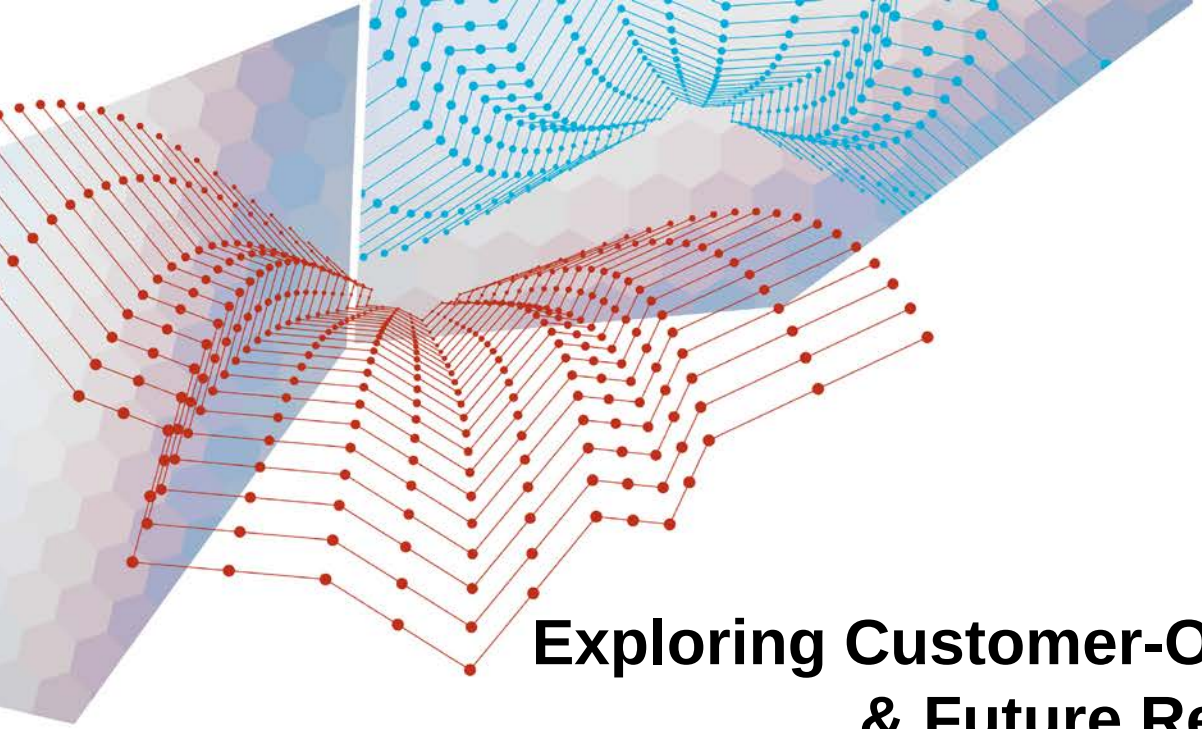

ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Exploring Customer-Oriented Networks & Future Regulatory Options

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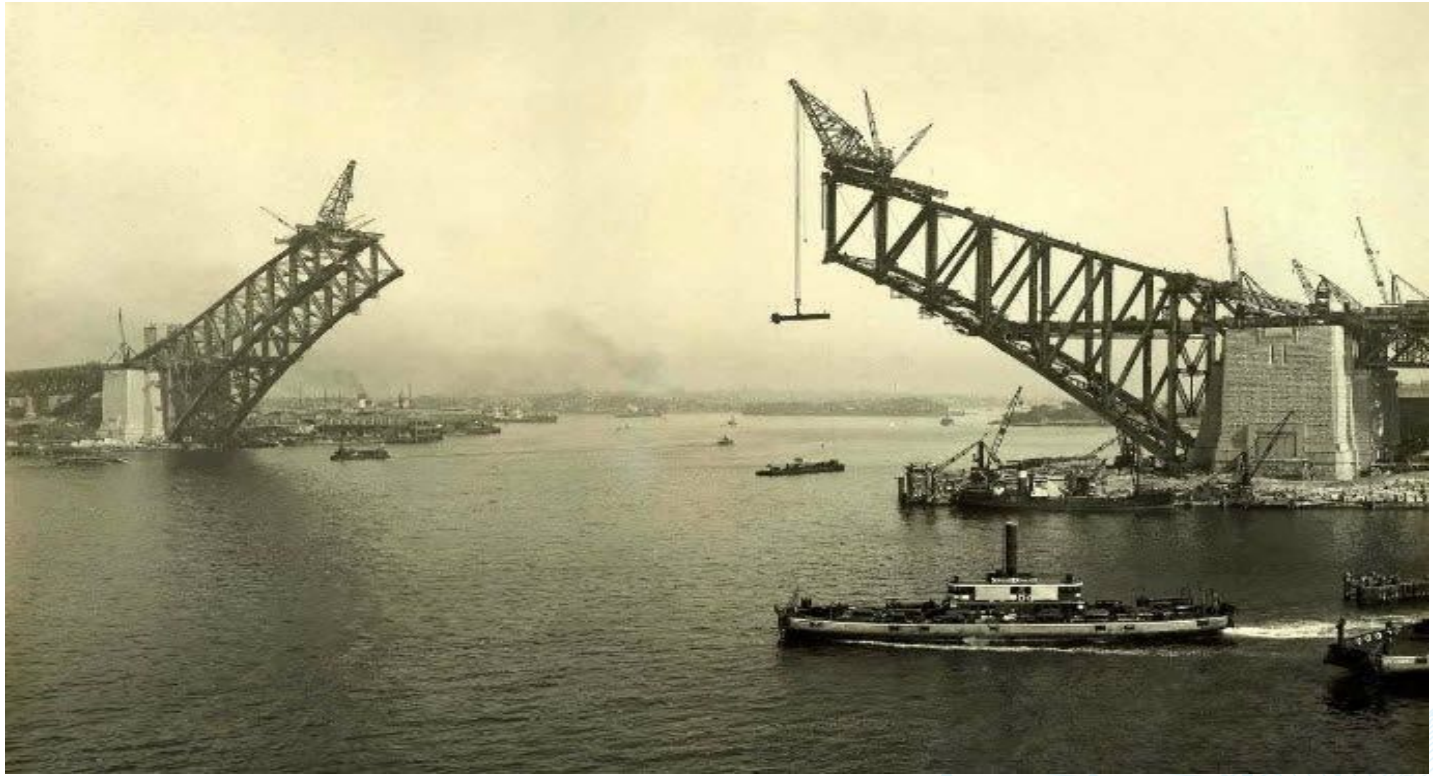
Important Notice

These slides are solely for workshop purposes only on the 23rd June 2016. As such, the contents have been designed to foster a diversity of thinking about future possibilities in Australia. They do not represent the official position of either the Energy Networks Association or CSIRO.

Workshop Notices

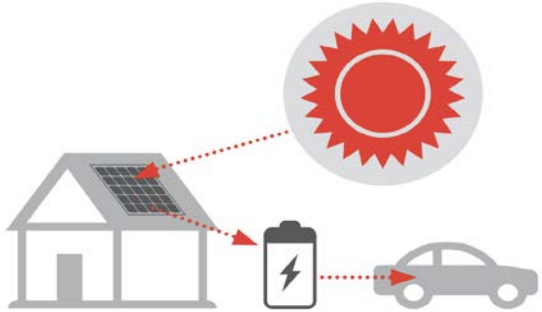
- Emergency exit locations
- Amenities and mobile phones
- ‘Chatham house’ rules
- Competition and Consumer Act provisions apply
- Participants to make their own call on sharing commercially sensitive material
- Engagement Principles



The Disruption Generation…

Four plausible views of 2050…

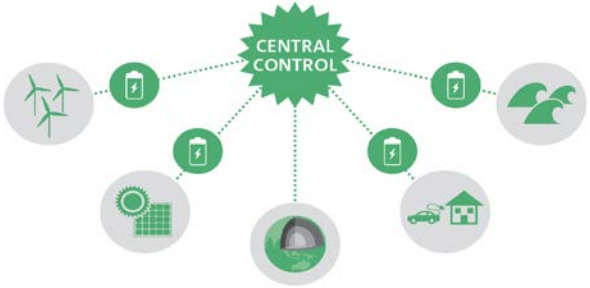
Set and forget



Leaving the grid

Customer-centric model
where customers consume, trade, generate and store electricity.

Rise of the ‘Prosumer’

