Energy News and ABB

Annual New Zealand Electricity Survey

SURVEY RESULTS 2017

ENERGY NEWS
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ABB

Introduction

Energy News and ABB are delighted to announce the results of the Annual New Zealand Electricity Survey 2017. This document contains some fascinating insights gained from industry participants sharing their opinions on the New Zealand electricity sector.

The survey, now in its sixth year, focused on changes to the industry – both immediate and on the horizon – to track respondents' thoughts on emerging technologies and trends.

Twenty thought-provoking questions tested respondents' views on important electricity industry topics, such as emerging technologies (including electric vehicles, data, battery storage and peer-to-peer electricity trading), changes to industry structure, climate change responses and future generation options.

We repeated a feature introduced last year where we asked the industry when they saw some milestones being achieved. Notable changes from last year's answers include:

- The sector thinks that we will have 10,000 electric vehicles on our roads two years earlier than they thought last year
- The next network amalgamation is expected to happen six years sooner than predicted in 2016
- We will have 40 retail brands to choose from by 2019. Last year the sector thought this would never happen
- This country will reach 100 MW of solar capacity two years later than predicted last year. The sector thinks exponential growth could be impacted by confusion over the economic benefits of solar, or potential customers waiting for prices to drop further

There was strong sector support for electric vehicles in this year's survey. Respondents expect EVs to have the biggest impact on the industry this year, and that they are the best option for the sector to reduce greenhouse gas emissions. There is overwhelming support for dropping the price of EVs to encourage greater uptake.

A majority of the sector also thinks major changes to asset portfolios and supporting systems will be required in the next two decades to meet future needs. There is also strong consensus that the distribution sector will face the biggest transformation in coming years.

Outside of this, there is no consensus on some emerging decisions facing the sector. Respondents were split on who should be responsible for standardising access to EV chargers. While there was agreement on whether there should be a review of the country's distribution sector, different camps emerged on the best option to ensure the greatest efficiency.

The sector chose geothermal, wind and hydro as the generation options that would best meet New Zealand's electricity requirements going forward. It is almost equally split on when Genesis Energy's Huntly coal units might close, if at all.

A breakdown of respondents by organisation type is available on page 24. This year respondents included distributors, gentailers, regulators, consultants and consumers. The survey questions and range of responses were again guided by an advisory panel chaired by John Hancock. The panel members are listed on page 3 and we would like to thank them for their input.

Please email any feedback to kate.barker@freemanmedia.co.nz. We welcome any and all suggestions for questions and responses for 2018.

Kate Barker – Research Analyst
Freeman Media (publisher of Energy News)

About ABB

ABB is a pioneering technology leader that works closely with utility, industry, transport and infrastructure customers in roughly 100 countries. With more than four decades at the forefront of digital technologies, we are a leader in digitally connected and enabled industrial equipment and systems with an installed base of more than 70,000 control systems connecting 70 million devices.

ABB is proud to have been providing power and automation solutions to the New Zealand market for over 80 years.

About Energy News

Energy News is New Zealand's online news and information service for the energy sector. The website (www.energynews.co.nz) was launched in 2008 and now boasts more than 5,000 readers every month from 300 subscribing organisations. Its readership consists of New Zealand energy sector organisations and service companies spanning the electricity, oil and gas, petroleum and alternative energy value chain.

The subscription-based site provides daily news, executive interviews, opinion and commentary. It also hosts a suite of information resources including two large databases of sector participants and energy resources. Other information tools include 30-minute electricity prices, supply and demand monitoring, petroleum permit deadline summaries and an oil price monitor.

2017 survey highlights

The electric vehicle revolution

50%

of respondents think we'll have 10,000 EVs on New Zealand roads by 2019.

60%

think lowering EV prices is the best option to meet this country's target of 64,000 EVs on NZ roads by 2021.

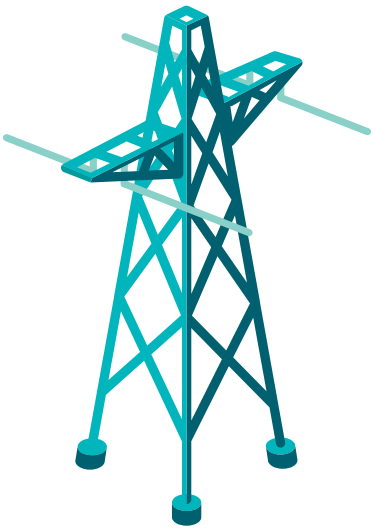
43%

think encouraging EV uptake is the most effective way the sector can reduce greenhouse gas emissions.

EV

uptake is expected to have the biggest impact on the electricity sector in the next 12 months.

Other highlights

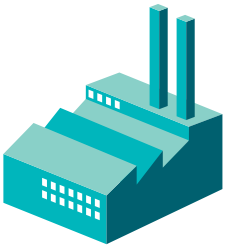


76%

of the industry think the country's distribution sector should be reviewed, but are split on what option would create the best operating efficiencies.

Distribution is the traditional industry group expected to experience the biggest transformation in the coming decade.

The industry thinks the most valuable use of sharing consumption data is to increase consumer control of electricity use.



Views are almost equally split on whether Genesis Energy's Huntly coal units will close in 2022 or 2030.

The advisory panel

John Hancock (Chair)

John Hancock is an independent consultant to utility companies and their suppliers. He is the independent chair of the Electricity Authority's Wholesale Advisory Group, secretariat to the NZ Smart Grid Forum and has chaired the advisory panel for this survey since its inception in 2012.

Erik Zydervelt – Mevo

Erik is the founding Director and CEO of Mevo, New Zealand's first electric car share and the world's first climate positive car share service. Prior to this Erik was COO for a distributed energy start-up focusing on delivering renewables to informal settlements in Sub-Saharan Africa and South East Asia. Erik trained as an urbanist at the University of Victoria, Wellington.

Ewan Morris – ABB

Ewan Morris is the Managing Director of ABB New Zealand, a role he has held since March 2014. He has been with ABB since 1988, and has enjoyed a long and extensive career in the company across five countries including New Zealand, Australia, Sweden, Malaysia and Switzerland. This has seen him gain 20 years' professional experience in international industrial sales, marketing, product and service management.

James Boyle – Meridian Energy

James Boyle is the Industry Insights Manager within Meridian's Strategy and Performance Team. This team is responsible for monitoring and advising the executive team on opportunities across the electricity sector. Prior to joining Meridian in 2013 he worked in strategy and finance roles for the Bank of New Zealand. He is a Chartered Financial Analyst.

Kate Barker – Freeman Media

Kate is Freeman Media's research analyst and is responsible for the premium content on the Energy News and Inside Resources websites, as well as being involved in the development of new and existing Freeman Media products and services. Kate worked as a journalist for Energy News for more than three years before moving into the research role in early 2017.

Steve Gregan – Electra Group

Steve is the Deputy Chief Executive for the Electra Group providing oversight for Strategy, Risk Management and key trading subsidiary operations. He has had a long involvement in the electricity sector going back to the corporatisation of ECNZ and at M-co in the early stages of the electricity market.

Jeff Roorda - TechnologyOne

With an academic and professional background in surveying, civil engineering and knowledge management systems, Jeff has worked in asset and facilities management for over 30 years with a strong background in information technology and project management.

Jeff's experience includes asset capacity building projects with over 200 asset intensive organisations, and developing international infrastructure service delivery improvements for infrastructure services in USA, Canada, Australia, New Zealand, China and Malaysia.

Linda Thompson – Fonterra

In her Energy Manager role at Fonterra, Linda is responsible for the energy portfolio – one of Fonterra's largest costs within manufacturing in New Zealand – spending more than $300 million per annum. Her role includes developing and implementing the energy strategy, managing and sponsoring key strategic priority projects covering energy efficiency, risk mitigation and new technology or energy initiatives.

