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The role of strategic litigation in meeting international legal climate obligations and the implications for addressing the energy trilemma in New Zealand

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Abstract

There is a twin challenge to reduce carbon emissions to at least net zero, but also to achieve energy security and equity. This article assesses climate litigation in New Zealand within the framework of the energy trilemma based upon analysis of New Zealand's supply side energy generating systems and resources. Currently 40 percent of total energy consumption and just over 80 percent of electricity generation in New Zealand is produced from renewable sources. Electricity generated from renewable sources is already 100 percent utilised. The New Zealand Government's most recent Nationally Determined Contribution (NDC) targets of 50 percent of total energy consumption coming from renewable sources by 2035 and 100 percent renewable electricity generation by 2030, is less than 13 and 8 years away, respectively. Considerable new renewable generation capability needs to be developed in that time. The lead time in developing these projects is already heavily constricted, and often encounters legislative hurdles.

Procedural cases which seek to protect local environment and cultural heritage can be misaligned with overarching goals of pure climate cases aiming to increase ambition of NDC's. The confluence of these claims may create a barrier to some commercial-scale energy projects while increasing risk associated with fossil fuel generation capability. This could project to energy access short falls in the future. The energy trilemma index performance has also seen generally negative trends in recent years. New Zealand has recently seen energy supply deficits offset with imported fossil fuels, suggesting that New Zealand energy sector sustainability performance is intrinsically linked with strong performance in energy equity and security. To be successfully implemented, the energy transition must be well planned, adequately communicated, appropriately resourced, and provided sufficient political support to maximise performance and outcomes in energy trilemma metrics, but also to ensure that decarbonisation goals are achieved.

Contents

Word count

The text of this paper (excluding table of contents, footnotes, and bibliography) comprises approximately 11,696 words.

I Introduction

Energy makes the world go around, both literally and figuratively. The acceleration of the transformation to net zero carbon emissions, shortfalls in energy investment in recent years,[1] high fuel prices, high and rising carbon prices, inflationary pressures, and the economic and political impacts of the Russian invasion of Ukraine are creating a powerful mix of pressures and incentives in the energy sector.[2] In the setting of this upheaval of the sector, some states are calling catastrophe![3] Climate crisis, energy crisis, cost of living crisis; energy is central to each of these proclamations of distress.

The energy supply sector (electricity, heat, and other energy) is the largest contributor to global greenhouse gas emissions.[4] Some 80 percent of global energy and 66 percent of electrical generation are supplied from fossil fuels.[5] That is a vast amount of energy generation to displace with renewable generation options or emissions to offset. New Zealand is well-placed globally with respect to its current energy generation market. New Zealand has the sixth highest rate of renewable energy as a portion of primary supply in the OECD.[6] The country has favourable environmental conditions to support delivery of a range of additional renewable generation technologies. [7] Moreover, there is public and economic support to transition to a low emissions economy.[8] Despite this, 60 percent of

[1] IEA, World Energy Investment 2022 (International Energy Agency, Flagship Report, June 2022) at 6. Available online.

[2] IEA, World Energy Investment 2022 (International Energy Agency, Flagship Report, June 2022) at 6. Available online.

[3] Which states

[4] United Nations "Facts and Figures" (accessed 30 October 2022) United Nations | Act Now <https://www.un.org/en/actnow/facts-and-figures>

[5] United Nations "Facts and Figures" (accessed 30 October 2022) United Nations | Act Now <https://www.un.org/en/actnow/facts-and-figures>

[6] OECD "OECD Data – Renewable Energy" (18 September 2019) World Energy Statistics 2019 < https://data.oecd.org/energy/renewable-energy.htm>. Report also available online.

[7] Ranging from hydro schemes, geothermal, wind and solar. As well as opportunity for tidal and other technologies which are yet to be developed

[8] Including effort from government to support the transitions to a low carbon economy such as Ara Ake, public support as seen in protest action and public interest.

