Promoting clean energy in the Navajo nation

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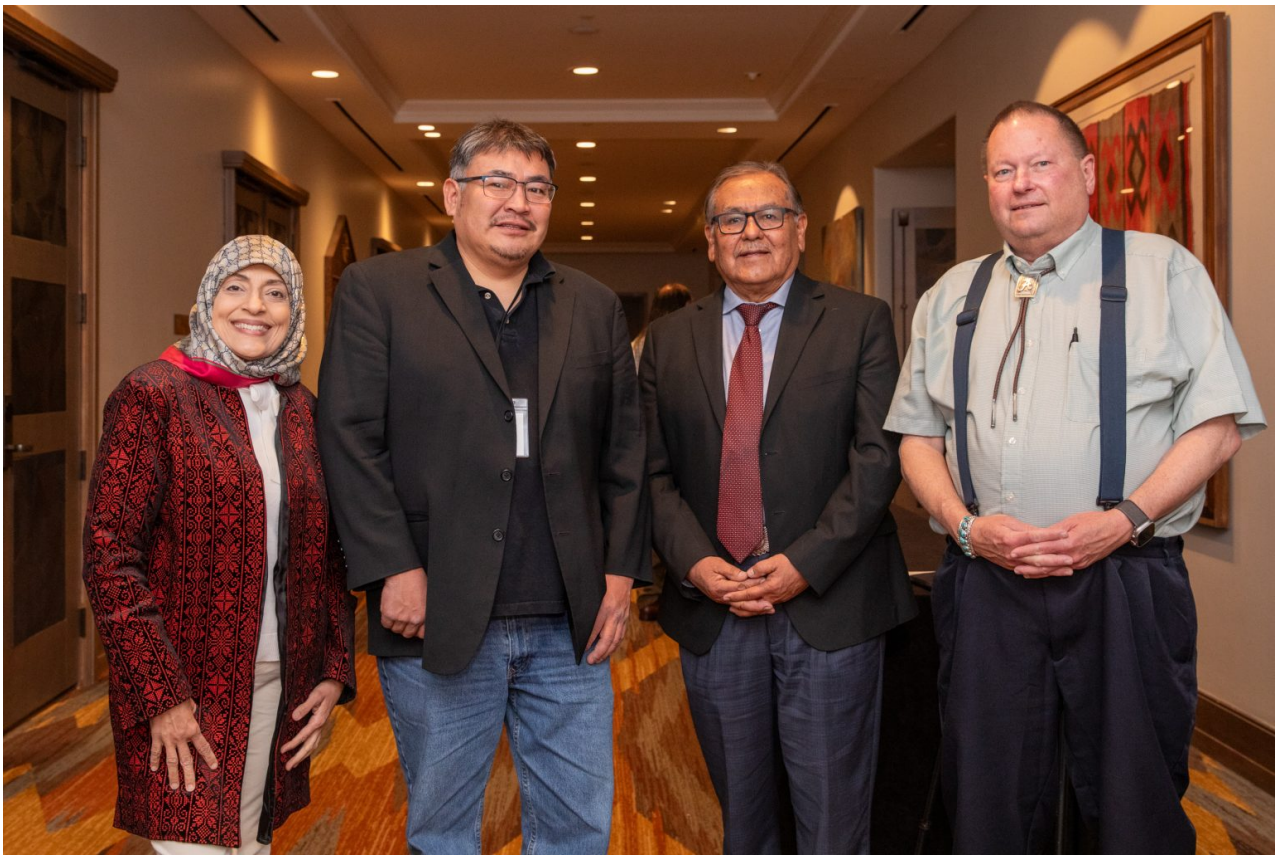
25 June 2024



Navajo Technical University leaders at the Workshop on Convergent Clean Energy Research. Right to left, Dr. Peter Romine, NTU Electrical Engineering, Dr. Elmer Guy, President NTU, Darrick Lee, NTU Energy Systems. Dr. Wafa Hozien, former NTU Graduate Dean.

University President Elmer Guy examines the vital role of educational institutions like Navajo Technical University in empowering communities and supporting their efforts to achieve clean energy development goals

The Navajo Nation encompasses more than 25,000 square miles of desert and scrubland in the southwestern US. The Navajo People, or Diné as they refer to themselves, have long advocated for self-determination. Through the Navajo Technical University (NTU), the Navajo community has the ability to educate its youth in line with its traditions, cultures, and beliefs. However, the lack of Navajo engineering faculty results in a scarcity of role models for engineering students.

Dr. Peter Romine, Head of Electrical Engineering at NTU and founder of the Electrical Engineering program has established an engineering graduate program to train Navajo engineers who will inspire the next generation.

How NTU serves the Navajo

NTU, as an educational institution, is not just a provider of knowledge but a catalyst for change. “Education was used as a colonisation tool against the Navajo,” Dr Romine points out. As a tribal college, NTU is a testament to the Navajo’s resilience and determination.

