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Note on considerations for the development of New Zealand's energy strategy

New Zealand is on the cusp of the greatest energy system transformation for generations. How we produce, transmit and consume energy will be a key factor in whether the country meets its climate change commitments over the next three decades. How we manage agricultural emissions will be the other.

Policy choices and investment decisions made this decade will have significant long-term consequences for both the direction and speed with which New Zealand decarbonises its energy system. They will inevitably set up self-reinforcing path dependencies. Given the consequences of these choices for the public at large, they should not be left to market forces alone to resolve. Guidance from Government is required and appropriate.

For that reason, I welcome the Government's recent announcement that it will undertake and publish a whole-of-system energy strategy. However, it has been stated that the energy strategy will not be finalised until the end of 2024. While I acknowledge it is important to get any such strategy right, I fear that this is an unnecessarily drawn-out process that risks being overtaken by decisions and actions taken in the meantime.

The lengthy process could contribute to undue uncertainty and will almost certainly invite arguments, narratives and actions by market participants whose interests are not necessarily aligned with the wider national interest. I am concerned that decisions taken by private and public agents over the next couple of years prior to the publication of the energy strategy could commit New Zealand to suboptimal outcomes for the economy and the environment.

For example, a decision by the private sector to develop a large green hydrogen production facility to resolve dry-year risk would limit other system-wide energy solutions before the merits of all potential options can be assessed. Resolving dry-year risk will have significant system-wide consequences so it is important that all options are considered as part of a whole-of-system energy analysis before path dependency takes root.

The Boston Consulting Group (BCG) has estimated that $42 billion of new investment in electricity system infrastructure will be required in New Zealand over the next decade.[1] Two-thirds of this spending will go towards upgrading the existing transmission and distribution network infrastructure so that it is fit for purpose in a largely renewable and digital future.

The Government could provide useful leadership by making it clear what is in and what is out of scope for the energy strategy. Clarifying the scope of the strategy could also identify those elements that need to be delayed pending a whole-of-system energy analysis and those that can proceed on a no-regrets basis. It would also provide public and private operators alike with the clarity they need to manage investment timelines.

[1] https://www.bcg.com/publications/2022/climate-change-in-new-zealand.

The elements that should await a whole-of-system analysis are those that can have consequences for the entire system. Decisions made in the absence of a whole-of-system analysis could render some elements redundant, or risk suboptimal outcomes. Obvious examples are proposals such as the Lake Onslow project and green hydrogen, to which I devote more detailed comments below. The essential high level point is that the Government must undertake *a comprehensive whole-of-system energy analysis that compares different energy scenarios on a fair and consistent basis prior to any decisions being made to advance specific options*.

Low regrets options that can be implemented immediately

By no means are all investments in this class. To assist the transition to a low carbon economy, there are many low regrets options that can and should proceed immediately. The following seem self-evident:

- Investment in the energy efficiency of buildings, vehicles and appliances.
- Investment in new distribution and transmission infrastructure to support the acceleration and deployment of new renewables at multiple scales across the electricity network.
- Investment in smart electricity infrastructure (such as smart virtual infrastructure) that can monitor and control electrical systems using automation and artificial intelligence.
- New regulation and systems that allow for the monitoring and recording of electrical flows across the network down to the household level for use by market participants in a transparent, anonymised and accessible format.
- Investment in electricity infrastructure that allows increased flexibility and multi-directional electricity flows within and between local distribution and transmission networks.
- Upgrading the high voltage direct current (HVDC) Inter-Island link to increase the capacity of two-way flows between the North and South Islands to improve energy resilience and security.
- A requirement for all new electric vehicles to be sold with smart chargers, thus enabling electric vehicles to play a more active role in managing electricity demand and supply across the network.
- The designation of new renewable energy zones to optimise the investment in new transmission infrastructure and encourage competition in new renewable generation.[2]
- Specification of standards to ensure interoperability and competitive markets that avoid high barriers to entry and customer capture by existing providers through high switching costs.

[2] https://www.transpower.co.nz/projects/renewable-energy-zones.