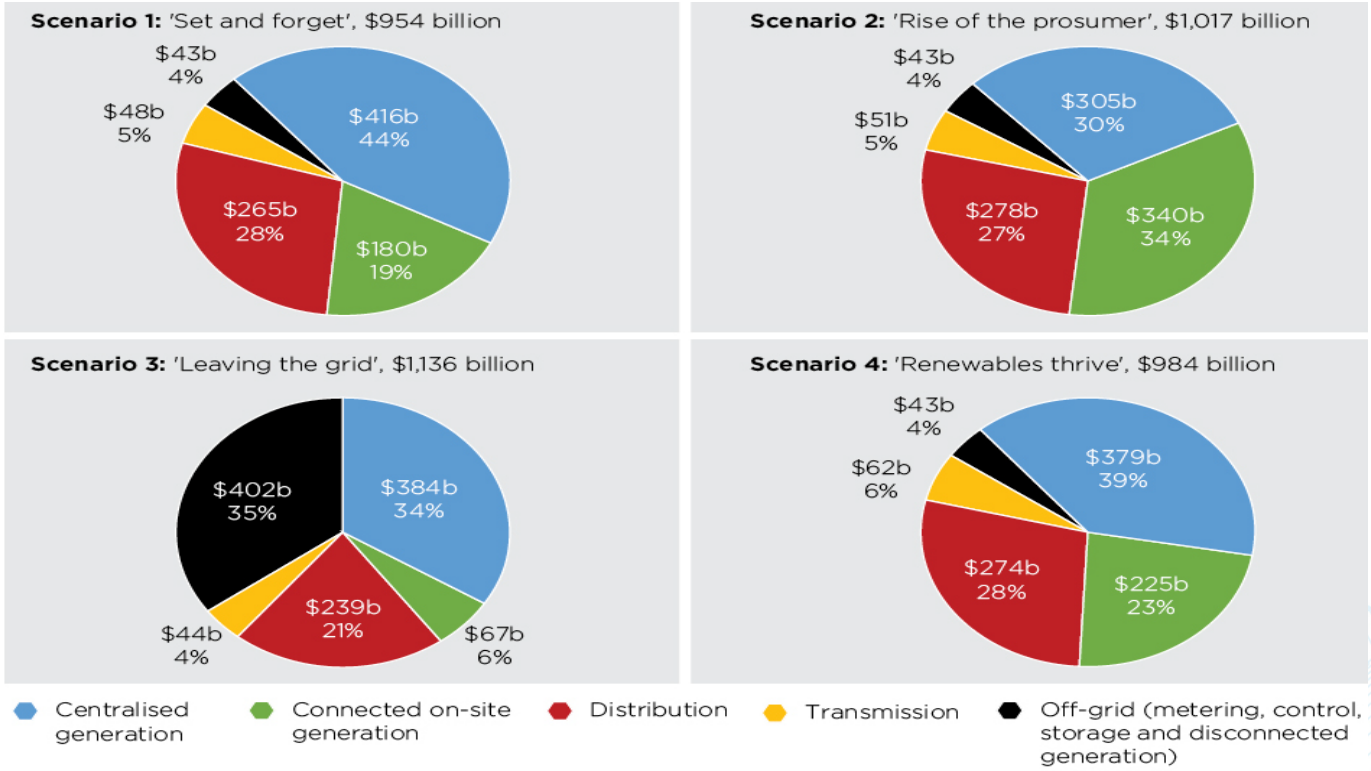


Renewables thrive

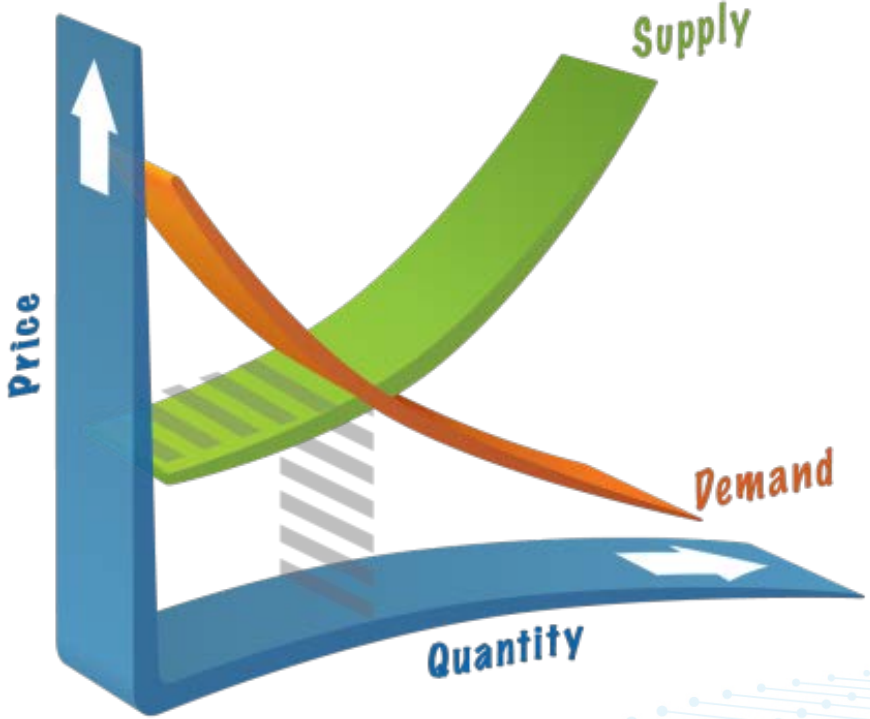
Six broad reflections on transition

1. Network-centric → Customer-centric decision making power
2. Centralised → Hybrid/Decentralised technological architecture
3. Dispatchable FF generation → Increasing decarbonisation (with dispatchability, intermittency and enertia challenges)
4. Regulated natural monopoly → Increasing exposure to competitive forces and product substitution.
5. 30 – 50% of Australia's electricity volume (MWh) served by distributed generation by 2050.
6. Under every scenario, electricity networks continue to play a critical set of roles in 2050

2015 Refresh of the scenarios demonstrated the diversity of potential futures



Economics 101



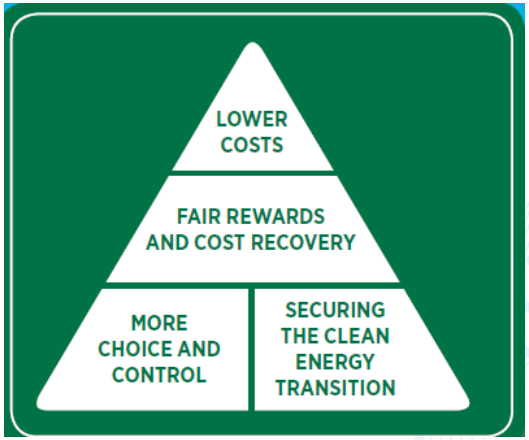

Welcome to
2027
SPACEBITS

Roadmap Vision / Outcome

Australia's electricity systems in 2027 and beyond are **resilient to all of the divergent futures described by the four Future Grid Forum 2050 scenarios**.

This resilience will be underpinned by systems that enable:

- A 'balanced scorecard' of long-term customer, societal and environmental value creation;
- Whole-of-system efficiency, reliability, safety and flexibility; and,
- Millions of end-users participating in and sharing the benefits of whole-of-system optimisation through open, vibrant markets and appropriate protections.



The ‘DNA’ structure of the Roadmap project

A. Customer Orientated Networks (WP 1 & 2)

- Transformation Drivers
- FGF Update
- Customer Reorientation

B. Revenue and Regulatory Enablers (WP 3 & 4)

- Business Models
- Regulatory Frameworks – Risk Sharing; Scope of Service; Customer Protection

C. Pricing and Incentives (WP 5)

- Cost-Reflective Pricing
- “Second Wave” Incentives
- Value of New services including Micro-grids, Ancillary Services

D. Technological Enablers (WP 6 – 8)

- Standards, operating platforms
- Advanced Power System Operations, Reliability and Security
- Grid-side technologies and innovation
- Future Workforce requirements

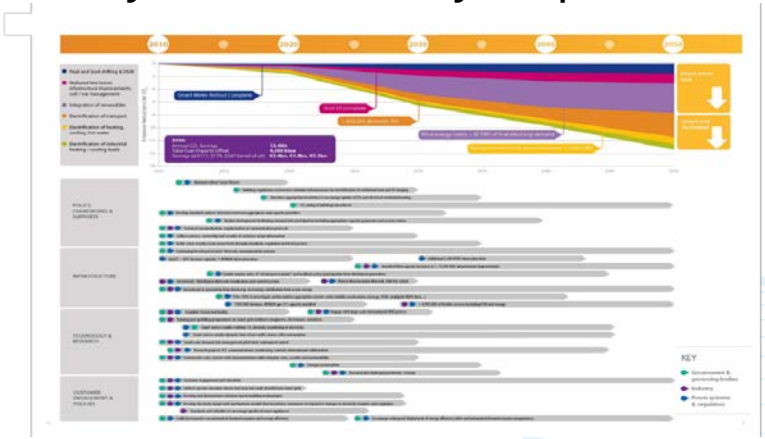
E. Next Generation Platform (WP 9)

- Transactive Energy models
- Institutional frameworks

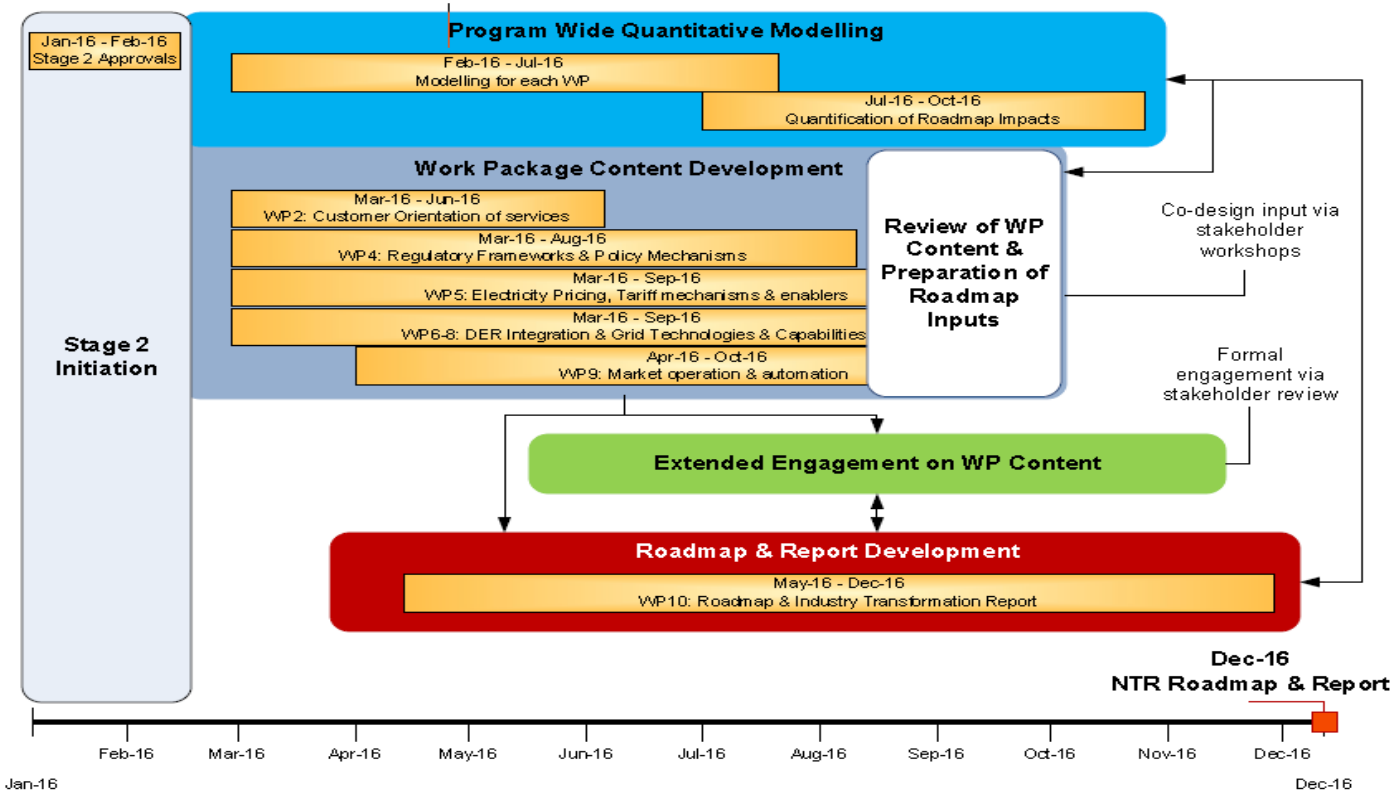
Roadmap construction

The 2017-27 Roadmap will concisely set out:

- An integrated set of ‘no regrets’ actions spanning all Domains (or ‘swim lanes’);
- The sequence, interrelationships and milestones for actions across the decade; and,
- Nominated primary and secondary responsibilities for each action.



