Energy market is undergoing unprecedented changes....

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<td>Upstream</td>
<td>Innovation in oil and gas markets</td>
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<td>Generation</td>
<td>Carbon, renewables, overcapacity at times and under capacity other times</td>
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<td>Retail</td>
<td>Declining or plateaued on-grid demand – customers in charge</td>
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<td>Transport</td>
<td>Electric vehicles, driverless cars</td>
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Energy sector has seen these changes before....

Source: Richard Sears TED
Electricity sectors macro trends continue....

Decarbonisation

Decentralisation

Technology transformation

Customer transformation

Market transformation

Political/Policy uncertainty

Business model uncertainty
• Australia’s electricity industry is a $27.5 billion industry that employs over 47,000 people.

• Electricity is an essential service, fundamental to quality of life, economic growth and wealth creation.

• But the sector is currently going through a phase of disruption. New technologies are impacting the way customers engage with their energy service providers and environmental policies are driving the sector towards decarbonisation.

• This disruption creates challenges as incumbents struggle to respond to new markets and new commercial drivers. It also creates opportunities for nimble and innovative organisations with new ideas and new ways of creating value.

• The telecommunication industry learnt this lesson, with many incumbents failing to predict the value that customers would place on mobile phones, and the potential associated opportunities.

• Electricity is having its ‘mobile’ moment, solar panels, batteries, smart energy efficient appliances, electric vehicles… the ‘electrification of life’ change the way we engage with electricity.

• The experience of telecommunications shows there will be some big winners and some big losers from disruption and transformation.
New businesses are entering in to the market

High uptake of distributed energy resources and smart technologies are increasing the decentralisation of generation capacity

• Distributed energy resources have been a driver of new markets on the demand side of the energy market
• Virtual Power Plants aggregate the capacities of distributed energy resources to generate, store and feed energy back into the grid
• Virtual Power Plants also encourage retailers to offer consumers a different product from the traditional offering. Retailers incentivising behind the meter behaviour to help market outcomes can produce better results for the energy market
• Can benefit retailers, generation and networks. Markets emerging to ensure the optimisation of DERs
• Emerging companies in this space are: GreenSync, Reposit Power, Geli, Autogrid
• Enabling devices: Tesla, Schneider, ABB
New business models are emerging
Larger organisations are directly investing in renewable energy through corporate PPAs

• There are 89 companies in India, China, Europe and the US that have committed to 100% renewable energy through the RE100 initiative. They are procuring renewables and installing on-site renewables to reach their targets and increase the mix of renewable energy generation in the grid.

• Below are examples of some companies leading the way:

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<th>Company</th>
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<tr>
<td>Google</td>
<td>Will reach 100% renewable energy in 2017, and had 2.6GW contracted commitments of renewable energy by end of 2016</td>
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<tr>
<td>IKEA</td>
<td>Has a target of 100% renewable energy by 2020</td>
</tr>
<tr>
<td>Apple</td>
<td>In 2016, 96% of Apple’s electricity was sourced from renewable energy</td>
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<tr>
<td>Facebook</td>
<td>In 2016, Facebook contracted 150MW of renewable energy taking it’s total to 500MW</td>
</tr>
<tr>
<td>Olam International</td>
<td>Signed a corporate PPA in 2018. This PPA is with Flow Power, allowing Olam direct access to renewable energy over 10 years from Ararat Wind Farm</td>
</tr>
<tr>
<td>UNSW</td>
<td>UNSW has recently signed a corporate PPA with Origin Energy and Maoneng Australia to supply 100% of its energy with solar energy</td>
</tr>
<tr>
<td>Melbourne Renewable Energy Project</td>
<td>A group of local governments, cultural institutions, universities and corporations have collectively purchased renewable energy from a newly built facility, Crowlands (80MW)</td>
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Source: [http://there100.org/companies](http://there100.org/companies), UNSW newsroom, City of Melbourne
New business models are emerging
Energy as a service, not as a product

Currently, the battle for behind the meter services is focused on selling technologies to households, but few players are thinking about what you could do with these technologies to add extra value.

• Most customers don’t like to think about their electricity consumption. They pay their bill every month or quarter, notice that the price has increased, and don’t think about it again until their next bill.

• Technology developments might change this to an extent – a smart meter will give customers real time data about their electricity use so that they can make more conscious decisions about how they use electricity and the technologies they invest in to reduce their bill.

• There is a potential opportunity for an innovative organisation that sees the potential of technology not as a product to sell to consumers, but as a way to provide a service to customers.

• This could involve providing a package of products to a customer - like a solar panel, a battery, an electric vehicle and an electric vehicle charger, energy efficient appliances - bundled with a smart meter to manage that customer’s usage of electricity in exchange for a monthly fee.

Electricity products could be provided in a similar way to mobile phone products currently sold by telecommunications businesses, where a set cost per month is charged to the customer in exchange for the technology and the use of the technology.
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