New Zealand's energy[9] (~19 percent of electricity generation[10]) is derived from fossil fuels. These proportions have remained relatively steady since the mid 1990's[11] despite commitments by New Zealand under both the Kyoto and the Paris Agreements to decarbonise.[12]

Globally, 73.2 percent of emissions is from the energy sector.[13] This includes electricity, heat, and transport. The sector has seen a steady increase in its emissions since 1990 from approximately 9 billion tonnes in 1990 to nearly 16 billion tonnes in 2019.[14] As a result of the emissions associated with the energy sector and its omnipresence in everyday life, the sector is subject to increasing climate and sustainability related litigation, both directly and indirectly. Cases vary in their intended outcomes but generally stem from disenfranchisement of the efficacy of government and private sector progress in decarbonisation.[15] As a result, activists have decided to influence the conversation, and in some instances, decision making through the courts in concerted effort to alter climate change governance and management. Cases range from holding governments to international commitments,[16] domestic goals,[17] and challenging the ambition of efforts[18]

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[9] Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 1. Available online.

[10] Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 2. Available online.

[11] Panos, E., Densing, M., Volkart, K. (2016). Access to electricity in the World Energy Council's global energy scenarios: An outlook for developing regions until 2030. Energy Strategy Reviews, 9, 28-49. Available online.

[12] Paris Agreement Under the United Nations Framework Convention on Climate Change 3156 UNTS (done at Paris 12 December 2015, entered into force 4 November 2016).

[13] Ritchie, H., Roser, M., and Rosado, P. (2020) - "CO_2 and Greenhouse Gas Emissions". Published online at OurWorldInData.org.

[14] Ritchie, H., Roser, M., and Rosado, P. (2020) - "CO_2 and Greenhouse Gas Emissions". Published online at OurWorldInData.org.

[15] E.g. Smith v. Fonterra , Lawyers for Climate Action NZ v. The Climate Change Commission, Thomson v. Minister for Climate Change Issues, Students for Climate Solutions v Minister of Energy and Resources, and other cases

[16] E.g. Paris Agreement, art 2 (1)

to holding large private sector emitters to account for their contribution to greenhouse gas emissions and influencing the ambition of company emissions reduction policy.[19]

Most states have reached a consensus that to avoid the worst risks and impacts of climate change, global average temperature should be held to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.[20] This is formalised through the Paris Agreement which New Zealand ratified on 4 October 2016. The Paris Agreement also provides mechanisms for setting emissions reductions targets and increasing target ambition based on the most up-to-date international scientific guidance collated within regular International Panel of Climate Change (IPCC) reports.[21] It also reflects the close links between climate action, sustainable development, and a just (fair) transition.[22] New Zealand restated its commitment to the just transition when the Minister for Climate Change signed the International Just Transition Declaration along with 14 other signatories on 5 November 2021 during COP26. The concept of the 'Just Transition' aims to plan for, and to manage the social, economic, and environmental impacts of a transition in recognition that historical periods of social and economic change has disadvantaged some groups more than others.[23] The Emissions Reduction Plan[24] released on 16 May 2022 further sets out

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[17] E.g. Paris Agreement, art 3; Ministry for the Environment (2022) "Government climate-change work programme" Published online at https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/about-new-zealands-climate-change-programme/#emissions-budgets

[18] E.g. Lawyers for Climate Action NZ v. The Climate Change Commission or Thomson v. Minister for Climate Change Issues

[19] E.g. Milieudefensie et al. v. Royal Dutch Shell plc.; Smith v. Fonterra Co-Operative Group Limited

[20] Paris Agreement, art 2 (1)

[21] Paris Agreement, art 4 (1)

[22] United Nations "Supporting the conditions for a Just transition internationally" (4 November 2021) UN Climate Change Conference UK 2021 <https://ukcop26.org/supporting-the-conditions-for-a-just-transition-internationally/>

