

ARENA



Australian Government
Australian Renewable
Energy Agency



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PV Association

The Regulatory Arrangements Required for a Distributed Energy Market

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Distributed Energy markets – Stakeholder Workshop
Canberra, 19th July 2013

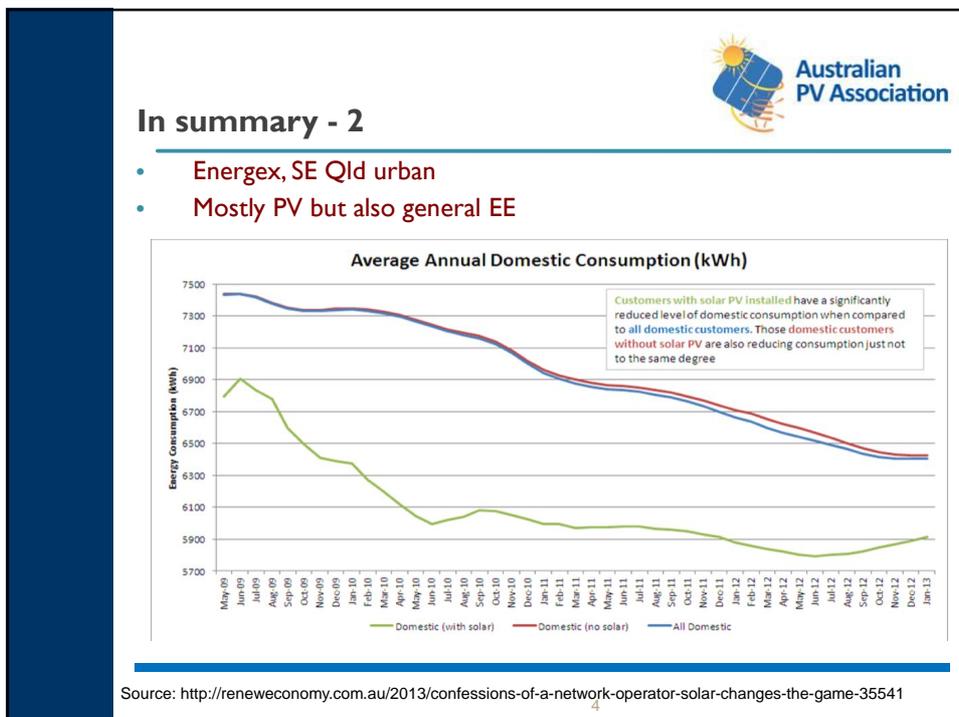
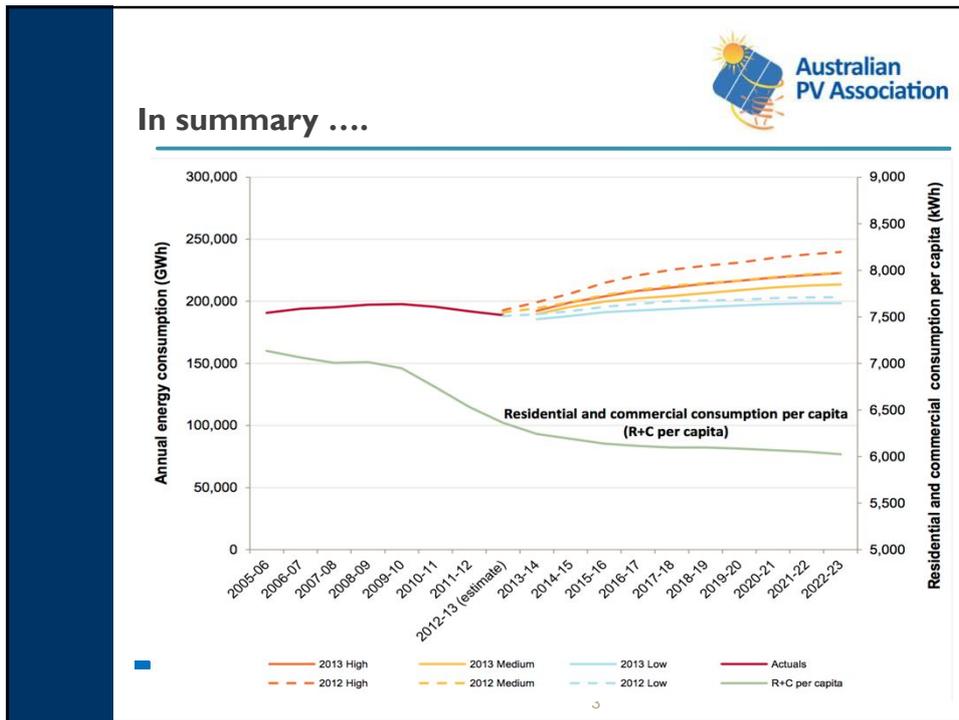