Neil Wembridge – Freeman Media

Neil Wembridge is the General Manager at Freeman Media, which sees him take responsibility for the commercial side of the energy sector products of Freeman Media, including all events, map products, surveys, stakeholder management and business development.

Neil came to Freeman Media from a role as a strategic consultant to the New Zealand energy sector based in Wellington. He previously worked for Total and Oracle in the UK.

Nick Coad – Transpower

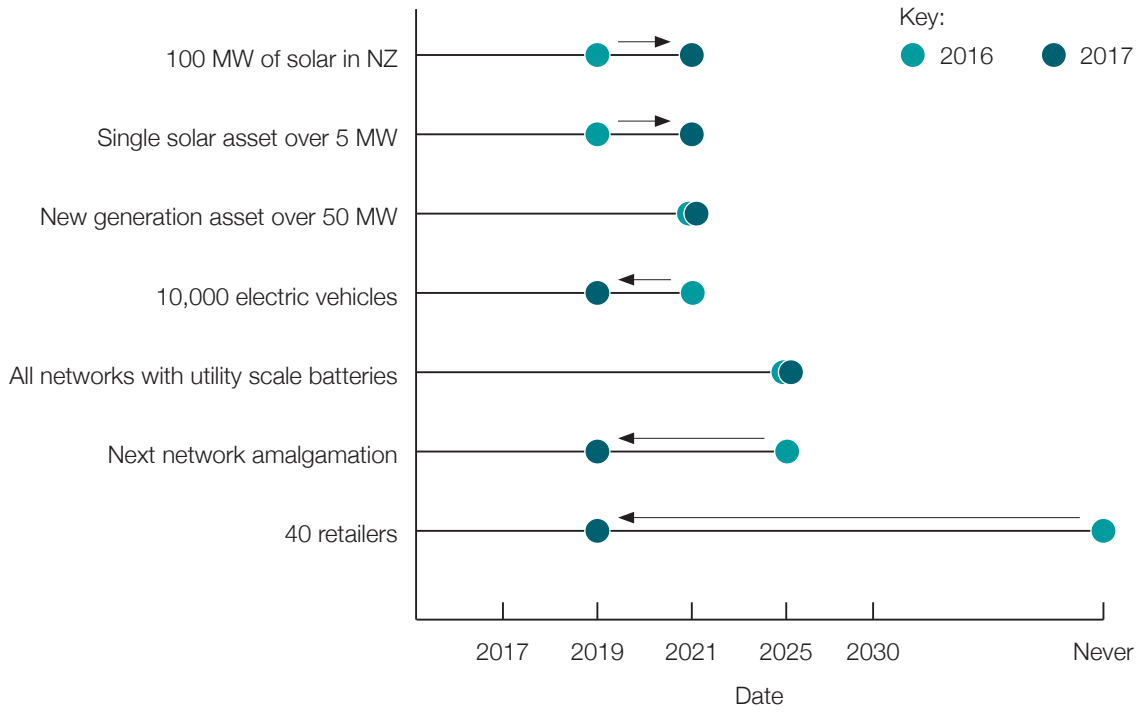
Nick is the Business Improvement Manager Delivery at Transpower New Zealand. His role sees him focusing on how Transpower improves its delivery to meet rapidly-changing markets. Nick has had a number of roles that span the industry from power station commissioning and maintenance, through geothermal and earthquake engineering and Works Planning. Nick was part of an industry initiative that developed the first multilateral agreement to transfer security decisions from Transpower to industry governance before moving to major construction as the Project Director for the North Island Grid Upgrade starting in 2006.

Nikki Bloomfield – Flick Electric

Nikki Bloomfield is Flick's General Counsel and Company Secretary. She has been with Flick since 2015. Nikki has 10 years' experience in the electricity industry advising on a wide range of electricity sector issues and projects. She has previously held roles at Meridian Energy and Powershop.

Timeline for change

Question 1
We introduced this question last year - asking when all these sector milestones might actually be achieved. How much has industry opinion changed in 12 months? Think about the past year then take a guess. What year will we see:

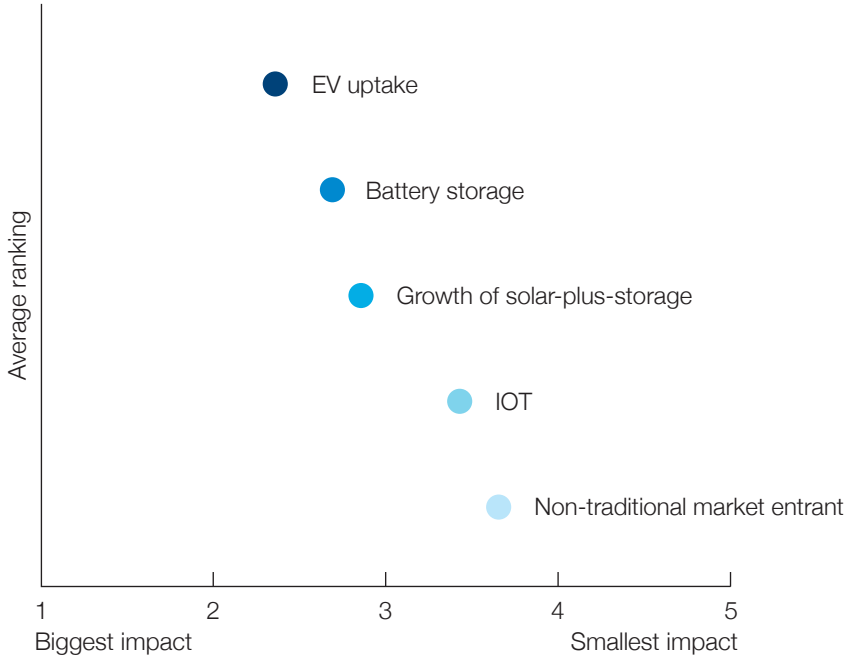


	2017	2019	2021	2025	2030	NEVER
100 MW of solar installed? (50 MW currently)	2.2%	35.2%	**38.2%**	19.3%	4.4%	0.70%
A single solar project over 5 MW? (Yealands is the largest at 0.5 MW)	0.7%	12.6%	**30.1%**	28.3%	20.1%	8.2%
A new generation asset over 50 MW?	0.4%	22.1%	**35.2%**	26.2%	7.5%	8.6%
10,000 electric vehicles? (3,300 currently in the country)	1.1%	**48.2%**	33.6%	13.9%	3.3%	0.0%
Every lines network with utility-scale batteries? (Three currently)	0.0%	2.6%	18.8%	**33.1%**	25.4%	20.2%
The next distribution network company amalgamation?	3.3%	**36.8%**	32.7%	13.6%	6.6%	7%
40 retail brands to choose from? (Currently there are 31)	3.7%	**37.5%**	19.5%	14.7%	3.3%	21.3%