[23] Hon James Shaw "New Zealand commits to a just transition" (5 November 2021) Beehive Releases <https://www.beehive.govt.nz/release/nz-commits-just-transition>; Ministry of Business Innovation and Employment "Just transition" (15 November 2021) <https://www.mbie.govt.nz/business-and-employment/economic-development/just-transition/>

[24] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. Available online.

how the Government plans to transition to a low carbon future in a just, inclusive, and equitable way.[25] Decarbonisation of the energy and energy-intensive sectors are primary initiatives and actions in the Emissions Reduction Plan.[26] Because the plan must consider how the transition to a low carbon future can be achieved in a just, inclusive, and equitable way it is convenient to frame it against the concept of the energy trilemma. The energy trilemma can be used as a metric to monitor the affordability or equity, security, and sustainability of an energy system.[27] It can also be used as a tool to compare energy systems performance, to the reflect trade-offs that may be required to maintain a healthy energy system,[28] to measure domestic progress and to compare a country's performance relative to the rest of the world. Given the consistency between the key parameters of the energy trilemma and elements the Just Transition aims to manage, it provides a useful metric in assessing New Zealand's progress to a low carbon economy.

The concept of the energy trilemma has emerged as a symbolic term to represent the complexity of achieving a secure, sustainable, and equitable energy system. The World Energy Council describes the transition process, and thus the energy trilemma, as "a connected policy challenge—[where] success involves managing the three core dimensions: Energy Security, Energy Equity and the Environmental Sustainability of Energy Systems throughout the transition process".[29] In this statement the World Energy Council indicate that the transition to the low carbon economy should:

- *be capable of meeting current and future energy demand reliably, while being resilient to system shocks with minimal disruption to supplies. This includes*

[25] Hon James Shaw "New Zealand commits to t a just transition" (5 November 2021) Beehive Releases <https://www.beehive.govt.nz/release/nz-commits-just-transition>

[26]Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. Available online. At page 12

[27]World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

[28] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[29] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

effective management of domestic and external energy sources, as well as ensuring the reliability and resilience of energy infrastructure. In New Zealand this includes resilience to natural hazards associated with natural processes, particularly the plate boundary, and independence for electricity generation due to New Zealand's geographic isolation.

(secure)

- Provide *universal access to reliable, affordable, and abundant energy for domestic and commercial use. This advocates for basic access to electricity and clean cooking fuels and technologies, access to prosperity-enabling levels of energy consumption, and affordability of electricity, gas, and fuel.*

(equitable)

- be sustainable including *mitigating and avoiding potential environmental harm and climate change impacts*. This aims to minimise *the anthropogenic impact of energy systems on the environment*[30] it targets *productivity and efficiency of generation, transmission and distribution, decarbonisation, and air quality*.[31]

(sustainable)

The energy trilemma index is not a fool-proof comparison; there are elements of subjectivity and relativity because of the enormous complexity in each of the competing dimensions of the energy trilemma. Its application is skewed towards capability to "measure" performance in any metric, and with measured criteria further categorised by "key indicators" which may not be all encompassing. For instance, the sustainability

[30] Makarov, A. A., Mitrova, T. A., & Kulagin, V. A. (Eds.) (2019). Global and Russian energy outlook 2019. Moscow: ERI RAS and Moscow School of Management SKOLKOVO.

[31] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

component favours readily quantifiable metrics like emissions reduction,[32] but does not effectively quantify other sustainability considerations such as land disturbance, ecological or hydrological impacts, or remedial and recycling opportunity where sectoral impact cannot be easily differentiated. Similarly, the frameworks for considering energy security and equity are overly simplified where terms like "energy storage" within the energy security metric only considers ability to meet oil and gas demand, rather than taking a more sectoral view on storage such as grid-sized batteries, or hydroelectric or geothermal schemes with which current storage or baseline generation is quantified. The "access to electricity" within the energy equity category does not consider actual access, but rather the ability to access. Despite these limitations, the Energy Trilemma framework provides useful insights into a complex problem; for instance, it allows for a standardised frame to compare a state's year-on-year performance as the energy transition occurs, and it provides a platform to compare states against each other in a universally applicable index.

