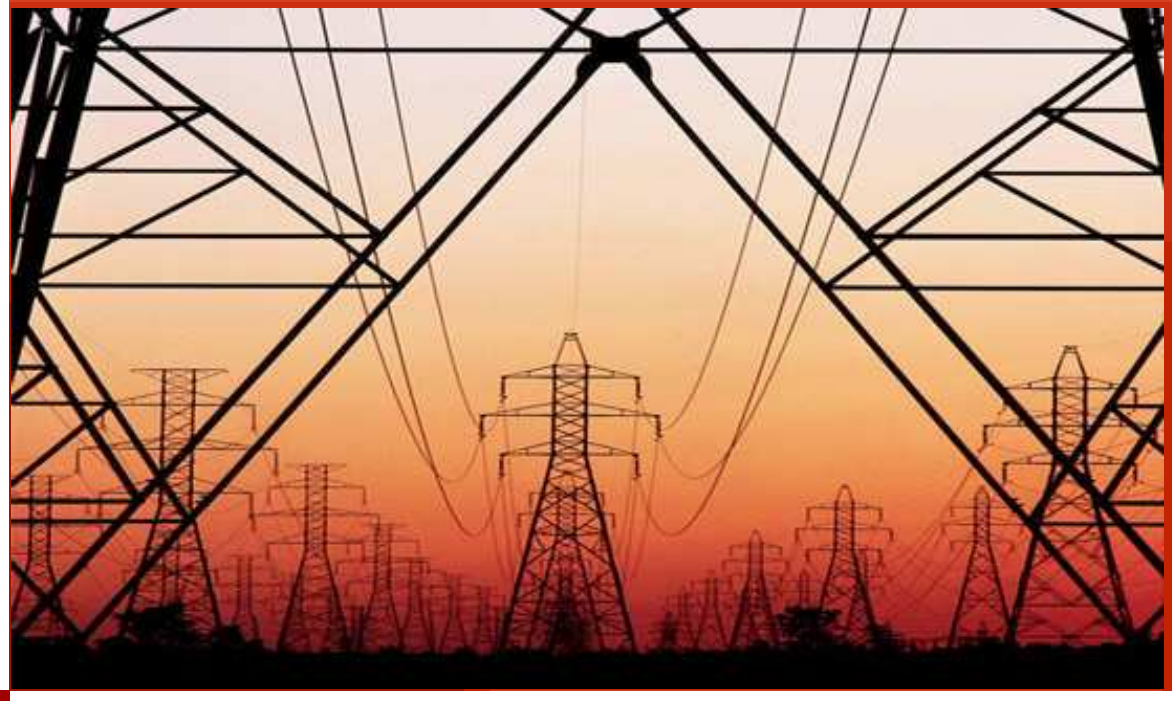
www.pwc.com.au

Australian Electricity Market Reforms and Business Cases

PwC Australia



pwc

Mark Coughlin – Partner

Short CV

Mark Coughlin is a leader of the Australian and Asian energy and utilities practice . Mark has almost 30 years experience working in and advising utility and infrastructure businesses in Australia and internationally. His experience includes Commercial Management, CEO and CFO roles in large Australian utility corporations. These roles encompass all strategy, regulatory, operational and financial management elements of utilities businesses.

Mark advised on asset valuations, corporate operating models, systems implementations and process design during the Australian market liberalization in the 1990s. While being an industry CFO with Origin Energy's network business, he was a major sponsor and participant in end to end reform programs such as improving safety and risk management. National President and Chairman in 2005/06 of CPA Australia

Relevant Experience

Key experience:

- Strategy
- Operational management
- Risk assessment

Industry:

- Energy (electricity, gas and oil)
- Utilities

Relevant project experience

- Advisor to major Australian electricity retailers on:
  - review of wholesale trading risk management processes and controls
  - development of new operating model for merged retailer and generator
- Advisor to Queensland and Victorian governments on market design and regulatory development during the market liberalization, as well as review of network business efficiency and effectiveness
- Provided specialist advice to energy companies with smart grid strategic options analysis
- Assisted major energy companies with regulatory strategy and submission support projects
- Provided risk assessment services to network companies across their entire assets

