

Investigating the future of electricity in Australia

Developing and exploring potential scenarios for Australia's energy future and supporting the decision-making process around next steps.

The challenge

The electricity system is central to Australia's modern lifestyle and economy. However, it is at a significant crossroad, facing complex and unprecedented challenges. These challenges include efficiently and securely decarbonising electricity generation, improving customer bill outcomes, and preparing for rapid adoption of new technologies such as solar, storage and electric vehicles.

Many studies and reviews have evaluated the drivers of change now affecting the system, but most have focused on specific parts of the system or on the perspective of particular stakeholders. Australia's electricity sector agreed that given the challenges it faced, a whole-of-system evaluation was essential.

Since 2007 the average household retail electricity price has increased by two-thirds.

The response

In recognition of the extraordinary circumstances of this time in the electricity sector, CSIRO convened the Future Grid Forum (FGF) in 2012 to develop and explore potential scenarios for Australia's energy future. The forum brought together more than 120 representatives of every segment of the electricity industry, as well as Federal and State governments and community stakeholders, to inform and inspire a national conversation and provide a way forward.

While the FGF identified the key alternative futures and broad responses, CSIRO recognised that a process was required to develop more detailed steps for responding to the industry's changing circumstances. To this end, following the FGF, CSIRO and Energy Networks Australia (ENA) partnered in 2015 to develop an Electricity Network Transformation Roadmap (the Roadmap) – a blueprint for transitioning Australia's electricity systems to enable better customer outcomes.

The impact

The FGF and Roadmap research identifies key milestones to be achieved through a set of detailed actions by businesses, policy makers, and regulators as part of an integrated pathway for Australia's energy transition over the next decade. CSIRO's FGF and Roadmap research has the potential to lead to a range of impacts, including reduced household electricity bills, reduced electricity system expenditure, and reduced greenhouse gas emissions.

The overall benefits of the FGF and Roadmap research depend crucially on the adoption and actual achievement of the projected benefits.

Based on particular adoption assumptions, estimates suggest that the real project expenditure of \$3.0 million by CSIRO could lead to:

- ♦ Total benefits (in real, present value terms) between \$7.8 million and \$30.3 million;
- ♦ Net benefits between \$4.6 million to \$27.3 million; and
- ♦ A return on investment ratio between 2.5:1 and 10:1.

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AT CSIRO WE SHAPE THE FUTURE

We do this by using science to solve real issues. Our research makes a difference to industry, people and the planet.

WE ASK, WE SEEK, WE SOLVE.

FOR FURTHER INFORMATION

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