Centre for Energy and Environmental Markets

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Challenges and opportunities for the NEM's retail electricity arrangements

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Energy Market Conundra Session

CEC Clean Energy Week

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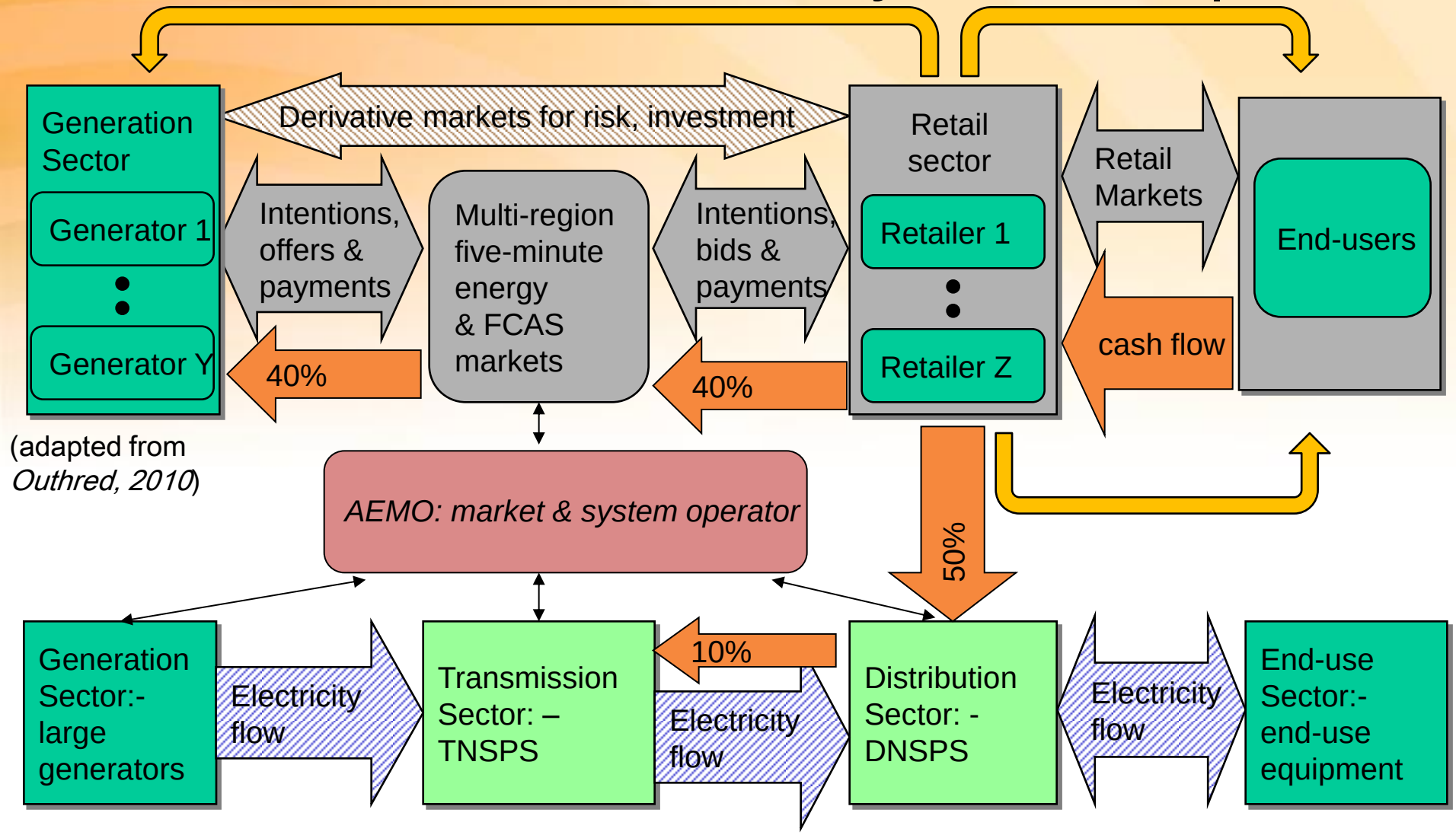
Conundrums

A riddle whose answer is or involves
a pun or unexpected twist
A logical postulation that evades resolution
an intricate and difficult problem

Q: What's wrong with the NEM's retail markets?

A: They aren't actually markets

The Australian NEM – many markets, prices..



Markets

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

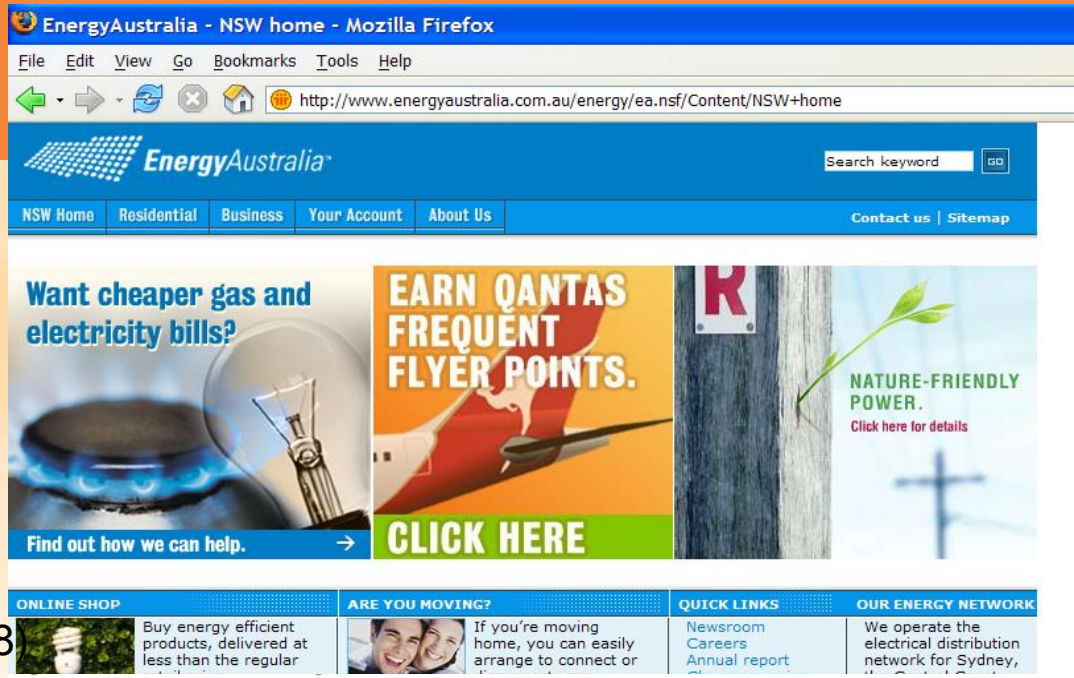
- Do consumers 'meet' with sellers?
  - *Electricity industry has poor end-user engagement*
- Does the market sell the good or service desired?
  - *Buyers seeking energy 'services', not kWh 'goods'*
- Prices where supply meets demand?
  - Or are buyers paying imposed 'prices' – ie. charges