Outline

1. Overview
2. Current market participants
3. Utility of the future

Overview of the current Australian electricity markets

Brief description of major Australian market participants

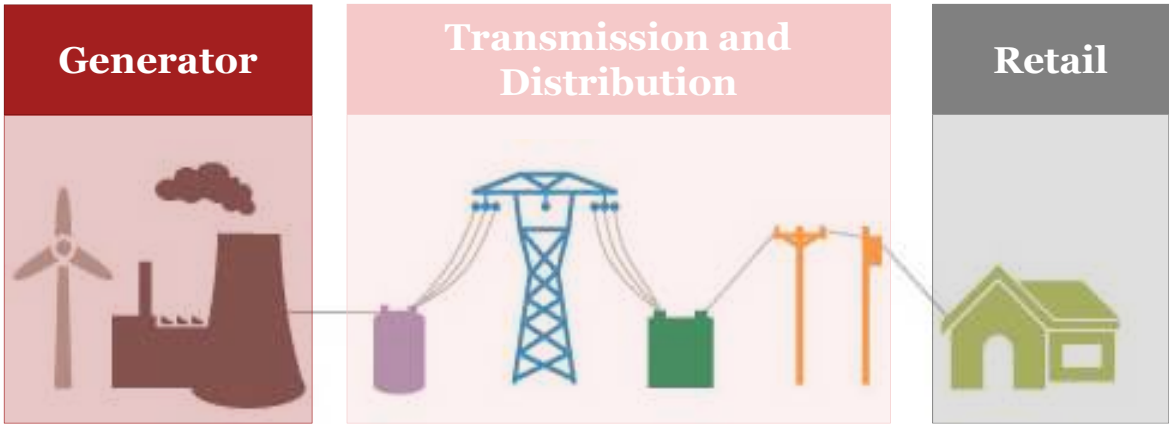
Overview of PwC's recent thought leadership

Overview

1

Overview of the current major Australian electricity markets

Australian markets are vertically separated

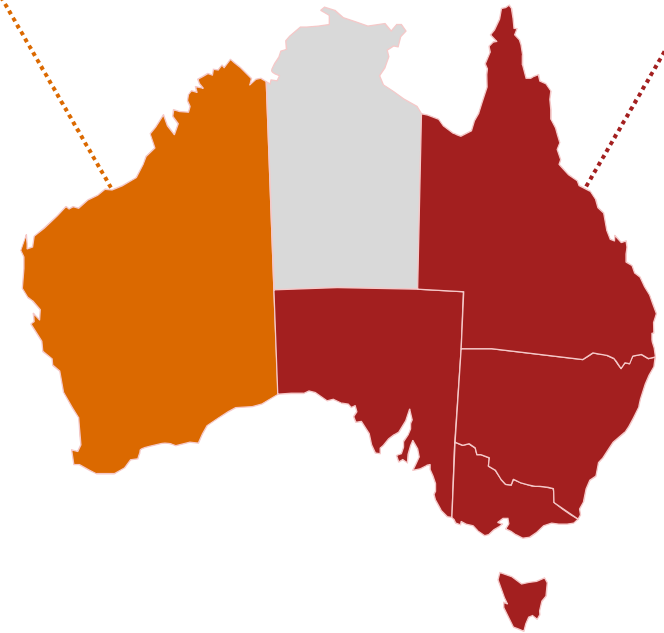


Note, there are several markets in Australia, but the most relevant is the National Electricity Market (NEM) that covers East and South Australia.

Australian Energy Market

Western Australian Energy Market (WAEM)

Starting Date	2006
Region	Western Australia
Supplied output	~ 18 TWh/year (2010)
Generating capacity	6,300 MW (2010)
Customers	~ 2 million



National Electricity Market (NEM)

Starting Date	Began operation as a wholesale spot market for electricity in Dec 1988
Regions	QLD, NSW (incl. ACT), SA, Vic, Tas, ACT
Supplied output	~200 TWh/year (2013)
Generating capacity	48,321 MW (2013)
Traded value	A$12.2 billion (2012-13)
Customers	9.3 million

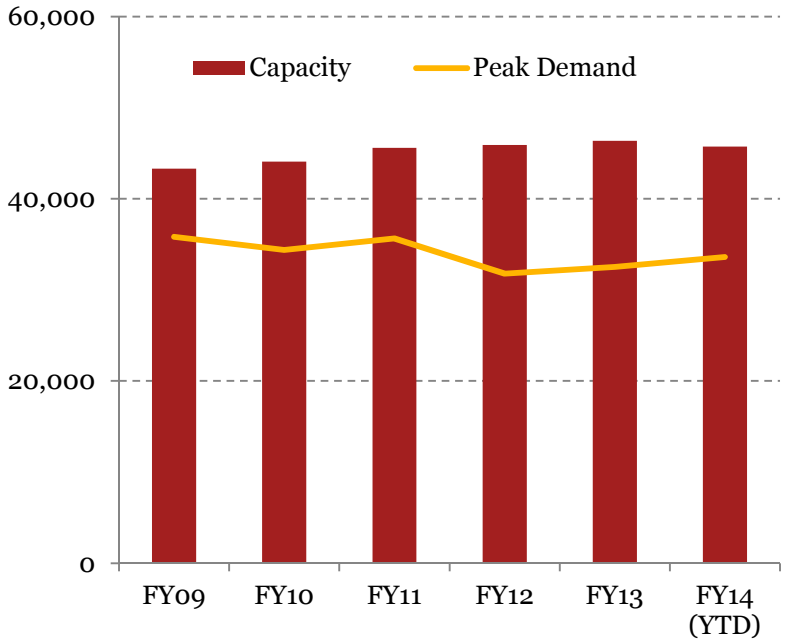
The NEM represents ~89% of the total Australian electricity market by generating capacity

Source: Australian Energy Regulator statistics;

Overview of the National Electricity Market (1/3)

Snapshot of the National Electricity Market	
Participating jurisdictions	QLD, NSW, Vic, SA, Tas, ACT
Installed capacity	48 321 MW
Number of generators	317
Number of customers	9.3 million
Turnover (2012-13)	A$12.2 billion
Total energy generated (2012-13)	199 TWh
Maximum historical demand	35 551 MW (2009)

