Centre for Energy and Environmental Markets

UNSW THE UNIVERSITY OF NEW SOUTH WALES SYDNEY • AUSTRALIA



Workshop on Distribution Network Tariff Assessment and Design

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UNSW Sydney CBD Campus

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Our task

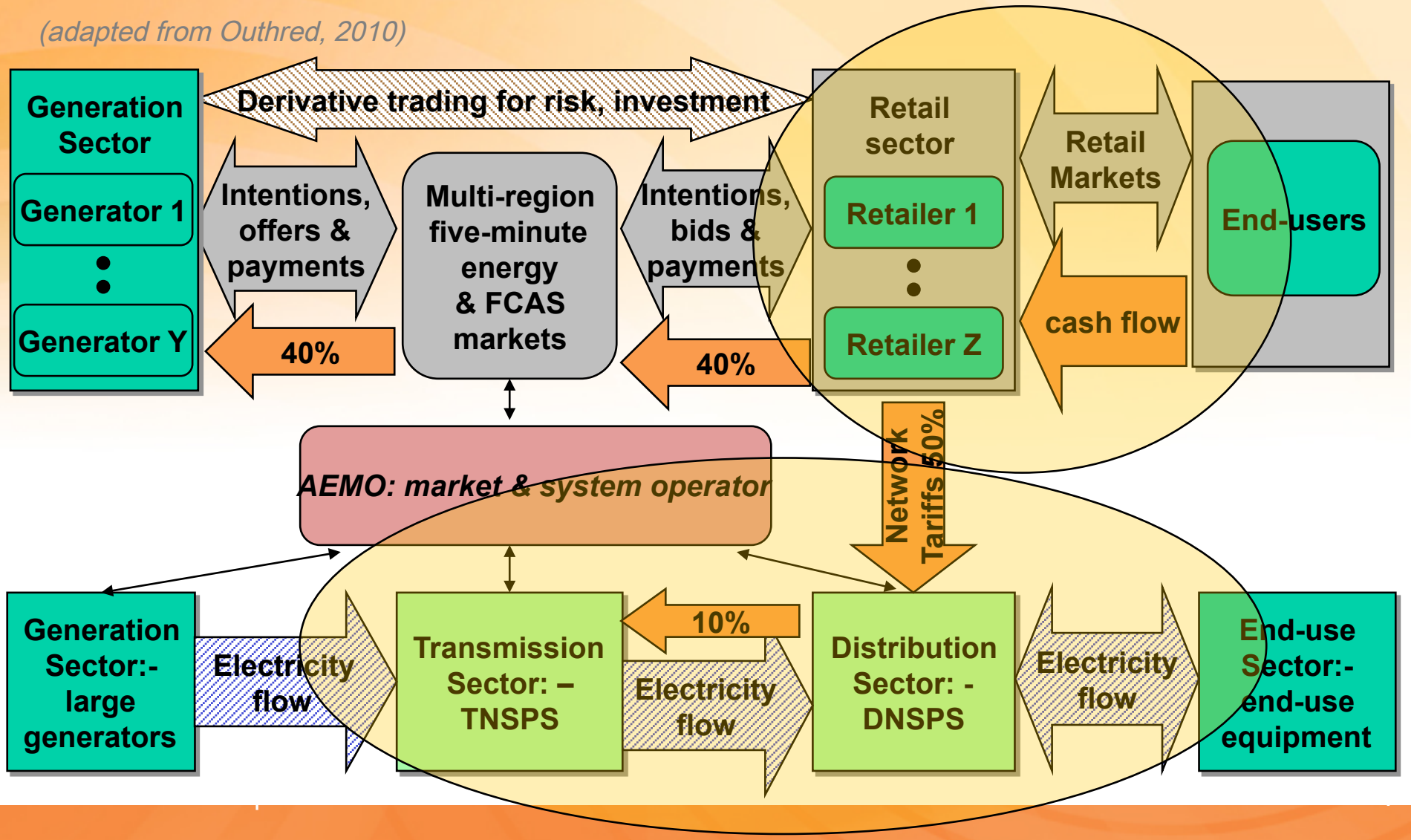
- Discuss the opportunities yet challenges of introducing more cost-reflective distribution network tariffs into the Australian NEM
- Hear from a range of invited speakers regarding stakeholder participation in relevant rule making and regulatory processes
- Introduce our distribution network tariff modelling tool, and provide an opportunity for interested stakeholders to try it out and obtain a copy for their own use
- Seek feedback from stakeholders on possible improvements and extensions to the tool.

