

Taking charge in electricity research

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Dr Rebecca Ford, from the School of Engineering and Computer Science, is part of a nationwide research team exploring the future of electricity supply and consumption in New Zealand.

The GREEN Grid project, funded by the Ministry of Business, Innovation, and Employment (MBIE), is a wide-ranging investigation into how New Zealanders use power, how demand can best be met using renewable sources, and how the national grid can be made smarter and more efficient.

Joining researchers from Auckland, Canterbury and Otago universities, Dr Ford will be helping to explore the potential development of a Smart Grid, which incorporates information and [communications technology](#) into New Zealand's electricity infrastructure—advancements which, she says, are well overdue.

"We've currently got electricity infrastructure which is relatively 'dumb', in the sense that we have some elements of control but we don't really know what's going on throughout the entire network," says Dr Ford.

It's hoped that improved information about electricity flows will lead to increased flexibility and efficiency within the grid, putting more control in the hands of consumers and the industry.

"A consumer who had a smart meter would no longer get a bill once a month, but would be able to log on and see a chart of how much electricity they're using every day."

Dr Ford says a better understanding of how and when consumers are using power would equip them to have greater control of their electricity energy usage.

Power companies would also benefit from the information gathered by smart meters she says. It would provide them with a greater understanding of both their customer's needs and the needs of the network in general.

Dr Ford says in the future this knowledge could lead to financial incentives for customers to use power in off-peak times when the network is under less strain. While this is not currently an option in New Zealand, the development of smart appliances could mean it is not far off.

"More and more home appliances are being developed with information and communications technology which means they can be switched on and off remotely. With this level of control, consumers could choose to run energy hungry appliances during off peak, lower cost periods to decrease their power bill and help out the network."

Household electricity usage has been the focus of Dr Ford's research, who completed her PhD in engineering at Oxford University with research that looked at how people can better manage the way they use energy in their homes.

"With our research, we want to get a better idea of what people are doing, how they're using their appliances and then what options they have for better managing them and shifting patterns of demand. This could help people save energy and money, and could also help improve our overall management of the [electricity grid](#)."

The research will inform new operating models for the wider [electricity](#) system which are being investigated by the New Zealand Smart Grid Forum, a group of industry stakeholders and customers. The Smart Grid Forum, established by MBIE and the Electricity Networks Association, is also looking at the infrastructure and commercial arrangements needed to benefit from new operating models.

Provided by Victoria University

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