Drivers of change

Question 2

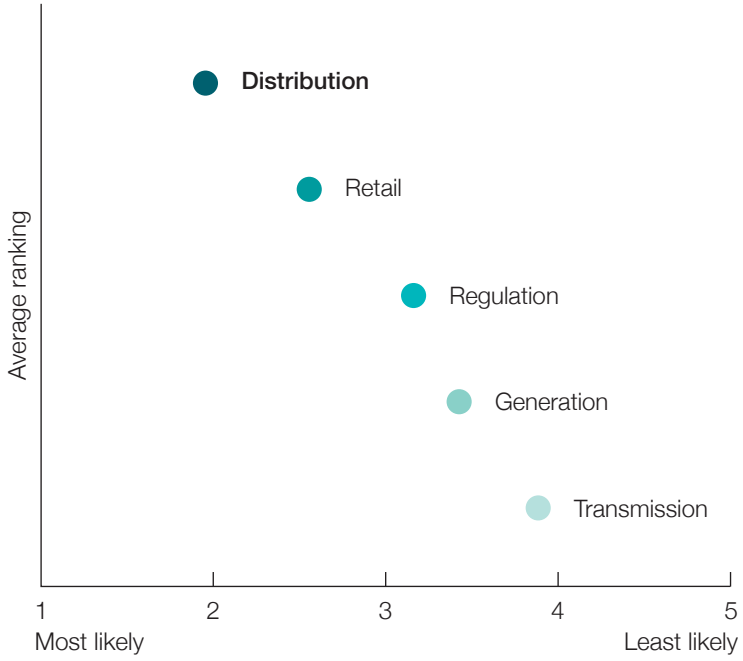
2017 – What changes are just around the corner? In the coming year, which of the following will have the biggest impact on the electricity sector? Last year our respondents thought it would come from distributed generation and the rise of the prosumer. Rank the following options, with one having the biggest impact:



- **EV uptake = 2.4**
- Battery storage = 2.7
- Growth of solar-plus-storage installations and the rise of the prosumer = 2.9
- Internet of Things = 3.4
- Non-traditional retail market entrant (e.g. Google, Apple, a telco) = 3.6

How prepared are we?

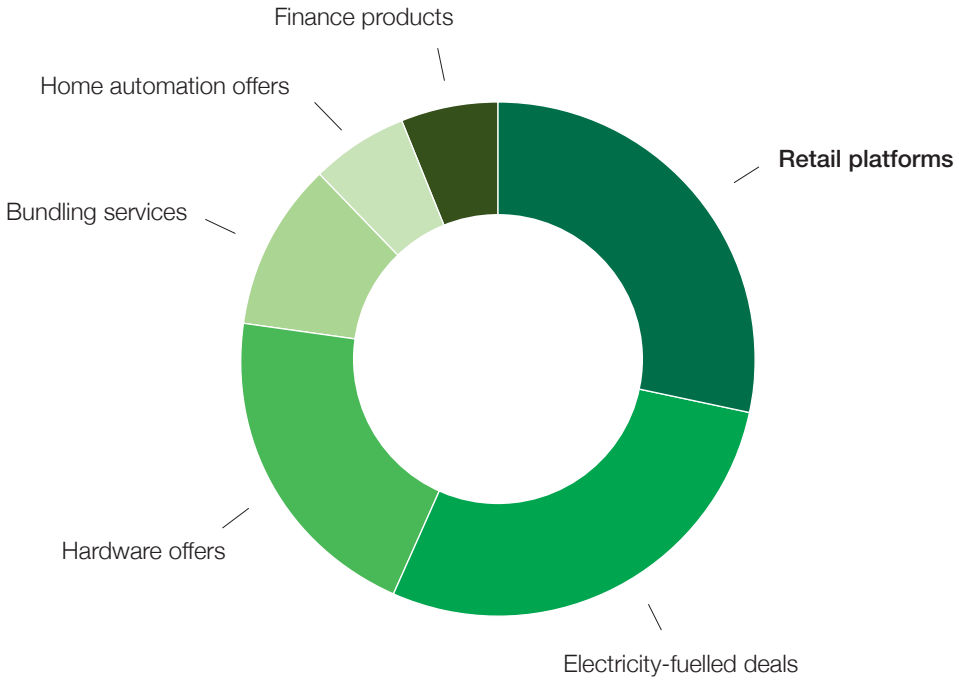
Question 3
The emergence of disruptive technology is unavoidable and is blurring the lines of traditional industry roles. Which of these traditional industry groups do you think is most likely to experience the biggest transformation in the coming decade? Rank the following options, with one being most likely:



- **Distribution = 2**
- Retail = 2.6
- Regulation = 3.2
- Generation = 3.4
- Transmission = 3.9

How prepared are we?

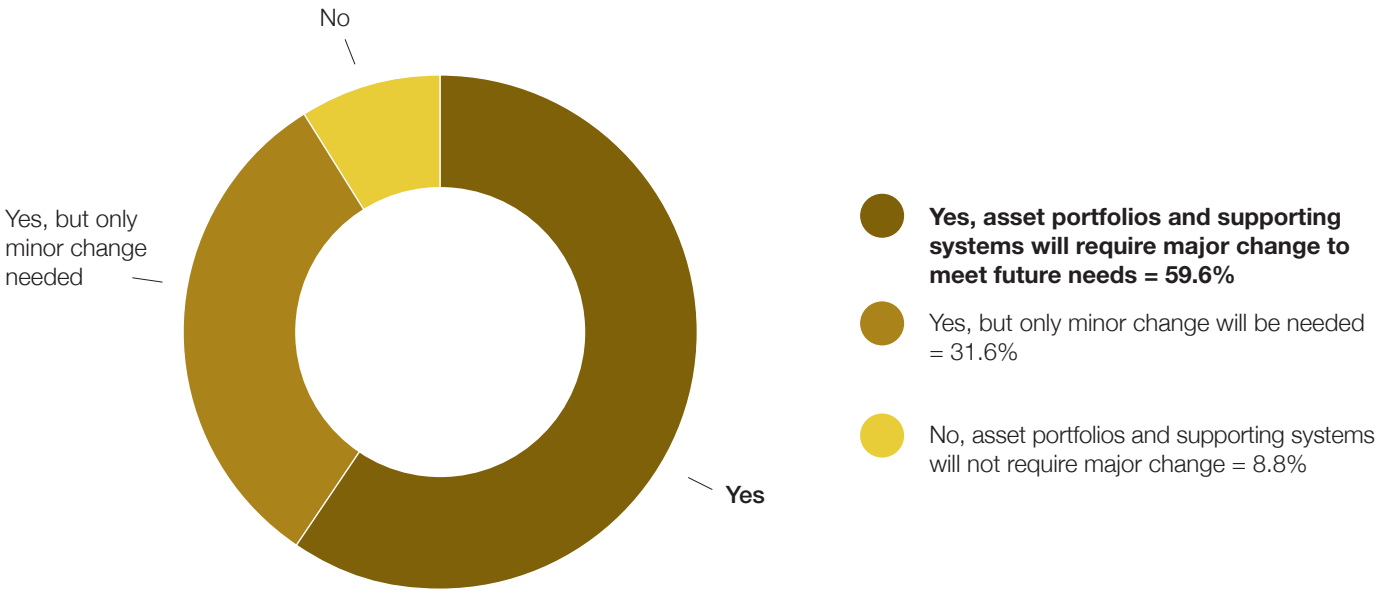
Question 4
Consumers' desire for control is expected to increase as the public has access to more information. Telecommunications providers now offer television and music streaming, broadband and mobile data alongside traditional services. Where is the biggest opportunity for the electricity sector to add value? Choose one option that best fits your view:



- **Retail platforms that allow a consumer to function as a prosumer and energy trader = 23.9%**
- Offering electricity-fuelled transport deals with power plans = 22.8%
- Hardware offers, such as battery storage solutions = 15.7%
- Bundling electricity with competitive broadband and telecommunications offers = 14.1%
- Offering home automation software = 13.7%
- Access to finance products for items such as solar panels = 9.8%

