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ENERGY MARKET Newsletter

ACIL ALLEN

Energy Consumers Australia – Case Studies

by Marianne Lourey

Electrification policy often focuses on the willing consumer who just needs the right nudge, but when you sit down with small businesses and ask them what's going on, a more complicated picture emerges. We recently developed a series of case studies for Energy Consumers Australia, speaking with 5 businesses across distilling, early learning, hospitality and advisory services. What they told us challenges some of the core assumptions underpinning current policy settings.

Motivation isn't the main barrier. Some of the businesses we spoke with were genuinely open to electrification but couldn't act. A Perth distillery had already committed to gas-based equipment that was working well. A regional Victorian cafe wanted to reduce costs but had no financial room to invest. A Canberra restaurant found itself moving into new premises that were all-electric, with limited say in the matter.

Structural constraints are just as significant. Many small businesses don't control the buildings they operate in, which means they don't control their energy systems either. A Melbourne advisory firm operating in a co-working space had no realistic electrification pathway short of relocating entirely. When policy treats electrification as an individual business decision, it misses this entirely.

Information gaps are also real and persistent. Businesses struggled to find trusted, sector-specific guidance. One restaurant couldn't locate commercial-scale electric wok equipment locally. Another only engaged with solar because of repeated cold calls.

The clear takeaway from this work is that the system currently places too much risk and complexity on individual businesses. Better alignment between planning rules, incentive programs, commercial property arrangements and retail protections is what will actually move the dial.

You can read ECA's full commentary and download our case studies at the link below.

See Energy Consumers Australia's blog post here.

Read more

The Cheaper Home Battery Program: Winners and Losers

by Cara Chambers

Since launching on 1 July 2025, the Cheaper Home Battery Scheme has driven a remarkable acceleration in residential battery uptake. In just 7 months, over 250,000 installations were completed, matching five years of prior accumulated installations. Average battery sizes have more than doubled to 24 kWh, and the scheme has added 6 GWh of distributed storage capacity, equivalent to a quarter of all grid-scale battery capacity in Australia's main electricity markets.

Projections point to a further million installations and 25 GWh of additional capacity by the end of 2030.

Benefits to the electricity system

Home batteries offer real system-level benefits. They absorb rooftop solar exports during the day and discharge during morning and evening peaks, reducing reliance on coal and gas generation and lowering grid emissions. At sufficient scale, they could ease the path to the 82% renewables target and defer future investment in grid-scale infrastructure.

They also act as a hedge against transition risk. Unlike large-scale renewable energy and storage projects and transmission projects, which face delays and long lead times, home batteries are rolling out quickly and can help absorb demand pressure across a range of scenarios.

The cost question

The unsubsidised cost of distributed battery storage is roughly twice that of grid-scale alternatives. Network savings are unlikely to bridge that gap, since battery households remain connected to the grid and still require the supporting infrastructure.

Who benefits?

The most direct beneficiary is the installing household, which receives immediate bill reductions. However, most batteries are not aggregated into virtual power plants (VPPs), limiting broader market benefits. There is a tension between individual owners maximising personal returns and the collective benefit of VPP participation, which puts downward pressure on wholesale prices.

More broadly, batteries may flatten consumption profiles for households with solar batteries, reducing retail supply costs and creating conditions for lower bills across the market (all other things equal).

Key stakeholders will be watching this development closely. The Australian Energy Market Commission (AEMC will be attuned to its implications for tariff reform. The Australian Energy Regulator (AER) and regional regulators including the Queensland Competition Authority (QCA) and Victorian Essential Services Commission (ESC), which set price caps and regulate retail tariffs, will factor these dynamics into their determinations, and new and existing retailers will need to adapt in an increasingly competitive market offering innovative products and services.

You can read more about the Cheaper Home Battery Program here.

Read more

Understanding the Emerging Challenge in the Energy Sector

by Jiao Wang

Modern economies rely on tightly interconnected critical infrastructure, where the performance of one sector depends on others through complex upstream and downstream relationships. Energy systems occupy a foundational role in this network, powering telecommunications, banking and finance sectors, data centres, space technology and geospatial technologies.[1]

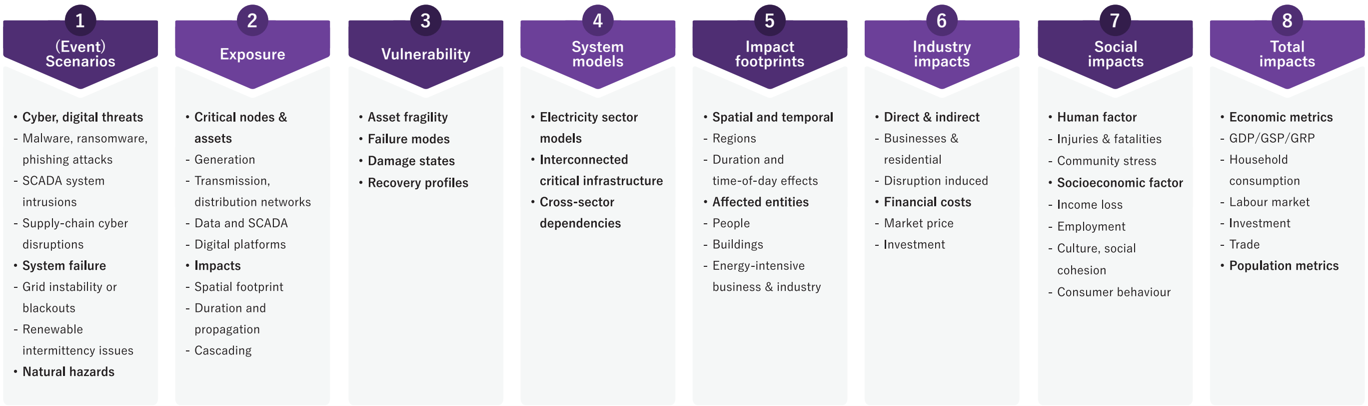
Australia's energy landscape is undergoing a rapid structural transformation. Accelerated electric vehicle adoption, expanding data centres and digital infrastructure, and the national transition to renewable energy are driving rising electricity demand and reshaping the business and industry landscape. Unlike traditional centralised generation, renewable energy assets are distributed and variable, relying on digital control and SCADA systems for real-time monitoring, forecasting, dispatch, and grid stability (voltage and frequency).