Energy users and retail arrangements

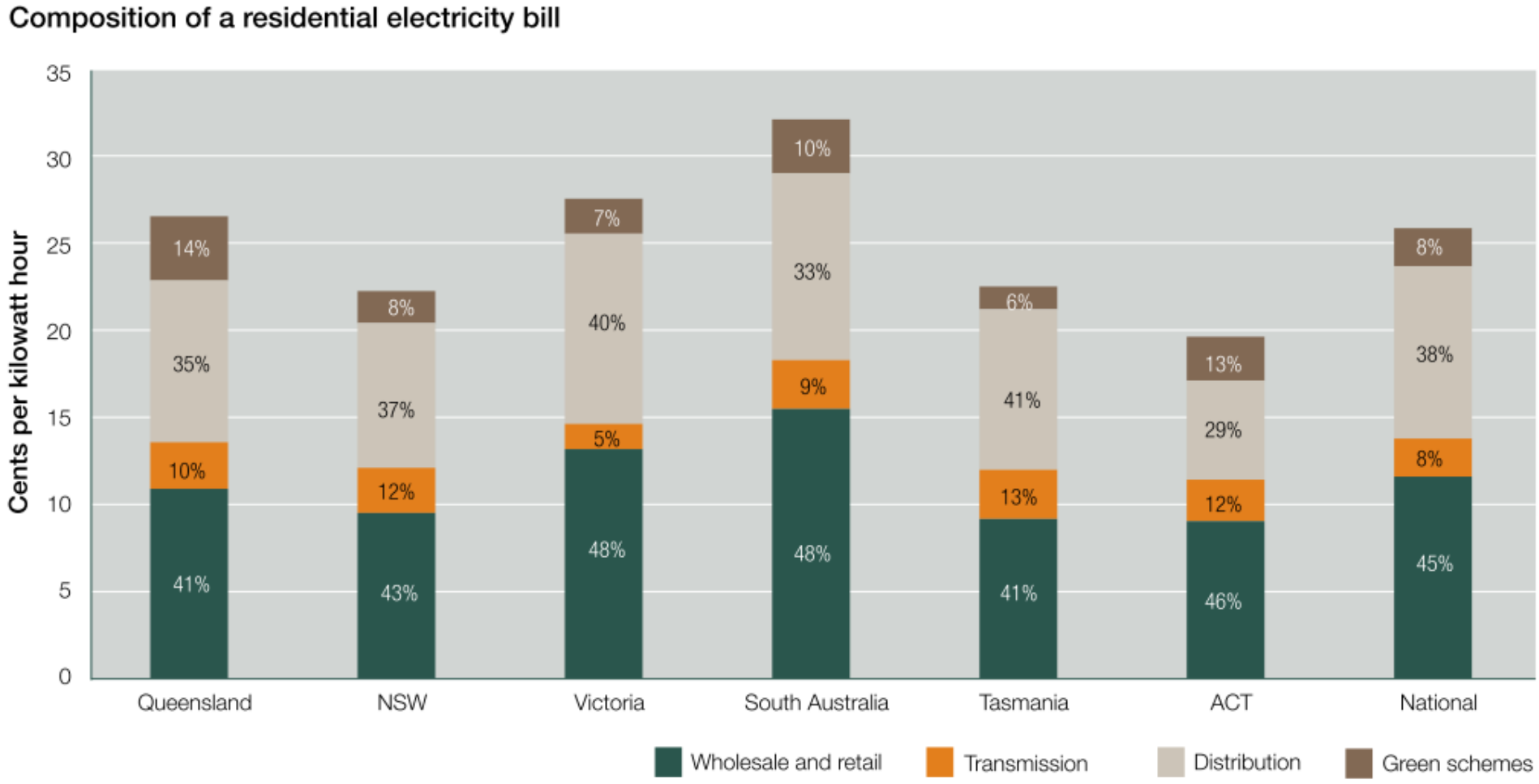
- From clients
  - Early tailored industrial or commercial (lighting) applications with *service oriented contracting arrangements*
- ..to citizens
  - Electricity as an essential public good – rural electrification with *socially constructed tariffs*
- ..to consumers
  - The vertically integrated utility of growing size and scope with overall *cost-recovery, socially constructed, tariffs*
- ..to customers
  - Electricity industry 'reform', liberalisation, restructuring with *more mkt oriented energy 'pricing', more cost-reflective network tariffs*
- ..to perhaps now partners, competitors, or even 'deserters'?
  - *More of the same or a genuine market opportunity?*

Small end-users in the Australian NEM

(adapted from Outhred, 2010)



Major, although now falling, proportion of house -hold costs go to 'non-competitive' n/w sector



Current NEM N/W tariffs for small energy users

- Largely remain a legacy of former technical capabilities and socialist 'energy an essential public good' tendencies
- Send a primarily 'volumetric' consumption signal that incentivises lower consumption – *a good thing!?*
- Have 'worked' more or less so far, unless you

…consider near doubling in network expenditure over less than a decade a 'failure'

.. are concerned about changing distributional impacts, equity

.. Seek to facilitate appropriate distributed energy options and end-user engagement towards sustainable energy ends

- ***Clear opportunities to improve this interface***

Facilitating greater consumer engagement – demand-side participation *in principle*

Efficient markets are characterised by effective participation of both the supply and demand side. The supply side of the market provides a product or service at a price, and the demand side (ie consumers) responds to the price/value of the product or service being offered.

While there is some evidence of uptake of DSP in the NEM over recent years, the efficiency of the electricity market can be improved by more active participation by the demand side. This will require changes to some aspects of how the supply side of the electricity market operates and interacts with consumers.

(AEMC, Power of Choice, 2012)

The Power of choice review has identified opportunities for consumers to make more informed choices about the way they use electricity. Consumers require tools - information, education, and technology, and flexible pricing options - to make efficient consumption decisions. Recommendations presented in this report will support these conditions and enable consumers to have more control of their electricity expenditure.

…and with respect to network tariffs

Australian Energy Market Commission

AEMC

Home | Australia's Energy Market | Energy Rules | Market Reviews & Advice

Home > News > New rules for cost-reflective network prices

New rules for cost-reflective network prices

27 November 2014

The National Electricity Rules will be changed from 1 December 2014 to require regulated network companies to structure their prices to better reflect the consumption choices of individual consumers.

Under these changes, network prices will reflect the costs of providing the electricity to consumers with different patterns of consumption.