Large projects with system-wide impacts

Beyond these steps, there are several large energy projects actively being considered by the Government and the private sector. It is the system-wide impacts of these different options and how they may interact with other options that must be fully understood before decisions are made. This requires a comprehensive understanding of the environmental, economic and climate impacts that these various projects will have should they become part of the energy system.

There are potentially far too many competing claims over too few resources for each of these different projects to be considered in isolation from the rest of the energy system. The accelerated deployment of electric vehicles, the gas-transition plan, real-time market electricity pricing, new network infrastructure, accelerated deployment of solar photovoltaic and onshore wind generation, new offshore wind,[3] the biofuel mandate, short haul electric flight, near shore electric marine transport, the fate of the Tiwai Point Aluminium Smelter, green hydrogen and Onslow pumped storage are all large enough on their own to have significant implications for the entire energy system (see Table 1 in the Appendix).

Understanding how they might interact with one another is something different again. It is essential that we can gain an appreciation of how these different elements could play out in real time. Only then will we know whether the energy system that emerges will be low-carbon, secure and, crucially, affordable.

The sorts of conflicting claims that the strategy should seek to resolve

The examination of Onslow by the Government has caused a range of players to expend rather a lot of energy trying to cast doubt on its worth. While it is crucial to find out whether the project is physically deliverable (i.e. geotechnical and hydrological risks) and what the eventual costs might be, its role in the broader energy market would be to reduce system risks. The system-wide benefits of this must not be ignored.

Despite what some gentailers say publicly,[4] their own commercial interests are not necessarily aligned with the interests of the Government or of New Zealand Inc. It would be unfair to expect that they should be. Gentailers participate in a competitive electricity market to maximise profit for their shareholders. It is therefore in the best interests of gentailers to keep competition low and electricity prices high. This comes at the expense of securing the least costly transition to a de-fossilised economy.

In competitive markets, higher risks tend to generate higher returns. Gentailers are therefore also motivated to maintain an artificially elevated but manageable level of risk within the electricity system. Solutions such as Onslow have the potential to reduce a range of system level risks that would limit the ability of existing market participants to charge a premium for the risks they actively manage.

The reaction of market participants to this possibility has been illuminating. Over the last twenty-four months there has been a continuous stream of media articles discussing the likely impacts of Onslow on the broader energy system. In my view, a lot of this material misunderstands how Onslow would operate within the broader electricity market. Some of this messaging has systematically downplayed the system-wide benefits that Onslow could provide.

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[3] https://www.mbie.govt.nz/have-your-say/enabling-investment-in-offshore-renewable-energy/.

[4] https://businessdesk.co.nz/article/energy/moving-parts-fall-into-place-for-hydrogen-plant.

For instance, it has been claimed that Onslow is creating uncertainty in the market and stifling investment in renewables.[5,6,7] The evidence at hand suggests otherwise.[8, 9] The recent BCG study on New Zealand's electricity sector showed that there is sufficient renewable generation already in the development pipeline to achieve 98% renewable generation by 2030.[10] Because Onslow would be a significant purchaser of power from the grid, especially when prices were low, it would in effect put a floor under wholesale electricity prices. A market floor price has important implications for wind and solar because these resources cannot reduce output and save energy when wholesale prices drop or go negative.[11] Given this effect, Onslow would likely bring forward investment in solar and wind generation and reduce the economic viability of flexible fossil-fuel generation such as open-cycle gas turbines. It would also substantially reduce spill losses from existing hydro lakes and minimise the curtailment of renewable electricity.

The fact that Onslow is located in the South Island is also being used to question its benefits. While it is true that its location and size mean network infrastructure and the HVDC cable pose constraints, work is already underway to identify and upgrade network system infrastructure.[12] For the most part, Onslow would not add to transmission losses because it would effectively just delay the transmission of electricity north.[13] Notably, transmission losses across the entire national grid were only 3.2% in 2021.[14]

There is no reason why Onslow alone should carry the implication of a significant "market intervention" when compared with other dry-year risk solutions, such as overbuilding renewables, which would also require substantial market intervention. *How* Onslow might eventually be operated is therefore what matters.

