

# Case Study:

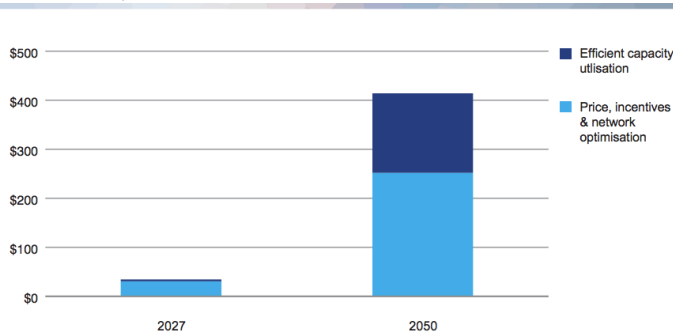
## Supporting Australia's Market-Based Roadmap Towards a Radically Transformed Grid

### BACKGROUND

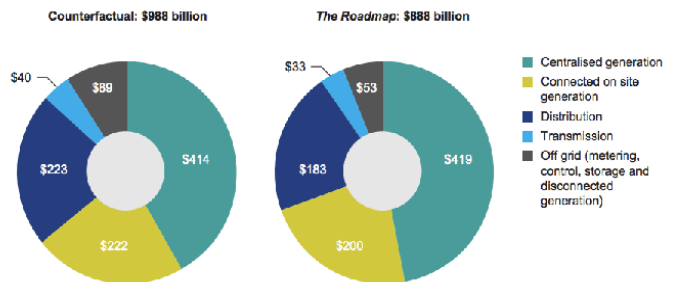
Australia is in the throes of a consumer energy revolution that is, in many respects, at the forefront of trends transforming how the world produces and consumes its energy. CSIRO, Australia's national science agency, and Energy Networks Australia, the national industry association representing Australia's electricity transmission and distribution businesses, embarked on a deliberate process to make sure that Australia's grid adapts to these changes in a manner that is fair, minimizes costs to consumers, allows for more choice and control, and enables deep decarbonization.

CSIRO and Energy Networks Australia engaged Strategen to support this process, and in particular, to provide a close look at distribution-level markets and more dynamic retail structures designed to enable economic incentives for distributed energy resources (DER) to contribute to network optimization.

Projected savings in average residential bills under the roadmap scenario



Cumulative electricity system total expenditure to 2050 - roadmap & counterfactual scenarios



### APPROACH

Strategen conducted an extensive research effort to determine some of the global best practices that could be applied to the Australian context. This research examined future visions of the grid around the world, looking at pilot DER aggregation and management projects and innovative DER service valuation and procurement mechanisms. The objective was to develop a roadmap over the next decade that enabled a balanced scorecard of outcomes underpinned by increased consumer choice and control.

On the basis of this research, CSIRO and ENA developed a roadmap of the no-regrets actions that network operators, government regulators, policymakers, and industry participants should take over the coming years to support Australia's future grid, and the advanced retail markets necessary to enable DERs to be valued for the services they provide. Strategen provided key inputs to this roadmap, from global best practices to a series of recommended short, medium, and long term actions that should be taken to unlock the role that DER can play on the grid, from controls and informatics, to dynamic retail level energy markets.

#### Illustrations:

Graphs - Electricity Network Transformation Roadmap: Key Concepts Report, December 2016, ENA and CSIRO

Table - Framework for Network Optimization & Unified DER Value Streams in Australia, 2016, Strategen Consulting

### RESULTS

The rationalization of all forms of procurement mechanisms, controls, and other value streams for DER into a set of cohesive and dynamic market participation mechanisms is, in Strategen's view, an essential component of achieving a vibrant, well-functioning grid in a high DER environment. In the case of Australia, one of the conclusions of Strategen's effort is that the end goal should be a unified, laminar set of participation mechanisms and value streams that revolve around network optimization at both the distribution and transmission levels.

	Contracts	Markets	Controls
Power System Needs	Non-wires Alternatives for Infrastructure Planning	System Optimisation and Balancing	System Operations
Time Scale	Years/months	Day Ahead/Hourly/15-Minute/5-Minute	Minutes, seconds, sub-seconds
Transmission (Bulk System)	Reverse Auctions for DER: Non-wires alternatives procurement mechanisms (forward contracts) WMP must-offer obligations	Wholesale Market Platform (WMP) Aggregated DER Participation	Interconnection Requirements (e.g. smart inverters, ramp rate, etc.) Marketised Dispatch Signals For Aggregated DER via WMP
Distribution (Local System)	Reverse Auctions for DER: Non-wires alternatives procurement mechanisms (forward contracts) NOM Contracts Control Requirements, managed by DERMP DNOM must-offer obligations	Digitised Network Optimisation Market (DNOM) Direct DER Participation	Interconnection Requirements (e.g. smart inverters, ramp rate, etc.); managed by DERMP Marketised Dispatch Signals for DER via DNOM
	Exists Today	Short/Medium Term (~5 years)	Long Term (~10+ years)