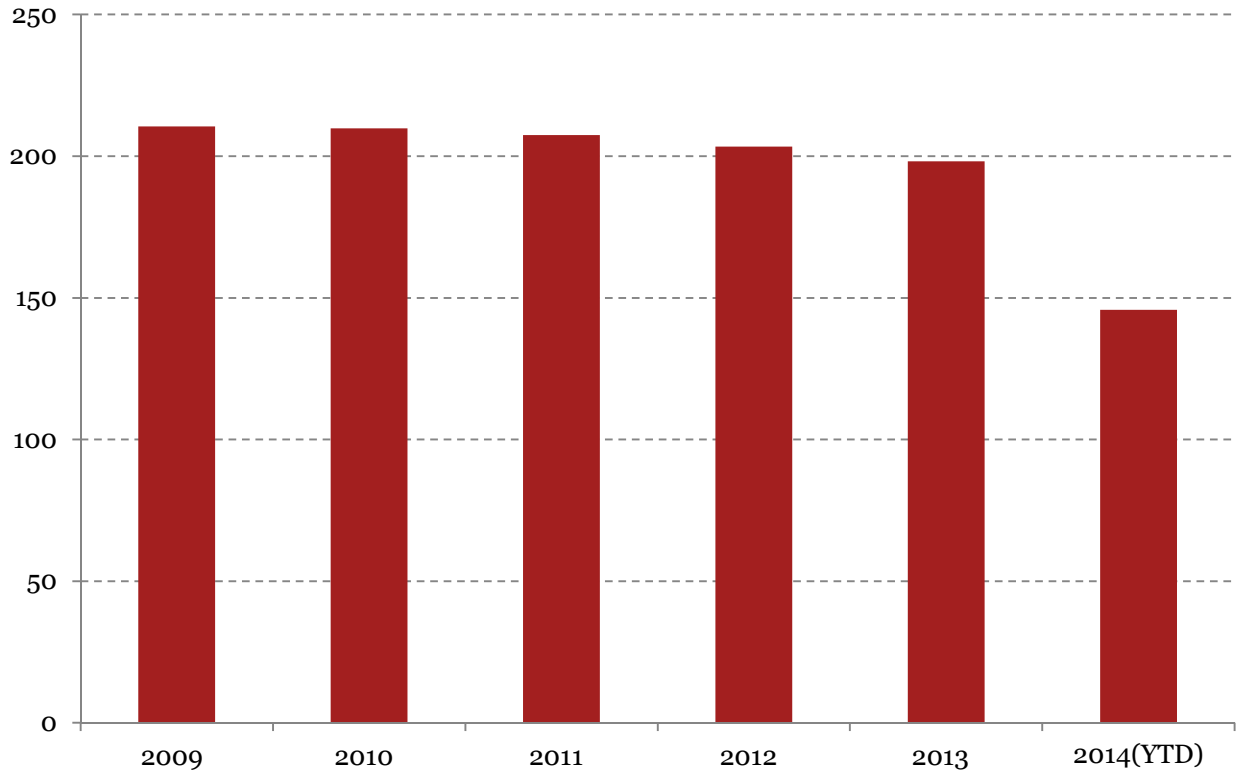
NEM Market Capacity and Demand (MW)



Source: Australian Energy Regulator statistics

Overview of the National Electricity Market (2/3)

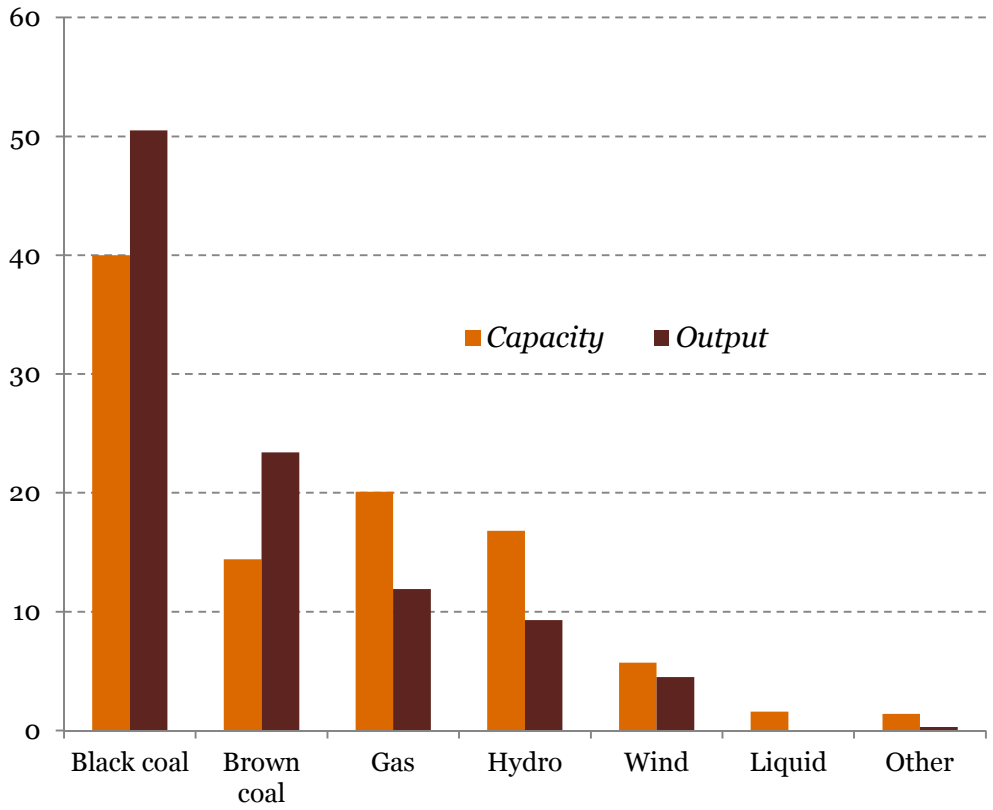
Total annual energy consumption in the NEM (TWh)



