

Future currents: Frequently asked questions

Who's the publication aimed at?

- 'Everyday New Zealanders' - we want to involve as many people as possible in the dialogue about the future of our society and our electricity system.
- If you want more details, a separate Technical Report on our website explains the model we used for our analysis.

Why did you develop two scenarios?

- To highlight the implications of taking a 'supply side' approach (building more electricity generation to meet demand) compared with an 'integrated demand side' approach (providing people with the energy services they want in very efficient ways).

Aren't you being a bit optimistic about NZ's energy efficiency potential?

- The opportunities to make big gains in energy efficiency are already being demonstrated in New Zealand and elsewhere. Our report includes examples (see page 14) of a business saving 60-70 percent of its energy costs, and homes that stay warm in winter without using heaters. These examples are not currently "mainstream" – even though they make good economic and environmental sense. To achieve major gains in energy efficiency we will need to see many more of these examples.
- Roy Hemmingway, Chair of New Zealand's Electricity Commission, has commented that energy efficiency investments *are already* 2-3 times cheaper than investments in more electricity generation and transmission infrastructure.¹
- Our scenarios are conservative. By 2050 in *Sparking new designs*, New Zealand gets only half way to what we assume is possible for energy efficiency improvements.

Will people simply use more electricity when energy efficiency improves?

- Energy use does sometimes 'rebound' with energy efficiency improvements, and this reduces the overall amount of energy savings. We discuss this on page 34. However, most homes and businesses are unlikely to use much more electricity simply because they can get services such as warmth for less money. For example, it is already possible to design buildings that do not require any electricity for providing warmth. Also, if people invest in energy efficiency improvements that have very long payback periods the rebound effect can be avoided.
- These issues need to be considered but the 'rebound effect' should not be

exaggerated. The UK government believes it lowers potential energy savings by about 10 percent.

- Talking only about the 'rebound effect' can be one-sided. Energy savings can also be amplified – for example, if people spend some of their savings from efficiency improvements on investing more in energy efficiency.

Why is nuclear power not considered?

- A Royal Commission on nuclear power in 1978 found that it would be a bad option for New Zealand. Governments since then have agreed. New Zealand has also had a nuclear free policy since the mid-1980s.
- Nuclear power would be much more expensive than other options for an economy our size – even if we assume government would carry the liability for nuclear mishaps, as they do in nuclear-powered countries.
- Given our geological and volcanic history, there are unlikely to be suitable sites for the power plants and for storing radioactive materials.
- Nuclear power plants need highly specialised back-up and maintenance support, and it would be difficult and expensive to retain a pool of suitably qualified people in New Zealand.
- (For more details, see the appendix of *Future Currents*, p83)

We could import gas to generate electricity. Why is this not in the scenarios?

- Gas could be shipped here, in the form of Liquefied Natural Gas (LNG). We would need to build major infrastructure to collect, store and distribute it. The cost of LNG is expected to rise significantly over coming decades and New Zealand would be competing for it with many other countries with growing energy demands. We assume it would not make economic sense to import LNG for electricity generation.
- As gas becomes more expensive, we also expect it to be used for higher value purposes. It would make more sense to use gas directly instead of burning it to generate electricity.

Can't the CO₂ emissions from coal power stations be stored underground?

- Technologies to capture and store carbon dioxide emissions from coal power plants are now being developed. If viable, they are unlikely to be cost effective for another decade at least. In *Fuelling the future* we assume that some CO₂ emissions from coal power plants are being stored in New Zealand around 2030.

Why does the central North Island 'grid upgrade' take place in both scenarios?

- We assume in *Sparkling new designs* that energy efficiency investments are slow at first, but that improvements gather steam with more experience. It is therefore difficult to avoid building the 'grid upgrade' in the short-term. A strong grid is also important in a long country like New Zealand, where most electricity is generated in the South Island but largely used in the North Island.
- It would also be plausible to develop a scenario without this upgrade. This would require a much stronger uptake of energy efficiency measures and other initiatives in Auckland as soon as possible.

Why did you assume so much wind power in both scenarios?

- Wind is already cost-effective in New Zealand. According to research by the Energy Efficiency and Conservation Authority, most New Zealanders accept it as a desirable form of electricity generation.² However, we also assume there are social limits to how many mega wind farms can be built, and that these will be reached before any technical limits.
- In *Sparkling new designs* many wind power developments may be smaller in scale. There could be many locally owned projects and we might see more micro-scale wind turbines – for example, very quiet turbines on top of suitable buildings.

How did you decide which rivers were used for hydro generation?

- It is important not to get caught up in the details of the scenarios, as they are not predictions. They only portray a general picture of what could happen.
- We simply selected some rivers that have been assessed for electricity generation, although we did not consider rivers in conservation areas.

(Footnotes)

¹ See <http://www.electricitycommission.govt.nz/pdfs/publications/pdfs/Power-Summit-presentation.pdf>

² See http://www.eeca.govt.nz/uploadedDocuments/umr_wind_research.pdf