



# Vision Mātauranga case study: Te ahuru Mowai

Ramesh Rayudu<sup>1</sup>

<sup>1</sup> School of Engineering and Computer Science, Victoria University of Wellington, Wellington

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Future Architecture of the Network  
c/o University of Canterbury  
Private Bag 4800  
Christchurch 8140  
New Zealand

Email: [futurearchitecturenetwork@canterbury.ac.nz](mailto:futurearchitecturenetwork@canterbury.ac.nz)

Web: <https://www.fan.ac.nz/>

## **About FAN**

Electricity and electrification are seen as the significant enablers for decarbonisation of our nation. The Future Architecture of the Network (FAN) | Te Whatunga Hiko programme aspires to meet the challenges the electrical power system will face as we journey towards sustainable decarbonisation.

Our vision is to provide an infrastructure paradigm through a hybrid AC/DC transmission and distribution system that meets the needs of tomorrow's efficient, low-carbon, reliable and resilient electrical power system.

With a brief unconstrained by the present technical and economic limitations, and a horizon of 2050 and beyond, the programme is ambitious in its goals to deliver significant knowledge and capability development; transition pathways; new technologies; and input into design processes, standards and regulations.

Funded as part of the New Zealand Government's Strategic Science Investment Fund (SSIF) on Advanced Energy Technology Platform (AETP), the research team is investigating what the future electrical power system might look like. The main hypothesis is that high penetration of DC transmission and distribution (conveyance) into the AC grid will provide many benefits to transition to a low-carbon power system. The major research challenge is to determine the future architecture, topology and a transition pathway.

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## **Disclaimer**

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# Case study

This case study was done for Ngāti Toa for Te Ahuru Mowai. This project was performed as part of FAN's VM strategy and involves Te Ahuru Mowai housing portfolio. SSIF's contribution is mainly in concept, application to MREF, design and project execution. The project is mainly funded by MBIE MREF. The case study was mainly performed to support the urban Māori housing energy. Energy poverty is a big issue in urban and rural Māori, and this project was proposed to provide support for addressing the issues.

Our proposal involved solar and battery as a solution for multiple dwellings. We have also proposed to install an in-house developed controller that would sense excess solar and divert the energy to heat the electric water heater.

All aspects of the research have been completed except for the controller installation (scheduled for 2025 summer) and energy and well-being analysis (ongoing). Once the project was successfully funded by MBIE MREF, we have shortlisted the installer through a tender process. We have then selected the dwellings based on some factors such as residents' income, roof stability, and insulation of the house. 21 potential dwellings were selected. The installation took almost a year to complete. By the end of the contract, 16 dwellings were installed with solar and battery.

The collaborators were MBIE Māori Renewable Energy Fund, Te Ahuru Mowai (Ngāti Toa), Victoria University of Wellington, Solar Zero (installer), MOTU and FAN.

The results include completion of installation of solar and batteries for the identified dwellings, operation of installed units and, after ten months of installation, an energy analysis of the dwellings.

Both Te Ahuru Mowai and the renters in the installed dwellings are using the results of this project. The energy analysis conducted after 10 months of activity is shared with the users of the technology. There was a combined savings of close to \$19000 for the ten-month period. The analysis revealed that the savings achieved is dependent on the choice of energy providers. This and other findings were communicated with persons living in the dwellings.

The future work on the project includes installation of the hot water cylinder controller and wellbeing analysis of the residents.