“NTU is decolonising education,” says Conrad Begay, a Pre-Engineering Instructor and an engineering student in NTU’s new graduate program. The teaching approach at NTU is unique, rooted in Diné philosophies and values, and it incorporates Diné culture and language, ensuring that the community is at the heart of every lesson.

Conrad expresses the significance of NTU by emphasising that it allows students to stay connected to their home and community, offering affordable education that keeps families together.

The importance of electrical engineers amidst the climate crisis

Electrical engineering, a field that encompasses the study, design, and use of equipment and systems that harness electricity, is at the forefront of the battle against the climate crisis. Electrical engineers, with their ability to design, build, improve, and repair electrical equipment, are instrumental in our daily lives. As we navigate the challenges of the 21st century, our dependence on electricity and technology is only set to increase, underscoring the vital role of electrical engineers in shaping a sustainable future.

“Engineering is a tool for economic development,” says Dr Romine. “Training Navajo engineers and creating engineering jobs within the Navajo Nation will give young people the opportunities to stay and improve their local economy.”

The shift towards cleaner, renewable energy sources requires the expertise of electrical engineers to develop technologies for generating electricity from sources like solar, wind, and geothermal power. Additionally, these professionals work on efficiently transmitting this electricity for use in homes and industries.

As more Navajo individuals are trained to become engineers, they will serve as advocates for the community, emphasizing how engineering can empower the Navajo Nation.

Clean energy and the Navajo Nation

In the past, coal mines and coal-fired power plants provided jobs and electricity for the Navajo Nation. The local economy suffered when these mines and power plants closed, as many people lost their jobs, and the Navajo Nation lost revenue from the coal mines and the power plants. Dr Romine hopes that the Navajo Nation will now build a new economy based on clean energy resources.

NTU’s electrical engineering program focuses on renewable energy as it aims to develop a workforce that is educated and trained to provide clean energy to the nation. “Electrical engineering can help our Navajo People build solar farms to regain power on the

reservation," says engineering student Jordan Largo. "This will provide solar economic opportunity for our Nation."

The shift from coal to clean energy will not only boost the local economy by creating new jobs but also benefit the local environment. Abandoned coal and uranium mines continue to pollute Navajo lands and waters. Embracing clean energy sources will enable the Navajo to meet their energy needs without causing further harm to the surrounding landscape and wildlife.

The Workshop on Convergent Clean Energy Research

In an effort to address critical energy challenges facing sovereign and prosperous tribal nations, the Workshop on Convergent Clean Energy Research was recently convened in Santa Ana Pueblo, New Mexico. Sponsored by the National Science Foundation and organized by Microgrid Systems Laboratory, Seattle University, Navajo Technical University, and the Rochester Institute of Technology, the workshop brought together leading experts and stakeholders in the field.

The two-day event, held in March, featured keynote addresses, breakout sessions, and panel discussions focusing on various aspects of clean energy development and research agendas.

During the discussions, participants focused on energy sovereignty, tribal sovereignty, and the challenges in clean energy development. This includes various renewable energy sources such as solar, wind, water, and geothermal. David Breecker, President of Microgrid Systems, led the workshop, while Mara Schindelholz, a program director with the National Science Foundation, highlighted the workshop's objective of understanding the technical challenges, cultural values, and workforce development needs associated with clean energy adoption by tribal nations.

Dr Romine participated in the workshop and discussed the workforce's need to address these challenges, emphasizing the importance of developing both technical and non-technical research agendas. The focus is on ensuring that research efforts are respectful, transformative, and mutually beneficial to tribal communities. "Efforts must be grounded in the principles of sustainability and cultural sensitivity to truly empower tribal nations in achieving their energy visions," he said.

At a keynote address, Navajo Technical University President Elmer Guy emphasized the importance of research in real-world applications. He highlighted the contributions made by faculty members across various disciplines, such as biology, microbiology, advanced manufacturing, and environmental science.

Guy stated that these efforts, which are based on community needs and cultural awareness, exemplify the university's dedication to advancing the wellbeing and unity of the Navajo Nation through research-driven innovations. He reiterated the university's ongoing commitment to progress, acknowledging that significant endeavours are still to be pursued at Navajo Technical University.

Workshop participants included tribal leaders and clean energy experts from Alaska to Washington, DC.

Breakout sessions delved into designing technical and non-technical research agendas, followed by a working lunch presentation from the Sustainable Native Communities Design Lab. The event culminated in a panel and plenary synthesis session, where panelists discussed the intersection of research and practice in addressing the energy needs of tribal communities.

The workshop received praise from participants in academia, federal research facilities, and tribal energy sector organizations. It provided a platform for collaboration and knowledge-sharing, empowering Indigenous communities to tackle energy challenges while upholding cultural values and traditions. The workshop's outcomes will be documented in a white paper outlining a research and workforce development agenda aimed at promoting the development of clean energy to support prosperous and sovereign tribal nations.

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