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Presentation outline

1. Quick summary ...
2. Consequences for utilities
3. Responses by utilities
 1. Concerned about use
4. Responses by government
 1. Concerned about prices, but also use
 - some help for EE, DSM, DG
5. If want significant DE, need more fundamental change
6. What is a Distributed Energy Market?
 1. Networks
 2. Day-to-day competition
7. Conclusions

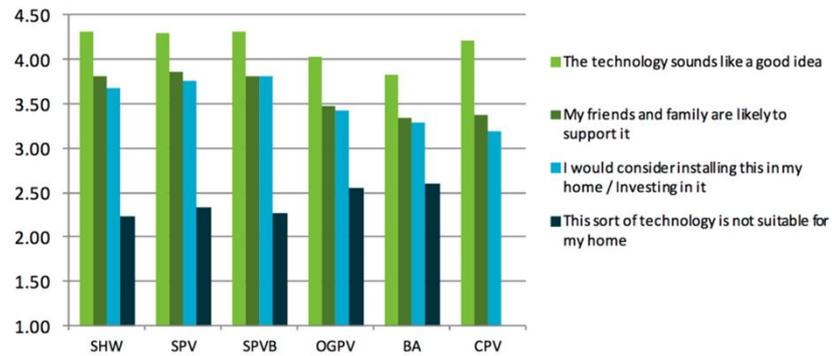
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Source: <http://reneweconomy.com.au/2013/confessions-of-a-network-operator-solar-changes-the-game-35541>



In summary - 3

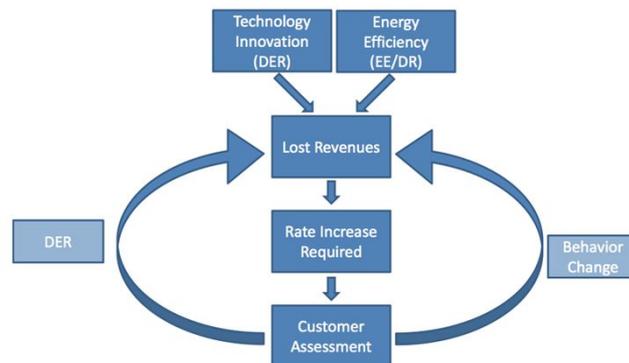


Source: Romanach, L., Contreras, Z., and Ashworth, P. (2013). Australian householders' interest in active participation in the distributed energy market: Survey results. Report No. EP133598. CSIRO, Pullenvale



Consequences for utilities - I

- **Generators: reduced wholesale prices and reduced sales**
- **Network operators: reduced revenue**
- **Retailers: reduced sales**



Source: Kind, P., 2013, 'Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business', prepared by Energy Infrastructure Associates for the Edison Electric Institute, Jan 2013



Consequences for utilities - 2

- **Edison Electric Institute**

“...falling costs of distributed generationincreasing customer, regulatory, and political interest in demand-side managementgovernment programs to incentivize selected technologies and rising electricity prices in certain areas of the country are potential “game changers” to the U.S. electric utility industry, and are likely to dramatically impact customers, employees, investors, and the availability of capital to fund future investment

....The financial risks created by disruptive challenges include declining utility revenues, increasing costs, and lower profitability potential, particularly over the long-term....

.... Left unaddressed, these financial pressures could have a major impact on realized equity returns, required investor returns, and credit quality....”