Prices versus Schedules of Fees…

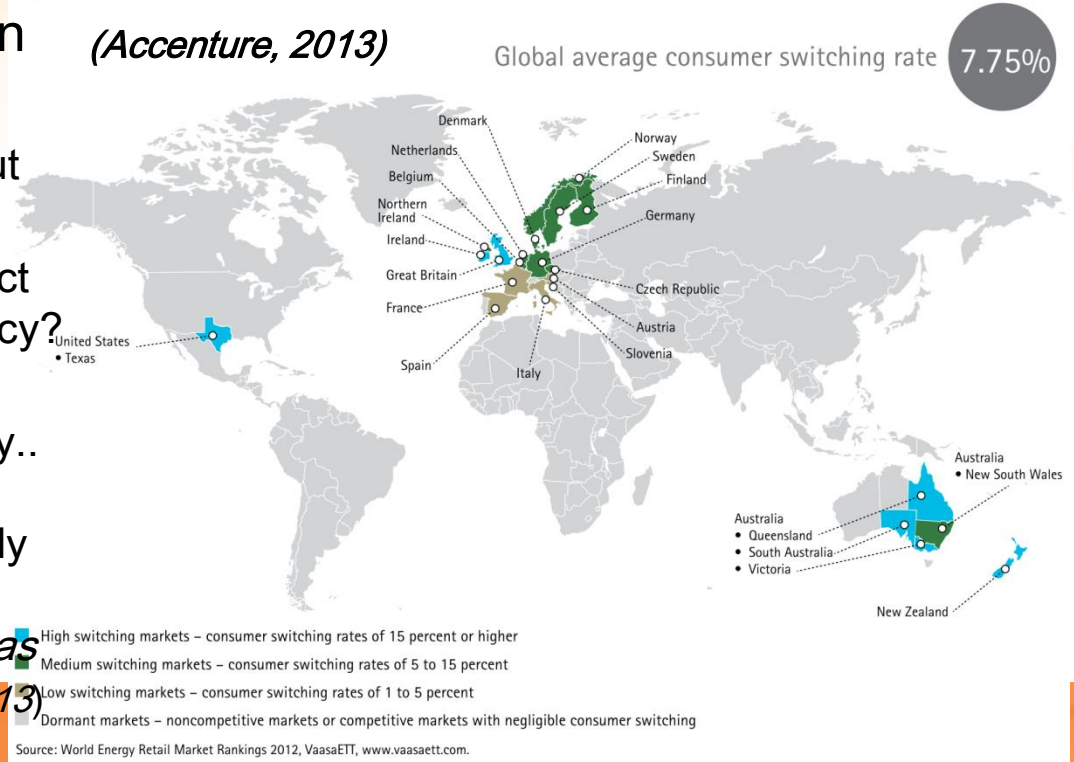
- NEM wholesale market has prices
- Predetermined retail electricity tariff (schedule of charges) is not a price in 'economic efficiency' sense of term
  - That requires locational and temporally varying and uncertain spot and future prices for both energy and network services (Outhred and MacGill, 2006)
  - Major reform of interface b/n supply and demand sides of electricity industry and NSPs required before genuine 'price discovery' can occur
  - Little apparent interest or willingness to do this to date by key players
- Electricity industries
  - traditionally 'charge' 'schedule of fees' sufficient to deliver essential current & future access to 'reliable' electricity supply 'service' s.t. underlying customer 'class' costs, wider considerations (eg. equity).
  - In restructured industries, an unresolved question, often only limited moves towards 'economically efficient' pricing wrt earlier arrangements

NEM retail markets and competition

- Little focus on energy services
  - "… an important reason there is effective competition in Victoria is .. because the provision of energy is viewed as a homogenous, low engagement service" (AEMC, 2008)
- Current measures of competition might miss key issues
  - Yes, NEM high switching rates – but real customer choice or just churn?
  - Yes, NEM price spreads – but reflect competition, stickiness, or govt policy?
  - "The thing about the energy retail market is it's effectively an oligopoly.. There are a small number of large players—three—who are effectively providing a commodity." *Jim Myatt, founder of Australian Power and Gas on its sale to AGL (crikey.com.au, 2013)*



(Accenture, 2013)



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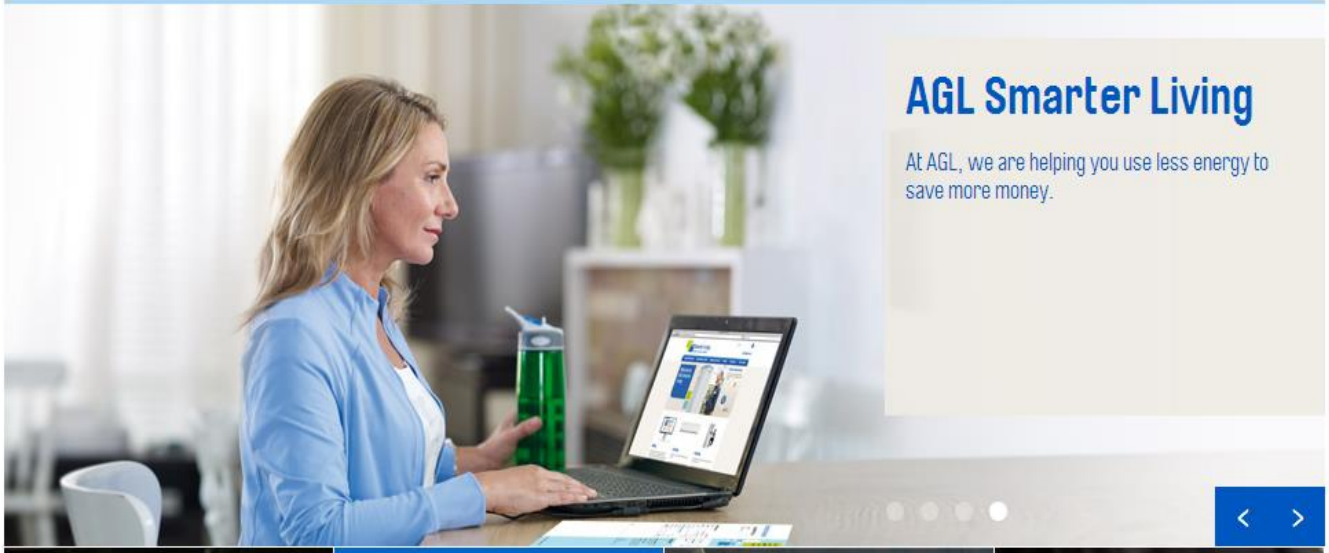