The new rules follow extensive consultation over the past year, and take into account submissions received when the draft rules were released in August.

AEMC Chairman John Pierce said the prices we pay for electricity would actively respond to the different ways people choose to use it under these new rules.

"These changes put consumers at the centre of future decision-making about energy," he said.

"By having prices that reflect the costs of different patterns of consumption, we are giving consumers clearer choices as we develop a more efficient, incentive-based network regulation framework.

Will new cost-reflective tariffs efforts help?

- Which costs – past, present or future?
  - *Future costs and benefits are key for transformation, past costs the key incumbent consideration – hence treatment of residuals*
  - *And what of location specific costs?*
- For future costs, is Long Run Marginal Cost (LRMC) a truly meaningful and actionable concept for networks?
- What of transition?
  - Metering capabilities
  - Social expectations, hence political realities
- What of integration into broader end-user industry interface?
  - Does it matter if N/W tariffs aren't mirrored in retail tariffs?
    - Theory says no as 'someone is paying them'; but in practice?
  - Does it relieve DNSPS of obligations to engage with energy users?

Facilitating greater engagement *in practice?*

CRT proposals to date:

- steep declining block
- higher fixed charges
- 'non-peak demand' demand charges
- special 'solar' household tariffs

(Reneweconomy, 2015)

While some cross-subsidies are not to be discussed

- eg. locational between urban and regional consumers

All may limit consumer options to invest in new technologies and behave in ways that reduce bills while also reducing longer-term network expenditure

- The NSW distributors' definition of 'marginal' costs does not capture all major types of marginal costs as it excludes replacement capital expenditure and related costs
- The NSW distributors' timeframe over which they forecast costs is too short to be considered 'long term' (this applies to Endeavour Energy and Essential Energy, in particular).

A contested space

Our draft decision	Ausgrid revised proposal
We did not approve Ausgrid's proposed declining block tariffs for residential and small business customers.	In its revised proposal Ausgrid proposed to replace its existing residential and small business declining block tariffs with flat tariffs.
We did not approve Ausgrid's proposed assignment of new residential and small business customers which distinguished between those new customers with embedded generation and those new customers without embedded generation.	In its revised proposal Ausgrid accepted the AER draft decision. From 1 July 2018 all new residential and small business customers with or without embedded generation will be assigned by default to a time-of-use tariff. These customers will all have the option to opt-out to the transitional residential and small business tariffs.
We did not approve Ausgrid's proposed charging windows for peak, shoulder and off-peak for residential and small business customers on time-of-use tariffs. We required Ausgrid to either amend its charging windows or provide further justification regarding its proposed charging windows in general.	For residential customers, Ausgrid proposed different peak hours on working weekdays for summer and winter months (2pm–8pm and 5pm–9pm, respectively). Ausgrid also removed the 2pm–8pm peak period on working weekdays for non-summer and non-winter months. For small business customers, Ausgrid removed the 7am to 10pm shoulder period for weekends and public holidays.

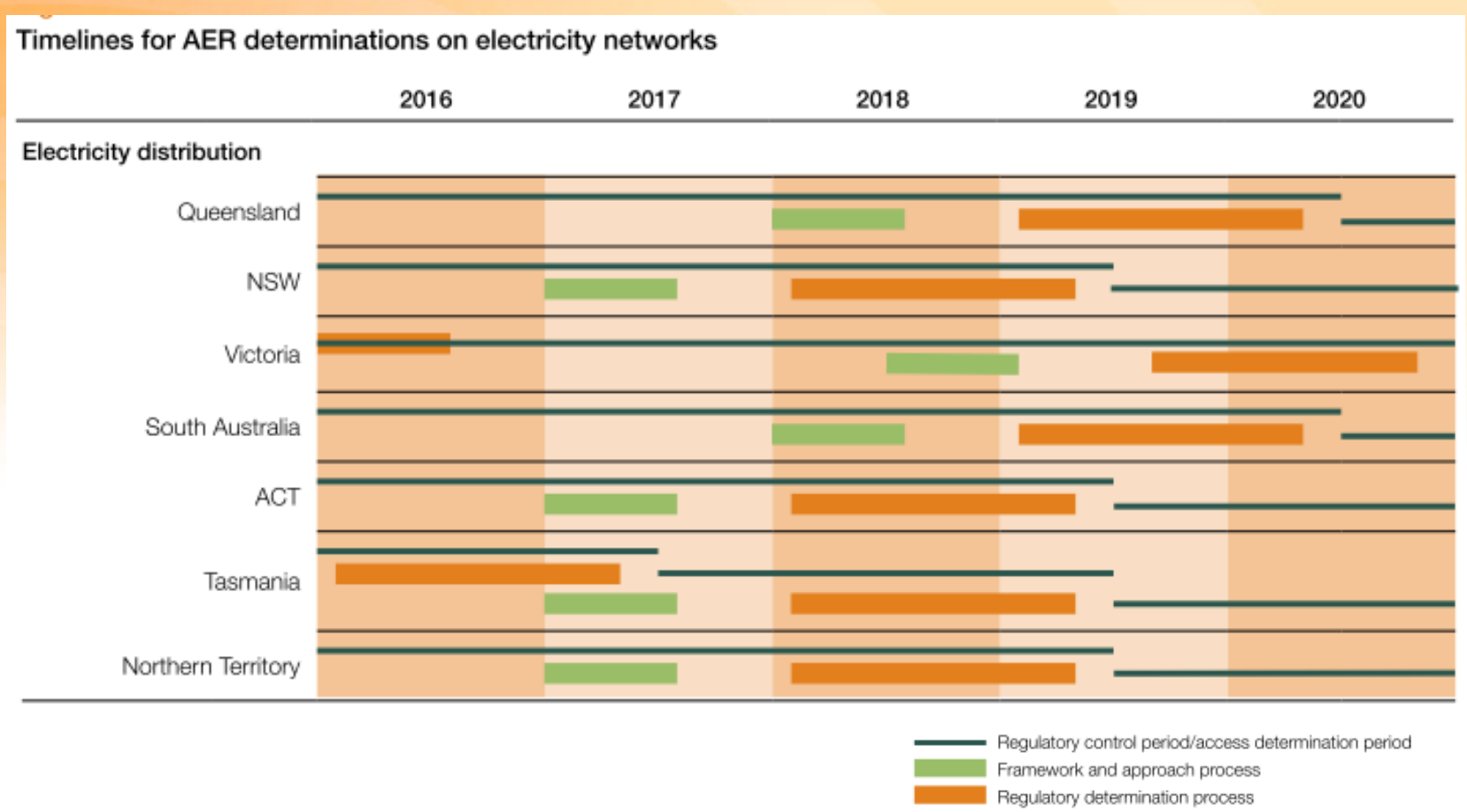
(AER, NSW Distribution Tariffs, 2017)

