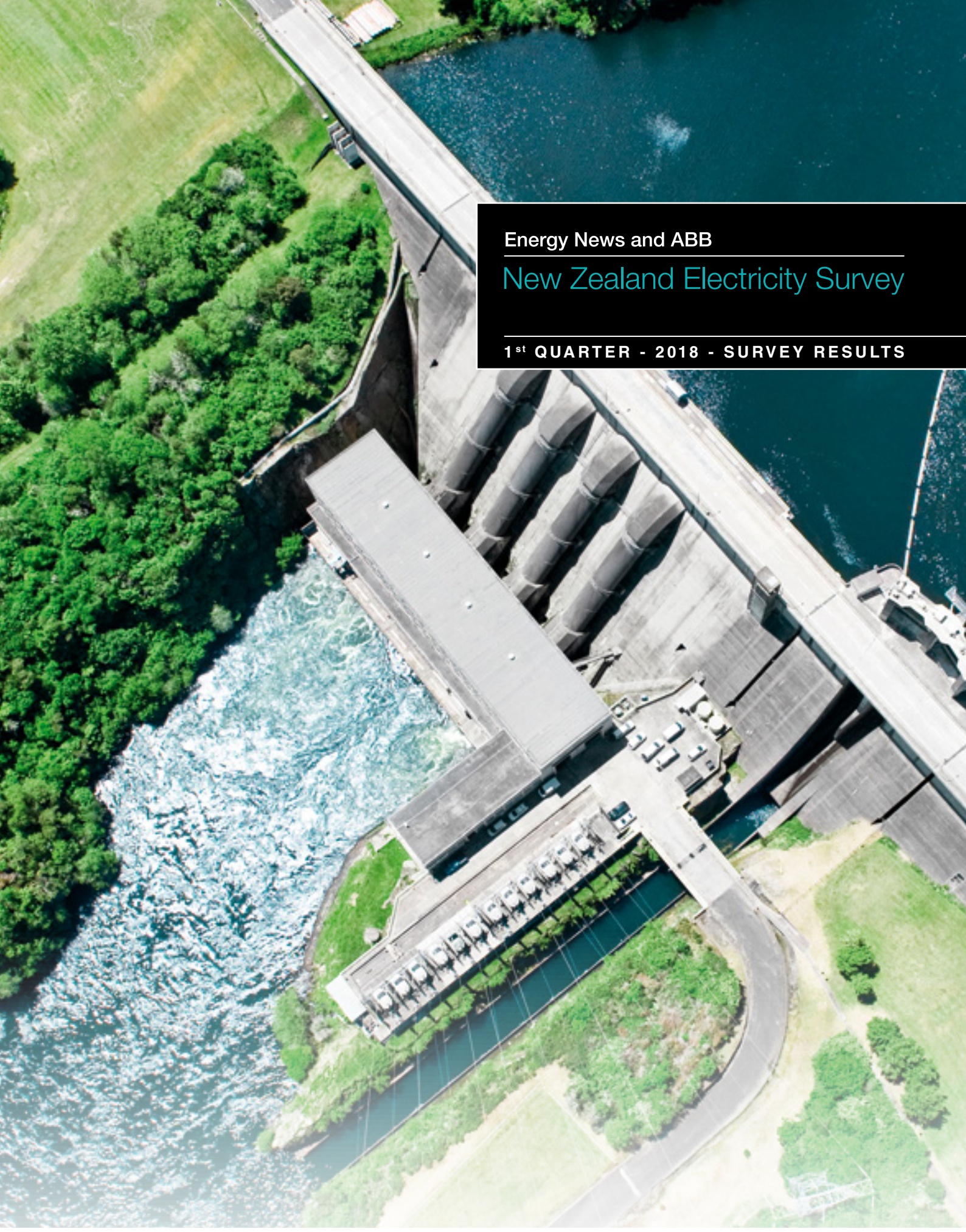


Energy News and ABB

New Zealand Electricity Survey

1st QUARTER - 2018 - SURVEY RESULTS

ENERGY NEWS
www.energynews.co.nz

ABB

Commentary

Results from the 1st quarter Energy News and ABB New Zealand Electricity Survey are now in. Over 350 respondents completed the 6 questions sharing their views and helping us establish whether the electricity sector agrees or is divided on key challenges and opportunities ahead.

