international level – more global governance is of paramount importance. The EU's Maritime Spatial Planning and Maritime Security Strategy are good examples of what can be achieved.

The timing of the European Maritime Day Conference was ideal, as it took place only 2 weeks after we unveiled our EU action plan to drive innovation in the maritime economy. If we are to exploit our waters in a sustainable way, a number of challenges need to be overcome.

For instance our knowledge about the sea is still limited and maritime research in different countries is not linked up. Unsurprisingly access to finance is also a recurring theme heard when out and about talking to researchers and entrepreneurs alike. We are doing what we can to cut red tape and incentivise investment across all industries.

But we have also identified 3 issues that are particular to the blue economy – poor marine knowledge, fragmented marine research and shortage of skills. We will address those by reducing bottlenecks in accessing marine data, creating a multi-resolution seabed map of European waters and by making sure that we have the people with the right skills in place to fill the new jobs we hope to create.

We don't just need to develop innovative products but also ensure that we continue to develop the skills and technology needed for the longer term. That's why we are extending programmes like Erasmus to include fostering cooperation in education and training and why, through our dedicated research and innovation fund, we will equip Europe's best scientists and innovators with the tools they need to do their work.

The costs of cutting-edge research is greater than ever before, and even with our investment are often too large for individual organisations so we will encourage and incentivise co-operation and results sharing.

Our seas and oceans, just like all other natural resources, are not infinitely substitutable and global environmental and economic challenges are on an unprecedented scale. The way we respond to them will require greater levels of ingenuity and innovation than ever before. I am glad for having picked the brains of Europe's brightest minds in Bremen's European Maritime Day and seen the maritime sector to share ideas on how sustainable growth from the seas can bring Europe's economy back to safer waters and ensure that we leave a legacy of opportunity to tomorrow's Europeans. ■

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Maria Damanaki
European Commissioner for Maritime Affairs and Fisheries
European Commission
www.ec.europa.eu/commission_2010-2014/damanaki/index_en.htm

Skaginn – Icelandic pioneers in Super Chilling

Driven by the ingenuity and innovational vision of its co-founder and now pioneer CEO, Skaginn's Super Chilling solutions offer a range of benefits. Through highly automated features, Super Chilling increases yield, preserves quality, adds to product value and can double shelf life. The efficient processing – now with a revolutionary high speed, gentle handling, quality controlled weighing and packing system – eliminates unnecessary product transport and thus reduces carbon footprint.

Already an industry leader in Iceland when it comes to efficient pelagic processing, freezing and chilling solutions, Skaginn's growing reputation for its adaptability to tailor make solutions to individual assignments if needed, is fast establishing the company as a key player in a fiercely competitive international environment.

Skaginn and 3X join forces

Skaginn's recent acquisition of an 80% stake in 3X Technology – another leader in its field in Iceland – has further fortified its position, coupled with an 1800 square metre expansion of its manufacturing facilities. The two companies, established in traditional Icelandic fishing towns, have a history of co-operation on a range of projects, making closer ties between them a logical progression.

Only recently Skaginn has delivered two major pelagic processing facilities. One in Iceland, the other in the Faroe Islands. A key feature of the new facilities is the weighing and packing system supported by the combined use of weighing and vision techniques. The system creates an accurate batch of the pre-selected fish in a hopper weighing unit and then sends it to a bagging machine together with traceability information per batch for barcode printing.

A Skaginn technician makes final adjustments to ensure the production line delivers to its capacity

Behind this one tonne pallet of frozen pelagic products ready for transport or freezer storage, is only one working hour through the automated processing system.

Emerging markets

In addition to its pelagic systems, Skaginn has commissioned a large-scale IQF freezing system for Regal Springs in Mexico, one of the world's largest tilapia producers. What makes the freezer unique is that it can be used for individual quick freezing while simultaneously used for super-chilling. Skaginn has also recently completed an IQF solution for scallops for Seatrade and Eastern Fisheries in Boston. The company is currently working with the local staff of Friosur in Chile to improve quality and to examine a potential overhaul of its production procedures.

Volumes replaced by values

Iceland's fishing industry has been through some tough years, emerging as not only one of the most modern in existence, but also one of the most progressive. When quotas are tight, values replace volumes. In an industry where there are no state subsidies and no safety net to fall back on, you have to push hard, break with convention, sometimes forgo tradition and break new ground. These are exactly the values that have driven Skaginn's innovative approach.

About Skaginn

Founded in 1998, the company's roots lie in the fishing industry, initially as a specialized department of the local shipyard in Akranes in West Iceland. Goundwork for the the development of sophisticated hi-tech solutions within the seafood industry simultaneously opened up channels into the meat and poultry industries. Skaginn's products include Pelagic Processing Solutions, IQF Freezers, Automatic Box Freezers, Fluid Ice Systems, Tup Tippers, Ice Clean cleaning systems and more.

Skaginn's co-founder and now principal owner and CEO is Ingólfur Árnason. Financially robust, the combined number of the group's staff is around 170.

Skaginn

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No chemical additives
all natural

Natural Way's priority is the preparation and protection of raw products before processing to ensure better yield, shelf-life and improved quality of the end product.

Our process and products effectively eliminate and prevent the development of biofilm, thus reducing potential micro-organism attack and damage to the fish and seafood. This also controls and reduces the incidence of pathogenic (e-coli, listeria, campylobacter, salmonella) and spoilage bacteria (Pseudomonas) as well as fungi to give better shelf life and reduce the potential for foodborne disease. Controlling enzymatic reactions and oxidation also ensures the best quality and higher yields.

Further to the health benefits, our processes and products are safe to use and non-residual, which allows the food to retain its natural texture, appearance and taste.

These factors are applied in the following stages:

• On board vessels and within factories to ensure that all tanks, pipework and equipment is kept free from bacteria.

• In ice-making equipment to keep all of the equipment and process water clean and free from harmful bacteria.

• Tthe removal of bio-hazardous biofilm from pipes, tanks and equipment within all areas of processing and production.

• Controlling pathogenic bacterial growth within the process water, and manage malodours within water systems, effluent plants and production areas.

natural-freshlong under-cooling

natural-freshlong is temperature controlled ice-slurry, made from water, natural mineral-rich sea-salt, nc-fresh (rosemary blend), and flake ice from fresh water.

The use of nc-fresh (rosemary blend) keeps the slurry fresh for as long as possible as blood, bacteria and enzymes from the fish will contaminate the slurry in time. This under-cooling slurry lowers the fish core temperature down to -0.5°C at the start of the process, and ends at ±0.0°C in around 10 hours.

The natural-freshlong under-cooling method cleans, controls temperature, gives longer freshness and saves yield and gaping in the later processes.

The gills are the first to breakdown due to blood and bacteria, therefore it is important to remove the head as soon as possible after landing. The stomach area is full of bacteria and enzymes, bringing negative consequences to the shelf-life of the product/raw material, whilst waiting for processing.

Haddock is softer than cod and its stomach has stronger enzymes. By using our methods, it is evident that all kinds of white fish, mackerel and tuna retain more of the original, natural quality which results in a better quality product.

The natural-freshlong under-cooling method does not increase the weight of the fish, as the fish does not absorb salt, water, nor rosemary residue. Neither does it lose protein (drip loss).

Zymetech – Marine Marvels

Zymetech is the global leader in the therapeutic application of marine-derived enzymes. We strive to improve the quality of life of people with dermatological ailments, musculoskeletal problems, and respiratory infections.

Zymetech is a privately owned Icelandic biotechnology company specialized in the development and manufacturing of marine-derived enzymes and their applications to the health and beauty industries worldwide. Since our foundation in 1999 we have focused our development on infectious diseases, dermatology and wound healing, and inflammation and pain.

Headquartered in Reykjavik, Iceland, we employ a dedicated team of professionals with years of experience and expertise in the life and medical sciences.

Our formulations containing the patented marine-derived enzymes, called the Penzyme® technology, are at the core of our intellectual property. Core and clinical research has demonstrated effectiveness of Penzyme® against a variety of skin conditions, wound healing, and viral and bacterial infections.

Penzyme technology

Our Penzyme® technology is based on the use of natural marine enzymes from North Atlantic cod in medical devices, pharmaceuticals, and cosmeceuticals.

Enzymes are natural catalysts that speed up biological processes and have been used in medicine and science for more than a century.

The marine enzymes are manufactured in an ecologically friendly manner using underutilised raw materials from the seafood industry sourced through sustainable fisheries.

This patent-protected technology is based on decades of scientific research by Zymetech and the University of Iceland.

The intellectual property rights cover the use of the marine enzymes in the treatment of several clinical conditions. This includes infections of the upper respiratory tract, symptoms of atopic dermatitis, wound healing, inflammation, and pain.

We are a world leader in manufacturing and formulation of marine enzymes in medical devices, pharmaceuticals, and cosmeceuticals.

Product categories

Medical devices & Pharmaceuticals

Infectious diseases: Penzyme® has demonstrated its potential as an antiviral and anti-bacterial agent. Current research is primarily focused on the common cold viruses and on bacterial biofilms.

Dermatology & wound healing: Our initiatives include OTC lotions and ointments, classified as Medical Device

Class I and III. In addition, new formulations are in development for advanced wound treatment.

Inflammation & pain: Partly based on market feedback, our development efforts include research into the effect of Penzyme® on inflammation and pain, with primary focus on arthritis and sports injuries.

Zymetech has registered CE-marked medical devices in Europe that utilize the Penzyme® technology against skin problems and respiratory viruses.

Cosmeceuticals

Our portfolio contains various formulations for facial skincare and hand and footcare, including body lotion and anti-aging facial serums. New formulations include face masks, exfoliator treatment and special skin condition treatment.

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Professional development in fisheries

The contribution of fisheries to human well being

Fisheries have always been a part of human survival, development and welfare, but there is a need to address the management of fisheries resources, post-harvest handling and processing and aquaculture to achieve the UN sustainable development goals for the post 2015 development agenda. For the EU to implement its Blue growth policy it must look beyond its borders. A measure of the challenges in the sector is staggering:

• About 75% of landings from capture fisheries and over 90% of farmed fish come from developing countries[1];

• About 10% of the world population depends to a large extent on fisheries for their livelihood;

• Fish constitute about 20% of animal protein consumed in developing countries, and about 25% in low income food deficient countries;

• Net export of fish from developing countries has grown rapidly and now exceeds USD 35 billion per year[2];

• FAO estimates that about 90% of exploited fish stocks are either over fished or fully fished.

An economic analysis of world fisheries carried out by the World Bank in 2009 suggests that improved management in capture fisheries can increase economic rent by about 50 billion USD annually[3].

Establishment of the UNU-FTP

The United Nations University Fisheries Training Programme (UNU-FTP) was established in 1998 in Iceland when the UNU signed an agreement with the Iceland Ministry for Foreign Affairs and the Marine Research Institute (MRI). The MRI provides expertise to the UNU-FTP in stock assessment and fishing technology and partner universities and research institutes in Iceland provide expertise in fisheries economics, food science, aquaculture and management of fisheries companies.

Professional development for the sustainable use of living aquatic resources

Current handling and fish processing practices lead to post-harvest losses and compromise food safety. Improved education and skills training could minimise losses and increase the value of stocks while providing a base for dealing with overfishing. The UNU-FTP supports global research based capacity building by enhancing institutional and individual capacity to develop sustainable use of living aquatic resources, supporting partners in meeting their development goals. It is primarily funded by the Icelandic government, but also engages in capacity development activities on a cost sharing basis with partner countries and international organisations. The UNU-FTP has increased professional skills and knowledge by working in the fisheries sector in nearly 50 countries since 1998.

The educational activities of the UNU-FTP comprise three interlinked areas complementary to one another.

1. Learning from each other – a six month post-graduate course in Iceland

The core activity of the UNU-FTP is a six month applied programme in Iceland designed for practicing professionals in developing countries. Professional development is at the heart of the programme which follows the model of education for sustainable development as promoted by UNESCO[4]. By 2014 286 fellows from 49 countries had successfully completed the six month course.

The programme starts each September with about 20 fellows from 12-14 countries. The aim for the first six weeks is for fellows to develop a wide perspective on fisheries and the development potential of their own fisheries. There has been a special focus on Sub-Saharan Africa and Small Island Development States. After one week of orientation is five week course which gives a global overview of fisheries and aquaculture. The multidisciplinary nature of the sector is addressed and fellows contribute and make presentations on various aspects of their fisheries and put them into regional and global context and discuss their development potential. During this part of the programme a number of visits are made to regulatory and research

institutions, private companies and fishing communities. Fellows must also formulate and defend their personal development goals for their work in Iceland.

In the 7th week specialist training starts. A range of research Institutions and universities in Iceland are responsible for six week intensive courses, which are followed by a 14 week individual research project. The projects address an issue in their home countries and are often based on data and other information fellows bring with them or collect during the project period. Each fellow has one or two supervisors for their projects and UNU-FTP staff monitor progress through regular meetings with fellows and their supervisors.

In some cases the fellows in the six month programme are part of externally funded projects in their home institutions and their work in Iceland. The final project not only promotes individual professional development but also contributes to the successful implementation of the project.

2. Learning together – short courses in partner countries
Since 2004, the UNU-FTP and national, regional and international partners have developed and delivered short courses in many countries. So far about 30 courses have been held in 14 countries, many of them more than once, involving about 1000 participants.

The courses are based on local case studies, often from final projects in the

six month course. Former fellows are involved in the development, preparation and delivery of the courses, in cooperation with colleagues from Iceland. The short courses are based in local training institutions and universities.

"Current handling and fish processing practices lead to post-harvest losses and compromise food safety. Improved education and skills training could minimise losses and increase the value of stocks while providing a base for dealing with over-fishing."

3. Further learning – scholarships for former fellows
The UNU-FTP offers scholarships to selected former fellows to study towards either MSc or PhD degrees at Icelandic universities. The research project must in part be carried out in the candidate's home country and must always address issues of particular importance to the home countries. So far 11 MSc and 13 PhD scholarships have been awarded.

Learning to transform oneself and society
During the 16 years since its establishment, the UNU-FTP staff, fellows and partner organisations have gained a unique view of the status and development of fisheries, in particular in developing countries. Three aspects are considered critical to sector development:

• Knowledge-based management of living aquatic resources based on

information on stocks and sound economic principles,

• Practice-led promotion of food security and safety through improved handling and processing practices, and

• Development of informed practice for sustainable aquaculture, the fastest growing food sector in the world.

The UNU-FTP is always interested in partnering with local and international organisations and in the next issues of this publication these particular issues will be looked at more closely.

[1] http://www.springerlink.com/openurl.asp?genre=article&id=doi: 10.1007/s10531-012-0360-9

[2] http://www.fao.org/3/a-i3720e.pdf

[3] http://siteresources.worldbank.org/EXTARD/Resources/336681-1224775570533/SunkenBillionsFinal.pdf

[4] http://www.unescobkk.org/education/esd-unit/definition-of-esd/

UNITED NATIONS UNIVERSITY
Fisheries Training Programme

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Quality Fish Processing Machines

Curio produces Awarded high-tech, efficient and elegant machines for the processing of fish

The Curio operation simmers with passion for craftsmanship, technology and unbound imagination. We bring together the devotion inherent in handmade machinery parts, technical innovation and ingenuity – and with this magical mix we assemble potent fish processing machines with a strong character and a great performance.

Curio Ltd. produces fish processing machines for heading, filleting, skinning and sharpening. The Curio machines have won awards for good use and their popularity and reputation is rising steadily.

Curio processing machines can be set to suit different fish species of different sizes. Curio strives to provide excellent service and maintain a full range stock of spare parts at all times.

Collaboration

We customise the Curio machines to meet the different needs of each customer. While one customer primarily processes haddock another customer can focus on tusk, Atlantic wolfish, salmon or trout, therefore requiring totally different processing solutions.

Curio History

Founded in 1994, Curio started out in traditional machine production, but in recent years we have focused on fish processing machines for heading, filleting, skinning and sharpening.

In 2008, our new line of machines for fish processing was introduced and it instantly became a success when we finalised our first header midway through 2008.

During 2008-2012 our production capacity was 3-4 machines per year, but following the transition to our current location the capacity increased to 12-24 machines per year.

Our Curio technicians and designers carry on a constant and ongoing development regarding the lifetime, usage and speed of our fish processing machines.

It should therefore come as no surprise that the Curio machines have already won awards for good usage and their reputation continues to rise.

Production

The production of Curio machines starts with cutting and machining each individual part using high precision CNC machinery. A state of the art laser positioning system welds the machine frame together assuring that it meets the strict design specifications. Once the frame has been assembled it is given a special chemical treatment along with all the machine covers and guards, giving a smoother surface with higher resistance to the elements.

The machine components are then assembled by highly trained personnel, carefully placing each part to its designated place and making sure that the machines are set to the customer specific requirements.

Before each machine is shipped out, it undergoes a series of tests to guarantee a safe operation and insuring that all the safety, design and operational requirements are met. Once the machine has been given a Curio stamp of approval, it is shipped to the customer. A Curio specialist helps with the set-up of the machine on-site, providing operation and maintenance training helping towards a long successful operation of the machine.

Facilities

Curio has operated in its current location since 2011. The facilities are a total of 800m^2 on two floors and all production units are located on the first floor.

Poseidon Remote Controllable Trawl door

Polar Fishing Gear from Iceland, has completed a big step in their latest development of trawl doors – the Poseidon Remote Controllable Trawl Doors – when a pair of 4.1m^2 Poseidon trawl doors were tested onboard the modern 70m Icelandic research vessel, Árni Fridriksson.

The idea is to control the water flow through the trawl doors and guide the trawl doors and the complete fishing gear to a preferable position in the sea for the most effective fishing results.

The trawl doors are constructed from aerodynamic shaped wings – a total of 6 wings, 3 on the upper section and 3 on the lower section. By moving the wings, or part of the wings of the trawl door, the water flow can be controlled. The **trawl doors** can be guided to operate with either a little spreading force or its maximum spreading force and also controlled close to the surface or deeper in the sea.

Greater efficiency

This revolutionary idea, where each wing can be controlled individually, can move the fishing gear to the optimal position to catch the school. This is very effective when combined with other fish finding equipment in the fishing vessels.

During the test tows, with maximum doors spread and all wings closed for minimum flow of water, the door-to-door distance was 72m and when adjusting to minimum doors spread with all the wings open for greater flow of water, the door-to-door distance was reduced to 54m.

The power output to the propeller dropped from 510kW towing at 4.8 knots down to 455kW when the spreading force was reduced. Fuel consumption during towing with the doors adjusted in maximum spread was 163litres per hour and was reduced to 138litres per hour during minimum doors spread.

Environmental friendly trawl doors

We expect that use of remote controllable trawl doors will have a huge effect on trawl fishing for the benefit of more economical operations and several environmental issues:

· **Less fuel consumption** – when there is no or little fish concentration, the doors can be controlled **to reduce door-to-door distance** and the complete fishing gear will have much less resistance;

· **Greater catches** – with high fish concentration, the doors can be controlled to the optimal position to increase door-to-door distance so the fishing gear will catch more fish;

• **Less maintenance** – the Poseidon remote controllable trawl doors and the total fishing gear can be guided to work 'off the seabed' with no bottom contact at all.

• **Less lost fishing time** – because the trawl doors can be controlled remotely from the fishing vessel. Currently the trawl doors must be taken onboard the fishing vessel, the chains and shackles unhooked, the doors set to different positions and lowered back into the sea.

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There's no such thing as fish waste

In 2050, the global population is expected to reach 9 billion[1]. At the same time, per capita protein consumption is expected to rise heavily, especially in populous growing economies like China and India. The challenge for agriculture and fisheries industries to keep up with demand is profound. Fish populations and land will likely remain virtually unchanged, stressing the importance of one imperative factor: raw material utilisation. Specifically, the global fisheries and aquaculture output is around 150 million tons and rises steadily. Incremental changes in product yield can translate into massive increases in the global supply of protein.

Dried fish

50% goes wasted

Technological advances in commercial fisheries sectors have brought considerable improvements in product yield. For instance, Icelandic producers of cod fillets have seen their product yield increase by as much as 20% over the past two decades[2]. However, the fillet only makes up 35 to 45% of the cod's weight. The remainder is head, bones, skin and intestines – raw materials that garner far less obvious choices for products. However, due to strict fisheries management regulations, Icelandic fisheries have been forced to innovate and invent profitable ways to exploit these by-products. And innovate they have: since the 1990's, the utilisation of fishery by-products has increased 30-fold, the export value per cod kilogram has risen by a factor of 4 and the array of different marine products has multiplied. Today, Icelandic cod producers typically make use of up to 95% of their raw material.

According to the Iceland Ocean Cluster's [3] research, the average raw material utilisation rate of cod in Europe is just over 50%, meaning that about half of each fish's weight goes wasted in the production process. Clearly, the opportunity for other nations to learn from Iceland's experience and increase the world's protein supply (and fisheries' profits) through better utilisation is substantial.

The technology is here

At Ocean Excellence we share a common vision that new technologies and processes can enable any seafood business to improve utilisation and expand profits without increasing raw material supply. For instance, recent advances in fish drying technologies allow small and large fish processors to make use of by-products in a quick and highly cost-effective way. In fact, new technologies make drying the most energy efficient method to process and preserve seafood. Aside from drying, several companies profitably make food products from liver, roes, heads and intestines.

More advanced ways to utilise by-products include enzyme technologies, nanofiltration and various biotechnological methods that isolate certain valuable ingredients from fish.

PROFILE

Ocean Excellence's new modular fish drying unit

Around the North Atlantic, fish is increasingly being transformed into omega, vitamins, collagen, gelatin, chitin, protein, peptides and other supplements.

Ocean Excellence has assisted numerous seafood producers around the world to implement these solutions and escalate the utilisation of existing raw materials. It amazes us to see how many producers are simply unaware of the capabilities their raw materials have. In our view, it's simple: there really is no such thing as fish waste!

[1] United Nations: http://esa.un.org/wpp/

[2] Meaning that the fillet of each fish is 20% larger today than it was 20 years ago.

[3] See www.oceancluster.is

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Icelandic fisheries: Sustainable and efficient

Sigurður Ingi Jóhannsson, Minister of Fisheries and Agriculture in Iceland considers the role the fishing industry plays on the Icelandic economy...

For most developed countries wild capture fisheries are not economically very significant, but Iceland is one of the exceptions. Fisheries have for a long time been the backbone of the Icelandic economy. In 2012 some 1.5 million tonnes of fish were caught around the island with an export value of €1.7bn. Fisheries and fish processing represent some 11% of GDP and 27% of the total export earnings. New research indicates that, if the various sectors supporting the fisheries sector are taken into account, their contribution to GDP might be as high as 26.7%. Today, fisheries in Iceland are sustainable, efficient and highly profitable.

How did this come about?

In Iceland, like most other coastal states, there was no perceived need for fisheries management in the early days, when landings just kept on increasing year after year. International acceptance through UNCLOS (UN Convention on the Law of the Sea) of the 200 mile Exclusive Economic Zone finally gave Iceland full control of its fishing grounds. After the "cod wars", when foreign fleets were excluded from Icelandic waters, fishing was free and practically unrestrained for all Icelanders. Around 1977 signs of overfishing had become undeniable. Something had to be done. To deal with the problem, Iceland, like most other nations, opted for "input controls" such as "days at sea" programmes plus various other technical options to curb the fishing power of the fleet. However, this proved to be ineffective. The fleet was quick to increase its fishing efficiency within this framework, so overfishing persisted. Fishing was really driven by fierce competition for the fish, regardless of quality and market conditions. To catch the most the fastest was the name of the game. As an example, 70% of the cod (representing over 50% of the value of total fish exports) was caught in a period of 3 months in the summer, often leading to very poor yields and poor quality.

Sigurður Ingi Jóhannsson
Minister of Fisheries and Agriculture

In 1984, permanent quota shares of the annual total allowable catch (TAC), decided by the Minister of Fisheries, were allocated to individual fishing vessels. This meant that each fishing vessel could now catch its share of the different fish stocks in its own time. The benefits soon came to light, such as saving fuel by not racing to the fishing grounds, staying in harbour in bad weather, using the most efficient vessels etc. Quotas became transferable between vessels in 1990, leading to a market system for fishing quotas that were nevertheless subject to certain restrictions. On the whole, this led to an important transformation of the industry: From a quantity mentality to that of quality and value. The quota system also led to vastly improved efficiency: Only 9,000 people are now directly employed in fishing and fish processing. This corresponds to 5.3% of the Icelandic workforce, but new jobs have been created in specialised industries serving the fisheries sector, driving the change to more efficiency every year.

Improvement in productivity has been achieved by constant streamlining and the use of automation and robotics, as well as incentive schemes of various types. As a result, the real value of cod products over the last 30 years has doubled due to higher yields, better quality, value-added products and more focussed marketing. By-products, which were formerly considered as waste, such as fish heads, livers, fish frames, skin etc. are now processed.

From a political point of view many view the system as being "unfair". Cases have been brought to the courts of law, even international courts, to test various aspects of access limitations to this common resource of Icelanders. There is an on-going debate on how high the resource rent or fishing fee should be. Admittedly, the system has not proved to be perfect. Many of the remote villages around the island have faced severe difficulties, e.g. when fishing quotas have been transferred to vessels operating in other parts of the country. It is a system under constant development and various measures have been taken by the government over the years to counteract the negative aspects. Yet, it is clear that the nation as a whole is the biggest beneficiary of an efficient fisheries management system. That is the fact that should be kept in focus – the rest is all about fine tuning a well functioning system.

The figures about efficiency speak for themselves. The industry is efficiently managed, rather than (top down) regulated, and it is not subsidised. Over the years, vessel ownership has become more concentrated through the transfer of quotas and a vertical integration of companies has taken place. Most importantly, management decisions are moving towards long-term harvesting rules and discards are forbidden. All decisions of this kind are now based on the best available science, a policy that is supported by most of the industry. The outcome has been that fish stocks are now generally at good levels. That is the key issue when it comes to responsible and sustainable harvesting of living marine resources. ∎

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Sigurður Ingi Jóhannsson
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Improving the utilisation of the geothermal resource in Iceland

GeoSilica Iceland, an Icelandic start-up company, aims to improve the utilisation of the geothermal resource in Iceland by extracting valuable minerals from the mineral rich waste water from geothermal power plants.

There is more to the utilisation of geothermal power than using the thermal energy of geothermal fluid for heating and passing the steam through turbines for power generation. Much more. The utilisation of geothermal power produces, like most industries, its own by-products, and these could then be utilised further downstream of power production.

What is the main by-product of geothermal power plants? It is generally called geothermal waste water. It is the geothermal fluid originally drawn up from the depths of the convection zone of the geothermal reservoir, after heat has been extracted from the liquid phase, and electricity produced from the steam phase.

The waste water is very mineral rich since the originally extremely hot fluid has dissolved a lot of minerals from the hot rocks, and this is reflected in its chemical composition. The major mineral in geothermal fluid is silicon dioxide, more commonly known as silica. Initially, the silica is in its dissolved form of silicic acid, but as the fluid cools, the silicic acid polymerizes to form precipitated silica.

Precipitated silica is a valuable commodity and can fetch US$20 per kilogram if pure enough. Every year, about 40,000 metric tonnes of precipitated silica go to waste in the geothermal plants in Iceland.

GeoSilica aims to extract some of this silica to produce purified silica sols for use in novel silica healthcare products, where the price of one kilogram of very pure precipitated silica can reach US$2,000.

The disposal of waste water and the sustainability of geothermal power

What is done with all the waste water from geothermal power plants? Generally, as much of it as possible is returned back into the geothermal reservoir by pumping it into re-injection boreholes of various depths. This is crucial for the sustainability of the resource, because in most cases, the natural recharge of the reservoirs is limited.

However, this is often difficult and costly because the silica, having precipitated out of the fluid when it cooled, tends to clog the re-injection wells which are very costly. Thus, for power companies, the silica is not a blessing but a curse.

There are other valuable minerals besides silica in geothermal fluid. An example is lithium. As boreholes get deeper, it is expected that the concentrations of such metals, and even precious ones such as gold, will increase substantially. Extraction of such metals from the fluid has to be done downstream of silica extraction.

The large scale extraction of silica from geothermal waste water would make it easier to reinject it back into the geothermal reservoirs, thus improving the sustainability and the utilisation of the resource, while at the same time, enabling the extraction of other precious metals.

GeoSilica is currently looking for funding in order to scale up its production capacity and bring its products to European and other international markets. GeoSilica strives to be a socially responsible company and intends to improve the society by conducing towards healthier environment, creates new jobs, maximising the utilisation of the geothermal resource in Iceland and contribute to EU sustainable objectives.

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The importance of maritime safety throughout Europe

Markku Mylly, Executive Director at the European Maritime Safety Agency (EMSA) details how they work with the European Commission to maintain safety and implement EU legislation...

For Europe, maritime transport has been a catalyst of economic development and prosperity throughout its history. Maritime transport enables trade and contacts between all the European nations. It ensures the security of supply of energy, food and commodities and provides the main vehicle for European imports and exports to the rest of the world. Almost 90% of the EU external freight trade is seaborne. Short sea shipping represents 40% of intra-EU exchanges in terms of ton-kilometres. The quality of life on islands and in peripheral maritime regions depends on good maritime transport services. Each year, more than 400 million passengers embark and disembark in European ports. Overall, maritime industries are an important source of employment and income for the European economy.

The maritime industry is crucial to Europe in many ways and the health of that industry depends on maintaining the highest possible standards of safety. EU countries have worked hard to ensure that their own flag fleets have a good safety record and to apply high standards to other ships by inspecting them when they enter EU ports. Generally, the maritime safety record in Europe is good, but everyone can remember the occasions when things have gone disastrously wrong; the names of the Erika and Prestige, the Estonia and most recently the Costa Concordia, are familiar to all.

Working with the European Commission to maintain safety and implement EU legislation

EMSA's creation came in a package of EU legislation that was developed in response to the Erika casualty. The Agency's founding regulation[1] establishes it "for the purpose of ensuring a high, uniform and effective level of maritime safety, maritime security, prevention

of, and response to, pollution caused by ships as well as response to marine pollution caused by oil and gas installations."

"The maritime industry is crucial to Europe in many ways and the health of that industry depends on maintaining the highest possible standards of safety."

The Agency's tasks are set out in the Founding Regulation and reflect the added value that can be achieved by cooperation between EU countries. The basis for this cooperation lies in a body of EU legislation covering a range of safety issues, such as EU recognition of classification societies that survey ships on behalf of Member States; the coordination of inspections of ships in EU ports; standards for seafarer training, certification activities and various technical standards such as those for domestic passenger ships and ro-ro ferries that operate from EU ports.

The Agency assists the Commission in the preparatory work for updating and developing such legal acts and in their effective implementation, in particular by visiting Member States and inspecting classification societies and third countries that train and certify seafarers. The results from a series of these visits and inspections are analysed across the board to identify any potential improvements to the legislation.

In addition the Agency works with the Commission and Member States to organise relevant training activities, provide supplemental pollution response resources and in providing technical assistance to contribute to the work of the technical bodies of the IMO, the International Labour Organisation, and the Paris Memorandum of Understanding on Port State Control ('Paris MoU'), with regard to matters of EU competence.

At an operational level EMSA has developed and operates information systems such as the EU Long-Range Identification and Tracking Data Centre and the EU's Maritime Information and Exchange System (SafeSeaNet) which can provide vital ship data and

tracking information for use in an emergency or to facilitate measures against threats of piracy and or other intentional unlawful acts. The Agency also helps to improve the identification and response to unlawful discharges by using the European Satellite Oil Monitoring Service (CleanSeaNet) to monitor the extent and environmental impact of such pollution.

The Agency analyses safety investigation reports prepared by Member States to identify added value at Union level in terms of lessons to be drawn, and provides reliable and comparable statistics, information and data to enable the Commission and the Member States to take the necessary steps to improve their actions, and to evaluate the effectiveness and cost-efficiency of existing measures.

Challenges involved in maintaining effective levels of maritime safety

Shipping is an international business and the ships that visit the EU are, more often than not, flagged in non-EU countries and subject to the legal regime of their flag state. EMSA's activities help the Commission and the EU Member States to ensure that all ships that visit or operate in EU waters can expect uniformly high standards to be applied. The activities of monitoring ships and illegal discharges, developing and hosting systems such as THETIS, which is used to coordinate port state inspections, and contributing to the development of cost-effective standards at an international level, all help to fulfil this aim. ∎

[1] Regulation (EC) No 1406/2002 of The European Parliament And Of The Council of 27 June 2002 establishing a European Maritime Safety Agency, as amended

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Investing in future energy

Adjacent Government outlines how the UK is investing in renewable energy projects to create a benefit to the economy and reduce greenhouse gasses...

Renewable energy can come in a number of different forms, but can have the same impact on the environment and energy bills. Using renewables can help to create jobs and secure economic growth in communities, and help to reduce carbon dioxide and other greenhouse gases. Many renewable technologies exist on the energy market, including: solar PV; wind turbines; hydroelectricity; and, ground source heat pumps.

Since 2012, the UK has made great progress towards the government's 2020 renewables target to deliver 15% of our energy demand from renewable sources. In 2012 more than 4% of the UK's energy came from renewable sources – which was above the government's interim target.[1]

According to the government's 2013 Renewable Energy Roadmap, renewable energy is continuing to support economic growth, through green jobs and investment. Since 2010, £31bn worth of private sector investment in renewable electricity has been announced with the potential to support over 35,000 jobs across the UK.

Renewable energy projects in the UK, such as offshore wind farms, have the ability to create up to 4.5GW of electricity for the national grid. They are crucial to creating new jobs, and helping the UK to meet European targets. In April the government furthered their commitment by pledging support to 8 major renewable energy projects in the UK.

Five of the schemes backed are offshore wind farms, which are said to be worth up to £12bn in private sector investment. In July a further £200m was made available for renewable energy projects as part of the government's reforms to the electricity market.

In July 2014, Energy and Climate Change Secretary

Ed Davey said: "Our plan is powering growth and jobs in the UK economy. We are building a secure, sustainable energy system for the future, dealing with an historic legacy of underinvestment and neglect that threatened to undermine the whole economy.

"The funds we invest now in keeping the lights on could, in future be available to support cheaper projects that deliver lasting reductions in peak electricity demand."[2]

The government recently set out details for the first £10m Electricity Demand and Reduction auction from a £20m budget. The funding will be available to businesses and projects that reduce electricity demands and cut carbon emissions.

"I want to unlock the untapped potential of better efficiency in electricity use – so that more efficient kit can compete with building new power stations in the future," said Davey.

"Our £20m pilot will fund schemes that will help to reduce our demand – not only saving business and their customer's money, but reducing the amount of electricity we'll need to generate."

The government hopes that by stripping away barriers to investment in the energy market, it will create benefits for the UK economy and energy consumers. ■

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/255182/UK_Renewable_Energy_Roadmap_-_5_November_-_FINAL_DOCUMENT_FOR_PUBLICATIO___.pdf

[2] https://www.gov.uk/government/news/boost-for-business-energy-efficiency-and-electricity-sector-investment

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Power-up with Power-on Connections

It's hard to believe that it has now been over a decade since the UK construction industry has truly had the freedom to select an independent alternative to the local electricity utility – for example WPD, UKPN, Scottish & Southern Energy etc., (now known as Distribution Network Operators, DNO's) to provide the new connections to their developments.

Prior to this, developers and main contractors seeking new electrical connections for their developments could only do so through the DNO's. This, usually because of high demand, was often time consuming, expensive, problematic and frustrating. Although the provision of competitive connection facilitators had been developing for some time, it was not until late 2003 that the sector saw a real breakthrough, when an accepted industry wide standard of accreditation for Independent Connection Provider's (ICP's) came into place.

The revolution began...

The revolution was underway... the new system not only satisfied the DNO's that standards of quality and safety would be upheld when an accredited ICP undertook to deliver the electricity connection for a development project, it also helped to open up a whole new area of competition, meaning that developers had a choice. This in turn meant that these companies could focus on the interests of the client!

Today, the ICP's role is to provide competition alongside the DNO's in the provision of assets required to connect new load to the distribution networks. The opening up of this activity was a direct result of persistent lobbying by user groups consisting largely of developers and main contractors frequently frustrated by poor service levels.

"Over the past ten years Power On has provided new electricity supply connections totalling over 1000MW on over 2500 contracts, with a current repeat order success rate of over 80%. These include many landmark developments across the regions' cities, major city living projects as well as a growing track record with national developers for distribution hubs across central England."

In more recent years Independent Distribution Network Owners (IDNO'S) have provided additional competition in that they would own and operating these newly connected assets. This new arrangement presented our clients with additional benefits of reduced contributions as each connection has a future recognised value to the asset owners.

Attitudes are changing...

DNO's have had to accept the changing position although even now today the competition market place is not fully open and operating effectively. Barriers still have to be overcome and challenged albeit that the end may be in sight.... Two more years!!!!!!

Emerging as a force...

Power On's strategy has been to take ownership of the works from start to finish, offering a complete turn-key service from the initial enquiry, through to energisation of the project using their own teams; Giving their clients the simplest, possible interface for construction co-ordination.

Power On operates a highly trained design, project management and construction workforce from their operational centres in Leicester, London, Stafford and Leeds enabling the company to work strategically across the whole of the UK. The company prides itself on a high level of service, having easily contactable staff, offering a quick turnaround of proposals to clients, with guaranteed cost certainty, completion dates and improved project cash flows compared to those offered by all of the UK's DNO's.

Working on behalf of many national and regional companies, Power On has achieved an invaluable reputation for delivering on time and to budget. The emphasis on flexibility and certainty, with staged payments and terms and conditions that enable effective risk management.

To date, Power On projects have covered all types of development, from speculative light industrial, commercial, educational and retail, to large-scale manufacturing and freight distribution warehousing. Power On also specialises in connections for high-density apartments, whether that be city living, student accommodation or retirement homes. The high density of this type of development, combined with the locations selected, pose many challenges, one of which is arranging the new electrical supplies for building.

Our sister company the Electrical Network Company (ENC) operate as an IDNO and therefore within each of our quotations we are able to provide the financial benefits of IDNO ownership back to the customer. This is clearly a winning approach as over 80% of our projects won are adopted by ENC.

Other service offerings within the Group….

Through a number of market leading brands at Brookfields Utility UK (BUUK) we can offer residential and commercial gas connections, heat and hot water systems, clean and foul water connections as well as fibre connections.

This makes BUUK the only multi utility operator across England, Wales and Scotland. We currently operate over 3,000 electricity networks and over 30,000 gas networks and have over 1.3 million customers with another 500,000 contracted connections.

This capability, competency, financial security and track record of delivery provides our customers with the secu-rity and peace of mind to know that we are a credible and dependable force in the connections arena.

Building on a track record…

Over the past ten years Power On has provided new electricity supply connections totalling over 1000MW on over 2500 contracts, with a current repeat order success rate of over 80%. These include many landmark developments across the regions' cities, major city living projects as well as a growing track record with national developers for distribution hubs across central England.

"Today, the ICP's role is to provide competition alongside the DNO's in the provision of assets required to connect new load to the distribution networks. The opening up of this activity was a direct result of persistent lobbying by user groups consisting largely of developers and main contractors frequently frustrated by poor service levels."

Last year Power On commissioned two 33kV primary substations on time and to budget, whilst really putting a stamp on the company's capabilities and benefits offered.

Power On has extensive experience assisting Local Authorities & Main Contractors with their LIFT and PFI building projects including health centres and schools across the UK.

Working closely with the customer from an early stage to ensure mini-mum requirements are inherent in the design, Power On enables clients to make informed decisions when alternative solutions exist.

The future…

'Self-Assessment' for the Point of Connection eliminates the need for the DNO to determine where on their network a connection is to be made.

'Self-Connection' eliminates the need for the regional electricity company, or DNO, to complete the final connection and power up the site.

'Higher Voltage Capability' as load demands increase, we are developing our competency to include 132kV design and project management capability.

This increased flexibility allows customers to benefit from a 'one stop shop' solution provided by one company, thereby avoiding unnecessary delays to construction programmes.

POWER ON *connections*

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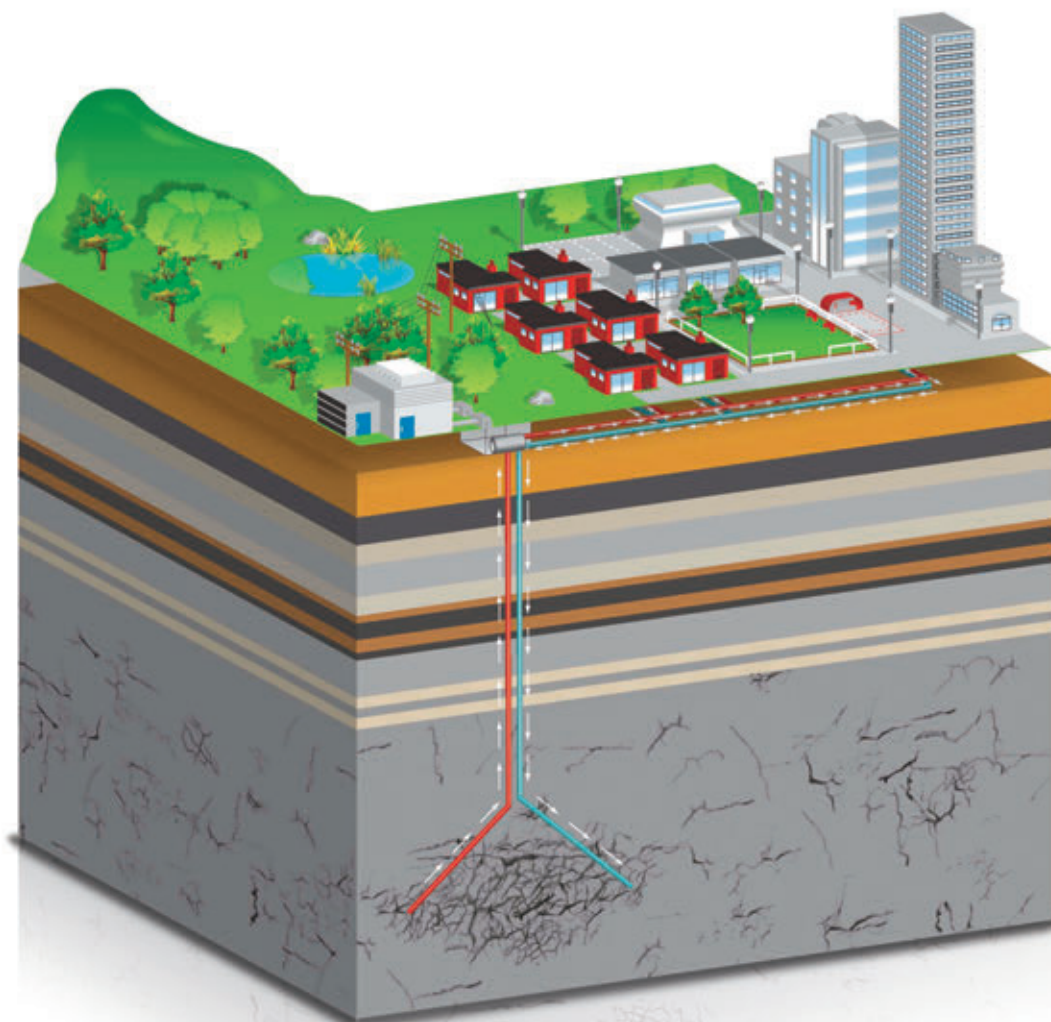
Tapping into the district heating network

An innovative district heating network project aims to dig deep to power Stoke-on-Trent's economic renaissance. Andy Platt, Cabinet Member for Green Enterprise at Stoke-on-Trent City Council outlines the project and its benefits...

The whole of the UK faces a mounting challenge to protect consumers from the ravages of a volatile energy market while simultaneously increasing the use of renewable power and cutting carbon emissions. Stoke-on-Trent's circumstances are no different.

It would be easy to argue that, having invested tens of millions of pounds in retrofit energy saving improvements for local homes in recent years, as well as supporting the creation of the multi-million pound Centre of Refurbishment Excellence in the city, the council has done all that it could to meet this challenge – particularly at a time when financial constraints pose a threat to our core services. But we are determined to go much further than this and bring to fruition our own unique vision for localised energy security.

The scale and urgency of the escalating energy price challenge have forced us to look in greater detail at how the city's energy needs are likely to shape our communities and our economy. Stoke-on-Trent has traditionally been home to some of the UK's most energy-intensive industries, and although the commercial landscape has changed significantly in the last 30 years, reliance on plentiful energy is still an important economic consideration.