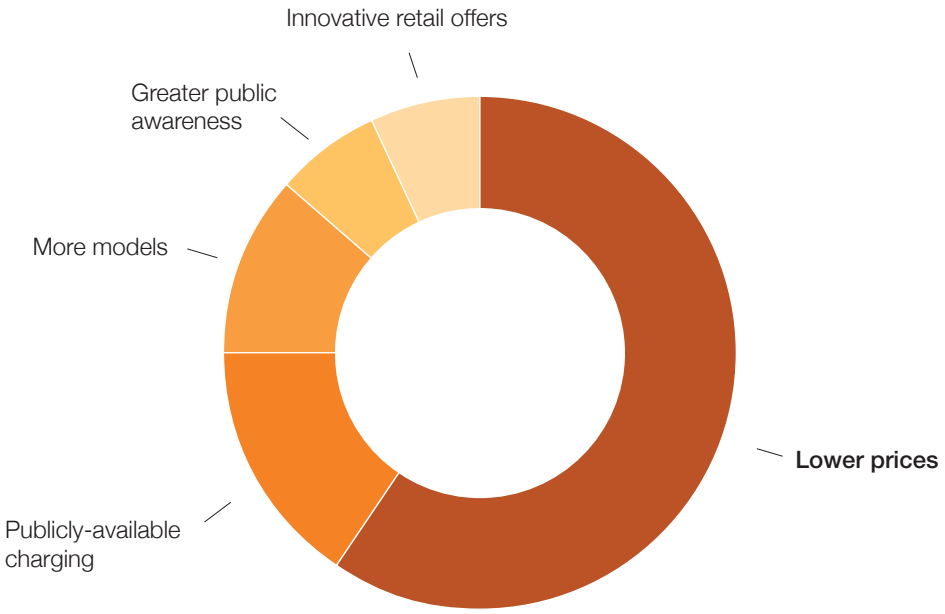
How prepared are we?

Question 5
This question is brought to you in partnership with TechnologyOne: The current register of energy assets and supporting systems represent a significant policy and engineering achievement, but this network was designed for a different world to the one it confronts today. Do current assets and management systems need to change to meet future needs over the next 20 years? Choose one option that best fits your view:



Electricity Evolution – Electric vehicles

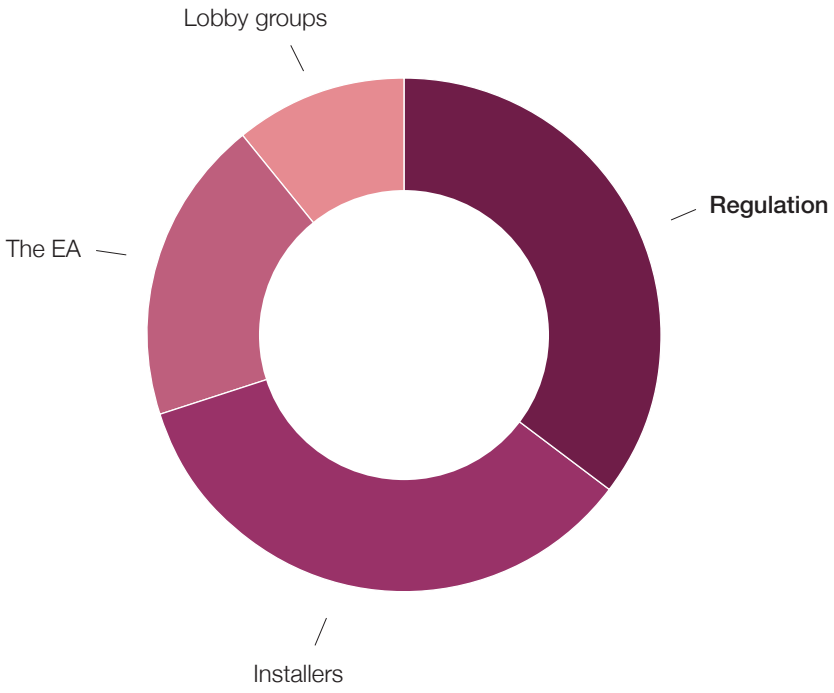
Question 6
The rate of EV uptake is tracking alongside the Government's target to have 64,000 of the vehicles on New Zealand roads by 2021. What would best ensure that we meet or even exceed this target? Choose one option that best fits your view:



- **Lower EV prices = 59.7%**
- More publicly-available charging infrastructure = 15.4%
- More models to choose from = 11.5%
- Greater public awareness = 6.7%
- Innovative offers from retailers for EV owners = 6.7%

Electricity Evolution – Electric vehicles

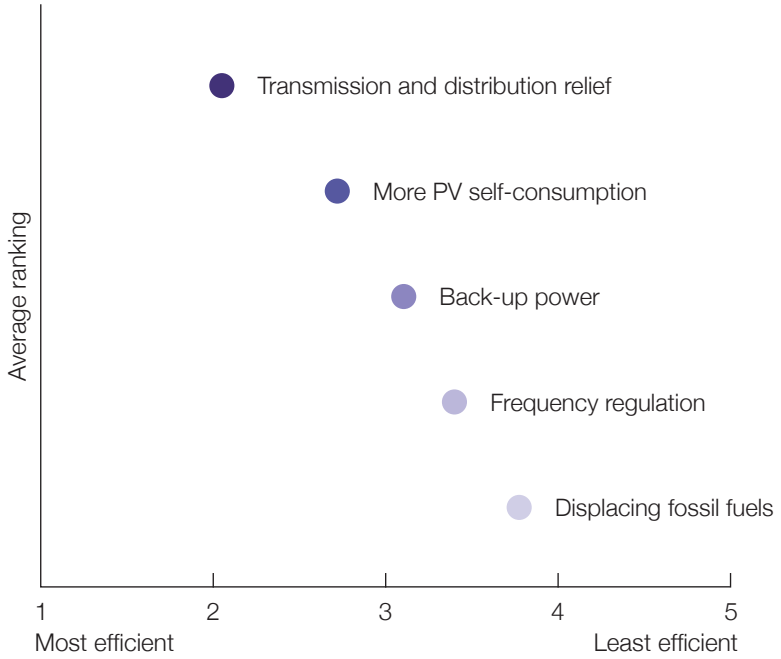
Question 7
A number of organisations are working to install EV charging infrastructure throughout the country, including lines companies, ChargeNet and large retail stores such as The Warehouse. Where should responsibility lie for standardised access to these chargers? Choose one option that best fits your view:



- **Government regulation = 35.3%**
- Companies responsible for installation = 34.9%
- The Electricity Authority = 19.1%
- Lobby groups such as Drive Electric or the AA = 10.7%

Electricity Evolution – Batteries

Question 8
Battery storage is becoming a feasible proposition for some consumers and utilities. Outside of storage for consumer consumption, what is the most efficient way this technology could be used to benefit the electricity sector? Rank the following options, with one being the most efficient:

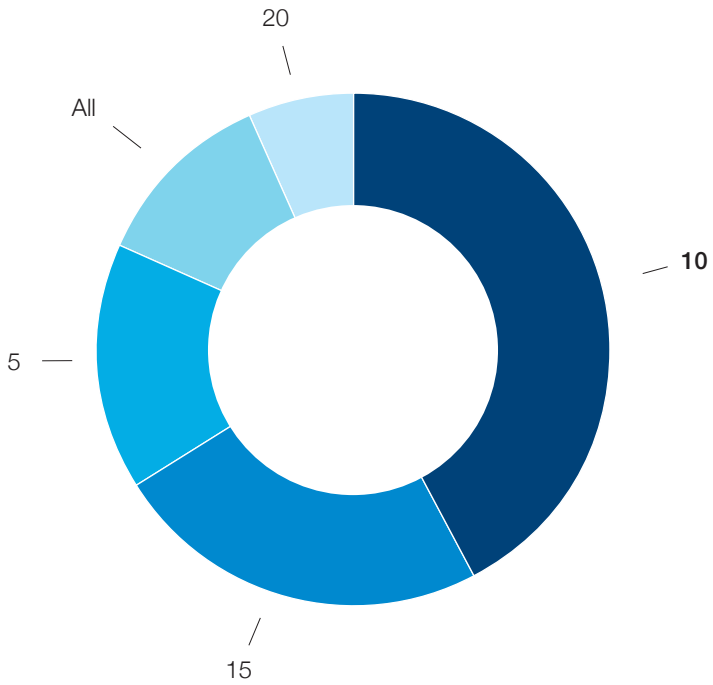


- **Transmission and distribution congestion relief = 2**
- Increased consumer PV self-consumption = 2.7
- Back-up power during outages = 3
- Frequency regulation = 3.4
- Displacing fossil fuel-based generation = 3.7