MBIE has noted that since the launch of the NZ Battery Project, electricity industry participants have themselves been investigating technologies to resolve dry-year risk.[15] For example, Genesis Energy is exploring the use of stabilised biomass able to be stored outdoors at the Huntly Power Station,[16] and Meridian Energy and Contact Energy are looking into green hydrogen production in Southland as a source of flexible demand. One wonders whether, in the absence of the NZ Battery Project, market participants would have started exploring alternative dry-year solutions with such diligence. The evidence suggests that instead of deterring exploration and investment in alternative options, the market is now more engaged in resolving the dry-year risk problem than ever before.

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5 https://businessdesk.co.nz/article/onslow-project-an-analogue-solution-in-a-digital-age.

6 https://businessdesk.co.nz/article/10-reasons-why-project-onslow-is-a-bad-idea.

7 https://businessdesk.co.nz/article/major-players-ask-is-the-electricity-market-broken.

8 https://businessdesk.co.nz/article/mercury-commits-to-new-generation-despite-uncertain-winds.

9 https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/plain-page/attachments/Queue%20Management%20System%20consultation%20-%20For%20publication.pdf.

10 https://www.bcg.com/publications/2022/climate-change-in-new-zealand.

11 https://doi.org/10.1016/j.tej.2015.04.001.

12 https://www.transpower.co.nz/projects/hvdc-submarine-cable-replacement-and-enhancement-investigation.

13 https://www.newsroom.co.nz/the-giant-puddle-that-could-power-nz.

14 https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/electricity-statistics/.

15 https://www.mbie.govt.nz/dmsdocument/23346-update-on-the-new-zealand-battery-project-proactiverelease-pdf.

16 https://www.newsroom.co.nz/genesis-imports-us-wood-pellets-to-fuel-huntly-renewable-energy-trial.

While it is a good thing that market participants are doing this, it places even more emphasis on the need to undertake a whole-of-energy-system analysis to properly understand the system-wide implications of the various options that are being put forward and to ensure that they are subjected to the same stress-testing. We need to be confident that we are comparing like with like.

The NZ Battery Project was given a somewhat limited remit to investigate solutions to the dry-year risk problem. This perhaps represents a missed opportunity to understand the whole-of-system effects and other risks that could potentially be resolved by a pumped hydro scheme at Lake Onslow. Importantly, Onslow reduces a number of system-wide risks across the electricity system. These include:

1) Onslow remains the only solution that can, by itself, resolve dry-year risk. The NZ Battery Project has reported that the only other viable alternative to the dry-year risk problem is a portfolio of different solutions.[17] Without a system-wide energy analysis it is not possible to know how a portfolio of solutions would be capable of resolving dry-year risk in a competitive electricity market.

2) By participating in electricity markets throughout the year, Onslow would be able to provide firming capacity and reduce the intermittency risk that comes with increased renewables on the network. It would therefore substantially reduce the electricity spilt from hydroelectricity dams or wasted during windy or sunny periods.

3) Being able to ramp up and down generation, Onslow would also provide ancillary support to power systems infrastructure by supporting grid stability and ensuring that electricity network infrastructure continues to operate within safe operating limits.

4) In wholesale electricity markets, Onslow would smooth electricity prices by pumping water when prices were low and generating when prices were high. This has the effect of reducing investment risk for the construction of new renewables by providing more certainty over future spot prices and placing upward pressure on minimum wholesale prices. Similarly, there would be downward pressure on high prices, which would disincentivise the development and operation of flexible fossil fuel generation.

5) Independent analysis by the NZ Battery Project has shown that overall,[18] Onslow would result in lower average wholesale electricity prices compared to a scenario without the asset, thereby improving affordability for end-consumers, including industry and businesses. Lower electricity prices represent a comparative advantage on international markets at a time when renewable electricity supply is highly valued.

6) Onslow could have as much as 1.5 gigawatts of generating capacity and up to 5 terrawatt-hours of energy storage.[19] New Zealand has a predicted electricity shortfall of 3–5 terrawatt-hours per year in a normal dry year. If configured correctly, Onslow could provide grid support between successive dry years if it was complemented with demand response and replenished between successive dry years using solar, wind and bioenergy.

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[17] https://www.mbie.govt.nz/dmsdocument/23346-update-on-the-new-zealand-battery-project-proactiverelease-pdf.