Tariffs as a social construct

(CSIRO,Consumer's likely response to CRP, 2016)

- A 'basic' flat rate tariff (without any 'risk relief') is significantly more appealing to consumers than:
  - any form of *capacity* pricing, even with a money-back guarantee or automatic enabling technology; and
  - *real-time* pricing without any such 'risk relievers'.
- *Real-time* pricing must come with a compelling money-back guarantee in order to approach the appeal of a basic flat rate tariff, or have even a chance of being accepted.
- Even with the prospect of a risk-free trial, or an enabling device to help maximise the advantages of the new plan, there is limited consumer interest in shifting to novel, demand-based pricing structures like *capacity* pricing.
- A *flat rate* tariff offer with money-back guarantee achieves an unparalleled level of consumer acceptance, unmatched by any other combination of tariff and risk relief.
- Only a limited set of cost-reflective pricing offers seem to rival consumer acceptance of flat rate tariffs, specifically:
  - *peak time rebates* with the offer of a free automation device (aimed at easing management and maximising consumer benefit from the tariff); and
  - *time of use* tariffs, or *critical peak* pricing, when accompanied by the money-back guarantee (aimed at alleviating consumers' perceived risks in trialling the new offer).

An ongoing process



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Open data, tools

openmod open energy modelling initiative

Openmod in a nutshell

The Open Energy Modelling (openmod) Initiative promotes open energy modelling in Europe.

Energy models are widely used for policy advice and research. They serve to help answer questions on energy policy, decarbonization, and transitions towards renewable energy sources. Currently, most energy models are black boxes – even to fellow researchers.

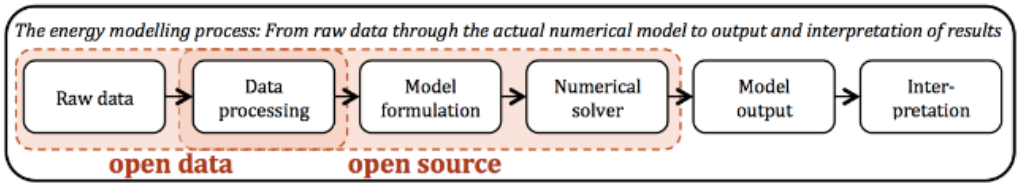
"Open" refers to model source code that can be studied, changed and improved as well as freely available energy system data.

We believe that more openness in energy modelling increases transparency and credibility, reduces wasteful double-work and improves overall quality. This allows the community to advance the research frontier and gain the highest benefit from energy modelling for society.

We, energy modelers from various institutions, want to promote the idea and practice of open energy modeling among fellow modelers, research institutions, funding bodies, and recipients of our work.

The idea of openmod

The energy modelling process: From raw data through the actual numerical model to output and interpretation of results



Energy scientists must show their workings

Public trust demands greater openness from those whose research is used to set policy, argues **Stefan Pfenninger**.

wards a clean and sustainable energy future
ew figures from Europe this month show
on track to reach its goal of a 20% renew-
and renewable capacity in China and the
ut many technical, political and economic
st in the data and models used to underpin
inties need open discussion, and yet energy
are based on research not open to scrutiny.
or example, to study the economic and
US government (called NEMS) are met
. On its website, the Energy Information
eveloping the model, pronounces: "Most
NEMS in the past have found out that it
use."
l Energy Modelling
. Most assumptions,
used to set energy
box simulations can-
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hnologies. It is mod-
demic exploring a range of qualitatively
an energy supply, say) and for numbers
deciding on the remuneration level of a
e).
tters because it contributes to policies on
n, on climate mitigation — that produce
hout the global economy, and so can be
s are among the crucial driving forces that
he development of wind and solar power.
ergy models and data are not openly avail-
dentiality; concerns over the security of
re to avoid exposure and scrutiny; worries
ented or taken out of context; and a lack

BLACK-BOX SIMULATIONS CANNOT BE VERIFIED, DISCUSSED OR CHALLENGED.

tic, because it is well known that closed
mistakes. A classic example is the spread-
sheet error discovered in the influential Reinhart–Rogoff paper used to support economic policies of national austerity. The European Commission's Energy Roadmap 2050 was based on a model that could not be viewed by outsiders, leaving it open to criticism. Assumptions that remain hidden, like the costs of technologies, can largely determine what comes out of such models. In the United Kingdom, opaque and overly optimistic cost assumptions for onshore wind went into models used for policymaking, and that may well have delayed the country's decarbonization.