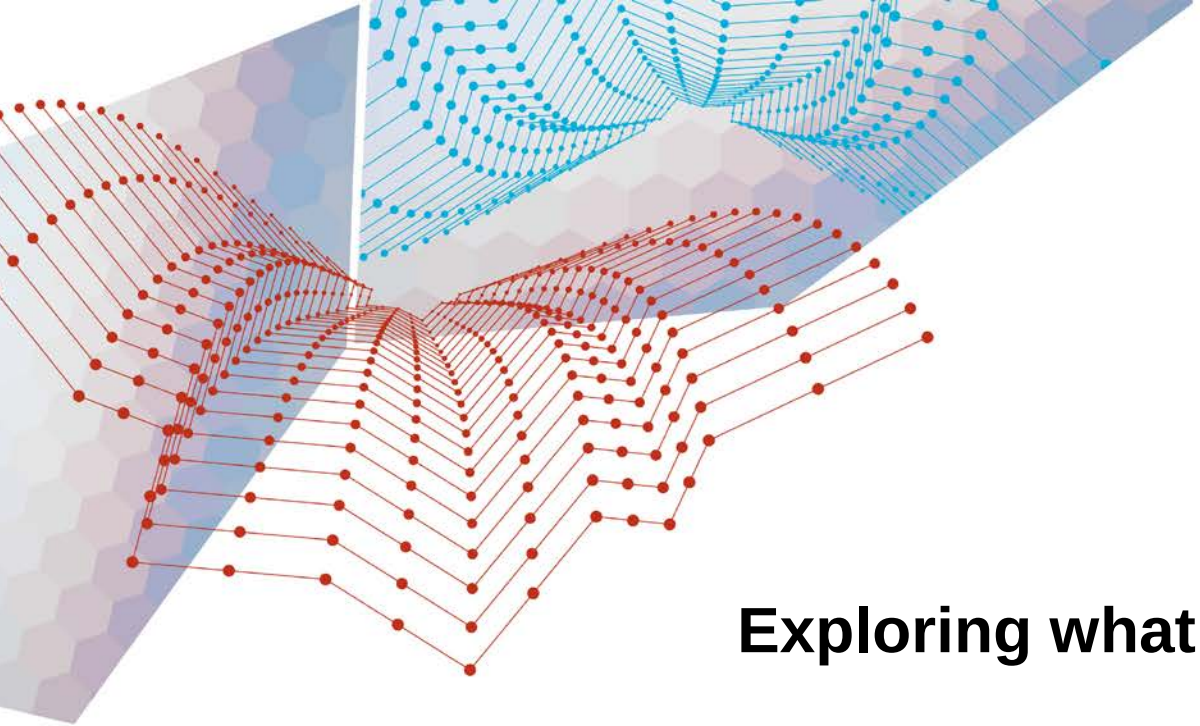
Stage 2 Schedule



Remember these…?

Meanwhile…

http://thewidelensbook.com/



ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Exploring what future customers may value

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Thinking about future customers…

Future electricity customers are likely to:

– be **increasingly heterogeneous** in their expectations

– be diverse across a broad **vulnerable—engaged—empowered continuum** of market segments.

– continue to value solutions that provide **secure and reliable** electricity for an increasingly digitized and automated lifestyle and the expanding role of EVs; and

– In some cases be **willing to trade-off** aspects of services that were traditionally standardised in return for a financial benefit.

Figure 2: Example market segmentation curve for residential customers in 2025

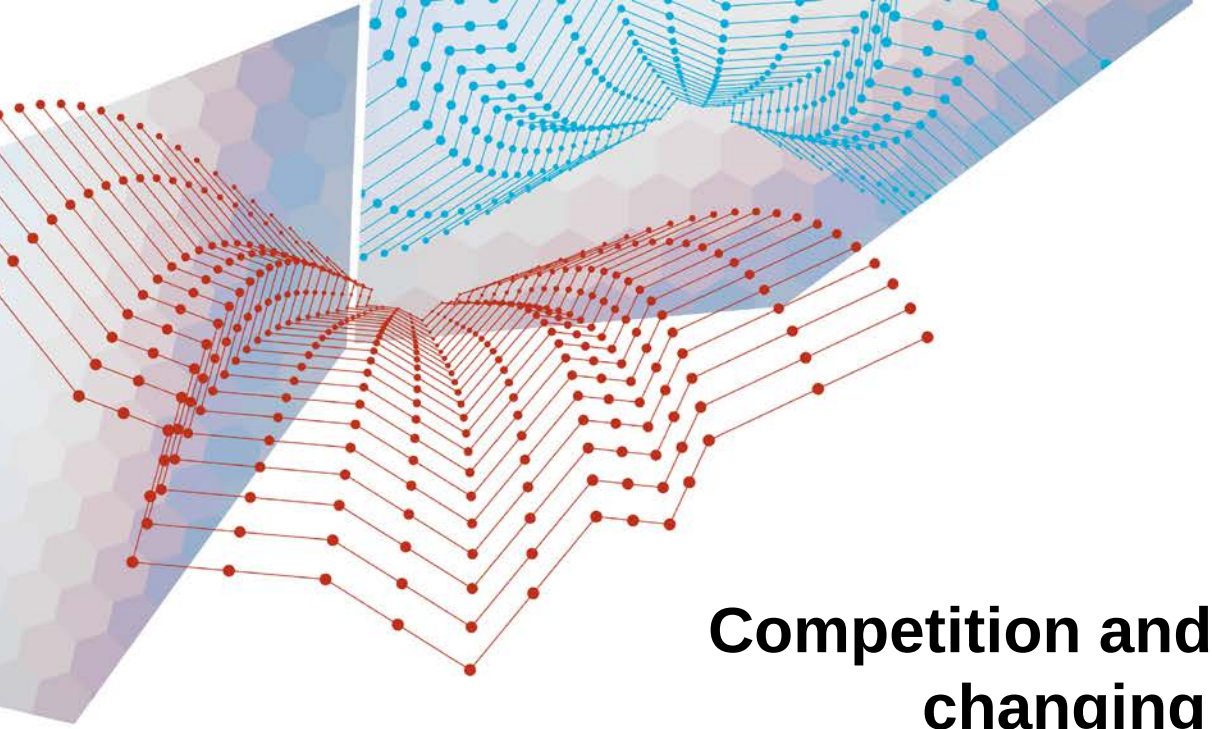
Prospective 2027 Market Segments - Residential

Table 1: Summary of future residential customer segments based on what they value most

	Autonomous	Tech focused	Hands on	Be my agent	Service dependent
Distinctive features	**Independent**: Wants full control, granular cost management and the ability to configure the operation of the electricity solution. Will often involve disconnecting from the grid entirely, and may be motivated by locational cost or reliability issues.	**Empowered**: Has a strong affinity with technology and desires control. Wants to influence directly the design and operation of the customised solution. System cost is important but maximising returns on investment from trading energy services with the grid is critical.	**Active**: Wants to understand what each available option has to offer and to be involved fully in the selection process. Willing to maintain a moderate to high involvement in the ongoing operation. System cost and return on investment from interacting with the grid to trade energy services are both important.	**Passive**: Prefers electricity solutions that provide ease and convenience at a reasonable cost. Desires an agent to provide a shortlist of options that make sense, are easy to deliver and require a minimum of ongoing involvement. May invest in additional cost saving measures if simple and convenient.	**Dependent**: Needs affordable network services and help to identify the most suitable options. Includes vulnerable customers experiencing energy hardship. Also includes households that cannot adopt new electricity solutions, given rental property constraints or a lack of access to capital.

Future Customer Value Drivers

	Empowered		Engaged		Vulnerable
	Autonomous	**Tech focused**	**Hands on**	**Be my agent**	**Service dependent**
Valued solution features	Reliable systems and technology with guaranteed outcomes as a key feature. Extendable and modular technologies that can be easily added to or integrated with others. Ability to upgrade over time (future proofed – no stranded technologies). Real time and digital access to data on energy flow and technology performance. Access to community or shared experience with peers. Social recognition is important. Packages must provide predictable costs and savings. Must also provide back-up services and guarantees in event of breakdown or technical issues.	High degree of customisation and bespoke solutions. Want a high degree of choice and control over technology, energy management and configurability. Latest technology with complementary services (e.g. water, internet bundling). Willing to engage with complex arrays of tariff/pricing options to maximise returns. High degree of market access with options to maximise value (e.g. demand response, market bidding). Highly granular access to data and digitalised energy trading platform. Part of a digital community, but require assured levels of security and reliability.	Customisable range of options that provide automated control. Needs to be relatively easy. Digital platform access to data including energy, cost flows and outcomes. Configured solutions need to help customers save money, and data flow needs to highlight this with peer-to-peer comparisons. Need a degree of simplicity but willing to engage with a range of integrated technologies to enhance lifestyle and control. Access to latest technology and energy market is important if easy to work with. Guaranteed service levels/outcomes important with risk of breakdown or difficulty addressed in service promise.	Choice and simplicity offered through pre-packaged, bundled solutions providing comfort and convenience. A single and simple point of contact to get everything done (simple, coordinated single source of full options and information). Bundled energy solutions somewhat configured to energy profile. Bundles link technology, finance and energy management products into simple packages with range of options. Limited configurability but must be easy. Access to data and new technology important, but not too much and needs to be straightforward.	Simple payment options with predictable, stable costs. These can be connected with 'ramped' or guaranteed levels of supply. Supported by simple access to data and information. Access to better products and energy solutions through bundled solutions potentially incorporating efficient appliances to enhance key lifestyle outcomes, simple energy management and distributed energy technologies and data access packaged with simple finance solutions. Aim: relieve bill stress, lower costs and help customers access the energy market with better products while maintaining reliability.



ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Competition and value-creation is changing in every industry

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Your traditional source of
competitive advantage is eroding
This is a tale of incumbents vs. insurgents

Incumbents operate within defined industry boundaries

Insurgents INVENT new boundaries

Incumbents innovate products & processes

Insurgents innovate experiences & interactions

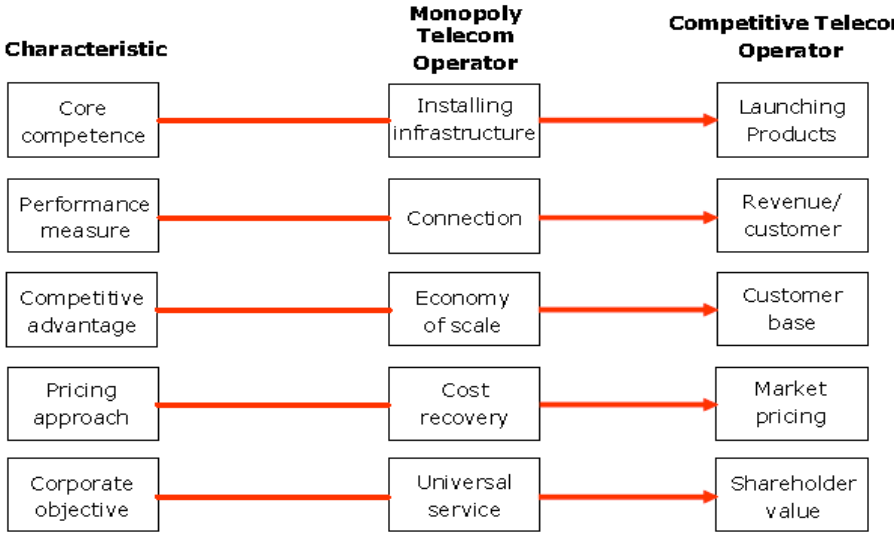
Incumbents are (often) vertically integrated

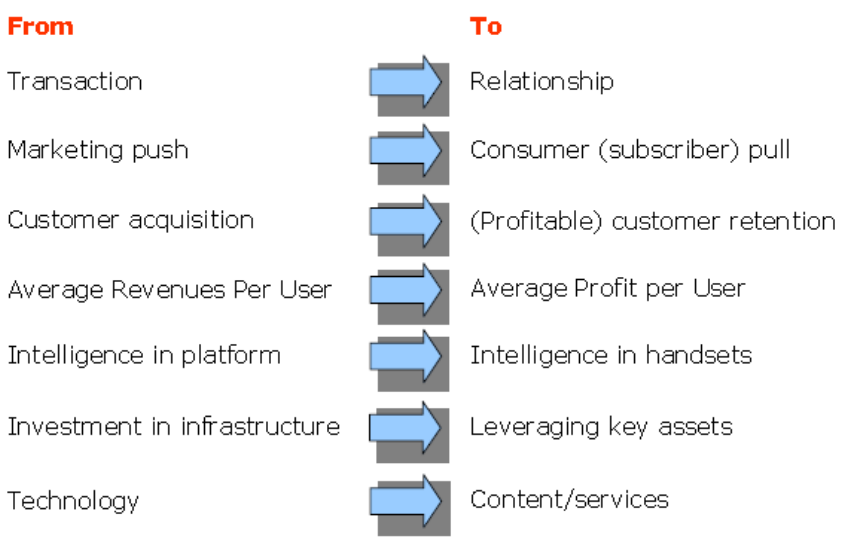
Insurgents exist in open and networked ECOSYSTEMS


Can an incumbent become an insurgent?

Linear ‘supply chains’ are declining
‘Value networks’ are exploding

Telecommunications industry has seen huge innovation and disruption in the past 15 years. As a result delivery of value has shifted from dominant infrastructure providers to a diverse range of mobile service providers.

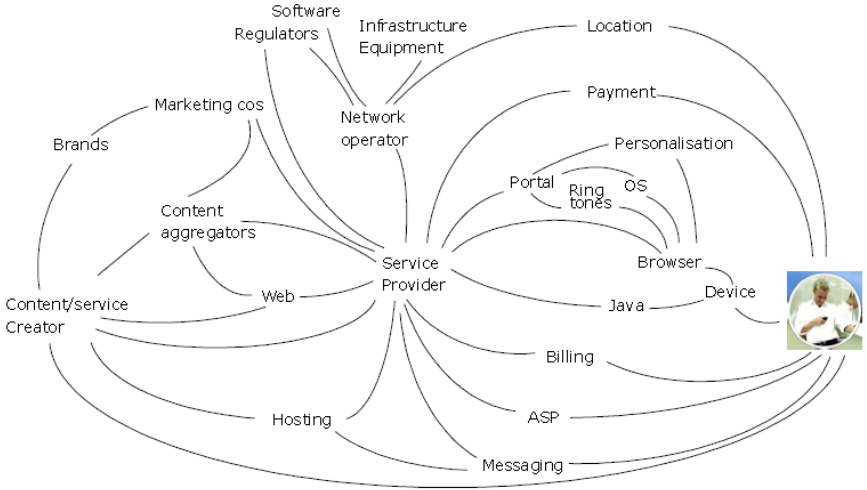




Source: Peppard & Ryland: From Value Chain to Value Network: Insights for Mobile Operators. European Management Journal 2006

From Value Chain to Value Network

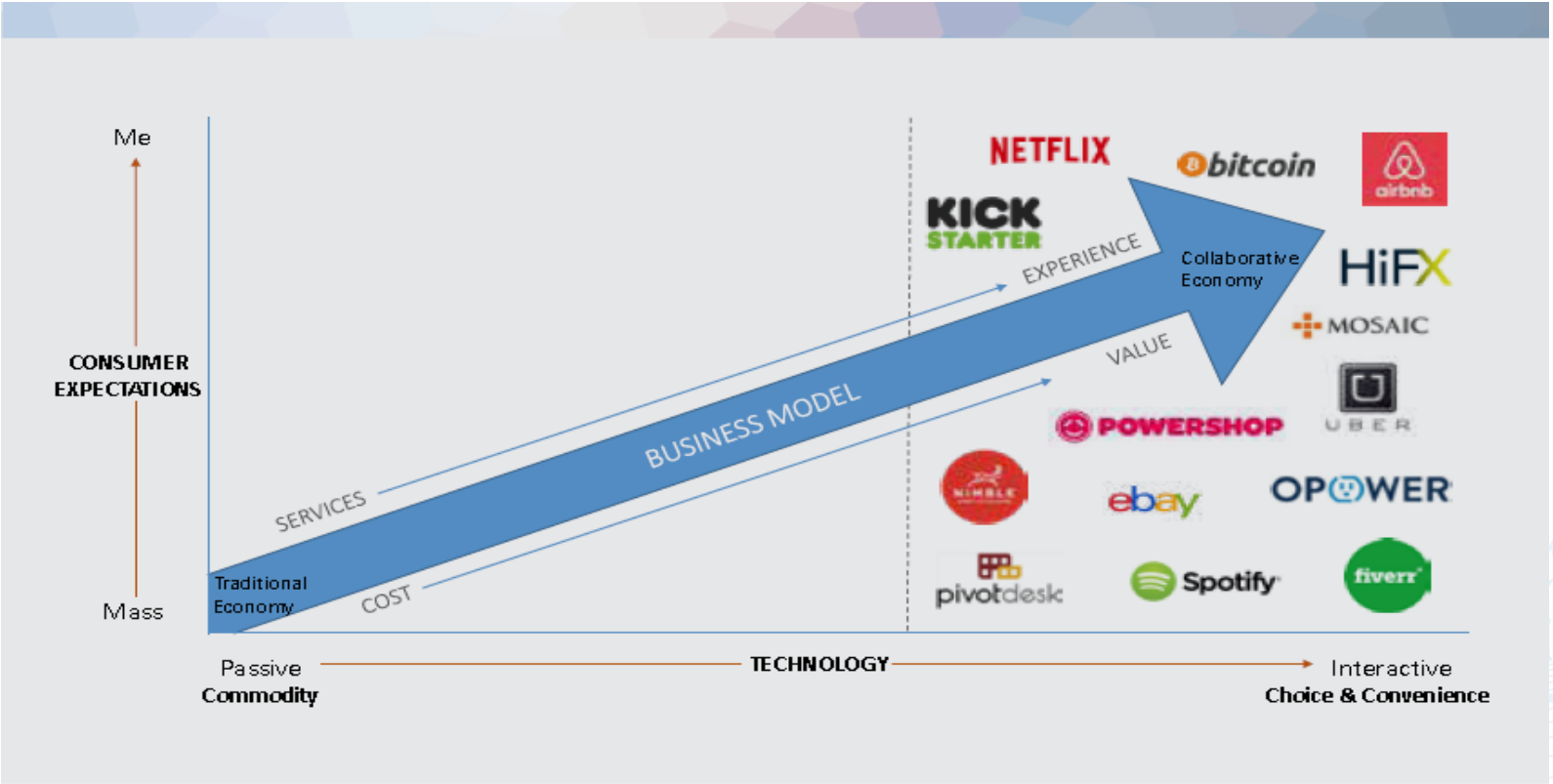
- The telecommunications industry demonstrates how value networks can enhance customer value:
  - By exploring where value lies in the network and how value is co-created
  - By understanding how an organisation's activities affect other members in the network and how this impacts end-customers
  - Understanding how other members in the value network will respond