1st Quarter highlights:

Not so fast, except solar

The sector generally now thinks a number of significant milestones will now happen later compared to their predictions from the same time last year.

The only milestone to happen sooner than previously predicted was achieving 100 MW of solar installed. Is the solar revolution happening quicker than expected?

Retail saturation?

An end to new retail competition? The majority of respondents think we will never reach 50 retail brands. A brave call since Electricity Retailers of New Zealand (ERANZ) recently reported we are already up to 47 retail brands.

Did the government get it right?

The large majority thought the government's review should focus on sector readiness to embrace consumer choice around digital disruption and distributed technology. Now that the final Terms of Reference are out we can see this is included but prices and profits seem to be the bigest focus.

Fans of geothermal, but opinion divided

Geothermal emerged as the winner in the new generation beauty contest, however, it shouldn't get complacent as the winning margin was slim.

No consensus

The sector seems uncertain and divided on a few key things

The **best form of energy storage** and **effects of decarbonisation** seem to divide and fragment views. Will a consensus emerge or is it a case of no clear answer because we just don't know yet.

About ABB

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner of Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 135,000 employees. www.abb.com

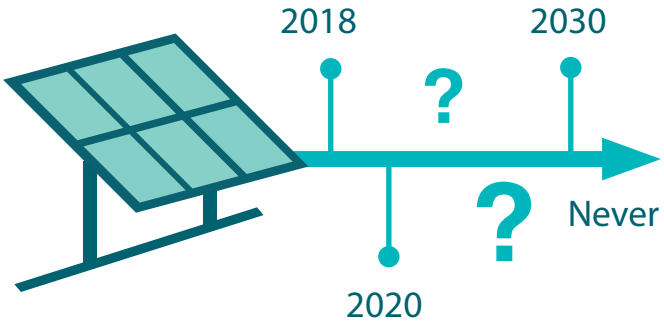
About Energy News

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.

1st Quarter - Ready for the challenge?

Key milestones will happen later than previously thought except for 100 MW of solar installed

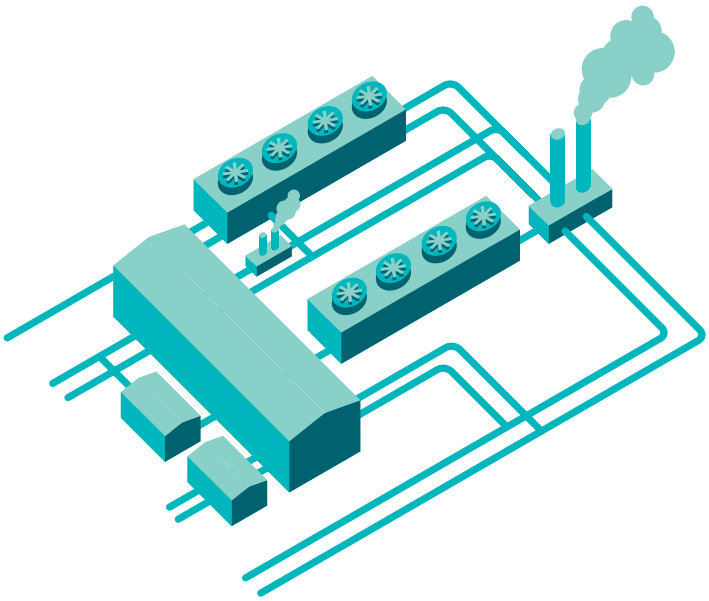


….and we will never have 50 retail brands.

Developing a fully integrated fast charging network

…is the best thing to ensure meeting the government target of 64,000 EVs by 2021.

Geothermal was the winner



…for the best new generation plant to complement the existing system.