This closed culture is alien to younger researchers, who grew up with collaborative online tools and share code and data on platforms such as GitHub. Yet academia's love affair with metrics and the pressure to publish set the wrong incentives: every hour spent on cleaning up a data set for public release or writing open-source code is time not spent working on a peer-reviewed paper.

Nevertheless, some academic-led projects are pushing towards more openness. The Enipedia project is building a worldwide open database on power plants, with data such as their locations and emissions. The Open Power System Data project gathers data such as electricity consumption from government agencies and transmission-network operators, and pushes for clarity on the licensing under which these data are made available. The Open Energy Modelling Initiative is emerging as a platform for coordinating and strengthening such efforts.

Regulation can also help. The European Union has mandated open access to electricity-market data, resulting in the creation of the ENTSO-E Transparency Platform to hold it, and there are good arguments for the creation of national energy-data agencies to coordinate the collection and archiving of a range of important data.

The vast majority of published research is still untouched by these fledgling initiatives. Only one energy journal — *Energy Economics* — currently requires data and models alongside submissions. Other journals should follow suit.

The open sharing of code and data is also important because it permits more meaningful collaboration between academics. Sharing a DNA sequence in an established format is, of course, easier than sharing the unstructured assumptions behind a techno-economic scenario study, for which no standard format exists yet. So the energy community must decide on standards for sharing code, data and assumptions.

A change in journal policies would help to kick-start these discussions. In policy-focused research, where one 'truth' does not exist, one cannot assess whether a modelled scenario is 'correct', so the important yardstick is not truth, but trust. The arrival of the post-truth world shows that trust in experts is lower than ever — and surely this is partly the experts' fault. ■