An example of value network map for mobile content

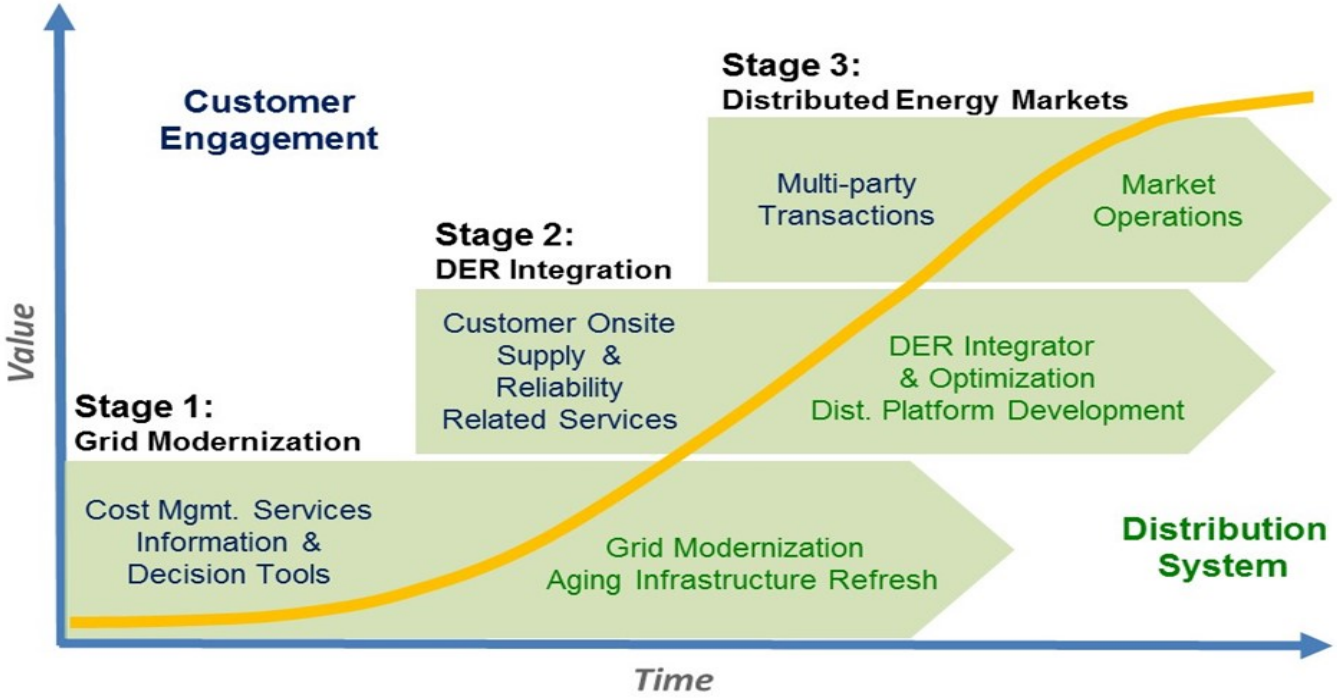
Source: Peppard & Ryland: From Value Chain to Value Network: Insights for Mobile Operators. European Management Journal 2006

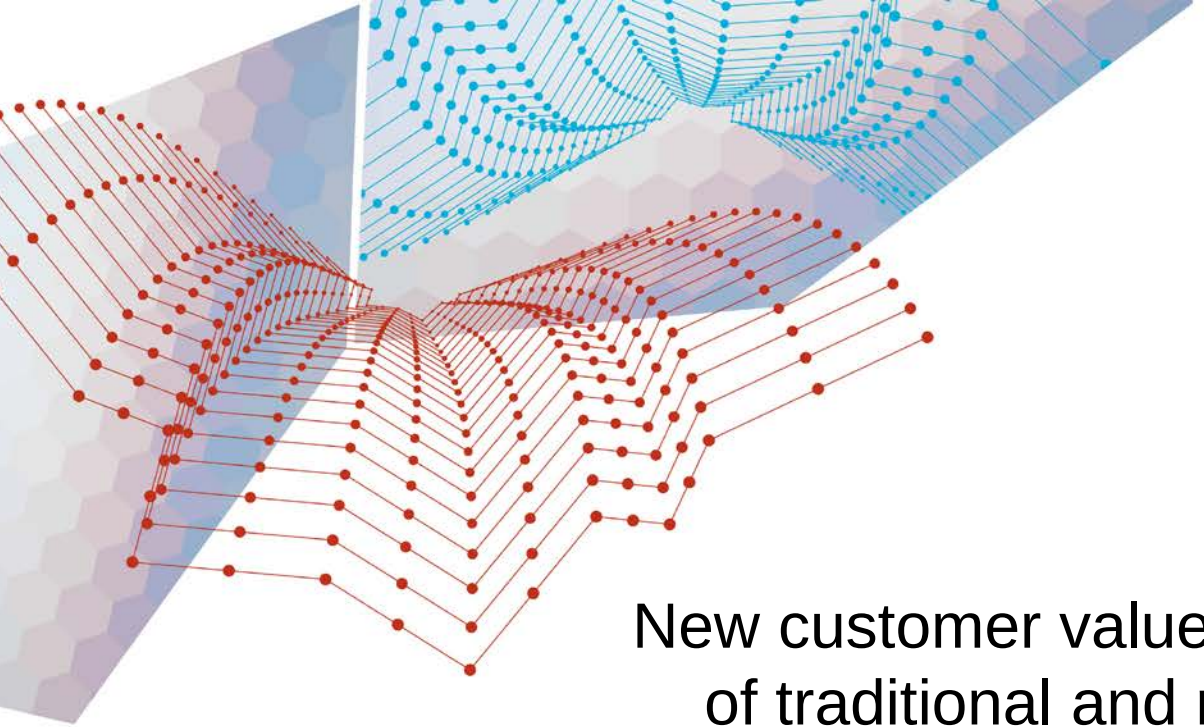
Value Network driven business models



Source: Sinclair, R (Energy Consumers Australia), 2015, *Future energy customers*, CSIRO/ENA Customer-Orientation workshop, Melbourne, 11 August.

Networks transitioning to support a value-network future (De Martini)





ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

New customer value in an ‘ecosystem’ of traditional and new market actors

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Mojo Power – ‘De-coupling consumption from profits - The Costco of energy’

What are Mojo offering?

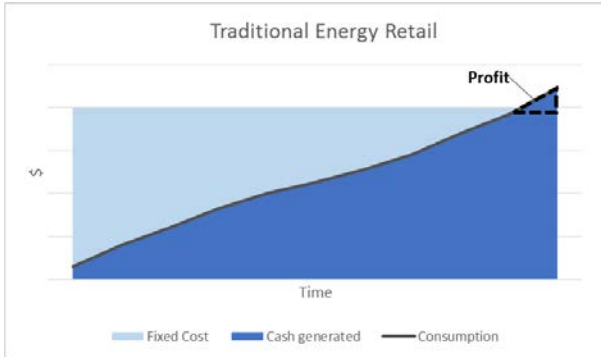
New energy retail offering based on subscription model. Gives customers access to wholesale prices - decoupling profits from direct energy consumption*

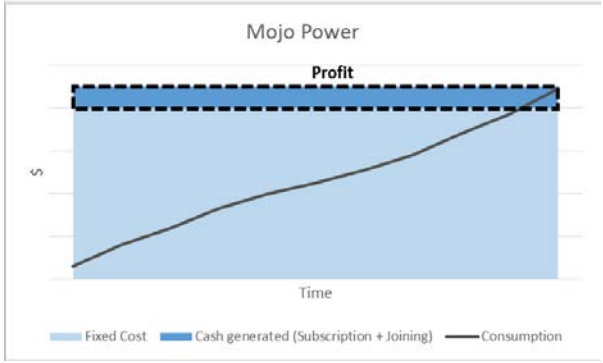
- Subscription based product called ‘EnergyPass ™’ – 3 different levels of service
- Enables strong alignment to customer needs (unbiased advice) - a ‘Costco for retail energy’
- Customers pay a joining fee, then a fixed subscription fee monthly for access to a proxy of wholesale pricing
- The “Plus+” and “Premium” subscriptions come with smart meters to enable real time monitoring of consumption and the ability to take advantage of flexible tariffs
- Fully online model (only Premium customers have access to phone support)

Why is it different?

First in Australia to recover costs with a fixed fee rather than based on usage*

- Designed to mitigate the effect of mass uptake of PV and storage on traditional retail model
- Completely online model to bring down costs (low breakeven) with optionality for extra service
- Retailer offered smart meter and analytic insights into energy usage for Plus+ and Premium customers
- Market niche positioning - appeal to large energy users and those lacking trust in sector
- Some similar subscription models exist such as New Zealand’s Flick Electric Co.





Illustrative only

* Global patent pending

Mojo Power - ‘De-coupling consumption from profits - The Costco of energy’

Who are the target customers?

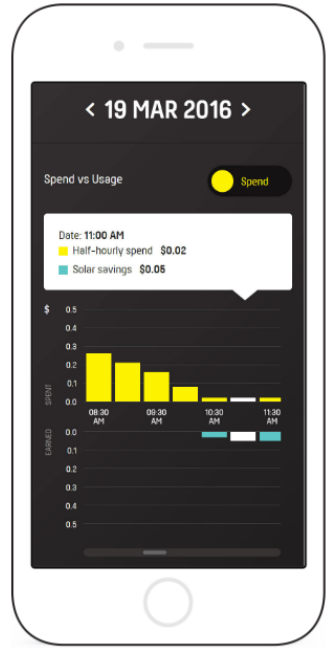
<u>Appeal to higher energy users keen to reduce their bills and those who may mistrust incumbent suppliers.</u>

- Appeals to higher energy usage households (traditional retail model generally cross-subsidises lower usage customers)
- Customers wanting simplicity, trust and technology based insights
- Offer currently available in NSW and will expand into QLD and VIC over the coming year
- Duel fuel customers may find less appealing in the short term

What are their plans for the future?