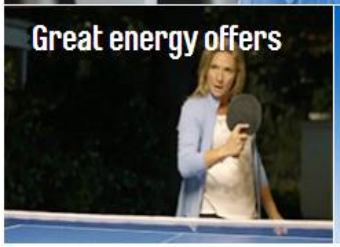

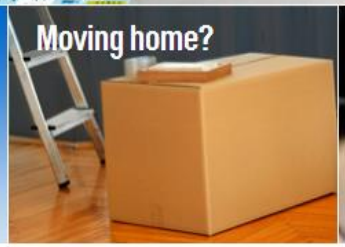

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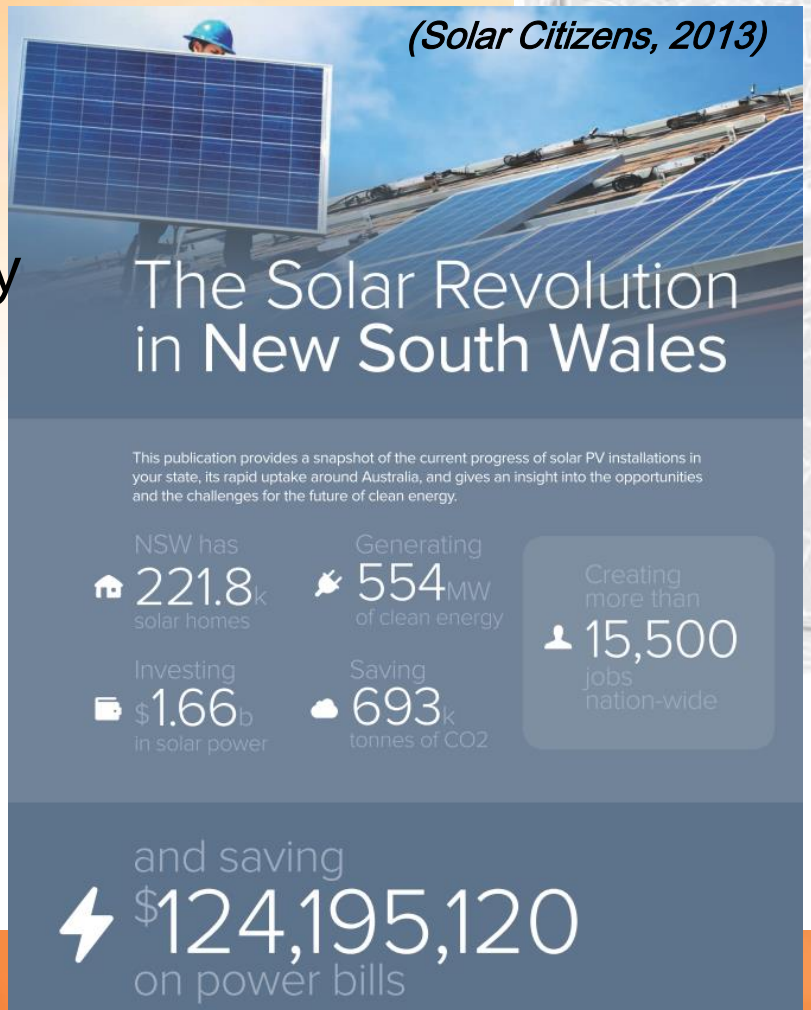
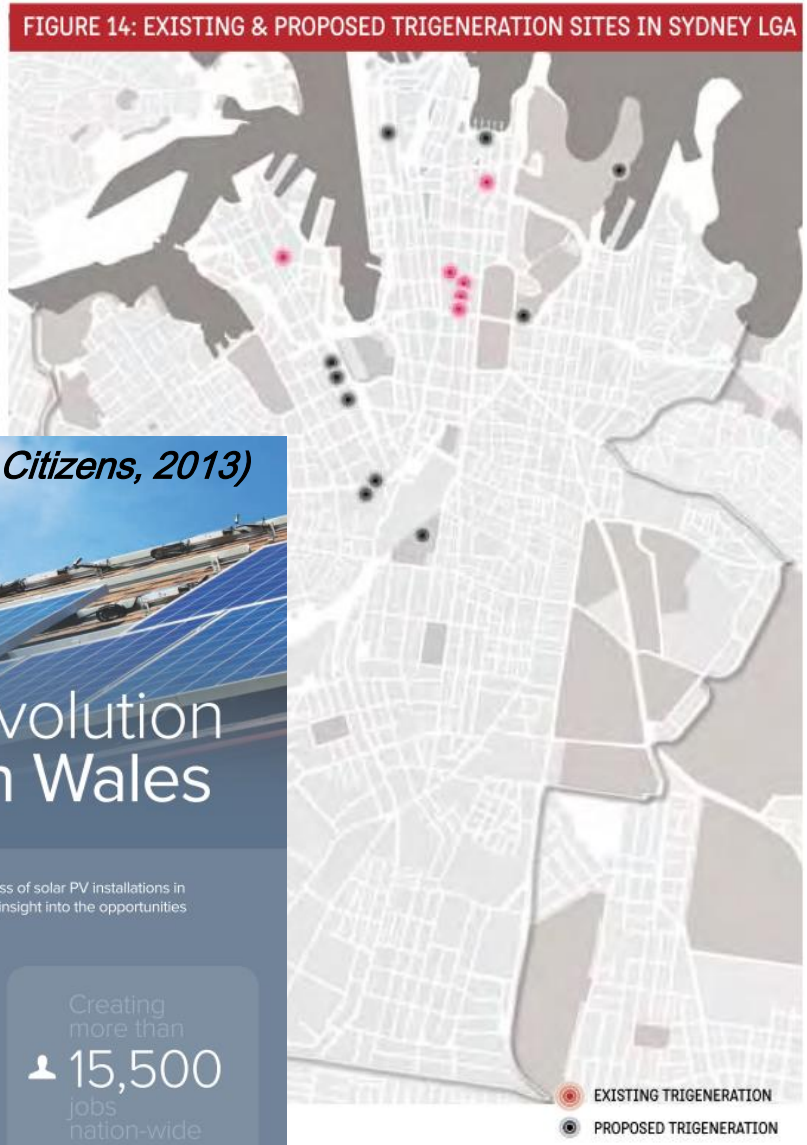
Some real competition?

- Distributed generation
  - Photovoltaics
  - Trigeneration
  - Others to come…
- Distributed energy management
- End-use energy efficiency



(Solar Citizens, 2013)



(City of Sydney, 20132

These options are a ‘market’ response

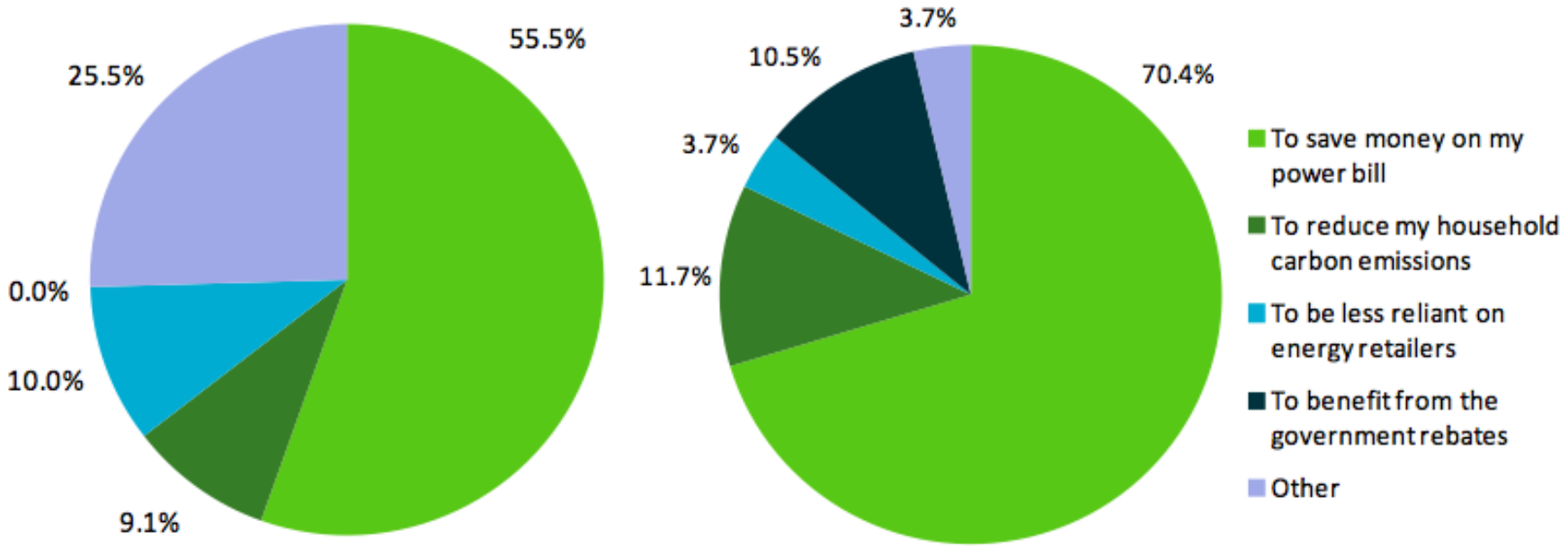


Figure 10 Motivation for distributed energy systems by households already using SHW (left) and SPV (right)