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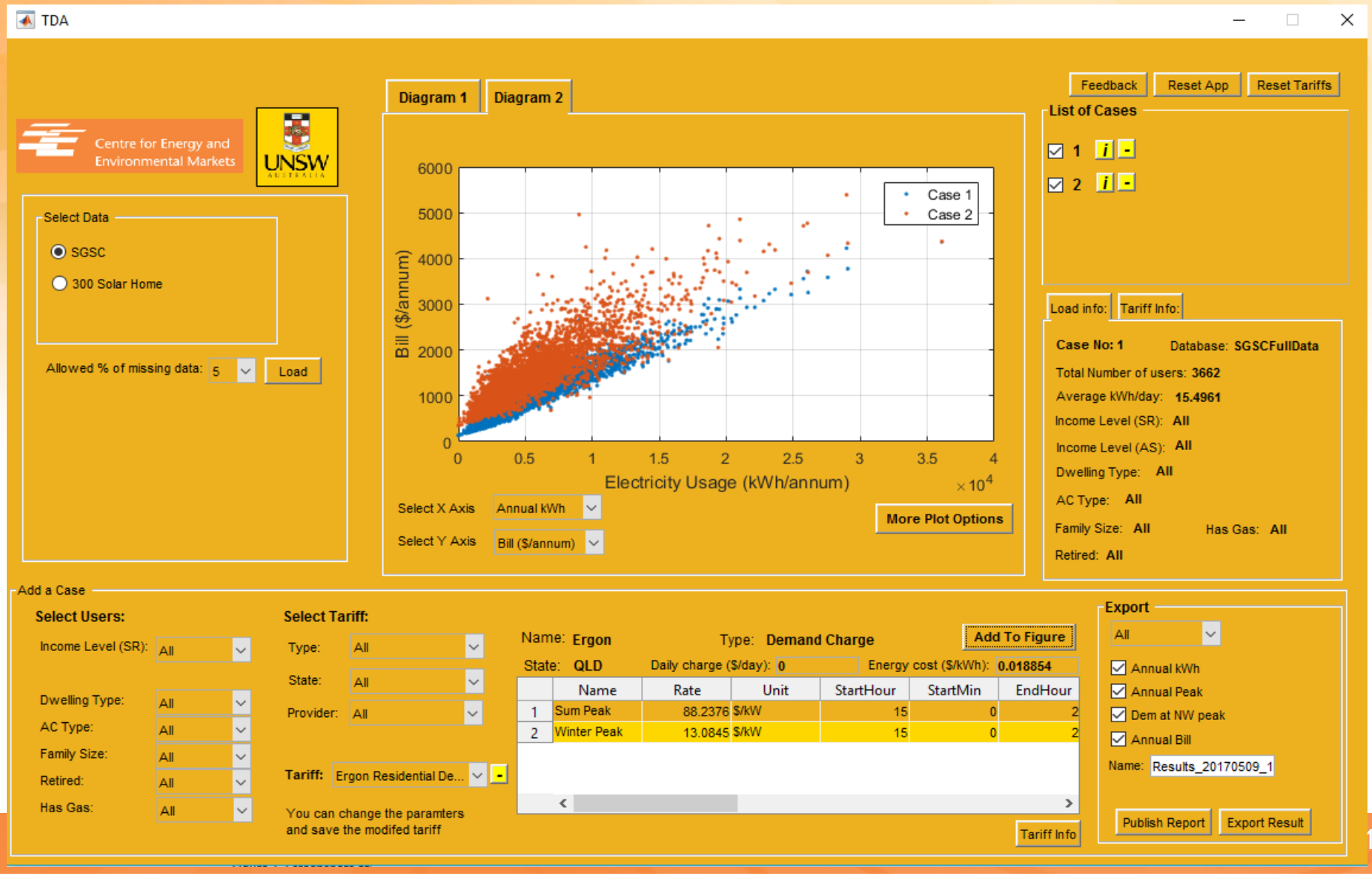
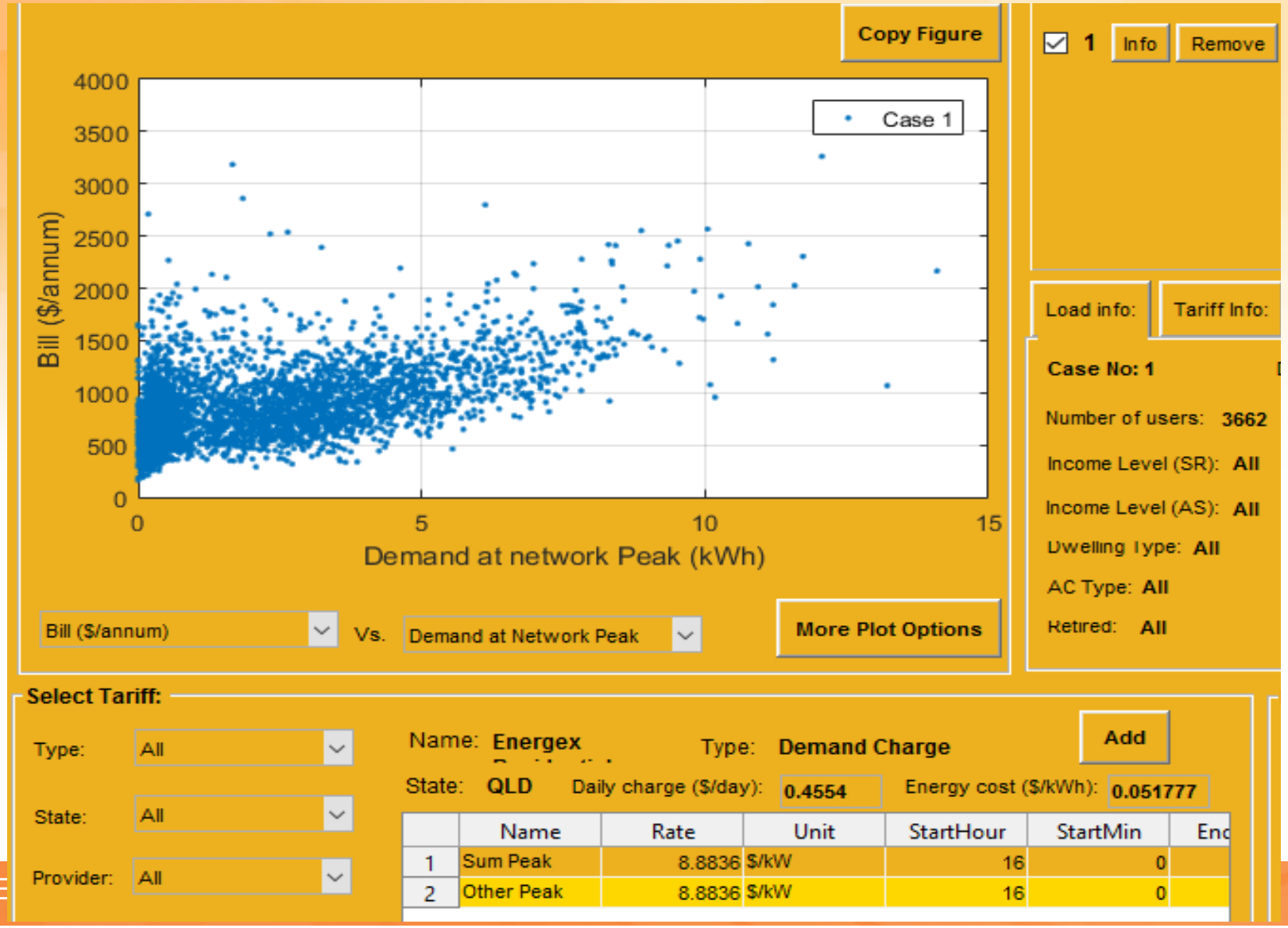
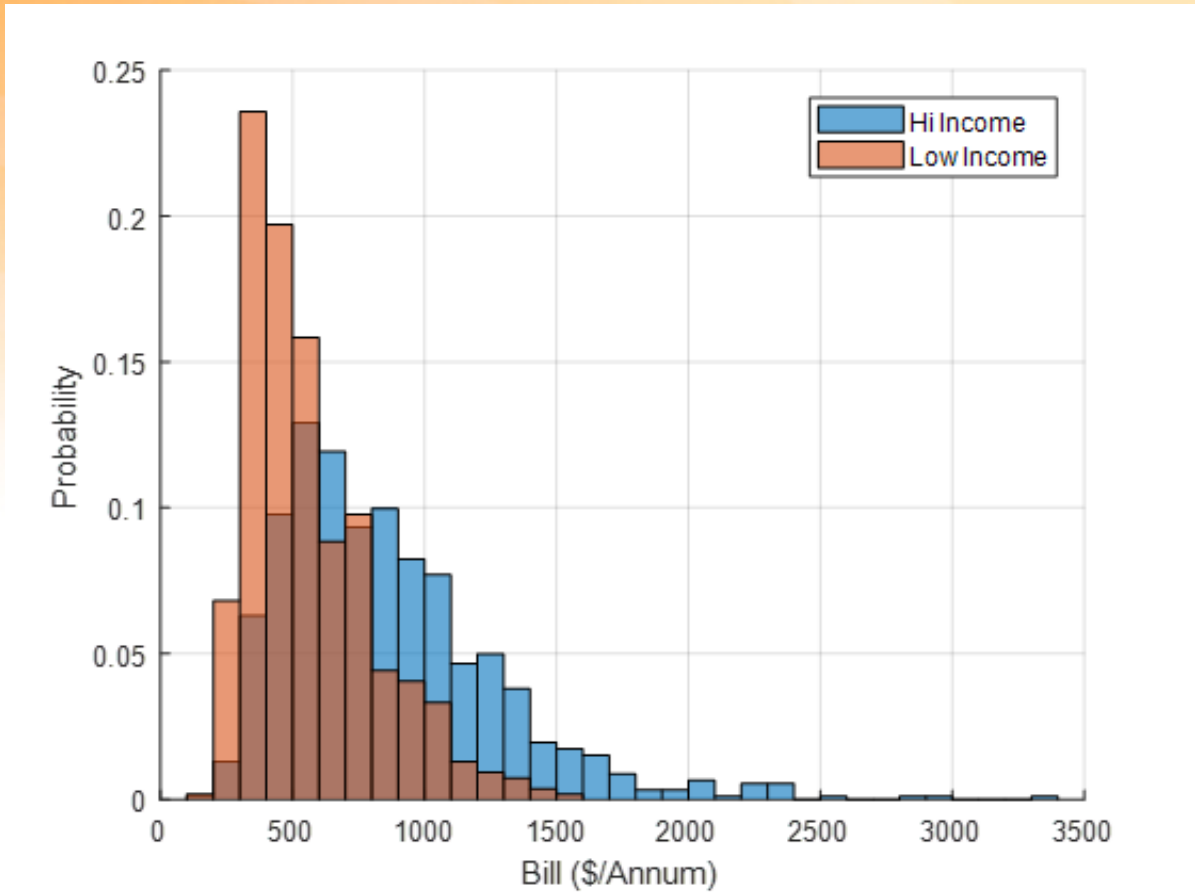
Tools – *transparent, open-source*