Energy

In the absence of clear national consensus, we have resolved to take matters into our own hands to shield vulnerable businesses and communities from the excesses of the energy market. Faced with an increasingly stark choice between capitulation and innovation, we opted for the latter.

Surveys indicate that Stoke-on-Trent is situated about two kilometres above a naturally occurring source of geothermal energy, enabling us to tap into heat from within the Earth's crust to warm buildings on the surface.

We are confident that, with financial support from the Department for Energy and Climate Change, we will be able to tap into this abundant renewable energy source, pump it to the surface and distribute the heat direct to the city's university and further education colleges, commercial and business premises, council-owned buildings and homes.

According to our projections, from 2018 locally produced geothermal energy will supply heat at a predictable, attractive price on an 11 kilometre network spanning the city centre, the Etruria Valley business park, the University Quarter and Stoke town.

The availability of up to 45 gigawatt hours of renewable energy will cut Stoke-on-Trent's carbon emissions by an estimated 12,000 tonnes a year. But more importantly, it will also offer unparalleled energy price stability, removing much of the uncertainty which continues to dog the wider domestic energy market.

Earlier this year, our vision for local energy security took a huge leap forward when the city council, along with our partners in Staffordshire County Council and the Stoke-on-Trent and Staffordshire Local Enterprise Partnership, signed a momentous city deal with the government worth about £113m over the next 10 years. The centrepiece of this deal was a £20m government funding pledge towards the £52m cost of creating the District Heat Network.

The early instalments of this financial support are already trickling down from Whitehall, enabling us to focus on strengthening our business case so that we can put our proposal to the market in order to line up potential commercial partners with the necessary expertise. This partnership approach will enable us to access and extract the subterranean hot water and, by means of a heat exchanger, use it to energise a district heat network that will serve buildings in the public and private sector.

There are still many steps to go through in the process of getting the District Heat Network up and running, and every groundbreaking infrastructure project encounters its fair share of challenges on the journey from concept to completion. However, it is heartening to note that Stoke-on-Trent secured the second largest injection of government funds out of the 20 wave two cities – particularly considering that bids were assessed against their feasibility and commercial viability, as well as expected environmental and social benefits.

We believe that our proposal has the potential to transform our city's economic prospects and help to accelerate Stoke-on-Trent's renaissance as an emerging national hub for renewable energy research and innovation. What is becoming increasingly clear is that ministers share our view and are responding to the city council's growing confidence in its regeneration strategy.

The District Heat Network is about far more than securing short-term energy price stability. The success of this unique project will send a clear signal to potential investors, central government and regional drivers of growth that Stoke-on-Trent is an innovative city with the focus, the leadership and the will to take control of its own destiny and claim its rightful place as a future economic powerhouse. ∎

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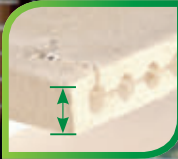
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Insulation: A guarantee of savings

Investing in solid wall insulation brings huge benefits in terms of reduced energy costs and carbon emissions. Steve Tanner, General Manager at SWIGA discusses what its guarantee can offer the consumer...

With many energy saving insulation solutions readily available for homes and businesses large and small, there really is no excuse not to insulate.

Although months away from winter, the Solid Wall Insulation Guarantee Agency (SWIGA) is advising that now is the perfect time for property owners to invest in insulation and combat rising energy costs and climate change sooner rather than later.

The way a building is constructed, insulated, ventilated and the type of fuel used, all contribute to its carbon emissions. A worrying fact is that a significant proportion of the money spent on energy is literally being thrown out of the window as a result of inadequate levels of insulation, with around 58% of the heat being lost through the roof and walls alone. By simply insulating with SWI savings of up to £460* per year can be achieved.

The Solutions

Solid walls can be insulated with either; External Wall Insulation (EWI), Internal Wall Insulation (IWI) or a combination of both and either option will greatly increase comfort, while also reducing energy bills and the associated environmental impact.

IWI typically consists of either dry lining in the form of laminated insulating plasterboard (known as thermal board) or a built-up system using fibrous insulation such as mineral wool held in place using a studwork frame.

IWI has the advantage that it can be installed room by room with the tenants in situ. It increases internal surface temperature within a room and also improves response to heating input when heated intermittently. IWI can also be installed in any weather and cost can be kept to a minimum if combined with other works, e.g. if internal repairs or rewiring is required.

Laminated insulated plasterboard can be used in many situations and is fixed directly to the existing brick. Depending on the system, thermal boards can either be screwed or glued using a dry wall adhesive directly onto the brick work just like standard plaster board. It is normally thinner than studwork systems due to its better thermal conductivity, although there are instances, such as uneven existing walls where a studwork based system may be more suitable.

EWI comprises of an insulation layer fixed to the existing wall, with a protective render or decorative finish including real brick slips or brick effect finishes. EWI increases the thermal quality of the building – particularly relevant when refurbishing non-traditional housing. It also overcomes moisture and condensation issues, protects the existing building envelope can reduce heating bills by up to 25% as well as greatly improve the appearance of the building.

EWI is a tried and tested method of upgrading the thermal performance and external appearance of existing properties which are literally transformed into warm, energy efficient and attractive homes and buildings. Improving appearance is of particular significance to many local authorities targeting housing projects in poorer areas. Adding EWI on a whole street basis will raise residents' morale and give a sense a pride in their community.

There are many benefits of EWI including the fact that no living space is lost. There is minimum disruption for the residents as the work can be carried out while they are in their homes and it also adds a water-proofing layer to the outside of the property which will last for decades with minimal maintenance required.

There are a lot of things for the consumer to consider during the installation of IWI or EWI. Good quality detailing in design and installation is key and different materials and systems are available each with distinct benefits.

Not only does SWIGA provide consumer protection with our independent 25-year guarantee, we can offer the consumer independent industry expertise – our membership includes all major system designers who we can draw on, but we also have an independent approach and can offer expert opinion on client projects.

We differ from insurance companies in that in the unusual event of installation issues, we will arbitrate on any disputes and get remedial work done, then deal with the contractual aspects between our members afterwards. Our prime focus has always been and is on prevention, not cure. Our Quality Assurance framework is key and our pre-vetting procedures do more than any other to avoid issues from the outset.

The government's Green Deal Home Improvement Fund and the Scottish equivalent are a big step in opening up the market for individual householders living in solid wall homes but these schemes won't be enough on their own though.

It is vitally important that the proposed changes to the Energy Company Obligation are decided upon and communicated to the industry and other stakeholders as soon as possible. SWIGA hopes that government increases the Solid Wall Insulation minima from the original proposal otherwise there will be a large gap in their CO_2 commitment, and a large impact on the SWI industry, with many jobs at risk.

Membership of SWIGA is open to SWI installers and System Certificate Holders. For more information about SWIGA please contact Steve Tanner. ∎

* Based on a detached gas heated house, with an 81% efficient gas boiler and average gas tariff of 4.21p/kWh and electricity tariff of 13.52 p/kWh; Figures from Energy Saving Trust and valid for 2014.

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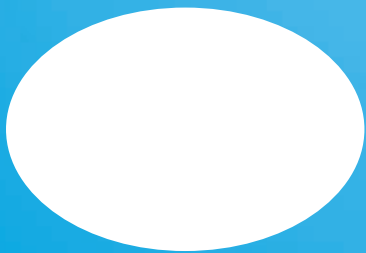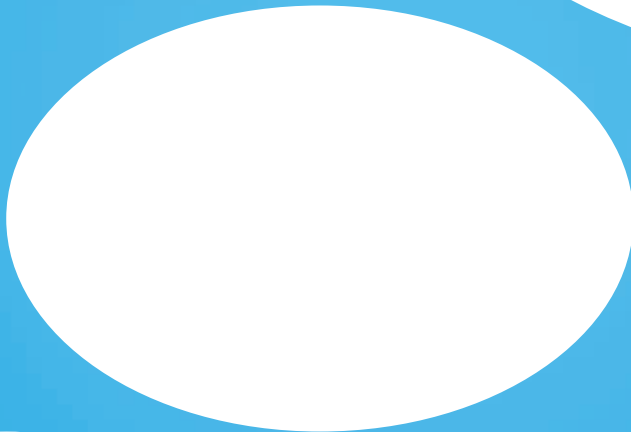
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CCS – Grasping the opportunity

While Carbon Capture and Storage (CCS) projects in the UK are increasing in pace, Judith Shapiro, Policy and Communications Manager at the Carbon Capture & Storage Association explains why there is still work to be done…

To say that CCS has been on a rollercoaster ride in the UK over the last few years would be an understatement. Following the collapse in 2011 of the first competition launched in 2007, the government was quick to launch a new competition – the CCS Commercialisation Programme – in April 2012. The name of this competition indicates an outcomes-focussed competition, with the aim of enabling CCS to be cost-competitive with other low-carbon technologies in the 2020s. By March 2013, 2 projects were selected as preferred bidders and both of these are now progressing with Front End Engineering and Design studies (FEED), which is great news indeed. These projects are the White Rose project at the Drax site in Yorkshire and the Peterhead Gas CCS project in Scotland. The

FEED studies for both projects are expected to last for approximately eighteen months – after which final investment decisions will hopefully be taken and the projects should be operational by 2020.

So, the first 2 CCS projects in the UK are progressing well. However, 2 projects do not an industry make. For CCS to fulfil its role in tackling climate change whilst becoming cost-effective with other low-carbon technologies in the 2020s, we will need a steady roll-out of projects. In fact, the government have already stated (in their response to the CCS Cost Reduction Task Force) that a second phase of CCS projects will be needed before CCS is likely to be cost-competitive with other low-carbon technologies. Crucially, it is recognised

that this second phase may need to be developed in parallel to the 2 projects in the current competition. This is an important point – if we were to wait until the competition projects were built, plus perhaps a few years of learning lessons before second phase projects are built, it could be 7 years or more before further projects see the light of day. This is too large a gap and is not a sustainable roll-out pathway for CCS. Developers will have moved on, skills will be lost and the supply chain will not develop as necessary.

Fortunately in the UK, potential second phase CCS projects are already under development. There are at least 2 projects which were not selected in the competition that are now desperately trying to find a route to market. Whilst these projects do not have the benefit of the £1bn capital grant that is allocated to the competition, in principle they should be able to access a Contract for Difference (CfD) under the Electricity Market Reform framework. However, there is currently very little clarity on how CCS projects beyond the competition can access a CfD and whether there is even sufficient funding available for non-competition projects in the overall budget (the Levy Control Framework) of £7.6bn by 2020/21. In the next few months we urgently need to see commitment from government on these crucial issues, otherwise there is a very real danger that these projects will collapse – and the impact on the entire CCS industry could be devastating. Investment in these non-competition projects would provide a seamless transition to the second phase of CCS in the UK, which would begin to realise necessary cost reductions and deliver the outcome of the Commercialisation Programme – CCS that is cost-competitive with other low-carbon technologies in the 2020s.

Whilst CCS faces some real challenges at the moment, the prize is also great. Earlier this year, the Carbon Capture and Storage Association published a joint report with the Trades Union Congress setting out the Economic Benefits of CCS in the UK. The report concludes that a decarbonised electricity sector by

2030 which includes CCS delivers real benefit to the consumer – an £82 reduction in household bills per year compared to decarbonisation scenarios where CCS is not included. An ambitious roll-out of CCS has the potential to create 15,000-30,000 jobs annually by 2030, with a cumulative market value of £15bn-£35bn.

These numbers show that CCS is not just an essential tool in the fight against climate change, it is good business as well. The next few months will show whether the UK can grasp the CCS opportunity and realise the significant benefits that this crucial technology can deliver. ∎

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Transforming industrial heritage into a high value low carbon future

Industries from chemicals to biofuels, oil refining to steel, lie at the centre of Teesside – the industrial heartland of the UK.

Teesside, in Tees Valley, is home to the largest integrated chemical complex in the UK and the second largest in Western Europe. All types of base chemicals are represented, producing the raw materials that ultimately go into the manufacture of all kinds of plastic goods, fertilisers and pharmaceuticals. The area is a world-class centre for the petrochemicals, energy, bio-resources, steel and advanced manufacturing industry.

Teesside is supported by world-leading infrastructure to help maintain these industries, including a deep water port, the Central Area Transmission System (CATS) pipeline bringing in gas from the North Sea, as well as excellent road and rail connections.

Support for growth is provided by Tees Valley Unlimited, the Local Enterprise Partnership for the area, assisted by the Centre for Process Innovation (CPI) at Wilton, NEPIC, a clustering support organisation that represents industry and its supply chain, and the Tees Valley Enterprise Zone, which offers enhanced capital allowances for major investment. In addition there is a significant advanced engineering industry that can design and maintain large-scale industrial plants. With more than 1,400 companies directly involved

or in the supply chain to the process industry in the region, the sector contributes over £1bn/year to gross value added (GVA) in Teesside, as well as contributing to the North East being the only net-exporting region in the UK (2012).

World Leader

Across all sectors, Teesside is at the forefront: supplying offshore wind projects in the North Sea; exploring opportunities for industrial plants to integrate; pioneering opportunities to use household waste to create chemicals; developing new biotechnologies; creating a cluster of biomass and biofuels plants; leading on carbon capture and storage technology; and supporting the growth and development of the major international companies based in the area such as Huntsman, INEOS, SABIC, GrowHow and Sembcorp.

Teesside's economic vision is to build on this existing cluster to establish Teesside as an integrated carbon-efficient industrial hub, achieving economic stability and growth through the production of low carbon energy and products. A modern Teesside will be one where plants are as energy efficient as possible: where waste replaces hydrocarbons to produce chemicals; where heat and energy is shared between chemical plants and is also used to reduce household energy bills; where carbon is captured and stored underground; and where green hydrogen is produced and used in hydrogen vehicles. At the forefront of this vision are the development of a CCS (Carbon Capture & Storage) network and the deployment of novel district heating schemes.

Industrial Carbon Capture & Storage

The Process industry is one of the only a few exporting sectors in the UK. The Teesside Process cluster is one of the largest in the UK covering a diverse sector base of chemicals, petrochemicals, steel and energy companies. This cluster directly employs over 9,000 people, with exports of c. £4bn per annum (2013). However these industries also make Teesside one of the most carbon intensive locations in the country.

The companies in Teesside have invested over a considerable number of years to reduce their carbon emissions, however where emissions of carbon dioxide are an inherent part of the process, a real step-change can only be made by implementing carbon capture and storage.

This is not only essential for the UK to meet legally binding carbon targets, but also to supply increasing consumer demand for low carbon products. For example major international corporations, such as Coca-Cola and Tesco, are demanding low carbon raw materials for their plastics. In the future, companies who cannot meet this demand will not win the contracts. A CCS network will allow companies to compete for an increasing market share for low carbon products and will act as a unique selling point for the UK, ensuring the future viability of an integrated industry.

Industrial CCS is a cost effective mechanism for the UK to meet its carbon targets, which could create 4,000 high value jobs and safeguard £4 billion worth of exports every year. In addition, CCS decarbonises the UK's agricultural sector, produces green hydrogen and low carbon plastic and decarbonises the second largest blast furnace in Europe (SSI). Using City Deal funding agreed in December, Tees Valley Unlimited are developing the business case for the full chain (capture, onshore transportation, offshore transportation and storage) with four key industrial emitters that currently produce around 7 million tonnes of CO_2 per year. Teesside is the only place in the UK actively developing an industrial CCS network.

District Heating

Teesside is dominated by large energy intensive industry, much of which emits low temperature, low pressure heat for which there is limited indus-

MAJOR RECENT INVESTMENT IN THE TEESSIDE PROCESS INDUSTRY		
Company	**Project**	**Capital Expenditure**
Air Products	World's largest renewable energy plant using advanced gasification energy-from-waste technology; building second plant	Over £300m
BOC Linde	Linde UK's largest hydrogen plant, supplying hydrogen and steam to Huntsman, North Tees	£100m
The Centre for Process Innovation (CPI)	National Biologics Manufacturing Centre to be built in Darlington and operated by CPI	£38m
Chemoxy International	Doubling the size of existing Billingham plant	£6m
GrowHow UK	NOx abatement investment	£9m
Huntsman Tioxide	Upgrade Billingham and Greatham works	£65m
Lotte Chemical UK	New PET manufacturing plant at the Wilton International site	Over £60m
Sembcorp UK & SITA UK	New energy-from-waste facility at the Wilton International site	£200m
SNF Oil & Gas	New polymer plant to produce polyacrylamide emulsion for enhanced oil recovery (EOR)	£150m
Tracerco (owned by Johnson Matthey)	New 61,000 square feet (5,667 square metres) bespoke research and development facility	£8.6m

trial use. Firstly, this low grade heat represents wasted energy which could be used to heat homes and businesses, and secondly it represents a lost opportunity to increase industrial energy efficiency. By utilising this wasted energy, the companies in Tees Valley become more efficient and competitive, and businesses and homes benefit from heat at a lower cost than conventional gas central heating.

Teesside is in a unique position to exploit its industrial assets with two ambitious industrial heat-powered district heating schemes:

• Compared to other clusters of energy intensive industries in the UK, Teesside's industry is in close proximity to residents, commercial operations, and public sector buildings resulting in a compact network;

• The Teesside industries were originally developed to have a self-sustaining energy supply providing an established infrastructure of interconnecting services including heat which can be exploited by a new network;

• Companies who generate the heat are already supplying closely located users with commercial agreements in place;

• Parent companies of the heat suppliers have experience of mixed use district heating schemes outside of the UK. These companies operate in highly competitive markets which constantly drives them to reduce their energy costs.

The councils in Tees Valley are currently developing these schemes, which could save homes and businesses 10-15% on their energy bills and reduce carbon emissions even further. Collectively these schemes could save over 50,000 tonnes of CO_2 every year, and would start operating from 2017/18.

Tees Valley's Low Carbon Future

Tees Valley is ideally situated to capitalise on the predicted future demand for hydrogen, already producing 50% of the UK's output. The increasing use of hydrogen-based technology in the automotive industry, amongst others, puts Tees Valley at the forefront of this emerging fuel source. Teesside has the opportunity to convert excess renewable energy into hydrogen for use in fuel cells, or to produce it from household waste, and from the application of CCS. Teesside is also the only place in the UK which could store the hydrogen in underground salt caverns.

Building on its industrial heritage, Teesside now leads the UK in low carbon economic growth: securing jobs, bringing in investment and developing the region's long-term prosperity.

Tees Valley Unlimited is the Local Enterprise Partnership for the five local authorities of Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton on Tees. The public and private sector organisation is responsible for driving forward the local economy, working in partnership with industry.

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Success story on mineral carbonisation of CO_2

Pushing academic research towards industrial scale through advanced modelling and piloting

At Aalto University, School of Engineering, Professor Mika Järvinen's Energy Engineering and Environmental Protection research group is conducting pioneering research on biomass combustion, CO_2 sequestration and storage by mineral carbonation, circulating fluidised bed gasification of waste and also advanced modelling of industrial processes, mainly on energy and metallurgical applications.

To have good industrial collaboration, we aim to carry out research both on full and pilot scales for avoiding the problems in up-scaling and to have immediate solutions for companies. The latest process we have been developing deals with the CO_2 sequestration and storage by mineral carbonation, using steel slag (a by-product from steelmaking) as a raw material.

The principle of our carbonation process is simple. We first dissolve the calcium from steelmaking slag with an ammonium salt solvent selectively, and then, bubble or spray the Ca-rich solution with CO_2 containing gas. In 2011 Aalto University Foundation, together with Abo Akademi and Rautaruukki Oyj, successfully secured a patent for a technique that produces calcium carbonate (CaCO3) from alkaline by-products. This CCS approach aims to reduce CO_2 emissions by using alkaline industrial waste materials and by-products and

Carbonation pilot team: Upper row from left: Timo Laukkanen, Sanni Eloneva and Seppo Poimuvirta. Lower row from left: Pertti Kiiski, Mika Järvinen, Arshe Said and Vadim Desyatnyk

flue-gases rich in CO_2 to create a CaCO3 product that is marketable to the paper or plastic industry for example.

The conventional production of this precipitated pure CaCO3 requires limestone to be mined, transported and then submitted to highly energy intensive calcination processes that also emit CO_2, but by substituting limestone as the raw material with industrial alkaline by-products, this patent method extinguishes the need for such wasteful activities.

Before we can begin to think about up-scaling to an industrial scale, it is imperative that the processes are first understood at every level in the pilot

plant. We need to test all the process parameters. This way we will find out the actual energy consumption, the chemical consumption, the steel slag residue's quality, as well as the quality of the end product (PCC), and the amount of CO_2 we can fix.

In order to sell CaCO3 as a filler or coating material, it is essential that the end product is up to scratch. During the spring 2014 we were able to produce several successful batches of CaCO3 from the new pilot plant at the Aalto University – and it is working really well. Once the process has been optimised at every level, we can begin to translate the method to a larger scale. We are currently looking for the best ways, and new partners to grow towards production on a commercial scale.

A!
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Volunteering to develop new skills

Veronica Wadley, Senior Adviser to the Mayor of London talks about the Mayor's solution to tackling youth unemployment...

How should young Londoners gain work without experience if they cannot gain experience without work? This conundrum is sadly faced by many young people and the Mayor of London, Boris Johnson believes that volunteering may be at least a part of the answer.

Youth unemployment currently stands at just under 20% and yet businesses are reporting recruiting challenges. There is clearly a mis-match. Time after time when the Mayor and I meet business leaders the overwhelming message is that this challenge is not simply an issue of literacy or numeracy, but it is the 'work-readiness' or 'soft skills', which many of our young people lack. The basics in confidence, communication, leadership and teamwork mean not only are they challenged to secure a job, but once they have one, they struggle to succeed.

In Team London, the Mayor's volunteering programme, we believe we have the start of a solution. As the school leaving age rises to 18, we want to equip our young people whilst they are still at school with the skills to compete. We believe that providing them the opportunity to volunteer does just this. When they engage in a volunteering project with a local charity they learn how to plan, to show up on time, to work with and communicate to those of different ages and different backgrounds as a part of a team, to deal with challenging situations, sometimes to lead in their own way. They also gain valuable experience to draw on when they are sitting in an interview or writing a UCAS form.

Over the last year my team has been working with youth charity The Challenge, and communications experts AGL Young People to develop a programme

which demonstrates that volunteering really can be a route to work for young people. HeadStart London offers 16-18 year olds employability workshops, communications coaching and a guaranteed interview for part-time or seasonal work – once they have given 16 hours of their time volunteering in their community. What we have seen through our fantastic business partners New Look and Starbucks – who have offered interviews to the young people for part-time or seasonal work – is that those who have volunteered are much more successful at interview than those who haven't. Starbucks were so impressed at the last assessment day that they offered 11 out of 13 young people a job, from their normal recruitment pool they deem 1 in 5 as work-ready.

"We believe that providing them the opportunity to volunteer does just this. When they engage in a volunteering project with a local charity they learn how to plan, to show up on time, to work with and communicate to those of different ages and different backgrounds as a part of a team, to deal with challenging situations, sometimes to lead in their own way."

At a recent event with business, Emmanuella a graduate from the HeadStart London programme spoke confidently and calmly in front of an audience of senior business leaders about how her volunteering role in a charity shop had supported her to take on her first part-time job at New Look. This is all adding to her skills, confidence and experience as she looks to pursue a career in fashion in the future. Prior to the programme, she had not been self-assured enough to speak to an audience, which shows just how much of a change even a relatively small amount of volunteering can make to a young person's confidence.

We believe that through this programme not only do we have the opportunity to change the course of the next generation's futures but, even better, we are offering them the opportunity to change their own course. Together we can start to tackle youth unemployment, one of the largest challenges that we face in London and across the country.

For a future workforce that is able to compete in an ever-competitive global marketplace, young people need to be prepared for the defining moments of their life with the right communication skills, work experience and volunteering experiences. They will be better aware of the world around them, comfortable working alongside those of all different ages and backgrounds. 73% of employers say that they would rather hire someone who has volunteered and 78% of employers cited employability skills as one of the most important factors when recruiting young people.

We are working with businesses large and small to ensure they recognise this volunteering experience in their recruitment processes and also enable their own staff to volunteer, giving them a minimum of 1 day a year to give their time to support the next generation to develop their skills. Over 20 businesses have already committed to support the Mayor in this mission.

Whilst youth unemployment may seem a huge challenge, young people like Emmanuella are now telling the next cohort of 16 year olds that the answer is simple – volunteer today.

Team London is the Mayor's volunteering programme for London, find out more and volunteer today at www.volunteerteam.london.gov.uk. ■

. . . .
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Senior Advisor of the Mayor of London
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www.london.gov.uk

Volunteering – developing key skills for employment

Volunteering can help young people develop essential skills they need for the world of work, here Fiona Blacke, CEO of the National Youth Agency details why...

It is a very difficult time to be young. The recession has hit young people particularly hard, with youth unemployment hovering just below a million and not showing much response to the green shoots of recovery.

In addition there are regular reports from business and employers groups that young people are ill equipped for the world of work. The academic emphasis on our education system is leaving young people lacking many of the key attributes which go to make desirable employees – the ability to work in a team, to get on with people, to empathise. Last year, the National Youth Agency established a commission into youth work in formal education, and found that

bringing youth workers into schools helped develop these 'soft' skills which employers often cited were hard to find in today's new recruits.

These types of skills have been shown to be important not just for employment, but also in building a better society for us all. An evaluation of the National Citizens Service found that improving teamwork, communication and leadership, improving social mixing and encouraging community involvement – all crucial characteristics of this team-led social action programme – contributed to a more responsible, cohesive and engaged society.

There is evidence that young people are seeing the opportunities that volunteering or social action offer.

Education and Training

According to official national statistics there has been a significant increase in the proportion of young people aged 16-24 years (up from 25% to 31%) who had volunteered in the last 12 months compared to 2005/06.

In addition, rising youth unemployment may have an impact on young people's volunteering. A study by youth charities BeatBullying and MindFull found that nearly half of young people who do not volunteer would be likely to do so if it led to a job or training. 54% of those surveyed who already volunteered would do more if it offered the prospect of employment or training.

Getting young people involved in social action, or volunteering, lies at the heart of many National Youth Agency programmes.

We are a key partner in the NCS Network, which offers young people a four week programme that culminates in a social action project, benefiting both young people and society. We also manage Think Big, a £1.5m youth programme, supported by Telefonica UK/O2. The programme provides young people with opportunities to set up projects to make a difference to their own lives and to the well-being of their communities.

Another programme which takes the best of both of these was our Social Action Fund project, supported by Think Big and the Cabinet Office. The aim was to engage young people who have completed the NCS programme, as well as some who hadn't any previous experience, and encourage them to continue volunteering and engaging in positive volunteering activity.

It worked. An evaluation found that of the young people who had never previously been involved in volunteering 84% agreed that they would continue to do so. Of those young people who had previously volunteered often 96% reported they would do more.

Our current Social Action Journey Fund project, focuses on a younger age group, disadvantaged young teenagers, aiming to establish a pattern of volunteering from late childhood.

Running alongside all these programmes is the skill and experience of youth workers, dedicating their time to helping young people in their personal and social development, and equipping them with the practical skills they need to be resilient.

In these challenging times, young people are finding their own ways to get essential employment skills and experience, and we are developing a new generation of socially minded young people who see the power of volunteering, as a result. ∎

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Structured insulated panels (SIPs) for schools

Matthew Evans, Technical Manager at Kingspan TEK explains why structures insulated panels (SIPs) offer a great solution for school building construction requirements...

By 2022, the Department for Education estimates there will be a further 949,000 students in state funded schools[1]. The construction of new schools or extension of existing buildings is therefore essential; however these projects are often amongst the most challenging to manage, combining strict site restrictions, limited construction space, tight completion deadlines and high energy efficiency targets. Structural Insulated Panels (SIPs) offer a straightforward solution for all of these requirements.

SIPs

A typical SIP comprises 2 OSB facings either side of a rigid urethane insulation core. Whilst frequently used in structural applications, the lightweight construction of the panels also makes them highly suited for cladding applications, either fitted in-board or out-board of a steel or concrete structural frame.

SIPs can achieve U-values of 0.20 W/m2·K "out of the box", or better U-values with an additional insulation layer, and their factory engineered joints ensure high levels of insulation continuity at junctions. Their inherent jointing arrangement can also form an effective air seal, preventing unnecessary air loss and allowing buildings to achieve air-leakage rates as low as 1m³/hour/m² at 50 Pa. As a result, the desired level of fabric performance can be accomplished with a minimal SIP thickness, helping to maximise classroom sizes and avoid space loss from the surrounding playgrounds.

As SIPs are factory pre-engineered and cut to the building plans for each project, site waste is minimised and a weathertight building envelope can be erected in a matter of days, allowing follow on trades to begin on site much earlier than with other forms of

Kingspan TEK® Cladding Panels offered a thinner solution to achieve the desired thermal performance, when compared with a traditional masonry construction, helping to maximise space within the internal classrooms

construction. Their predictable installation programme is particularly beneficial at active school sites, where construction has to be carefully planned around classes.

Case Study

To accommodate up to 210 more pupils, a new 2 storey learning block was constructed at the Ravenor

Kingspan TEK® Cladding Panels were installed in just three weeks on the steel frame of the new two storey learning block at Ravenor Primary School in Greenford

School in Ealing. Wooden packers were bolted to the outer face of the building's steel frame and 142mm thick SIPs were then fixed to these with headlock screws. To allow vertical movement, the screws sit at the top of 18mm holes drilled through the panels. The bottom plate of the SIPs was also nailed to the sole plate and a breather membrane was fitted to their outer face.

SIPs support a wide range of exterior finishes and the façade of the centre was formed through a combination of fibre cement cladding panels and high gloss rainscreen façade panels, installed on an aluminium rail and bracket system.

The 2 storey high SIPs were designed and pre-cut with a lead in time of less than a month and were fully fitted in just 3 weeks through the use of a mobile crane and elevating platforms. The learning centre has been pre-assessed as 'Very Good' under the 2011 version of BREEAM New Construction – Education, with an external wall U-value of 0.20 W/m²·K.

Brighter Future

With the economic recovery continuing, the short to medium term demand for new school buildings is another positive for the construction industry. By using SIPs it is possible to reduce the pressure in design and construction phases, whilst also delivering space and energy saving benefits throughout the building's lifespan. ∎

[1] National Pupil Projections: Future Trends in Pupil Numbers, Department for Education https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263801/SFR53_2013_MainText.pdf

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E-learning – from alternative to norm

Alastair Creelman, Vice-President at EFQUEL sheds light on why e-learning is no longer an alternative form of education...

The concept of e-learning is in danger of soon becoming redundant. In today's digital society, where the European Commission forecasts that 90% of all jobs by 2020 will demand digital literacy, any course that doesn't involve the use of technology may been seen as irrelevant. It's time to stop seeing e-learning as an alternative form of education and focus on developing new models and structures for education and learning that fully exploit the opportunities of today's digital revolution.

"Teachers and students today have a wide range of tools and methods at their disposal, both traditional and digital, and we are only now beginning to see how these can be used pedagogically."

E-learning, the use of information and communication technologies (ICT) in education, arose as an alternative for students who were unable to participate in traditional classroom education. Typically such courses were largely based on guided self-study with a linear progression through modules consisting of recorded lectures, course literature, written assignments and multiple-choice self-tests. This model is still in use today, especially in many of the popular MOOCs (Massive Open Online Courses) offered by major universities. Technology has so far been used to simply reproduce traditional methods such as building closed virtual classrooms and offering recorded lectures rather than investigating what new pedagogies and paradigms digital technology can enable. E-learning has often been viewed as a compensatory phenomenon offering a "second best" solution for those not able to attend a regular course. There has also been a tendency in the e-learning community to focus on the technology, tools and devices rather than a discussion of how digital technology can enhance learning and how we can develop new pedagogies to fully exploit these opportunities. New technology does not lead to better learning; it's what you do with that technology that can make a difference.

Alastair Creelman, Vice-President

Today we have a wide range of free or easily afford-able tools that enable us to do things previously unimaginable, both inside and outside the classroom: invite an expert guest to appear in class via Skype, publish class work and projects globally via blogs, wikis and e-books, create communities of interest on a national or international scale, write collaborative documents and projects, engage in dialogue with subject experts and students around the world. Teachers, librarians and educational technologists must work together to design stimulating collaborative learning environments for students and this involves questioning traditional practices and developing new skills. Teachers and students today have a wide range of tools and methods at their disposal, both traditional and digital, and we are only now beginning to see how these can be used pedagogically. The educational debate of recent years has often tended towards an unnecessary either/or polarisation (classroom/computer, physical/virtual, book/e-book) rather than an inclusive view where both traditional and digital tools and methods are all available and valid in the right setting. There are many arenas for learning available today, from the classroom to social media and virtual worlds, and the challenge for all in education is choosing the right arena for the right purpose.

Education is moving from the traditional information transfer model focused on content to the acquisition of skills such as teamwork, critical analysis and entrepreneurship that are increasingly demanded by employers. New forms of assessment and examination are needed to measure these new competences and new validation procedures are essential to ensure the international validity of new credentials. This demands new roles for both teachers and students and extensive support will be required to help them acquire the necessary digital skills. Educational institutions and authorities will need to thoroughly revise their quality assurance systems to accommodate these changes.

We are now moving from seeing e-learning as an alternative solution, with its own quality criteria, to full integration with mainstream education. The integration of technology into all forms of education is a reflection of the global digitalisation of society and it is essential that we have international cooperation around quality assurance, new forms of assessment, examination and credentials. EFQUEL has for almost 10 years been one of the leading European stakeholders working for innovative quality assurance and excellence models in e-learning and has, through various EU-supported projects, developed quality certifications for both institutions and programmes/courses. One particularly relevant initiative we are involved in at present is the SEQUENT project together with ENQA (European Association for Quality Assurance in Higher Education) and EADTU (European Association of Distance Teaching Universities) to map out paths for integrating existing e-learning quality certifications into mainstream university quality assurance. Through this and other initiatives we hope to contribute to the full integration of e-learning into European educational quality assurance. ∎

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Technology Enhanced Learning

Learning is an important social and economic factor in community development. Due to changing parameters and continuously increasing amount of knowledge learning has to change also. This opens up for new learning methodologies and learning environments. At Technische Universität Chemnitz, Germany, a new learning approach has been developed based on three mayor key ideas: Evaluation, mobility and individualisation.

Evaluation: With evaluation different learning methodologies and environments including e-learning, blended-learning and distance-learning can be analyzed. A new structure oriented valuation model (SURE) has been defined and used for evaluation of existing learning methods. SURE model reflects complex structures of multi criteria optimisations. Stakeholder's interests are considered as well as learner's and teacher's needs. Thus strengths and weaknesses can be identified which are valuable information for optimisations and direction of new learning approaches.

Mobility: The second key issue which has been found is the need of mobile learning environments. Here technology can be introduced. Tablet computers and smartphones are well known examples. However we have found that technology has to be combined with new learning methods because mobility introduces new learning parameters. For example, the average time slot for learning with a mobile device is reduced to 10 percent of regular learning intervals. In our approach the learning situation is analyzed using the mobile device's sensors. With this information the learning lesson can be adapted to the situation. Additionally, learning agents can be introduced. Varying situations due to mobility may interrupt the learner. Main tasks of learning agents are to track the learning progress and to support the learner in returning to his lesson. This binds together virtual learning environments which are accessed by mobile devices and real life situations.

Individualisation: The third key issue we identified is individualisation. Learners have different social background as well as different education. This individualises two points. First, the learning entry has to be chosen. If necessary this can be supported by a questionnaire which is helpful to find out the own learning level. The learning environment has to adapt to this situation. Here we use knowledge system based approaches to adapt the actual learning situation. Second, the learning progress is subject to individualisation. We distinguish between the order of learning lessons and the time schedule of learning lessons. Both are individualised in future learning environments. If the learner can choose the order of lessons the motivation for learning will be maximised, which is a key issue for learning success. Individual time schedules allow learning progress even if classmates have not reaches the personal learning level. This maximises learning progress because waiting periods for classmates or teaching terms are eliminated.

This new learning approach finds application in international master programs, postgraduate professional education and in-service training. The introduced technologies in hardware and software enable evaluation, mobile learning and individualisation. In this way diversity in terms of cultural background, language and education are overcome in a common learning approach.

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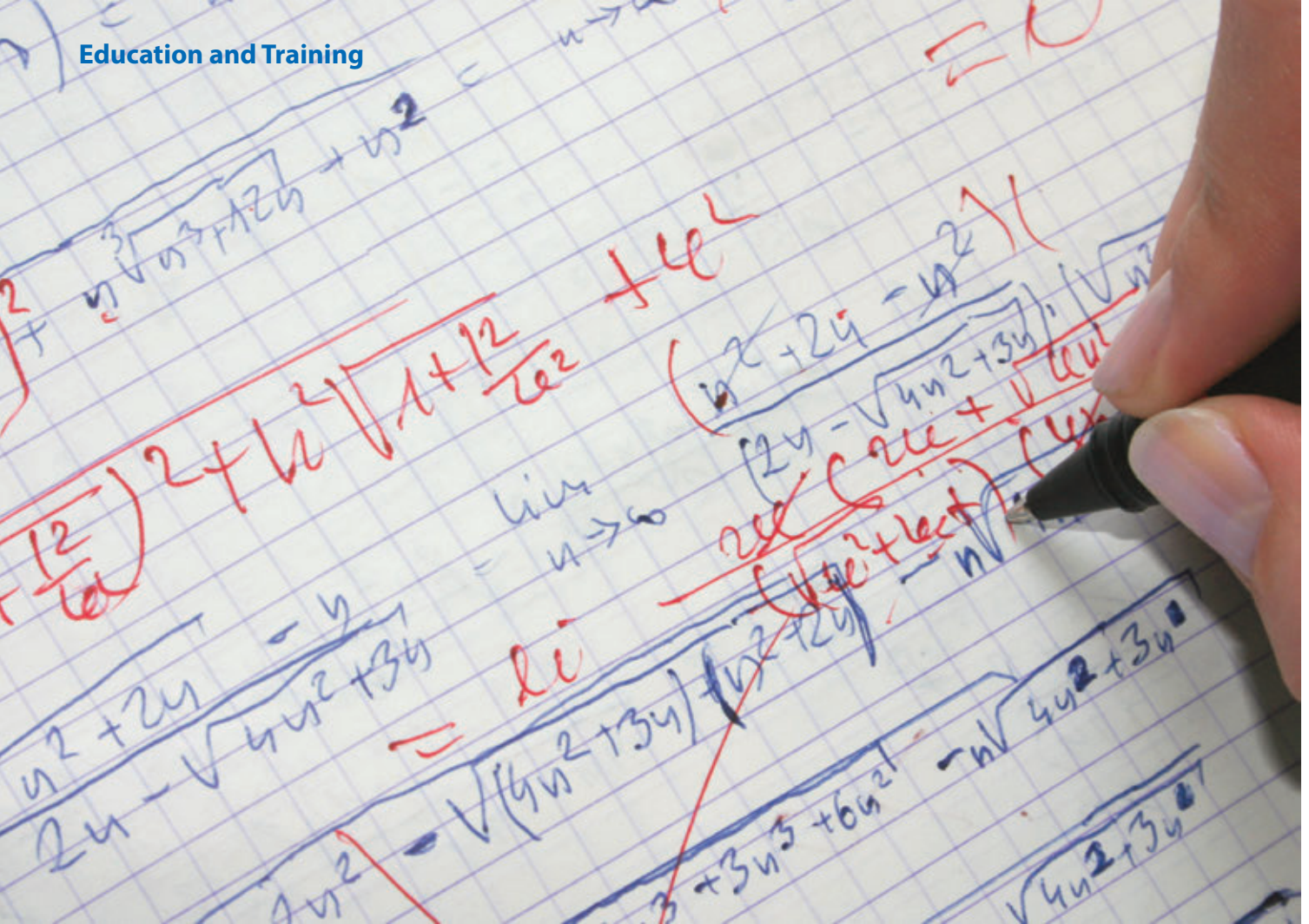
Nurturing maths throughout Europe

Adjacent Government highlights the work of the European Mathematical Society (EMS), and how it's helping Europe to remain a global player in that field...

Last year, the Organisation for Economic Co-operation and Development (OECD) reported the European Union on the whole was seriously lagging behind in mathematics. The figures showed there had been no progress in improving the percentage of low achievers at EU level since 2009.

However, the OECD also reported that Estonia, Finland, Poland, and the Netherlands are among the top performing countries globally, having reached a low achiever rate below the EU benchmark of 15%.

The report also acknowledged that significant progress – more than 2 percentage points – had been made in Bulgaria, Ireland, Croatia, Latvia, Austria, and Romania.[1]

In response to the results, Androulla Vassiliou, European Commissioner for Education, Culture, Multilingualism and Youth, commented: "I congratulate those Member States which have improved their performance, but it is clear that the EU as a whole needs to work harder.

"Member States must sustain their efforts to tackle low achievement in school education to ensure that youngsters have the skills they need to succeed in the modern world. The results are a reminder that investment in quality education is fundamental for Europe's future."

Supporting mathematics is vital if Europe is to remain a global player in the field. The European Mathematical

Society (EMS) represent mathematicians, and promotes mathematical research throughout member states.

With around 60 national mathematical societies, 40 research centres, and 3,000 individual members, the society will celebrate its 25th anniversary next year. EMS provides membership for both corporations, and individual members.

Speaking during the 6th European Congress of Mathematics, EMS President Marta Sanz-Solé outlined the importance of the subject. She commented: "Like many other disciplines, mathematics has reached a degree of extreme specialisation. Nevertheless, there remains a need for keeping its unity as a scientific discipline, for resisting fragmentation, and for maintaining and even increasing fluid communication between its domains. A holistic structure will better contribute to genuine progress of scientific knowledge.

"As for other theoretical or experimental areas, scientific, social or humanistic, the most significant mathematical advances and breakthroughs involve a complex and sophisticated combination of ingredients, expertise and techniques from different fields.

"By keeping our minds wide open, and nurturing the desire of exploring beyond the boundaries of one's specific research speciality, we will have a better chance to be at the forefront of the scientific advances in our discipline." [2]

The society is undoubtedly the main voice for mathematics in Europe, offering a platform for the subject, and bringing together experts.

Promoting research is a key facet of the EMS. In 2001, the society launched its Publishing House. EMS PH prints peer-review journals to disseminate mathematics research within the community. The society currently publishes 18 journals, and has also printed books, newsletter, and e-books on the discipline.

In a Europe Physics news journal article, published in the summer last year, Sanz-Sole outlined how the EMS supported mathematics and the described the different ways the society helped to promote the

subject. She highlighted the role of societies like EMS to continue to develop the field.

She said: "In the global world, international learned societies are more than ever of strategic importance to support the advances of disciplines and to promote indispensable interactions.

"The current political structures in Europe and its strong historical identity, provide full meaning to and show the strong necessity for the existence of solid scientific umbrellas, platforms and networks within Europe. We can proudly state that EMS is playing this role for mathematics in Europe." [3]

Mathematics is undoubtedly the life blood of research, underpinning multiple fields. Without significant promotion of the subject there is a concern that the next generation of scientists may fall behind on this subject. Europe has a duty to ensure all its students perform well in mathematics, and continue to extend targets to ensure improvements occur.

Societies such as the EMS play a pivotal role not only in the promotion of the field, but in ensuring research is pushed to the centre stage via respected and prestigious peer-review publications. Sanz-Sole has worked hard to push her field to the forefront, and to break down perceived gender barriers within the discipline. When Sanz-Sole reaches the end of her tenure as president next year, it will certainly be interesting to see what direction her successor takes the society – and the field – in. ∎

[1] http://europa.eu/rapid/press-release_IP-13-1198_en.htm

[2] http://www.6ecm.pl/en/speeches/marta-sanz-sole-president-of-the-ems/marta-sanz-sole-president-of-the-ems

[3] http://www.europhysicsnews.org/articles/epn/pdf/2013/04/epn2013444p19.pdf

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Pure Mathematics at UGent

In the last few decades, there has been a tendency to invest in applied science rather than in fundamental research. This happens everywhere around the world, and it is a logical consequence of the budget restraints and the demand for very fast profit. Fundamental research is not profitable, at least not in the short term. And in the long run, the profit does not come from where the main research was performed. In fact, fundamental research sometimes meanders its way to applications very slowly, not at all foreseeable, and certainly not on command.