Source: Australian Energy Regulator statistics, based on generated energy per financial year

Overview of the National Electricity Market (3/3)

Registered generation by fuel source (% of total generation)



- ***Although black and brown coal account for only 55% of registered generation capacity they supply 75% of output***
- ***Coal fired generation declined 7% in 2012-13***
- ***Hydro generation increased by 36% in 2012-13***
- ***Government subsidies led to a rapid increase in solar PV generation over the past 5 years, but installed capacity is still residual (2300 MW in 2012-13)***

Source: Australian Energy Regulator statistics, data as at 01 April 2014

Features of Australian retail electricity market

Price	• Victoria and SA do not regulate retail electricity prices. • Queensland committed to removing electricity retail price regulation by Jul 2015 and TAS by Jul 2014. • Retail electricity prices in 2013-2014 have stabilized in most jurisdictions. • Gas retail prices tended to rise more strongly for gas than electricity in 2013-2014 due to international demand for LNG exports. • Rising costs of energy networks (electricity poles and wires, and gas pipelines) were the main driver of rising energy retail prices over the past 5 years in many jurisdictions.
Regulation	• In retail the transition to national regulation of retail energy markets is continuing with 4 jurisdictions (TAS, ACT, SA, & NSW) implementing the National Energy Retail Law.

Demand & Generation	• Reverse in the rising trend for electricity demand causing surplus generation capacity and decreasing appetite for new generation builds and network expansion.
	• Unlikely need for new generation capacity in the next 10 years.
	• Decrease in electricity demand for 2013-14 due to:
	  • Customers responding to higher electricity costs by reducing energy use and by adopting energy efficiency measures
	  • Subdued economic growth and weaker energy demand from the manufacturing sector
	  • Rise in solar PV generation

Retail Competition	• Retail sector experienced a slight increase in market depth in 2013-14 with small private retailers (mostly new entrants) gaining market share • 3 retailers (AGL Energy, Origin Energy and EnergyAustralia jointly supplied 77% of small electricity customers and 85% of small gas customers in 2012-13 (NEM).

Market design

Four main aspects to the design of the market

Wholesale markets	A competitive spot market for generators to sell their electricity to retailers at prices in 30 minute increments and for five regions. Generators bid into the market, and are dispatched based on the lowest price bid, in the order of those who bid the lowest to highest. The price is set at the highest dispatched price.
Network access	A framework that provides generators with access to monopoly transmission and distribution lines, and therefore the end-user, on a non-discriminatory basis. Revenue/Prices are set periodically by a regulator.
Retail markets	A competitive market where retailers package the costs of production and sell to end-users. The degree of competition varies between different Australian states, ranging from very to little competition.
Service standards	Standards that relate to energy security, reliability and customer service, varying in each jurisdiction.

Roles, institutions & governance

Legislation that create the NEM:

- Primarily the National Electricity Law (NEL), which provides high level guidance and is implemented by the National Electricity Rules (NER); and
- Supported by additional legislation, such as the National Electricity Retail Law and the Australian Energy Market Commission Establishment Act 2004

Businesses that participate in the NEM

- Retail – 23 businesses, with the majority of market share owned by three retailers. Many of the businesses are integrated generators and retailers.
- Network – 5 transmission businesses, 13 distribution businesses and 3 interconnectors that link the NEM together.
- Generators – 32 generators, with the majority being both generators and retailers.

Institutions that Govern the NEM

- Economic Regulation and compliance – Applies the NER by economic regulation of the network businesses, and compliance of the entire energy sector with legislation and rules. The Australian Energy Regulator, overall, is responsible for this. Some state regulators also have a role.
- Rule maker – A body that interprets and applies the NEL to derive the NER to create the NEM, and the development of it. The Australian Energy Market Commission is responsible for this.
- Policy – Primarily the COAG Energy Council, a body that represents energy Ministers from Australian State and Federal Government.
- Market operation and planning – Operates the NEM's electricity markets and systems, and assists in transmission network planning.