A ‘cost reflective’ ‘demand’ tariff



Testing tariff distributional implications



The program

9:20 Introduction to CRT issues and Tool, Iain MacGill, UNSW

9:40 Stakeholder Presentations, including:

- Brendon Crown, ENA
- Mark Byrne – Total Environment Centre
- Ausgrid
- Craig Memery – PIAC
- Anthony Seipolt – AER

10:40 Discussion

11:10 Morning Tea

11:30 Previous CEEM Tariff Analysis, Rob Passey, UNSW / APVI
Introduction to the Tool, Navid Haghdadi, UNSW

11:50 Facilitated Discussion – feedback on tool functionality and priorities for further development

12:30 Lunch and Training

1:00 Workshop conclusion

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Thank you… and *questions*

Many of our publications are available at:
www.ceem.unsw.edu.au

Electricity prices vs tariffs?

*"A market is any place where sellers of particular good or service can meet with buyers of that good or service and there is a potential **price** that allows for a transaction to take place"*

Present Retail Electricity 'Markets'

- Do consumers 'meet' with sellers?
  - *Electricity industry has traditionally had poor end-user engagement*
- Does the market sell the good or service desired?
  - *Buyers seeking energy 'services', not kWh 'goods'*
- Prices where supply meets demand?

No market means no prices - buyers paying imposed tariffs?

- *Clearly the case for network tariffs*
- *arguably the case for current retail 'market' arrangements*