This convergence of energy and digital infrastructure introduces new systemic vulnerabilities. Disruptions are increasingly systemic rather than isolated, with failures capable of cascading across sectors through shared physical, digital, logistical, and economic dependencies. Initial disruptions are often invisible – cyber intrusions, corrupted data, or supply-chain vulnerabilities can propagate unnoticed, creating interdependency failures across sectors beyond the energy sector itself.

As a result, critical energy infrastructure rarely fails in isolation. Small failures can trigger non-linear consequences, exceeding traditional risk thresholds and challenging conventional business continuity planning. For the energy sector, deeply intertwined with telecommunications, cloud services, and digital control systems, organisations face an urgent need to design risk strategies that account for cross-sector dependencies, cyber threats, and cascading system impacts.

Navigating this complexity requires risk frameworks that move beyond traditional asset-level analysis. Integrated approaches such as drawing on economic analysis, systems modelling, and infrastructure risk modelling, can help organisations map interdependencies across generation, transmission, distribution, and digital systems; identify cascading risk pathways before they materialise; and support evidence-based decisions on business continuity and risk governance. This is particularly important as energy systems become more deeply embedded in cyber-connected environments where the boundaries between physical and digital risk continue to blur.

Energy Sector Cyber-Risk Impact Framework



1 (Event) Scenarios

- **Cyber, digital threats**
  - Malware, ransomware, phishing attacks
  - SCADA system intrusions
  - Supply-chain cyber disruptions
- **System failure**
  - Grid instability or blackouts
  - Renewable intermittency issues
- **Natural hazards**

2 Exposure

- **Critical nodes & assets**
  - Generation
  - Transmission, distribution networks
  - Data and SCADA
  - Digital platforms
- **Impacts**
  - Spatial footprint
  - Duration and propagation
  - Cascading

3 Vulnerability

- **Asset fragility**
- **Failure modes**
- **Damage states**
- **Recovery profiles**

4 System models

- **Electricity sector models**
- **Interconnected critical infrastructure**
- **Cross-sector dependencies**

5 Impact footprints

- **Spatial and temporal**
  - Regions
  - Duration and time-of-day effects
- **Affected entities**
  - People
  - Buildings
  - Energy-intensive business & industry

6 Industry impacts

- **Direct & indirect**
  - Businesses & residential
  - Disruption induced
- **Financial costs**
  - Market price
  - Investment

7 Social impacts

- **Human factor**
  - Injuries & fatalities
  - Community stress
- **Socioeconomic factor**
  - Income loss
  - Employment
  - Culture, social cohesion
  - Consumer behaviour

8 Total impacts

- **Economic metrics**
  - GDP/GSP/GRP
  - Household consumption
  - Labour market
  - Investment
  - Trade
- **Population metrics**

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[1] https://www.cisc.gov.au/legislation-regulation-and-compliance/soci-act-2018

The Plexos modelling platform

by Cara Chambers

Plexos is a globally recognised energy market simulation engine providing analytics and decision-support across electric, water, gas and renewable energy markets.

ACIL Allen deploys the Plexos modelling platform where least cost planning approaches to modelling are required, such as in Transmission Investment Test for Transmission (RIT-T) assessments.

Recently, ACIL Allen has been engaged by clients such as Transgrid, the Australian Energy Regulator (AER), and APA, to undertake RIT-T assessments of network and generation assets in the National Electricity Market (NEM).

ACIL Allen has developed an in-house model for RIT-T assessments, which draws from the Australian Energy Market Operator (AEMO) Integrated System Plan (ISP) model. The AEMO ISP dataset forms the basis for the detailed long-term (DLT) planning component of the ISP and has been used in the past as the basis for RIT-T assessments.

ACIL Allen's modelling framework allows us to model the NEM at three levels, encapsulating long-term investment (typically in 7-year steps), medium-term operational decisions (typically in annual steps), and short-term operational constraints (typically in hourly steps):

The detailed long term (DLT) planning component within Plexos is used to produce the generator and transmission development program, which is consistent with the RIT-T application guidelines. The DLT divides the modelling horizon into multiple steps (4, 7-year blocks) which are optimised sequentially. The shorter optimisation windows allow a chronological optimisation of each day of the modelling horizon that preserves the original chronology of the demand and renewable resource time series, ensuring a more detailed representation of demand and variable renewable energy (VRE) variability. Demand and VRE profiles are represented using a fitted chronology.

The DLT utilises a sub-regional representation of the NEM as shown in the figure to reflect current and emerging intra-regional transmission limitations.

Secondly, the medium term (MT) component is deployed to optimise the operation of hydro storages subject to annual energy limits and storage targets, which are decomposed into a set of equivalent short-term constraints which can be applied in the third component (short term). The MT component models the market at an hourly resolution and divides the modelling horizon into annual steps, which are optimised sequentially. Demand and VRE profiles are represented using a fitted chronology.

Finally, the short term (ST) component is run to chronologically optimise dispatch at an hourly resolution. Generators are assumed to bid in at their short-run marginal cost (SRMC), consistent with the RIT-T guidelines. This component utilises the look-ahead function allowing short-duration storage facilities to optimise their operation across a 24-hour period.