[18] https://www.mbie.govt.nz/dmsdocument/23346-update-on-the-new-zealand-battery-project-proactiverelease-pdf.

[19] https://www.mbie.govt.nz/dmsdocument/23346-update-on-the-new-zealand-battery-project-proactiverelease-pdf.

In sum, Onslow is unique in that it would effectively meet all three objectives of the so-called energy trilemma by improving security of supply, reducing electricity prices and lowering emissions. It is rare in electricity markets for proposed solutions to address all three aspects of the energy trilemma simultaneously.

Whether Onslow proceeds must, of course, be determined by its geotechnical viability and the associated costs of construction, operation and maintenance. It is important that these costs and benefits are considered using a whole-of-system analysis over the full life of the infrastructure asset. Appropriate environmental and social values must be assigned to the long-term costs and benefits that would accrue to the project. This includes assigning a discount rate methodology and shadow price of carbon that adequately allows for the infrastructure asset over its full life. Te Waihanga New Zealand Infrastructure Commission and I have both called for a review of the social discount rate that is used to evaluate infrastructure projects of a long-lived nature.[20,21] The Treasury has also agreed to modify its guidance to recommend using quasi-hyperbolic discounting for proposals with long-lived environmental or social benefits.[22] Onslow meets these criteria.[23]

In a similar vein, options should be reconsidered based on whether they will make New Zealand's transition to net zero more difficult. Earlier this year I wrote to you expressing my concerns about the Government's vision for producing green hydrogen in New Zealand for the export market. In that letter I made the point that the production of green hydrogen for export will do little to help New Zealand achieve its own climate change commitments and may even make achieving its commitments more difficult and expensive.

Even more speculatively, a new proposal has been put forward by Firstgas Group to produce green hydrogen from renewable electricity, store the hydrogen in depleted gas fields and then use the hydrogen to generate electricity.[24] The practicalities of novel storage and reticulation that the concept raises must be considered in light of the uncertainty that comes with any commercially unproven technology. The report itself only considers the effects of this option in the year 2050, without clarifying when or whether such a solution would be commercially viable before 2050. In addition, using green hydrogen to generate electricity is estimated to have a round trip efficiency of 30%, compared to Onslow's 75%,[25] which means more than twice as much renewable electricity generation would be required for each unit of electricity delivered compared to Onslow.

As I noted in my earlier communication, should a hydrogen export industry develop in New Zealand it will aid in the decarbonisation of other countries' economies and could place at risk the potential for New Zealand to meet its own climate change commitments. Exporting hydrogen will expose New Zealand to international energy prices and leave New Zealand with additional costs for securing high quality carbon offsets from other countries. At the very least, the Government should confirm that it will not in any way subsidise or underwrite projects to produce hydrogen for the commercial export market.

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[20] https://media.umbraco.io/te-waihanga-30-year-strategy/1sfe0qra/rautaki-hanganga-o-aotearoa-new-zealand-infrastructure-strategy.pdf.

[21] https://pce.parliament.nz/publications/wellbeing-budgets-and-the-environment.

[22] https://www.parliament.nz/resource/en-NZ/53SCEN_EVI_118246_EN10244/48991f53e9493c9701be4714c1608733dbd37c28.

[23] It is an interesting question to reflect on whether our existing hydroelectric assets would be built today if some of the doubts raised about Onslow had been deployed then. Where would we be now if these dams had not been built?

[24] https://firstgas.co.nz/wp-content/uploads/First-gas-hydrogen-storage-modelling-Nov-22-FINAL-1.pdf

[25] https://firstgas.co.nz/wp-content/uploads/First-gas-hydrogen-storage-modelling-Nov-22-FINAL-1.pdf

Using scenarios to understand the trade-offs we face

It is considerations such as these that lead me to underline the urgency of completing a whole-of-system energy analysis. The key issues are reasonably well understood and should not need another two years to complete. Our current system still uses significant quantities of fossil fuels for heat, transport and electricity generation during periods of peak demand. We have to move to a system that reduces our reliance on fossil fuels, which inevitably means a much greater use of electricity, while still guarding against dry-year risk. It implies more reliance on intermittent renewable resources and increased price volatility in the absence of significant energy storage or demand side management.