The sector is divided around what form of energy storage will be best for NZ

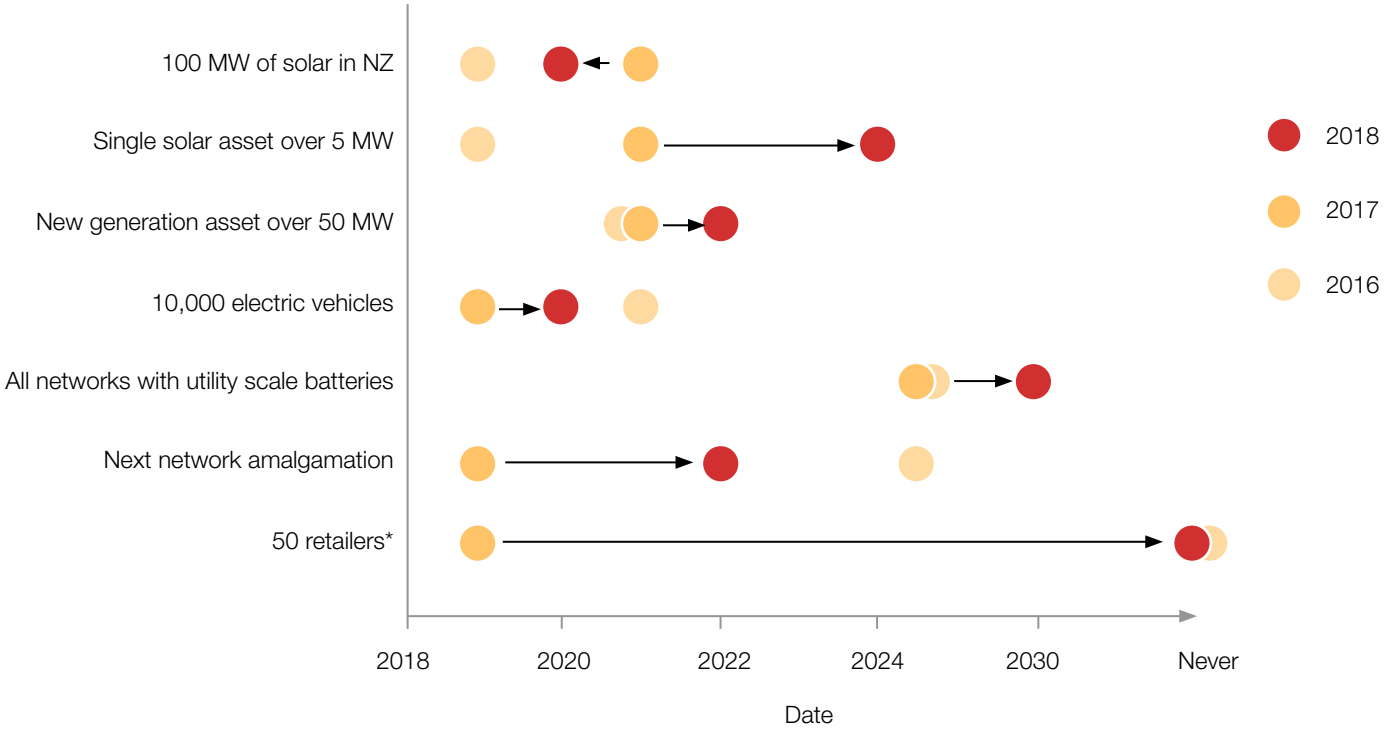
It's also divided on what the government's increased focus on decarbonisation will mean for industry and customers.

Read on to see all of the detailed results from the 1st quarter survey...

Timeline for change

Question 1

We've been tracking this since 2016, asking when all these sector milestones might actually be achieved. How much has industry opinion changed over two years?