Financial / physical hedging framework

Electricity derivatives can be traded on Australian financial markets to assist in managing wholesale market risk

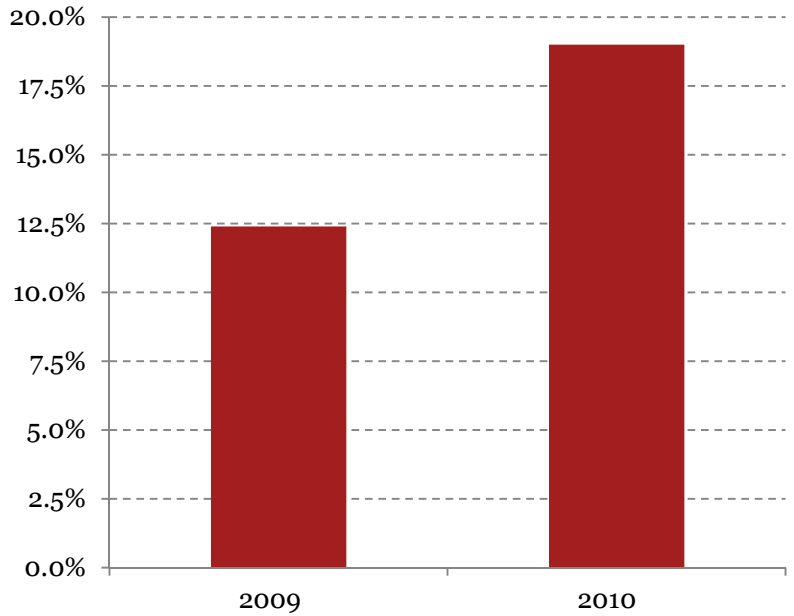
- Financial products can be traded Over-The-Counter or through a dedicated exchange.
- Products include options, futures contracts and swaps
- Governed by Australian financial market laws and regulations
- Electricity generators and retailers often trade
- Most liquidity is found for products 18 to 24 months in the future

Current market participants

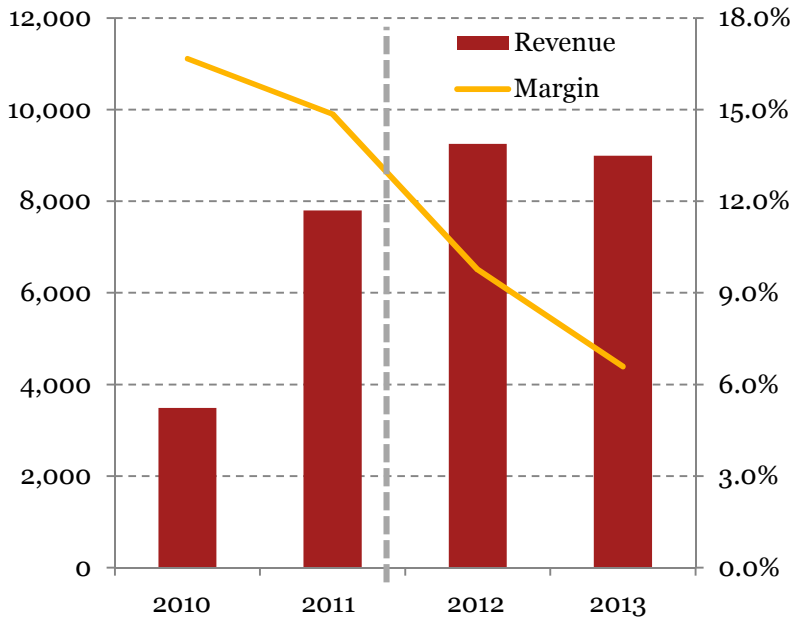
2

EnergyAustralia – Company Overview

EnergyAus Return on Equity (%)



EnergyAus Revenue (A$m), EBITDA Margin (%)



Acquisition by CLP Group

- Standard & Poor's downgraded EnergyAus rating due to suppressed prices in the wholesale market, resulting from an over-supply of generation and falling demand
- Retail operations remain weak due to existing duplication of customer relations system since the acquisition of the NSW retail business in 2011, resulting in a higher opex

Source: CLP Group Reports, EnergyAustralia Annual Report

EnergyAustralia – Company Overview (cont'd)

EnergyAustralia significant generation assets

Plant	Origin Ownership	Capacity	Type	Fuel
Yallourn	100%	1480 MW	Coal-fired	Brown coal
Mount Piper	100%	1400 MW	Coal-fired	Coal
Wallerawang	100%	1000 MW	Coal-fired	Coal
Hallett	100%	203 MW	Open Cycle Gas Turbine	Natural Gas
Ecogen	Gentrader Rights	966 MW	Open Cycle Gas Turbine	Natural Gas
Tallawarra		420 MW	Combined Cycle Gas Turbine	Natural Gas
Wilga Park		16 MW	Open Cycle Gas Turbine	Natural Gas
Waterloo		111 MW	Wind Farm	Wind
Cathedral Rocks	Joint-venture	66 MW	Wind Farm	Wind

Source: EnergyAustralia – 2013 reports

Number of households and business accounts (million)

Total generation capacity (MW)

Percentage of renewable generation (%)

EnergyAustralia – Company Overview (cont'd)

Company Strategy

Current

- EnergyAustralia has become one of the largest vertically-integrated energy companies in Australia, through both major acquisitions and organic growth.
- EnergyAustralia is overhauling its customer service IT system .