(CSIRO, 2013)

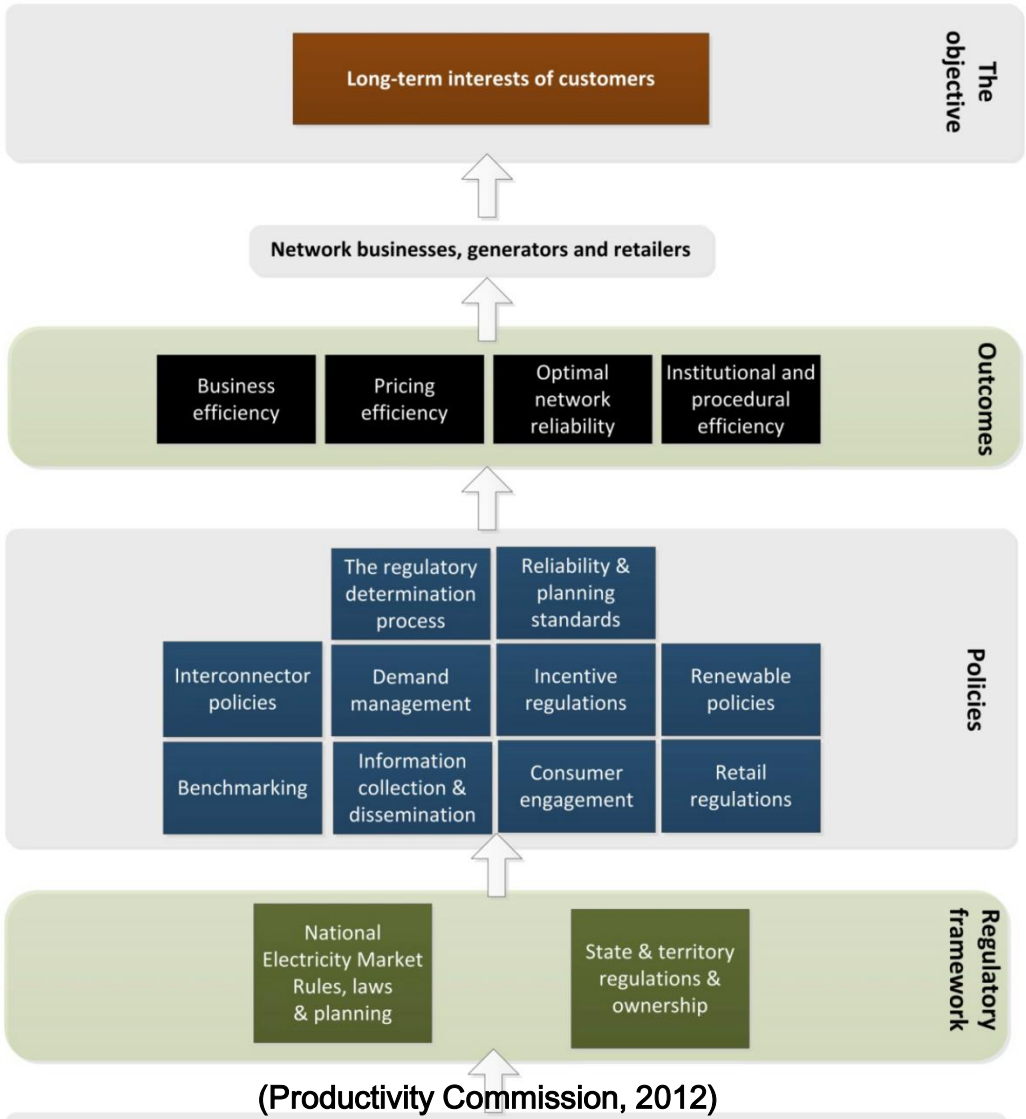
Challenges and opportunities for Distributed Energy

- How well do electricity industry arrangements establish and allow such distributed energy options to suitably receive
  - Energy and network values
  - Wider social and environmental values

- In restructured industries a question of wholesale & retail market design, network regulation & policy frameworks
  - Challenges of technology and participant neutrality for emerging DE options that have very different technical & economic characteristics, location near and ownership by end-users
  - *Retail markets where distributed energy resides are the 'unfinished' business of many electricity industry restructuring processes*
  - *Intersection of regulated network and competitive supply/demand options invariably complex and imperfect*
  - No serious efforts yet in most jurisdictions to fully address environmental, energy security and wider social externalities of energy markets

In response

- Key role of current actors; motivations & interactions in current developments
  - Surprisingly, Productivity Commission doesn't see generators, retailers and NSPS as one of the main institutional actors?



Some current developments

Power supply shake-up

Daniel Mercer, The West Australian, July 15, 2013

Hundreds of thousands of WA households could be hit with higher electricity prices under a proposed shake-up of bills aimed at recovering the massive cost to the system caused by the popularity of rooftop solar panels.

Hundreds of thousands of WA households could be hit with higher electricity prices under a proposed shake-up of bills aimed at recovering the massive cost to the system caused by the popularity of rooftop solar panels.

WA's energy chiefs are understood to be pushing for a change in the structure of bills to make customers pay more in fixed charges.

At present, most of a householder's electricity bill stems from the amount of electricity used. Fixed costs, such as the supply charge, make up about 15 per cent of the bill. However, solar panels have slashed consumption for those households, cutting revenue to State-owned power companies, including retailer Synergy and network operator Western Power.

The trend has been highlighted as one of the big issues facing the electricity system and Energy Minister Mike Nahan has been warned that if nothing is done the consequences could be catastrophic. Either households without solar panels would be left to pick up the tab, forcing their bills to unaffordable levels, or electricity providers would be financially crippled.

WA's take-up rate of photovoltaic cells - initially fuelled by generous State and Federal incentives - stands at more than 10 per cent of households and this figure is expected to double within years.

"To encourage energy efficiency governments must not only establish environmentally responsible construction and manufacturing standards, but can also set a regulatory framework for progressive energy tariffs to make consumers more aware of energy efficiency as a means to reduce overall national energy costs…." *(World Energy Council, 2012)*

Do we want our electricity market to reduce its price signals to end-users on the value of undertaking energy efficiency actions? *eg. by increasing standing charges relative to variable charges* (QCA, 2013 pricing determination)

"The ESAA estimated the current total of PV 'avoided' costs at $340 million, or around $30 per household. To put this into context, this sum is – according to the ESAA's own data – just one eleventh of the cross-subsidy paid by households with no air conditioning. The ESAA estimates these air con network costs at $330 per household, and it is certainly not "hidden", because it has been one of the key reasons why networks have been "supersizing" their grids over the last few years, at an aggregate cost of nearly$40 billion." *(RenewEconomy, 2013)*

Do we want our electricity market to continue current cross subsidies for air-conditioning, but instead target the smaller cross-subsidies for clean and green PV?