Electricity Evolution – Batteries

Question 9

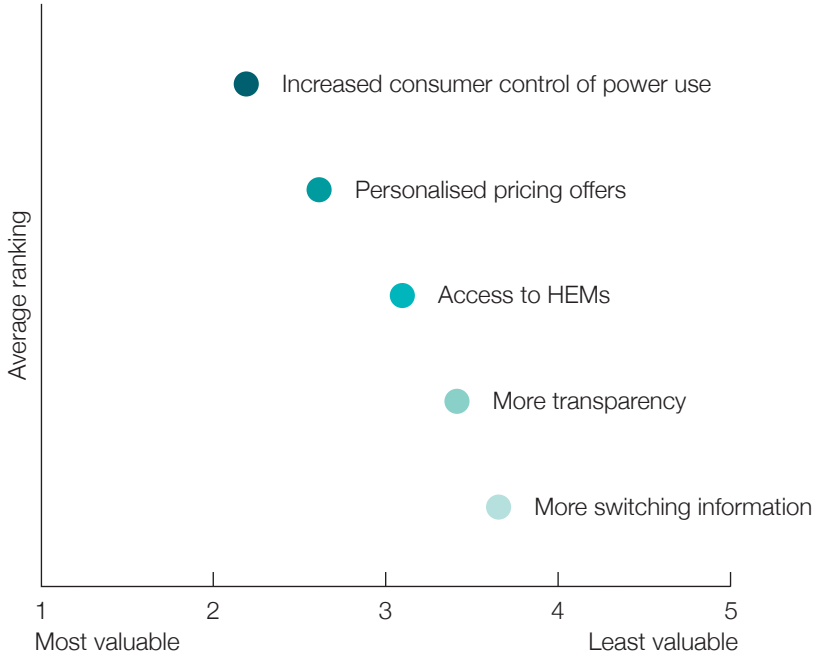
Vector and Alpine Energy are already using utility-scale batteries on their networks. Counties Power plans to commission one mid-2017. How many networks do you think will install this technology in the next five years? Choose one option that best fits your view:



- **10 = 42.3%**
- 15 = 23.8%
- 5 = 15.7%
- All of them = 11.7%
- 20 = 6.5%

Electricity Evolution – Data

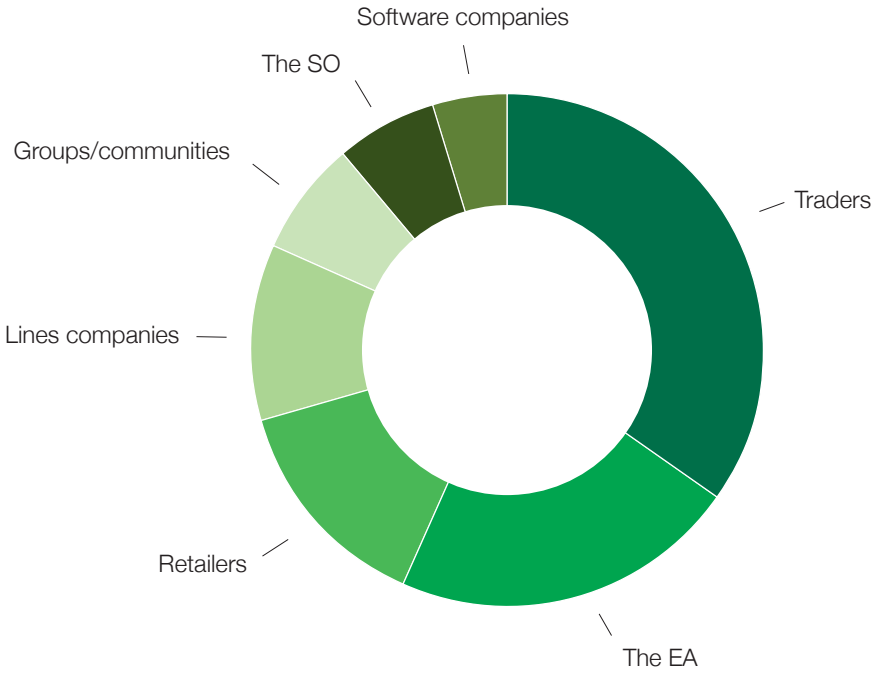
Question 10
Access to consumption data is becoming an important discussion in the industry. What value could sharing this data unlock for consumers? Rank the following options, with one being the most valuable:



- **Ability to allow increased consumer control of electricity use = 2.2**
- Access to more personalised pricing offers = 2.6
- Access to more smart home energy management systems = 3
- More transparency between the consumer and retailer = 3.4
- Access to more information before switching retailers = 3.6

Electricity Evolution – P2P energy trading

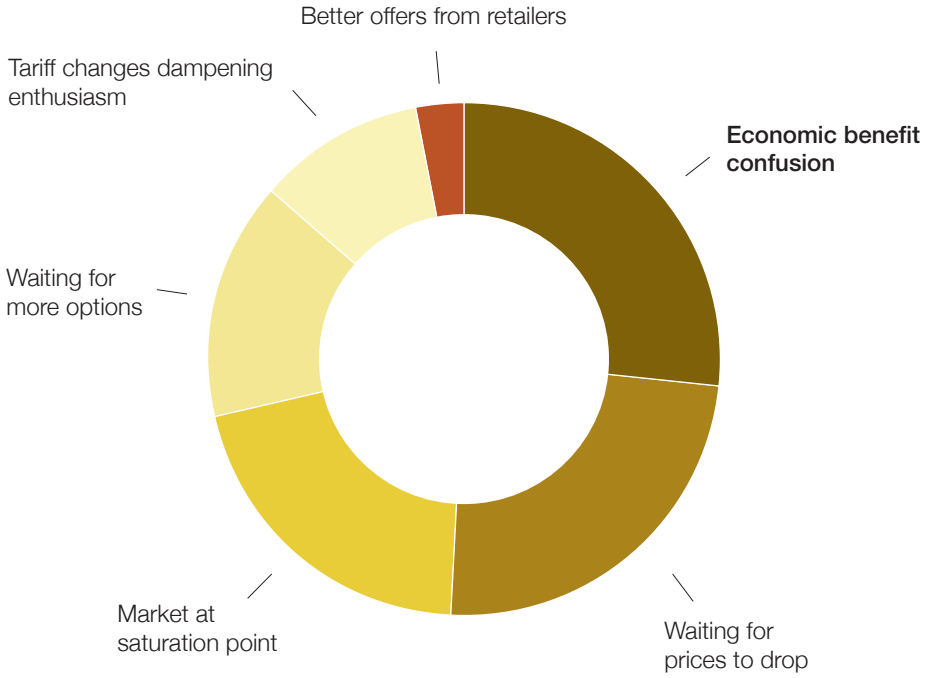
Question 11
New Zealand now has its first peer-to-peer energy retailer, in the form of P2 Power. Vector is also trialling P2P energy trading in Auckland. If take-up of this form of retailing grows, who is responsible for establishing a platform for it? Choose one option that best fits your view:



- **The traders themselves = 35%**
- The Electricity Authority = 21.8%
- Retailers = 14%
- Lines companies = 11.1%
- Interested groups/communities = 7%
- The System Operator = 6.6%
- Software companies = 4.5%

Electricity Evolution – Solar

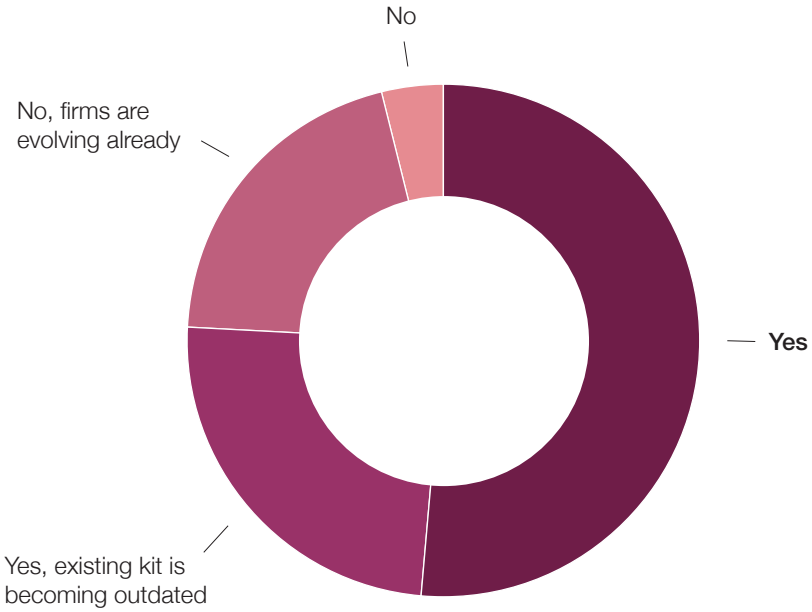
Question 12
Solar installations are still growing at a steady rate, with more than 13,400 systems installed at the end of March. What is holding this country back from seeing exponential growth of solar? Choose one option that best fits your view:



- **Confusion over economic benefits = 26.7%**
- Prospective buyers are waiting for the price to drop further = 24.3%
- The market is reaching its natural saturation point for systems at the current price = 20.7%
- Prospective buyers waiting for more solar-plus-storage options = 15%
- Recent tariff changes for solar users by some lines companies dampening enthusiasm = 10.5%
- More retailers are offering better choices for grid-connected power = 2.8%

Transmission and Distribution – Distribution sector review

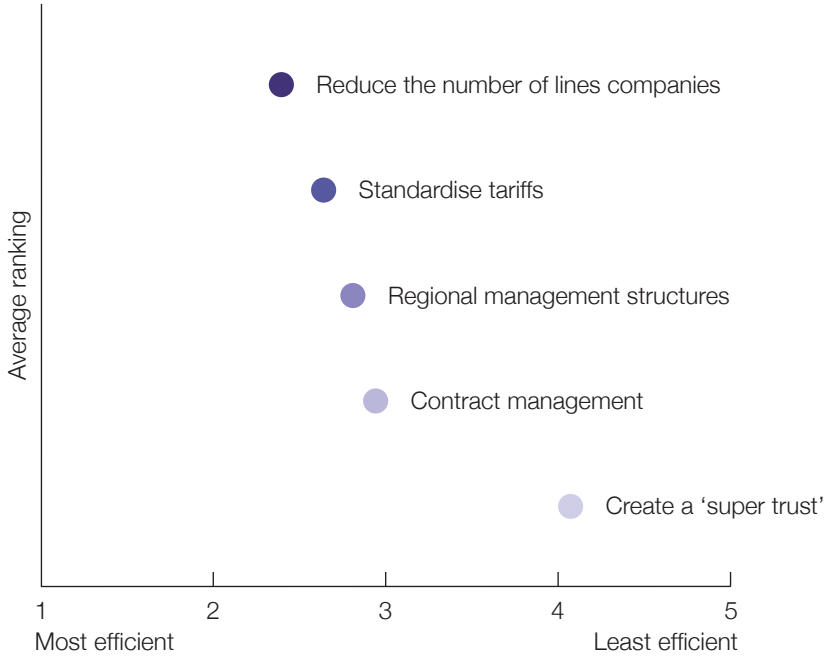
Question 13
In February, a report by the International Energy Agency suggested this country's distribution sector should be reviewed. Is it time for the Government to address this? Choose one option that best fits your view:



- **Yes, there are efficiencies to be gained = 51.4%**
- Yes, the existing structure is fast becoming outdated = 24.5%
- No, firms seem to be evolving and finding efficiencies under the existing model = 20.4%
- No, any restructure would cause far too much disruption = 3.7%

Transmission and Distribution – Distribution sector efficiency

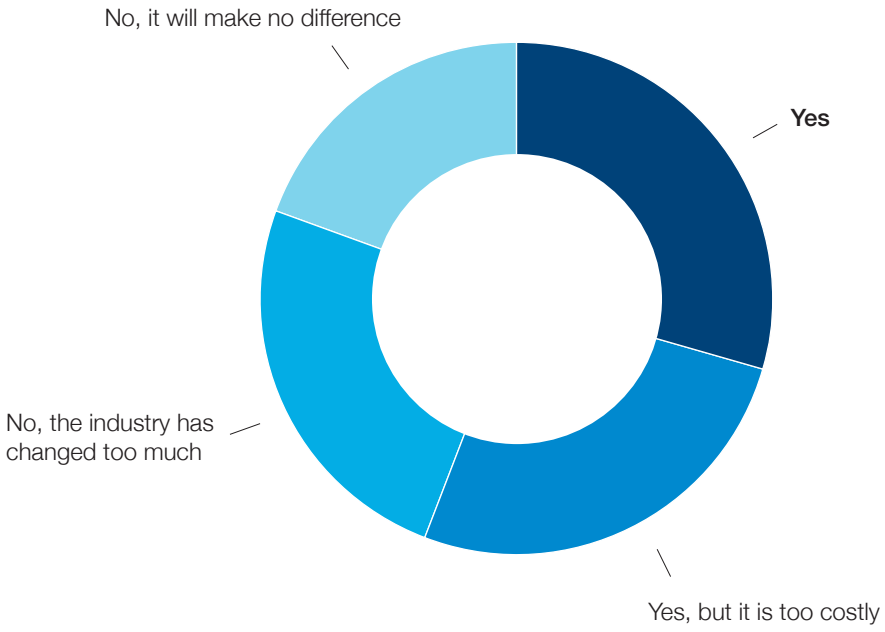
Question 14
If a restructure was to happen, what would be the best option to ensure New Zealand's distribution networks operate efficiently? Rank the following options, with one being the most efficient:



- **Reduce the number of lines companies = 2.4**
- Standardise tariffs = 2.6
- Implement more regional management structures, similar to the PowerNet model = 2.8
- Implement wider contract management, similar to the Centralines/Unison model = 3
- Create a 'super trust' to manage the trust-owned lines companies = 4