Future

Short term

- Continue to improve customer systems and migrate customers from the old system onto the new platform and to extract efficiencies including reduction in bad debts.
- Optimise the generation portfolio in line with prevailing market dynamics.
- Pursue low-cost direct sales including growth in the digital channel.
- Transform the IT as well as human resources functions.
- Focus on a vertically integrated business as the best model to effectively balance the market risk associated with the supply of energy and meeting consumer demand for energy.

Medium term

- Leverage the strong retail presence and provide an innovative and differentiated experience for customer segments.
- Improve core efficiency and be at the forefront of digital and technological capability.
- Provide flexible fuel and lower cost generation balanced to the needs of mass market customers.

Emergence of rapidly growing 'disruptors'

Lumo Energy

- Owned by Infratil – a NZ listed utility and transport owner and operator
- Taking advantage of poor customer service of major retailers – customer numbers growing at 10% per annum over past 3 years
- Has unique product in 'Direct Connect Australia'
- Largely a retail and 'cost to serve' and 'trading/contracting' play with almost all generation being purchased from the market
- Currently under strategic review

Alinta Energy

- Private equity owned – TPG
- Acquired assets from a failed investment bank 'Babcock and Brown'
- Generators in SA (35% of output) and Victoria
- Retailer in WAEM with 50% market share
- Expanding retail offering in NEM targeting growth in Victoria, SA Qld and NSW
- Our hypothesis is TPG looking to exit in 24 months

Emergence of rapidly growing 'disruptors'

GDF Suez

- Small investment by global player GDF Suez – 30% owned by Mitsui
- GDF acquired as part of global acquisition of International Power (UK)
- Owns and operates 3540 MW of renewable (wind turbine), gas-fired and brown coal-fired generating plants in Victoria, South Australia and Western Australia.
- Rapidly growing retailer 'Simply Energy'
- Long brown coal generation play – renewable energy policy opportunity/risks to value

Other disruptors

- Some ISPs now bundling internet/content and gas and electricity
- Data plays becoming likely with liberalisation of smart meter market
- Virtual power plant pilots in place with a number of network businesses
- Solar PV businesses have grown over last 5 years and are moving from equipment to energy services
- Major retailers are looking at how they can 'own the home' and offer a full range of home services

Utility of the future

3

Transformation of the electricity sector

The foundation of the electricity marketplace is shifting with multiple global trends reshaping the power sector

Disruptions to electricity supply channels

- Distributed generation and and disconnections from the grid via self-generation are a threat to the electricity utility business model
- Changing fuel price relativities is altering behaviour

Influence of technologies on the energy supply chain

- Solar PV, electric vehicles, battery storage, energy efficiency, demand-side management and smart grid technology head the list
- New technologies have the potential to compete with utility-provided services and impact traditional utility business models

Impact of the new energy customer

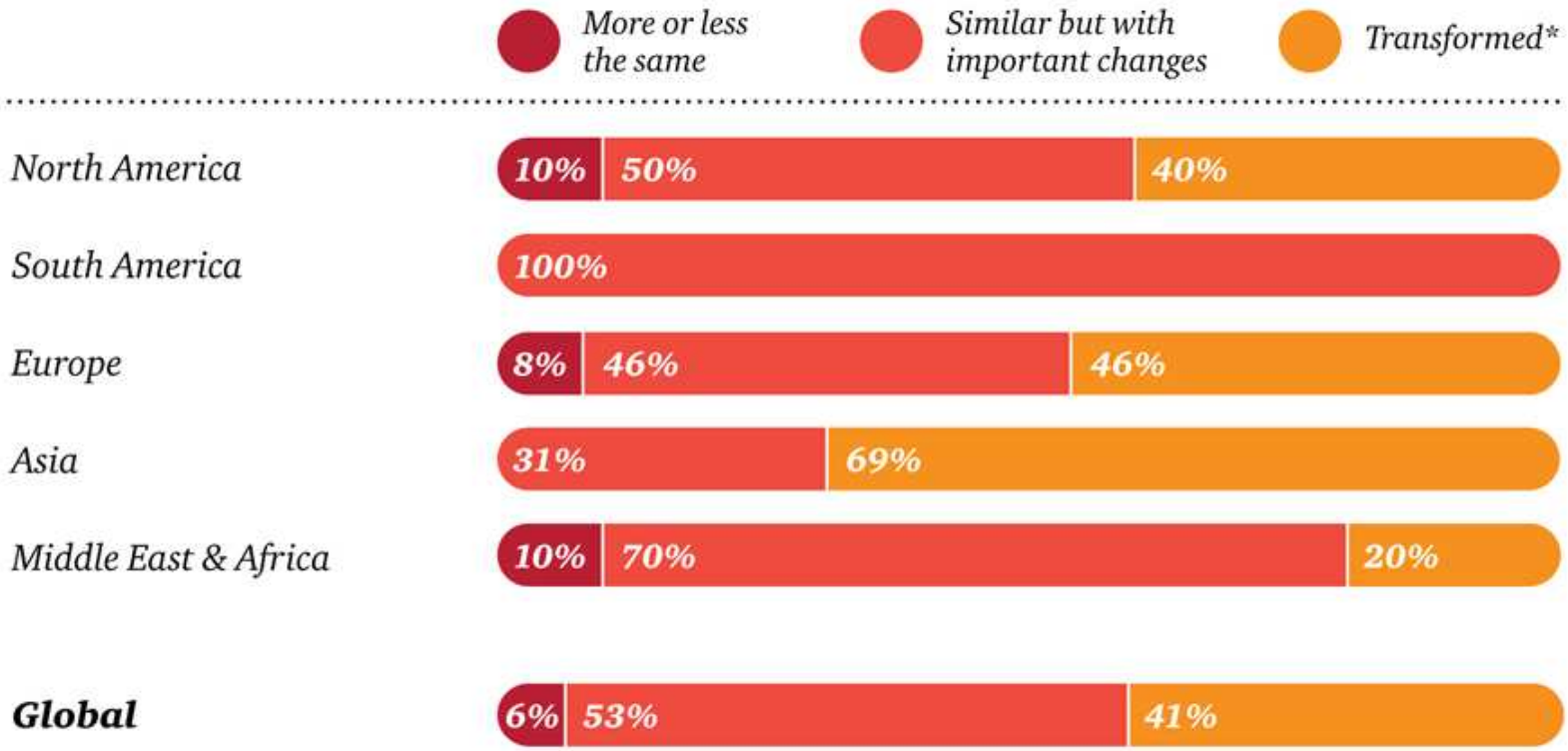
- Customers are becoming more mobile, social and digitally interconnected
- Data analytics and agile strategy will become core competencies

