Energy storage solutions samoa

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The Battery Storage and Grid Integration Program (BSGIP) hosted two research scientists from Samoa recently to help build capacity and strengthen the island nation"s ability to meet climate and energy challenges. The researchers spent valuable time in BSGIP"s state-of-the-art Battery Materials and Energy Storage Laboratory (Battery Lab) with Associate Professor Alexey Glushenkov.

The researchers, Mr Faafetai Kolose and Ms Aiomanu Penaia, are leading energy storage research within the Renewable Energy Division of the Scientific Research Organisation of Samoa (SROS). Associate Professor Alexey Glushenkov, and his team, spent time advising them and supporting their research aims.

"It was a pleasure to host the Samoan researchers in the Battery Lab and engage on various aspects of battery development," said Associate Professor Glushenkov. "We also had a gainful discussion on the nickel - iron battery chemistry the Samoan team is pursuing.

"The battery materials group is looking forward to visiting Samoa to continue working with the local team on the nickel – iron battery development."

Samoa is in the midst of an energy transition. With relatively high energy prices, the push for renewable energy is seen as a way to help reduce cost of living pressures and increase resilience to fossil fuel shocks. In 2021, Samoa achieved 45 per cent installed renewable power generation. This figure has been increasing year on year. Samoa has a target of 70 per cent renewable energy use by the end of 2031, transitioning to a mix of solar, wind and hydropower augmented by battery storage.

Context is crucial when considering what technologies are appropriate for any given situation. "Currently we have Tesla Power packs, but we don"t have a say about that battery. If anything is wrong, the Tesla team is contacted to fix it. I wanted to look at options that suit the Samoan context and Samoan people," said Mr Kolose.

Mr Kolose was working as a physics lecturer at the National University of Samoa when he was approached, some year ago, to explore ways to store the excess solar that was being produced abundantly in the country. "We were producing a lot of solar, too much solar," said Mr Kolose. "We needed a way to store it. I started researching storage solutions that would be suitable for Samoa and could be operated by Samoans," said Mr Kolose.

"I became very interested in the nickel - iron battery, also known as the Edison battery. This battery is known for its robustness and longevity. We"ve successfully developed a small-scale prototype of the Edison battery.

The next step is to refine the design and put in place appropriate processes for testing each material before assembling the battery," said Mr Kolose.

According to Mr Kolose the key concerns for battery technology in Samoa are durability, cost effectiveness, battery longevity, and access to critical minerals and other battery parts. "There may be more advanced, more expensive alternatives but we need to consider what works best in our context," said Mr Kolose.

"In Samoa, a research initiative to create battery storage locally for renewable energy is a relatively new idea," said Ms Penaia. "A limitation we face is that we do not have the cutting edge equipment that a Battery Lab should have but through this opportunity we are grateful to Alexey and his team for giving us access to the lab equipment so we could test things in practice. We had the theory, but it is another thing to put the theory into practice," said Ms Penaia.

"Alexey really helped us understand simpler alternatives that could work for our situation. For example, utilizing the abundant source of local, organic material, such as coconut shells to make a super capacitor," said Ms Penaia. "The coconut shells, something we have in plentiful supply, can be used to create activated carbon which is then used as an active material in battery cell assemblage."