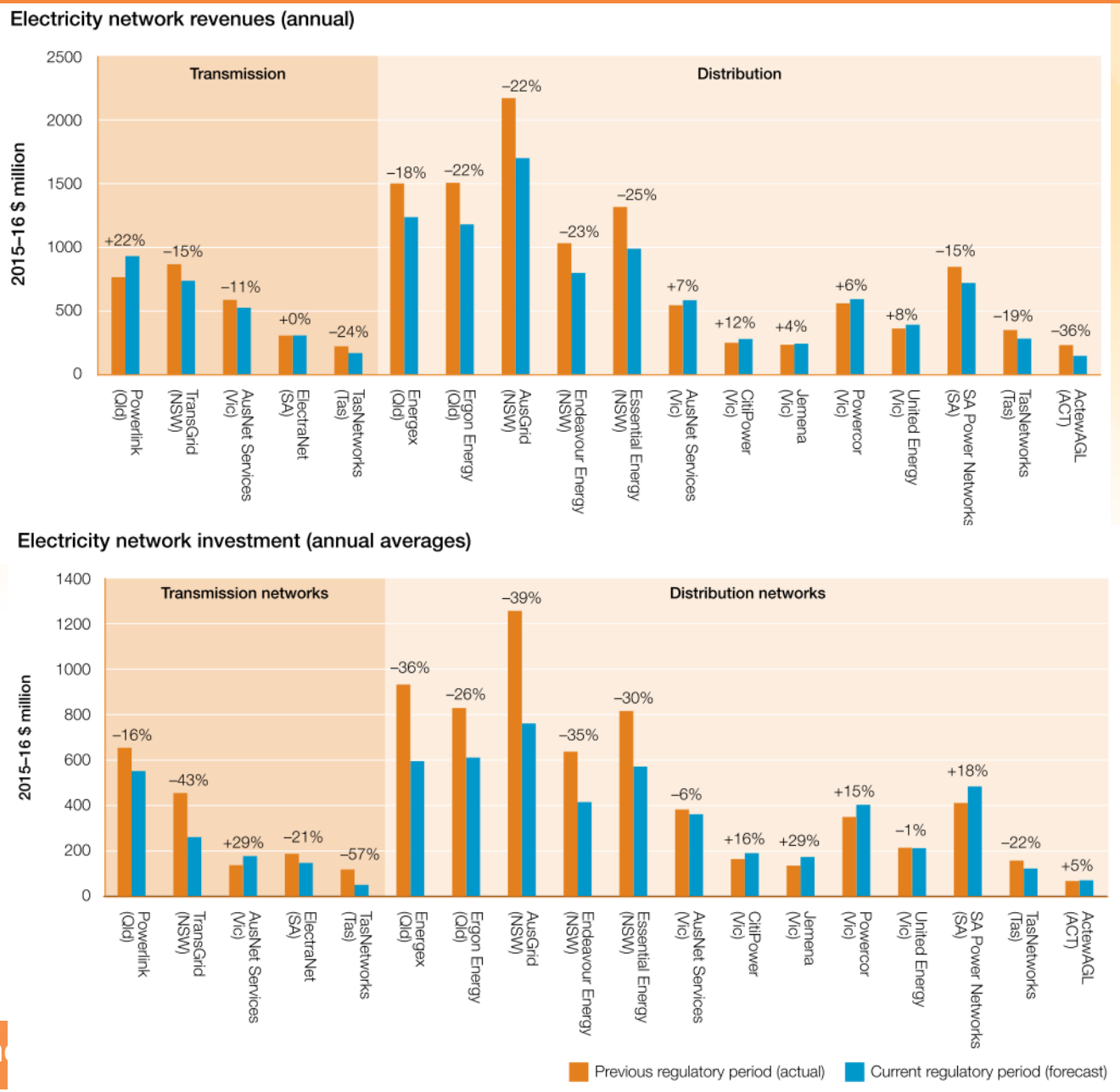
Table 6.1: Current special reviews of the electricity retail market

Special Review	Body	Timing
Electricity supply and prices inquiry	ACCC	Preliminary report in September 2017; final report in June 2018
Review of electricity and gas retail markets in Victoria	Victorian Government	Final report to the Minister by May 2017
Market monitoring report (one-off report for FY2017)	Queensland Competition Authority	By 31 October 2017

The following reports are published annually, half yearly or quarterly (Table 6.2).

Table 6.2: Periodical energy market reports

Periodical report	Body	Timing
Retail energy competition review	AEMC	Published annually
Residential electricity price trends report	AEMC	Published annually
Retail energy market performance reporting	AER	Quarterly updates and a report published annually


Electricity network revenues (annual)
2015–16 $ million
2500
2000
1500
1000
500
0
Transmission
Distribution
+22%
–15%
–11%
+0%
–24%
–18%
–22%
–22%
–23%
–25%
+7%
+12%
+4%
+6%
+8%
–15%
–19%
–36%
Powerlink (Qld)
TransGrid (NSW)
AusNet Services (Vic)
ElectraNet (SA)
TasNetworks (Tas)
Energex (Qld)
Ergon Energy (Qld)
AusGrid (NSW)
Endeavour Energy (NSW)
Essential Energy (NSW)
AusNet Services (Vic)
CitiPower (Vic)
Jemena (Vic)
Powercor (Vic)
United Energy (Vic)
SA Power Networks (SA)
TasNetworks (Tas)
ActewAGL (ACT)
Electricity network investment (annual averages)
2015–16 $ million
1400
1200
1000
800
600
400
200
0
Transmission networks
Distribution networks
–16%
–43%
+29%
–21%
–57%
–36%
–26%
–39%
–35%
–30%
–6%
+16%
+29%
+15%
–1%
+18%
–22%
+5%
Powerlink (Qld)
TransGrid (NSW)
AusNet Services (Vic)
ElectraNet (SA)
TasNetworks (Tas)
Energex (Qld)
Ergon Energy (Qld)
AusGrid (NSW)
Endeavour Energy (NSW)
Essential Energy (NSW)
AusNet Services (Vic)
CitiPower (Vic)
Jemena (Vic)
Powercor (Vic)
United Energy (Vic)
SA Power Networks (SA)
TasNetworks (Tas)
ActewAGL (ACT)
Previous regulatory period (actual)
Current regulatory period (forecast)

Possible conclusions

- Cost Reflective Tariffs provide possible *means* to improve desired electricity *ends* of affordable, secure, environmentally sustainable energy services
- *… but also an 'opportunity' to work against these*
  - Serious intent about addressing some sacrosanct cross subsidies?
  - More Cost Reflective Tariffs will reduce cost of consumption, in market with unpriced environmental externalities driven by consumption; *may actually reduce overall economic efficiency*
- And we still need better institutional + regulatory arrangements to facilitate appropriate end-user engagement
- And stakeholders need to be engaged and need assistance
  "If you're not at the table you're probably on the menu"
  A continuing role for network service providers to faciliate