Changing tasks and roles of regulators

- Policy-makers have difficult task of balancing supply availability, affordability, proximity and environmental impact
- Changing approach to economic regulation / revenue setting
- Broad reforms to market design /planning /governance framework

Power & Utility business models will change dramatically by 2030

Figure 1: How do you expect utility business models to be in 2030 compared to today in your market?



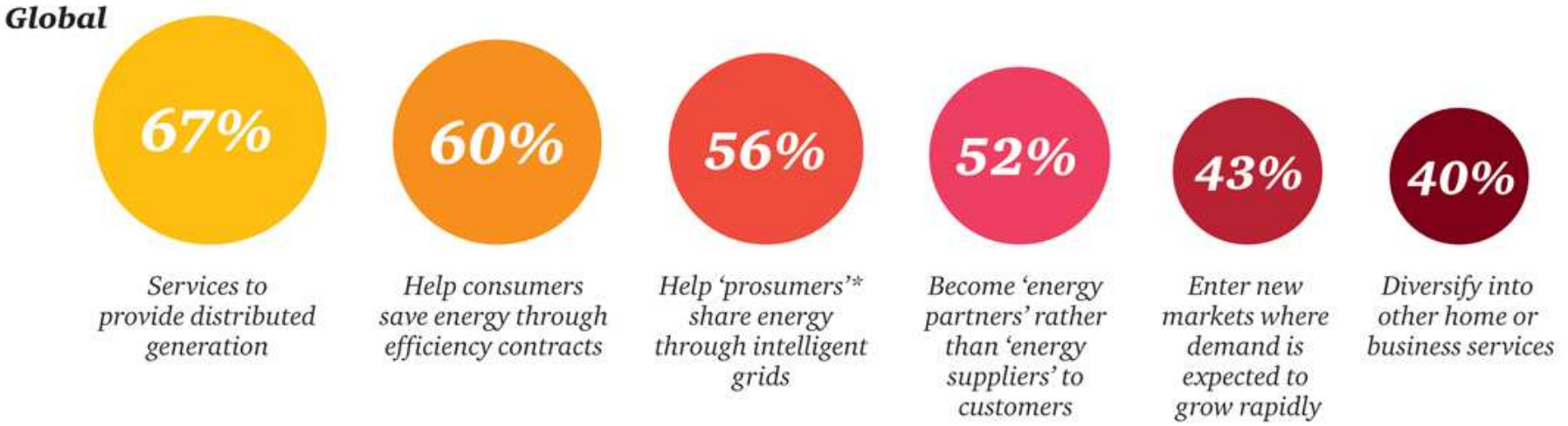
* of which 'unrecognisable transformation' – North America 0%, Europe 8%, Asia 8% and Global 4%.
Source: 13th PwC Annual Global Power & Utilities Survey

Five customer value drivers for the future utility market

- Customers are looking to take control – they will look to manage their energy far more effectively than they can today
- Power generation and networks will be transformed - those that innovate will protect and increase value and defend against tech disruption
- Role of the utility will transform into a service company that enables 'energy solutions' and in many cases 'home solutions'
- Data will play a dominant role in the future energy value chain – new value will be found within utility customer and network data
- Governments and regulators must reshape energy/related services markets to keep pace with customer and 'energy enabler' needs