The best way to reach an enduring consensus on the shape of such a strategy is to test a range of scenarios. We need to understand the consequences of different energy pathways for the economy, the environment, our climate commitments and final consumers. Such an analysis should meet the following design criteria:

1) Scenarios must compare apples with apples. Some of the scenarios that have been completed to date constrain Onslow with the requirement for 100% renewables or place an upper limit on the amount of electricity that can be exported over the HVDC cable. These assumptions should be relaxed and tested across all scenarios. Placing constraints on Onslow, but not placing the same constraints on other configurations risks scenarios not being compared on a like-for-like basis.

2) There will inevitably be a wide range of uncertainty associated with each of the different scenarios. Uncertainty will arise from technology maturity (e.g. hydrogen is a more immature technology than pumped hydro), electricity demand projections, economic forecasts, the timing of transmission and distribution infrastructure upgrades, the capacity of the HVDC link and the speed of transition. It is important that the level and source of uncertainty is reported for all scenarios so that different options can be adequately compared on a like for like basis.

3) There is a wide range of environmental as well as climate impacts across the different energy scenarios that will require an assessment of the trade-offs involved. For example, pumped hydro at Lake Onslow will require raising the lake level. This will have impacts on biodiversity,[26] displace farmland and may affect recreational fishing. On the other hand, the development of a hydrogen production facility may require building more than double the number of wind turbines to account for the low efficiency of hydrogen production and the additional renewable energy required. There will be environmental trade-offs that must be made explicit during any system-wide analysis.

4) Energy scenarios are going to have different impacts on mana whenua and local communities. These need to be thoroughly explored and reported. Different scenarios will have more or less community support or opposition that must be taken into account before decisions are taken.

[26] https://www.forestandbird.org.nz/resources/lake-onslow-climate-conundrum.

5) All scenarios should explore the consequences of Tiwai Point Aluminium Smelter remaining and closing. The fate of the Tiwai smelter continues to hang over New Zealand's energy future as it has for decades.[27] Rio Tinto says the smelter has been a commercially marginal proposition for the last decade but continues to dangle a possible continuation that seems to be based more on burnishing the company's green international credentials than paying the marginal cost of electricity production in New Zealand.[28] If Tiwai remains open it must not be at the expense of New Zealand's low carbon transition. Neither should it attract a new round of subsidies.

6) It is important that appropriate environmental values are considered when comparing the financial costs and benefits of the different scenarios, particularly as they contribute to carbon mitigation and involve infrastructure assets lasting many decades. The type and level of discount rate and the shadow carbon price that is used to assess the different proposals is also critical. The construction of a hydroelectricity dam that could last for over 100 years would justify the use of a very low discount rate to reflect the environmental benefits and long-life of the asset. This would imply a discount rate of less than 2%.[29] The BCG report and NZ Battery Project used a discount rate of between 5% and 7% respectively, which discounts the costs and benefits that accrue after several decades to just a small fraction of what they should be. This same argument for a low discount rate applies for transmission and distribution network infrastructure and upgrading the HVDC link between the North and South Island.

The sooner a comprehensive whole-of-system energy analysis is completed to assess the environmental, social and economic consequences of different options, the better.

Rt Hon Simon Upton

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

CC:
Hon Grant Robertson, Minister of Finance
Hon James Shaw, Minister of Climate Change
Hon David Parker, Minister for the Environment

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[27] https://businessdesk.co.nz/article/opinion/what-rio-tinto-is-really-saying-about-the-tiwai-pt-smelter.

[28] https://businessdesk.co.nz/article/energy/tiwai-point-smelter-very-unlikely-to-generate-material-value-rio-tinto.

[29] It would be less than 2% using constant exponential discounting or less than 5% using hyperbolic discounting.

Appendix

In Table 1 below I have collated a list of the concurrent work programmes and notable decisions that could have system-wide impacts before the energy strategy is published.

Table 1: List of energy initiatives presently being carried out by Government.