So, in recent years, we have seen many positions for pure mathematics change into positions for applied mathematicians, or computer scientists. This mainly happened in departments where pure and applied mathematicians live together. In Ghent University, we have a single department for "Mathematics", teaching pure mathematics. The non-pure mathematics is concentrated in another department, the Department of Applied Mathematics, Computer Science and Statistics. So you would think pure mathematics is safe and can run its own business.

But another issue is slowly taking us down. The financing according to the number of publications a university, faculty, or department produces. Although it is commonly known that the publication culture strongly differs from area to area, not many administrators take this into account. Take pure mathematics. First of all, there are very few authors on a publication. Secondly, the average number of publications per person is considerably smaller than in other fields of science, although the number of pages per article can be larger. Therefore, compared to fellow scientists of the same faculty, but a different field, the mathematician is seen to underperform if solely based on the amount of publications they produce.

"Fundamental research is not profitable, at least not in the short term. And in the long run, the profit does not come from where the main research was performed."

This results in a continuous shrinking of the Department of Mathematics. Nevertheless, the research groups perform valuable work. With nine mathematicians, we try to cover the most important areas, and publish influential papers. Historically, it has been so that the research group "Incidence Geometry" could profit from the performance of its founder, Prof. Em. Joseph A. Thas. That was reflected in four full professor positions, currently held by Bart De Bruyn, Leo Storme, Koen Thas and myself. Another group, "Analysis and Logic" has three full professors, Hans Vernaeve, Jasson Vindas and Andreas Weiermann. The other two research groups live on one full

professor each, the "Algebra" group with Tom De Medts, and the "Differential Geometry" with Frans Cantrijn.

Our department is a nice blend of younger and senior scientists: With four under the age of 40, one exactly 40 and four around 50, we have future and experience! And the senior mathematicians, like myself, are not at all suffering from a burn-out – on the contrary. Personally, I am involved with PhD students, and have set up a rather large research project on the Freudenthal-Tits Magic Square in order to better understand Lie groups of type E8. It is a fantastic project, because it brings together ideas from different fields, things you only see through a lot of experience. And bringing this project to a good end together with young researchers is such a worthwhile thing to do!

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The PHE's Change4Life Smart Swaps campaign

Improving health in the community

Professor Kevin Fenton, National Director of Health and Wellbeing at Public Health England provides insight into how local authorities are helping to improve health and wellbeing in the community...

The average person in England is overweight and 1 in 4 is obese. If we don't tackle this epidemic more effectively, we'll increase the odds of chronic diseases, which include heart disease, type 2 diabetes, breast (in postmenopausal women) and colorectal cancer.

We have to make it easier for people to make healthier choices in their diet and activity levels. But we know that our lifestyles are heavily influenced by habit, how we were brought up, how we live our lives and by the local environment – from access to green spaces to how we travel and the type of shops in our neighbourhoods.

If we want to shift unhealthy behaviours, we've got to take action across all these areas and more, Public Health England's role is to work with local authorities to help make this happen. Our social marketing

programme, Change4Life, helps families to improve their health in ways that fit in with daily life, one small step at a time: for example swapping sugary drinks to "sugar-free" or lower fat milk or water.

Local government can play a big role in giving these campaigns more prominence. Leeds City Council, for example, ran its own local Smart Swaps campaign with over half of community venues displaying Change4Life campaign materials.

But there are lots of other examples of what local communities are doing to help improve diets. In temples: the Shree Jalaram Hindu Mandir in Greenford and Sri Guru Teg Bahadur Ji Sikh Gurdwara in Wolverhampton, thousands of weekly visitors are served free vegetarian meals that have lower salt and saturated fat, through a British Heart Foundation project, which could potentially be used in other Gurdwaras and Mandirs.

In the London Borough of Havering, a group of public sector caterers delivering food to local schools, care home residents, universities and public sector workers, is setting high standards for food purchasing – exceeding mandatory national food and nutrition standards for schools.

"If we want to shift unhealthy behaviours, we've got to take action across all these areas and more, Public Health England's role is to work with local authorities to help make this happen. Our social marketing programme, Change4Life, helps families to improve their health in ways that fit in with daily life, one small step at a time..."

Local authorities have many other ways – from measures to local transport plans – to influence the current and future health of local residents. For example, St Helen's Council has a policy of restricting planning approvals for fast food outlets that are close to schools and sixth form colleges. Training and guidance for local businesses can also have an impact. For example, the Chartered Institute of Environmental Health together with the Greater London Authority and the Association of London Environmental Health Managers has developed a healthier catering scheme, providing advice on healthier food preparation for local businesses.

Of course, food and calorie intake is only one part of the equation. The other half of the equation is physical activity. Here too, there's a lot that local authorities can do. For example, 20mph speed limits in priority urban areas (as well as other measures such as traffic calming) can help to improve road safety, creating more opportunities for walking and cycling. Schools can work with local authorities on school travel plans to encourage more children to walk or cycle to school. There are also lots of examples of how communities have transformed public spaces into gardens and places where local residents can garden, exercise, or just play. In some of Dudley's parks, for instance, outdoor gym equipment has been installed as part of 'health hubs'. In Plymouth, the city council has found ways of supporting people living in deprived areas to take advantage of green spaces through volunteer-led 'walking for health' groups.

These are just a few examples of the vision, determination and collaborative spirit that communities are showing in promoting the health and wellbeing of residents. Now that local authorities are responsible for the public health of their local populations, there's an unprecedented opportunity to strengthen the links between public health, planning, transport, education and other sectors. Working together across local and national boundaries provides us with exciting opportunities to put the community voice at the centre of our work. If we're going to crack the obesity epidemic across the population, we need to start in the neighbourhoods in which we live, work and play. ∎

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Eradicating cardiovascular diseases for good

Professor Joep Perk of Linnaeus University, and a member of the European Society of Cardiology, speaks to Editor Laura Evans about the importance of reducing cardiovascular diseases in Europe and how this can be achieved...

In Europe, cardiovascular diseases cause over 4 million deaths and over 1.9 million deaths in the European Union, which equates to 47% of all deaths in Europe and 40% in the EU. According to the European Heart Network,[1] death rates from cardiovascular heart disease (CHD) are generally higher in Central Europe, whereas death rates from stroke are much higher in Central and Eastern Europe. Overall CVD is estimated to cost the European Union economy €196bn a year.

Cardiovascular diseases are all the diseases of the heart and circulation, including coronary heart disease (angina and heart attack), heart failure, congenital heart disease and stroke. There are many factors that increase the risk of developing a cardiovascular disease including; smoking, weight gain, diet, and lack of exercise.

Member of the European Society of Cardiology, and Clinical cardiologist and Professor of Health Sciences at Linnaeus University, Professor Joep Perk speaks to Laura Evans about the problems cardiovascular diseases can cause throughout Europe, and what more could be done to decrease fatalities.

"If we go back some way in time, cardiovascular diseases were fairly uncommon in the beginning of the past century," Professor Perk begins.

"In Western Europe they started to show up in the 1930s and 40s and culminate around 1970 and 1980. In Western European countries there has been a steady decrease over the past 20-30 years. Research has shown that, of the 6-year increase in life expectancy between 1970 and 2000, 65% of the increase – or almost 4 full years – is due to reductions in CVD mortality alone. As positive as this scenario is, heart disease remains the leading cause of death and the new epidemic has the potential to threaten the advances made to date. Europe is currently facing a series of emerging trends, such as the growing ageing population, that could create new challenges for healthcare systems."

"In Sweden, premature and early mortality in heart diseases has reduced to a third of what we had in the 1980s, which is a tremendous difference. At the same time as we see this lowering in Western Europe, we see some parts of Eastern Europe still experiencing problems."

Professor Perk explains there are some areas of Europe where cardiovascular disease is still rife. For example in Eastern Europe, the problem seems to be bigger than Western Europe, which Perk believes is due to lifestyle differences.

"Cardiovascular diseases are becoming a problem in middle and low income countries like India, Pakistan and Brazil, with 80% more early cardiovascular deaths being recorded.

"It is very much to do with public health; smoking, physical activity, what you eat, stress and our sleeping habits. In several Western European countries we have seen two thirds of a drop in mortality over the past 25 years, which is due to the fact that people are smoking less, and are slightly more physically active.

"A country like Bulgaria for example has a huge problem. People are getting fatter, they are smoking more, move around less, and have more stressful lives which leads to a direct increase in mortality."

The difference in mortality rates has a lot to do with developed countries having more effective treatment to hand. For underdeveloped nations, mortality rates are higher due to effective treatments or quality of care not being available, as Professor Perk explains.

"If you look at the risk factors, the number of people overweight and smoking is a bigger problem in richer countries. In poor countries, the quality of care, especially the follow up, is still undeveloped. For example, if you have a heart attack in Bangladesh, the survival rate is far worse than if you had one in the UK. If you look at the risk level for the average British citizen who is overweight and less active, when they have a heart attack they still have a better chance of surviving than the lean non-smoker in Bangladesh."

Cardiovascular diseases remain the prime cause of premature deaths under the age of 75, and Professor Perk believes if we can tackle the problem head on, 80% of all cardiovascular diseases could be eradicated which is a huge achievement in itself.

Perk believes that education and legislation could play a key part in eradication. If people had the correct information and knowledge about these diseases, mortality rates could be a lot less.

"On a political level – more legislation on smoking, the amount of salt in food, access to fresh fruit and vegetables and physical activity is needed," said Professor Perk. The EACPR issued an interesting paper about this.[2]

"People need to be informed that heart attacks are something that at least 80% of people can influence through their own behaviour. We recently conducted a study and discovered the basic knowledge on how people could prevent this disease is lacking. There is a need for good public knowledge so people can take responsibility for their own health.

"On these 2 levels (public and personal) we can further eradicate cardiovascular disease. We know there is a significant difference of cardiovascular disease between the higher and lower income countries. If you make fruit and vegetables a lot cheaper, you give people with less resources a better chance of getting anti-oxidants into their diet, which can help to keep you healthy."

Perk believes it is important to try and eradicate cardiovascular problems now, in order to prevent the next generation from developing the diseases.

"The main aim is to help the next generation who I would like to see active in sports. They have a body that has a reasonable guarantee to get to 90 years old. We have lots of children that are failing at school, they don't sleep enough, and they don't eat the right foods, and that is one of the main challenges in Europe.

"Because I am professor of health science I work mainly on trying to transfer the knowledge we already have. We need to educate people and tell them these diseases are a waste of our time and we don't need them." ∎

[1] http://www.ehnheart.org/cvd-statistics.html

[2] Population-level changes to promote cardiovascular health. Eur J Prev Cardiol. 2012 May 9. http://cpr.sagepub.com/content/early/2012/05/09/2047487312441726.full.pdf+html

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Strengthening Danish Healthcare

Adjacent Government discusses the approach Danish Minister for Health Nick Haekkerup aims to take in order to transform the healthcare system in Denmark...

Over the last few years, Denmark has developed a reputation as a leader and a pioneer in health. Under the auspices of the former Minister for Health and Prevention Astrid Krag, Denmark has successfully grown its digital programme, pushing it to the forefront of healthcare in Europe.

New minister Nick Hækkerup certainly has some big shoes to fill when it comes to developing innovation in the Danish healthcare system. Despite only being in power since February, the Minister has yet to really get his teeth into his agenda. However, the Minister recognises the importance of tackling health inequalities in the nation, and understands that there is not a one size fits all approach when it comes to healthcare.

In comments made to the Danish newspapers – "Frederiksborg Amts Avis" and "DAGBLADET Køge/Ringsted/Roskilde, the Minister said: "We need a different approach if we are to transform the Danish population's habits and lead them in a healthier direction.

"I agree that when we discuss health, there is a need to move away from talking about the client and instead focus on directly speaking to citizens and listening to their needs."

Minister Haekkerup was very open about being a socialist and driven by the desire for equality in the Danish healthcare system. He believes the government has a moral obligation to act.

"The free and equal access to healthcare is one of the crown jewels of the Danish welfare state. I have therefore taken the initiative to strengthen efforts to combat health inequalities", he said.

"We need to treat people differently in order to treat everyone equally well. We should accept that as citizens we are different and that our needs are too – and this must be reflected in our healthcare system."

Like the UK, Denmark's healthcare system offers free and equal access to services, as well as universal coverage for all. In 2011, 9.3% of gross domestic profit (GDP) – 1.5% higher than in the UK – was spent on public healthcare expenditure alone .

Minister Haekkerup would like to see healthier choices available for Danes. He believes that a different approach to healthcare can help transform the population habits, and lead then in a healthier direction.

"We aim to ensure that the proposals in the healthcare system are more tailored to the individual's need," he explained. "It is also about designing healthcare to be able to offer varied services for people.

"Depending on their health and lifestyle needs, citizens should be allowed to determine and contribute to their own health, without being lectured." ■

The comments in this article were taken from comments made by the Minister in "Frederiksborg Amts Avis" and "DAGBLADET Køge/Ringsted/Roskilde – newspapers.

A new horizon in molecular imaging – inflammation

Correct diagnosis is a must for rational therapy, and nuclear medicine offers a unique instrument. As opposed to conventional diagnostic imaging with x-rays or magnetic resonance imaging (MRI), molecular imaging provides understanding and quantification of molecular processes in the body. By tracking from outside the body the distribution and fate of molecules inside the body and being up to a million times more sensitive, molecular imaging offers early and more correct diagnosis and staging of disease and, in addition, monitoring of treatment response. As such molecular imaging is the prerequisite of 21st Century personalized medicine.

Positron emission tomography (PET) is the heart of molecular medicine. Positrons are cyclotron produced radioisotopes. When attached to a molecule, these become detectable and quantifiable by a PET scanner. Modern PET/CT or PET/MRI hybrid scanners provide molecular and structural information of the entire body. The most common tracer is a modified glucose molecule called FDG, which accumulates in cells with increased metabolism, e.g. cancer cells. By FDG-PET/CT most cancers and their metastases can be accurately detected. The error rate is about 10% as compared to 33% with conventional imaging. This has enormous implications.

Increased glucose metabolism is a hallmark also of inflammation, whether infectious or non-infectious. Inflammation is the major reason for "false"
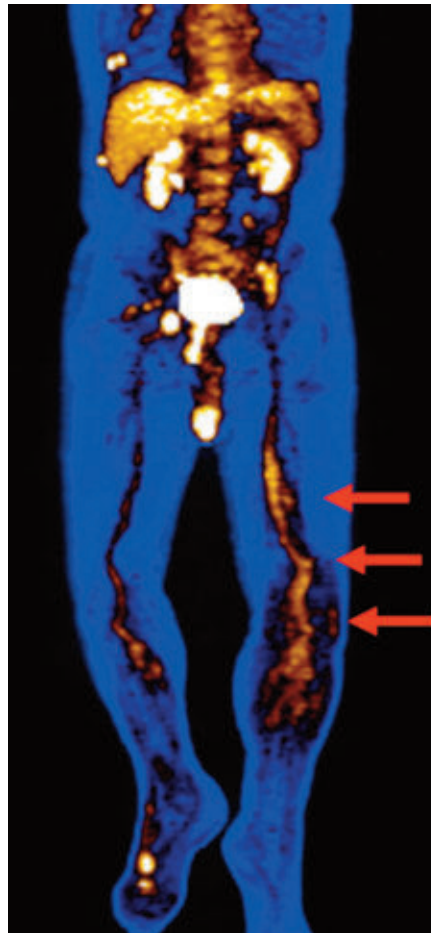
Deep vein thrombosis in left leg. FDG-PET/CT imaging shows a dilated vein with high metabolic activity (red arrows) consistent with a fresh new clot.

results with FDG-PET/CT. Due to different dynamics, changes caused by cancer and inflammation can often be separated. Inflammation is considered "the mother" of many diseases. PET can detect inflammation at an early stage, when it is still curable. This as opposed to cancer, which is no longer considered a curable but a chronic disease, which, at best, one may die with instead of from.

The major role of inflammation was demonstrated by PET in psoriasis, which

affects 2-3% of all women and men, and also in deep vein thrombosis, which is the fore-runner of pulmonary embolism. In psoriasis, PET surprisingly disclosed that patients, besides inflammation of the skin, may have inflamed major vessels inside the body and abscess-like changes in various organs. In venous thromboembolism, the blood may clot in the leg veins during long-distance flights or prolonged bed rest. This is a serious condition, since fragments of the clot may dislodge and wedge in the lungs as pulmonary emboli. Anticoagulant therapy is effective, but carries a risk of haemorrhage causing stroke or bleeding stomach ulcer. In these patients, PET ensures the correct indication for therapy. Since inflammation is a key factor in diseases like arteriosclerosis, rheumatoid arthritis, inflammatory bowel disease, chronic obstructive pulmonary disorder and maybe even cancer, molecular imaging may cause a paradigm shift in their management.

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Europe's drugs problem 'increasingly complex'

New challenges are causing drug problems in Europe to become increasingly complex, here the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) details why...

Europe's drugs problem is becoming increasingly complex, with new challenges emerging that raise concerns for public health. This is according to the *European Drug Report 2014: Trends and developments* released by the EMCDDA on 27 May [1]. This annual review of the drug phenomenon describes an overall stable situation regarding the more established drugs, where some positive signs are observed. But this is counter-balanced by new threats posed by synthetic drugs – including stimulants, new psychoactive substances and medicinal products – which are becoming more prominent in a changing European drug market.

Commenting on the report, European Commissioner for Home Affairs, Cecilia Malmström said: "I am deeply concerned that the drugs consumed in Europe today may be even more damaging to users' health than in the past. There are signs that the ecstasy and cannabis sold on the street are getting stronger. I also note that the EU Early Warning System, our first line of defence against emerging drugs, is coming under growing pressure as the number and diversity of substances continue to rise sharply".

The report shows how the rise in the number, type and availability of new psychoactive substances (NPS or 'new drugs') in Europe shows no signs of abating. In 2013, 81 new drugs were notified for the first time to the EU Early Warning System, bringing the number of new substances monitored by the EMCDDA to over 350.

New drugs may be produced in clandestine laboratories inside Europe. More commonly, however, they are sourced legally as powders mostly from China and India, and imported into Europe where they are processed, packaged and sold as 'legal high' products or 'research chemicals', as well as sold directly on the illicit drug market. The Internet continues to play a key role in shaping the NPS market. In 2013, the EMCDDA identified some 650 websites selling these substances to Europeans.

With regard to heroin, global production remains high, but latest data on the demand for treatment and on seizures in Europe point to a downward trend in the use and availability of this drug. There are an estimated 1.3 million problem opioid users in Europe, mostly heroin users. The report raises concerns over heroin being replaced by other substances, such as synthetic opioids. Illicitly produced or diverted from medical sources, these include highly potent fentanyls and substances used in opioid substitution treatment (e.g. methadone).

EUROPEAN DRUG REPORT PACKAGE 2014

A set of interlinked elements allowing full access to the available data and analysis on the drug problem in Europe

European Drug Report 2014

Trends and developments
providing a top-level analysis of key developments (print and online)

Data and statistics
containing full data arrays, graphics and methodological information (online)

Country overviews
national data and analysis at your fingertips (online)

Perspectives on drugs
interactive windows on key issues (online)

"Looking at the big picture, we see that progress has been made in Europe on some of the major health policy objectives of the past", comments EMCDDA Director Wolfgang Götz. "But the European perspective can obscure some important national differences. Our latest data show how encouraging overall EU trends on overdose deaths and drug-related HIV infections, for example, sit in sharp contrast to worrying developments in a few Member States".

Overall, around 6 100 overdose deaths (mainly related to opioids) were reported in Europe in 2012, compared with 6,500 reported in 2011 and 7,100 in 2009. Nevertheless, the report shows how overdose deaths remain high in Europe, and are increasing in some countries.

Over the last decade, large gains have been made within the EU in addressing HIV infection among people who inject drugs. Yet the latest findings show that developments in some countries are impacting negatively on the long-term decline in the number of new HIV diagnoses in Europe. "Outbreaks of HIV among drug users in Greece and Romania, together with ongoing problems in some Baltic countries, have stalled Europe's progress in reducing the number of new drug-related HIV infections", states the report.

Cocaine remains the most commonly used illicit stimulant drug in Europe, although most users are found in a small number of western EU countries. An estimated 14.1 million Europeans (15-64 years) have used the drug; 3.1 million in the last year. A number of indicators suggest that cocaine use may be on the decline; for example the number of clients

entering treatment for the first time in their life for primary cocaine use in Europe decreased from a peak of 38,000 in 2008 to 26,000 in 2012.

Use of amphetamines (a term encompassing amphetamine and methamphetamine) remains overall lower than that of cocaine in Europe, with around 11.4 million adults reporting lifetime use and 1.5 million last-year use. Of the 2 drugs, amphetamine is more commonly used, but there are growing concerns around methamphetamine. The report describes how methamphetamine seizures in Europe, while still small in number and quantity, have increased over the last decade, suggesting increased availability of the drug. And use of methamphetamine, historically low in Europe and mainly limited to the Czech Republic and Slovakia, now appears to be spreading. Also highlighted in the report is the re-emergence of high-quality ecstasy (MDMA) powders and pills.

Cannabis continues to be the most commonly used illicit drug in Europe, with around 73.6 million Europeans having used this drug at some point in their lifetime, and 18.1 million in the last year. An estimated 14.6 million young Europeans (15-34 years), report last-year use. Cannabis use in Europe overall appears to be stable or declining, especially in young age groups, although national trends appear more divergent. Public health concerns are greatest for Europeans who use the drug on a daily, or almost daily, basis (around 1% of adults, 15-64 years).

Europe's drug phenomenon is clearly dynamic and continues to evolve. This leaves no room for complacency as new threats emerge to accompany residual and long-established problems. ∎

[1] European Drug Report 2014 package
www.emcdda.europa.eu/edr2014
Press and promotional material
www.emcdda.europa.eu/edr2014#pressInfo

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Realising reproductive health for all

Marleen Temmerman and Rajat Khosla from the Department of Reproductive Health & Research at WHO discuss the importance of access to reproductive health services worldwide*...

Reproductive and sexual health is fundamental to individuals, couples and families, and the social and economic development of communities and nations. The International Conference on Population and Development in 1994 ushered a new era for the work on reproductive health by emphasising a comprehensive approach to reproductive and sexual health. It emphasises that reproductive and sexual health is closely associated with sociocultural factors, gender roles and the respect and protection of human rights.

Since the adoption of this comprehensive approach 2 decades ago there have been numerous achievements. Countries have devised innovative strategies and programmes, to advance the sexual and reproductive health agenda. Reviews point out that progress has been made in several areas. These include: reduction in the rates of new infection for HIV in many countries, an overall 50% reduction in maternal mortality, and increases in the use of modern contraception.

Despite these promising advances, significant gaps in ensuring universal access to reproductive health remain. Sexual and reproductive health problems represent one third of the total global burden of disease for women between the ages of 15 and 44 years, and violence against women and girls remains the most frequent human rights abuse worldwide. Worldwide, 222 million women are estimated to have an unmet need for modern contraception and the need is greatest where the risks of maternal mortality are highest. In 2008, globally an estimated 500 million new (incident) cases of curable STIs (gonorrhoea, chlamydia, syphilis and trichomoniasis) occurred. In addition, 536 million people are estimated to be living with incurable herpes simplex virus type 2 (HSV-2) infection. Approximately 291 million women have an HPV infection at any given point in time, and it is likely that the numbers of HPV-infected men are similar.

When we examine the reasons behind these gaps it is clear that there are structural factors which impair progress. One key factor is rising inequalities. There is clear evidence that inequalities and inequities in the accessibility and quality of health systems across and within countries continue to persist. Poverty is one of the biggest reasons behind inequitable access to health systems, particularly sexual and reproductive health. As evidence shows, the burden of reproductive and sexual ill-health is greatest in the poorest countries where health services tend to be physically inaccessible, poorly staffed, equipped, and beyond the reach of many poor people. Too often, improvements in public health services do not reach poor and other marginalised groups. Within many middle- and high-income countries, pockets of weak and poor health system coverage or low-quality services abound for certain areas or populations, such as for the poor, older persons, rural residents and residents of urban slums, and for uninsured or undocumented persons.

Another key dimension behind slow progress is poor quality of care. Sexual and reproductive health services should be, but often are not, provided at a level of quality that meets human rights standards. In addition to medical ethics and the public health imperative, the right to the highest attainable standard of health obligates governments to ensure that health facilities, goods and services, including sexual and reproductive health services, are of good quality.

"The burden of reproductive and sexual ill-health is greatest in the poorest countries where health services tend to be physically inaccessible, poorly staffed, equipped, and beyond the reach of many poor people."

To address these challenges and to meet the reproductive and sexual health needs of people all around the world, the WHO Reproductive Health Strategy (2004) recommends a comprehensive approach. Guided by human rights principles, the Strategy recommends that to accelerate progress countries should address the 5 core aspects of reproductive and sexual health are: improving antenatal, perinatal, postpartum and newborn care; providing high-quality services for family planning, including infertility services; eliminating unsafe abortion; combating sexually transmitted infections including HIV, reproductive tract infections, cervical cancer and other gynaecological morbidities; and promoting sexual health. Because of the close links between the different aspects of reproductive and sexual health, interventions in one area are likely to have a positive impact on the others. It is critical for countries to strengthen existing services and use them as entry points for new interventions, looking for maximum synergy.

It further suggests the need to strengthen health systems capacity including through sustainable health financing mechanisms, human resources and quality in service provision. The strategy also calls for the need to ensure supportive legal and policy environment and to strengthen monitoring and evaluation systems and mobilisation of political will.

As the world leaders meet to define the new vision for international development, we must recommit ourselves to these principles to ensure the realisation of reproductive and sexual and health needs of people around the world. ∎

*The views expressed here are those of the authors themselves and they do not necessarily represent the views of WHO.

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Reducing the barriers for deafblind people

Adjacent Government looks at how technology such as hearing aids can help people with deafblindness lead independent lives...

In the UK alone it is believed that there are around 250,000 deafblind people – which is a combination of sight and hearing impairment. The disability is one with very little understanding, and public awareness of how it affects people's abilities is low. We rely on our sight and hearing for everyday tasks, and the world around us can present many challenges for deafblind people.

For people who are deafblind, the barriers they face can be a lot more challenging than people who have just a single impairment. Blind people, to a certain degree, can compensate by using their hearing – and vice versa. However, multi-sensory impairment raises many challenges, and many deafblind people rely on sensory aids to help tackle everyday tasks.

Speaking to Adjacent Government in February, Gill Morbey President of Deafblind International highlighted some of the causes for sensory loss:

"Causes of deafblindness vary across countries," she said. "They can include infections during pregnancy, prematurity, rare syndromes, such as Usher and CHARGE, illness and accidents, and sensory loss in old age.

"In the UK, vaccination has almost eradicated rubella however in some parts of the world the absence of vaccination programmes such as MMR means that children are still being born with the entirely preventable Congenital Rubella Syndrome (CRS)." [1]

Morbey pointed out that no matter what the cause is, deafblind people have a unique set of needs and require specialist support.

Hearing aids can be a substantial benefit to people who suffer with sensory loss. Quality of life can be greatly improved especially for elderly people who have mild or moderate hearing loss. Sense, the national charity

that campaigns and supports people with deafblind-ness, estimates 63.5% of people aged 70 or over have a mild or moderate hearing loss problem.

Many deafblind people rely on their hearing aids for environmental cues to help navigate outside their homes and give them confidence to leave the house. In a recent study carried out by Sense and the Ear Foundation, deafblind people were found to be reliant on their hearing aids, with 94% wearing them all the time.

Suffering from both hearing and vision loss increases with age, with estimates suggesting that 220,000 people aged 70 or over currently suffer from duel sensory loss. It is thought the number will more than double by 2030. [2]

Living independently can become near impossible for a deafblind person. Without specialist support, just carrying out one-on-one conversations are a difficult task.

North Staffordshire CCG recently launched a consultation about their proposal to stop providing hearing aids to adults with mild to moderate hearing loss. However, concerns have been raised by Sense about the negative impact this could have on quality of life.

The concerns raised by Sense following the consultation includes that early intervention of hearing aids for progressive cases of hearing loss, such as presbyacusis, can allow people to maintain existing communication methods or provide them with the auditory input they require to develop new ones.

Sense also believe that restricting hearing aid provision will affect the ability of deafblind people to access healthcare in terms of communicating with health professionals and obtaining appointments. For example a deafblind person without a hearing aid might find it difficult to hear instructions for their prescription or even make GP appointments over the phone.

Hearing aids also provide deafblind people with envi-ronmental help in regards to hazards around them.

For many people the aids provide them with a sense of security around the home and also in the outside environment.

Technology has had a great impact on the lives of people with duel sensory loss. As well as hearing aids, braille systems, computer aids and screen readers are just some of the examples that help deafblind people live independent lives.

"Advancements in communication technology have had a huge impact on deafblind people," added Morbey. "At last, through computers and tactile displays, deafblind people can be supported in employment and complex tasks through to simple but important things such as directly contacting friends.

"More advances in technology have the potential to make real life changes for people who are deafblind and disabled."

Lack of access to technology such as hearing aids could considerably impact on the independence of a deafblind person, and reduce their confidence to leave their house. ∎

For more information regarding the consultation please visit http://www.sense.org.uk/content/our-response-north-staffordshire-ccgs-proposals-hearing-aid-provision

[1] http://www.adjacentgovernment.co.uk/lg-edition-001/a-whole-new-world/

[2] http://www.sense.org.uk/content/how-many-deafblind-people-are-there

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The key to communication

Professor Marleen Janssen outlines how her team of seven PhD students is breaking new ground in unlocking communication methods for those with congenital deafblindness

Could you shed light on the term deafblindness?

Individuals born with congenital deafblindness suffer with serious visual and auditory impairments, which influence all aspects of their lives, particularly access to information, communication and language. These people experience dual sensory loss before they developed a language. There are thousands of people with congenital deafblindness in the Netherlands, many of whom are not diagnosed yet because they are in facilities for people with intellectual disabilities and expertise on deafblindness is still very scarce. I may be the only professor in the world to have a special Chair solely focused on communication in people with deafblindness.

Through what means do those with deafblindess communicate and what problems does this method pose?

Persons with deafblindness don't use words to communicate, because most of them cannot speak. Their methods of interaction and communication can be described as 'conversations with bodies'. Participation in these 'bodily conversations' requires a high level of sensitivity, special insights and considerable skills for the hearing and sighted caregivers. You can imagine that in daily practice mutual misunderstandings easily can lead to severe emotional problems and challenging behaviours.

Daily communication with their caregivers is extremely important for the mental wellbeing and social functioning of people with deafblindness. However, in practice, persons with deafblindness and their hearing and sighted caregivers experience serious difficulties in expressing their intentions and creating mutual understanding.

How will your research projects help to improve communication methods for deafblind individuals?

In my research programme we try to develop high-quality communication methods in which caregivers learn new insights and skills in such a way that persons with deafblindness can share their ideas and thoughts with others about all kind of topics relevant within and outside the direct here and now context.

The running PHD projects are more focused on meaning making. Every project is focused on different aspects of the first two layers of intersubjectivity and is performed with children and adults.

What theoretical basis underpins your research?

We are calling upon previous theoretical and empirical research to base our projects – some of which was completed by my self. Our studies focus on intersubjectivity – a conceptual construct used to describe the interactional relationship between individuals. Within the concept, communication is described as having certain layers. At the bottom is basic communications – asking for a drink, for example – with subsequent levels involving higher level and more in-depth and abstract communication. These further levels often involve greater use of symbolic communication and language. The research, conducted by the PhD students explores the first and second levels of intersubjectivity so far.

What will the future hold in terms of real-life improvements for patients?

For me, this means that caregivers need intensive communication coaching on a more permanent basis. Only with the help of a communication coach, caregivers can be trained in a way and on a level that the person with deafblindness can develop his or her potential for communication.

Caregivers very much enjoyed discovering their own strengths and weakness with the help of video-analysis and feedback. They learned quickly when they saw themselves on video and were able to adapt their approaches. All caregivers learned from these interventions, although

BIOGRAPHY

Marleen Janssen has served as Professor (Tenure Track) at the Department of Special Needs Education and Youth Care at the University of Groningen since 2008. She is leading the Research center on Congenital and Early Acquired Deafblindness, sponsored largely by Royal Dutch Kentalis, where she worked previously for 25 years.

there were individual differences. In all cases positive effects for the people with congenital deafblindness were found with also very interesting individual differences.

How will your research evolve in the coming years?

Five PhD projects on high-quality communication will finish in 2014. These studies will deliver 20 articles in international peer-reviewed journals and 5 dissertations. I hope that these publications will support policy makers and managers in the clinical field in providing them with the necessary evidence base for new communication methods to implement.

The practical application of the research is obviously something that has been of interest to the private sector, with the Royal Dutch Kentalis – an organisation in the Netherlands who provide diagnostic treatment and specialist care for the deafblind – funding a number of the projects.

In addition to financial support, the researchers are able to use the facilities and expertise of the Deafblindness Centre of Excellence owned and managed by Royal Dutch Kentalis. This state-of-the-art facility is internationally renowned for those with congenital deafblindness, providing researchers with access to the best equipment and experts in the country.

Additional partners, including Bartimeus and Royal Vision, two Dutch organisations specialising in care for the visually impaired, are supporting the projects. With such important and influential partners, knowledge transfer can be optimised.

Furthermore, I want to expand the research program for high-quality communication internationally, focusing on testing the theory of tertiary intersubjectivity and language acquisition and follow some cases in different countries for five years in collaboration with European clinical institutions and other universities.

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A bright future for paediatric rheumatology research

A panel of experts from the Royal College of Paediatrics and Child Health outline the latest research in paediatric rheumatology...

Paediatric Rheumatology includes conditions which cause inflammation of the joints or soft tissues (such as arthritis), autoimmune conditions that can affect every organ in the body (such as lupus, dermatomyositis, vasculitis, scleroderma), fever syndromes, hereditary disorders of connective tissue and mechanical joint problems. We still do not know how these conditions arise in children, but recognise interplay of genetic susceptibility and environmental factors. Many of the diseases are chronic with no cure, thus having a huge impact on the child and family at a crucial time of development. Management within a specialist multidisciplinary team with expertise in paediatric rheumatology is crucial to address these issues. Children are not simply 'mini-adults'. It is important that children and young people are cared for in a suitable environment by an appropriate team to ensure that the best possible long-term outcome is achieved through early recognition and aggressive treatment.

It is a very exciting time to be involved in paediatric rheumatology with current research covering all key areas from laboratory research to clinical trials of new drugs. Basic science research is focusing on the roles of the innate and adaptive immune systems and genetics of these diseases (including gene expression pathways, genome-wide association studies and research into gene-immune phenotype of disease). Translating knowledge gained from the laboratory to new treatments for these children and determining biomarkers of disease activity is key in reducing the morbidity from these disorders. The advent of new biologic drugs offers a major step forward in the spectrum of disease modification that was not available to patients a couple of decades ago. New legislation by the European Union makes it mandatory for new drugs to have clinical trials in children if deemed appropriate. In the UK we have very good infrastructure established by the National Institute for Health and Research (NIHR) to enable us to be at the forefront of these clinical trials globally through the Medicines for Children Research Network (MCRN). More research is needed to understand the interactions with the environment that leads to developing arthritis. Important research is looking at safe effective use of vaccines preventing infectious diseases in children on immunosuppressive medications used to treat rheumatic conditions.

The UK is leading internationally in undertaking the first large scale clinical trial in children with sight threatening eye disease secondary to arthritis. This study is supported by the research arm of the NHS (NIHR) and a charity (Arthritis Research UK). We are also pioneering new laboratory research in lupus (a disease which can affect multiple organs in the body). These and many other current and new trials and studies planned in UK mean that children with rheumatic diseases in the UK can have the best possible therapies at the earliest possible timeframe.

Each paediatric condition is rare, with some conditions only occurring in a few children per million per year. National and international collaboration is essential to answer questions such as the genetic and immunological influences on disease phenotypes and which treatment works for which patient/disease. The UK paediatric rheumatology community is exemplar in supporting collaborative research and works fully integrated with international research partners. For international collaboration, all clinicians need to be talking the same language and significant efforts have taken place through established networks to work

collaboratively on diagnostic criteria for individual diseases, as well as criteria for defining disease activity and disease remission. This allows the development of standardised measures to use in clinical trials. Research needs to focus on long-term outcomes of disease, including decreasing the risk of cardiovascular disease in later life due to inflammation, and how this can be addressed and prevented in younger years.

There are many continuing challenges involving a postcode lottery regarding access to care, including early diagnosis and access to therapies. The British Society for Paediatric and Adolescent Rheumatology (BSPAR) has produced standards of care for children with arthritis in an attempt to address this issue that have been recognised internationally as exemplar. This year, EU funding has led to the establishment of a European collaboration, Single Hub and Access Point for paediatric rheumatology in Europe (SHARE), with the aim of defining a Europe-wide minimal standard of care.

Despite major advances in paediatric rheumatology, many children and young people continue to suffer significant pain and disability, with consequential significant impacts on their quality of life, sleep, education, and future employment. A key challenge is targeting research to address issues that are important to patients and their careers. In the UK, prioritisation of clinical research strategy has been developed through a comprehensive consultation process including consumer involvement through the NIHR MCRN / Arthritis Research UK Paediatric Rheumatology Clinical Studies Group (CSG). The multidisciplinary CSG itself has 10 "Topic Specific Groups (TSG)" that are disease or theme focussed that support a wider group of stakeholders who directly input into the evolving strategy of the CSG and support development of specific study applications. Patient/parent representatives are key members of the CSG and each of the TSGs, and so directly influence research priorities. Work is on-going to define better patient/parent reported outcome measures as it is recognised that current measures of disease activity do not necessarily capture all issues relevant to patients and their carers. The CSG works in close partnership with BSPAR in achieving its goals.

It is essential to ensure that we encourage the next generation of doctors to enter into this exciting specialty. The Royal College of Paediatrics and Child Health has a key role in directing training, supported by the Rheumatology Clinical Specialty Advisory Group. In addition, involvement of Allied Health Professionals in research is vital to ensure holistic care. A clinical-academic ethos that has developed in the UK units promotes discussion for new research ideas between clinicians and academics, and ensures true translational research. This, together with patient/parent involvement, sets a fantastic platform to test research ideas through established collaborative networks. The future is bright for paediatric rheumatology and the specialty is likely to continue to grow from strength to strength. ∎

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Paediatric Rheumatology in 2014

Paediatric Rheumatology has become recognised within the last 20 years as a paediatric subspecialty. Previously the care of these patients was undertaken by interested adult rheumatologists. However, the National Service Framework for children recognised that children should be seen in child-friendly areas by staff trained to look after children. In the UK, there are not enough Paediatric Rheumatologists to see all of these patients, and many are still seen by adult rheumatologists, or are seen by non-specialists. This is no longer acceptable practice.

In the last 20 years arthritis treatments have emerged which have brought fundamental improvements to the outcomes of children. These improvements can be measured not only in the number of adults who are not consigned to life in a wheelchair, but less demonstrably the even greater numbers whose functionality has been maintained through their school days, enabling them to fulfil their potential in life. However, the distribution of areas of best practice is lamentably poor, creating an inequality of access to care. There is no overall grasp of the problems that the current lack of systems throws up. Specialist commissioning is, to a certain extent, addressing some of the issues, but is itself overwhelmed by the huge task it has been assigned.

As a paediatric subspecialty, Paediatric Rheumatology has 2 major drawbacks: paediatricians were not historically taught how to examine the musculoskeletal system, and many of the emerging drug treatments are more familiar to oncologists or immunologists than to paediatricians. Therefore, paediatricians are often unfamiliar with the skills to look after these patients and do not have a ready source of training to close the skills gap. At the moment, there is no added incentive for District General Hospitals (DGH) to provide paediatric rheumatology clinics, and many paediatricians are unwilling to take on the responsibility of caring for these patients.

The conditions that paediatric rheumatologists look after are chronic conditions that are considered to be rare: the commonest of these is Juvenile Idiopathic Arthritis (JIA) with an incidence of 1 in a 1000 children. DGH Paediatricians who start to see children with arthritis are often surprised by the number of patients (80 to 100 per DGH) they see. These children need to be seen frequently within the first year of their diagnosis (and when their arthritis flares), as well as every 3 months once their disease is under control to monitor their growth and ensure their joints are developing normally. Added to this cohort will be children with musculoskeletal aches and pains that mimic arthritis: most DGHs should be running a regular Paediatric Rheumatology clinic.

BSPAR (British Society for Paediatric and Adolescent Rheumatology), in conjunction with ARMA (The Arthritis and Musculoskeletal Alliance), have published Standards of Care for JIA which have been internationally recognised. These describe the support that children with arthritis need access to: this includes access to physiotherapists, specialist nurses and occupational therapists. Paediatric musculoskeletal physiotherapists are needed for children with musculoskeletal aches and pains, whether they are due to arthritis or the more

common biomechanical problems (such as a muscle imbalance). This care should be provided locally: at the moment, the specialist centres are trying to plug this gap and are being overwhelmed. Patients with difficulties in activities of daily living (due to disease or pain) should have the support of an occupational therapist to help with access to schooling or to help them maintain their independence at home. The patients with arthritis, and other inflammatory diseases requiring immunosuppressant medication, should have the support of a clinical nurse specialist to help them understand their disease, their medication and to oversee the monitoring of the medication.

At the moment, most of this care depends on Paediatric Rheumatology Centres that have developed in a haphazard way. Each centre has been built up by an interested doctor, with no regard to population numbers or geography. Each centre has developed its own model of care with varying levels of support local to the family. Not all patients have access to a specialist centre and these will often be looked after by adult rheumatologists.

This inequality in care leads to a wide variation in outcomes: research has shown that delay to diagnosis is a poor prognostic factor for good outcome in

many inflammatory diseases. Arthritis is often viewed as an unexciting condition which is not life-threatening. Children with inflammatory diseases are at risk of life-threatening events, which are often poorly recognised until too late. Paediatricians, quite rightly, set great store in whether a child looks well or not. Unfortunately, these children often look relatively well, with only the blood tests indicating the severity of their underlying condition, until they collapse and end up in intensive care. Though this only occurs in the smaller number of children with systemic illness (rather than illness restricted to just the joints), the early stages are eminently treatable. Even with children whose disease is restricted to just one joint, such as the knee, the joint damage caused by arthritis leads to an inability to walk, leg length discrepancy and secondary spinal deformity. Children with multiple joints affected used to end up severely disabled with stunted growth, often in wheelchairs and unable to lead independent lives.

The advent of better medication in the last 20 years (methotrexate and then biologic agents such as etanercept) has improved outcomes enormously by controlling inflammation and allowing normal growth and development to take place. Teams looking after these patients have seen a shift from

struggling to keep these patients moving despite their joint problems, to supporting patients to regain normal strength and to maintain full access to their education.

There is a financial as well as a human cost in failing to provide proper care in the early years of disease. Stinting on preventive treatment in early years multiplies exponentially the cost of support and care in the rest of life. Existing Paediatric Rheumatology Centres are all oversubscribed and specialist commissioning aside, there is no attempt by government or the NHS to address the lack of an overall strategy to save children from unnecessary lifelong hardship. Paediatric Rheumatology teams are keen to improve the care of the children, but lack the time to train local teams to set up, and maintain, appropriate care. The tools exist, but we are failing our children by not enabling them to be put to use.

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Germany – promoting a healthier nation

Adjacent Government gives an overview of Germany's impressive healthcare system, and their priorities for improving wellbeing in the nation...

During a recent interview with the New Osnabrück newspaper in July, German Health Minister Hermann Gröhe praised the system for providing over all good quality, but added "even good things can be better." [1]

Germany certainly does boast an impressive healthcare system that is dedicated to improving the wellbeing of its citizens. In a recent report carried out by The Commonwealth Fund, Germany's healthcare system was ranked 5th out of 11 of the world's wealthiest country. [2]

Unlike the UK, healthcare in Germany is funded via insurance. This is paid via statutory contributions, although private insurance is also available. Payments are split between the employee and the employer. This grants citizens access to free healthcare through insurance funds. According to the figures, approximately 90% of Germans have statutory health insurance[3].

Services are separated into inpatient and outpatient. Outpatient services are overseen by independent physicians who are contracted to statutory health insurers and practise on a freelance basis. They are registered with the regional Association of Statutory Health Insurance Physicians.

In Germany, hospitals can be broken down into 3 types: public, voluntary, and private. Public hospitals are the responsibility of local authorities, whilst voluntary facilities come under the remit of the church or non-profit organisations. Private hospitals are independently run, free commercial enterprises.