Source: Kind, P., 2013, 'Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business', prepared by Energy Infrastructure Associates for the Edison Electric Institute, Jan 2013



Responses by utilities

- **TOU tariffs**
 - Helps to reduce generation/network costs, and increase revenue..., not good for PV but good for EE, DSM, storage
- **Higher demand charges**
 - Helps to reduce generation/network costs, and increase revenue..., possibly good for PV and good for EE, DSM, storage
- **Higher fixed daily charges**
 - Just maintains utility revenue, suggestion that PV owners should have higher fixed charges ... no mention of owners of AC systems
- **Low payments for exported electricity**
 - At the lower end of, or below, range recommended by governments
- **Imposition of network limits on DG**
 - Because of technical impacts, some justified, some not. Certainly the easiest option to deal with 'disruptive' technologies
- **Some retailers promote PV, DSM and EE**
 - PV sales offset lower elec sales? Marketing? Reducing wholesale purchase costs?
- => Aim to maintain current business models



Responses by governments

- High electricity prices are a strong focus of governments (Federal and State)
- Also States focus on maintaining revenue for electricity networks that are seen as an 'essential service'
- => how to reduce electricity costs while maintaining payments for networks?
 - Have come up with some reasonable proposals
- However
 - Have generally been ad hoc and piecemeal
 - EE, DSM, DG just 'add-ons' to electricity market, which remains unchanged
 - EE: Focus on reducing demand peaks rather than overall demand
 - DG: Divergent views on whether it should be supported, much outright opposition (eg. low payment for export, higher fixed charges, TOU tariffs)
- Need
 - Fundamental changes to operation of electricity market

9

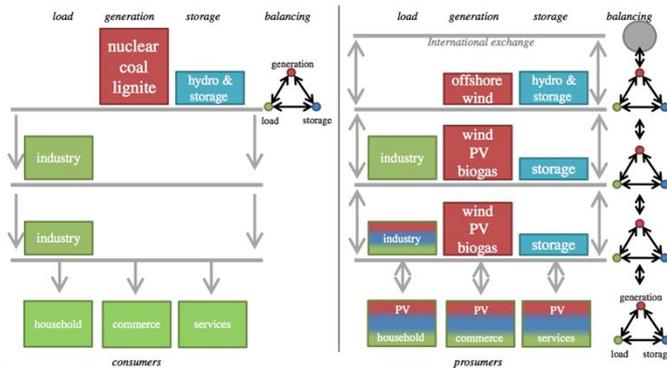


The Need for More Fundamental Change

- EE, DSM, DG are 'disruptive'
- Don't simply integrate, but exert change eg. telecommunications

Top-down supply system
(central control)

→ **Multi-level exchange system**
(subsidiarity, shared responsibility)



Source: Schleicher-Tappeser, R., 2013, 'How renewables will change electricity markets in the next five years', *Energy Policy*, 48, p64-75

10



What is a Distributed Energy Market?

- **Fundamental principle: competition at all levels**
 - Generation, Networks, Retail
 - Supply vs Demand
- **Networks – a special case**
 - High sunk capital costs, regulated monopoly
 - Seen as an 'essential service' and so regulation aims to ensure their income
 - => Competition also needs to occur during the planning stages (when networks are being built)
 - => Integrated Resource Planning
- **Also full competition on a day-to-day basis**

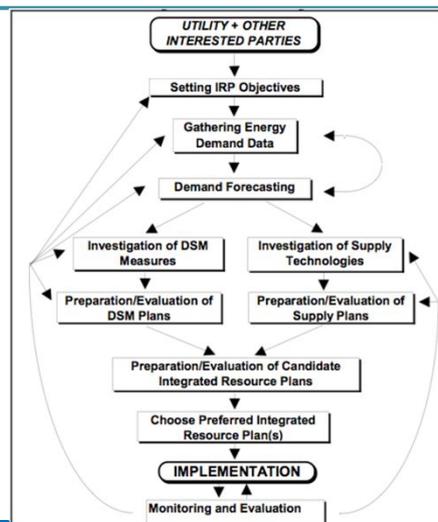
11



Networks - Integrated Resource Planning

1. Considers a full range of feasible supply-side and demand-side options and assesses them against a common set of planning objectives and criteria;
2. Is transparent and participatory throughout, meaning that parties other than the network operator can propose both supply-side and demand-side options;
3. Is subject to oversight by an independent body (normally government); and
4. Is subject to regular review

Source: Tellus, 2000, 'Best Practices Guide: Integrated Resource Planning For Electricity', by the Tellus Institute for the Energy and Environment Training Progra, of the Office of Energy, Environment and Technology, Global Bureau, Centre for the Environment, United States Agency for International Development, 2000