Initiative	Description	Release date
A roadmap for hydrogen[30]	The roadmap will explore the issues that need to be resolved for hydrogen use in the wider economy.	Roadmap completed April 2022
Sustainable biofuel obligation[31]	The introduction of an emissions intensity reduction target to replace liquid fossil fuels for transport.	Biofuel obligation now delayed until April 2024
Biofuel transformation plan[32,33]	The Ministry for Primary Industries are planning to develop an industry to turn forestry waste into biofuels as part of an Industry Transformation Plan for wood processing.	Consultation released August 2022.
Gas transition plan[34]	The Ministry of Business, Innovation and Employment is developing a plan for an equitable transition for the fossil gas sector.	Finalisation of gas transition plan December 2023
New Zealand Energy Strategy[35]	The Ministry of Business, Innovation and Employment is developing an energy strategy to support the transition to a low emissions economy, address strategic challenges and signal pathways from fossil fuels.	Publication late 2024
New Zealand Energy Efficiency and Conservation Strategy (NZEECS)[36]	The government has committed to a new five-year energy efficiency and conservation strategy to replace the existing strategy to better align with the governments climate change and energy system priorities.	Timeline still to be determined.
Enabling investment in offshore renewable energy[37]	MBIE is consulting on options for enabling investment in offshore renewable energy and innovation.	New regulatory settings in place by 2024

[30] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/hydrogen-in-new-zealand/a-vision-for-hydrogen-in-new-zealand/roadmap-for-hydrogen-in-new-zealand/.

[31] https://www.mbie.govt.nz/have-your-say/increasing-the-use-of-sustainable-biofuels-in-aotearoa-new-zealand/.

[32] https://www.mpi.govt.nz/news/media-releases/te-uru-rakau-nz-forest-service-explores-biofuels-as-a-major-opportunity-for-new-zealand/.

[33] https://www.mpi.govt.nz/dmsdocument/52669-Draft-Industry-Transformation-Plan-web.

[34] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/gas-transition-plan/#:~:text=The%20Plan%20will%20focus%20on,fossil%20gas%20use%20in%202035.

[35] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/.

[36] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/.

[37] https://www.mbie.govt.nz/have-your-say/enabling-investment-in-offshore-renewable-energy/.

Similarly, Table 2 lists several initiatives that are actively being explored or have already been implemented by the private sector. The market is designed to incentivise and reward private sector investment in new generation, there is a risk that private actors will behave in a way that pre-empts government actions and limits the potential for system-wide improvements to reliability, efficiency, affordability and decarbonisation.

Table 2: Private sector initiatives under discussion.

Initiative	**Description**	**Date**
Southern Green Hydrogen[38]	Meridian Energy is seeking to partner with a lead developer for the implementation of the Southern Green Hydrogen Project	Negotiations ongoing
Biomass pellets in Huntly[39]	Genesis Energy is trialling the import of steam exploding biomass pellets to fire its 250 megawatt Huntly generator.	Trial has commenced
Utility-scale solar photovoltaics[40]	Multiple utility-scale solar farms are in the generation pipeline that will contribute hundreds of megawatts of new capacity to the system.	Already happening
South Taranaki Offshore Wind Project[41]	A 900 megawatts offshore wind project to be located off the south coast of the Taranaki region of New Zealand.	Commissioning of project expected in 6–10 years.
Other onshore wind and geothermal projects added to generation pipeline[42]	There is a range of new renewable generation options actively being considered and developed.	Ongoing
Tiwai Point Aluminium Smelter closure[43]	Tiwai Point renegotiated a highly concessional deal with Meridian Energy to delay closure until the end of 2024. Tiwai Point wishes to stay open beyond 2024.	Negotiations are ongoing

[38] https://www.southerngreenhydrogen.co.nz/.

[39] https://www.newsroom.co.nz/genesis-imports-us-wood-pellets-to-fuel-huntly-renewable-energy-trial.

[40] https://www.stuff.co.nz/environment/300735444/green-light-to-create-new-zealands-largest-solar-farm-with-900000-panels.

[41] https://southtaranakioffshorewindproject.com/.

[42] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-publications-and-technical-papers/nz-generation-data-updates/.

[43] https://www.newshub.co.nz/home/money/2022/07/tiwai-point-aluminium-smelter-begins-talks-with-power-companies-to-stay-open-after-2024.html.