Undoubtedly, one of the things that makes Germany's healthcare system impressive is the governments willingness to embrace technology. As a country that boasts an incredible science base, it is little surprise that technology has been embraced and utilised in their health system.

Since taking power as Germany's Federal Minister for Health, Grohe has pushed technology in healthcare significantly. eHealth has become a huge field globally, one that is capable of revolutionising the way in which healthcare is delivered to people. Telemedicine and telematics, in particular, both have the ability to reduce costs, and remove pressure from key primary services.

Germany's eHealth Initiative aims to "enable broad access to medical expertise, especially also in rural areas," which will "ensure both the quality of care and the quality of the rural location in question."[4]

However, despite the benefits of eHealth, Federal Minister Gröhe recognised that often telemedicine ideas were not able to develop past the funding point. To ensure the opportunities created by the industry were better utilised, Gröhe has worked to promote the field.

Under Gröhe, the Federal Ministry of Health introduced eHealth Cards, which stores the patient's administration information. The card works with the electronic healthcare network (telematics infrastructure) to gain patient information safely and rapidly. The card will eventually enable the safe exchange of medical data, no matter where the patient is in the country.

From the 1st January this year, every citizen wishing to use medical services in Germany was required to submit the card as proof of entitlement.

In the future, it is hoped that data relating to the patient such as pre-existing conditions or allergies

can be uploaded to the card. In emergency situations doctors or paramedics would have instant access to this information, which could save lives. Patients will be able to choose how much or how little information is stored on the card.

Gröhe's ministry is also committed to looking beyond its own borders. Recognising the challenges brought by the increased mobility of people, goods, and services, the ministry notes the risk of failing to tackle health on a global level.

The ministry stated: "Globalisation promotes, on the one hand, the homogenisation of consumption habits and living conditions worldwide. On the other hand, this homogenisation is accompanied by a rising prevalence of chronic non-communicable diseases, especially among the middle class of many threshold and developing countries.

"Avoidable deaths from infectious diseases and, increasingly, from chronic non-communicable diseases exert a negative effect on economic growth and development opportunities as well as on the social and political stability of entire regions.

"They are a principal cause of poverty, lost development opportunities and the ensuing conflicts."[5]

Recently, epidemics and pandemics have shown just how important it is to look at healthcare on a global scale. Disease can spread rapidly, and can affect thousands of lives. The ministry recognised this, stating that: "Owing to international air traffic, travel and trade relations, new risks of infection are able to reach every corner of the earth within a few hours or days.

"In a very short space of time, epidemics are able to produce serious, protracted economic consequences."[6]

But Gröhe's ministry is also quick to note the positive outcomes of global health, such as access to medicines, new technologies, and knowledge – all of which have made research easier to conduct.

Global health policy in Germany focuses on 5 main areas. Protection against cross-border health risks, enabling the development of global healthcare systems, improving and expanding intersectoral cooperation, developing health research, and strengthening global health architecture.

Over the last 14 years, Germany has more than tripled its expenditure on bilateral and multilateral development cooperation in the health sector. Compared to its European neighbours, Germany is one of the leading donor countries, spending more than €700m per year on health.

Gröhe may have more to do in terms of developing healthcare in Germany, but it currently does many things well. The forward thinking of the minister will certainly enable the system to flourish and remain innovative. The continued use of technology in its services will undoubtedly improve and create a more effective service for the German people. ■

[1] http://www.bmg.bund.de/ministerium/presse/interviews/noz-12714.html

[2] http://www.commonwealthfund.org/publications/fund-reports/2014/jun/mirror-mirror

[3] http://www.bundesaerztekammer.de/page.asp?his=4.3571

[4] http://www.bmg.bund.de/ministerium/presse/english-version/health/the-electronic-health-card/background-material-on-the-e-health-initiative-of-the-federal-ministry-of-health.html

[5] http://www.bmg.bund.de/ministerium/presse/english-version/ministry/international-co-operation/global-health-policy.html

[6] http://www.bmg.bund.de/ministerium/presse/english-version/ministry/international-co-operation/global-health-policy.html

A New Model of Social Change in Mental Health in Europe

The Importance of Framing Change in Mental Health

The system of mental healthcare in Germany requires more than medical-technical innovation – it requires innovative policy reform.

In 2012, healthcare expenditures in Germany exceeded €300bn,[1] accounting for 11.3 % of GDP – 2% higher than the OECD average. Nearly a third of these costs were from the hospital sector, while spending on prevention programs accounted for less than 7% of healthcare costs.[2] Despite above average healthcare expenditures, Germany ranks below average in the EU in key health and well-being outcomes.[3] These figures reveal a system that reactively spends massive amounts of resources to achieve relatively poor outcomes – making it clear that the healthcare system is an illness-care system.

"Innovative policy reforms have the power to affect social systems and improve social outcomes. The public can pave or block the road toward innovative policy."

Mental health, in particular, is an area where the spending-to-outcomes paradox and the lack of innovation are particularly striking. Over the last 2 decades, the German mental health system has experienced a paradigmatic split – with the acute care branch of the system moving towards an increasingly hospital-based and pharmaceutical-driven approach, and

the community-based care approach moving into an integrative, community based support and preventive direction. As the differences between these branches have grown, mental health outcomes in Germany have suffered. Creating a more unified approach to mental health care has the potential to improve outcomes. New Zealand, for example, has invested in a strategy based on prevention, early intervention, skill building and community-based support, resulting in marked decreases in the very areas where the German system has faltered.[4,5]

While prevention-oriented strategies have the potential to improve mental health outcomes, investments in such work have been cut significantly over the last decade. The lack of demand

for these services among the public is at least part of the explanation for these cuts and the fact that the prevention work that remains is focused narrowly on only the most high-profile areas – such as sexually transmitted diseases and smoking.

Improving mental healthcare and devoting more resources to prevention is made even more challenging because mental health is simply not on the public's radar as a social issue.[6] Public awareness efforts that have been made appear to have been ineffective in getting this issue onto the public agenda and expanding public understanding.

Over the last five years, the Pfalzklinikum, located in the south west of Germany, has attempted to improve

mental health outcomes by providing services that focus on early intervention, coping skill development and supporting independent living. Unfortunately, a significant part the Pfalzklinikum's efforts have been spent paddling against the current – managing mistrust with the so called cost-bearers and working with clients, trying to bridge the gap between the role as a 'patient' and as a citizen. Over the last five years it has become clear that communications challenges are impeding the Pfalzklinikum's efforts to improve mental health outcomes.

Thinking seriously about the importance of communications research led the Pfalzklinikum to the Alberta Family Wellness Initiative in Alberta, Canada. Here, the Pfalzklinikum found an approach to communications that took seriously, and empirically, the role of public understanding in improving social outcomes. The Alberta Family Wellness Initiative was using an innovative strategy to combine scientific knowledge with communications research to improve mental health policy and practice. They were working with a non-profit communications research organisation called the FrameWorks Institute.

As members of the Pfalzklinikum began to study and observe the work of the Alberta Family Wellness Initiative and the FrameWorks Institute, they became convinced that improving mental health outcomes in Germany would require more than new medical, therapeutic or pharmaceutical innovations – it would require investments in

strategic communication as part of a larger social innovation strategy.

So we have to answer the question: Why is investing in communications research a vital part of improving social outcomes and social innovation in mental health?

"Despite above average healthcare expenditures, Germany ranks below average in the EU in key health and well-being outcomes.[3]"

Public understanding is a key driver of the policy and programmatic innovations that are essential to sustained change and measureable improvements in social outcomes. As Mauss and Wolfe wrote almost 40 years ago:

"There is no such thing as a social problem, until enough people, with enough power in the society, agree that there is. Social problems are produced by public opinion, not by particular social conditions, undesirable or otherwise."[7]

We would take this further and argue that there is no social solution until there is both space in public opinion for new ideas and public will to drive reform.

Innovative policy reforms have the power to affect social systems and improve social outcomes. The public can pave or block the road toward innovative policy. Where there is robust public understanding and support for solutions, there emerges

a demand for new policies. Public demand for change puts immense pressure on policy makers and practitioners to make and implement change. On the other hand, where there is not space in public discourse, efforts to enact policy change will stall and languish, never gaining the momentum of the public will required to change systems and, in turn, improve lives and outcomes. In this way, public opinion is the harbinger of the policy and programmatic change that experts and advocates know is necessary to improve social outcomes.

If public understanding is so important, what can advocates and experts do to shape and expand the 'organised mass'[8] of public thinking in ways that open up space for more productive discussions of and support for better policy? The answer lies with the idea of 'culture in mind.'[9] As members of a common culture, people share foundational ways of looking at the world – what anthropologists call 'cultural models'. These models might include the assumption that individuals, through their exertion of willpower are responsible for their outcomes and the improvements thereof, or the implicit understanding that social problems like poverty and injustice are simply too deeply engrained to meaningfully change. These shared expressions of culture in mind influence the way that people process and react to information. Culture in mind has the power to make certain solutions hard to engage with and get behind and others easy to support.

The fact that these cultural understandings can complicate efforts to change systems is frustrating to those who seek new approaches to improve outcomes. However, cultural models are flexible and responsive to information cues and patterns of presentation – understanding is frame dependent.[10] Communication has the power to open new avenues of public thinking and translate information in ways that allow for meaningful engagement and more space for productive debate. This is the science of Framing. In its ability to help experts and advocates navigate the landscape of public understanding, framing holds the key to leveraging the role of public understanding in systems reform for sustained social change.

By studying public understanding and empirically testing framing strategies, the FrameWorks Institute seeks to translate scientific and expert information in ways that expand public discourse. The FrameWorks Institute pursues a portfolio of research projects investigating how Americans view issues including, health access, immigration, obesity, mental health, child development, climate change, racial disparities and public safety. Primarily working in the United States, but also internationally, FrameWorks has created an approach to communications research that is grounded in the cognitive and social sciences, using a multi-disciplinary process that pays attention to the public's deeply held worldviews and widely held assumptions. The approach is designed to help experts and advocates leverage their work to change the public discourse and pave the way for social change.

We have found that thinking seriously about communications is a vital front-end activity for those working to change systems and improve outcomes. When communications are taken seriously and empirically, experts and advocates can create and sustain public support for the changes necessary to improve outcomes. Surrounded by this support, their efforts can gain traction, changing systems and improving outcomes. This is why public understanding matters and why an empirical approach to communications is one of our most valuable tools in creating and sustaining the systems changes that lead to better social outcomes. Frames make change.

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[2] Ibid

[3] OECD (2013) OECD Health Data 2013: How does Germany Compare, Health Data 2013, June 2013

[4] OECD (2013) Health at a Glance 2013: OECD Indicators. OECD Publishing, p.120-122 http://dx.doi.org/10.1787/health_glance-2013-en

[5] OECD (2013) How's Life? 2013, Measuring Well-Being, Country Snapshot Germany. Statistic Directorate Paris, www.oecd.org/howslife

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Improving and enhancing adult social care

England's Chief Inspector of adult social care, Andrea Sutcliffe, sets out how providers, commissioners and partners alike have a responsibility to champion high-quality adult social care services...

My focus is to help make adult social care the best it can be for today, tomorrow and future generations to come – after all, we all might need to be cared for one day. As the regulator, we cannot make this happen by ourselves – lots of us have a part to play.

People who are using residential and home care services deserve to receive care that is safe, effective, caring, responsive to individual needs and is well-led. It has to be good enough for my mum, your mum or anyone's loved one – and it is vital that this common purpose is shared by everyone who delivers, commissions and regulates this fast growing sector.

From October, the Care Quality Commission (CQC) will be launching a new and transformed approach to the way we monitor and inspect adult social care services – one that sets out explicitly what standards we expect to see, and explains the characteristics of what good and outstanding care looks like. We will continue to respond to concerns raised with us by staff, people using services, their relatives and local agencies.

The new regime will also see more specialists, like our Experts by Experience, join us on our inspection work and enable people and their families to share their experience of care with us in a much more meaningful way.

Autumn will also be the time when we start to officially rate every single adult social care service so that people can be absolutely clear about what we think. We will identify and celebrate the good and the outstanding care that we see day in, day out. But we will also shine a spotlight on services that require improvement or are inadequate, and when we do, we will expect providers to tackle the problems effectively.

Andrea Sutcliffe
England's Chief Inspector of Adult Social Care

All of this work is underpinned by strengthened regulations that providers must follow so we can be confident that the right care is being delivered to suit people's individual needs. We use the regulations to determine whether we need to take action against providers if we find any breaches. The regulations are changing, and we are changing our approach to what we will do about breaches.

Laid before Parliament and enshrined in law as the Health and Social Care Act 2008 (Regulated Activities) Regulations 2014, the new requirements will be more commonly referred to as the 'fundamental standards' of care. This is because they are part of the government's responses to the recommendations made by Sir Robert Francis QC following his public enquiry into the tragic failings of care at Mid Staffordshire Foundations Trust.

There are 11 fundamental standards and they are more focused than the regulations that they will be replacing. Importantly, they include the widely publicised 'duty of candour' requirement (Regulation 5) and the 'fit and proper person' requirement for directors (Regulation 20) requirement. These will oblige providers to be open and honest when things go wrong and ensure directors are held to account when care fails people.

The government intends to introduce these 2 requirements from next April (subject to Parliamentary process) for Adult Social Care – along with the rest of the new regulations. These changes are significant.

And if you are registered with CQC to provide care, you will be obliged to follow them.

While it will be up to providers to decide on how they should meet the new regulations, it will be up to CQC to make sure that they do, and if they do not, to decide on what action to take.

Where services fail the very people they should be supporting, we will use all powers available to us and take appropriate action to make a positive difference.

We have set out guidance on how we think providers could meet the new regulations. The guidance is not prescriptive but it does indicate what we consider to be best practice to ensure that people receive good care.

If you work in a leadership role within any organisation that provides adult social care – or indeed anyone with an interest in our work – now is the time to share your views.

We want to know whether you think we are clear on how providers could meet the regulations; whether we have we missed anything out; or, whether there is anything in there that shouldn't be.

Not only will our final guidance help us decide if a regulation is being followed, but it will help to guide all providers on how they can meet the new regulations.

Ultimately, this will help contribute to making sure that people receive safe, high-quality, effective and compassionate care. That has to be something we all care about. ∎

Note: Those wishing to comment on CQC's draft guidance have until Friday 17 October to coordinate and submit their responses. Click here for all the details.

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Caring in the digital age

In an interview with Editor Laura Evans, Health Minister Dr Daniel Poulter and CEO of Cloudbuy Ronald Duncan discuss the Care Act and the impact it will have on local authorities...

Following healthcare reforms last year, the role local authorities' play in public health has significantly grown. Social care is at the heart of the reforms and The Care Act, which will come into effect in April 2015, will further cement this.

The Care Act is one of the most significant reforms to the social care system in more than 60 years. The Act hopes to make a substantial difference to the lives of some of the most vulnerable people in society, and help them to live more independent lives.

Aiming to place more emphasis on prevention, the Act will help to make the care system clearer and fairer for those that use and need it. Carers for the first time will be put on the same level footing as the people they care for. It will also simplify the process to enable older people to be looked after by another local authority, without interrupting their care.

Following a speech delivered at the LGA conference in July, Editor Laura Evans spoke to Health Minister Dr Daniel Poulter MP, and CEO of cloudBuy Roland Duncan, on how The Care Act will impact local authorities and the role ICT plays in supporting independent living.

"Undoubtedly the Care Act will have a very positive impact, not just for local authorities but also the people they look after. For the first time we're going to have a National Affordability Care Assessment, which means if a person being cared for is moved from one local authority to another, their level of care can be reassessed without it being interrupted," explains Poulter.

The Act will not only benefit local authorities, but also carers and the people that are cared for. A total of £3.8bn will be made available for councils across the

UK to help improve their services and transform the way care is delivered.

Poulter said: "There are some real benefits for the people who are looked after and the local authorities themselves.

"The £3.8bn Care Fund will transform the way that care is delivered. It is about making sure that people with long term conditions such as dementia, heart disease, or disabilities are looked after in a much more personal way and receive better support in their own home and communities."

In order to help people live more independently, technology plays a significant role, delivering effective support to help deliver the right care.

"There are many care providers that are not doing it to be millionaires, but are doing it to provide better care. They work more like charities than private sector companies, and the new technology is making it a lot easier for them to administer services. This is an important aspect because if you can streamline services – it makes for better care."

Intelligent use of technology allows people to manage their own care at an early stage and reduce the amount of emergency NHS admissions. The Better Care Fund aims to help local authorities do this by managing services in a more efficient and effective way, as the Minister explains:

"It reduces the impact on acute services for the local authority and NHS. It is also good community care. People will have support at home rather than having to turn up in crisis in A&E.

"From a cost perspective there is a real opportunity for local authorities as well. At the moment they are often assessing someone's care needs, and the NHS or social services will often be doing the same.

"Putting money into place will help to reduce some of the duplication of processes and administration. Investments in the right technology will help to support people in their own homes, as well as with the delivery of the care budgets."

The Better Care Fund will be distributed via an arrangement between the NHS and local social services, based on the needs of local areas. The two sides will work together in order to determine where the main priorities lie. However, the Minister believes the Better Care Fund is building on work that is already there.

"It is about breaking down the barriers between the NHS and local authorities and prioritising quality of care. If it hadn't been for the Better Care Fund, much of the challenges would still be institutional barriers", he says.

Duncan concluded that the technical hurdles have been overcome such as budgets, and its now about getting people working together in partnership to deliver the care that is needed.

A consultation has been opened by the Department of Health for local people to give their view on how local authorities should deliver care and support reforms. More information can be found here – http://careandsupportregs.dh.gov.uk/ ■

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Your care is our care

Social Care and Dementia

There is sadly no single answer to the difficulties of dementia. It is recognised that the increasing numbers of, principally, the elderly are suffering from some form of dementia. More research reveals that the underlying causes of this disease are many and there are often multiple causes rather than a single cause. The Care Act is attempting to address many of the present problems and is well intentioned. When it comes into force, next year, local authorities are being asked to anticipate what their service users will require. From their present position that is a big ask and with their constrained finances only significant savings will encourage them and it will take time. The NHS trusts are struggling still with the concept of paying for care out of the hospital in the home for patients who would otherwise be bed-blocking. Their payment processes in many instances are not yet in place

Meanwhile the care industry has to deal with what is. The overwhelming belief of us in the industry is that the finance is the main cause of the difficulties. From the district nurse to the care worker pressure is put on the front line workers to get more from less. In the public sector the time available per client is reduced, the transport allowance is cut back, the number of care assistants is reduced in this relentless need to reduce costs. The politicians offer more for less with the best of intentions but reality is different.

Where possible the elderly should be allowed to stay in their own homes or moved to sheltered accommodation. Some will not move but if moved when they can still engage socially with others the elderly society that develops within sheltered housing provides support which appears to delay the onset of dementia. A well run, well designed complex will provide this. The new residents can bring their own furniture and life with them. There are resultant cost savings to the community as the residents are often keen to help each other. And any outside care required can be spread over the community residents. The loneliness that is so prevalent amongst the elderly ceases to be such a factor in their lives. The community will support the couples when one departs.

Where the elderly are unwilling to move to a new place the pressure on the carer must be relieved. It cannot be right for carers to be time limited in their visit to those who desperately need their services. At Companions of London, as with a growing number of agencies, there are no short term visits. We operate a minimum 3 hour rule for any assignment. This is for the benefit not just for the service user but also for the carer. The carer can provide the companionship and the observation required to ensure that the health and mental state of the service user is noted. Dementia is progressive, not necessarily at constant rate, but in steps. To care with those suffering a good and well directed carer will understand the development and will be able to anticipate the progression. This requires time, observation and understanding.

eHealth: accelerating towards a healthy future

Aiming to put citizens in control of their health and wellbeing, Neelie Kroes, Vice President and European Commissioner for the Digital Agenda discusses e-health and its benefits for efficiency in healthcare…

Over recent years the European Commission has been working hard to shape a new vision that puts people in control of their health and wellbeing. At the wheel are the patients, on the road towards efficient and effective healthcare. The benefits are a triple win: putting the patient in control, saving on costs and efficiency, and creating huge opportunities for innovative services and start ups. This is the ethos behind our European Innovation Partnership[1] for Active and Healthy Ageing.

I attended the eHealth Forum[2] in Athens in May, which put this vision on the public stage at a time of substantial market opportunities. One of the key issues we discussed was the emergence of mobile health, or mHealth, defined as the use of mobile phones, tablets and other wireless devices in healthcare. These are smart devices for disease self-management and remote monitoring, leading to prevention rather than cure, and more independent living; tools offering fitness and dietary tips as well as lifestyle and wellbeing apps. These new technologies can all help healthcare professionals treat patients more efficiently, get citizens more involved in managing their health and diseases and help Member States deal with tight budgetary and human resources, while facing an ageing population.

One example of a mHealth service is the EU-funded REACTION project which developed a mobile system that helps doctors and nurses within the hospital to treat patients with diabetes. Via sensors, the system monitors vital signals such as blood glucose levels and administered drugs and gives therapy advice; the data stored on a server are shared via tablets used by the medical staff. This has significantly reduced the workload, increased the autonomy of nurses and improved the quality of care of diabetes patients.

Booming business

The mHealth market is rapidly developing: around 100,000 health and well-being apps are already available across Apple's AppStore, Google Play and on other global platforms. So far, more than 200 million individuals have downloaded sports, fitness and

Neelie Kroes
Vice President & responsible for the Digital Agenda

health apps. The rise of mHealth is unstoppable and we want to ensure mHealth reaches its full economic and social potential and contributes to high-quality healthcare. This will create huge opportunities for innovative services, start-ups and the app economy.

Beyond mHealth, the market for digital health and wellbeing technologies is also growing rapidly. The global market for telemedicine alone is set to grow from €7.2bn in 2010 to €19.3bn by 2016. At the same time, the convergence between wireless communication technologies and healthcare devices and between health and social care is creating innovative new businesses. And as our population ages, the 'silver economy' is emerging as a highly promising market.

Overcoming barriers

On 9 April, the European Commission published a consultation on mHealth to ask what should be done to increase user trust and patient safety in order to boost mHealth's contribution to high quality healthcare. We want to know whether this should be done regionally, nationally or at an EU level. We want feedback on issues related to ensuring that health apps meet citizens' demands for quality and transparency. mHealth services must adhere to strict data protection rules,

and we should be intelligent about how we use the data: we could prevent an epidemic in the future.

For all eHealth systems to work seamlessly across national borders, the many different systems used by hospitals and other healthcare providers need to be able to communicate with each other. While projects such as epSOS have taken great strides forward, this is not a widespread reality. On top of that, both patients and professionals need to learn to use these new systems. But perhaps the biggest challenge is the required change in mind-set: getting used to managing our health and care in a different way, from emailing your doctor to using devices to track your daily activities and levels of fitness.

Connected Continent

In order to benefit from the great advantages which eHealth offers us, we of course need fast, reliable broadband networks, as well as a quality guarantee for high-quality connections end-to-end – the connections that new healthcare innovations may depend on. Our proposed safeguards for the open internet mean providers cannot just decide to block or throttle any content, application or services, including new health apps or services. And the successful vote of the Connected Continent regulation in the European Parliament back in April is a huge step forward in achieving this guarantee. ■

[1] http://ec.europa.eu/research/innovation-union/index_en.cfm?section=active-healthy-ageing
[2] http://ehealth2014.org/
[3] http://www.reaction-project.eu/news.php
[4] http://www.epsos.eu/

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http://ec.europa.eu/commission_2010-2014/kroes/

Main strategies in active and healthy ageing in Europe

The importance of identifying the users groups and their profiling

Active and Healthy Ageing (AHA) is a main direction in the HORIZON2020. One of the basic tasks is to face the challenge of turning existing research efforts to reality for healthy and chronic diseased elderly people across Europe. Existing flexible ICT solutions could assist elderly users in organising, carrying out and completing daily tasks and functions having been part of their life for years and provide essential stability and adjustment factors for continuing to be and feel independent. Thus, within AHA we will need to develop all-around, personalised, multi-faceted existing ICT solutions and services addressing diverse daily activities (shopping, eating, physical activity, commuting, mental stimulation, communication, social interaction, etc.) to elderly users taking largely into account cognitive impairments and their carers living in their own home or in care centres.

Current practices

As aforementioned, ICT solutions are existing applications and services which will be improved and most solutions are considered to be at technology readiness level 7 and above. Several solutions are already commercial or open source products and available for use and others were developed within the framework of European projects and are prototypes.

It is expected that we start from a relative mature level 5 (levels: 1-9) for the majority of tools and we anticipate to reach a TRL of 7 more for around 75% of tools within the next 7 years.

It is clear that the needs and requirements for the addressed user groups at an early stage of developing chronic diseases or changing states in their organism functioning are essential and are a cornerstone within an extended and flexible evaluation framework.

For example in the case of cognitive impairment, the main user groups are:

1. Mild Cognitive Impairment (MCI) people are usually elderly who have lost cognitive functioning on at least one aspect, with no sign of dementia, and who still function in daily activities. People with MCI are estimated to account for 20% of the elderly over 65. ICT solutions as interventions might have more potential for people with mild cognitive impairment, as these are still in the early stages of forgetting and are still active, eager, and can learn new functionalities.

2. Early stages of Dementia, people have been diagnosed with dementia but they are still maintaining some aspects of their daily functions (early signs of dementia are apparent) and users have been diagnosed by specialists (i.e. neurologist, neuropsychologist) and might be under medication. The improvement in daily functioning is usually rather limited compared to the deteriorating effects of the disease. Since early and moderate dementia users can still carry out certain activities with assistance.

3. Cognitive impairment as a co-morbid condition, users with other conditions and diseases with cognitive impairment as a co-condition is a common situation among the elderly. Increased medical co-morbidity is evident in elderly. High rates of medical co-morbidity are evident in elderly living at large urban areas due to low socio-economic status (SES) and poorer access to health services.

4. Caregivers, either formal (i.e. healthcare, social, etc.), or informal (i.e. family members and friends) that need to be empowered with knowledge and tools to support the elderly in their everyday life activities. Informal caregivers often struggle combining work and caring for their relatives, resulting in strains on their own health and coping mechanisms.

In addition, there are many **stakeholders** with an interest in, but not a direct involvement in day-to-day care provision. Some main stakeholders, are described briefly below:

Regulatory authorities on local, national or international level, regulating a wide range of aspects from device safety and essential performance, via legal, ethical and privacy related issues. This group

includes an Ethics Control Board with external expertise and representatives from all the pilot sites for ensuring applicable regulations are respected.

User interest organisations work to serve the interest of their members. This group involves care centres and organisations for elderly people and dementia centres with experience in working with and for users with cognitive decline.

Standardisation bodies are organisations that define how AAL care systems should work in a consistent manner (i.e. members of Continua Alliance). Furthermore, another important standardisation body is INFOTERM, aiming to promote and support standardisation actions in the AHA area.

Public bodies, insurance companies and care organisations are important as they define care standards offered and the reimbursement levels provided. We need to interface these stakeholders primarily via on-site care centers, outpatient clinics, hospitals, organisations, dementia research centers and their networks.

It is in the domain of consumers' study that the move away from the 'medicalisation' has been more radical with the introduction of the concept of *resilience* in opposition to that of frailty. The concept of resilience can be defined and measured along two dimensions: a) capacity to function in terms activities of daily life or of disability-free status; and b) Socio-Economic Status (SES), where we include not only more tangible dimensions (income, education attainment) but also social support and networks.

Using these two dimensions we can determine the taxonomy. We identify four archetypes (so in qualitative and ideographic fashion) that have different needs, should be the target of different interventions, and possibly of more granular monitoring indicators. For the sake of simplicity we describe the four segments considering the extreme (low/high) and neglecting the nuanced and intermediate situations.

Dependent. These are individuals with low SES and with poor health severely hampering the capacity to function. They may also suffer from isolation and lack of social support, which means little or no access even to informal care. They need public support for immediate care.

Assisted. These are individuals with good SES yet suffering from health related limitations. Since they can afford it, they are likely to seek quality of life improvements and can afford to buy care and other support, or can rely on social support and networks. They can potentially demand and pay for assisted living and other aides to independent life. They may be the target of some of the services that can be brought to market and can afford to pay for them.

At risk. These are individuals with low SES but holding onto normal life due to their good health status enabling resilience at least in one dimension. They are at risk in the sense that lack of SES resources may bring them easily in the condition of the dependent elderly, when and if, a health problem emerges and limits their functioning capacities. They may be the target of pre-empting public policies such as for instance health awareness and prevention services or skills building measures

Active elderly. These are individuals with high resilience they are ageing well and actively and we could also call them the 'discerning old'. They are likely to seek quality of experience and demand for luxury goods and leisure such as smart homes.

Based on the above baseline for user profiling, the main innovation that is needed is to estimate the real life depiction of a large-scale effort to estimate the potentially positive effect of ICT solution on AHA such as in cognitive decline and multi-morbid elderly for statistically adequate number of users which reflect the diversity of real users with actual cognitive impairments for a long period of time. Ensuring the inclusion of significant indicators for assuring successful assessment and investigation of the Quality of Life indicators ensures the extrapolation of findings and the viable transfer of knowledge to business modelling and health service provision with measureable and generalisable indicators as ROI and SROI have been accepted to be.

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BRIPPED scan for undifferentiated dyspnea

Patients presenting to the Emergency Department (ED) with undifferentiated shortness of breath (SOB) can be among the most challenging in terms of the diverse underlying pathology and urgency of appropriate treatment. Until a clear diagnosis is made, several pathways may be pursued simultaneously, resulting in tests ordered with low clinical yield. A patient in extremis may be unable to provide an adequate history, and physical exam findings key to diagnosing causes of shortness of breath may be less reliable. It is unfortunate that most definitive diagnostic tests used for the work up of shortness of breath cannot be resulted in the first critical minutes of a patient's presentation. It is our belief that the BRIPPED scan, aids Emergency physicians in rapid evaluation of potential causes of shortness of breath.

The BRIPPED scan is a standardised ultrasound evaluation of the below components. These Emergency ultrasound (EUS) applications were chosen based on literature review and personal experience with ultrasound and considered to be likely to provide diagnostic clues about the cause of patients' SOB. The BRIPPED scan takes less than 6 minutes to perform.

Our data suggests the BRIPPED exam is also valid if deconstructed to include some of its components. If, for example, a deep venous thrombosis (DVT) is absolutely not a considered potential diagnosis, the lower extremity scan will not influence the final differential ranking and can be omitted
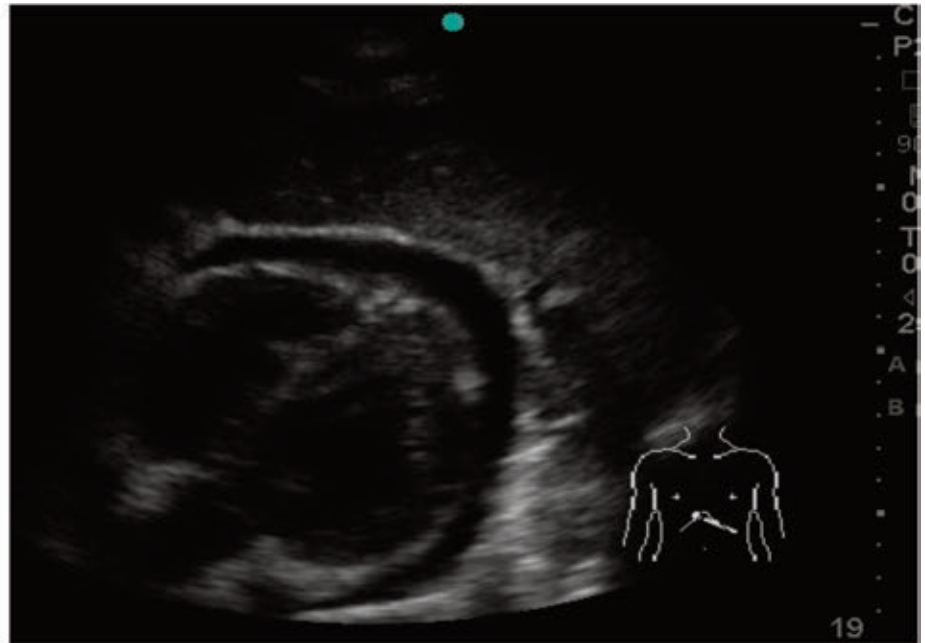
Pericardial effusion

without affecting the final differential ranking. By omitting this component, the BRIPPED exam would be performed in under 4 minutes.

The BRIPPED scan develops a rapid, accurate, standardised approach to using emergency ultrasound in the evaluation of shortness of breath in the Emergency Department. BRIPPED influenced physician differential diagnoses to the same degree as routine laboratory, ECG, and radiographic testing in the evaluation of this patient population. Additional research is needed to evaluate the BRIPPED scan's influence on patient outcomes, complications, and associated costs.

Components of the B-RIPPED Scan

B-lines:
Sonographic thoracic B-lines are found on the pleural surface and have

been shown to correlate with congestive heart failure. B-lines are artifact created from fluid filled alveoli. BRIPPED utilises any anterior midclavicular fields, with one image taken on each side. Preference is given to apical views, as many patients with dyspnea were unable to comfortably lay flat.

RV strain:
A PE, acute right ventricle (RV) infarct, CHF, pulmonic stenosis or pulmonary hypertension can cause right ventricular strain. The goal of BRIPPED is not necessarily to definitively differentiate between these conditions, but to risk stratify patients for need of further testing or admission. RV strain is a well-documented risk factor for early mortality in PE. For simplicity, we have chosen to use a RV to LV size ratio of 1.0 or more as abnormal as measured from an apical 4-chambered view.

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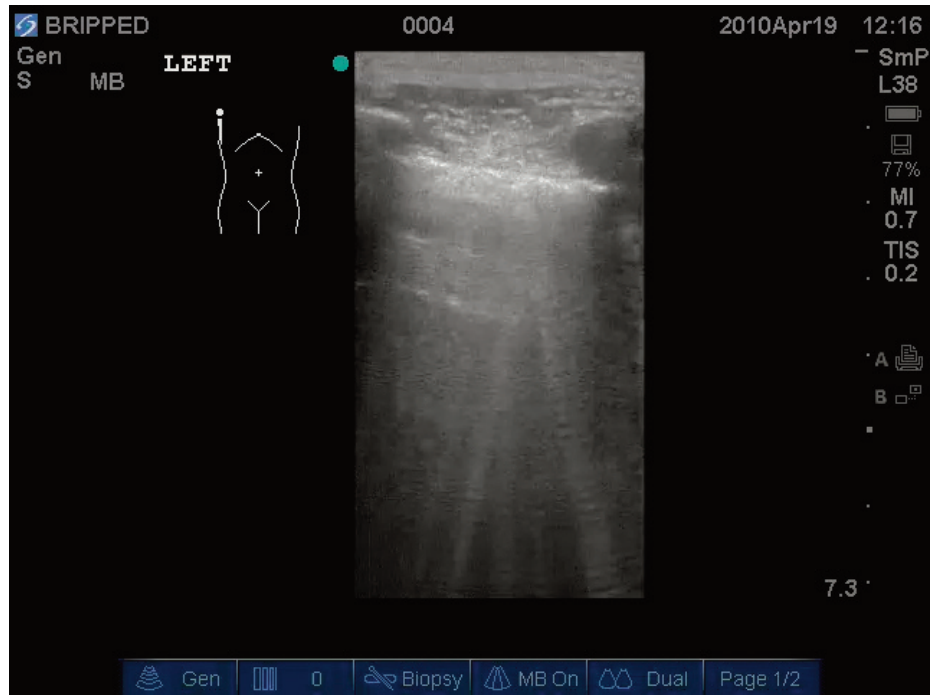
A pulmonary edema

IVC-size and collapsibility:
Complete collapse of the IVC with respiration, or dilatation greater than 2cm is used under the BRIPPED protocol.

Pneumothorax:
For pneumothorax, bedside ultrasound has been proven to be similar or more accurate than supine chest x-ray and with diagnostic ability approaching that of CT. Pneumothorax is documented in 2 points, one on each side, simultaneously with B-line documentation per above.

Pleural effusion:
Ultrasound can detect as little as 20mL of accumulated pleural fluid. Such a minimal amount is unlikely to cause immediate danger to the patient, however, the presence of pleural effusion warrants further work up to determine its etiology. The BRIPPED protocol evaluates lateral anterior mid-axillary lines, one view each side. This visualises the bilateral costophrenic angles, areas commonly associated with fluid accumulation in an upright patient.

Pericardial effusion:
As it is an integral part of the Focused Abdominal Sonography for Trauma (FAST) scan, most ED physicians have adequate experience in using bedside ultrasound to determine the presence of pericardial effusion. In experienced hands, it is the gold standard to detect pericardial effusion. In this BRIPPED protocol, a parasternal long-axis view will be used to determine if pericardial effusion is present. Subcostal views are used during FAST examination, and may be utilised, however patients must be supine for optimal scanning. In the pilot study, it was found that many patients presenting with shortness of breath were unable to lie flat comfortably, and on review of images many subcostal ultrasound views were suboptimal, likely due to positioning and patient habitus.

Ejection Fraction:
Emergency physicians trained in the use of ultrasound can differentiate between normal, decreased or severely decreased left ventricular ejection fractions. The BRIPPED scan utilises a parasternal long axis view to estimate ejection fraction.

DVT in lower extremities:
Diagnosing DVT and PE can be very challenging in the ED as the symptoms can be nonspecific. In this BRIPPED protocol, only views and compression of the common femoral and popliteal veins are used.

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Healthcare in the digital age

Airedale NHS Foundation Trust details how telemedicine is helping to provide solutions for some of the most challenging healthcare problems...

Digital healthcare uses information technology services, to help address some of the challenges faced by an aging population and to support people to live independently with clinical support. Airedale NHS Foundation Trust has a unique digital healthcare solution, which has been developed in a range of settings by their consultants working to meet the needs of patients. Some of the most pressing challenges facing the UK today are the increasing costs of healthcare, finite budgets and an aging population. Telehealth allows healthcare professionals to provide patient care from a remote location. The term Telehealth is used as the overarching term for all 'tele' technologies.

Last July, a unique telemedicine joint venture called Immedicare was formed between Airedale NHS Foundation Trust and technology company Involve using a Telehealth Hub, based at the hospital site run by the Trust's specialist nurse and consultant teams. It is the provision of remote secure and encrypted video consultations between clinicians, patients, service users and carers for diagnosis; review; assessments and interventions to minimise the severity of a patient's condition, deal with deterioration, assess future care needs or provide routine out-patient and follow up services.

Airedale was the first hospital to use the acute module of TPP's SystmOne, which allows a patient's GP and hospital care record to be shared. The joint venture Immedicare now provides a full end-to-end service – clinical expertise and the technology – to nursing and residential care homes, patient homes and prisons throughout the country.

The Immedicare partnership also provides telemedicine to 108 nursing and residential homes – and a further 114 in the pipeline (July 2014) – throughout the county. Between April 2012 and March 2013 in nursing and residential care homes, telemedicine resulted in a 35% reduction in hospital admissions and visits to A&E dropped by 53%. The service is also used in patients own homes, typically people with Coronary Obstructive Pulmonary Disease, (COPD) heart failure and to provide end of life care. Airedale also provides a remote consultant-led service including full trauma, orthopaedic and dermatology clinics, to 16 prisons across the country.

Case study

Ninety-three-year-old Ernest Towers is a resident at Sutton Lodge – one of 200 care homes to be provided with a telemedicine service through Immedicare, a unique partnership between Airedale Hospital and technology company Involve.

The residential home, based in Sutton-in-Craven, is linked to the Telehealth Hub, based at Airedale hospital, which is run by the Trust's specialist nurse and consultant teams.

This means that Ernest and hundreds of other residents can get on call face-to-face specialised medical care around the clock, albeit remotely via secure video link – without having to leave the comfort of their home.

Michael Hebden, manager of Sutton Hall, is delighted with the face-to-face, albeit remotely, specialised medical care.

He said: "It's brilliant, we really appreciate having back-up from the consultants and their medical team. We can always call if we have any doubts or queries about our residents or need a second opinion and that makes our staff feel more comfortable – especially out of normal surgery opening hours.

"Anything that reduces the time that our residents spend in A&E is good for us as it's so stressful for them to travel to hospital.

"We've used it for advice on breathing complaints, a head injury, rashes, chest infections and the patient can be seen so clearly on screen."

Rachel Binks, nurse consultant for outreach and critical care at the trust, adds the high definition cameras and screens, linked by the NHS's secure N3 network, provide a very clear view of the patient. "We can see whether they are having a problem, say with their breathing, and we can use other equipment like telemonitoring to assess them."

Rebecca Malin, deputy director of business development and investment at Airedale NHS Foundation Trust, said: "For many elderly people, unplanned admissions to emergency departments or even routine hospital appointments can be hugely disruptive.

"Our patients, their relatives and the nursing or care home staff say they would prefer to receive more specialist care without having to leave their home – so it's been down to us to change the way we work to meet their needs."

The message we hear back constantly is that patients and carers feel assured just by having access to telemedicine from their home and knowing that if they need to see a nurse they can at the touch of a button.' ∎

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COMPLETE NETWORKS
Communications Without Boundaries

Network Convergence

Voice and data convergence, also known as Network Convergence refers to the provision of telephony, video and data communications services over a single network.

Traditionally, for many decades, voice and data services have been provided by separate infrastructures both internally and externally to an organisation. Voice services were, and still are to a large extent provided by circuit switched technologies. This means that when a telephone call is made a circuit with dedicated bandwidth is opened between the source and destination of the call. This provides a very reliable connection, but it is inefficient in bandwidth usage (the circuit remains open even if there is silence on the call). Circuit switched networks are unsuitable for data communications because of the inefficiency, which is why packet switched technologies were developed starting in the 1960's to support computer to computer communications.

Historically, speech communication dominated business interactions, but today businesses and customers demand a plethora of different types of business to business and business to customer interactions including voice, email, SMS, web technologies. Sophisticated, high speed converged data networks have been developed to support theses interactions.

Technology and business drivers for network convergence

Technically, voice processing has become less of a challenge to support within modern data networks. The standardisation and wide spread adoption of the Session Initiation Protocol (SIP) has been key to enabling voice to be successfully integrated into data networks. However, the key inhibitor for voice integration into data networks in the early 2000's has been the lower reliability – or perceived reliability of data networks. Yes, it was technically feasible, but data networks were simply not as reliable as traditional circuit switched telephony.

So, it is the improvement in reliability of data networks in the last decade that has truly enabled network convergence to be a realistic goal for enterprises. The reliability of a network can be measured by:

• Quality of Service – Converged networks must have predictable delay, jitter and latency.

• High availability – Converged networks must target availability levels equivalent to ISDN systems which are exceptionally reliable.

The business driver and the real prize for implementing a converged network is the cost savings of maintaining a single network infrastructure which support all media types.

Implementing converged networks

In a series of articles, we will explore various aspects of implementing a fully converged network by reference to an example of an acute NHS hospital trust making the transition towards convergence:

• Infrastructure resilience

• Converged network architecture

• IP telephony in the cloud

• Ultra high WAN resilience

Infrastructure resilience

The trust's data infrastructure comprises a central data centre housing core network and server infrastructure with approximately 20 communications hubs around the hospital housing edge switching equipment and patch panels for connecting end user devices.
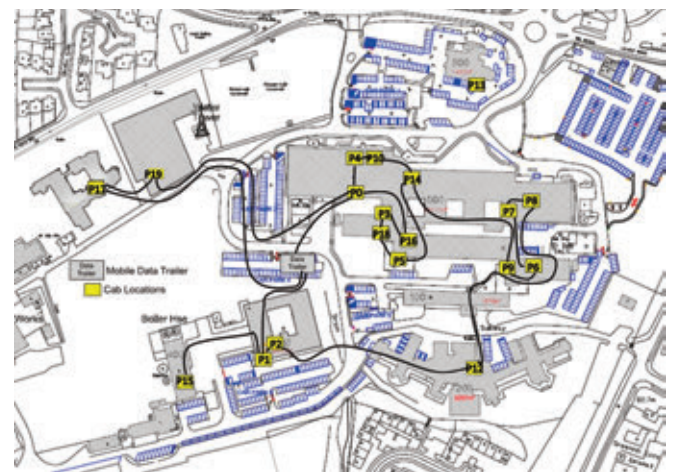
Security and environment

Very often, especially in older buildings, data networks were not planned into the buildings from the start. Sometimes communication hubs can be found in cupboards, riser rooms, loft spaces and other locations which are not ideal for active equipment. It is usually expensive and impractical to move a communications room, but as a minimum, air conditioning and security must be addressed to provide a truly high availability converged network. Our upgrade program specified air conditioning with temperature and humidity monitoring as well as secure swipe card access for all communications hubs.