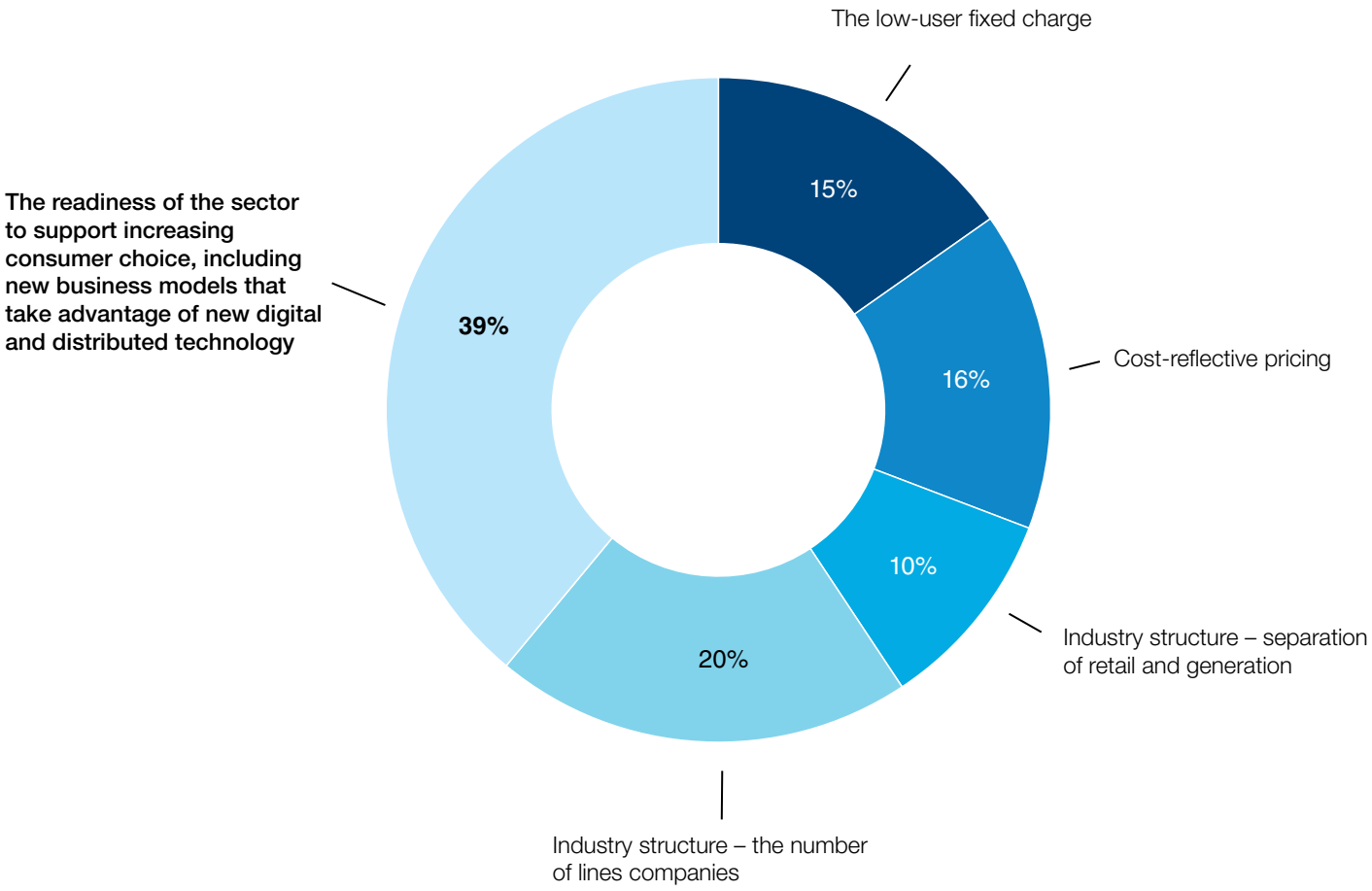
Milestone	2020	2022	2024	2030	NEVER
100 MW of solar installed? (68 MW as of 31 Jan 2018)	**47%**	36%	11%	4%	1%
A single solar project over 5 MW? (Yealands is the largest at 0.5 MW)	12%	28%	**31%**	21%	8%
A new generation asset over 50 MW?	16%	**30%**	25%	21%	9%
10,000 electric vehicles? (6,603 as of 31 Jan 2018)	**76%**	17%	6%	1%	0%
Every lines network with utility-scale batteries? (Three in 2017)	3%	16%	29%	**36%**	15%
The next distribution network company amalgamation?	28%	**35%**	21%	7%	8%
50 retail brands to choose from? (36 as of 31 Oct 2017)	13%	23%	16%	13%	**35%**

** We increased the number of retailers to 50, from 40 in 2016 and 2017. We are at 47 retail brands as at April 2018!*

Ready for a review?

Question 2

The new Government has proposed a "full-scale" review of the electricity market. What's the biggest issue that should be focused on?