12

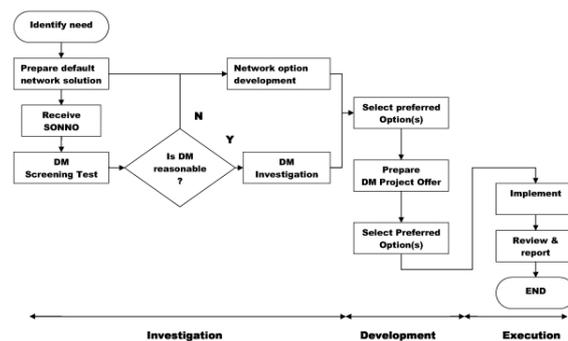


Current Network Planning Process

1. A certain level of demand is assumed
2. Alternatives to network augmentation are internally assessed
3. Networks then designed to meet that demand
4. Is reviewed by external party, but serious information asymmetry

Senate Select Committee on Electricity Prices

- The main reason for high electricity prices is inefficient over-investment in electricity networks driven by perverse incentives inherent in the regulatory environment



Source: Ausgrid, 2012, Demand Management Process, accessed 17 Dec 2012, <http://www.ausgrid.com.au/Common/Our-network/Demand-management-and-energy-efficiency/Demand-Management-at-Ausgrid/Demand-Management-process.aspx#.ULV7TphhniQ>



IRP in the US

1. **Con Edison**
 - Distribution utility in the New York area
 - 2003, voluntarily issued request for EE, implemented where cheaper than augmentation
 - 89MW of EE, benefit/cost +2.8, saved USD223 million
2. **Rhode Island**
 - 2006, State adopted System Reliability Procurement policy
 - Incorporate DG/EE/DSM into network planning, submit to regulator every 3yr
 - > USD1 million, <20% reduction in peak demand, >36 months, only augmentation
3. **Vermont**
 - Act 61
 - Incorporate DG/EE/DSM into network planning process, submit to regulator
 - Minimum 10 year planning horizon, plans every 3 years
 - Emphasises public consultation

Australia: Regulatory Investment Test – D (RIT-D)

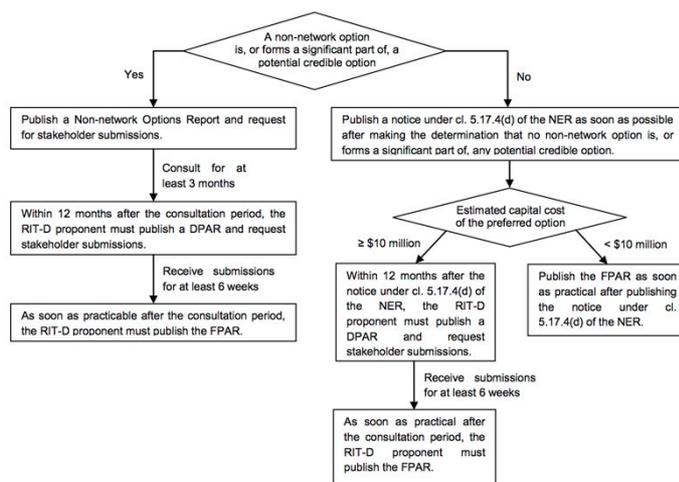


1. Will come into force 1 Jan 2014
2. Network augmentations must consider all feasible non-network solutions:
 - “any measure or program targeted at reducing peak demand, including:
 - improvements to or additions of automatic control schemes such as direct load control
 - energy efficiency programs or a demand management awareness program for consumers
 - installing smart meters with measures to facilitate cost-reflective pricing.
 - increased local or distributed generation/supply options, including:
 - capacity for standby power from existing or new embedded generators
 - using energy storage systems, load transfer capacity and more”

Source:

15

RIT-D - 2



Source: AER, 2013c, 'Better Regulation: Draft regulatory investment test for distribution Application Guidelines', Australian Energy Regulator, June 2013.

16



RIT-D - 2

Non-network Options Report

1. Description of all the non network options assessed
2. May be combined to form an integrated solution
3. May be combined with a network option
4. Allow 3 months public consultation
5. Is where additional options can be proposed

Yes

Publish a Non-network Options Report for stakeholder submissions.

Within 12 months after the RIT-D proponent must publish stakeholder submissions.

As soon as practicable after the RIT-D proponent must publish the FPAR.

Receive submissions for at least 6 weeks

As soon as practical after the consultation period, the RIT-D proponent must publish the FPAR.

Source: AER, 2013c, 'Better Regulation: Draft regulatory investment test for distribution Application Guidelines', Australian Energy Regulator, June 2013.