Fibre resilience

Prior to the upgrade, each hub was connected back to the data centre via 1GBit fibres. The trust had suffered some data outages when fibres were broken during refurbishment work as workers accidentally cut through unmarked fibre routes.

A new fibre infrastructures was specified and deployed using armoured 10Gbit fibre in a ring architecture so that each communications hub had 2 diverse routes back to the data centre (Fig x). This means that two fibre breaks are needed to isolate a communications hub and it has therefore dramatically reduced the possibility that a communications hub can become isolated by a fibre failure.

Power resilience

Probably the most common cause of failure of a communications hub is loss of power. Although, in this case study, the entire hospital was backed up by generator, isolated fuse board failures were a significant cause of loss of service. This is an important point when comparing service levels for separate voice and data infrastructures. Typically, traditional voice services are provided directly from the data centre or telecommunications hub without the need for active hubs (that have risk of power failure) for distribution. In order to achieve equivalent resilience in a converged data network it is important to ensure there is resilient power supply at each active hub.

In our case study example, each hub was upgraded with power feeds from two separate distribution boards. In addition, two UPS units were installed in each hub and redundant power supplies fitted to all installed data switches.

Security and environment

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Network monitoring

Usually, a large organisation will have an internal IT help desk which responds to calls from users regarding service disruption. However, it is possible to monitor converged networks very closely these days. In our case study example, we installed a network monitoring system to monitor vital signs not only in the data centre itself, but also in the every communication hub around the hospital trust. As a minimum, the following vital signs are monitored at each communications hub:

- Temperature/Humidity
- UPS health
- Dual 10Gbit fibre links back to data centre
- All data switches
- Data switch power supplies
- Wireless access points

When redundancy is built in to a network it is, in fact, essential to monitor both the primary and backup functions. If this is not done it is possible, for example, for a primary power supply to fail without any impact on service because the back power supply takes over. However, the loss of resilience must be detected by network monitoring and restored before the backup system fails.

The result of comprehensive service monitoring is that the IT department are usually aware of any service disruption before the first help desk call is received from an end user. This leads to faster time to fix and a better service to end users.
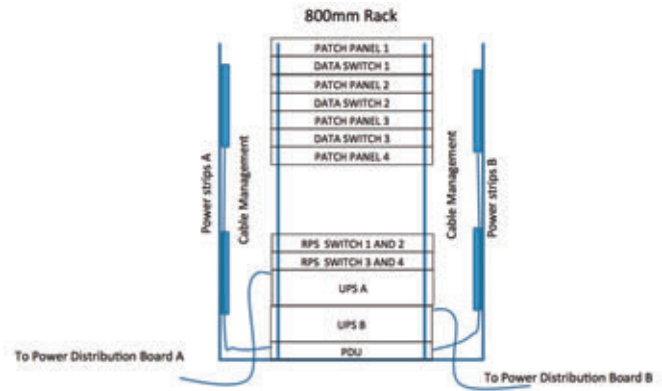
The figure above shows a standard communications hub rack layout fed from two separate power distribution boards, with dual UPS, data switches, RPS units to provide backup power to the data switches, patch panels and horizontal cable management panels and vertical cable management trays.

Finally, please keep it tidy!

Day to day maintenance of a communications hub is kept much easier if short, colour coded patch cords are used to patch from data switches to patch panels. It is good to specify a different patch cord colour for each function. IT engineers can see at a glance what function each patch cord is performing. An example colour code is provided below:

Function	Patch cord colour
Data + IP voice	RED
Analogue Voice + Fax	GREEN
Wireless	BLUE
Medical/ Patient monitoring	ORANGE
Cameras and Access Control (security)	MAUVE
Third Party Equipment	GREY

Appropriate patch cable lengths should be used. Too often we see 3m patch cords where 0.25m will do. The two photographs below show a communications hub before and after the upgrade process. I hope the comparison speaks for itself!

BEFORE   **AFTER**
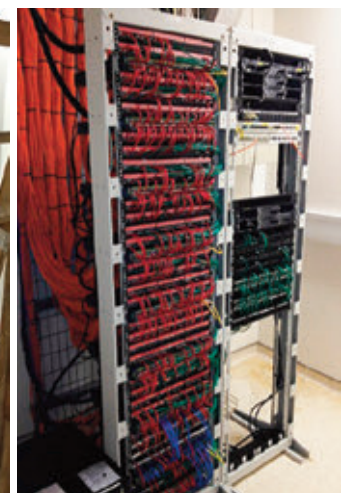
Regulating the alternative

Linda McAvan, MEP at the European Parliament details how e-cigarettes are to be regulated in Europe...

In April this year, MEPs and governments from the 28 EU member countries agreed a new law to regulate tobacco sales which will also regulate e-cigarettes across the European Union for the first time. This regulation is both flexible and robust, and will ensure that consumers can be assured of the safety and quality of e-cigarettes which are a new product on our market and ones which are attracting large numbers of new users. Up until now, e-cigarettes have been subject to no regulation in the UK beyond basic product safety law and when the UK MHRA (the medicines regulator) examined a number of e-cigarette products, it found a range of problems which led to the UK government to argue for a tougher regulatory framework. Other European countries have introduced piecemeal regulation on e-cigarettes, including bans in some country, but the new EU law will mean consistent regulation across Europe. The USA is also examining similar legislation.

"The outcome of negotiations on this new law ensures that safety and quality controls for consumers are treated with high priority. I believe this is an outcome that the vast majority of European citizens can support. The new law will take effect from 2016."

Under the new law, E-cigarette manufacturers have the option of having their products regulated like tobacco products, meaning they can be sold freely as long as they meet certain safeguards, but like other tobacco products they will be subject to advertising restrictions and health warnings on the same basis as cigarettes. Alternatively, e-cigarette manufacturers who wish to do so can apply for a licence to have their products treated like other smoking "quit" products such as patches and chewing gum. If this option (often referred to as the "medicines route") is chosen, manufacturers would be able to advertise their products, have them available in pharmacies, on prescription by doctors, and sell stronger strength products. Two major e-cigarette companies in the UK have already announced they will seek a medicines license in this way.

Throughout the process of deciding this new law, I and other decision-makers were aware of the potential benefits of e-cigarettes for regular smokers who want to cut down or quit smoking. But we were also mindful that there are safety issues with e-cigarettes which need addressing and a need to ensure they do not become gateway products into nicotine addiction for young people. A number of governments in the EU, including the UK government, originally wanted to make all e-cigarettes subject to a medicines licence. But a majority in the European Parliament objected and we therefore steered a middle way path, avoiding over-regulation, keeping e-cigarettes on the market but within a reasonable regulatory framework which responsible manufacturers can accept. The outcome of negotiations on this new law ensures that safety and quality controls for consumers are treated with high priority. I believe this is an outcome that the vast majority of European citizens can support. The new law will take effect from 2016. ∎

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If it ain't broke...

...be cautious not to fix it until it breaks

The German language has a word we do not have in English: verschlimmbesserung, meaning a supposed improvement that makes things worse. When it comes to the thorny topic of electronic cigarette regulation, policy makers would be well advised to exercise caution, lest they inadvertently create a verschlimmbesserung.

It is essential to remember that electronic cigarettes are a disruptive technology, and that they are competing with a dangerous established incumbent: smoked tobacco cigarettes. Over-zealous regulation of the challenger product (ecigs) shows increasing signs of creating regulatory protection of the disrupted, dangerous product (tobacco cigarettes). Consumer protection should be paramount, but clearly there is a balance to be struck.

Before any regulatory measures are contrived, policy-makers should have been asking themselves a vitally important first question: "What is the problem we are creating regulation to address?" In some instances, (ecigs quite probably being a case in point), it may be the most prudent thing for regulators to simply leave well alone. In any event, mechanisms exist to weigh-up the risks and benefits of regulatory interventions, and it is a great shame that these have not been properly employed during the process of many of the regulatory proposals and, indeed, measures which have

been introduced into law. There are negatives as well as positives with regulation, so the precautionary principle needs to be considered fully – from both sides of the equation, i.e. if we do something, what will the impact be, and if we do nothing, what will the impact be? Unless policy-makers have clear evidence to support both of these, they will be more likely to make mistakes. Even seemingly erring on the side of caution may not actually allow enough caution to be applied (ironically).

Proponents of medicines regulation for electronic cigarettes ('ecigs') have suggested that ecigs need to be offered on prescription to help the poorest and most vulnerable in society. Indeed, the Stop Smoking Services (SSS) in the UK were deliberately designed to target those people affected by the inverse care law, i.e. the poorer you are, the worse the health care you can expect to receive. Unfortunately, however, this argument falls down in 2 key areas: firstly, SSS are only accessed by a paltry 1-2% of smokers, and secondly because if the poorest in society can afford to smoke, they can afford to buy their own ecigs – as firmly demonstrated by the lack of social demographic difference in ecig users:

"None of the demographic variables entered demonstrated strong association with current e-cigarette use, though due to the imprecision of

estimates we cannot exclude the possibility of moderate associations that this analysis failed to detect."[1]

Clearly, it is not only the more affluent who are switching in their millions to ecigs; the poorer in society are choosing this route, too. As Dr Hayden McRobbie, an international expert on nicotine and tobacco, said recently:

"We don't need medicines regs to be able to advertise, and get to people who smoke. [...] This has been an interesting field in which people are using these without us [tobacco control] even interfering, and so why not just let it be, and let that spread through the community? People talk to each other."[2]

And what has this mass migration away from smoking and onto vaping led to? Approximately a 33% increase in successful quit attempts within the past year, with a drop in smoking prevalence to 18.7%, according to data from Professor Robert West's Smoking Toolkit Study.

This is an unprecedented improvement in population level public health outcomes, and one which is not to be sniffed at. Tobacco Control measures over the past 5 decades have not achieved such dramatic improvements in such a short space of time, and have actually plateaued in recent years. That stubborn core of hard-to-persuade smokers was resolutely

Success Rate for Stopping in Those Who Tried
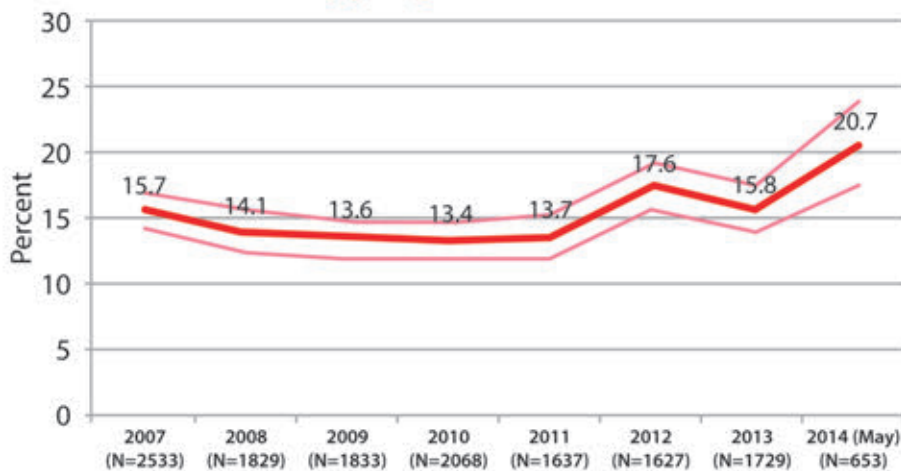
Base: Adults who smoked in the past year. Graph shows prevalence estimate and upper and lower 95% confidence intervals

stuck at around 20% of the population, but this is now coming down.

If policy-makers and regulators apply the precautionary principle only to the side of the equation relating to protecting consumers from potentially dangerous products, and ignore the growing body of evidence which supports that electronic cigarettes are a) not killing people; b) being used by millions of smokers and former smokers around the world; and c) dramatically improving smoking prevalence rates and successful quit rates, then surely they are missing out the very significant precautionary approach which ought to be applied to any regulatory intervention which might change any of these factors.

Setting the regulatory barrier too high will create a dangerous black market. This is simply a fact – and well-supported by regulatory enforcement officers who have to deal with the fall-out from such problems. Black market products will not necessarily have the appropriate safety and quality standards in place, so we could see consumers beginning to be killed by substandard products.

Many consumers are law-abiding citizens who would not buy from a black market, so the only alternative for these people might be to return to smoking. Indeed, we have seen a tragic example of this in Spain recently, where one ill-informed doctor spread some egregious lies about electronic cigarettes through the media, including suggesting that ecigs are as dangerous as continuing to smoke, and an alarming number of former smokers gave up their ecigs and went back to smoking tobacco cigarettes!

If regulation protects the dangerous product (tobacco cigarettes) from the disruptive new technology (ecigs), then smoking prevalence rates will go back up, successful quit attempts will fall, and we will be back to square one, with about 20% of the population continuing to smoke, with no hope of a 'get-out-of-disease-free' card.

What is broken here? What are we seeing that requires a draconian regulatory response? What will happen if regulators are over-zealous in trying to fix mythical problems at the expense of the documented population level public health gains we are currently

enjoying without their interference? Verschlimmbesserung, that's what.

[1] Dockerell, M., Morison, R., Bauld, L., and McNeill, A., (2013), E-Cigarettes: Prevalence and Attitudes in Great Britain, Oxford Journals, Nicotine & Tobacco Research, doi: 10.1093/ntr/ntt057 http://ntr.oxfordjournals.org/content/early/2013/05/21/ntr.ntt057

[2] https://www.youtube.com/watch?v=l-RWs4uR4aM

http://www.smokinginengland.info/

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Regulating innovative medicines

Web editor at Adjacent Government, Amy Caddick gives an overview of how the European Medicines Agency (EMA) supports the development of new innovative medicines and therapies for healthcare...

The pharmaceutical industry has a pivotal role to play in the treatment of disease. Over the years, many breakthroughs in the field have enabled complex conditions to become eradicated completely, whilst helping other life threatening diseases to become manageable.

The regulatory body for pharmaceuticals in the European Union is the European Medicines Agency (EMA). It has a significant part to play in advancing innovation in the field. One of its main long-term strategic goals is to 'foster research and the uptake of innovative methods in the development of medicines'. [1] EMA is dedicated to creating safe and effective medicines for all patients. It also seeks to ensure high quality medication reaches the market in a timely fashion.

One of the ways in which the EMA supports the development of new therapies is through collaboration. Working closely with experts in their respective fields is vital to ensure progress, and prevent duplication of research.

In 2004, the EMA and the Committee for Medicinal Product for Human Use (CHMP) set up a think-tank group dedicated to innovative drug development. The group consisted of members of the CHMP, and focused on identifying high quality emerging science in the pharmaceutical industry.

The group offered a place to enable stakeholders to present and discuss their views on evolving strategies in drug development. It also worked to identify bottlenecks in the process – both at the research and development (R&D) end of process, as well as the academic side.

It also brought together large multinational companies, and smaller enterprises. It enabled the EMEA to examine areas that required improvement within the industry, and to strengthen relationships between the key players in the European pharmaceutical sector.

Furthermore, in 2010 the EMA published its 'Road Map to 2015', which set out the strategic vision for the agency, building upon the existing strategy. In the area of emerging science, the road map acknowledged the role of new fields such as personalised medicine, nanotechnology, novel drug development, regenerative medicine, and synthetic biology. The document stated that emerging science was "becoming increasingly established as part of the new wave of medicines development," and that there had to be "new ways to address current unmet medical needs".

The Road Map also noted that part of the process of dealing with innovative and emerging medicine was the careful consideration of the legal and regulatory frameworks, as well as the benefits and risks of developing these drugs.

The Road Map said there is "a need for debate on how best to support and translate the new science into regulatory requirements. Further thought will also have to be given to aspects such as ethical and environmental considerations. Such important scientific progress will require regulators to be attuned to the new technologies in both human and veterinary fields, and to learn from research and experience in other industry sectors." [2]

Supporting small and medium enterprises (SMEs) in their endeavour to develop new innovative medicines has also been part of the EMA's strategy. Undoubtedly,

smaller enterprises have a significant role to play in the development of innovative medicine. Research published in Nature[3] ('Regulatory watch: Where do new medicines originate from in the EU?') into the origins of new medicine, found that SMEs often created more new substances than academia, although the latter still plays an important role in the industry.

In fact, the results showed that between 2010 and 2012, a total of 27% of medicines containing a new active substance, recommended for marketing authorisation, came from SMEs. However, SMEs only accounted for 13% of the marketing-authorisation holders.

Comparatively, only 17% of these medicines originated from academic institutions, public bodies, and public-private partnerships. These three organisations are no longer involved in marketing-authorisation applications.

Furthermore, 61% of medicines with an orphan designation originated from SMEs, with marketing-authorisation holders standing at 22%. Only 11% of these drugs originated from academic institutions, public bodies, and public-private partnerships.

The authors of the research said: "Understanding the factors that could affect drug innovation, such as the nature of the organisations involved, could help in developing strategies to catalyse further advances."

"This analysis shows that SMEs, academic institutions, public bodies and public-private partnerships represent an important source of innovation and bolster the product pipelines of larger companies."[4]

Recognising the role of SMEs in the innovation process, the EMA developed a programme to support these organisations throughout all stages of pharmaceutical development.

Speaking earlier in the year, Head of the EMA's SME office Melanie Carr said: "This analysis underlines the importance of the support that the EMA offers early in development, which should facilitate and promote the emergence of innovative medicines."[5]

Another way in which the EMA has worked to further progress the development of innovation in European

pharmaceuticals is via the Innovation Task Force (ITF). This was put in place to improve coordination across the agency, and to assist SMEs by identifying scientific, legal, and regulatory issues relating to emerging therapies through early dialogue.

The ITF also provides recommendations regarding the eligibility of innovative or borderline human medicines for the agency's pre-authorisation scientific services. This is done free of charge, and recommendations are provided within 60 days of receiving a request from an applicant.

Improving current medication for life threatening diseases, and creating new products is imperative in the continued fight against disease. It is clear that smaller pharmaceutical companies have a significant role to play in advancing drug therapies, but it is also obvious that these organisations require much more support from agencies like EMA.

Undoubtedly, EMA have their own part to play in facilitating the advancement of emerging drugs, helping with the development of the industry, and ensuring regulations are in place. Furthermore organisations like the EMA have the ability to bring together experts, and improve the route from the laboratory to the market place. ∎

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5 ibid

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A novel silicon dietary supplement

Made from 100% natural Icelandic geothermal silica

Millions of people have bathed in the mineral rich geothermal waters of Iceland for the beneficial effects of the water's silica on the health and beauty of skin. Now an Icelandic start-up company aims to bottle it for consumption as a supplement for an even wider range of benefits. GeoSilica Iceland is an Icelandic start-up company specialising in the production of novel silica healthcare products produced directly from the silica rich geothermal waste water of geothermal power plants in Iceland.

The supplement, in the form of very pure colloidal silica of natural geothermal origin, is produced by concentrating the silica in the geothermal water of the Hellisheidi geothermal power plant, and then purifying it by removing everything but the silica from the water using sophisticated techniques. The colloidal silica in the supplement is a source of the element silicon, which is often called the "forgotten nutrient" on the basis of how little people are aware of how essential it is for the body.

The importance of silicon for our health

In 1970, a research done by Edith M. Carlisle, PhD, showed that silicon is an essential mineral for bone formation and bone mineralisation, independent of vitamin D. Her research was confirmed by several other scientists shortly after. Since 2002, there has been steadily increasing research regarding the role of silicon in a variety of tissue including bone.

It is now a known fact that silicon plays a vital role in the formation of collagen, the major constituent of connective tissue, and furthermore, that silicon acts as a cross-linking agent, forming chemical bonds between collagen and the major macro molecules of connective tissue, thus making connective tissue stronger and healthier.

Bones, cartilage, ligaments, tendons, skin, and blood vessels are examples of tissues consisting largely of, and supported by connective tissue. It is thus not surprising that silicon is essential for strong bones, strong and elastic blood vessels, and healthy and beautiful skin. Silicon supplementation has also been shown to make hair stronger, nails less brittle, and even to lower the frequency of sport injuries.

Much of the recent research on silicon is focused on silicon supplementation as a means of treating or preventing osteoporosis, particularly in women. 1 in 3 women over the age of 50 are estimated to have osteoporosis.

Do we get enough silicon from our diet?

For the majority of people in the western world the short answer is "No". Epidemiological studies report that dietary silicon intake of more than 40 mg/day correlates with increased bone mineral density, but the average dietary intake of silicon is 20-30 mg/day for the typical western world diet. Silicon uptake from diet decreases as we get older, and because of this post-menopausal women average approximately 18 mg per day.

The company is currently looking for funds in order to scale up the production and bring the supplement to European and other international markets. GeoSilica strives to be a socially responsible company and intends to improve the society by conducing towards healthier environment, creates new jobs, maximising the utilisation of the geothermal resource in Iceland and contribute to EU sustainable objectives.

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Working 'smart' in wound care

Salla Seppänen, President of the European Wound Management Association discusses the challenges faced in wound care...

Wounds are a major problem to patients and health care systems. A single chronic wound can cost between €6,650 and €10,000 to treat, and it is estimated that around 1–1.5% of the EU-population has one or more of such wounds. Of the total healthcare expenditure in the EU, wound management alone is estimated to make up 2–4%[1]. Ultimately, it is the patients who suffer when they have a wound; therefore, ensuring that they receive proper care is important. A major challenge in wound care, however, is the lack of united services aimed at addressing all the health care needs of individuals with wounds[2].

Demand for healthcare is growing at a rate corresponding to an increasingly elderly population and an increase in the number of individuals with chronic disease, which is likely to grow further in future; it is obvious that the systems are under pressure. A look at the growth in healthcare costs over the past decades bear witness to this[3, 4]. In other words, in order to prevent a future breakdown of the healthcare sector, especially in light of the recent recession, it is pivotal to find ways to cut costs.

These health economic considerations are already causing a drive towards an earlier discharge of hospitalised patients. As a consequence, more patients suffering from complex pathological conditions, including those with wounds, are being treated at home[5, 6]. In essence, what we are observing is a shift in the location of service delivery, e.g. wound care, from secondary care to primary and community care. This development makes it even more important that social and health care professionals communicate effectively with each other and that well-defined care pathways integrating specialised and primary care services according to the patients' condition and needs exist. Wound care in the community requires educated professionals and multi-professional co-operation to ensure that individuals with wounds receive proper care.

Evidence-based practice and education

With resources being limited and the demand on service delivery increasing, the success of the health service is dependent on choosing the most appropriate treatment available. The prevention of avoidable health-related complications, such as pressure ulcers, is more important than ever, and one of the means to increase the value for money is to implement evidence-based practice and guidelines in everyday care delivery by health professionals[7]. However, to be able to meet clinical demands from evidence-based guidelines, health professionals who take care of individuals with wounds need to have access to education and training. This is the only way they can develop and maintain the required competences in wound prevention and management and make well-informed decisions about wound care.

The team approach

In 2 newly released publications by the European Wound Management Association[8, 9], it is argued that a multidisciplinary team approach to wound care is fundamental to maximising health and social gains. No profession has all the skills required to address the complex needs of individuals with wounds, and therefore health professionals, social caregivers, and family members should be included in the care team with the patient at the centre of all decision-making. In fact, well-orchestrated interdisciplinary care increases the chances that patients do not experience unnecessary and often harmful complications and

inconveniences like amputation, pain, and malodour; circumstances that can lead to social isolation and in the worst cases, death [10]. Collaborating across professional borders with the patient and family members in focus also requires that wound specialists develop the right skills for teamwork and communication. Part of the challenge is to inform and educate the patient and caregivers about the condition, and provide information such as how to use a specific dressing and how frequently it should be changed. It is also crucial that everyone in the team is aware of when to consult a specialist if, for example, the wound is deteriorating. Other challenges are patient compliance and making information about the patient and the treatment available to everyone in the team.

Communication and new technologies

A new and promising development is the use of telemedicine that enables the exchange of information about the patient condition and treatment choices between patients and professionals, and between different groups of professionals and care providers. By providing distance expert evaluation and guidance from wound specialists to home care nurses and thereby possibly reducing risks of insufficient/wrong treatment and care, patient visits to outpatient clinics and hospitalisations, the implementation of these technologies in wound care may provide opportunities to improve patient care and save health care costs. However, recurring issues with data security and exchange of personal information pose a challenge. Telemedicine and other eHealth solutions for wound care are still not generally implemented throughout Europe and the benefits are still being evaluated; currently, 2 large-scale, EU-supported projects: the Renewing Health project (www.renewinghealth.eu/en/) and the United4health project (www.united4health.eu) in which EWMA participates as a partner organisation, are examining the potential effects for different disease areas.

Conclusion

The number of people with wounds and the demand for health services will continue to increase due to changing demographics and an expected rise in the number of people with chronic diseases. As a consequence, healthcare systems are facing a major challenge. Investments in education and the development of strategies for implementation of communication pathways and evidence-based guidelines are necessary to enable prevention of wounds as well as in making well-informed decisions in wound management. The team approach is focused on enhancing outcomes for individuals with wounds and a high degree of self-management. New technologies are helpful tools in realising effective wound care across professional borders, but we are still faced with the challenge of making relevant data available to everyone involved in the care team. ∎

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WHAT BEING A WOUND CARE PARTNER TRULY MEANS

We all know that populations are ageing, obesity and diabetes are increasing to epidemic proportions and healthcare demands are escalating. Against this backdrop, it is clear that effective wound care improves lives, reduces suffering, speeds recovery and saves money.

A major area of expenditure for health care providers in both the acute and primary care sectors is wound care. Posnett and Franks (2008) calculated that two hundred thousand people in the United Kingdom had a chronic wound with an estimated cost of treatment being £2.3-3.1bn per year.[1] Additionally the National Prescribing Centre (2010) approximated that wound dressings accounted for around £120m of prescribing costs in primary care in England alone each year.[2]

As life expectancy continues to rise and surgical operations are performed on an ever ageing population the prevalence of co-morbidities and chronic disease increases and we conclude that **the cost of wound care will also continue to rise**. In fact in the United Kingdom, the fastest growing age group in the population are those aged 80 years. Therefore appropriate choice of cost effective wound dressings with reliable evidence to support choice is vital. Added to this is the importance of maintaining and promoting a good quality of life for the patient, including pain management; prevention of dressing related trauma; prevention of post-operative wound blistering; management and prevention of infection and the effective management of wound exudate.

Mölnlycke Health Care is a global provider of healthcare solutions. It consists of a wound care and a surgical division, two separate yet complementary areas of the company working together to benefit patients and healthcare professionals alike. Mölnlycke Health Care has a history of developing innovative wound care dressings for nearly 70 years. Over that period our aim has been to improve the quality of life for millions of people.

Our wound care products are based on the concept of gentle and effective care to deliver novel, patient-centered, trauma and pain-free solutions that prevent, protect and provide an optimum environment for a wound to be healed. Our wound care product portfolio includes; advanced wound care dressings, such as foam and anti-microbial dressings with Safetac® technology, surgical dressings, dermatology products and a negative pressure wound therapy offer.

Partnership is a term that can be thrown around quite loosely, so what does being a wound care partner truly mean? For Mölnlycke Health Care it means **taking the time to understand each customer individually** and help them meet the challenges that they are facing so that the quality of care that a patient receives remains best in class. We don't believe that one size fits all, we believe that all of our customers should be treated uniquely so that that they can receive the right level and type of support needed. By understanding the rapidly changing market and our customers challenges we aim to help them meet their objectives with the best in value and quality products, initiatives and programmes.

We listen to those who can contribute to our insight and knowledge. We also use our experience to analyse complex problems and understand a condition, a diagnosis or type of wound. With the prevailing pressure ulcer crisis we recently decided to help address the problem by specialising in developing a solution to help reduce the risk of pressure ulcers occurring when they were avoidable.

Mölnlycke Health Care offers support to the health care sector in a variety of different ways; to name a few we aim to provide our customers with clinical education and resources, most of our solutions come complete with a wide range of evidence, both clinical and value justification and **we aim to support in controlling costs and meeting their financial objectives**.

Clinicians who treat patients with wounds need access to the resources that will enable them to deliver the best and most appropriate treatments. Education is an increasingly important issue and we try to fulfil the demand for training and provide clear, comprehensive outcomes to educational objectives with a wide range of courses, seminars and online learning. We run a Wound Care Academy whereby we produce educational materials and best practice documents through the working of Special Advisory Groups. A significant number of our field staff are clinically trained with registered nurse status. We share our clinical expertise by giving advice and our best practice to our customers. Continuously creating and delivering clinical education and evidence is one of the most important ways of securing that the products we offer are both safe and efficient.

With economic constraints on health care budgets, meeting financial objectives has become increasingly tough. We aim to provide our customers with the most cost effective wound management and when considering the cost of wound care it is important to consider all aspects of the patient pathway and not simply the cost of dressing products. It is important to realise that 'least costly dressings' are not necessarily those with the 'lowest price'[3]. Dressings only account for 15-20% of the total costs of woundcare management[4].

NICE and the National Prescribing Centre support the use of 'least costly dressings'; **they recognise that the costs of dressings are dwarfed by the wider costs of caring for people with wounds**. Assessing the costs incurred across the whole pathway is the only way to deliver best value for money. The English QIPP wound care comparator (net ingredient cost per item) focuses on 'least costly dressings' not solely 'price' – recognising that more frequent dressing changes and wastage have a larger impact on costs. Our range of dressings with Safetac® Technology aim to reduce pain at dressing change reducing the need for analgesia and deliver a longer wear time compared to traditional dressings; reducing staff time and costs. This may help the NHS to deliver both improvements in quality and productivity through a range of innovative products. **Innovation is part of our DNA and we will continue to invest in the future of wound care** to keep delivering new cost effective solutions.

To ensure that expected efficiencies are being actualised, Mölnlycke Health Care use an analytical computer programme for comparing existing product usage against alternative products from the Mölnlycke Health Care range and highlighting potential savings. The reports produced clearly show; pricing, the exact products that have been compared and use a traffic light system to flag any direct alternatives, those with minor differences or those that are not direct replacements.

Our next article in November will provide a more detailed and specific feature on Patient Care, for now we will leave you with a video of Helen Taylor, triathlon enthusiast and business woman, who shares her experience of living with a cavity wound following cancer surgery and the positive difference NPWT with Avance® Solo made to her day-to-day life and wound management.

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MÖLNLYCKE HEALTH CARE

Healing wounds through innovation

Prof Keith Harding, Prof Michael Clark and Dr Douglas Queen from the Wound Healing Unit at Cardiff University details the significant problems wounds can cause, and how innovation is helping alleviate some of these...

Each year millions of people world-wide experience wounds that arise through multiple causes including surgery, burns, accidents, poor blood supply to the legs (venous leg ulcers), a consequence of diabetes (diabetic foot ulcers) and through illness, and poor mobility (pressure ulcers also known as bedsores).

Regardless of the cause, wounds that fail to heal are a significant problem to patients and health services. Pressure ulcers may cost the NHS almost 4% of its annual budget to both prevent and treat, but for individuals living with a wound this often entails pain, social isolation (often as a consequence of malodour or where fluids leak from the wound), and a significantly reduced quality of life.

Given the heavy costs both financially for health services and for the lives of patients, there has been great interest over recent years in new approaches both to prevent wound development and to speed wound healing. Over the past 5 decades technology has been innovated through synthetic materials, cellular based therapies and molecular diagnostics. However innovation in wound healing is not limited to new product development.

Innovative working among clinicians and researchers has increased given recent developments, both in communication technology and social media. For example, clinical guidelines for the prevention and treatment of pressure ulcers will be released in the late summer of 2014, which have been developed jointly by 3 organisations working in the United States, Europe and in the Pan-Pacific region. These new guidelines will help to standardise the care patients receive to help reduce the occurrence of pressure ulcers across a large part of the world, a development that would have been possible without the availability of easy methods to communicate face-to-face frequently across multiple time-zones.

Innovation in wound care can go far beyond the traditional models of care delivery in hospitals or GP surgeries. The Lindsay Leg Club Foundation support a growing number of Leg Clubs across the UK, Europe and Australia. A Leg Club is a unique partnership between local nursing services and their communities, and operate in non-healthcare settings, including community and church halls with a body of community volunteers running them and nurses attending to deliver lower leg treatment mainly for venous leg ulcers. Members of the clubs can attend for advice, active treatment of leg problems or just for company and a cup of tea. They are an example of social innovation that can change where and how wound treatments are delivered with reported benefits in terms of patient satisfaction with their care.

The recent creation of the Welsh Wound Innovation Initiative is the first national wound centre world-wide with the responsibility for improving both the health of patients with wounds in Wales, and also the wealth of the country through attracting inward investment by wound care companies that seek to partner with the strong expertise in wound healing in Wales. This new initiative highlights that wounds are increasingly being viewed as a major health care issue that affects millions of lives, and absorbs large amounts of health service funding. ∎

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Growing the field of stem cell research

Professor Melanie Welham, Executive Director of Science at the Biotechnology and Biological Sciences Research Council (BBSRC) gives an overview of how publicly-funded research to understand the basic properties of stem cells has paved the way for the emerging field of regenerative medicine...

Stem cell science has come of age over the past 20 years – thanks, in no small part, to research funded by UK taxpayers.

The first dedicated UK institute for stem cell research (ISCR) was established by the University of Edinburgh in 2000. But its origins go back a further 10 years, having started life as the Centre for Genome Research (founded by the Agriculture and Food Research Council – a forerunner of BBSRC) with a broad remit to develop and exploit techniques in transgenic biology, such as germline and stem cell manipulation, and genetic manipulation by mutagenesis, of relevance to agriculture, medicine and mammalian biology.

The ISCR achieved early success in the identification of proteins that controlled the ability of embryonic stem cells to replicate limitlessly, as well as identifying a signalling pathway that promoted stem cell multiplication. The findings were useful in understanding how the fate of stem cells could be influenced.

Over the same period, and, by coincidence, in the same city, scientists at the BBSRC-supported Roslin Institute were studying nuclear transfer in sheep. The subsequent birth of Dolly provided the first demonstration that all the programming needed to transform a fertilised egg into a living, breathing animal was contained within a somatic cell – any cell in the body other than sex cells or stem cells.

But, despite such rapid advances in cell technologies, there were major technical hurdles that needed to be overcome in order to realise the full potential of stem cells and to facilitate their safe application in healthcare.

Building capacity

In 2002, the UK government announced the provision of £40m to 5 Research Councils to support research on stem cells, including funding to establish the UK Stem Cell Bank. The Bank was established to ensure that research using human embryonic stem cells was ethically robust as well as to provide a repository of each and every human embryonic, foetal and adult stem cell line derived in the UK. Today, it provides quality controlled stocks of these cells, which researchers worldwide can rely upon to facilitate high quality and standardised research. It also prepares stocks of EUTCD-Grade cell lines for use as starting materials for the development of cellular therapies.

Then, in 2005, Sir John Pattison led a high-level review to formulate a 10-year vision for UK stem cell research. His first recommendation was to establish a public-private partnership to explore the potential of using stem cell-derived cell cultures in the early, high-throughput toxicology screening of potential new medicines. The consortium, Stem Cells for Safer Medicines, represented the first significant investment by 'big pharma' in UK stem cell research. AstraZeneca, GlaxoSmithKline and Hoffman-La Roche were founding members along with the Department of Health, the Department for Innovation, Universities and Skills (now Business, Innovation and Skills), the Scottish government, BBSRC and the Medical Research Council (MRC).

Maintaining public consensus

In 2007, BBSRC and the MRC co-ordinated the UK's biggest ever public consultation on stem cell research, funded by the UK government's Sciencewise scheme. The project captured the opinion, aspirations and ambitions of 200 members of the public on the science

and ethics of stem cell research, as well as canvassing the views of nearly 50 stakeholders from fields such as science, medicine, industry, ethics and religion.

The dialogue revealed that both professionals and the public valued investment in basic research that could, for instance, address obstacles to the development of treatments. But their support for translating research into treatments was conditional on ensuring that public funding was focused on 'serious' medical conditions rather than cosmetic uses.

Future platforms

A £25m UK Regenerative Medicine Platform (UKRMP), funded by BBSRC, EPSRC and MRC, was launched in 2012 to address the scientific and technical challenges required to support the development of regenerative medicine therapies for a range of applications. This included £4.5m to establish a new 'hub' for pluripotent stem cell research.

Induced pluripotent stem cell (IPSC) technology is a way of restoring the flexibility of embryonic cells (which can turn into any type of cell) to adult stem cells. It is a particularly exciting area that provides the opportunity not only to develop therapies matched

to a patient's own cells but also to establish more accurate cellular models of diverse human diseases based upon the genotype of affected individuals.

The refinement of methodologies to achieve cell reprogramming in the production of IPSCs, for example through a better understanding of epigenetic memory – an area where UK researchers are world-leading, could open up further applications and therapeutic options.

Continued investment in the field of stem cell research and its applications is vital to ensuring that the potential of this exciting field is realised for the UK – benefiting the health of the public and the economy. ∎

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Stem Cells and immunity

Stem cells, Chromosomal instability and Cancer

Life expectancy in the western world has been on the rise, leading to an upshift in median age that will continue in the next decades[1]. As a consequence of population ageing, the incidence of ageing-related ailments has escalated; not only degenerative diseases such as Parkinson or Alzheimer, but also the number of people affected by cancers has risen drastically. Notwithstanding its impact on society, the underlying mechanisms are still not completely understood, translating into relatively coarse and unspecific cancer treatments. Only in the last few years has the treatment of some forms of cancer evolved into a more guided approach, and years of investigation will still be needed to design intelligent treatments for a wide variety of cancers.

Figure 1. Stem cell depletion and cancer. Whereas the majority of ageing stem cells will enter senescence or apoptosis upon accumulation of genetic defects, a small proportion might survive and evolve into the rapidly dividing resistant population that causes cancer.

Stem cell biology of cancer

Stem cells have a central role in most if not all ageing-related ailments. In most of the diseases studied, the depletion of stem cells and reduction of their proliferative capacity seems to be the main cause of tissue degeneration. In cancer, however, excess growth is the central underlying mechanism. The role of stem cells in tissue homeostasis depends on the equilibrium between differentiation and self-renewal. Whereas stem cell differentiation into more specialised cell types is the mechanism that produces the somatic tissues, self-renewal assures the maintenance of an undifferentiated cell population that maintains a

proliferative capacity. In cancer, the equilibrium between differentiation and self-renewal is disturbed, provoking the accumulation of a population of poorly differentiated but highly proliferative cells.

The identification of a stem cell population at the heart of tumor growth[2] comprises yet another link between ageing and cancer; the role of stem cells in cancer is just as important as in degenerative diseases. Whereas stem cell depletion and their uncontrolled growth appear unrelated phenomena, they are in fact closely related; whereas a proportion of stem cells are lost during ageing, the

surviving stem cells have an increased chance of chromosome alterations.

Chromosomal Instability (CIN)

A key difference between healthy, normal stem cells and tumor cells is the acquisition of genomic alterations by the latter. Most carcinomas present some form of genetic instability, either as an accumulation of intragenic mutations or as a large-scale alterations – translocations, deletions and numerical changes – termed chromosomal instability (CIN). Although the hypothesis that CIN itself can cause cancer has taken a long time before being accepted, CIN is frequently detected in tumors before intragenic

mutations and thus comprises a driving force in carcinogenesis[3]. Current theories suggest that CIN can induce cellular transformation through gene dosage or gene translocation; the genome fragments gained or lost in CIN frequently contain hundreds of genes, each of which can affect a pathway regulation step. The extra copies of many genes in CIN cause a gross imbalance in cellular regulation, which easily spills over into other pathways including cell cycle control[4]. Pathway interconnectedness thus appears to be the Achilles´ heel of genomic stability in mammals.

Stem cells, CIN, and cancer therapy

Because of their unique role in tissue renewal, stem cells have a combination of characteristics that renders them susceptible to genetic damage, transformation, and tumor initiation. Stem cells not only undergo rapid growth and division, but also seem to be tolerant for gene dosage effects that would induce apoptosis in other cell types. Notwithstanding their resistance, cancer stem cell theory clearly indicates that this population must be targeted to treat carcinomas efficiently.

Traditional anticancer therapy depends on tumor cell eradication by cytotoxic drugs, through the induction of additional chromosome defects that lead to apoptosis or necrosis. Although the efficacy of the classical cancer treatments has advanced tremendously, they still suffer from side effects, such as the shutdown of stem cells in skin, intestine, and immune system. Thus, a drawback of many chemotherapeutics is the low capacity to distinguish between cancer cells and rapidly dividing non-cancer cells. In addition, most of the chemotherapeutic compounds favor selection of resistant and aggressive cancer cells.

The last decade has seen the development of new therapies, aimed at a more specific elimination of cancer cells while reducing toxic effects. One phenomenon in particular, oncogene addiction, might yield novel targets for anticancer therapies[5]. In oncogene addiction, the cancer's need for survival leads to activation of the corresponding signal pathways, to an extent where cells become completely dependent. Oncogene addiction has been characterised in only a few types of cancer so far, but preliminary results are promising. Oncogene addiction seems to increase with tumor progression, so targeting survival pathways might be the way to treat advanced cancer, where classical therapies loose efficiency. For example, the high level expression of HER that characterises the most aggressive forms of breast cancer is exploited for treatment with the neutralising antibody Herceptin®, improving the prognosis of HER-positive tumors. Novel targets in signaling pathways must be seen as an addition to classical therapies for now, but further characterisation of pathways might help to treat a wide range of cancers. Especially the targets that overlap with stemness and differentiation are interesting, for the possibility to attack cancer stem cells.

Concluding remarks

The fundamental way in which cancer is treated is just recently being modernised. New therapies will hopefully be able to discriminate better between cancer cells and healthy stem cells, and be tolerated better by the patient than current treatment schedules. The combination of data from stem cell biology, tumor evolution, and genetic analysis of patient material has greatly improved our understanding of cancer biology. Still, continued efforts are needed to use this knowledge for the benefit of cancer patients.

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Pluripotent stem cells in mammals

The objective of my team "Pluripotent stem cells in mammals" is to develop new biotechnologies for health using pluripotent stem cells. We have a long-standing expertise in studying the biology of pluripotent stem cells in mice and non-human primates (NHP), with a strong emphasis on the regulation of the cell division cycle. More recently, we began studying the biology of pluripotent stem cells in rabbits and Humans. We have derived the first embryonic stem (ES) cells and the first induced pluripotent stem (iPS) cells in rabbits and rhesus monkeys in Europe. We are most interested in how these cells can be used to study gene function and generate animal models of human genetic diseases. Our work with ES and iPS cells aims to generate new cell lines with a better controlled proliferation and increased genetic stability. These cell lines can then be used to interrogate the safety and efficacy of cell therapies in animal models of neurodegenerative diseases.

We achieve our goals thanks to the expertise of the Stem Cell and Brain Research Institute (SBRI, Inserm U846) co-directed by Drs Colette Dehay and Henry Kennedy, in areas as diverse as transcriptome analysis at multi and single cell levels, stem cell engineering, CRISPR technology, targeted genome modification, iPS cell technology, nano-biotechnologies, controlled reproduction in NHP, NHP adult and developmental neurobiology, neuroanatomy, electro-physiology, and positron emission tomography.

Pierre Savatier, Principal Investigator

My team is a member of two French Laboratories of Excellency (LabEx), DEVweCAN and CORTEX. I am the Director of the PrimaStem platform, which provides customized services for ES and iPS cells derivation and genome engineering in NHPs.