It is estimated that presently some 750 million people globally lack access to electricity,[33] and that approximately 80 percent of global energy and 66 percent of electrical generation are supplied from fossil fuels.[34] New Zealand fares well in these statistics, with 100 percent of New Zealanders reported as having access to reliable electricity,[35] approximately 80 percent of which is generated from renewable sources.[36] In terms of total energy generation, about 40 percent is derived from renewable sources.[37] However, New Zealand is a net importer of energy, and thus is currently reliant on international

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[32] See World Energy Council "World Energy Trilemma Index – New Zealand Country Profile" (2021) < https://trilemma.worldenergy.org/#!/country-profile?country=New%20Zealand&year=2021> information pop up on the key metrics sections.

[33] United Nations "Facts and Figures" (accessed 30 October 2022) United Nations | Act Now <https://www.un.org/en/actnow/facts-and-figures>

[34] United Nations "Facts and Figures" (accessed 30 October 2022) United Nations | Act Now <https://www.un.org/en/actnow/facts-and-figures>

[35] https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=NZ

[36] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[37] Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 2. Available online.

markets to meet energy demand.[38] This is associated with the risk that high prices can reduce energy equity and make energy unaffordable despite the theoretical 100 percent accessibility. Recent years have highlighted this risk, whereby New Zealand has had to rely on high coal imports to meet peak demand in the wake of low hydro-lake levels, outages at the domestic gas fields,[39] and insufficient generation from alternate renewable sources to meet demand,[40] which has included low wind flux and below average hydrogeological years. Lack of investment in infrastructure, unstable policy directives which can be influenced by the courts, and challenges consenting some types of renewable infrastructure, may put pressure on the measured outcomes of the energy trilemma in the New Zealand context.

The article is organized as follows. The second section introduces the energy generation sector in New Zealand, giving an overview of the types of energy generation and some relevant energy market information. The third section summarises on international and domestic law and policy settings relevant to climate change and energy systems in New Zealand. The Fourth section introduces and provides some discussion on international litigation trends, related to climate change and the energy sector. The fifth section integrates concepts developed in the preceding sections discussing interaction of law and policy, litigation, and energy systems. Investigating the influence of a confluence of incentives, risks and drivers affecting New Zealand's energy markets and how these factors may affect the country's ability to maintain its high performance in energy trilemma metrics.

Discussion is limited to primary production, that is energy and electricity production and generation. Secondary uses such as for transport and industrial use is mentioned where relevant but it not a focus of this piece.

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[38] Ministry of Business, Innovation and Employment. Energy in New Zealand 18 – 2017 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, October 2018) at 1. Available online.

[39] Note, in New Zealand one of the key uses for gas production is electricity generation. Gas may also be transformed to methanol for export.

[40] See Appendix 1.

II Energy in New Zealand

Energy consumption within a society is a function of economic activity, population, the structure of the economy, the climate, and energy resource availability.[41] In New Zealand, the primary energy supply derives from both renewable and non-renewable sources, comprising approximately 41 percent and 59 percent of New Zealand's primary energy supply in 2021, respectively.[42] Relative contribution of renewable and non-renewable generation in New Zealand varies annually depending on prevailing weather conditions and the commissioning of new infrastructure, but has remained relatively constant at about 40 percent renewable and 60 percent non-renewable since 2010.[43] In 2021 primary energy sources included coal (7.5 percent), oil (34.0 percent), natural gas (17.6 percent), hydro (10 percent), geothermal (23.4 percent) and other renewable sources including wind, biomass (wood), biogas, liquid biofuels and solar (7.4 percent).[44] Waste heat contributed an additional 0.1 percent.[45]

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[41] Ministry of Business, Innovation and Employment. Energy in New Zealand 18 – 2017 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, October 2018) at 1. Available online.

[42] See Appendix 1

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 2. Available online.