RIT-D - 2

Draft Proposal Assessment Report

1. Description of the need
2. Commentary of the submissions to the Non-network Options Report
3. Description of each option
4. Benefits of each option
5. Detailed description of methods
6. Results of NPV evaluation of each option
7. Proposed preferred option, and technical description
8. Indicative capital and operating costs

Yes

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Source: AER, 2013c, 'Better Regulation: Draft regulatory investment test for distribution Application Guidelines', Australian Energy Regulator, June 2013.



Assessing RIT-D

1. Good: Well defined process, formal inclusion of 3rd parties (who can suggest options), Non-network Options Report, method, assumptions, scenarios, sensitivity analysis, independently reviewed
2. May be too easy to just say there are no non-network options?
3. Is not applied where the project is for asset replacement, only augmentation
4. Doesn't emphasise the need to test non-network options in advance
5. Only economic impacts, not 'externalities' such as social/environmental benefits
6. What impact will it have on the coming Network Determinations?
 1. NSW: Transitional to June 2015, subsequent out to June 2019
 2. Qld & SA: starts July 2015
 3. Vic: Starts Jan 2016
 4. Tas: Starts July 2017

19



What is a Distributed Energy Market?

- Fundamental principle: Competition at all levels:
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 - => Competition also needs to occur during the planning stages (when networks are being built)
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20



Full day-to-day competition

Relevant market arrangements can be divided into those that:

1. Relate to operation of incumbents
2. Relate to the design of the DE market itself
3. Stimulate the DE market

..... Some examples

21



I. Operation of incumbents

1. Decrease their opposition to DE
 1. Need to decouple network revenue from sales
 2. Most Australian distribution networks under a WAPC - their volume-weighted prices are capped, so reduced sales means less income
 3. Most proposals are for specific DM programs, not suitable for general EE etc
 4. Under a revenue cap, if sales decrease, prices can be increased next year to compensate
 5. Used in most US states, Denmark, Germany, the UK, Spain now in some Aust states ...
 6. Note: only decouples until the next regulatory period
2. Enable their participation in DE
 1. Easy enough for retailers eg. White Certificates
 2. Allowing network operators to engage in DE???
 3. Potential anti-competitive behaviour if regulated income used to subsidise DSM & DG – unfair to 3rd party providers of EE, DSM & DG
 4. Could have 'one-way' ring fencing, where \$ can only flow from DE arm back to network operator – but under a revenue cap there would be no incentive, so possibly keep % of revenue???

22



2. Design of the DE Market

Establishes an environment where different participants can fairly compete for example:

1. That consumers be able to source their electricity from, and sell their PV generation/DSM etc to, entities other than their retailer (portability)
2. That third parties (ESCOs) be able to provide energy services
3. Formalisation of solar access rights (PV, SWHs, lighting and heating passive solar buildings)

23



3. Stimulation of the broader DE Market

1. Support mechanisms
 1. Forecasting of short and long-term demand
 2. Maps of network constraints
 3. Capacity building of groups wanting to participate in IRP
2. Command and control mechanisms
 1. Minimum Energy Performance Standards
 2. Building Standards
3. Price mechanisms
 1. White certificate schemes
 2. Pricing GHG emissions

24



Conclusions

If want significantly increased uptake of EE and DG then need:

1. **Fundamental changes** that creates a full DE market that allows:
 1. incumbents to develop new business models, and
 2. new entrants to fully participate
2. **Networks: special case and competition needs to be at planning stage => RIT-D a good start**
3. **Ongoing supply/demand competition at generation, network, retail:**
 1. Operation of incumbents (eg. revenue cap)
 2. Design of the broader DE market (both incumbents and new entrants)
 3. Stimulate the broader DE market
4. **Measures that focus only on 3.3 have been, and will be, insufficient**

25



Additional benefits of IRP

1. **Social/Environmental benefits can be incorporated as explicit goals**
 - Minimise environmental impacts, increase use of local resources, electrification of disadvantages areas, maximise local employment and capacity building
2. **More accurate network costs**
 - Instead of relying on costs from network operator, they are transparent and subject to market-based competition from 3rd parties
3. **Helps overcome Regulated Asset Base (RAB) problem**
 - Currently network operators' returns are based on their RAB, so they have an incentive to build large networks and oppose alternatives. Under IRP, the choice between network augmentation and the alternatives is assessed by the independent arbiter

26