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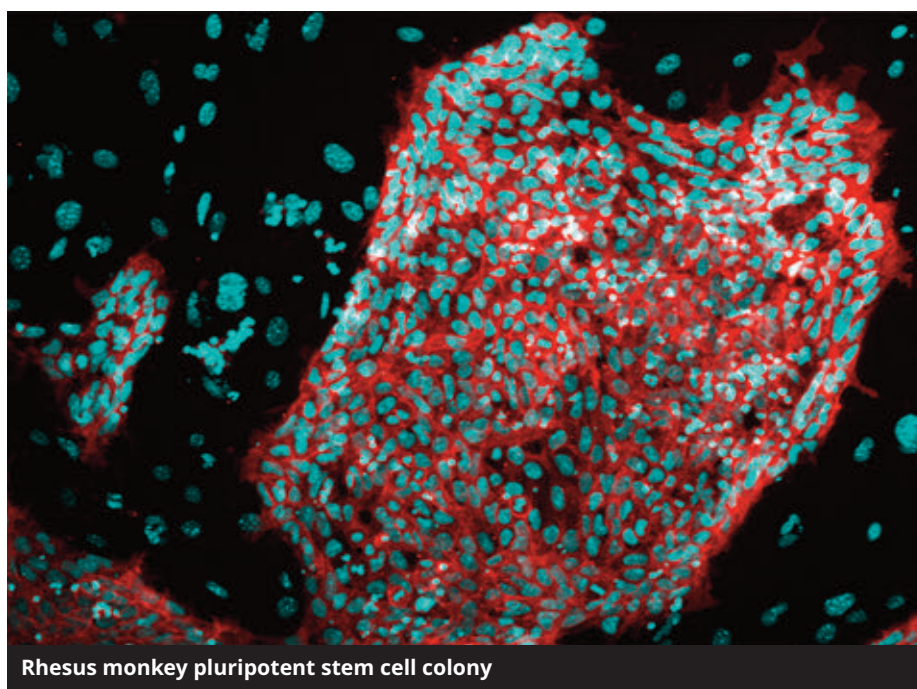
Rhesus monkey pluripotent stem cell colony

A focus on Stem Cells and Cancer

Contemporary cancer research

Cancer has an important biological characteristic: it causes cells to divide, or 'proliferate' in an uncontrolled fashion. Most current cancer therapies use drugs that interfere with one or more of the mechanisms of cell proliferation. These treatments are based on the assumption that healthy cells proliferate at a much lower rate than tumour cells. But healthy cells do still proliferate, so current therapies are highly toxic and cause many side effects, especially in tissues or organs where cells are regularly replaced, such as the hair, blood, or lining of the intestine. Most importantly, although these drugs initially manage to reduce the size of tumours, many cancers still remain incurable and relapse occurs in a large number of cases.

Are stem cells the cause of cancer relapse?

The cancer stem cell (CSC) theory explains relapses by suggesting that tumours are maintained by a special sub-population of cancer cells. According to the theory, these cells are the only ones within the tumour that can self-renew (copy themselves) and maintain the tumour. Because of their particular stem cell characteristics, these cells would be largely unaffected by standard therapies. Instead, they would survive and continue to divide, which would lead to the reappearance of the tumour with time. This could be compared with the effects of chemotherapy on other tissues, like the hair: the differentiated cells that form most of the hair are killed during treatment, but the stem cells responsible for hair growth survive. When the therapy is over, hair re-grows normally.

The CSC theory therefore argues that tumours are stem-cell based tissues, very similar in their architecture to other tissues in the body, but with a disease-causing fault. This point of view implies that studying the rapidly dividing differentiated cells which generally make up the bulk of a tumour might not tell us much about the cause of the cancer. Instead, we need to study the less rapidly dividing cancer stem cells, which maintain the tumour.

A theory with a history

Although it was proposed almost 50 years ago, the CSC theory has only begun to gain acceptance in recent years. The existence of CSCs has been demonstrated in many types of human cancers. Still, there are many opponents to the theory, particularly among clinicians. They argue that the theory mainly represents a laboratory artefact due to our technological inability to transplant tumours into experimental animals so that 100% of the cells are always transplanted. In this regard, I would argue that the fundamental concept essential to the CSC hypothesis does not have anything to do with the exact number of cells within the tumour. Instead, the CSC

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idea is that a tumour is made up of a mixture of cells with different functions, with only a certain set of cells in the tumour able to initiate and maintain malignant growth in the body. Nevertheless, there are many types of cancer and some do not seem to follow the CSC model.

Significant implications for future therapies and research

The existence of CSCs has a tremendously important therapeutic implication: only by completely eliminating the cancer stem cells can we avoid
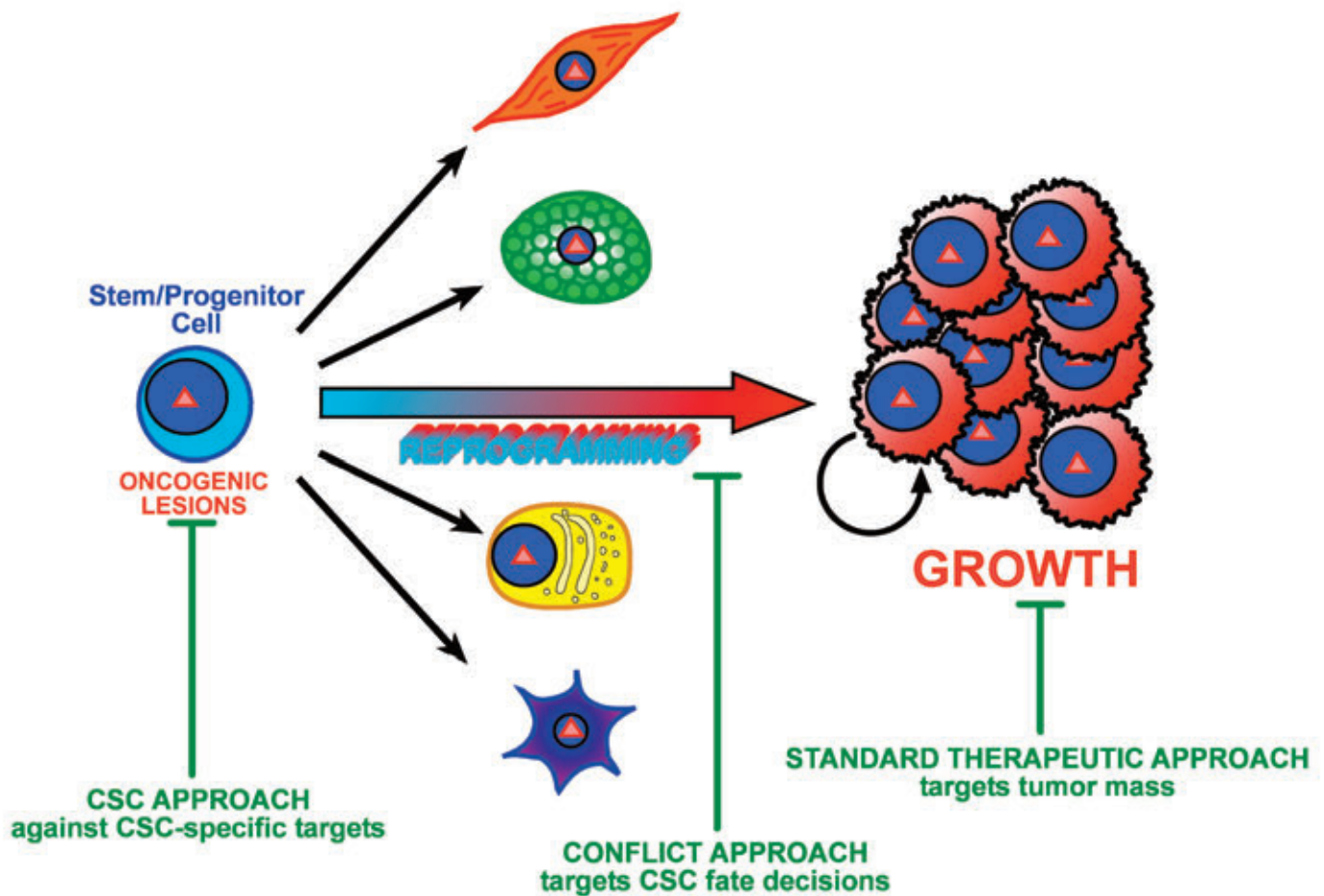
relance and achieve a definitive cure. In order to do this we must be able to target CSCs specifically, discriminating them from the normal stem cells that maintain normal tissues. Therapies that also kill normal stem cells would be lethal to the patient. This remains the biggest challenge for the coming years.

"CSC-based therapies must not replace, but rather complement, current approaches."

Looking to the future, there is new evidence suggesting that human cancer could be caused by a kind of reprogramming of cells. In other words, particular cancer-causing genes (known as 'oncogenes') are turned on in cells and this 'reprogrammes' them to behave differently – to turn into cancer stem cells. If the potential

growth of cancer depends on CSCs with such oncogenes turned on, it will be important to know how to turn off the reprogramming process (see Figure 1). In my personal opinion this is an important area on which to focus research efforts. The formation of tumour cells as a result of genetic reprogramming represents a new explanation of how cancer cells are formed and maintained. The practical implications that this new point of view has for cancer therapy are obviously enormous. What is clear is that CSC-based therapies must not replace, but rather complement the current approaches. Elimination of the bulk of the tumour is required in the initial stages of any treatment, whether or not we are also able to target cancer stem cells. The coming years will show whether optimism about new treatments based on the CSC theory is well

founded, or whether the immense complexity of this disease will continue to confound our best endeavours to treat it.

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The age of stem cells

Associate Professor Jan Nehlin from the Stem Cell Research Unit at the Department of Clinical Immunology, Odense University Hospital, details how the age of stem cells is relevant for regenerative medicine and body function...

Tremendous advances have been made since the original establishment of human embryonic stem cells lines (hESC)[1]. Their isolation and culture paved the way for the establishment of novel procedures that allowed researchers to differentiate such pluripotent stem cells (hPSC) into almost all possible developmental lineages. The maintenance of hPSC in their pluripotent and undifferentiated state allows for their expansion until the desired number is obtained. Thereafter, precise and efficient differentiation protocols need to be conceived that would allow obtaining the final cell product of choice with quality controls that can satisfy an unmet clinical need[2].

Even though hPSC are considered immortal and do not seem to become old, during their expansion, close monitoring of their genome integrity is required, as they are susceptible to mutational events, which call for the development of improved methods for their derivation and culture[3]. Ethical considerations are not the only concern, but also immunological issues, since perfect histocompatibility between a donor hPSC and a host that would benefit from any cell/tissue product derived from the original hPSC pool, may not be achievable. Therefore, to circumvent such obstacles, alternative methods have been conceived to generate hPSC, such as reprogramming of somatic cells, known as inducible-pluripotent stem (iPS) cells[4], and somatic cell nuclear transfer (SCNT)[5]. The SCNT methodology appears to resemble most the naturally-made hESC[6]. There is, however, a lot of work to be done to render clinically-acceptable protocols to generate histo-compatible cells for regenerative purposes. Autologous use of adult stem cells in tissue engineering technologies is also a promising avenue[7].

Aging of stem cells within the body

Aging is defined as the gradual reduction of body function with time. The causes giving rise to aging processes act in parallel in all organs, but the ultimate reasons remain elusive and are a matter of exhaustive clinical research. Accumulation of senescent cells is thought to be a driving factor. Aging has arisen as an anti-tumour mechanism to prevent cells that have accumulated damage beyond repair within those tissues, from becoming immortalised. Cellular damage can also be counteracted by programmed cell death or apoptosis mechanisms. The loss of cells will have the consequence that a compensatory process is initiated whereby adult stem cells are recruited from the vicinity or from distant reservoirs, to differentiate into those cells that have been damaged and lost, to keep adequate homeodynamics within the given tissue. The constant renewal of cells as a compensatory mechanism has the drawback that at a given point in time, the stem cells either proximal and/or distant, will fail to efficiently proliferate and differentiate, giving rise to a clinical pathology and disease. There are many recent examples in the scientific literature where aging of the adult stem cell compartments has been documented[8, 9]. Therefore, it is becoming evident that the body's demise, as a consequence of the natural aging program, is due in great part to the exhaustion of stem cell regenerative potential. There are several strategies one could envision being applied to counteract stem cell exhaustion with time:

1. Prevent or reduce damage from occurring, to allow the stem cells to function for longer periods;

2. Eliminate the aged, dysfunctional stem cells by the use

of a unique biomarker(s) or targeting procedure; and/or

3. Replenish the loss of stem cell function or tissue function by means of transplanted, preferably young or at least younger histo-compatible cells that can compensate for the defects.

Progress is being made in each one of these areas.

A vast amount of work lies ahead to investigate the effects of physical, philosophical and nutritional hormetins that bring about hormesis effects to the stem cell compartments. Hormesis is a state whereby favourable biological responses are achieved to low exposures to a single stressor or a combination of them. The old saying of "some bad will do some good" is not always applicable because some compounds present in our environments should be preferably avoided as they trigger senescence.

Advances in quantitative measurement of old cells, as well as biomarkers of cellular aging, are being made. This has led to several interesting findings, including evidence for immune-surveillance of old cells by immune system cells, as well as targeted destruction of genetically-manipulated old cells[10].

Regenerative medicine protocols to help replace a defective tissue or organ due to an abnormal pathology are being pursued. Replenishment with young stem cells or young systemic factors to counteract the detrimental effects of aged stem cells for rejuvenation purposes and ameliorating aged-associated patholo-gies is gaining ground[11,12].

Aging of stem cells in cell culture outside the body

As soon as stem cells lose their pluripotency after becoming differentiated into multipotent stem cells, also known as adult stem cells, they exhibit a finite replicative lifespan in culture. This poses an additional constraint, as cells start gradually becoming senescent, or old in vitro. Isolation and establishment of various classes of adult stem cells in culture taken directly out from the human body, deprives the cells from their intrinsic conditions (e.g. hypoxia, survival factors, cell-cell contacts, etc.), also known as the stem cell niche, resulting in rapid aging. Therefore, careful

manipulation of stem cells outside of the body, attempting to reproduce the conditions that they have in vivo (within the body), would help to extend their functional lifespan, and be useful for stem cell replenishment strategies.

Conclusions

Quantitative analysis of the presence of pre-senescent and senescent stem cells during cell culture expansion needs to be taken into account when addressing regenerative therapy trials. Their presence would impact negatively the overall function of the cell population[10].

When greater stem cell numbers are needed such as in whole-organs transplants, the ideal way is to expand histo-compatible hPSC in an as error-free, reproducible and efficient way as possible, followed by differentiation into the desired lineage and seeding onto tailor-suited biocompatible matrixes. Despite a number of hurdles, experience has been gained that will lead the way to eventually fulfil the long-expected goals of regenerative medicine. ∎

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A new era of wellness in human health

Regenerative medicine can help to tackle an array of health issues, here Aiswariya Chidambaram, Senior Research Analyst at Frost & Sullivan hails it as having the potential to transform healthcare...

Regenerative medicine aims to augment, repair, replace, or regenerate tissue and organs damaged by disease, injury, or the natural aging process. It encompasses a wide array of novel technologies and therapeutic approaches, which include cell therapies, using stem cells; genetic manipulation; small molecules and biomolecules; and synthetic and bio-based materials that act as a scaffold for cell or tissue growth. While a vast majority of currently available treatments for chronic and fatal diseases are palliative or delay disease progression, regenerative medicine is uniquely capable of altering the underlying disease mechanism. Although regenerative medicine is in a relatively early stage of development, a significant number of products, particularly cell therapy (CT)-based products and tissue engineered (TE) products, are already commercially available on the market.

Cell therapy to fuel regenerative medicine market growth

Cell therapy is the largest and the highest revenue-generating segment in the regenerative medicine market with nearly 50 cell therapy-based regenerative products approved and marketed in at least one country. Cell Therapy is primarily of 2 types, namely cell-based immunotherapies that involve different approaches to manipulate (e.g. induce, enhance, or suppress) cells of the immune system to combat diseases, and stem cell therapy that facilitates the self-replication of embryonic or adult stem cells even after periods of extended dormancy, unspecialised in function, and able to differentiate into various specialised cell types under appropriate conditions.

Organogenesis' Apligraf – comprised of living cells, proteins, and collagen, and used for wound healing in venous leg ulcers and diabetic foot – was the first cell therapy-based product to be approved by the US Food and Drug Administration (FDA) and launched in 1998. The recent FDA approval of Dendreon's Provenge, a cell-based immunotherapy for the treatment of late-stage prostate cancer in 2010, has initiated significant resurgence in the field of immunotherapy and personalised medicine. Currently, there are no licensed stem cell products approved by the US FDA although a handful of products are commercialised in other regulated markets such as Europe and South Korea. Collectively, the top 20 cell therapy products treated over 500,000 patients in 2011 and nearly 140,000 patients in 2012, generating revenues of $730m and $900m respectively.

Nearly 80% of commercially available cell therapy products target skin/non-healing wounds and musculoskeletal conditions. Different cell types are being evaluated in over 1,900 clinical trials globally for a wide range of indications and include primary cells, progenitor cells, adult stem cells, embryonic stem cells, and recently, induced pluripotent stem cells (iPSCs). According to the Alliance for Regenerative Medicine (ARM), in 2012 nearly 60,000 stem-cell transplants were performed worldwide and over 160,000 patients were treated with cell therapy products, generating revenue of over $900m. 2012 witnessed the approval of the highest number (7) of cell-therapy products by regulatory agencies globally, while 5 such approvals were granted between 2009 and 2011, and none from 2002 to 2008.

Clinical activity buzz to increasingly attract investors

Given the increasing approval rates and clinical activity, regenerative medicine proves to be an

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extremely attractive sector for investors and managed to raise a combined public and private investment of over $1bn in 2012. Currently, more than 2,500 regenerative medicine clinical trials are on-going, investigating a host of new product candidates for a myriad of clinical indications such as cardiovascular disease, peripheral vascular disease, diabetes, stroke, central nervous system (CNS) disorders, spinal cord injuries (SCIs), ocular disease, musculoskeletal disorders, wounds and soft tissue damage, cancer, and several other debilitating autoimmune and inflammatory diseases. 2012 garnered an investment of over $900m from private investors and public markets besides earning grants of over $300m, totalling approximately $1.2bn. Furthermore, industry consolidation in the form of acquisitions of profitable cell therapy companies by big pharma and strategic investments in up-coming cell-based therapy organisations are increasing in an attempt to embrace future technologies and stay competitive in the industry.

Critical unmet need and potential game-changing strategies

Given the rapid rise of the aging baby boomer population and increasing prevalence of chronic diseases, it is certain that regenerative medicine will play an important role in patient care, particularly in

therapies that avoid traditional drugs, devices, and surgery. However, the lack of consensus and strategic interaction at various levels of the regenerative medicine community (government, industry, academia, insurance payers, patients and physicians) warrants the establishment of a common point of contact at the national level acting as a liaison between FDA, CMS, NIH, NCHS, other federal agencies, and the private sector. Moreover, insurance payers are not convinced of the overall cost benefits, particularly for indications such as wound healing and skin substitutes. Hence, it is extremely important to create an exclusively defined list of critical therapeutic indications with unmet needs that represent national priorities in healthcare and establish a more efficient reimbursement coverage framework that will work in coordination with an accelerated clinical approval process.

Furthermore, the time, cost and complexity of clinical trials pose a challenge with regard to attracting investment from big pharma and gaining approval from regulatory authorities. Enabling better clinical trial design by expanding geographic access as well as enabling more effective utilisation of historical data from the NCHS, CMS, CDC, and other relevant agencies could be a potential solution. Thus, governments all over the world are working to support the development of regenerative medicine by framing and implementing legislative policies favouring the establishment of centres of excellence, manufacturing infrastructure, research networks, and economic diversification. ■

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Next Generation Biobanking

Professor Berthold Huppertz CEO of Biobank Graz discusses the next generation of biobanking...

The hype in biobanking and the boost of biobanks in the last 2 decades has led to the development of a huge number of biobanks around the globe. The number of human biobanks has especially grown, culminating in a total amount of about 200 million specimens currently stored in these. These human biological specimens include tissues (fixed and embedded in paraffin or stored at very low temperatures as cryo samples), bodily fluids (blood and derivatives, urine, saliva, but also liquor, follicular fluid, seminal fluid, etc.) and isolated biological structures (DNA, RNA, proteins, primary cells). Each and every biobank needs to connect samples to their associated data. In human biobanks these comprise mostly clinical data; however, data may also be derived from experimental data (e.g. data from omics technologies) or data related to demographic, environmental and social parameters of the donors. Of course, all this data needs to be saved and connected to the samples in a way ensuring protection of any personal data of the donors.

At present, the biobanking hype is still ongoing, especially in the field of human biobanking. This can easily be seen from the following data: Looking at the biobanks present today, more than 75% of them have been established since 1990*. At the same time, more than half of all biobanks (55%) are still quite small and store less than 10,000 samples*. Very few biobanks have already reached sample numbers of more than a million.

Lack of Definitions

Like any hype, due to its fast development biobanking has generated quite a lack of definitions that can be related to the pool of "How" questions related to this. To name a few:

- How is the collection strategy of a biobank defined?

- How is sample integrity preserved during sample collection?

- How is sample quality maintained during sample storage?

- How is the direct link between sample and data secured?

- How can the highest quality of data and samples be achieved and conserved?

- How is the privacy of donors protected?

- How can the samples be made available for academic and industrial research partners worldwide?

- How can scientists find the quality and quantity of samples needed for their studies?

- How can sustainability of biobanks, especially academic biobanks be assured?

Although there is the need to define a collection strategy, there is no requirement to standardise collection strategies in different biobanks or the amount of samples stored in a single biobank. At the same time, a single aliquot in a freezer should not be termed a biobank per definition as is true for specific countries.

Higher level of Communication

The further development of the field of biobanking in the next decade is crucially dependent on a deep analysis of problems and challenges. High levels of harmonisation and quality standards need to be set up to guarantee data and sample qualities in biobanks that match the needs of the new developing assays, especially the – omics technologies. This can only be achieved by communication on a very high level. International biobank networks, organisations and societies (including BBMRI-ERIC, ISBER and ESBB) as well as superregional biobanks will be heavily involved in setting up the framework of definitions and standards for the harmonisation of biobanking activities. In this framework, defining standards of SOPs (standard operation procedures) for sample and data handling, securing personal rights of donors in a networking world and certifying quality management procedures especially in biobanks are essential steps towards harmonisation.

Next Generation Biobanking

Although the private companies start to set up their own biobanks again, in a survey from 2010 the vast

majority of biobanks was owned by universities, national and regional agencies or non-profit foundations, while only 3% were privately owned*. The same tendency can be found when looking at the projects that use samples from such biobanks. Only a very small minority of the above biobanks (7%) releases samples and data for all kinds of studies including public, private and clinical research*.

The above numbers clearly show that today most of the biobanks are publicly owned small biobanks that were created for public and clinical research only. This data points toward the fact that such biobanks are not prepared to work with the private sector and hence may not be allowed or structured to give samples to industrial partners.

This is in contrast to the new development in Europe where there is a drift towards the comprehension that private partners are recognised as full partners in research. A respective cooperating of publicly owned biobanks with commercial partners from the private sector is anticipated and hence new ways to communicate and cooperate in joint projects need to be established. The integration of industrial research and partners into public biobank activities presents an important aspect to achieve an innovative and sustainable benefit for both, private partners and biobanks, to finally bring medical research into new horizons and advance health care for the population in general. ∎

* Data are taken from the JRC Scientific and Technical Report EUR 24361 EN-2010

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An alternative approach to dengue control

Controlling dengue fever remains a difficult task, here Dr Thomas Walker Lecturer at the London School of Hygiene and Tropical Medicine sheds light on current approaches to eliminating the disease...

Dengue fever is a mosquito-borne disease that results in significant mortality and morbidity in developing countries. The dengue virus, composed of 4 serotypes (DENV1-4), is transmitted between humans principally by the mosquito Aedes (Stegomyia) aegypti. It is estimated that 40% of the world's population live in areas at risk for infection and as many as 400 million cases are thought to occur each year in more than 100 countries. Dengue outbreaks result from rapid urban epidemics in many countries of Southeast Asia and South America. However, rare cases have been documented in the US and Southern Europe, and climate change is likely to expand the geographical range of transmission. The prevalence of dengue has increased significantly in the past 50 years due to factors including population growth, urbanisation in tropical and subtropical countries and proliferation of mosquito breeding sites. Early recognition and supportive treatment can help lower the risk of severe morbidity or mortality although diagnosis is often difficult in developing countries. Mosquito vector control has been the only way to prevent transmission, as there are currently no vaccines or drugs available for dengue.

Successful mosquito control for dengue has been problematic for several reasons. Aedes aegypti mosquitoes are anthropophilic (preferring to bite humans) and are extremely well adapted to living in urban environments in close proximity to dense human populations. This species of mosquito has a preference for laying eggs in artificial containers (e.g. water tanks and unused tires) so widespread larval source reduction is difficult to implement. Another widely used method has been outdoor spraying of insecticides such as DDT and malathion. Singapore is a good example of how dengue continues to persist even with a strictly implemented control program.

Dengue was first reported in 1960 and government interventions through integrated mosquito control programs reduced the incidence of transmission by the 1970s. However, Singapore has recently seen resurgence in dengue and cases are still reported despite a significant control program targeting mosquitoes. It is thought that re-introduction of the virus occurs through an influx of people from endemic regions (either as tourists or migrant workers). If a country like Singapore is unable to prevent dengue transmission, current vector control methods are clearly not working and novel methods need to be developed.

The options for developing new technologies for mosquito control fall into 2 major strategies. Population suppression aims to reduce or eliminate the wild mosquito population. Conventional methods such as insecticide spraying and larval source reduction aim to reduce mosquito populations. A novel suppression strategy that is showing great potential has been the generation of genetically modified mosquitoes that can be released to 'crash' the existing wild population. The British biotech company Oxitec are currently working in dengue endemic countries such as Brazil with a strain of mosquito that they are hoping can achieve population reduction or even elimination.[1] Oxitec have genetically modified mosquitoes to create sterile males (RIDL-release of insects with a dominant lethal) that are then released to mate with wild females. The resulting progeny inherit this 'lethal gene' and do not survive to adulthood. Oxitec are able to rear the mosquitoes in insectaries by providing a repressor (tetracycline) in the diet that prevents lethal effects. This approach has the advantage of being very species-specific and has no long lasting effects the target species (Aedes aegypti) as the aim is to eliminate the population in the release area. Critics of this strategy would question the cost-effectiveness of this strategy as repeated releases may be required if re-immigration of mosquitoes into the release area occurs. However, a larger issue for Oxitec's approach has been the concern regarding releasing genetically modified insects despite the many studies showing this approach is unlikely to have any major negative effects on the environment.

An alternative approach to dengue control is to replace the wild mosquito population with mosquitoes that are unable to transmit disease. Genetically modified mosquitoes that are 'refractory' to dengue transmission have been developed. However, concerns over the effects of GM on mosquito fitness, crucial if releasing to compete with wild mosquitoes, has prevented any large-scale trials. A novel approach that shows great potential is the use of endosymbiotic bacteria to prevent dengue from replicating within the mosquito. The 'eliminate dengue' project[2] based in Australia has been able to demonstrate that Wolbachia endosymbiotic bacteria can prevent dengue transmission in mosquitoes without significant fitness costs. Wolbachia naturally infects more than 65% on insect species and successfully transfer of Wolbachia from Drosophila fruit flies to Aedes aegypti mosquitoes has formed the basis for a biocontrol program that is now being implemented in dengue endemic countries such as Vietnam, Indonesia and Brazil. The advantage of Wolbachia is that these bacteria results in a reproductive phenotype that allows rapid invasion of uninfected mosquito populations. The 'eliminate dengue' project has undertaken successful trials demonstrating that Wolbachia-infected mosquitoes established in release areas in Far North Australia. The aim is to provide an economical and environmentally friendly strategy that can be implemented by simply releasing mosquitoes that contain this naturally occurring bacterial endosymbiont. The Wolbachia-based approach, like any other novel mosquito control strategy, requires significant further experiments to determine if this strategy would actually reduce, or even eliminate, dengue transmission in endemic countries. The likely increase in the geographic range of Aedes aegypti mosquitoes (and therefore dengue transmission) through climate change suggest novel control strategies will play an important role in preventing dengue outbreaks in the future. ■

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A battle on two fronts

One mosquito, two crippling diseases: dengue and chikungunya

It is often said that many of the world's most dangerous animals, the living monsters that populate our nightmares, do not fully deserve their villainous reputations. Poisonous snakes, spiders and crocodiles; all are perhaps more frequently subject themselves to the terrors of man's encroachment on their habitats than embodying the merciless persecutors of our imagination.

Sadly, the same cannot be said of the hands-down winner of the 'world's most dangerous animal' competition: the humble mosquito. One of our most ancient foes, the number of debilitating and often life-threatening diseases that mosquitoes pedal amongst us is bewildering. And far from being a victim of mankind's technological advances, many mosquitoes seem set to thrive and spread in an increasingly inter-connected world, while climate-change and increasing urbanisation are in fact rapidly expanding the habitat of warm-loving, urban-dwelling pests like the dengue mosquito Aedes aegypti.

Recently, this mosquito has been making headlines in Brazil, where it has been responsible for a dengue epidemic of frightening proportions. It is the reason that many travelling fans to this year's World Cup were warned of returning home with something rather more serious than memories of a football competition.

But this is not the only justification for

Blood feeding Aedes Aegypti. Dengue and chikungunya are transmitted through the bite of an infected mosquito

this particular mosquito's infamy. Because the dengue mosquito is also a primary vector for another, lesser known, disease, Chikungunya; and it is this plague which is currently casting its shadow over Central America and the Caribbean.

High fever, rash, agonizing aches and pains; the list of symptoms for Chikungunya will be ominously familiar to anyone who has seen or experienced dengue fever. Indeed, Chikungunya is often mis-diagnosed as its better-known relation. It frequently leaves its own particular calling card, however: a crushing joint pain (arthralgia) which can persist in victims for months or even years.

After remaining largely under the radar of most health authorities, Chikungunya burst onto the global health scene in 2005-6, when an epidemic in La Reunion affected 40% of

the population in a matter of months, and caused over 200 fatalities[1].

Since that time, public health officials have warned of the potential for a major outbreak of Chikungunya in the Americas, where both carriers of the disease – Ae. aegypti and its cousin, Ae. albopictus – abound. But it was not until December 2013 that the first cluster of victims was reported in St Martin. Over the last year, that small pool has swelled to a flood of cases throughout the Caribbean and in Central America. According to the Pan-American Health Organisation (PAHO), the latest count was 355,000 confirmed cases, with thousands more added week on week[2]. Unlike the outbreak in La Reunion, Ae. aegypti, rather than Ae. albopictus, this time is the primary culprit. Other countries throughout the Americas remain at high risk: with imported cases being reported in Brazil, Venezuela

Oxitec gm mosquitoes being released in Brazilian trials

and the US, it is perhaps only a matter of time before the disease establishes itself on a continent-wide footing.

Nor is Europe immune to the threat. A recent risk assessment from the European Centre for Disease Prevention and Control (ECDC) warns that, with the holiday season in full-swing, the risk of imported cases is high[3]. The presence of Ae. aegypti in Madeira, and Ae. albopictus throughout much of mainland Europe, mean that a European outbreak remains a distinct possibility.

With no vaccine, and no specific treatment, tools to combat the advance of Chikungunya are distinctly limited. Just as with dengue fever, halting the seemingly inexorable march of the dengue mosquito is our best option – and the only solution capable of combatting these twin scourges simultaneously.

Of course, that is no easy task. The dengue mosquito thrives in dense urban environments, where it is adept at commandeering any standing water to rear its young – which it produces at a prodigious rate. But with Oxitec's radical technology a new weapon has appeared in the pest control arsenal. By using genetically modified male mosquitoes to seek out and prevent wild-females from reproducing, Oxitec has ranged mosquito against mosquito – a system perfectly adapted to controlling these elusive pests. It is an approach which has already proved highly effective in Brazil, which earlier this year granted to the technology the World's first ever commercial license for a genetically modified insect.

There are now thought to be over 300 million cases of dengue fever each year. As if that were not sufficient argument, the evolving Chikungunya pandemic serves as a potent reminder of how desperately such new tools are needed in the fight against the dengue mosquito.

Author Michael Conway PhD student at Oxitec

[1] Science, 16 May 2008, p. 864

[2] PAHO Chikungunya update (11th July 2014):

[3] ECDC: Rapid risk assessment: Chikungunya outbreak in Caribbean region (June 2014)

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Contemporary public services – no change is no option

John Tizard, an Independent Strategic Advisor and Commentator shares his thoughts on why significant change can transform public services...

Over the last few years, the public sector has faced some of its biggest challenges for decades. Unprecedentedly significant and immediate public expenditure cuts have been accompanied by an ever-rising increase in demand for core public services including health and social care. And whilst the public (rightly) seeks higher quality outcomes and more responsive services, so too is technology transforming the ways in which the public can and do interact with many public services, with social media and the internet in particular making citizens and service users better informed and more challenging.

So, a period of rapid change – and of uncertainty, with the only certainties being that there will be still more change, and that the pace will increase further.

Against this backdrop, the challenge for public sector leaders and other leaders in the business, social and voluntary sectors who find themselves engaged in service design, commissioning and delivery is, to say

the very least, formidable. Specifically, how to achieve change that is sustainable, affordable, accords with public expectations, and remains true to some sense of public service ethos.

Given the level of cuts already made and planned (and we should not forget that the majority of the cuts resulting from the 2010 Spending Review are yet to be implemented) and the strong expectation of more to follow the 2015 general election, it is inevitable that some services will simply disappear whilst others will become hollow shadows of their former selves.

Every organisation with any sense of ambition and public (or indeed, private) purpose will wish to improve continuously. Of course, sadly some are content to stagnate but thankfully, most are not. And the reality is that most of the public sector and most public services can no longer look to some small scale, incremental improvement if they are to thrive

and survive. The challenge I have outlined above specifically requires that leaders should be inspiring their organisations to 'thrive' and proactively evolve, not just survive.

Addressing this challenge demands new thinking and innovation; productivity has to improve; new ways of doing new things to secure better outcomes are required; and long term problems with their long-term costs have to be addressed intelligently and swiftly to improve both the quality of life for people but also to save money.

Many of these long-term social, economic and environmental challenges are complex and require interventions and contributions from more than one sector or organisation. Given this fact, plus the need for financial restraint and the public's desire for responsive and seamless services, it is both inevitable and obvious that services and agencies will have to collaborate and share resources. Artificial, egotistical, professional, institutional and bureaucratic barriers must be torn down.

The imperative to both innovate and collaborate, and indeed for innovation and collaboration to mesh together, forms the building block to any future strategies if significant social, economic and environmental issues are to be effectively addressed; and if increasingly scarce resources are to be deployed in an optimum manner.

At first glance innovation and collaboration and the necessary conditions to make them happen may appear to be different. However, in fact, they have much in common.

Both require inspired leadership, focused on outcomes for people rather than institutions. They require empowerment of service users, staff and others to facilitate flexibility and exploration of solutions. Rather than processes, procedures and manuals – they depend on people at all levels (politicians and professionals, and senior executives, managers and frontline staff) having the right mind-sets and behaviours, as well as the space and time to explore, experiment and simply to 'talk' to each other, service users and the public.

Public service leaders must personally champion innovation and collaboration. This has to be more than slogans, project and job titles, and vague concepts. These leaders must themselves adopt and practice the behaviours consistent with effective collaboration and innovation. They need to be part of the solution – not part of the problem.

It is still too common to hear so called 'leaders' in all sectors claiming to be in favour of innovation and/or collaboration. But during a short conversation, it soon becomes clear that those initial right words and platitudes are in fact covering up a lack of any real understanding, dysfunctional behaviours, and a wholesale failure to embed the concepts in their organisation. In other words, such so-called leaders lack 'authenticity'.

Excellent leaders create and foster a culture of improvement, change, experimentation, looking beyond the organisation itself, learning and listening. They ensure that innovation and collaboration are encouraged and rewarded, and are 'core' to their organisation – not some 'add-on' or delegated as the responsibility of the 'innovation' or the 'collaboration /partnership' team. They invest in training and support for their staff and partners. They remove restrictive rules, regulations and procedures that get in the way of effective collaboration and innovation. They are ready to accept some failure as part of the natural learning process, and their first instinct is to learn rather than to blame.

Collaboration and innovation are not ends in themselves but they are vital to maintain the necessary momentum of change and continuous improvement such that public services do not just survive, but thrive. ∎

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The secrets to creating a high performance team

I have a confession to make... I am a failed filing clerk! I hate to admit it, but if the success of your organisation depended on my ability to administer records, then trust me – it's not looking good. But there again, if my clients depended on our Financial Controller (FC) to create effective, compelling and timely solutions, most of their staff would have retired by the time he'd finished his initial analysis of the problem!

But I can turn a solution on a sixpence and the FC can produce complex reports easily.

What we are looking at here are the two issues that make the difference between a team that's just getting by and a High Performance team that not only delivers, but regularly exceeds targets.

The first issue is **FLOW**: When I'm designing a solution, I'm totally in flow. I am highly effective and productive.

But when I have to – for example – "do my expenses" I am out of flow, seriously ineffective and afflicted with a recently diagnosed syndrome DBSO (Distraction by Bright, Sparkly Objects). This of course refers to absolutely anything other than expenses that comes into my gaze and needs therefore to be handled immediately.

The second issue is **TALENT:** Each of us has a unique talent that when har-

nessed correctly, allows us to shine brightly. It is not a static object, but a flowing force, like electricity. When connected, it can be directed to create extraordinary results.

Talent is not just what you do well. It's what you love doing well. That's why so many of us aren't even aware of just how valuable we are, because when we are having fun, or feel fulfilled with a task, we do it with ease.

Having the right people in the right roles where they are able to complete the work easily and enjoyably in FLOW using their natural TALENTS is absolutely normal for a high performance team, and that's what we can help you to do.

MASTERCLASS: The Touch of the Master's Hand

The Touch of the Master's Hand is a beautiful poem that relates the tale of a battered old violin being sold at auction. Of no particular value, it is about to go for a song when someone comes out of the audience, picks up the bow and plays it. Its true worth now revealed, it is valued afresh and is auctioned for a thousand times the initial bid.

Like the battered old violin, staff in the public sector can find themselves feeling undervalued which can lead to a downward cycle of being demoralised. But a manager with The Master's Touch, has the power to unleash the true

value of staff and the service they deliver, leading to a more highly motivated, engaged, and energised workforce.

This is a highly practical one-day workshop where you'll experience and fully understand the impact you can make. Content is drawn from the following:

• **How managers** can create a platform of increased awareness, ownership and effectiveness at all levels, so that they can motivate (and keep motivated) those they are responsible for;

• **How individuals** can see and own the personal value that they bring to the team;

• **For each team member** to understand the value that they create, with the effect of greater collaboration within the whole team and wider organisation;

• **For the entire team** to understand their primary purpose, and be able to actively and meaningfully translate that understanding into the day-to-day behaviours and decisions that will deliver the service required.

We are running a **FREE introductory webinar** on The Touch of the Master's Hand on the 9th September at 2.00pm and I would like to invite you to attend. You'll gain real learnings on FLOW and TALENT and take away

some techniques and ideas to use immediately. To register for this webinar **click here**.

THE TRUST CONFERENCE –
11th September 2014

There's just 6 weeks to go to the 2014 Global Trust Conference in London and over 500 people have already booked to attend. One of the keynote speakers is Stephen MR Covey, author of 'The Speed of Trust' and son of the late Stephen Covey, author of 'Seven Habits of Highly Successful People'. Delegates still talk about Stephen's amazing, value-packed speech from last year so I'm so pleased he's taking part again.

This year Stephen will be linking in via a live stream and during his 1 hour presentation on **"Leadership at the Speed of Trust"** Stephen will explain how trust is more than a nice-to-have, soft, social virtue, it is a hard-edged economic driver. He'll be sharing how trust:

• Drives employee engagement;

• Enables success in the midst of change;

• Is the greatest leverage for executing your top priorities;

• Is the currency of the new global economy.

This conference is **CPD Certified**, so counts towards your **Continuous Professional Development**.

If you'd like a ticket at the greatly reduced price of just £99, you'll need to use this **special link**.

I very much hope to see you there.

So does this mean I can get out of doing my expenses?

No it does not! Keeping track is a part of my job and all of us have areas of responsibility that may not be our favourite use of time. But for me, understanding quite why I found paperwork tasks so onerous gave me permission to devise a methodology that worked for me: which is what I did.

Times are difficult enough at the moment. Societal TRUST has fallen to an all-time low and people are anxious to be reassured that they're both trusted and safe in their roles.

I guarantee that you have staff in your organisation with the natural abilities to begin to solve almost all of your problems and deliver even higher performance. Discovering and harnessing these hidden gems will not only instantly lift efficiency and productivity, but it will increase motivation and overall wellbeing for yourself, your team and the whole organisation.

For more information, please contact me on the details below.

WELLBEING DYNAMICS

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The Voice of the Customer is getting louder!

We live in a customer-centric world.

Companies need to listen to and engage with customers as never before

Businesses that focus on the customer relentlessly are more likely to survive in this harsh climate rather than those that purely focus on their internal operations.

World class innovators possess a relentless focus on growth; continually transition their revenue source; and solve customers' problems – before the customer even knows it's a problem.

"Innovation moves from more than just new product or service development, to process, structure, capability and speed"

The fact is, we now live in a time in which we have to build new relationships with customers, because everything about the customer relationship has changed. With the increasing trend in the use of social networks with feedback and commentary on interactions with a company, customers have more access to comment on their customer experience – and it is not always complimentary. They can render a brand new product instantly obsolete if it doesn't match their expectations – as witnessed with tablets from both Blackberry and HP.

It is no longer acceptable for the customer to 'think' they are getting value – they need to be sure. So, involving your customers in your endeavours will pay huge rewards in the long run. The Voice of the Customer truly is the most vital ingredient in business development and performance.

In a recent survey of many business sectors including; manufacturing, financial services, healthcare, government, distribution there were several key points noted:

Key Findings

- Process professionals still favour the "Voice of the Business" when identifying and prioritising process improvement projects but to a lesser degree than in a similar 2009 survey

- Over 30% of companies reported themselves to be "ineffective" or "highly ineffective" at using and acting on Voice of the Customer data

- Organisations are their own worst enemy: data not being shared internally was cited as the biggest overall barrier to developing an effective VOC programme (21.8% of respondents said it was the primary barrier while nearly 60% of respondents said it was one of the top three)

- Customer complaints is a widely-used method for gathering Voice of the Customer feedback but those companies that rated themselves "effective" or "highly effective" used it less often to evaluate and prioritise process improvement projects than those organisations that consider themselves "ineffective" or "highly ineffective"

- Creating a data-driven, problem solving culture in the wider business was seen as a key enabler to being able to better evaluate and respond to customer feedback in a proactive and constructive way

Even though efficiency came out as the top driver for process excellence, for those companies where improving customer satisfaction was a stated aim, process improvement efforts were more likely to be rated as successful or highly successful.

Put simply, listening to the Voice of the Customer (VOC) means understanding your customers and aligning your business services and products to serve them better. It means you have a way of observing and understanding both spoken and unspoken customer needs – not just assuming that you know what they want.

There are a number of proven methods and way of doing this. Some are simply methodical – such as Six Sigma's emphasis on understanding "Critical to Quality" (CTQ) metrics or Lean's emphasis on removing non-value added activity defined as anything that customers would not be willing to pay for. These proven process improvement techniques offer practical tools that organisations can use to hone their business operations and improve value both for customers and for shareholders.

"Over 30% of companies were reportedly "ineffective" or "highly ineffective" at using Voice of the Customer"

As organisations reel from on-going uncertainty, the margin for error is getting slimmer. That means that truly knowing and understanding what your customers want can no longer be a "shot in the dark" – true insight is now business critical.
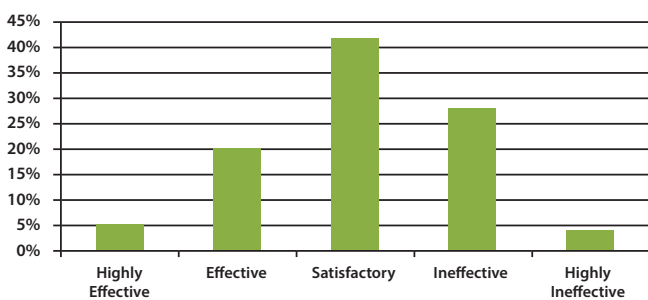
Overall, how effective would you rate your company's ability to collect and understand customer requirements/sentiments and translate that feedback into action?

"58.3% of respondents cited data not shared effectively between internal teams as one of the top 3 barriers to collecting and using Voice of the Customer"

The second most common barrier to effective use of VOC was the difficulty of linking customer feedback to specific processes for improvement (19.3% cited it as the primary barrier and 51.3% overall). Some of the specific challenges around linking feedback with process improvement were first knowing what to do with it – i.e. "what is this telling us?" or "how do we fix this?" – and then actually implementing a solution.

When conducting VOC you need to be very clear about what you want to know, and carefully construct your questions and methods in order to answer those questions. Once you get reactive data, then we can get clearer about the questions and hone in on unbiased requests to get data back and feedback.