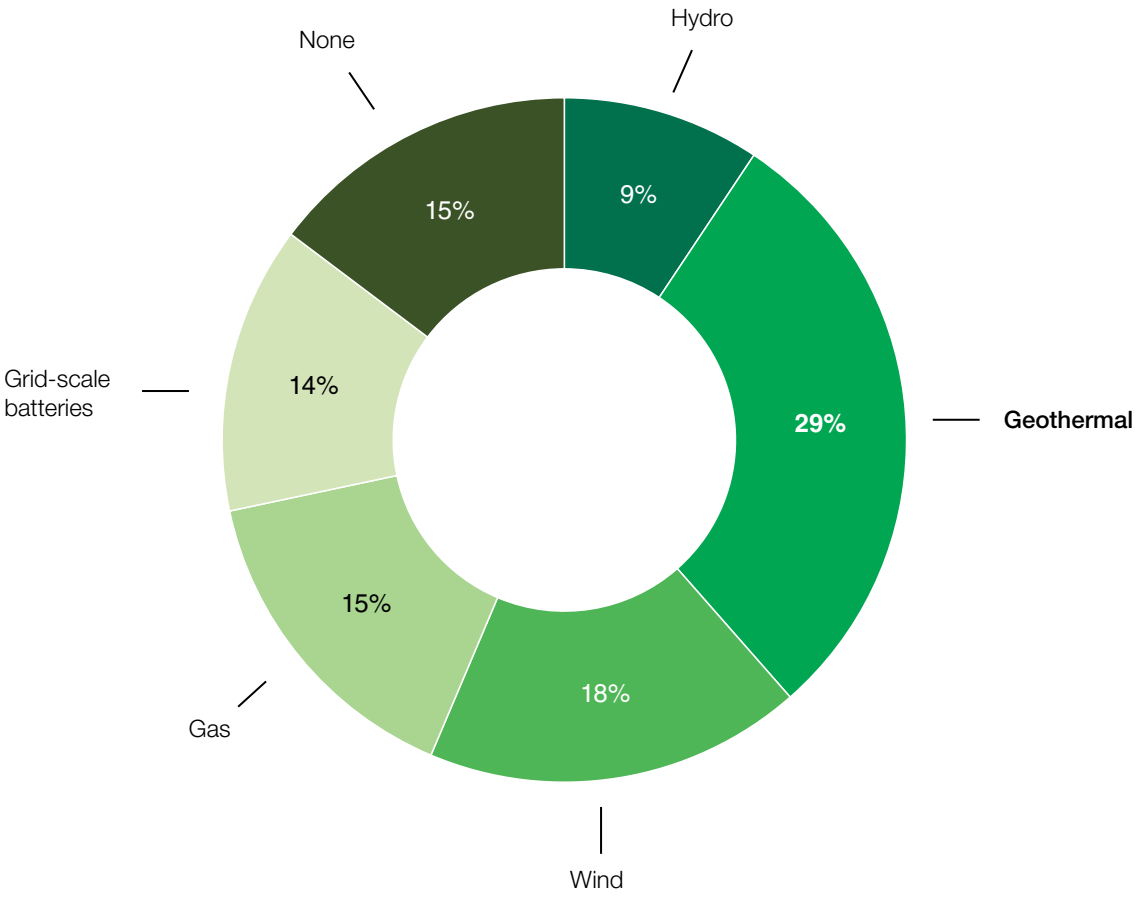


- The low-user fixed charge – 15%
- Cost-reflective pricing – 16%
- Industry structure – separation of retail and generation – 10%
- Industry structure – the number of lines companies – 20%
- **The readiness of the sector to support increasing consumer choice, including new business models that take advantage of new digital and distributed technology – 39%**

What to build next?

Question 3

Which type of big (e.g. >50MW) generation asset should be prioritised for development over the next 10 to 20 years to best complement the existing market?