(Solar Citizens, 2013)

Table 1: Tariff 11 – Bill Impacts for the Typical (Median) Customer

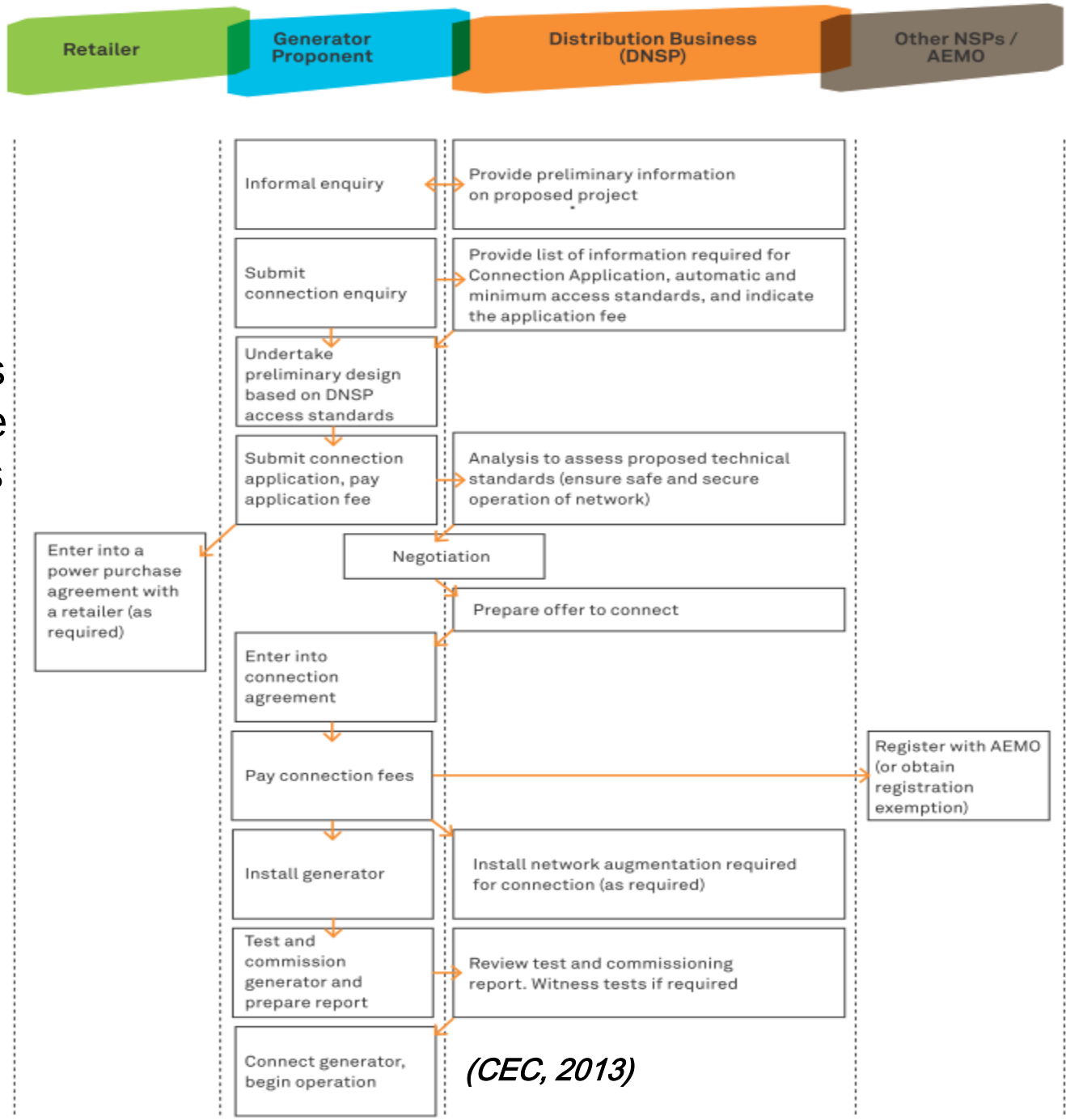
Tariff Component	*Frozen 2012-13*	*Transitional 2013-14*	*Increase*
Fixed charge (cents/day)[1]	26.170	50.219	*91.9%*
Variable charge (cents/kWh)[1]	23.071	26.730	*15.9%*
Annual Bill[2] ($, GST inclusive)	***1,184***	***1,451***	***22.6%***

1. GST exclusive.
2. Based on a typical (median) customer on Tariff 11 consuming 4,250kWh per annum.

Getting connected..

- Larger commercial / industrial PV systems and cogen/trigen face significant challenges in obtaining network connection.

Figure 1 – Overview of the connection process



(CEC, 2013)

Table 2 - Connection application documents

Document Title		Description
Connection Application cover letter		One page document that brief description of the pr the appropriate contact d
Connection Application form		Some DNSPs will provide forms to be completed, w others will simply specify information to be provide
Generally not required for projects <5MW, but the requirements of the connection application will vary between DNSPs	Generator Performance Standards	This document outlines h generator meets the requ of the system, ensuring that it can safely interact with the DNSP's network. It identifies the limits that the system will work within, and is typically based upon Schedule 5.2.5 of the NER and supported by detailed modelling studies.
	Technical Data Sheets [5]	A series of spreadsheets that illicit technical information about the equipment being used in the installation and grid connection. Example speadsheets which are often used as a basis for DNSP data request formats are available on AEMO's website. It requests four categories of data (S, D R1 and R2), as outlined in Table 3. Only S data is required with the connection application, but if D data is available it is beneficial to include it. R1 and R2 data relate to information that is required to be provided during registration and proven during commissioning tests. These are not generally required for generators <5MW.

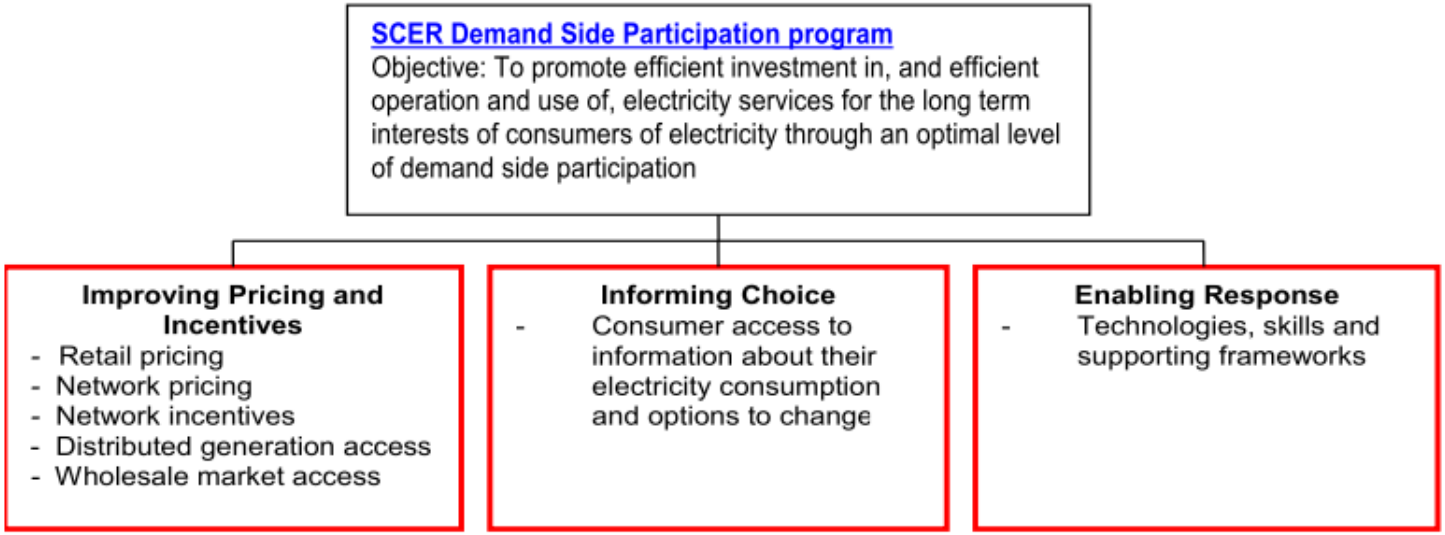
Table 4 - Typical components of a connection agreement