<u>Goal is to become a distributed generation company maximising the value of those assets to share with customers</u>

- Become a distributed generation company in addition to retail and take on the role of managing customers’ distributed resources, with a focus on self-hedging, network support value generation and peer-to-peer
- Use available customer data to recommend and tailor specific solar and home battery storage technologies
- Expand outside NSW



Screenshot of MyMojo online portal

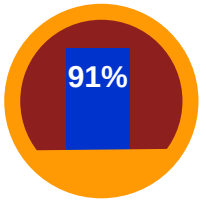
Powerpeers – ‘Power to the people – Airbnb model’

What are Powerpeers offering?

Subscription-fee online community energy platform focused on enabling customers to trace energy back to a specific clean source

- End consumers can individually share energy amongst each other. A consumer can individually chose to get solar power from a neighbour, parents and wind energy from a farmer etc. And the next consumer can have another selection
- The platform facilitates the exchange of energy, but it is not an aggregator and reseller of the individually supplied and consumed energy
- Subscription-fee service to subscribe to the platform as a consumer or prosumer
- Currently Powerpeers as the platform sets the price for electricity consumption
- Business model reinforces the use of the grid
- Through support from Vattenfall a significant amount of renewable resources are available. This also acts as a grid back-up to community generated supply to ensure there are no outages
- Highly sophisticated scheduling, tracing and invoicing algorithm to account for planned and actual feed-in and consumption form all points in the community

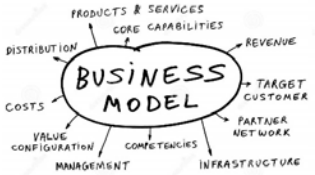
https://youtu.be/hM8sePEoslk



Customers more likely to switch to a provider for electricity offering energy-efficient products or services

Why is it different?

- A community, rather than central retailer based model
- Consumers can choose who exactly they receive their power from and when (i.e. full traceability of generation source, location and type) not just via a percentage of the whole generation pool.
- Allows customers to switch (or mix/match) suppliers while staying on the same platform (customer service and billing relationship)
- The model is not based on a per kWh margin
- Extends the value chain to the full B2B2C spectrum
- For an Australian context, this mechanism takes the ‘market settlement’ directly to the pro/consumer level



Powerpeers – ‘Power to the people – Airbnb model’

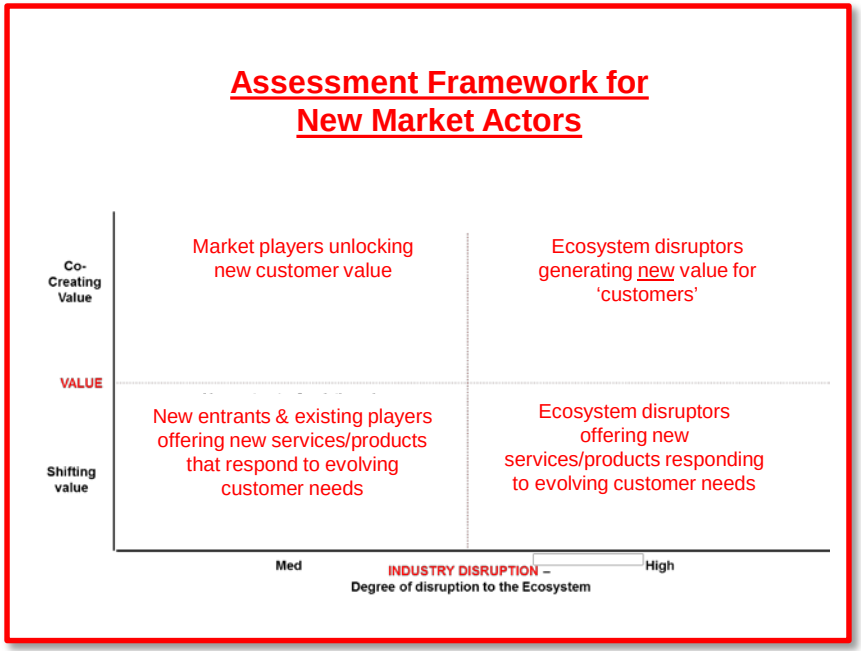
Who are the target customers?

- The offering firstly targets consumers with a community mindset.
- It also targets consumers with the want to know exactly where / who their power comes from
- It offers prosumers an outlet for generation above their level of self consumption and breaks the net metering restrictions

What are their plans for the future?

- Powerpeers think it possible that ‘traditional’ retailers or generators will create an offering on the community platform
- In the future, consumers and prosumers may be able to set prices themselves.
  Examples: The local ice-skating club offers power from solar PV on the roof of the rink to its members for a discount, parents living in the country provide their wind energy to their children in the city for free as green energy
- Open source model: The platform could eventually allow offers, products and services from 3rd party participants from which Powerpeers would take a transaction fee (akin to the Apple App store)
- Scalable and very low cost operations that are open to other markets
  E.g.: From our interview we saw parallels to Australia: High DER penetration, high prices, community mindset, need to have control, AMI enablement, highly progressed market liberalisation.

The ability to create new value and the degree of disruption to the established ecosystem are the primary criteria in the assessment of New Market Actors



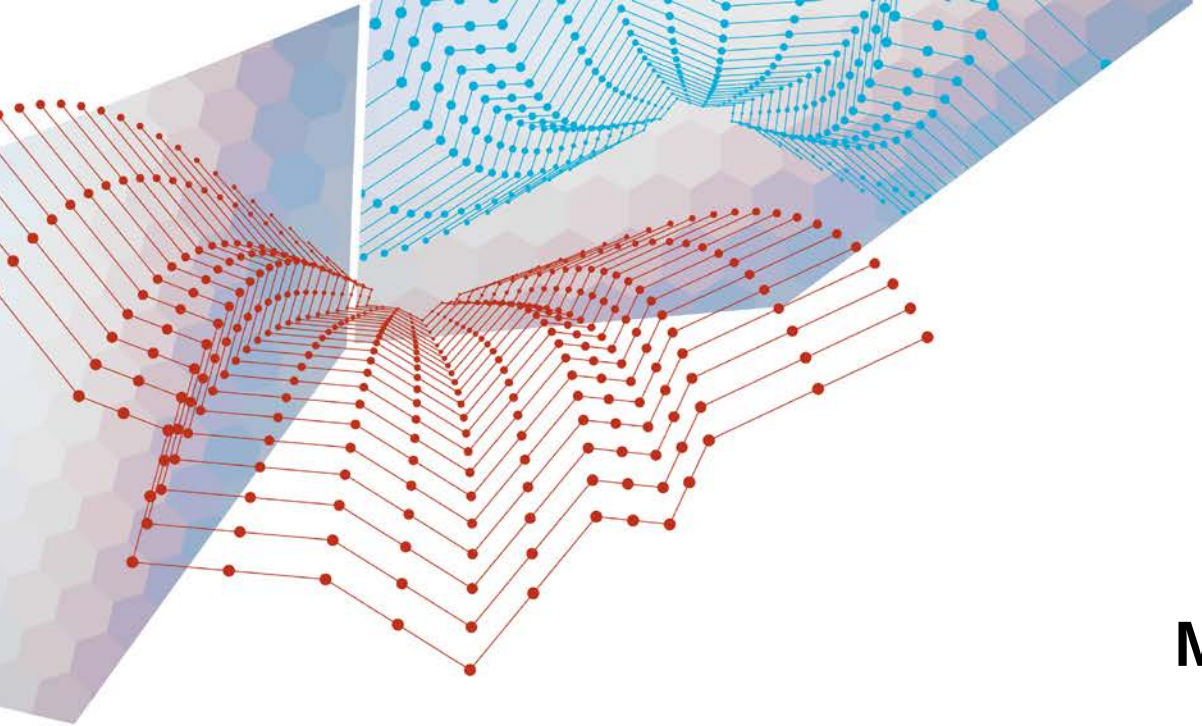
The Framework:

Value:

- Is new value being created by the NMA or is existing value being shifted along the value chain?
- New value includes new value to the customer as well as new value to the ecosystem
- New value could be created by the NMA directly or co-created by the NMA and the customer or the NMA and others (e.g. the distributor) in the ecosystem
- Shifting value describes where a NMA develops a business model that allows them to increase their part of the value chain by taking away from others (zero-sum)

Disruption:

- Does the NMA (have the potential to) significantly disrupt how the ecosystem will work in the future
- Does the NMA business model significantly impact the ability to or the way in which the industry currently operates
- Does the NMA's business model require others in the ecosystem to respond by changing their role



ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Morning Tea break

https://www.youtube.com/watch?v=gXPt6iUX1hQ

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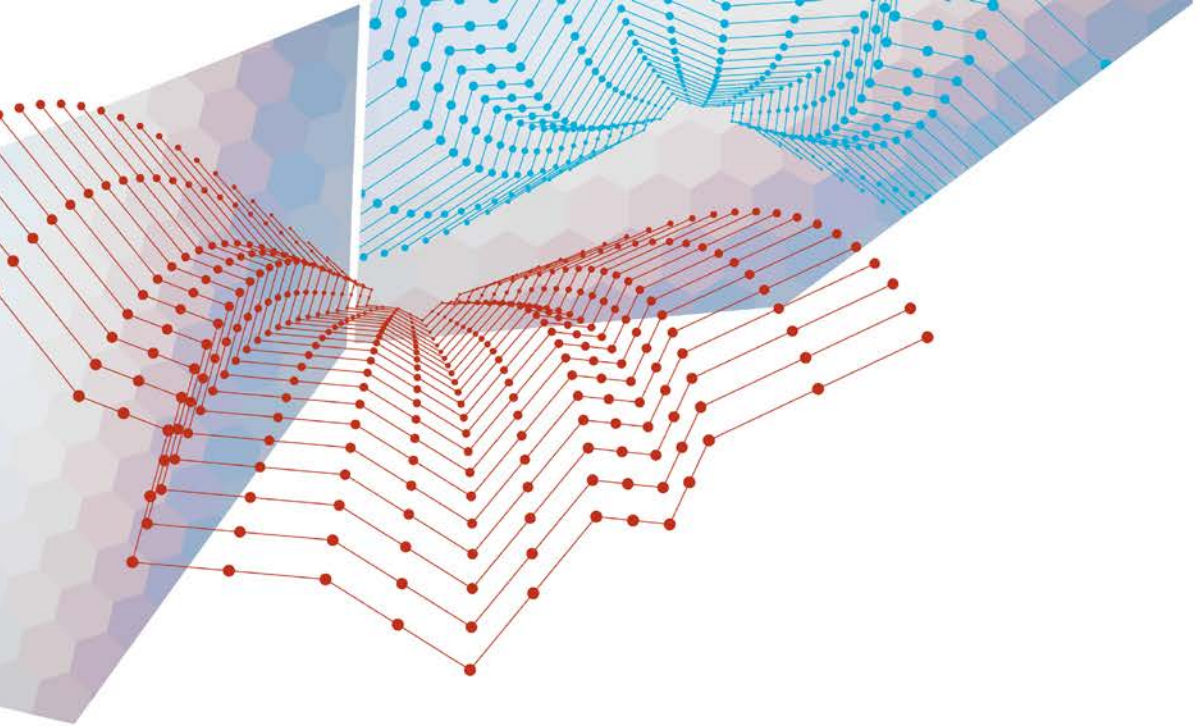
In table groups, analyse one of the New Market Actors presented (25 minutes):

1. What is the core value proposition for customers?
   - Why do customers want it / What ‘jobs’ does it do for them?
   - Are customers largely passive or are they involved in co-creating value for/with the NMA?
2. Is the business model providing optimisation benefits to any or all parts of the electricity system (i.e. in return for a financial benefit)? For example:
   - Wholesale market optimisation?
   - Transmission network optimisation?
   - Distribution network optimisation?



ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Lunch

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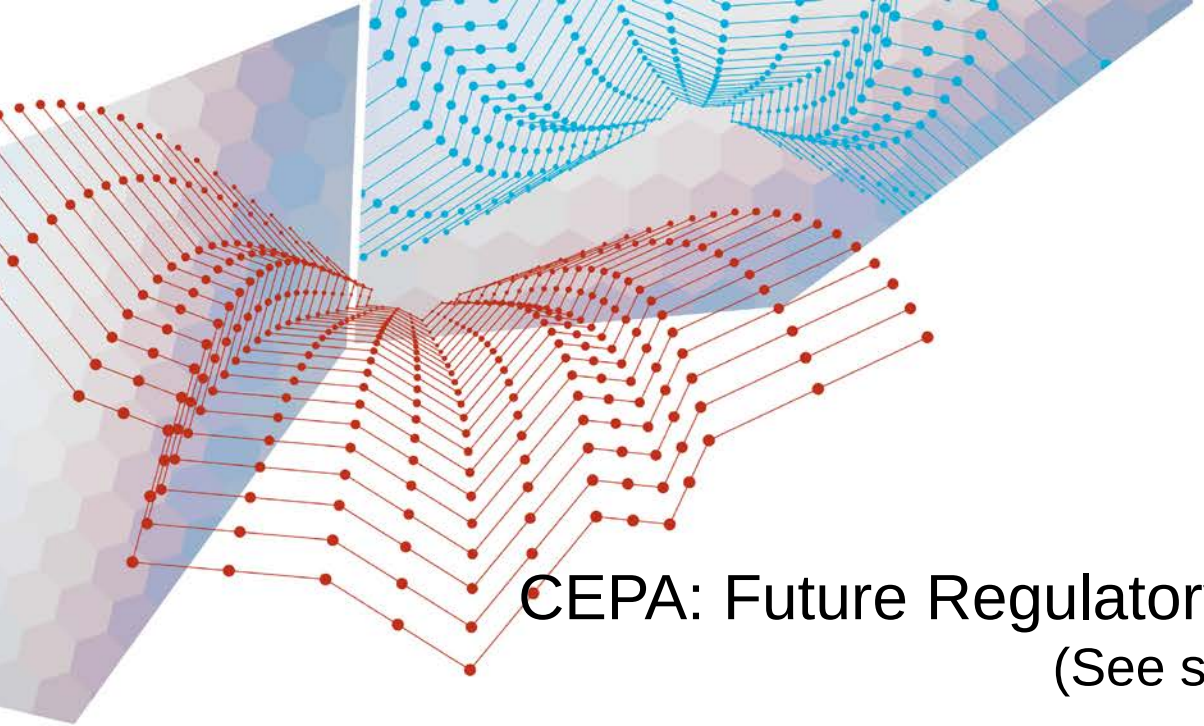

ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

CEPA: Future Regulatory Options Session

(See separate CEPA Slides)

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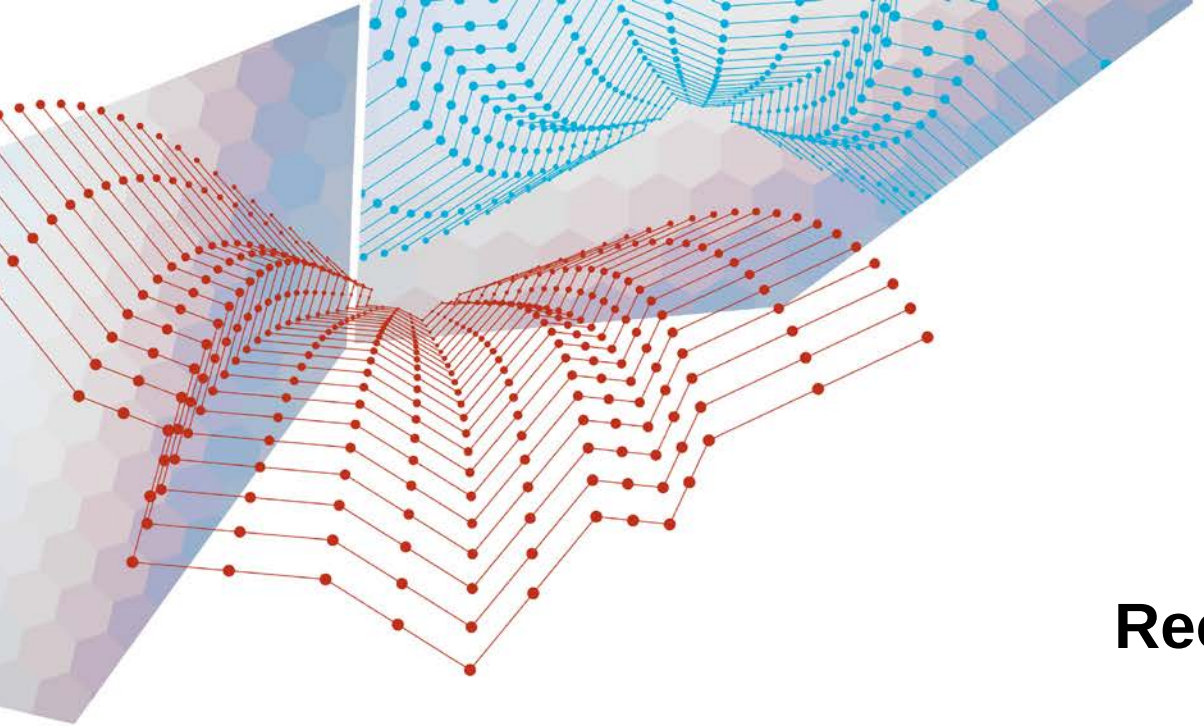