[43] See Appendix 1

[44] Information sourced from Data sourced from: MBIE https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-publications-and-technical-papers/energy-in-new-zealand/ energy overview workbook

[45] See Appendix 1

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 2. Available online.

Raw data from:

- Energy overview
- Energy balances

Primary energy supply may be used in their original form (e.g., heat, kinetic etc.), or they may be converted into secondary sources such as electricity and hydrogen.[46] In New Zealand electricity generation is the largest consumer of renewable energy sources, and its proportion has been steadily increasing reaching 82.1 percent in 2021,[47] up from 81.1 percent in 2020.[48] The electricity sector currently consumes 100 percent of the available renewable energy. Additional base load, peaking and emergency electricity supply is met by fossil fuels, primarily gas.[49] If insufficient gas is available to meet demand, then coal generation is used as a last resort.[50] Other key energy (renewable and non-renewable) consumers include the industrial, agricultural and transport sectors, these sectors rely more heavily on fossil fuels.[51]

New Zealand's general primary energy demand since 1990 has seen a steady year-on-year increase growing on average about 1.6 percent per year.[52] This equates to a cumulative energy demand increase of approximately 50 percent between 1990 and 2021.[53] During this period primary energy supply from renewable sources has increased by 10 percent from about 30 percent in 1990 to 40 percent in 2021.[54] Considerable development of geothermal generation capability in the Central Volcanic Zone has been

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[46] U.S. Energy Information Administration "what is energy" (13 December 2021) EIA <https://www.eia.gov/energyexplained/what-is-energy/>

[47] Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 2. Available online.

[48] Ministry of Business, Innovation and Employment. Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 2. Available online.

[49] Ministry of Business, Innovation and Employment "Electricity statistics" (20 September 2022) New Zealand government < https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/electricity-statistics/>

[50] Ministry of Business, Innovation and Employment "Electricity statistics" (20 September 2022) New Zealand government < https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/electricity-statistics/>

[51] Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

[52] See Appendix 1 data tables.

[53] See Appendix 1

[54] See Appendix 1

the primary contributor to this growth and having more than doubled its generation contribution since 1990 (from about 10 percent in 2004 to 23 percent in 2021).[55] Gas supply in New Zealand has declined by about one third since 1990 and will continue to decline after the 2018 offshore oil and gas ban.[56] The ban saw existing rights maintained and three further permitting rounds in the Taranaki Onshore area, there have been no new gas discoveries since the ban was announced.[57] Gas production is largely constrained to a domestic market and provides baseload, peaking and emergency generation. To date, the gas market share has mostly been offset by increases in geothermal generation, and through oil and coal imports.[58] Hydro-generation as a proportion of energy supply has been in relative decline since 1993, as no new commercial generation hydro-dams have been constructed since the completion of the Clyde Dam in 1993, despite continued growth of energy demand.[59] Other renewable energy sources including wind, solar, and biofuels have seen steady growth, although that appears to be approximately proportional to demand growth after efficiency gains.[60] Oil use saw relatively rapid growth between 1990 and the early 2000's, remaining relatively steady at approximately 33 percent of New Zealand's energy needs.[61]

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[55] See Appendix 1 chart and data tables

[56] See Appendix 1 chart and data tables

[57] There has not been any notices of gas discovery lodged, nor new petroleum mining permit applications see Ministry of Business, Innovation and Employment " permit Maps – Petroleum" (October 2022) New Zealand Petroleum and Minerals <https://data.nzpam.govt.nz/ permitwebmaps/?commodity=petroleum>

[58] See Appendix 1 chart and data tables

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

[59] Institution of Civil Engineers "Hydroelectric power New Zealand" (2022) <https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do/hydroelectric-power-new-zealand/>

[60] See Appendix 1 chart and data tables

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

[61] See Appendix 1 chart and data tables

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

New Zealand's energy-related greenhouse gas emissions (CO_2 equivalent) steadily grew between 1990 and 2003 (growing on average 2.7 per year, with a cumulative growth of 40 percent over that period) peaking in 2006 and 2008 at over 34.5 megatons per annum, before settling to about 32 megatons per annum until 2019.[62] Total energy sector annual emissions remain at about 40 percent higher than they were in 1990.[63] Emissions reporting from the Environmental Protection Agency indicate that energy related emissions were seven percent lower in 2020 than 2019.[64] This is attributed to a slower than expected recovery from the Covid-19 Pandemic, rather than the energy mix.