Component	Description
Terms and Conditions	
Network Services	Outline of the services to be provided by the DNSP Requirements of the generator to facilitate the provision of such services
Insurance	Insurance requirements of the proponent
Liabilities	Limit of liabilities of both pa
Variation to the charges	Outline of the conditions unc there might be a variation in
Taxes	Clarification of the ownershi government tax imposed on
Dispute resolution	Process for resolution of dis
Contract termination and extension	Provision for termination or of the contract
Notices	Process for issuing of notice
Technical Schedules	
Scope of works	Definition of each element of works to facilitate connection and identification of the responsible party for each element.
Term	Agreed connection date and duration of the agreement
Technical standards	A description of the technical standards that the generator will meet, including each of the aspects listed in section 3.5.2
Operating asset management	Definition of the generator's property boundary and equipment management (maintenance schedules, etc)
Access, inspection	Arrangements for access onto the generator's property (for metering, maintenance, etc)
Metering	The agreed provisions around metering, equipment rule, procedures for testing and inspection and metering data
Network protection	Outlines the network protection requirements
Testing and commissioning	Testing and commissioning procedures that will be applied
Fees and payments	Outlines the application fee, connection fees and the process for managing any other project fees levied by a third party Also outlines any ongoing payments to be made by the DNSP to the embedded generator for services provided
Technical reports	Reports pertaining to technical studies or detailed design carried out by the proponent

(CEC, 2013)

Other developments

SCER Demand Side Participation Program *(SCER, 2013)*



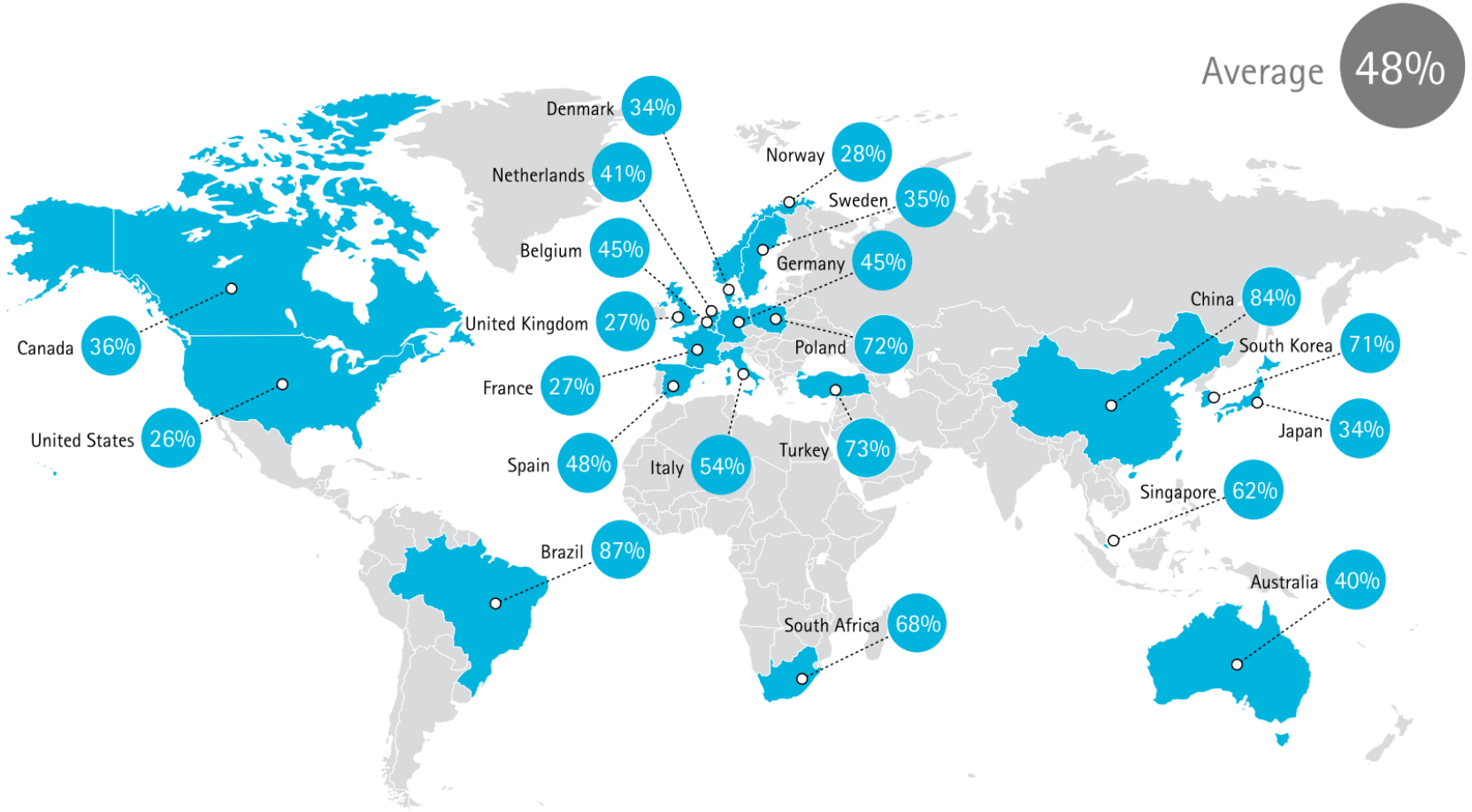
The Standing Council on Energy and Resources (SCER) has adopted this framework to guide its demand side participation (DSP) work. The framework provides an overview of SCER's policy objectives for DSP:

- **Improving pricing and incentives**: consumers need clear signals about the cost of their energy consumption in order to efficiently manage their demand, and supply chain businesses need appropriate incentives to implement and facilitate demand side participation options.
- **Informing choice**: consumers and demand side providers need a range of information so that they can identify and implement efficient demand options.
- **Enabling response**: a range of technologies, skills, and supporting frameworks are required to support pricing, information, and demand management options, and to enable timely responses to market signals.