"If your process takes too long or is too cumbersome, customers will stop complaining and just walk away"

In the survey, nearly 70% of companies without any formal process improvement program for instance, rated themselves as "highly ineffective" at translating customer feedback/sentiment into action with only a little over 30% of companies who have undertaken process improvement activities for one or more years reporting their VOC program to be "highly ineffective."

RECOMMENDATIONS

#1: Evaluate your processes from the customer's point of view

Look at your business processes from the perspective of customers in order to understand key "touch points" (i.e. the places where a customer interacts with your company such as a retail outlet, on your website, via e-mail, by telephone, etc.) and how your processes affect their experience.

#2: Encourage a culture of experimentation

Many companies cite the difficulties of linking VOC back to specific processes for improvement. They can identify the problems – they just don't know the

solutions. This is where the tried and tested scientific method comes in. Evaluate the data, come up with a hypothesis and then design an experiment to test your assumptions. If it works, continue with the solution. If it doesn't, try something else.

PDCA – Plan, Do, Check, Act – is a very effective way of identifying and implementing solutions. The simple, but very effective methodology will generate significant courses of action towards solutions

#3: Create cross functional teams and train them in basic process improvement tools

The process of collecting, evaluating and acting on VOC needs to involve representatives from different business units. It cannot be the sole preserve of an isolated group (such as a process improvement group) coming up with solutions and then imposing them on the business. Customer process problems likely cut across departments and you want to ensure that plugging a hole in one area doesn't end up creating new problems in another part of the business. As with all process improvement work, this is good practise anyway, but it's all the more important when trying to come up with solutions to multi-faceted problems that impact the customer.

#4: Senior leadership needs to encourage a data-driven, problem solving culture

Company leadership has an important role to play in creating the right conditions for customer-focussed and proactive problem solving organisations. Leadership's first response to problem should be "we've got problems, how can we solve them?" and not, "we've got problems, who's to blame?"
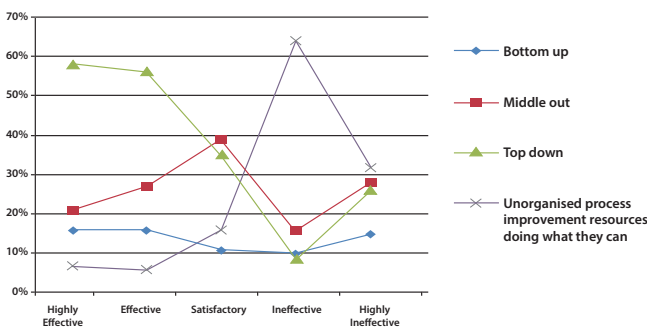
What best describes your approach to process excellence?

Interestingly, process improvement programs that are "top down" (i.e. driven and supported by senior leadership) rather than either the "bottom up" or "middle out" were much more likely to be associated with "highly effective" VOC programs (see above chart). This could be an indication that leadership understands the importance of making decisions based on data and believes in process improvement as a means to action.

INTERESTED IN LEARNING MORE?

Dembridge provides expertise in VOC methods and execution as part of process improvement methodologies incorporating Lean and Six Sigma.

E-mail: enquiries@dembridge.co.uk

Tel: 01905 513015 / 08700 342203

www.dembridge.co.uk

Acknowledgement:

Dembridge would like to acknowledge the permission of Process Excellence Network in allowing extracts of material from their 'Transforming customer feedback into opportunity 2012-2013' special report.
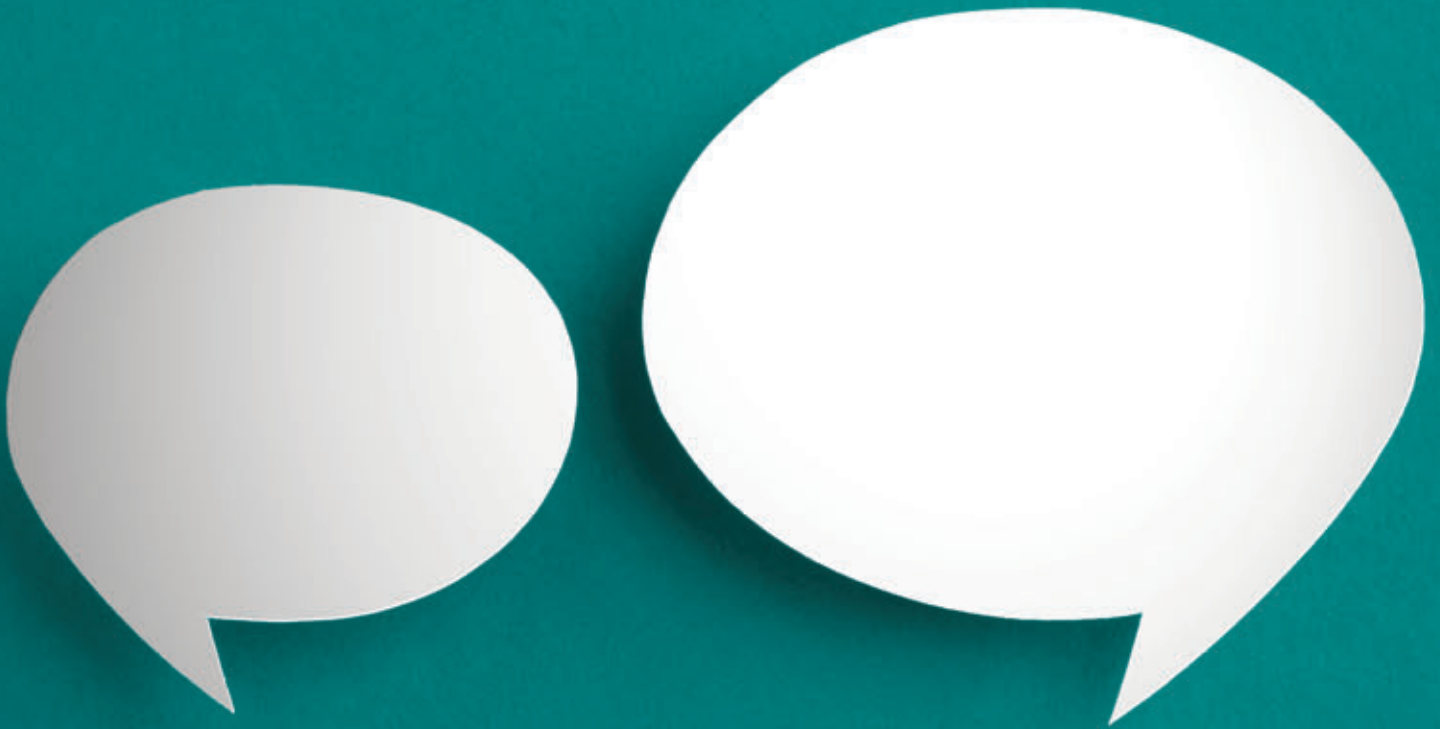
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Effectively managing change

Dr Naomi Logan, Manager of the Change Team at the University of Bristol gives an overview of how change management can make a positive difference...

Before taking up my current job I'd never heard of change management, although I had been using its concepts in practice for years. Now it seems to be everywhere, and that is because if you manage change properly, the commitment you gain from your staff will make your change stick. People in every organisation want change to be managed well, the question is, what does that look like?

The University of Bristol's Change Team has 2 main strategic objectives: to ensure that the University gets the fullest return on its investment in projects and change initiatives, and to support managers across the University to manage change better themselves. Colleagues in staff development complement this by providing training through a range of management and leadership development programmes. The Change Team focuses on key practical changes happening across the University, working with staff from senior leadership level down to every last affected person to provide tailored support, positive challenge and 2 way communication.

Change is around us constantly at work. By building staff's resilience in the face of change, and helping everyone see the benefits of the change in their role, their team's remit and their wider organisation, you are far more likely to see lasting results. True engagement is getting people on side because they want to be, and is the only way to change peoples' behaviour

and actions. Many projects achieve their outputs but a few months later no one can see any real difference in terms of improved outcomes – this is where the sustaining and embedding activities of change management can make all the difference.

The key to change management is in its ability to make engagement and consultation real and effective. We kick this off through 1:1 interviews with samples of staff affected to find out in advance what they see as benefits or difficulties to their roles, in what is being proposed. This can inform the design and rollout of the change. It also means that those who really are key to success are identified and included early on.

Secondly, we stress straightforward and honest communication using the most appropriate medium – ask staff how they like to be communicated with and you will soon build a picture of the best routes. This depends on the type of organisation, geographical location of staff etc. but, here in Bristol we know we need to place emphasis on 'live' face to face communications, through team meetings, champions, sometimes roadshows, presentations and training. Depending on the audience, newsletters, emails, and social media can also come in handy.

"True engagement is getting people on side because they want to be, and is the only way to change peoples' behaviour and actions."

Identifying where there might be issues or resistance before the change goes live is also critical so that this can be dealt with before it takes root. And finally, really making change happen involves a long tail of follow up work, talking to staff to find out what is working, identifying areas that need more support, putting reviews in place and ensuring that you really have changed behaviours in the desired ways. Listening to issues means that they can be addressed and dealt with.

A common misconception is that everyone needs to be on board to make change happen, but in fact you can use the 80:20 rule. Key influencers do need to be on board but not all people need to be with you right now. Others will adapt to the change in due course, and with support where it is needed - for example, through further training, a 'top tips sheet' or simply by allowing them time.

Ultimately, your leaders and sponsors need to drive change from the top and their absolute visible commitment to a vision is a key building block. But, these messages need to be translated so that all staff affected can see the benefits to their role and their team because if they see why it makes sense, or why certain (and particularly unpopular) choices had to be made, then they will understand and act. This also needs commitment in terms of resource – whether you train people from the business to act as change managers or whether you deploy a specialist change manager on a consultancy type model as we do at Bristol, it will cost. Not only in salaries but also in terms of funds to make and print leaflets, training materials, hiring rooms and allowing time for staff to participate in events. However that investment will pay dividends in terms of embedding and achieving long term, sustainable change. ∎

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Making business improvement enjoyable and sustainable

Benefitting from business process management

The only constant in business, private or public, is **Change**; and most people whether they admit it or not do not like change enacted upon them. It is therefore important as you approach designing and implementing a Continuous Improvement (CI) programme that you fully recognise and manage the change aspects. Continuous improvement is not a new concept, well promoted in manufacturing businesses; it requires intensive teamwork with team members that have the delegated responsibility to improve the processes they are part of.

Leadership is key in selling the vision of the future beyond the proposed improvements and designing a reward and recognition scheme that has a personal dimension to it. Change Management is multi-dimensional including education and training, business process modelling, and communications. All of these elements are then designed to match the organisational culture.

External Intervention and facilitation can be effective, in challenging the status quo, providing analysis tools and programme management; but sustainability can only be achieved from within and enthusiastic partici- pation can only be guaranteed if the process is enjoyable.

Making this process enjoyable requires that you ensure that each of the participants:
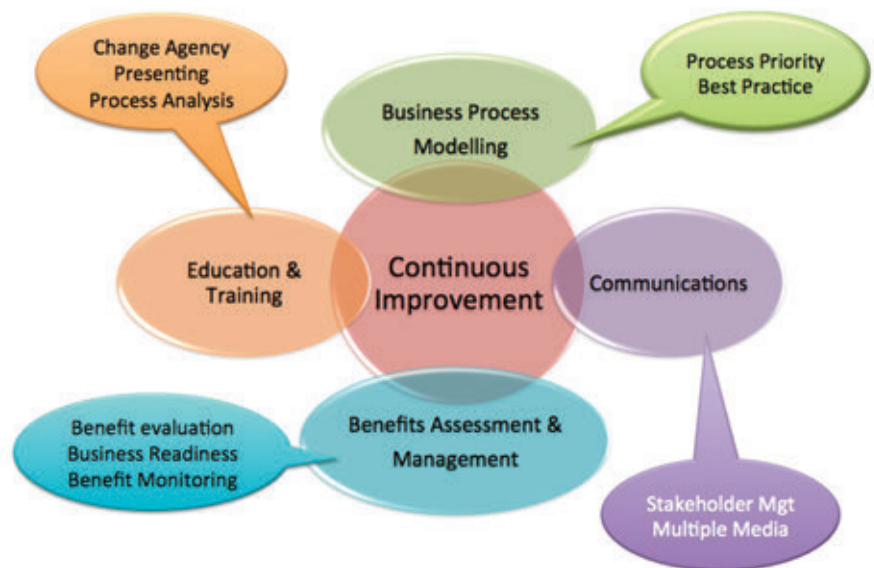
• Has a sense of control over the out- come.

• Understand their personal benefit.

• See how they will improve their skills making them more employable inside or outside the organisation.

• Receive recognition of their achieve- ments through the monitoring of benefits and the difference the change has made.

Why does this make it enjoyable?

Firstly, if you can see and feel in con- trol of your own destiny you are more likely to participate in changing it. This means leaders need to be able to project a vision of where they think continuous improvement is going to take the business, and then what part the participants will play in it. Leaders also need to emphasise and promote the personal benefits such as training as well as monetary rewards.

For example demonstrating that by participating in programmes such as this so they can progress within the business and in some cases this pro- gression might be significant enough that they move out of the business into a new career.

Sustainability requires that the busi- ness:

• Provides a strategic framework in which continuous improvement is

managed through process improvement targets set over a 3-5 year period.

- Provides for the monitoring of these targets as part of departmental 'business as usual' activities.

- Continues to provide training in analysis, communication and decision making skills perhaps using the early practitioners to develop others.

- Communicates regularly describing how the business is progressing and the contribution from CI.

What are the key elements of a successful CI programme?

We consider the corner stone to be a dynamic business process model. By understanding the present maturity of the processes, comparing to best practice provides the 'Gap' that must be closed by the CI programme. We debate process performance in a qualitative manner in cross-functional workshops. The maturity of these processes will vary and this will lead to different categories of improvement such benchmarking, step change and break through.

When redesigning processes we take into account that different processes have different values within the business, therefore there should be little discussion about streamlining activities and removing rework from back office processes and can be set to a 'best practice' standard; whereas 'added value' processes need careful design to ensure we deliver the most beneficial outcome.

The benefits model of the continuous improvement programme will directly be related directly to these processes also. Executive workshops enable senior managers to define the type of benefit and the degree of difficulty to achieve it. We use 3 categories Displaced Costs, Improved Productivity and Increased Revenue; and three degrees of difficulty High, Medium and Low to enable mangers to allow for the level of control they have in implementing the process improvement. This qualitative method engages managers better than traditional single target benefit measures.

Throughout a CI programme a significant level of honest communication is required, all stakeholders need to be understood and communication will vary from results notification to visioning. All the communicators will need to have a good level of skill and be able to address their work colleagues and senior managers in equal measure.

This ability requires structured training and to ensure good 'internalisation' of change we use workshops to engage the change agent in all participants; other skills training will include the ability to communicate with colleagues, facilitate workshops and present analysis and assessment results to senior managers. The senior managers role in this is to be listening, facilitating and mentoring, guiding; not managing and implementing.

In Summary

Throughout the next 12 months we will be looking at some of these techniques and approaches in more detail, but in conclusion the implementation and management of a successful continuous improvement programme requires good planning, a shared vision of the future, skilled internal change agents and extensive open communication.

We hope that we have shown that the human element is the key issue in the whole process; take your staff with you. In addition do not think you can delegate the whole process to outside agencies though they can help to provide tools and techniques and create initial momentum. For example there are many examples of where a change have been made without performing business modelling and in some cases this has resulted in extremely effective, short term cost reductions in head count, but an inability to perform the processes effectively after the programme stops.

Finally CI should be seen as redirecting your resources to add more value in activities that you may not be able to perform effectively because they are either not recognised, there is not enough resource in the business to do them or they are being protected by departmental approaches to process design and management that are ineffective in today's agile business climate.

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Developing essential health and safety in the workplace

Effective health and safety training at work can make all the difference, here Jo Carter Information Services Officer at the Institution of Occupational Safety and Health (IOSH) explains why...

Accidents in the workplace have been at a record all-time low, with 133 fatalities recorded in the UK from April 2013 to March 2014[1]. However this doesn't mean that we become complacent about safety at work – the numbers of accidents is still too high.

On top of that, consider occupational health: In 2011/2012, there were an estimated 450,000 new cases of occupational-related ill health and a further estimated 12,000 deaths each year caused by past exposures to harmful substances at work.[2]

A poor health and safety culture within the workplace encourages an atmosphere in which not complying with safe working practices is acceptable; this doesn't help the organisation to take effective action to solve health and safety problems. It can be challenging to influence a positive attitude on a workforce and can be difficult to alter attitudes and beliefs[3].

A positive health and safety culture often develops slowly and over time; this can lead to increased productivity and product quality, improved financial control and improved health and safety performance.

Research supported by the Institution of Occupational Safety and Health (IOSH) measured the effectiveness of training in promoting a positive OSH culture. A total of 10 companies were sampled, including SMEs and large organisations. Researchers found that training interventions were designed and implemented within all companies sampled, and that accidents were significantly reduced, leading to a more positive safety

climate over time. Their findings were that safety interventions can have a significant long-term impact on a company's safety culture[4].

Effective training within the workplace can contribute towards making employees competent in health and safety, can help businesses avoid the distress that accidents and ill-health cause, and can help to avoid the financial costs of accidents and occupational ill-health, such as damaged products, lost production and de-motivated staff[5].

Firstly, employers should show their commitment to employees so the people being trained recognise that training is important. Whether an employer, self-employed, a manager, a supervisor or an employee; everyone will be required to have some health and safety training within the workplace. The type of training depends on the requirements of the job being carried out; most external training providers can advise on the needs of the business and some training can be carried out 'in-house'. Training will need to be properly prioritised and planned for the workplace and competent assistance may be required to help or assist. The HSE states there are 5 steps to planning health and safety training[5], these are:

- **Step 1 –** Decide what training your organisation needs;

- **Step 2 –** Decide your training priorities;

- **Step 3 –** Choose your training methods and resources;

- **Step 4 –** Deliver the training;

- **Step 5 –** Check that the training has worked.

There have been devastating accidents that have occurred due to the lack of effective training in the workplace; an exceptional violation includes the Chernobyl disaster in 1986 which was the result of a flawed reactor design, operated by inadequately trained personnel. The disaster which occurred in the Chernobyl 4 reactor killed 2 plant workers on the night and a further 28 people within a few weeks as

a result of acute radiation poisoning. The lessons learnt from this disaster have resulted in improved safety reactor designs and the development of a safety culture[6].

It is the law to ensure that training is carried out by employers, this is to ensure that people are aware of hazards and risks and ways to control them. The health and safety at work etc act 1974 places particular duty on the employers to provide whatever information, instruction, training and supervision is necessary to ensure, so far as is reasonably practicable, the health and safety at work of employees. This is also defined in the management of health and safety at work regulations 1999, which identify situations where health and safety training is important when people start work, on exposure to new or increased risks and where existing skills may have become rusty or need updating[5].

Providing effective health and safety training will not just mean you are meeting legal duties to protect employees but will ensure people know how to work safely and without risks to health. This will impact on the safety culture providing a positive working environment where health and safety practices can become second nature to everyone. ∎

[1] http://press.hse.gov.uk/2014/new-figures-show-all-time-low-in-fatal-injuries-to-workers/

[2] http://www.hse.gov.uk/aboutus/occupational-disease/the-facts.htm

[3] http://www.iosh.co.uk/~/media/Documents/Books%20and%20res-ources/Guidance%20and%20tools/Promoting_a_positive_culture.ashx

[4] http://www.iosh.co.uk/~/media/Documents/Books%20and%20res-ources/Published%20research/The_effectiveness_of_training_in_pro-moting_a_positive_OSH_culture.ashx

[5] http://www.hse.gov.uk/pubns/indg345.pdf

[6] http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Chernobyl-Accident/

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Behavioural Safety Past, Present & Future

Paul Bizzell, Operations Director at Ryder Marsh Safety Limited, explains the background to Behavioural Safety and briefs on current thinking about Safety Culture...

The actual origin of the term Behaviour Based Safety (BBS) is variously attributed to a number of psychologists. What is clear is that several people were working in the field of understanding the relationship between risk taking behaviours linked to accidents from the 1970's onwards. Their work built on the publications of Heinrich[1] and Lewin[2] as far back as the 1930's. There was a flurry of publications in the mid to late 1990's by several key names in the field in the USA[3-6]. Simultaneously the original research on Behavioural Safety, in the UK was undertaken at UMIST in the 1990's by a team including Professor Dominic Cooper, Dr Tim Marsh and others. Dr Marsh founded Ryder Marsh Safety Limited in 1997 and the company has become established as a leader in the field in the UK with implementations worldwide.

1990-2005

Initially the most common question encountered was simply "What is it?" A brief explanation that it identifies the motivation for risk taking and suggests changes to the working environment to change behaviours; or that it was about the psychology of industrial safety would usually be a good start.

2005-2010

Whilst a small number of professional practitioners developed a body of good practice and BBS gained popularity the term was often adopted and misapplied by others to any and every attempt to enforce rules without any understanding of the underlying science and psychology. When implemented in the style of "I've told you the rules, now BEHAVE!" it just reinforces outmoded management styles and creates or perpetuates a blame culture. Quite rightly the unions in the US and UK condemned poorly implemented BBS initiatives and Unite lead a campaign under the banner "Beware Behavioural Safety"[7].

2008-2014

Perhaps as a result of this or maybe just out of a desire to adopt best practice from about 2008 onwards, as organisations had either implemented some form of BBS or at least considered an implementation the more common question became "How do we do BBS well?" There was a great deal of interest in benchmarking and comparing initiatives evident both in dialogue with our customers and papers being presented at relevant conferences. In many ways, of course, this evolution follows a similar pattern to the way Quality Systems and "classic" health and safety management systems emerged and matured in the latter decades of the 20th Century.

A well designed BBS implementation embraces the principles laid out in the core literature in the references. That is, it's based on scientific principles of data collection, analysis, hypothesis/design of change, implementation of change to environment or procedures, collecting new data and testing that the designed solution actually works (all of which needs to be done with proper engagement and input from the workforce in an environment that is seen as fair and consistent). The guiding principle when implementing a good BBS system is to remember that if you can make the safe way easy for the person doing the work then why would anyone not do it that way? Contrast that with the traditional approach to compliance which identifies a risk and then imposes "control measures" that often impose an additional burden of effort, training, concentration and time.

2014 onwards

In the last couple of years, again possibly in the light of the adverse press generated by poorly designed and heavy handed implementations, the emerging question is very much "What comes after BBS?"

The answer is a more holistic approach covering the all elements of a safety culture rather than just behaviour. This approach, Cultural Safety™, addresses the four main components of a Safety Culture.

They are Beliefs, Behaviours/Rituals, Language and Artefacts/equipment. Sociologists and Anthropologists would say that any significant difference in any single area indicates a different culture. The advantage of taking a cultural approach is that as well as the

behaviours (Rituals) we also look at the things that have the most significant effect on behaviours so we are dealing with root causes and not just symptoms. Once established, a cultural solution will be much more deeply embedded and long lasting whilst many changes to behaviour can be quite temporary and revert once a short-term stimulus ends.

There are established tools to assess the relative strength and development of each element. By undertaking a Safety Culture survey an individual organisation's relative strengths and weaknesses can be established and a programme developed to bolster the least developed. Rather than simply focussing on worker behaviour this often shows up fundamental weaknesses in areas such as Leadership & management, values, processes, contract terms and other systemic flaws which left unaddressed create massive inefficiencies in an organisation never mind the risks to safety.

Since many of the tools used in the data collection, analysis and change management parts of a Cultural Safety™ implementation are also used in other process improvement methodologies it is often possible to align with initiatives traditionally aimed solely at efficiency, such as Lean and Six Sigma, which leverages previous investments. The advantage of approaching process improvement from the Cultural Safety™ angle is that making processes safe and easy at the same time both reduces risk and improves productivity.

Current thinking on safety culture is best summed up in the recently published book by Dr Tim Marsh[8].

1 Heinrich, H. W. (1931). Industrial accident prevention: a scientific approach. McGraw-Hill.

2 Lewin K (1936) Principles of Topological Psychology Read Books

3 McSween, T.E. (1995) The Values-Based Safety Process: Improving Your Safety Culture with a Behavioral Approach. Van Nostrand Reinhold. New York.

4 Geller, E.S. (1996) Working Safe: How to Help People Actively Care for Health and Safety

5 Peterson, D. (1996) Analyzing Safety System effectiveness NY: Van Nostrand Reinhold

6 Krause, T.R. (1997) The Behavior-Based Safety Process: Managing Involvement for an Injury-Free Culture.

7 http://www.unitetheunion.org/uploaded/documents/Beware%20 Behavioural%20Safety%20(Unite%20leaflet)11-4843.pdf

8 Marsh, T. (2014) Total Safety Culture: Organisational Risk literacy Ryder Marsh Safety Limited

Author: Paul Bizzell, Operations Director. Ryder Marsh Safety Limited

Strengthening Safety Leadership

Almost 7 million EU workers experience an accident every year, costing families, employers, governments and societies a staggering €55bn or more. The solution to the problem is not more management and process – it is leadership and culture.

Effective safety leadership is known to strengthen safety culture and deliver financial benefits. It positively impacts employees' safety behaviour and attitudes, reduces injury rates, reduces insurance premiums, and increases productivity by eliminating production bottlenecks. Organisations that are good at managing safety also tend to manage operations well – in other words, operational and safety excellence go hand-in-hand.

Safety leadership is characterised as "the process of defining the desired state – setting up the team to succeed, and engaging in the discretionary efforts that drive the safety value". In practice, this results in executive leadership teams deciding what safety excellence means, and what it looks and feels like; developing, resourcing and implementing end-to-end plans to achieve success; and all leaders consistently displaying their commitment to achieving safety excellence.

Ineffective safety leadership is known to be a major contributor to workplace incidents. Primarily, ineffective safety leadership stems from confusion about the organisations' safety management systems and associated policies. This means leaders do not know their responsibilities, or how much authority they have to fix things. To overcome such problems, it makes sense to clarify and define the desired safety leadership behaviours, and develop a 'Competency Matrix' linked to the elements in the safety management system. Following-up with high quality education ensures all leaders are informed about the organisations safety management expectations. Providing leadership training workshops also helps leaders to competently demonstrate the desired behaviours, and ongoing organisational support enables each leader's success.

Leadership approaches

Although different people tend to prefer one leadership approach over others, these should be adapted to suit the demands of the situation, the requirements of the people involved, and the challenges facing the organisation. There is, therefore, a time and place for leaders to use different approaches, with none being good or bad. It's how they are used that determines success or failure: Good leadership is much more about meeting follower's needs to ensure their success, than satisfying the leader's needs. The main leadership approaches are transformational, transactional and servant.

Transformational leaders shape the culture of an organisation by visualising, describing, and directing people's efforts. They know where they want to get to and can describe a compelling vision of the future that motivates others to action. They describe the conditions necessary for success and encourage employee participation to achieve collective goals. Using positive language to sell the benefits, they try to connect their follower's sense of identity with the organisation's vision to provide real hope for a better future by promoting a 'can-do' attitude. Challenging and questioning prevailing assumptions, they constantly seek to drive change and move people beyond their own limitations. When talking to others, they include at least one question that causes people to think about safety in a new way (e.g. why is safety important to you?). This style of leadership is about driving change.

Transactional leaders embed the culture into the organisation by clarifying relationships between performance requirements and desired outcomes. They consider followers to be fully responsible for their work, and use performance monitoring with consequence management (e.g. praise, coaching, providing support, etc.) to reinforce people's behaviour. This style of leadership is about helping to ensure compliance to safety rules and regulations.

Servant leaders sustain cultural change by building personal relationships and conveying support to individuals

Dr Dominic Cooper CFIOSH CPsychol, CEO

through open 2-way communication, coaching, and unleashing people's potential. In turn, this helps to create a supportive environment which increases employee engagement that in turn positively affects team performance. This style of leadership is about setting people up for success by facilitating employee needs.

Evidence-based research shows that transformational and transactional safety leadership styles moderately influence employee engagement and people's safety behaviour, which in turn reduces incident rates. Servant leadership, on the other hand, creates a supportive environment, which exerts a much stronger positive influence on employee engagement, safety behaviour, and incident reduction.

Reducing known hazards

Unfortunately, the presence of known, uncontrolled physical hazards and risks suppresses the impact of all three safety leadership approaches. They neutralise supportive environments, decrease employee engagement, and increase unsafe behaviour, resulting in higher incident rates. This is best explained by employee scepticism about leadership's true commitment to safety. When known uncontrolled hazards and risks are present, employees struggle to believe leadership is sincere. People then withdraw from the safety process and behave more unsafely. If leadership is to make a difference, therefore, it is vital that known hazards and risks be eliminated or reduced to as low as reasonably practicable (ALARP). Facilitating this means providing a supportive environment and sufficient resources for individual leaders to ensure they have the means to maximise the impact of their efforts.

Known hazards and risks left in an uncontrolled state are often the result of the 'last mile' problem, where intentions are not converted into action due to time and/or budget issues, a lack of an efficient system for addressing them, and/or an unwillingness to put effort into resolving them. An effective leader will constantly challenge the 'status quo' and ask basic questions about what is stopping the issue(s) from being resolved, and driving any corrective actions. He/she will also keep people informed about the proposed solution(s), progress on completion, and the results of any evaluations once implemented.

Conclusion

In summary, effective safety leadership adds to the bottom-line in so many ways that organisations would be foolish not to implement an efficient safety leadership initiative. Successful safety leadership strategies deployed by BSMS that have reduced incidents by an average 35% include executive leadership coaching, workshops, training and cloud-based leadership software. Reducing high risk levels presented by known hazards also leads to much higher compliance with safety, and significantly boosts the impact of leadership on performance. In turn, employers, governments and societies can reap the benefits of lower incident rates and an improved safety culture, as well as achieving spill-over benefits in quality, productivity, asset integrity, and cost-savings.

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From leaders to leadership

Ksenia Zheltoukhova, Research Adviser at the CIPD – the professional body for HR and people development, discusses whether leadership skills are utilised enough...

Leadership is often viewed as a business holy grail, engaging people and, ultimately, contributing to greater productivity. But, have organisations been looking for leadership in the wrong places?

In a recent CIPD survey,[1] we raised a number of important challenges to the current approaches to leadership and management development in the UK. We wondered, for example, why 72% of organisations are concerned with a deficit of management and leadership skills, although 66% of them provide some form of training for managers. Our research showed that gaps in the quality of training provide only part of the answer; in addition many managers confirm that they are simply not able to apply their skills in the organisational context. Leadership skills are, therefore, rarely utilised in full, undermining the investment of the training spend.

Too often leadership development programmes sit firmly at the individual level, formulating a 'recipe' for an effective leader (driven to deliver, empathetic, engaging, a future executive, and so on). Although valid for growing individual capability, this approach misses an important consideration of what happens to those individuals when they leave the classroom and face the organisational reality, where everyone plays by the old rules.

Hierarchy and bureaucracy are characteristic of many organisational structures, particularly as a way of managing risk and assigning accountability. Counter-intuitively, a top-down decision-making approach is sometimes cited as a response to the increasing pace of change in the world of work, as it ensures that the entire organisation is singing from the same hymn sheet. In the long run though, lack of empowerment

Ksenia Zheltoukhova, Research Adviser

results in the lack of buy-in and leadership behaviours among middle managers and the front line.

"Too often leadership development programmes sit firmly at the individual level, formulating a 'recipe' for an effective leader (driven to deliver, empathetic, engaging, a future executive, and so on). Although valid for growing individual capability, this approach misses an important consideration of what happens to those individuals when they leave the classroom and face the organisational reality, where everyone plays by the old rules."

Short-term, bottom-line focus and individualism are linked to the focus of reward and performance management processes on individual task-related objectives, as the only measurable indicator of success. There is an implicit – and often unwanted – incentive for managers and employees to adopt a hands-on approach and forego teamwork in order to retain control over the delivery of outcomes to a deadline. At a larger scale short-termism contributes to conflict of priorities between siloed departments.

'Us' and 'them' mentality reflects an inability of organisational processes and systems to embrace diversity and allow for more than one 'right' way of working. In a bid to ensure consistency of approach to all staff, some organisations have created overly-prescriptive

policies. These policies can restrict the ability of individual leaders to apply discretion and do the right thing for the customer or a fellow employee, taking into consideration the specific circumstances.

Of course, the leaders themselves are expected to be driving organisational change. However, being impacted by the organisational system, they are often confused by the contradictions of their own interests, the organisational goals, and the needs of their teams. Research shows that, employees often feared that challenging leadership behaviours would be 'career-limiting' in an organisational environment, where offering an alternative opinion is equalled to being disruptive.

The world of work has already experienced one leadership revolution, where it has increasingly been acknowledged that individuals at all levels of an organisation can be leaders. Even employees at the front line, particularly those in the customer-centric roles, are likely to face situations where they need to make leader-like decisions on behalf of the business, often without time to consult up the organisational hierarchy.

The next leadership revolution for businesses is raising leadership development to the organisational level. While training of individual managers is crucial to grow the talent capacity and productivity in a business, it must be complemented by organisational design and development, ensuring that the organisational design, job roles and performance management systems are enabling leadership to happen. ∎

[1] http://www.cipd.co.uk/binaries/leadership_2014-easier-said-than-done.pdf

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Leading the way in Buckinghamshire

Buckinghamshire Country Council details how it is recruiting leaders of tomorrow and its success in training and retraining staff...

Alison Bulman is living proof that Buckinghamshire County Council acts on its proud declaration that it is passionate about recruiting the 'Leaders of Tomorrow'.

For she is now a key member of the Council's senior management team, 13 years and 7 jobs later after joining the authority as a homecare supervisor.

Welsh-born Alison drives each day to Aylesbury from her home in Portsmouth – setting off at 6am. But the epic round-trip of almost 200 miles does nothing to diminish her enthusiasm for her job as Service Director (Service Provision) in Adults & Family Wellbeing.

"I started at the Council in 2001 and love working here. I really feel part of the Bucks family that has turned things around in terms of social care," she said.

"What's interesting is that when I first joined the council, we were named and shamed as a failing authority.

Now, we're surpassing national performance statistics for adult social care and we have other authorities coming to us for advice and guidance. That speaks volumes, because we're obviously doing something right."

Alison, 37, who previously worked for the private care sector in Swansea, says she originally joined the Council as a 'bit of a side-step' to support her husband's career move.

"Since then I've had seven different roles as the Council has looked to play to my strengths and support me in my career progression," she said.

"Where possible we look to support, develop and progress from within. But that doesn't mean we're not looking for people from outside to help us continue in the work we're doing. We're always looking for people with the right skills who are keen to join a council that embraces those who have a passion and enthusiasm for what we're trying to achieve."

Alison Bulman
Service Director in Adults
& Family Wellbeing

Alison says she was initially 'apprehensive' when she was asked to cover the role of service director in 2012.

"It was a huge challenge for me," said. "However, I soon settled in to the role and now thrive on the challenges the job presents on a daily basis.

"To secure the job permanently I had to go through an extremely rigorous selection process and was thrilled when I was told I was successful. That's mainly because I was keen to carry on and build on what we had already achieved within the service. I'm extremely proud to work for Buckinghamshire County Council, a pride that I don't think many people get to experience about their work anymore."

Her rise to the top echoes the words of Council Leader Martin Tett who has spoken repeatedly of his desire to recruit the 'Leaders of Tomorrow'.

In an article in Adjacent Government in February, Mr Tett told why, despite 'tough times' and the need to make millions of pounds in savings, he continues to champion a project to invest in graduate trainees.

This year, Buckinghamshire County Council has recruited 6 high-calibre trainees in a scheme that will cost £300,000 over 2 years.

"I believe investing in youth is worth every penny and is something that, quite frankly, other councils should be also doing. We will be rotating all of the trainees around the organisation to build their skills and experience," he said.

Mr Tett went even further than this after the article was written to show his faith in his apprentices.

When Buckinghamshire was shortlisted for the Best Achieving Council in a national awards contest, he was asked to make a presentation to a panel of judges. He broke with the norm and threw caution to the wind by asking graduate trainee Audrey Marshall to attend and introduce the presentation on behalf of the Council.

"I wanted to show the judges that Buckinghamshire trusts its junior staff, and Audrey repaid my faith by wowing the panel with a brilliant introduction that set the scene for me and our Chief Executive to expand upon."

His faith in youth was further vindicated when the Council was Highly Commended in the awards at the end of June, a clear sign that his graduate trainee had impressed the judges.

He added: "I think Alison Bulman's success and longevity here shows just how important training and retaining our own staff is. If we get it right, there will be many more senior managers in the future with a similar career progression to her." ■

To find out more about jobs within Buckinghamshire County Council, visit www.buckscc.gov.uk/jobs/social-care/adult-social-care/

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SMEs in international trade: get rid of red tape

Jan Eggert, Director-General of the Foreign Trade Association (FTA), underlines the value of SME's for economic and social development in Europe...

Overall, global trade grew significantly over the last decades, triggered by unprecedented waves of liberalisation of trade rules and the use of innovative technologies. The process of globalisation helped to bridge physical distances and provided an ideal breeding ground for long-term growth and increase of welfare. In this context, many large companies rolled-out internationalisation strategies to respond to the challenge of growing global competition and to access new markets.

Small and medium-sized enterprises (SME) have evidently also taken part in this development and are actively looking to secure their share of the cake. This is particularly true in the retail sector which is increasingly relying on global value chains and imports of consumer goods from all around the world. SMEs play a crucial role in operating this complex supply chain, including all relevant steps from product development and manufacturing to sales, marketing and retailing. Long-established expertise of interna-tional markets and solid business networks built over time and on trust are the trademarks of many of these smaller trading companies.

However, the situation for SMEs, often a family-run business, is far from perfect. An important number of trade obstacles still limit the ability of these companies to unleash their full potential and achieve a higher level of integration into the world market. In many aspects, they are disadvantaged in comparison to multinational enterprises. The main reason very simply lies in the nature of SMEs – their size. For decades, cross-border trade was strongly hampered by obstacles such as tariffs and quotas, a costly but relatively stable and transparent system to cope with. Today, realities are far more complex and the sharp rise of technical barriers, like product quality requirements, employment law, licence regimes and packaging conditions, is a serious impediment to global trade. In other words, to trade internationally it is increasingly important to develop a high level of understanding of technical regulations and to invest substantial resources in complying with these rules. Given their size and limited means, SMEs are particularly vulnerable to the effects of red tape and the opaque tangle of legislation impacting trade in goods.

A few examples, referring to both developing countries and the EU, illustrate these challenges. Vietnamese legislation narrowly defines and frames the conditions for employing foreigners with the objective to substitute foreign staff by domestic personnel. Recent legislative changes limited the duration of work permits for foreigners to 24 months. In this context, SMEs have to compete with western multinationals – often a lost

Jan Eggert, Director General

cause – for trained labour in a country with shortage of skilled workers. Investment protection legislation in China does not yet correspond to international standards. Ordinary and investment legislation is characterised by structural shortcomings and current arbitration mechanisms have proven to be inefficient and time-consuming. It goes without saying that smaller companies, with little financial resources and less economic weight, will be particularly reluctant to defend their legitimate case under these conditions.

Looking at the EU, the increasing array of highly technical legislation, such as REACH, the Biocides regulation and the timber regulation, threatens to overburden SMEs. Despite goods intentions, many of these legislative projects voted in recent years created detrimental effects on business while only generating limited improvements for consumers and the environment. In the field of customs, the economic reality of global supply chains should lead to a net simplification of EU rules of origin. However, the current system, which is characterised by a high level of complexity, remains burdensome and time-consuming leaving it to economic operators to not lose track of the latest developments.

What is the solution? Obviously we cannot expect SMEs to change in nature. Therefore, it must be the explicit duty of the legislator and administrations to shape a trade environment suitable for smaller enterprises. There are 3 elements that are central pillars in realising this objective.

Firstly, the EU trade policy should systematically incorporate SME specific targets, instruments and cooperation platforms, all designed to respond to the very needs of SMEs. The discussion within the transatlantic trade partnership (TTIP) of including a chapter dedicated to SME issues points the right way.

Secondly, European legislation on product safety and environmental protection should find the right balance between improving protection and avoiding – disproportionately – strong burdens and costs for companies. Every legislative measure should be assessed on its impact on the capacity of smaller enterprises to trade internationally, and thus go beyond the current analysis of effects on the internal market only.

Thirdly, the EU should work hard for improving business conditions for SMEs at the international level. The World Trade Organization (WTO) is the ideal stage to promote and impose a simplified and harmonised trade rulebook. Strong emphasis has also to be given to preferential trade agreements and regulatory cooperation to help developing countries remove technical barriers.

SME's are the backbone of economic and social development in Europe. In this respect, the increasing internationalisation of them will undoubtedly promote domestic growth and foster the competitive position of the European economy. Consequently, the current EU policy term 2014-19 should give SMEs a strong helping hand and keep pace with the transforming business realities. ∎

FTA represents more than 1,300 retailers, importers and brand companies and advocates for free trade and sustainable supply chains.

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Jan Eggert
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Getting Ireland innovating

Dr Imelda Lambkin, National Director of Horizon 2020 Ireland at Enterprise Ireland, explores the assistance available for the business and SMEs that form the backbone of the Irish economy...

This century has been full of innovation. New technologies, new products, new services and whole new industries have emerged. Yet the call for innovation in business has never been more intense. It is a hugely challenging and competitive time for businesses, so what is Ireland doing in this space?

Enterprise Ireland is the Irish government agency charged with developing and promoting Irish enterprise. It partners with entrepreneurs, businesses, and the research and investment communities to develop Ireland's international trade, innovation, leadership and competitiveness. The ultimate objectives are increased exports, employment and prosperity in Ireland. Enterprise Ireland is also the agency responsible for helping Irish companies and researchers to participate in the EU's 7th Framework Programme (FP7).

The key research and innovation priority for Ireland's Presidency of the European Council 2013 has been to achieve political agreement on all the measures within Horizon 2020 (2014-20), the EU programme for research and innovation, and successor to FP7. Horizon 2020 can play a decisive role in helping to create jobs, growth and the European economy of the future. The programme seeks to secure major investment in key technologies, bridging the gap between research and the market, and promoting real commercial partnerships between member states and the private sector. Linking in with other EU programmes, it aims to increase participation by SME's from 15% to 20% in Horizon 2020.

SMEs have in recent years proved themselves to be the engines of economic growth and the principle sources of new employment. They are the backbone of the Irish economy and key contributors to growth and employment. SMEs make up over 99% of businesses in the enterprise economy in Ireland and account for almost 70% of people employed.

Their ability to exploit new technologies, and to respond quickly to changing market needs, gives SMEs a pivotal role in the success of the Irish economy. Support for the creation of new ventures and spin-offs from research institutions and large companies, as well as the removal of barriers to their rapid growth and support for the transfer of know-how, also deserve to be afforded the highest priority.

Enterprise Ireland's client companies achieved record levels of exports in 2012. Total export figures, at €16.2bn, were the highest ever annual export gain achieved by Enterprise Ireland clients. Driving this is research and innovation; for many of our client companies, science and technology is what they are all about – it's in their DNA. For others, innovation is a tool they will employ more strategically, for example, for new product development, to make manufacturing or business processes more efficient or to respond to disruptive waves.

This is why innovation is at the heart of everything Enterprise Ireland does – providing financial incentives from €5,000 Innovation Vouchers to suit a smaller company beginning their journey on the road of innovation, right through to support for major R&D projects from larger companies, involving investment in the million-plus category.

Innovation is one of the key strategic advantages that Irish companies can harness to gain a competitive edge and win in world markets. Enterprise Ireland is committed to helping companies get a foot on the innovation ladder.

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Dr Imelda Lambkin
National Director of Horizon 2020 Ireland
Enterprise Ireland
www.enterprise-ireland.com

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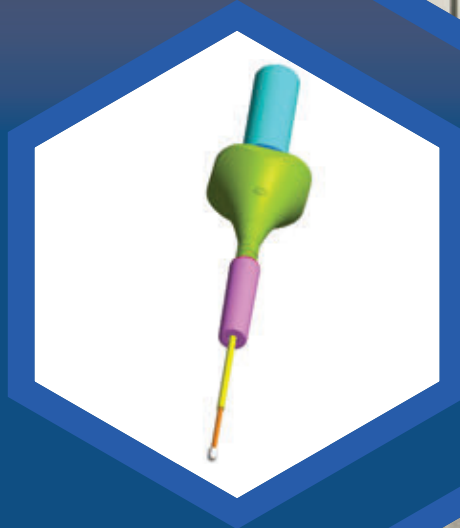
Cities are the pathway to a sustainable recovery

Andrew Carter Deputy Chief Executive at the Centre for Cities, details how UK cities have the potential to contribute more to the nation's economy...