Transmission and Distribution – TPM

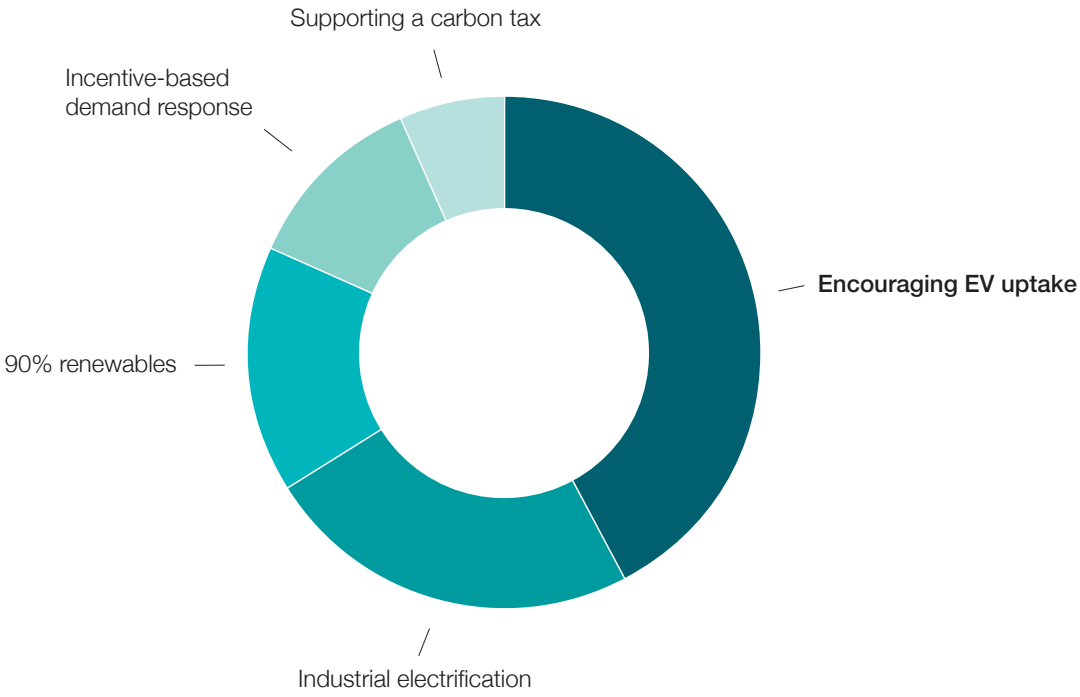
Question 15
The Electricity Authority is progressing its proposed transmission pricing methodology. In light of potential new distribution pricing and other looming changes to the industry, is the EA's proposal to implement an area-of-benefit charge to replace the existing HVDC and interconnection charges still relevant? Choose one option that best fits your view:



- **Yes, the proposal from the EA makes a lot of sense = 29.7%**
- Yes, but the cost to get there will outweigh any benefits = 26.2%
- No, once it is in place the game will have changed again = 24.9%
- No, without the charges flowing directly to consumers it makes no difference = 19.2%

Climate Change

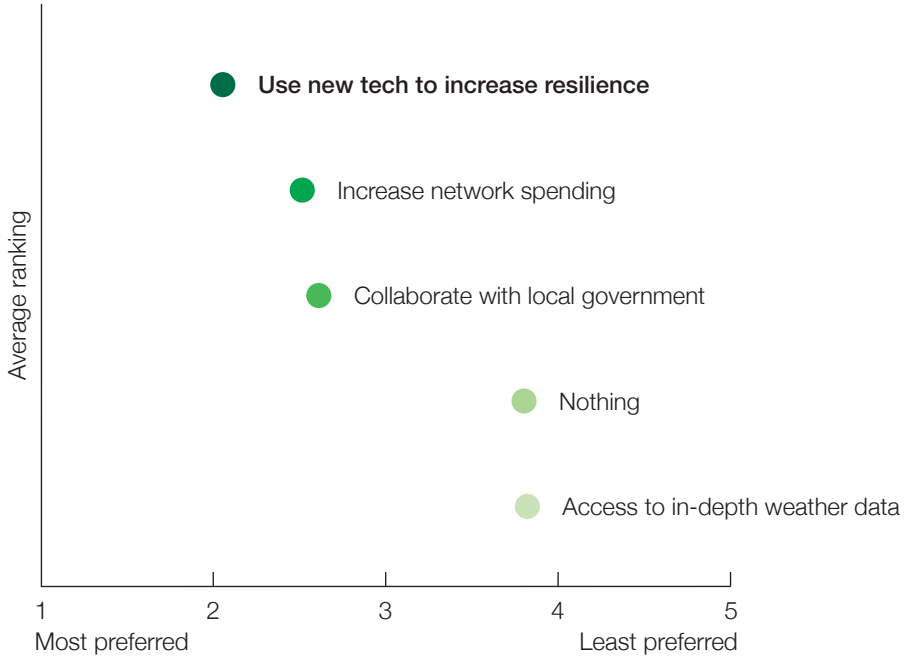
Question 16
The latest World Energy Council's trilemma index showed New Zealand's weakest performance area was in environmental sustainability. Last year survey respondents thought encouraging EV uptake would be the most effective way for the electricity sector to reduce greenhouse gas emissions. Is this still the case? Choose one option that best fits your view:



- **Encouraging EV uptake = 42.7%**
- Offering solutions for large industrial users to change from fossil fuels to electricity = 19.9%
- Working towards a 90 per cent renewable electricity generation target = 16.7%
- Implementing a wide and incentive-based demand response programme to ease peak demand = 11.4%
- Lobbying for the introduction of a carbon tax = 9.3%

Climate Change

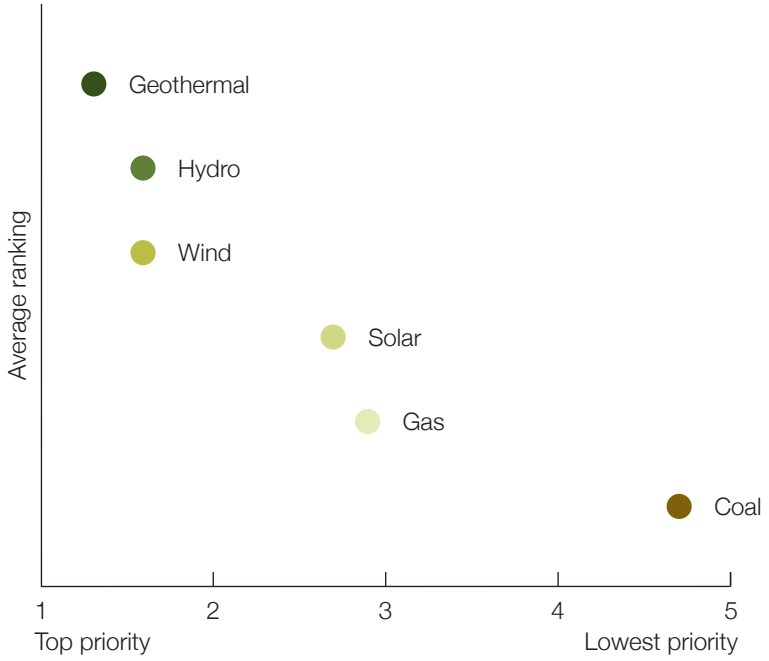
Question 17
New Zealand is experiencing extreme weather events more frequently. Recent storms and flooding have tested this country's electricity assets. How can the sector best prepare for future events? Rank the following options, with one being the best:



- **Take advantage of new technology, such as batteries and distributed generation, to increase resilience = 2**
- Increase spending to strengthen network resilience = 2.5
- Work more with local government and related agencies on resilience planning = 2.6
- Nothing – the sector is prepared as well as it can be for these events = 3.8
- Lobby Government to open access to more in-depth weather data to help improve preparedness = 3.8

Generation

Question 18
Given continual increases in efficiency and cost reductions across generation technologies, which generation types do you believe would best meet New Zealand's new electricity requirements over the next 20 years? Rank the following options, with one being the top priority:



Geothermal = 1.3

Hydro = 1.6

Wind = 1.6

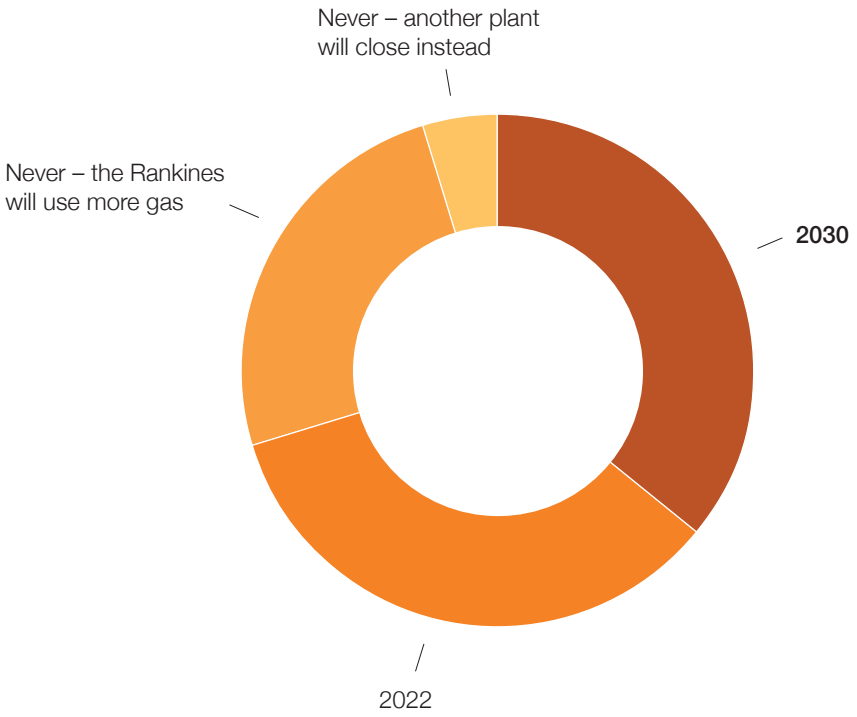
Solar = 2.7

Gas = 2.9

Coal = 4.7

Generation

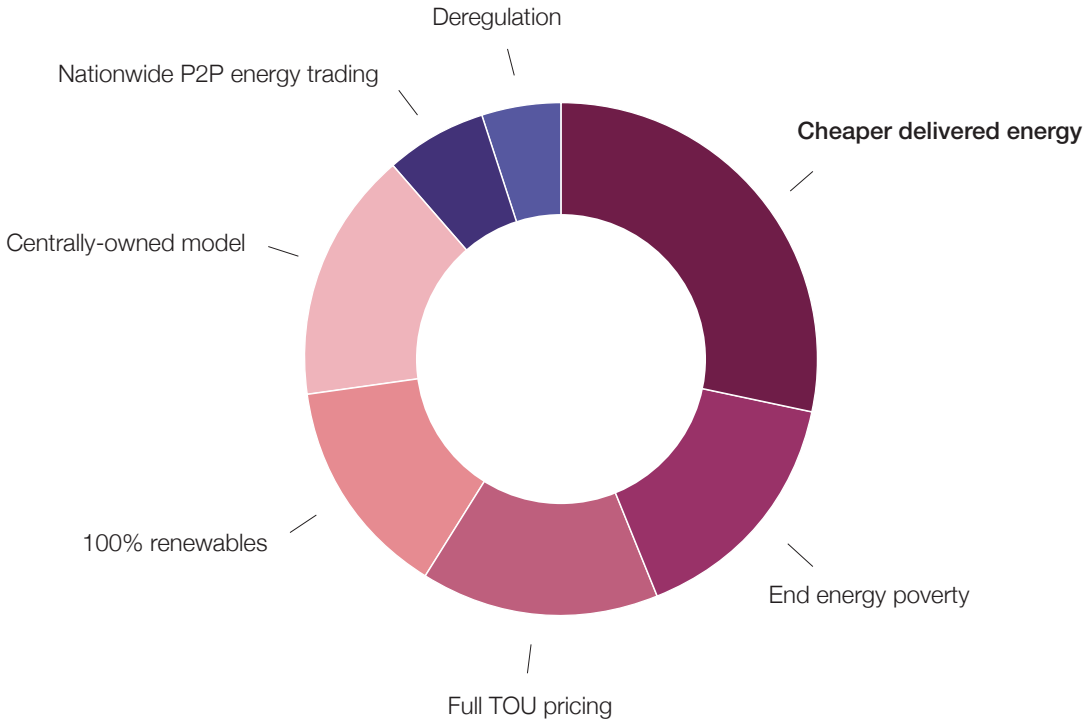
Question 19
Genesis Energy's Huntly coal units were back in the news last year when incoming chief executive Marc England said the third Rankine unit could return to market if conditions allowed. Given this perspective, when do you think the units might close altogether? Choose one option that best fits your view:



- **2030 = 36.1%**
- 2022 = 34.4%
- Never – but the Rankines will run primarily on gas = 24.9%
- Never – another thermal plant will close instead = 4.6%

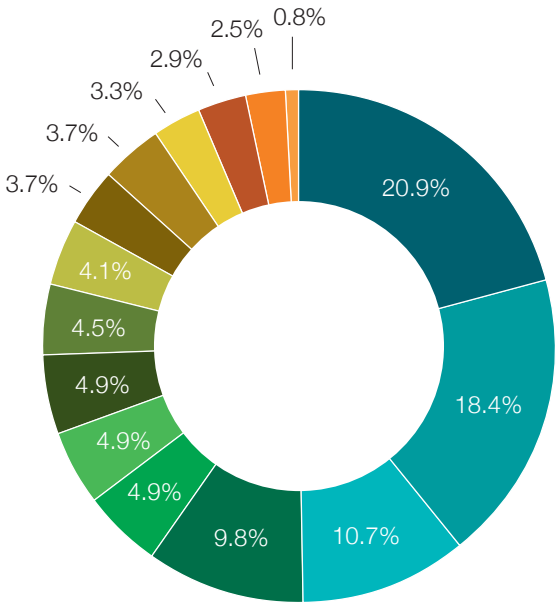
Make a wish

Question 20
Time to wave your magic wand. If you could change just one thing about the electricity industry, which would it be? Choose one option that best fits your view:



- **Cheaper delivered energy to consumers = 31.8%**
- End energy poverty = 17.6%
- Enable full time-of-use network pricing = 16.7%
- 100% renewable electricity generation = 15.5%
- Return to a centrally-owned model = 7.4%
- Nationwide peer-to-peer electricity trading = 5.7%
- Be completely unregulated = 5.3%

Participants by organisation type



- Distribution – 20.9%
- Gentailer – 18.4%
- Other – 10.7%
- Consultant – 9.8%
- Government department/agency – 4.9%
- Consumer – 4.9%
- Small retailer – 4.9%
- Professional services company – 4.5%
- Regulator – 4.1%
- Transmission – 3.7%
- Equipment supplier – 3.7%
- Lobby/association – 3.3%
- Consumer - large – 2.9%
- Generator – 2.5%
- Upstream oil and gas – 0.8%

Emax 2 and ABB Ability™ Electrical Distribution Control System

Microgrids and the power of data make energy digital

Transforming the flow of energy into analysable, manageable data – this is the function of Ekip SmartVision, the cloud computing platform that re-writes the rules for the energy management of low-voltage electrical systems. The internet of things is integrated into the devices, services and processes, allowing for better informed decision-making and easier supervision, even remotely. A simple, ready-to-use system that makes it possible to enhance radically, in combination with the new functions of Emax 2, the efficiency of latest-generation systems – microgrids – in terms of control, connectivity and ease of use.

Are you starting to understand what the future will be like?