No.	Work streams	Policy Areas			Description[1]
		Improving pricing and incentives	Informing choice	Enabling Response	
Energy efficiency and demand side interaction					
21.	Review of energy efficiency programs' interaction with demand side policy	→	→	→	**Purpose:** Energy efficiency and demand side participation are closely linked as options for consumers to manage their energy consumption and costs. Better coordination between energy efficiency and demand side participation policy and programs could result in more effective program design and resource allocation, and better outcomes for consumers. **Status:** Officials will consider options for progressing this work stream.
22.	Data availability on appliance load profiles	→	→	→	**Purpose:** Better information on the load profiles of appliances would help in targeting energy efficiency and demand side participation activities, and identifying opportunities for direct load control. **Status:** Officials will consider options for progressing this work stream.
Distributed Generation					
23.	National Strategy on Energy Efficiency – distributed generation		✓	✓	**Purpose:** The Strategy includes measures to address barriers to harnessing electricity markets to better enable the uptake of economic and cost-effective distributed generation. **Status:** Ongoing, including consideration of developing connection standards for small embedded generation (see below).
24.	Feasibility study of embedded generation connection standards			✓	**Purpose:** Consistent technical standards for embedded generation connections could lower costs for embedded generation project developers and distribution networks. **Status:** SCER officials are undertaking a study to consider whether it is technically feasible to develop such standards, and the degree of stakeholder support.
25.	AEMO Small Generator Framework Design		✓	✓	**Purpose:** AEMO has developed a number of principles for small generators (less than 5 MW) covering issues such as registration, metering, settlement, security and reliability, and information provision. **Status:** A final report was completed in April 2010 to guide AEMO's approach to prioritising future actions to address identified barriers to small generator participation in the NEM. AEMO submitted a Rule change proposal to implement elements of the framework in December 2011. This rule change has now been made, and AEMO is in the process of implementing consequential changes to procedures. The status of other aspects of the framework is available on the AEMO website, www.aemo.com.au.
26.	Protocols and standards for direct load control			✓	**Purpose:** In the electric vehicles review, the AEMC noted the potential of managed electric vehicle charging as a form of demand side participation. The AEMC considered that protocols and standards would help to manage the impact on networks and other participants of switching large blocks of controlled loads. **Status:** In the electric vehicle review, the AEMC noted that these issues may be addressed in the embedded generator rule change. SCER has asked the AEMC whether this will be applicable.
Retail market evolution and regulation					
27.	AEMC review of retailer switching		✓	✓	**Purpose:** In the Power of Choice review, the AEMC recommended a review into the time taken to complete customer requests to switch retailers. Improving the requirements for switching retailers could improve competition and residential consumer participation in the electricity market. **Status:** SCER will ask the AEMC to undertake this review.
28.	Advice to Ministers on need for additional regulation of third party energy service providers		→	→	**Purpose:** A range of services could help consumers make decisions about their energy consumption and demand side participation options, for example energy efficiency advice and direct load control options. There is debate in the industry about if any or all of these services should be included in the same regulatory framework that applies to selling and supplying electricity. **Status:** Officials will progress work for Ministerial decision on whether any changes are necessary to the framework currently established by the national energy laws and the Australian Consumer Law, taking into account the current stage of development of the market for energy services.
29.	Clarify definition of 'sale of energy' in the National Electricity Retail Law		→	→	**Purpose:** In the electric vehicles review, the AEMC considered that there is room for confusion on whether providing electricity for charging electric vehicles is a 'sale of energy' as defined in the energy retail law. The answer to this question has consequences for how electric vehicle charging services are regulated and the protections available to consumers. **Status:** SCER's policy on this issue is identified in its response to the electric vehicles review.
Broader work streams relevant to demand side participation					
30.	Productivity Commission Inquiry into Electricity Network Regulation	→	→	→	**Purpose:** The review examined benchmarking arrangements in network regulation, including consideration of demand side issues. For example, one goal of benchmarking could be to consider the extent to which networks have engaged in optimal demand side management. **Status:** A draft report was issued in October 2012 and the Commission provided its report to the Australian Government in April 2013.
31.	Energy Savings Initiative (tbc)[3]				**Purpose:** The Commonwealth is finalising its detailed investigation into the costs and benefits of a potential national Energy Savings Initiative (ESI). This work is a component of the Clean Energy Future package and is part of the Government's response to the 2010 report of the Prime Minister's Task Group on Energy Efficiency. **Status:** When the investigation is completed, the Commonwealth will consider whether or not to progress a national ESI. Any Commonwealth decision for action will be taken to the Council of Australian Governments (COAG) for agreement.

New business opportunities - end-user interest

In the next 12 months, are you planning to spend money on energy-related products and/or services for your home (e.g., energy-efficient appliances, smart thermostats, etc.)?



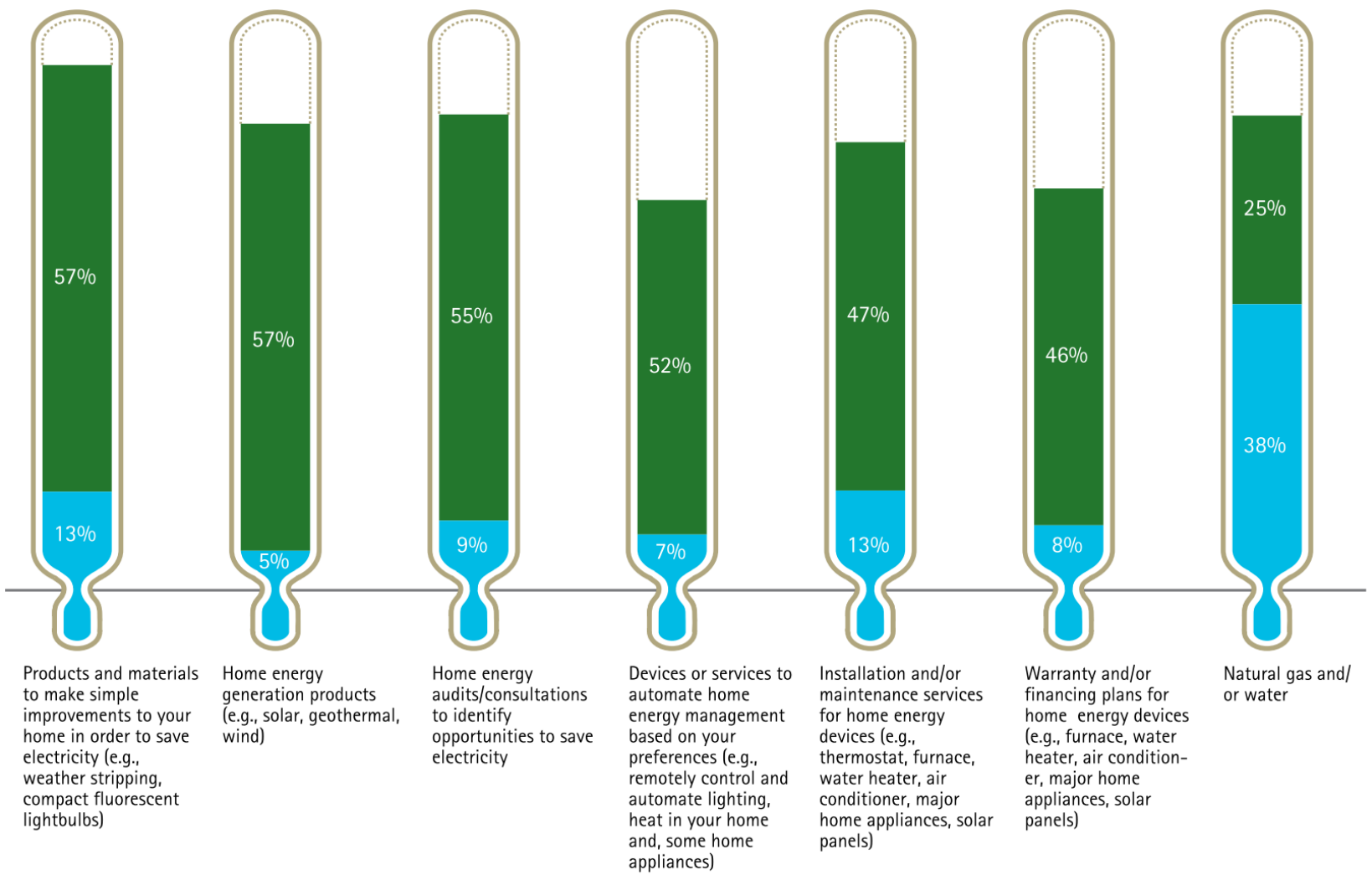
Yes

Base: All respondents

Source: Delivering the New Energy Consumer Experience, Accenture, 2013.