New Zealand's energy performance in recent years has been mixed. The share of total energy supply from renewables has been at its highest level since reporting started in 1990, at 40.7 percent.[65] However, a confluence of factors including Covid-19 related disruptions and then recovery for international markets, the Russian war on Ukraine and environmental factors such as La Niña conditions of the El Niño–Southern Oscillation (ENSO) climate pattern, which in the early part of 2021 brought reduced rainfall, river flow and therefore hydro generation in the South Island. This, coupled with a 13 percent fall in natural gas production saw coal use for electricity generation increase by 29.5 percent in 2021.[66] This had mixed effects on New Zealand's energy system and has

[62] See Appendix 1
Ministry for the Environment "New Zealand's Greenhouse Gas Inventory 1990-2019" (11 October 2021) Wellington: Ministry for the Environment. Available online.

[63] Ministry for the Environment "New Zealand's Greenhouse Gas Inventory 1990-2019" (11 October 2021) Wellington: Ministry for the Environment. Available online.

[64] Ministry for the Environment "New Zealand's Greenhouse Gas Inventory 1990-2019" (11 October 2021) Wellington: Ministry for the Environment. Available online.

[65] Ministry of Business, Innovation and Employment, Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 19. Available online.

[66] Ministry of Business, Innovation and Employment . Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 19. Available online.

increased wholesale energy prices for both electricity and natural gas during the winter months.[67]

This has increased pressure on industrial activity with some closures and increased risk of ongoing closures or migration offshore.[68] New Zealand's slower than expected recovery of energy use after Covid-19 pandemic has provided some relief to the system which is seeing increasing reliance on coal since 2017 to meet demand.[69] The winters of 2022 and 2021 have increased concerns over energy access and affordability and have been a reminder that New Zealand is a net importer of energy, meaning domestic generation potential is insufficient to meet demand.

There has been increasing pressure in New Zealand to move away from fossil fuel energy sources. Electrification of transport and industrial processes is proposed as the main strategy to achieve this.[70] New Zealand's main high-voltage transmission grid has been in use for a long time, it is close to the limit of its capabilities, and it is showing signs of stress. [71] This has the potential to increase the cost and challenge of the transition and to drive prices higher.[72] Experts have raised concerns that in order for the grid to be capable of more distributed and uneven generation patterns, characteristic of renewable

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[67] Ministry of Business, Innovation and Employment . Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022) at 19. Available online.

[68] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[69] See Appendix 1 chart and data tables

Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

[70] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[71] Zhiguo Zhang, Xiran Liu, Dan Zhao, Scott Post, and Jiasen Chen "Overview of the Development and Application of Wind Energy in New Zealand." Energy and Built Environment (2022). Available online.

[72] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

generation, the energy system will require significant upgrades.[73] This includes building new power transmission capacity.[74] Around $2 billion is currently committed to the construction of new renewable electricity generation, equivalent to around 8 percent of current total annual generation.[75] Storage capability is also necessary so that energy may be sourced in periods when generation is insufficient to meet demand.[76] Large-scale, expensive battery storage will likely be required to meet New Zealand domestic energy needs to offset wind and solar power intermittency.