ELECTRICITY NETWORK TRANSFORMATION ROADMAP

2017-27

Recap & Next Steps

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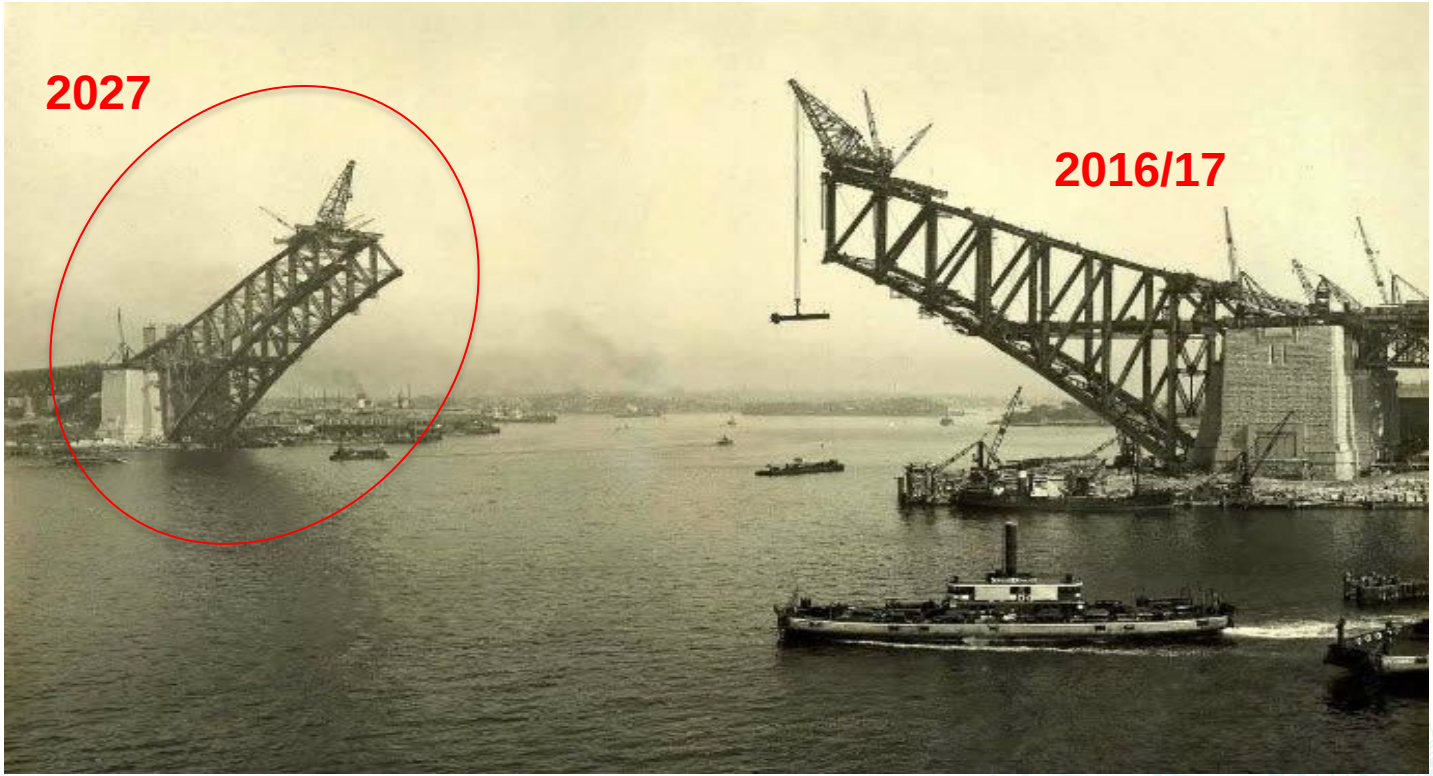
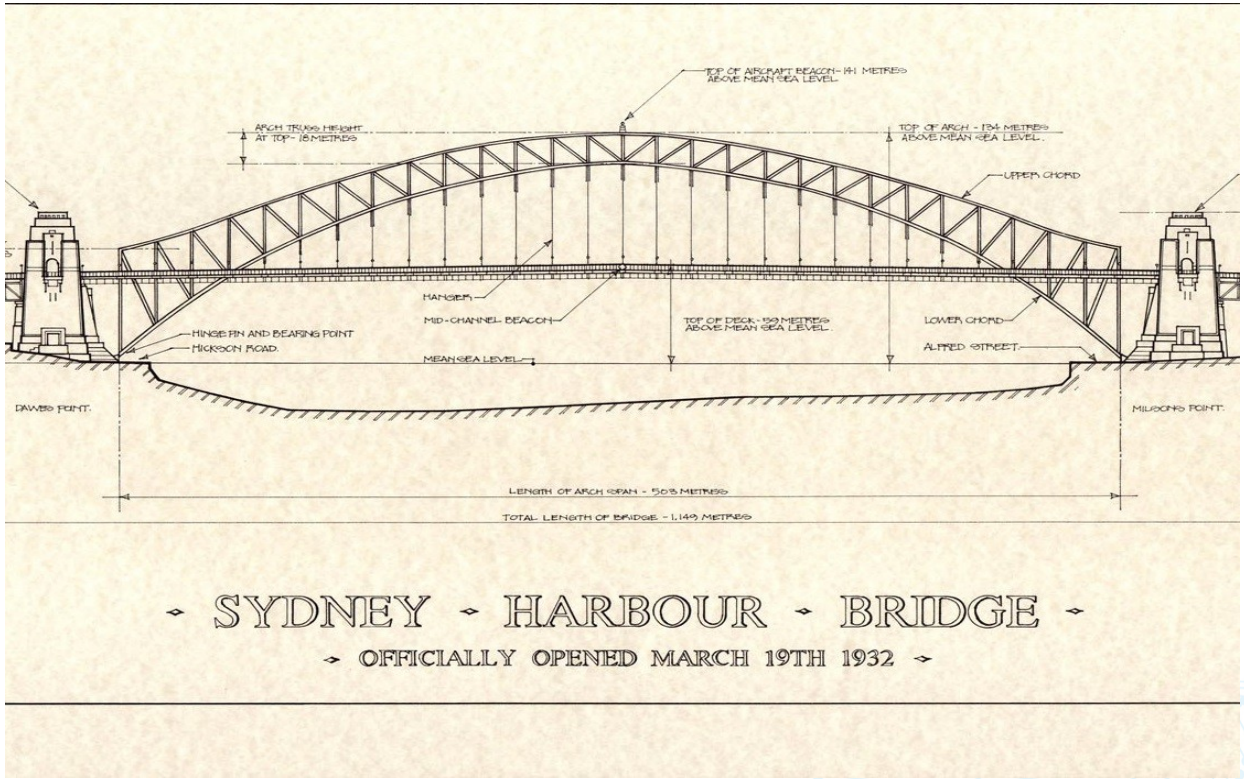

2027
2016/17

We are ‘blueprinting’ the 2017-27 decade (not building it)



WP2 – Customer-orientation of service

- Stage 1 extensively explored the likely diversity of future end-user needs and aspiration
- Accenture's Stage 2 work has looked at various market actors as network customers and co-creators of societal and end-user value
- This work will finalise over the next few weeks and a national webinar organised. It will help inform considerations around:
  - WP4 Regulatory Frameworks
  - WP5 Pricing & Behavioural
  - WP6/8 Technological enablers / DSO options
  - WP9 Next Generation Platforms

WP4 – Regulatory Frameworks

- Today has been getting the exploration started, underpinned by the principles outlined in Stage 1.
- Moving now to a range of smaller collaborative discussions with key stakeholders.
- National webinar on the draft CEPA report over the coming weeks
- Our target is for a finalised report by the end of Jul 2016
- This will feed into the further Roadmap development considerations over Aug – Oct 2016
- **Key Contact: Garth Crawford @ ENA**

Today's & Upcoming Workshops

23 Jun 16

A. Customer Orientated Networks (WP 1 & 2)

- Transformation Drivers
- FGF Update
- Customer Reorientation

B. Revenue and Regulatory Enablers (WP 3 & 4)

- Business Models
- Regulatory Frameworks – Risk Sharing; Scope of Service; Customer Protection

C. Pricing and Incentives (WP 5)

- Cost-Reflective Pricing
- "Second Wave" Incentives
- Value of New services including Micro-grids, Ancillary Services

7 & 8 Jul 16

D. Technological Enablers (WP 6 – 8)

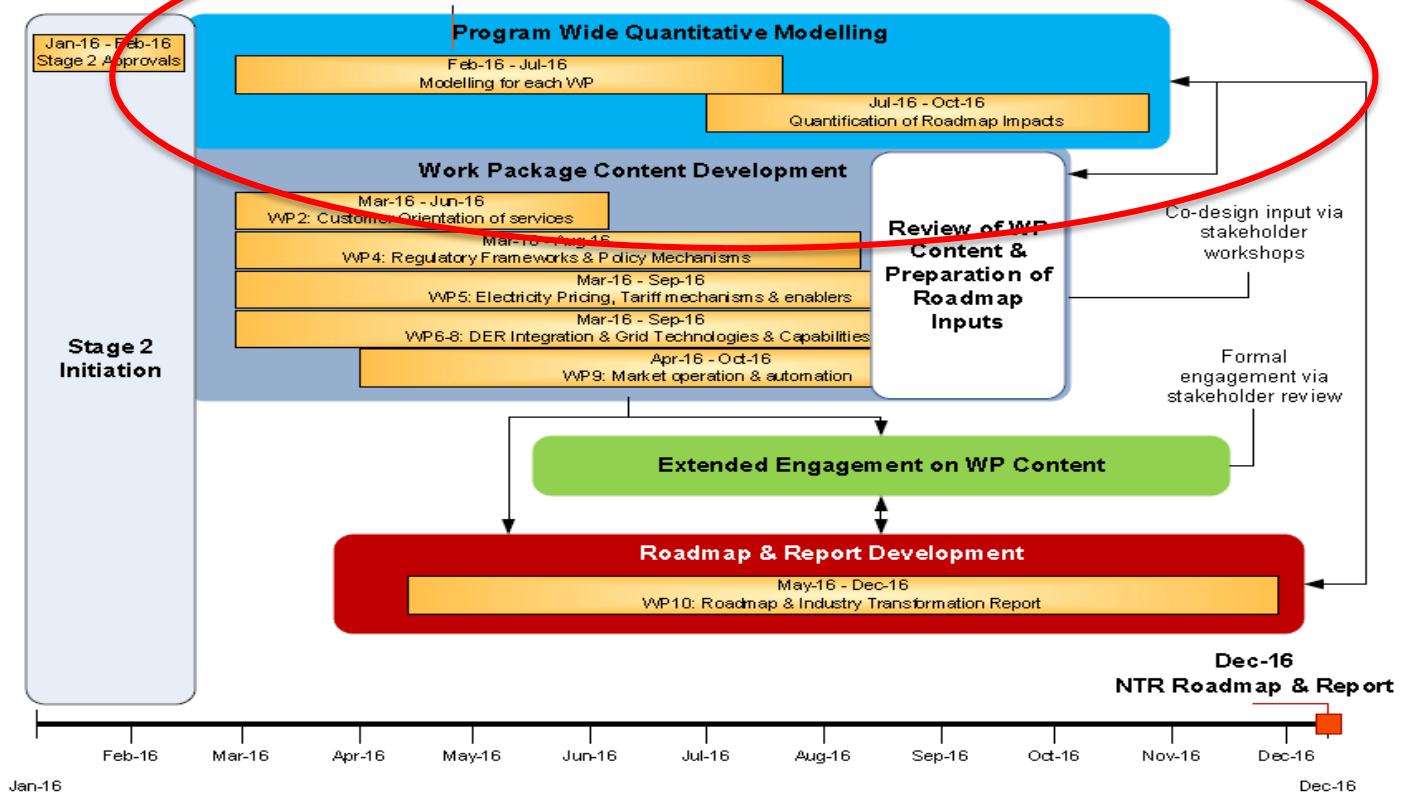
- Standards, operating platforms
- Advanced Power System Operations, Reliability and Security
- Grid-side technologies and innovation
- Future Workforce requirements

E. Next Generation Platform (WP 9)

- Transactive Energy models
- Institutional frameworks

Today's & Upcoming Workshops

25 Jul 16



Thank you for participating!

Slides will be provided on-line