(Accenture, 2013)

…and interest in, and need for guidance

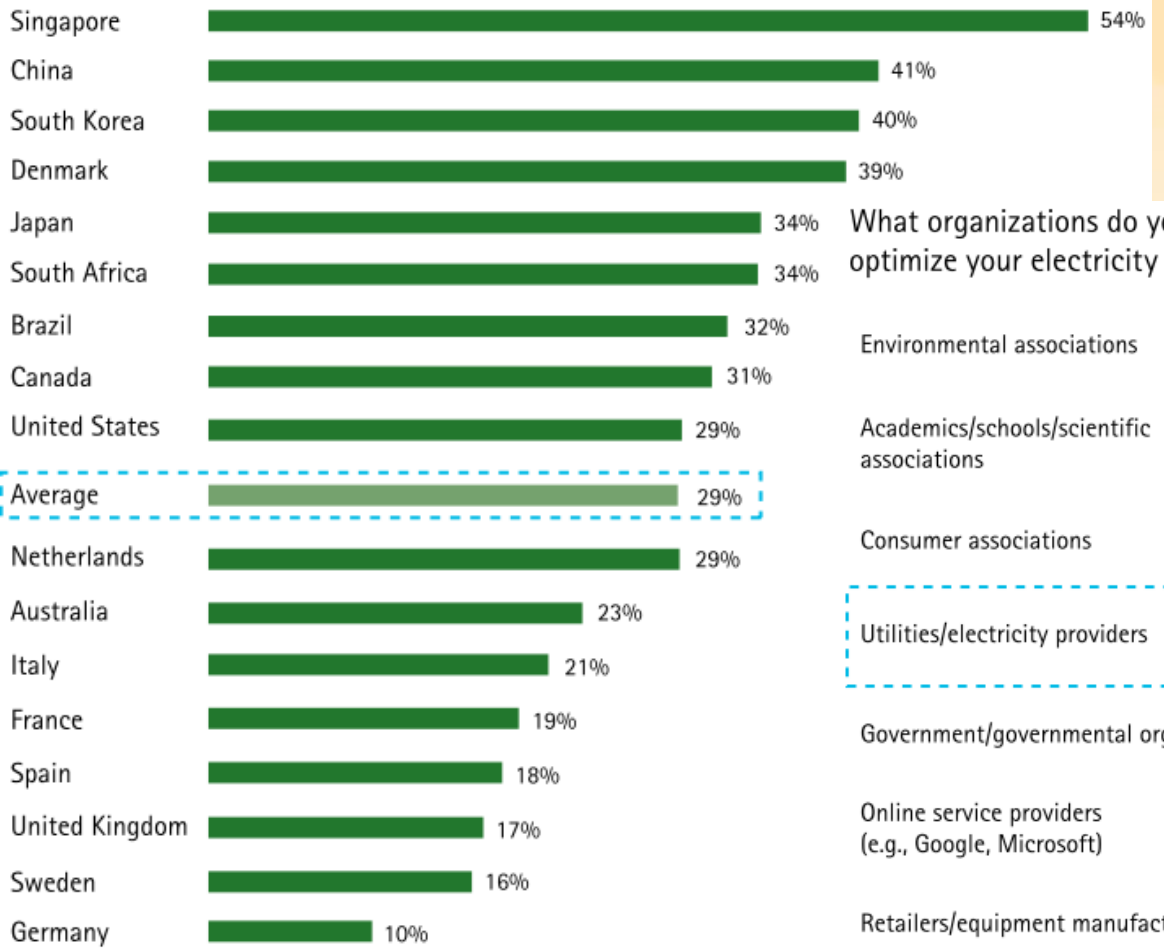


(Accenture, 2013)

Source: Actionable Insights for the New Energy Consumer, Accenture, 2012, www.accenture.com.

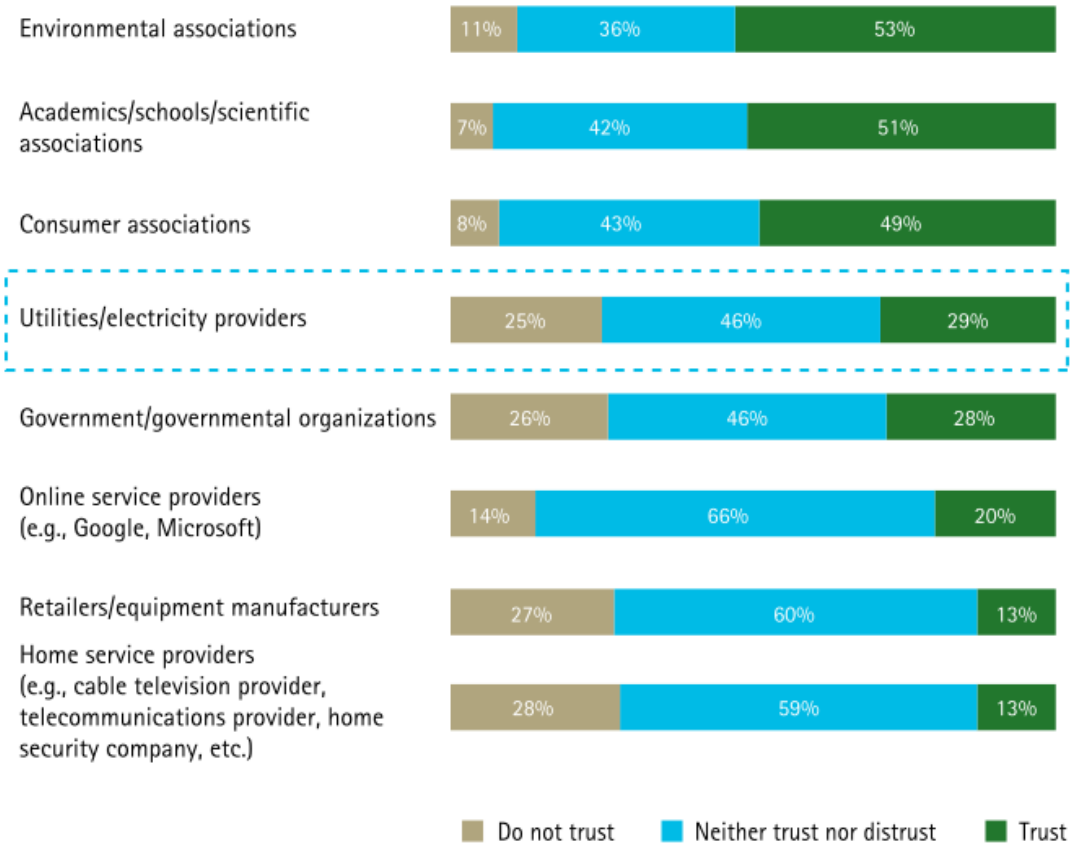
Currently some ‘trust’ issues for electricity providers

Do you trust your utilities/electricity providers to inform you about actions you can take to optimize your electricity consumption?



(Accenture, 2010)

What organizations do you trust to inform you about actions you can take to optimize your electricity consumption?



Conclusions- current 'retail' markets and prices

- Aren't providing and pricing what end-users actually need and hence want to buy
- Are clearly not economically efficient because
  - Current market arrangements don't facilitate appropriate levels of demand-side participation and energy efficiency which are both essential to achieve highest possible economic efficiency
  - NSPs faces perverse incentives to increase network expenditure, currently largely fail to implement non-network solutions
  - Still don't properly reflect broader societal objectives – social and environmental
- Some current developments
  - *may reduce potential role of pricing further – eg. increasing fixed charges which aid cost recovery, but don't send appropriate 'signals' to end users*
  - *may actively discriminate against new options – eg. solar tariffs*

And possible ways forward

- Many of our key opportunities going forward lie on the demand-side in current 'retail' markets – energy efficiency, demand-side participation, distributed generation
- However end-users have to be 'ready, willing and able' to act
  - Need support from Energy Service Companies (ESCOs) focussed on delivery of energy services - the missing 'institutional' player in the NEM *This should be key focus of future 'reform'*
  - More economically efficient retail + network 'prices' can play useful role but inherently limited in addressing wider concerns, hence more required
  - *Coherent and comprehensive policy, market and regulatory framework to facilitate rather than discriminate against societally valuable new options*
- Network decision making better served by more Integrated Resource Planning approach rather than current arrangements
  - *Greater transparency, stakeholder participation, separation of powers*

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Thank you… and *questions*

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