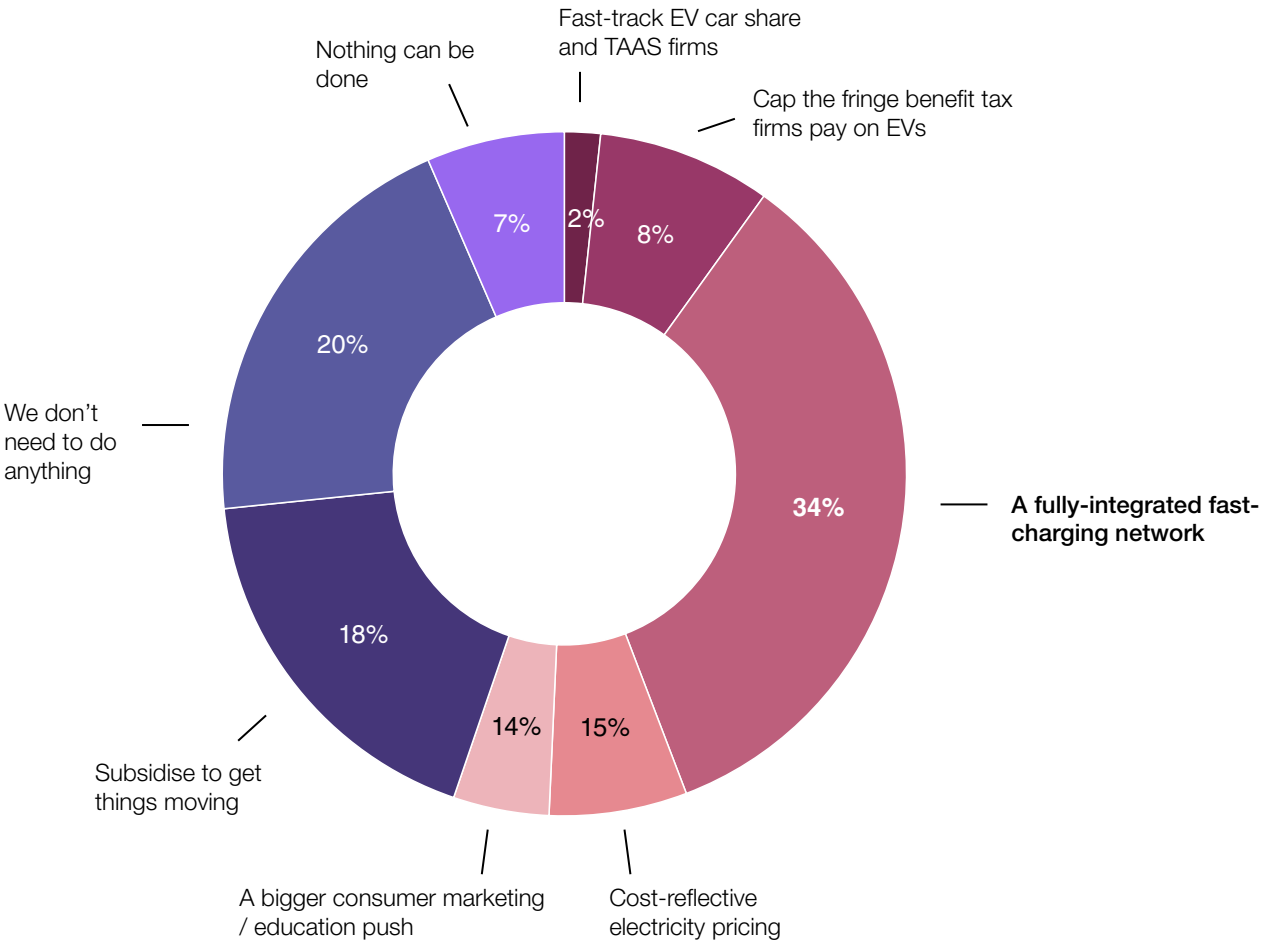


- New hydro, delivers the most power at the least cost in the long run – 9%
- **Geothermal, it is the best form of reliable baseload power we have – 29%**
- Wind, it is the best form of renewable energy to complement the abundant power provided by hydro and geothermal – 18%
- Gas, we have plenty of it and it can provide a flexible backup to our unpredictable renewable generation portfolio – 15%
- Grid-scale batteries – 14%
- None… with energy efficiency measures, and the advent of distributed energy solutions, we shouldn't be building any new big assets going forwards – 15%

EV support needed

Question 4

In 2017, uptake of electric vehicles exceeded targets set by the previous Government. What option will best help ensure the target of 64,000 EVs on NZ roads is met by 2021?