Boosting economic growth in our cities is the only route to building a strong and sustainable recovery for the UK as a whole. The UK's 64 biggest cities – ranging from London to Hastings – occupy just 9% of the UK's land, but by being home to over half of all businesses and 3 quarters of high skilled jobs, make an enormous contribution to the national economy.

The performance of the UK's cities is mixed, with some, such as Brighton, Reading and Milton Keynes, being star performers. Others, including the majority of our largest cities, trail the national average on a number of key indicators. The fact they are punching below their weight is bad for the people who live there, and for the national economy. While London continues to stand out on the international stage, we need more high-performing, large-scale cities to drive longer-term growth all across the country.

The scope for cities to improve their economic fortunes is made more difficult because of the over-centralised nature of the UK (and English, in particular) state. With Westminster holding onto the lion's share of funding and powers, UK cities often lack the capacity to respond to the opportunities and challenges that they face, compared to their international counterparts. Giving UK cities the scale, authority and funding needed to improve their economies and quality of life should be central to any credible plan to increase national prosperity.

There are many ways in which UK cities, with the right tools and flexibility, can improve their performance, including: connecting firms, workers, suppliers and customers with good transport and telecommunications links; providing a pleasant and attractive public realm; making sure workers' skills match those of the local labour market; and, enabling the expansion of

Andrew Carter
Head of Research

residential and commercial property supply in response to increased demand. For city leaders across the globe, delivering policies that address these and other issues is simply 'business as usual'. But in the UK, while city leaders can see the problems and opportunities they face every day, they don't have the levers of power or funding at their disposal in order to solve them.

In recent years, City Deals, and now Local Growth Deals, have started the UK down the path to addressing this problem. Greater Manchester's flagship 'Earnback' City Deal, in particular, offers an opportunity for the city to connect the virtuous circle of investing, and reaping and reinvesting the proceeds of successful city economic investment. By using the financial and economic gains from improving its transport system, the city will be able to, for example, provide training and apprenticeships for young people, which will further boost future tax revenues and reduce welfare expenditure. The New Development Deals in Newcastle, Sheffield and Nottingham should also give these cities the freedom to invest in critical infrastructure using tax increment financing, and enable them to borrow against future business rate income in key development zones.

However these cities remain exceptions to the rule. Despite the significant progress of City and Local Growth Deals, there's still a long way to go before UK cities can claim to have real autonomy over the policy levers that affect their local economies. The good news is that all 3 of the major parties appear to recognise the importance and urgency of the situation, which is why we have seen so many recent announcements from all sides of politics promising greater devolution. Over the past few weeks, George Osborne, Nick Clegg and Ed Miliband have all conceded that our cities don't have the tools they need to build stronger local economies, by capitalising on their strengths and addressing their weaknesses.

This emerging political consensus about the need to revitalise city economies across the country is very welcome. The challenge for the political parties is to set out how this can be achieved, and what a more decentralised system of government would look like.

At the very least, a more devolved system would provide cities with the opportunity to introduce a democratically accountable Metro Mayor, the powers and funds to take the big decisions on jobs and growth at the level of the real economy, and introduce a London-style integrated transport system, capable of supporting more people to access jobs, shops and services. Each of these initiatives would need to be enabled through giving cities greater fiscal and financial freedoms and incentives relating to council tax, business rates and other local revenue streams.

Cities in the UK, like they do in other countries across the world, could do so much more to drive national prosperity. They just need to be given the opportunity by Whitehall to fulfil their potential. ∎

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Economic Development
It's about placemaking

For those involved at a strategic level in economic development, placemaking as a tool is not new but its time is certainly now in view of the significant transformation towards a knowledge based economy which is taking place. The most important component of this transformation is a much greater reliance on intellectual capital and its application based on significant advances in communication and other technologies and the management of data. The importance of placemaking is that it plays a much more significant role in current decisions affecting economic development than ever before. As investment and people are now more mobile than ever before so does the consideration of the quality of a place become much more important.

Quality places retain and attract skilled and talented people. Talented people like places with natural, community, social, leisure, creative and cultural activities for themselves and their families and therefore, combining this with effective professional networks, access to resources and opportunities is even more attractive to the entrepreneur inclined to exploit intellectual capital. Investment decisions are made by people in terms of their time, talent or money based upon an assessment of the anticipated benefit or return. Investment decisions are also made by institutions and businesses according to their own interests and

balance sheet objectives but even these interests are increasingly being directly influenced by place.

"It is crucial that support is provided to create the right environment for entrepreneurship and technology transfer and to retain and attract talent to those smaller and medium sized places which can offer as much of a complete if not more affordable package to secure growth in investment and employment…"

Determining what a place based strategy should focus on starts with identifying what key assets, services and growth opportunities does the location provide which shape day to day life and economic opportunities. There is a series of challenging questions to be answered – are the basic and hopefully higher level elements of living, working and developing the community firmly established? Are the various forms of infrastructure adequate or a real factor in supporting a competitive commercial environment? Is there evidence of an enviable comparable quality of life to recognised successful locations? If not then why would someone consider investing their time, knowledge and expertise or money (including persuading others) in your location with the associated risks connected with each of the

shortcomings? Why would anyone wish to invest in a place that cannot demonstrate a will to invest in itself?

Charles Landry emphasises the importance of place to the economy, where places need to be "distinctive", have a recognisable "variety" of people, business, culture, buildings and "flow" where people can choose their own pace and path. The physical and cultural characteristics of the place are most clearly linked to the attraction of talent, business and investment.

The principles and benefits are not complicated but the execution of an effective place based approach has inherent challenges in view of the complexity necessary. In terms of the knowledge economy, are smaller and medium sized cities better placed to rise to these challenges? There are key characteristics which are so similar to the "Ideopolis" concept promulgated over the last decade in that ideally an economically successful city based economy comprises of the following aspects:

• high levels of economic success and knowledge based activity;

• a diverse industry base including distinctive specialist niches;

• one or more high level research and education based institutions that have

a mutually beneficial relationship with businesses;

• strong communications infrastructure;

• a variety of good transport links with and to other cities with multi-modal options;

• public and private sector institutions working together;

• strategies to ensure all communities benefit from the economic success.

"For those involved at a strategic level in economic development, placemaking as a tool is not new but its time is certainly now in view of the significant transformation towards a knowledge based economy which is taking place."

To illustrate this discussion, the wider Exeter economy has much of this approach established. Its economic performance pre-, during and the signs post recession are of a place making approach with credible examples of success. Some aspects are in need of further investment and its most recently approved economic development strategy certainly embraces this approach as fundamental to making its transition to a knowledge economy. Following this approach has resulted in independent studies identifying the city as out-performing larger cities within the UK and confirms its beneficial regional economic impact. The creation of high value employment opportunities, attracting and retaining highly skilled workers and graduates and capitalising on existing strengths and assets are

especially important as the city continues to strengthen its economy. Encouragingly, Exeter is outperforming the South West and England in terms of the % increase in qualifications amongst workers in the area over the last 10 years.

There are key drivers to establishing a successful knowledge economy inextricably linked to place making which the new economic development strategy for Exeter is based upon:

• creating the physical requirements – having the architecture and accommodation that businesses and workers require;

• building on what's there – recognising the city's existing strengths and weaknesses and playing to these;

• 'smart specialisation' – focussing on the range of economic specialisms for which there are credible opportunities, particularly in sectors related to big data, climate change mitigation, health, water science and agri-tech;

• attracting and retaining high skill organisations – organisations that rely on productivity through high quality jobs and highly skilled people;

• an acclaimed education sector – linking closely with the city and businesses;

• distinctive 'knowledge city' offer – for businesses and people who are considering investing, working and living in the city, supported by a diverse cultural offer;

• maintaining and improving strong

connectivity within and outside the city economic area with major economic hubs;

• strong leadership – around an economic vision supported by proactive networks and partnerships;

• a business friendly and pro-growth local administration.

It is crucial that support is provided to create the right environment for entrepreneurship and technology transfer and to retain and attract talent to those smaller and medium sized places which can offer as much of a complete if not more affordable package to secure growth in investment and employment away from the massive metropolitan areas. It's not about spreading the jam thinly but focussing on the value for money return such locations really do offer. Just maybe the more localised approach through the LEPs will enable this to happen.

Please see Exeter the place on this linked video. www.exeter.gov.uk/index.aspx?articleid=13847

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Pooling pension fund investments

Susan Martin, CEO of the London Pension Fund Authority (LPFA) talks to Editor Laura Evans about upcoming challenges and new initiatives for one of the largest UK pension funds...

The London Pensions Fund Authority (LPFA) is one of the largest in the UK, providing pension fund benefits to around 55,000 employees and pensioners in the Greater London area. The fund has a value of £4.8bn and works with 23 authorities in total, sharing expertise and providing a range of pension administration, communication and payroll services.

In January, Susan Martin, who has 20 years' experience in senior management roles, was announced as the new CEO of the LPFA. Martin has been with the LPFA since 2007, and has a vast amount of knowledge in pensions, mergers, organisational change and acquisitions across private and public sectors. Here, she speaks to Editor Laura Evans about what she hopes to achieve in her new role.

"I am very keen to ensure that the Local Government Pension Scheme (LGPS) is a sustainable pension scheme in the future, and because of that I have been working with colleagues to promote the concept of asset and liability management (ALM)". She explains that it's "Not just looking at the assets, but also looking at your liabilities and making sure you understand them. Knowing what you need from your assets ensures you have the cash to pay pensions when they are due."

Martin has been quoted as saying 'we've got people now saving for a pension that we'll be paying in the next century,' and believes that it is important to think long-term with regard to strategies, rather than just what's happening now.

The 89 LGPS funds are facing a combined £50bn deficit and Martin believes the way to tackle this is through partnership between individual funds "We had a 20 year target when we began our strategy. We look at the long term view of both asset and our liability management. Moving to ALM Partnerships is a way for organisations to voluntarily come together to pool their assets and to access the benefits of liability-driven investment," Martin says.

"Having the right people at the right time in the right role is important, as is achieving the vision of making sure we have a sustainable long term pension fund as a responsible investor of public sector money. Working in partnership with other funds can also create a UK citizens wealth fund that is then invested to ensure the UK economy is competing with the best in the world."

In response to the government's recent consultation on the future of the LGPS, LPFA has put forward a detailed proposal for voluntary ALM Partnerships. Pooling resources and investment allocation decisions whilst retaining strong local accountability could drive savings and access to asset classes which better match scheme liabilities – something which Martin is keen to see happen.

"ALM Partnerships would build on the collective investment vehicle approach but do not constitute merged funds. The partnerships would see funds coming together for asset and liability management, but the historic liability would remain the responsibility of the originating pension fund. The partnership would however, take the role of determining what cash flow is required so we can then determine the asset allocation strategy." she explains.

"The partnerships would include the understanding and management of the data and the liability. In addition, they would examine the assets and take that long term view ensuring we are in a position to invest to match these liabilities. ALM Partnerships would bring together people from all partner funds who have experience in running pension funds and managing investments in-house. They would be governed by a joint committee which could be made up of nominees from each fund which joins the partnership. This approach would enable all LGPS funds to invest in assets that smaller funds are not normally able to access.

"I am very keen to ensure that the Local Government Pension Scheme (LGPS) is a sustainable pension scheme in the future, and because of that I have been working with colleagues to promote the concept of asset and liability management (ALM)."

"We would be managing the investments directly or in a co-investment, meaning more emphasis on liquid assets, good equity management and hedging liabilities to address the impact of interest rates and inflation."

Knowing what investments to make and where your liabilities lie is vital, but ensuring the investments are made responsibly can add to the pressure. Martin believes that liability management is an important factor to take into consideration when investing other people's money.

"It's about looking at your liabilities and looking at what cash you need, understanding the market, and having a flexible asset allocation that allows you to invest in different asset classes," she explains. "By and large, if you're investing through other people, you need to have good negotiation skills to get the fees down and to manage their performance effectively. It is important to really engage with partners and find out what they are doing with your money on your behalf.

"It's about ensuring that you don't just claim our asset allocation is 'X' in this portfolio and 'Y' in that, you need broad benchmarks that have the flexibility to exploit opportunities if markets are changing. It's important to be aware of inflation and interest rate risks and ensure you are protecting an element of your fund by hedging."

With LPFA reporting fund growth of £480m in 2012-13, Martin suggests that people should not look at the headlines, but look beneath them at whether your liabilities have grown. "Even though a fund reported growth, it is not necessarily good news if your liability has grown more," Martin explains.

"We topped the LGPS chart in reducing our liabilities last year, so we've reduced our deficit by £387m between 2010-2013. For us it's not just about asset growth, it's about making sure we are able to meet our liabilities."

Despite successful recent years, there are still challenges ahead for the pension fund, with new schemes that require embedding and new legislation to take into consideration. However, Martin is confident that moving forward with ALM Partnerships is a key element of future success for the LGPS as a whole.

"We still have more work to conclude on ALM, and we're not sitting still on that because it's a key part of our beliefs in our business. Moving forward on ALM Partnerships is a key aspect for us as is governance, understanding your business and working in collaboration with others." ∎

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Reducing procurement costs across the NHS

The e-Procurement strategy will significantly reduce costs and help NHS trusts work more efficiently, explains Chris Doyle, Industry Marketing Manager for Healthcare at GS1 UK...

The way the NHS manages its annual £30bn of non-pay spend is a topic never far from the headlines. The NHS possesses the greatest purchasing power of any business in the UK, but the way in which it manages it's spend is inefficient. It is estimated that trusts can save £1.5bn by the end of 2015-16 through taking a cohesive approach to procurement based on global standards, national infrastructure and local delivery.

The Department for Health's recently published e-Procurement Strategy set out what trusts must do to achieve this.

Introducing this scale of change obviously brings challenges, but precedents exist in the global healthcare sector and the UK's banking, manufacturing and retail sectors through the way in which they have utilised technology to revolutionise their business operations.

Some of the changes introduced by the strategy are detailed below.

NHS GS1 Datapool
Master data relating to the things NHS procures lies at the core of the strategy. Master data is defined as all the information about a product necessary to perform business transactions. A datapool is a central repository for this data which is stored and accessed in a standardised way by suppliers and buyers. The use of a datapool ensures unequivocal identification of products and provides a synchronisation capability ensuring that buyers have up-to-date information at all times.

NHS PIM Solutions
There are a number of datapools around the world linked by what is known as the GDSN (Global Data Synchronisation Network). In order to ensure that Trusts' product catalogues only contain the data they need, a system which interfaces with the datapool. PIM (Product Information Management) solutions will be provided centrally by the Department for Health.

NHS GLN Registry
While a datapool helps to identify products and services (the 'what' of procurement), a GLN (Global Location Number) registry identifies the 'where'. GLNs uniquely identify legal entities, delivery and storage locations. A registry of GLNs means that the physical location of where to deliver goods and the destination of all business messages is also unambiguous.

Purchase to pay

The combination of accurate master data, good catalogue management and consistent location identification enables a fully automated purchase-to-pay process with little human intervention.

Systems like these have been used for many years in retail environments and are estimated to save the retail industry £11bn each year through error reduction, better stock availability, more accurate forecasting and myriad additional benefits derived from increased visibility.

Direct Patient Benefits

The general benefits that the retail industry experiences from the use of this technology often translates fairly directly into the healthcare environment, but the true value of these systems is improved care delivery and better outcomes for patients.

The procurement systems outlined above, when integrated into other systems, can deliver benefits far beyond the purely logistical and commercial. Considered in the light of correct patient identification, Electronic Health/Patient Records (EHR) and wider hospital systems the impact on better care delivery becomes clearer.

Patient Identification

Parents often retain the wristband issued to their children when they were born. The light blue and pink bands featuring a midwife's neat handwriting may provide a sentimental reminder of a happy event, but as the basis for a rigorous and unequivocal method of patient identification they are little use. Since October 2013 it has been a required standard (NHS ISB 1077) for NHS hospitals in England to issue patients with printed wristbands bearing a GS1 DataMatrix barcode.

This identification wristband can be used as the key to accessing a patient's EHR, to confirm identification before drugs are dispensed and to uniquely allocate instruments used for implants given to the patient, and is fundamental to enabling the wider benefits of automated procurement systems. In addition, the NPSA has for a long time recognised the safety benefits of consistent patient identification on the wristband and the positive impact this can have on a range of never events.

What next?

Most hospitals in England have made some progress with the adoption of GS1 standards. Many patient identification systems, surgical instrument decontamination systems, robotic pharmacy systems and inventory management systems rely on GS1 standards (commonly without realising it). To fully implement the new strategy each trust will be required to adopt a board-approved GS1 standards adoption plan. This plan will drive 4 main activities which can be started now:

- Identification of people (patients and care-givers) using NHS ISB 1077;

- Identification of places (using GS1 GLNs);

- Identification of things (assets in the hospital and, through supplier engagement, products supplied to the hospital);

- Integration of systems using GS1 as a global language.

Locations and people are the best place to start; supplier engagement is the best next step and integration of systems will come with consistency in upgrading and replacing existing systems. ■

GS1 UK have produced template plans which will be shared through the newly launched www.gs1ukinhealthcare.org website. GS1 UK will support suppliers and trusts to ensure that the e-Procurement Strategy not only delivers increased value and better care into the NHS but also enables manufacturers and suppliers to realise the supply chain and security benefits of the system.

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A robust approach to asset management

David Pocock from the Management Panel at the Institution of Civil Engineers (ICE) details why a step change is needed in the way infrastructure assets are managed...

The UK has extensive and sophisticated infrastructure that has been developed over hundreds of years. Because of this, unsurprisingly, a large proportion of it is nearing the end of its projected operational lifespan. The reality however is that our economic infrastructure assets are very rarely decommissioned at the end of their predetermined lifetime and must continue to perform and operate – supporting society and the economy and the changing demands placed on them through factors such as population growth. It is vital therefore, that these assets are managed properly throughout their entire lifetime and not just repaired or upgraded once a problem occurs or presents itself – as is often the case for strategic assets such as roads, rail and water systems.

This reactive approach can result in major disruption to the network, affecting society and the economy. It also means that asset managers are often asked to look after critical infrastructure with little available information about the asset, and, there are short-term budgetary restrictions due to the more reactive repair and upgrade culture. In these conditions there may not be sufficient opportunity to assess options, let alone the longer term risks associated with the chosen strategy or the future costs associated with such a choice.

A step change is needed in the way we manage our infrastructure assets through their life time. "Asset management" considers assets over their entire lifetime. It incorporates the comprehensive management of an asset from initial demand identification through planning and design to procurement, construction, commissioning, operation, maintenance, enhancement/ rehabilitation and finally to decommissioning, or renewal and re-commissioning, in order to optimise

the whole-life return on investment from both capital and operational expenditure perspectives.

Asset management principles and philosophy serve as a good basis for delivering a consistent, robust approach – and I believe should be understood and wholeheartedly implemented at all levels by organisations – commissioning bodies, delivery/service providers, and professional bodies - and individuals.

Our former President, Professor Barry Clarke, described asset management and its benefits very succinctly: "Asset Management creates this holistic focus, viewing our economic infrastructure over its entire lifecycle, and provides the basis for a coordinated and coherent approach. It also ensures our essential infrastructure receives appropriate investment and attention, has the appropriate resilience to meet new challenges and can sustain our economic prosperity."

Encouragingly, the government's National Infrastructure Plan appears to agree with that approach – highlighting the necessity for strong, coordinated and strategic investment in the UK's essential infrastructure. The plan aims to ensure that the most is made of any new infrastructure, and rightly also prioritises the maintenance and smarter use of existing assets.

There are published techniques to assess the efficiency of asset management systems adopted by individuals and organisations and compare these with existing best practice. One such tool is the PAS 55 standard, which was created by the Institute of Asset Management to provide objectivity across significant aspects of good asset management from lifecycle strategy to everyday maintenance. It enables the integration of all aspects of the asset lifecycle – from the first recognition of need continuing through to design, acquisition, construction, commissioning, utilisation or operation, maintenance, renewal, modification and/or ultimate disposal. This is further emphasised through the recent publication of the international standard ISO-55000.

At ICE, we know we too have a role to play in developing and promoting best practice for the management of infrastructure assets throughout the civil engineering profession – after all it is civil engineers who, right across the world, play a pivotal part in developing, operating, and maintaining the economic infrastructure networks we use on a daily basis.

Our Management Panel, a joint initiative with the Chartered Institute of Civil Engineering Surveyors (CICES) recently created the "Guiding Principles of Asset Management", which has been well received by the industry. The report aims to develop the knowledge and understanding of the factors and processes affecting assets throughout their lifetime. It also identifies the key principles to ensure civil infrastructure is kept at the forefront of advancement, benefitting our membership, the engineering profession and the public as a whole.

The Institution has also produced a paper entitled "Leveraging the Relationship between BIM and Asset Management" which importantly, explains the mutually supportive relationship between Building Information Modelling (BIM) and asset management. They should not be isolated practices, they must be considered together to realise the full benefits.

ICE will continue its work in this area to promote better understanding of asset management. We will also continue to engage with the Government, industry and other professional bodies to ensure the engineering community has the foundation necessary to develop a coordinated and strategic vision for managing infrastructure assets within the UK and abroad. ■

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Rail and ISO 55000: An Overview

With the new dynamics in the Rail Industry Asset Management has become a very important topic. The leading European Rail companies are organising themselves to cover Asset Management as an integrated part of their operations. Several as guidance use ISO 55000. This article gives the outlines why it is used.

ISO 55000 is the new international standard for asset management, released in January 2014. Simply put, the essence of this standard is value realisation from your assets, which achieves the desired balance of risk, cost and performance. It will provide assurance that the right things are being done right, and that these activities support the achievement of the mission and objectives of your organisation.

ISO 55000 requires that an Asset Management System (AMS) be developed and documented which is the "Set of interrelated or interacting elements to establish asset management policy, asset management objectives and processes to achieve those objectives". Asset Management (AM) is defined as the "Coordinated activity of an organisation to realise value from assets". The organisation's assets, which are within the scope of the AMS, must be identified.

The standard calls out the following benefits that organisations will achieve from adopting ISO 55000:

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☐ Improved financial performance taking account of the short term and long term view

☐ Managed risk reducing financial losses and liabilities, improving safety, reputation and environmental impacts

☐ Improved services, e.g. punctuality and output through better asset performance

☐ Demonstrated social responsibility with respect to environmental and societal impacts

☐ Demonstrated compliance with legal, statutory and regulatory requirements

☐ Enhanced reputation through improved customer satisfaction and stakeholder confidence

☐ Improved organisational sustainability effectively managing short and long term effects

☐ Improved effectiveness and efficiency by improving the organisation's ability to reach their objectives ISO 55000 is a strategic approach as opposed to a tactical approach and encompasses the following aspects:

☐ Organisation: ensuring that asset management objectives are consistent and aligned to the organisational objectives, that the stakeholders are identified and satisfied, and the scope and boundaries of the AMS are defined.

☐ Leadership: ensuring that the asset management leadership is put in place by top management, the asset management policy has been defined and reviewed, and the AM leadership is given the authority, responsibility and resources to achieve the identified objectives.

☐ Planning: ensuring that risks and opportunities are identified and plans are put in place to address them and support the achievement of the organisational objectives. These integrated plans should address what will be done, when it will be done, by whom and how it will be undertaken and evaluated. These plans should address risks and opportunities and how

they change over time achieving a balance of risk, cost and performance.

☐ Support: ensuring that competent resources required to achieve the plans are made available, the information systems are available to support the process and the information is documented, controlled, communicated and auditable.

☐ Operation: ensuring that the plans, implementations and processes are reviewed and controlled, including any activities that are outsourced, and encompasses change management activities as well. Evidence that the organisation carried out the plans and processes is required.

☐ Performance evaluation: ensuring that the asset performance and the effectiveness of the AMS is monitored, measured, analysed, evaluated and auditable. Top management should review the AMS for suitability, adequacy and effectiveness.

Improvements: ensuring that non-conformities or incidents with respect to the assets, asset management or the AMS are documented and evaluated, and corrective action is taken. Asset management and the AMS should be continually improved.

Asset Investment Planning and Management (AIPM)

AIPM is focussed on solving the problem of how to realise the highest value from your assets while balancing cost, risk and performance. If you want assurance that the right things are being done right, and that these activities support the achievement of the mission and objectives of your organisation, then AIPM is a best practice to help you decide what are the right things to do.

In the case of ISO 55000, the right things to do are those that collectively create the most value for the corporation given the cost, risk and performance objectives. Investments must be evaluated based on how they contribute to the achievement of the corporate objectives. AIPM efficiently identifies the optimum mix and timing given a myriad of potential investments and their alternatives and any organisational constraints or timing requirements.

Realising value from your assets with AIPM starts with:

☐ Bringing all the knowledge within the organisation to bear on the decision-making process in an integrated manner: what risks you are facing and how will these risks evolve over time, the opportunities that are possible, and creating a risk-informed evidence-based approach to decision making

☐ Understanding the corporation's values, defining these items explicitly and adopting them as your decision-making criteria

☐ Identifying "the right things to do" with your scarce resources that will deliver the highest value

☐ Efficiently create, compare and contrast multiple what-if scenarios to understand the risk, value and benefits of various investment strategies

☐ Gaining organisational buy-in through collaboration and transparency in decision-making

☐ Arriving at defensible decisions using a rigorous, consistent, repeatable and auditable process

☐ Learning all along the way, to continually improve based on: evaluating how you are doing, and how you did, with respect to the value creation you planned to achieve and the actual cost to achieve it. AIPM supports every aspect of the process above and Copperleaf's C55 is an excellent example of how to realize that today.

ZNAPZ

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A digital police revolution

Police and Crime Commissioner for Hampshire and the Isle of Wight, Simon Hayes, gives an overview of how technology is improving police services...

When appointed as Police and Crime Commissioner for Hampshire and the Isle of Wight in November 2012, Simon Hayes acknowledged the need to enable Hampshire Constabulary to fully integrate and exploit the benefits of digital technology.

As with all police forces, there is a very real need to continue delivering the highest quality service while facing unprecedented cuts to public services – making modernising policing a priority. The need to embrace digital technology is accelerated by criminals becoming increasingly sophisticated and innovative in their pursuit of criminality, and the pressure to evidence criminal activity and build trust in the police.

Thanks to vital funding from HM Government's Police Innovation Fund, Hampshire Constabulary piloted and rolled out the use of Body Worn Video (BWV) cameras – leading the way both nationally and internationally. BWV has helped gather high-quality evidence to help convict criminals; it deters anti-social behaviour, and is a useful tool in obtaining a visual record of occurrences like domestic abuse and public order incidents. Independent research conducted by Portsmouth University's Institute of Criminal Justice Studies has found that 90% of 1,200 people surveyed believed BWV cameras would help gather evidence, identify criminals and lead to more guilty pleas and successful prosecutions.

The use of mobile data technology (MDT) reduces the time officers spend in the station dealing with administrative tasks, as they have access to systems while on patrol. MDTs enable officers to access vital intelligence to assist them when responding to

Simon Hayes
Police and Crime Commissioner

incidents, allowing them to deal with incidents more efficiently than they would have done without that background knowledge.

Electronic witness statements (EWS) from victims or witnesses of crime can be taken and authenticated at the scene through MDT. This ultimately helps to speed up the criminal justice process, especially as courts are moving to digital case files. This has the added benefit of improving victim satisfaction.

A new electronic tagging scheme is also being trialled in Hampshire with the aim to support the rehabilitation of offenders leading to a reduction in crime. Codenamed START (Short Term At Release Tagging) is currently being run as a one year pilot and is available to offenders given a custodial sentence of less than one year. Its ultimate aim is to change the offender's behaviour and support them through the rehabilitation process and prevent reoffending.

Equipping officers with cutting edge smartphones or tablets, while complying with the necessary security standards, also provides greater flexibility and improved efficiency with the ability for officers to deliver more while 'on the move'.

As the digital revolution evolves, Hampshire Constabulary is continually developing or redesigning Apps that will allow officers to accurately and efficiently complete 'stop and search' information, search internal data recording systems and the Police National Computer (PNC) to obtain the most accurate information.

Simon Hayes comments: "Investing in digital technology and innovation has a vital role to play in modernising policing. As PCC for Hampshire and the Isle of Wight, I am committed to listening to the needs of police officers and the public, reviewing best practice internationally and finding solutions that build confidence in the police and help officers carry out their duties to a high level." ∎

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Delivering the digital policing transformation

A shift to completely digital, paperless operations transforms policing and delivers cashable savings

The needs of public safety organisations are evolving. Police, fire and ambulance services, as well as other public service agencies need to be more efficient and effective than ever before if they are to be successful in an environment of on-going austerity and fast-paced technological evolution.

Work is already underway to address these challenges through the police-led Digital First programme, which aims to enable police officers to record evidence digitally whilst on the beat and upload evidence to their local and national systems. By digitally capturing and storing evidence at the point of reporting, officers can start to build a case file, which can later be drawn from by the Criminal Justice System (CJS). The overall aim is for the complete end-to-end Criminal Justice System to be digital and of course

much of this starts on the front line with our police officers.

Digitisation challenge
The British government estimates that the digitisation work done to date, if fully implemented, could see up to 4.5 million man-hours saved across all forces every year – the equivalent of over 2,100 officers back on the beat. It is therefore vital that new police systems, such as body-worn video cameras, tablets and touch screens used on patrol, produce evidence that is made immediately available to the CJS.

However, local and national police systems were initially designed to meet specific business needs and, aside from notable exceptions such as the Police National Computer (PNC), are rarely integrated. A variety of tech-

nologies have been employed to try and resolve some of the operational challenges by allowing information to be passed electronically to and from the front-line.

To be effective, these technologies require wireless connectivity, which can be limiting due to patchy mobile coverage and limited bandwidth. Moreover, many of the mobile applications developed for PDAs and other mobile devices used by police officers are only addressing a specific process. In practice a single incident can trigger several processes meaning that multiple data needs to be captured and shared between a number of agencies.

Airwave's Pronto
Pronto, delivered by Airwave's wholly owned subsidiary Kelvin Connect, is a digital document and information management tool. It has been designed to significantly reduce the amount of time police officers spend in the back office, and instead allows them to spend more time in their communities. It provides officers with the tools they need to complete a range of activities in the field, rather than having to request information through a third person, or travel back to the station – the so-called 'yo-yo policing' effect.

Combining seamless access to national and local databases Pronto gives officers the ability to conduct

online searches in real time anywhere there is wireless connectivity, and complete all processes digitally in an asynchronous (offline) fashion when there is patchy or no wireless network coverage – mitigating the impact of poor coverage areas.

Nominal information, validated from national systems such as PNC, on a vehicle, person, object or location can be shared multiple times into as many processes as required, based on what the incident is, and submitted into appropriate back-office systems. This alleviates the need for officers to rekey data or return to the station.

Pronto is device agnostic and works on a number of platforms. This alone gives forces the flexibility to use existing technology without the need to purchase new devices. It includes a range of tools that can be tailored to the needs of the force, with an electronic notebook (eNotebook) comprised of a set of smart forms covering all areas of operational police business processes. The application suite includes an Electronic Witness Statement (EWS) application developed in partnership with the Home Office, it enables officers to capture information and images in electronic format. EWS files can be sent wirelessly to a police station or partner agencies such as the Crown Prosecution Service (CPS), and are admissible in a court of law.

Common operational picture

The processes dealt with by the police rarely end at the police station back office. There is almost always an onward step – be it a sudden death report that has to be completed and submitted to the coroner's office or information concerning a vulnerable child or adult that needs to be shared with social services or the local authority. Typically, the process of getting that information to the necessary agency entails the manual entry of information into a paper form that takes several days to arrive at the intended destination.

With Pronto, information captured digitally can be shared in real time to provide a common operational picture across all agencies, subject to agreed information sharing protocols. This means that all agencies can have relevant information to support accurate and timely decision making.

Operational benefits, cashable savings

It is expected that Great Britain's police forces will have had their budgets cut overall by 50 per cent by the next government. As a consequence, forces are spending money to boost their efficiencies, maintain a high level of visibility within their communities, as well as deliver against the Digital First agenda. A quarter of all police forces in Great Britain now use Pronto to support them in these objectives.

And the gains are significant. For example, the time savings in the back office are as much as 8 to 10 minutes per item, with an additional saving of between 25 and 30 minutes when a crime is recorded digitally.

In addition, there is a reduction in the number of requests handled by the control room as officers no longer need to call in for details as the information is available on the device. This means that critical activity can be prioritised and responded to more efficiently, and officers save on average two hours per shift which was previously spent on station-based administration.

Surrey Police is the first force in England within the national Electronic Witness and Digital Signature Pilot Project to present notes and a diagram drawn on an eNotebook's screen as evidence in court. With witness' signatures digitally captured, the vast sums of money invested in re-visiting victims and witnesses to take statements can be reduced dramatically.

From a storage perspective, current mandates mean the seven-year retention of forms and notebooks in a warehouse, as well as additional costs in terms of securely printing forms and disposing of older ones. Conversely, Pronto provides the option for digital documents to be stored in a secure server room.

With the entire end-to-end process digitised, Pronto eliminates activities that are not value-added, avoids instances where data is replicated or re-keyed into multiple business processes, and prevents officers from having to return to the station to complete paper forms. As the digitalisation of policing and the CJS transformation continues, Pronto technology ensures resources can be focused where they are needed most – on the front line.

AIRWAVE

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AMPS (Active Mine Protection Systems)

The Ultimate Active Mine Blast Protection System is Coming

Designed to counteract the devastating mine blast forces at the belly plate of the vehicle, the Advanced Blast & Ballistic Systems AMPS (Active Mine Protection Systems) technology is being developed to provide the ultimate form of armoured vehicle protection against under-belly mines and IEDS's.

A purely British development, fully protected by patents that are being pursued worldwide, the AMPS technology can deal with both the floor deformation and the global acceleration threats to the vehicle occupants. Given that the belly plate is not penetrated, the ABBS systems can provide complete protection from the serious injuries which normally result from even relatively small mines or IED's under vehicles.

The lighter the vehicle, the more severe are the global acceleration effects (the whole vehicle being blown into the air) and the effects can kill, so the ability to essentially eliminate this effect is critically important, and will extend full mine blast protection to even the lightest Special Forces and VIP vehicles.

Equally, the heaviest current military vehicles can also benefit from ABBS's AMPS technology, which is in its final development phase, with full scale vehicle testing due to take place before the end of 2014. The results will be reported in the next editions of Adjacent Government as they become available, but it is already clear that this technology will save many lives and serious injuries, and eventually will change the way that armoured vehicles are designed.

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Searching for the solution

Tony Hall, Defence Journalist, outlines the latest developments from the Norwegian Ministry of Defence for their search and rescue requirements...

In November 2013, the Norwegian government began final negotiations with helicopter manufacturer AgustaWestland for the delivery and through life support of its AW101 aircraft, answering a requirement issued by the Norwegian All Weather Search and Rescue Helicopter (NAWSRH) project.

The choice of the AW101 came at the end of a process that began in 2007. In that year, Norway's Ministry of Justice and Public Security began preparatory work to replace the ageing fleet of Westland Mk43b Sea King Search and Rescue (SAR) and medical evacuation helicopters, which had been in operation since 1973.

Management of the project was a collaborative one from the beginning, reflecting the cross-agency funding of search and rescue operations in Norway. SAR is regarded primarily as a police responsibility, with a lead being taken by the Ministry of Justice. The helicopters also act as air ambulances and as such are part funded by the Ministry of Health. Norway's Ministry of Defence provides personnel and operational support from the Royal Norwegian Air Force (RNoAF), and the Norwegian Defence Logistics Organization (NDLO).

The RNoAF's 330 Squadron has been the unit responsible for providing SAR and medical evacuation services since their introduction in the 1970s, and will be the unit introducing the NAWSRH helicopters into service when they begin delivery as scheduled from 2017.

The squadron currently operates around 12 Sea Kings in 4 flights from 5 bases across Norway, enabling a

helicopter to reach almost any part of the country in 90 minutes. The importance of the RNoAF bases in providing a support infrastructure to the NAWSRH project was emphasised during the procurement process. All candidate companies for the new contract were informed that it would be vital for them to familiarise themselves with each base as part of the bidding.

The need for this breadth of coverage is due not only to size of the country – Norway is 1800 km north to south – it also reflects the fact that SAR has to be able to respond to emergencies off the coast and beyond the Arctic circle, encompassing both the increasingly important oil and gas fields, and the fisheries within Norway's economic zone which extend out to sea for a distance of up to 400 nautical miles.

These challenges were detailed in a concept study completed by the Ministry of Justice in 2010, which assessed specific requirements of the NAWSRH project in preparation for the acquisition that began formally with an offer of bids in October 2011.[1]

The study found that since the SAR service began, demand had doubled every 10 years, with an estimated increase of up to 50 call-outs per year by 2030. Given this acceleration in demand, increased levels of economic activity expected in the oil and gas industries off shore, and the age of the existing Sea King fleet, it was recommended that life of the Sea Kings not be extended any further and that new fleet of all-weather rescue helicopters be acquired, to operate into the 2050s. The helicopters would be large, between 10-20 tonnes, long range, capable of operating in mountains and as fast over sea as they were over land.

The acquisition cost would be around NOK 12bn, with total life cycle costs of up to NOK 39bn over 30 years. As the project began there was an expectation that costs would be mitigated through a joint procurement agreement with Iceland, which was also looking to acquire at least 3 new SAR helicopters. The agreement had been signed in 2007, but in September 2012 Iceland was compelled to withdraw due to domestic

financial problems, leaving the NAWSRH as a Norwegian-only project.

From the beginning of the bidding process there was a requirement that NAWSRH would provide a commercial off-the-shelf solution. Pre-qualification information stated that the aircraft type submitted should have been in operation for at least 5 years, having logged 15,000 flying hours. Candidate companies could present both military and civilian types.

In December 2012 4 bids had been received from Eurocopter, NHIndustries, Sikorsky, and AgustaWestland. By July 2013 the Ministry of Justice announced that AgustaWestland's AW101 Merlin and Eurocopter's EC225 Cougar had been shortlisted. In September Kongsberg Defence Systems added weight to AW101 bid, signing an agreement with AgustaWestland to provide long-term maintenance and testing support to ensure up to 50 jobs and up to NOK 200m a year for Kongsberg, a Norway-based company.

On November 13th the Ministry of Justice announced that the AgustaWestland had been chosen as the preferred bidder. Its statement read: 'The aim is that the contract following final negotiations will be concluded by the end of the year. The contract includes 16 new SAR helicopters with an option for further 6, and ensures that the Sea King will be phased out across the country by the end of 2020'. ∎

[1] www.regjeringen.no/en/dep/jd/agenda/helicopters/nawsarh.html ?id=737609

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When minutes feels like hours

A traumatic scenario

" I'm sitting next to my severely wounded soldier comrade waiting impatiently for the field ambulance. A traumatic situation for all of us – what to do? We are in desperate need to do something for our friend and also for ourselves – it's horrible to just wait. It feels like an eternity".

Unfortunately this is not a unique scenario. Traumatic incidents affect everyone involved both the injured and bystanders. However, research has shown that 'eliminating' the feeling of uselessness by proceeding with determined actions minimises the risk of being severely traumatised.

The last four decades the focus of casualty evacuation (CASEVAC) and medical evacuation (MEDEVAC) has increased as a result of nations being engaged in conflicts far away from their own countries, an increasing number of terrorist actions and large nature catastrophes. With an almost ever-present media transmitting images of people in distress or of seriously wounded or even deceased into our living rooms, it is vital for nations to have satisfactory routines, procedures and equipment. Authorities need to assure soldiers and citizens that they are able to take care of their own people when wounded abroad, and bring them home for treatment and recovery.

After more than 60 years developing the routines and procedures, both within each nation and within coalitions, one would assume that terms

Photo: Erik Skjerven Defence Media Archive

and abbreviations as well as equipment interfaces would be harmonised between nations to ensure interoperability, flexibility and cross training.

A lot has been done in the past 20 years to achieve this. NATO has developed standards for equipment as well as terminology; several yearly conferences – both military and civilian organised – contribute to the transfer of knowledge and experience between services and nations.

Nevertheless, most nations still have huge areas of improvement before they can claim perfection.

Standardisation and harmonisation between services and nations

While trying to ensure interoperability of services as well as national forces,

we know that it is impossible to meet all interests. For example, the infantry soldiers want super-light and compact stretchers. For the vehicle operator it is vital that the stretcher fits into the actual stretcher support in the vehicle. The helicopter or aircraft operator needs a stretcher approved for aerial evacuation, while the wounded soldier has the best chances of survival and least pain if he is brought throughout the chain of evacuation on the same stretcher. Very often the result is different stretchers in different services, which arguably does not serve the patient.

Can the industry contribute to the process of harmonising, equipment, and assist armed forces in developing and maintaining flexible solutions with high capacity across services and nations?

Some potential CASEVAC-units:

There is a significant level of expertise and knowledge in the industry as well as in the medical services. NODIN Aviation suggests that this knowledge can catalyze the best solution for the customer and the industry can further improve their services to their customers by:

• Developing collaboration between companies to extend competence and capacity;

• Participating in arenas where the customers share their experience in field;

• Knowing, understanding and being loyal to applicable standards when designing solutions;

• Focusing on the patient and the medics, not the equipment, when doing innovative design solutions.

What can the customers do to make the suppliers better prepared to develop solutions, products and services that meet the needs of the patients?

NODIN suggests to:

• Improve the arenas where users share their experience in patient evacuation;

• Allow and encourage informal discussions between users and

industry, enabling industry to fully understand the need;

• Describe the issue and/or the need, not the solution. The best solutions may not yet have been invented.

There is a significant effort in many nations to improve their CASEVAC and MEDEVAC capability and if these activities are fairly coordinated the international community will see a huge increase in the total capacity to bring injured people out of disaster areas.

Back to the introductory traumatised scenario

As a company focusing on products and concepts for CASEVAC and MEDEVAC in wars and catastrophes we are obliged to support with solutions focusing on the patient, the medics and everyone involved when developing innovative and first class solutions.

Our new CASEVAC KIT was developed to change the role of any vehicle and mobile platforms in the battlefield or catastrophe area. The KIT consists of a four-folded Field Stretcher and a Shock and Vibration Damped Stretcher Suspension System, all packed in a handbag. Using this kit, a vehicle or any mobile platform will be converted into a CASEVAC-Unit in 1 to 2 minutes.

The MEDEVAC Field Stretcher is designed and manufactured in accordance to military and civilian requirements for all platforms on land, at sea and in air.

In addition to increase the evacuation capacity this solution enables the comrades of the wounded soldier to contribute in a positive way and the action itself make the soldiers handle the traumatic situation better.

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Acadamisation of care

Social and epidemiological changes present major challenges to the health systems of the Western industrial countries and, thus, also to the German health system. Read how Pfalzklinikum is tackling these challenges...

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INDEX

STEM CELLS AND IMMUNITY:

Stem cells, Chromosomal instability and Cancer

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Stem cell research today is driven mainly by regenerative medicine and cancer stem cell (CSC) biology. We aim to understand the biology of stem cells and to analyse the genetic and epigenetic alterations generated in the context of cancer, as well as their ability to act as immunosuppressant.

In addition, we try to reveal the connections between chromosome alterations and the stem cell theory of cancer, by studying the combination of genetic defects termed chromosome instability (CIN) that is found in approximately 85% of non-hereditary carcinomas.

Finally, in an attempt to identify conditions in which adult stem cells can be used to replace malfunctioning organs in the body, we have shown that adult heart contains a resident non-cardiomyocyte population of Bmi1-expressing stem cells (B-CSCs). This novel population shows enriched expression for critical multipotency and stemness markers and contributes to the generation of de novo cardiomyocytes throughout life.

Thus, we would like to get more precise information on the B-CSC population for a final evaluation in clinical trials.

CNB
CENTRO NACIONAL DE BIOTECNOLOGIA

THE KEY TO COMMUNICATION IN RESEARCH AND SOCIETY

Innovative communication methods for
people born both deaf and blind

In collaboration with the Kentalis Deafblindness Center of Excellence, seven PhD students
from the University of Groningen, are attempting to create strategies and techniques to
help people with congenital deafblindness to communicate at higher levels, by sharing
experiences and emotions with their daily carers.

Our research group is concentrating on real life settings and examples to find the key for
unlocking effective means of communicating for deafblind individuals.

To find out more, visit: **www.rug.nl/staff/h.j.m.janssen** and **www.kentalis.nl/deafblind**