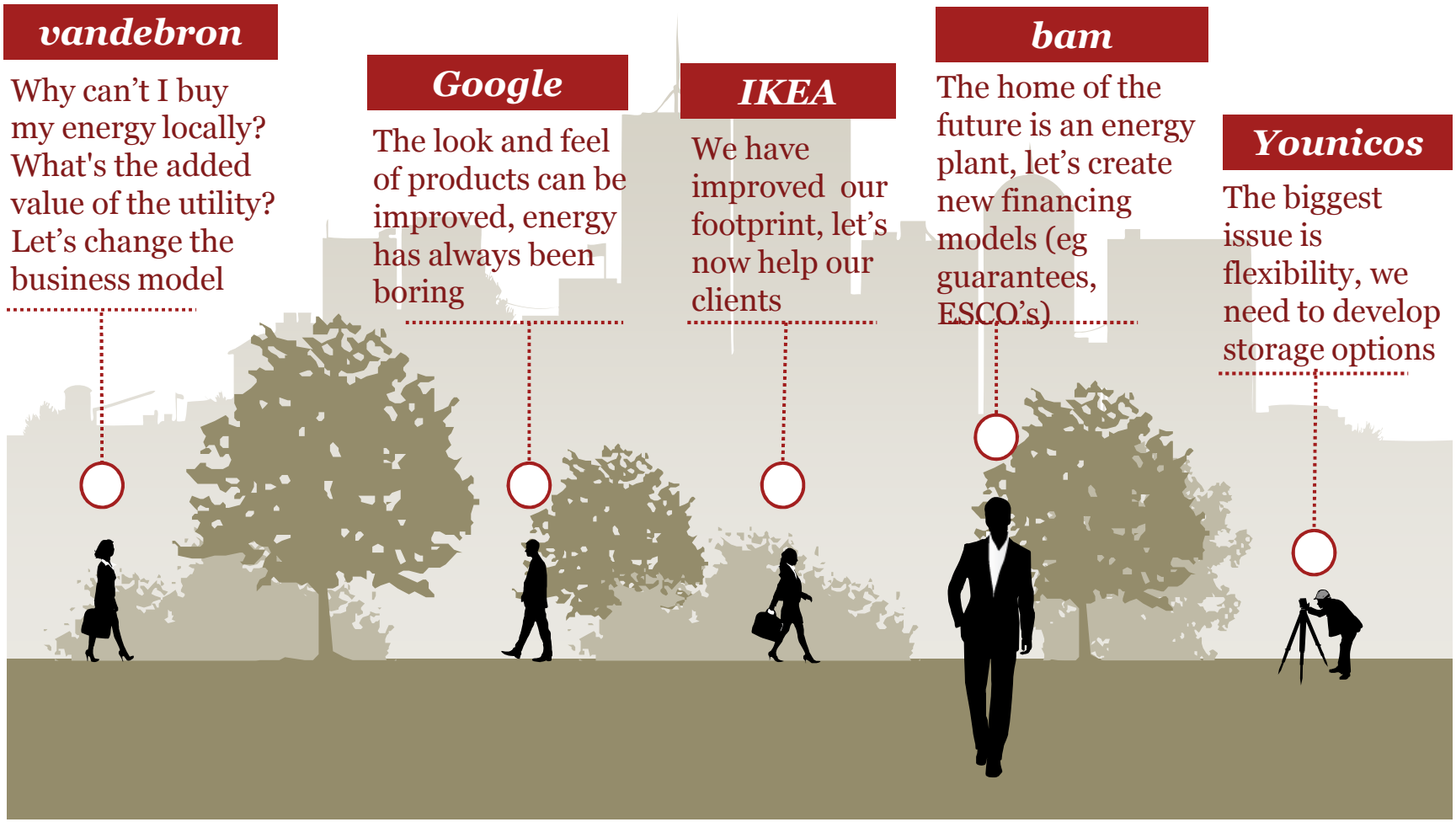
Providers of distributed generation services
Customer focus is a core strategy

Figure 8: Percentage of respondents rating the following strategies as likely or highly likely to be successful in a distributed generation market



* 'prosumers' refers to customers that generate their own electricity.
Source: 13th PwC Annual Global Power & Utilities Survey

On the mind of new energy entrepreneurs…



Example: IKEA

- 37% of energy use of Ikea already covered by solar panels and wind energy
- Additional investment in 49 wind mills in the US (announced April 2014)
- Sale of solar panels to clients (UK)
- *"IKEA wants to help you to live a more sustainable life at home"*

The keys to transforming today's utilities into tomorrow's 'Energy Enablers'

Stable long term government policy and establishment of a deregulated and open national electricity supply and services market

New customer-centric corporate strategies - develop excellent customer understanding, with emphasis on emerging power of analytics/socialytics

Creating value from the vast amount of data collected and created – utilise the best possible data management and analytics tools to support decisions

Improving productivity and asset management – have a clinical focus on asset value and manage assets via customer-centric frameworks

Create options for the future – build out agile and innovative businesses optimising the use of new and emerging technologies

Developing and continually refining agile and lean operating and business models focused entirely on executing customer and other strategies

The deregulation and disaggregation Australian energy markets has greatly enhanced the capacity of the Australian economy.

The market continues and will continue to reform as conditions and participants change…