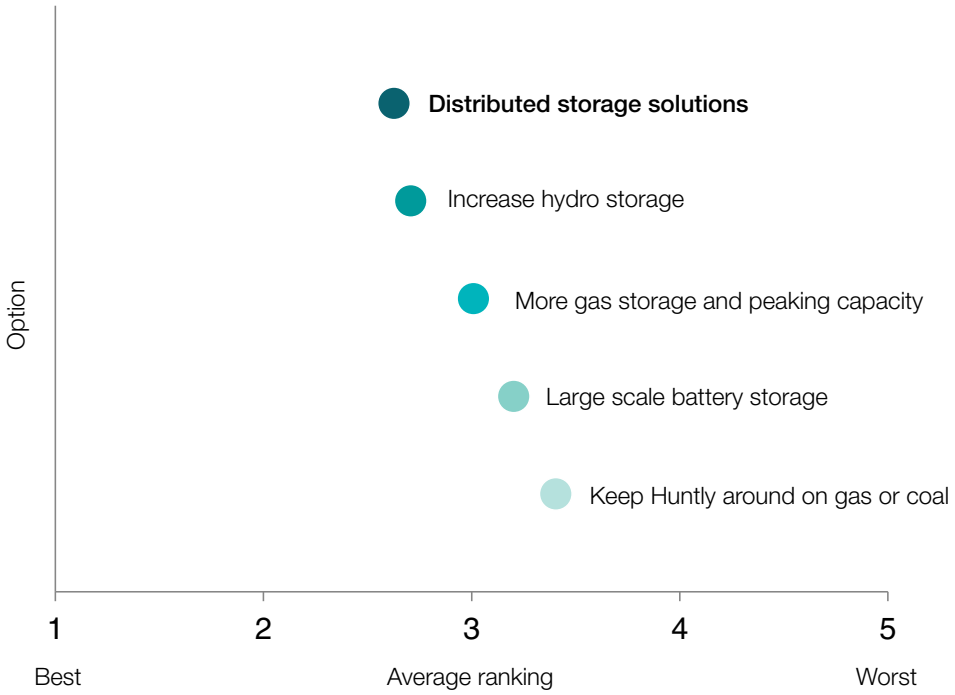


- Fast-track EV car share and TAAS firms, such as Mevo or Yoogo, to establish themselves around the country – 2%
- Cap the fringe benefit tax firms pay on EVs at the rate paid on fossil-fuelled cars that EVs replace – 8%
- **A fully-integrated fast-charging network – 34%**
- Cost-reflective electricity pricing – 15%
- A bigger consumer marketing / education push by the electricity sector – 14%
- Subsidise to get things moving (excuse the pun) – 18%
- We don't need to do anything, take-up is already tracking beyond annual targets – 20%
- Nothing can be done, we won't meet it. There aren't the range of new and used vehicles available at the right price levels to satisfy customer requirements – 7%

Is there a best form of energy storage for New Zealand?

Question 5

Given weather dependent renewable electricity generation (such as wind and solar) will be making up more of our energy supply mix, what is the best form of energy storage to support the system? Rank these from best to worst, with one being the best:

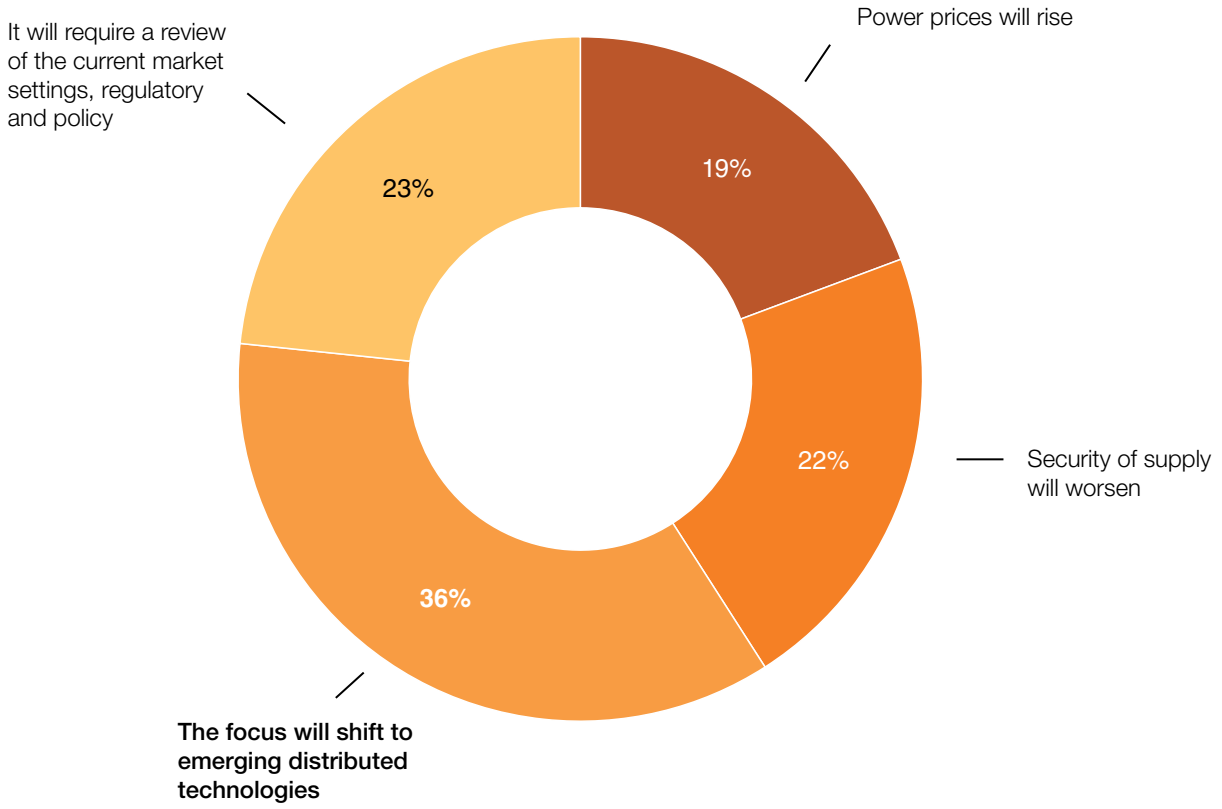


- **Distributed storage solutions such as solar plus battery and increased demand response participation – 2.6**
- Increase hydro storage (e.g. increased lake operating levels or pumped storage) – 2.7
- More gas storage and peaking capacity such as Ahuroa and McKee – 3.0
- Large scale battery storage such as the Tesla plant in South Australia – 3.2
- Keep Huntly around on gas or coal as it performs many valuable roles – 3.4

Decarbonisation and the electricity sector

Question 6

A Climate Commission is due to be established under the new Government. How will the electricity sector and its customers be affected by an increased focus on decarbonisation?



- Power prices will rise. The sector will need to figure out how to keep power prices steady as it decarbonises – 19%
- Security of supply will worsen. Without new expensive storage options and the thermal backup we will be more exposed to running out of water in the hydro lakes – 22%
- **The focus will shift to emerging distributed technologies such as batteries to help manage the transition – 36%**
- It will require a review of the current market settings, regulatory and policy, otherwise the status quo will prevail without government intervention – 23%

Smarter Mobility

For transport of the future, today

In 2017 there were more than 2 million electric vehicles worldwide and the market is growing, with electric car stock set to range between 9–20 million and 50% of new buses in Europe to be electric from 2020 onwards. Electric vehicles require power, and ABB offers a total solution, from reliable DC fast charging stations for cars to innovative on-demand electric bus charging systems.

Market leading position

No. 1
in connected EV charging infrastructure

>6,000
chargers installed **worldwide**

100%
connectivity: ABB Ability™ cloud-based technology and real time data for remote and proactive control

EV charger benefits

ABB chargers provide
99% **uptime**

3–6 minutes
re-charging time for buses

10–12
minutes charging time for 300 extra kilometers

2.6 million
tons less CO_2 per year, equivalent to about 10 million cars

ABB has years of experience in creating, installing and maintaining charging infrastructure, including several nationwide charger networks. We are laying the foundations for a future of smarter, reliable, and emission-free mobility, accessible by everyone, everywhere.

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