

Briefing to Minister Woods

- Engineering New Zealand (previously known as IPENZ) is the professional home for engineers, with more than 22,000 members – and the strongest and most influential voice on engineering issues.
- Engineers are at the coalface of New Zealand’s greatest opportunities and most pressing challenges. We also play a pivotal role in responding to, shaping and solving them.
- Engineering New Zealand asked engineers to identify the most critical engineering-related challenges facing our country. Fighting climate change by cleaner energy was a priority for our members.
- Last year we brought together engineers, policy makers and scientists to unpick these challenges and find a way forward for the sake of future generations’ prosperity and safety.
- In our report [*Engineering a Better New Zealand – Cleaner Energy*](#), we ask decision makers and all New Zealanders to take a hard, fresh look at two key areas - cleaner electricity and transport.

OUR RECOMMENDATIONS FOR CLEANER ELECTRICITY

1. Increase energy storage so we can use more renewable electricity

If we increase renewables, we need more storage to ensure supply. This means:

- A concentrated, joint effort to solve the seasonal imbalance.
- Exploring pumped storage of water at scale, batteries, solar thermal and hydrogen.

2. Refocus our electricity market to incentivise renewables and new technologies

Our current market is structured around hydro power stations and thermal units. Let’s expand our focus and review market rules to cater better for wind and other renewables. This means:

- Promoting storage and arbitrage to complement wind generation, so that New Zealand makes the most of our ample resource.
- Better coordination between generators, with a whole-of-New-Zealand approach to managing supply.
- Managing and incentivising at scale combinations of renewable sources that provide better resilience together; for example, wind and solar.

3. Future-proof our physical distribution network so it’s less vulnerable to climate change and storms

We need to deliberately plan for next-generation power consumption and generation in the distribution network. Future-proofing means:

- Enabling low-cost, microgrid-enabled connections and increased resilience.

- Incentivising the development of distributed supply and grids that integrate with smart appliances, more effectively balancing supply and demand.
- Taking a hard look at the benefits of undergrounding, especially in the context of increased storm activity and coastal sea-level threats generated by climate change.

4. Grow our engineering capability at the cutting edge

We need more engineers with the right experience to take advantage of technological advances, especially in terms of renewable sources like solar, tidal and wave. This means:

- Recognising and investing in emerging and niche fields, through our engineering schools and accreditation processes.
- Giving Kiwi engineers the chance to gain new skills and experience, in offshore projects and at home.
- Making sure we attract these kinds of engineers to New Zealand.

RELEVANT RECOMMENDATIONS FOR A CLEANER TRANSPORT SYSTEM

In our recommendations are matter relevant to the Minister's energy and innovation portfolios:

- As other cleaner energy technologies emerge, we need to be ready to pursue alternative fuels as well as electrification. This means taking biofuel and hydrogen seriously as an option, particularly for heavy vehicles.
- We need to engineer an urban transport system that's greater than the sum of its parts. For example, by introducing variable road pricing so that the electric car does not add to congestion by reducing the marginal cost of travel.

OUR WORK PROGRAMME

We are also engaged in other important work in collaboration with Government including:

- The [Diversity Agenda](#), which started as a partnership between Engineering New Zealand, the New Zealand Institute of Architects and ACENZ – and nearly 80 firms have already come on board. Our goal is to get 20 percent more women in engineering and architecture roles by 2021.
- The [Wonder Project](#), Engineering New Zealand's free programme for schools funded by Callaghan Innovation to get young Kiwis excited about science, technology, engineering and maths (STEM).
- The Rocket Challenge for year 5-8 launched nationwide in April 2019. Next, we are piloting the Community Challenge for year 7-10 with the aim of rolling it out nationwide in 2020. The STEM Careers programme for year 10-13 completes the journey through the support of our 1000+ ambassadors.
- Supporting the [Greater Christchurch Claims Resolution Service](#) (GCCRS) by administering an independent expert engineering panel, setting up a facilitation service to better understand differences of engineering opinion and providing better information for the public and engineers about engineers' role. We are also taking action on the learnings for us as a profession.
- Engineering New Zealand is making a submission to the [Inquiry into the Earthquake Commission](#). We need to better manage the immediate aftermath of natural disasters so that the right engineering input happens at the right time. This means being prepared with clear processes and guidelines and a pool of trained and competent initial assessors.

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