The New Zealand Government have identified a few energy storage opportunities to match supply and demand in a low emissions energy system. The New Zealand battery project[77] has been established to assess technical, environmental and commercial feasibility of pumped hydro and other potential energy storage projects in New Zealand. Energy storage will be required to bridge supply and demand gaps in a renewables-based electricity system. Pumped hydro is also suggested to mitigate dry-year risk. Hydro generation is a significant contributor to New Zealand's base load generation, typically providing between 55 percent and 60 percent of New Zealand's electricity supply.[78] However, the pumped hydro scheme has come under scrutiny by some commentators due to its inefficiency (large losses to pump water up hill) and because its proposed location has the same dry-year-risk as the majority of New Zealand's hydro generation capability. the number of sites for new large-scale hydro dams and wind farms in New Zealand is

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[73] Zhiguo Zhang, Xiran Liu, Dan Zhao, Scott Post, and Jiasen Chen "Overview of the Development and Application of Wind Energy in New Zealand." Energy and Built Environment (2022). Available online.

[74] Zhiguo Zhang, Xiran Liu, Dan Zhao, Scott Post, and Jiasen Chen "Overview of the Development and Application of Wind Energy in New Zealand." Energy and Built Environment (2022). Available online.

[75] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[76] Solomon, A. A., Daniel M. Kammen, and D. Callaway. "The role of large-scale energy storage design and dispatch in the power grid: a study of very high grid penetration of variable renewable resources." Applied Energy 134 (2014): 75-89. Available online.

[77] Ministry of Business, Innovation and Employment "New Zealand Battery Project" (17 October 2022) <https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/nz-battery/>

[78] Ministry of Business, Innovation and Employment. Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 2. Available online.

limited and because hydroelectric schemes are vulnerable to drought, it is likely that new electricity developments will look to alternative technologies.[79] The New Zealand government has also released a roadmap to hydrogen[80] in 2019 as part of the Renewable Energy Strategy. However, currently it takes 41.4 kWh to produce 1 kg of hydrogen which contains 33.33 kWh of usable energy.[81] The process of electrolysis represents an energy efficiency of 80 percent, or a 20 percent net loss of usable energy.[82] Storage options are also considered a risk. These projects are still in feasibility planning phase and may not be developed.

New Zealand is an island nation and a net energy importer. Considerable investment in new renewable generation including adoption of new technologies will be required to maximise performance under the energy trilemma framework.

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[79] Bridget M. Rule, Zeb J. Worth, and Carol A. Boyle "Comparison of Life Cycle Carbon Dioxide Emissions and Embodied Energy in Four Renewable Electricity Generation Technologies in New Zealand" (24 June 2009), Environmental Science and Technology, 2009, 43, 6406–6413 at 6406. Available online.

[80] Ministry of Business, Innovation and Employment "A roadmap for hydrogen in New Zealand" (8 July 2022) < 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/>

[81] Ministry of Business, Innovation and Employment . Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 33. Available online.

[82] Ministry of Business, Innovation and Employment . Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 33. Available online.

III International and domestic law and policy settings

New Zealand has a long history in supporting international climate law. Under the Kyoto Protocol, New Zealand committed to limit emissions to 1990 levels or to take responsibility for any emissions over this level by trading credits.[83] Under this regime, New Zealand opted to trade Kyoto units to meet its commitments as emissions continued to rise. More recently, New Zealand ratified the Paris Agreement on 4 October 2016.[84] The Paris Agreement does not contain any directly legally binding mitigation obligations although it seeks to introduce a virtuous dynamic[85] for states to achieve targets set out in Article 2. These goals include keeping the global average temperature well below 2°C above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5°C; strengthening the ability of countries to deal with the impacts of climate change; and to make sure that financial flows support the development of low-carbon and climate-resilient economies.[86] Marta Torre-Schaub writes that while the nature the Paris Agreement is not very precise, the obligations go beyond mere statements of "soft law"[87] by creating legally binding mechanisms for regularly reviewed greenhouse gas emissions reductions targets such as Nationally Determined Contribution's (NDC's) which are used to communicate and provide goals to undertake ambitious reduction efforts.[88] Nationally Determined Contributions (NDC) should represent a progression beyond the country's then current NDC and reflect a countries highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different

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[83] Ministry for the Environment "About the net position under the Kyoto Protocol" (17 June 2022) New Zealand Government <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-targets/about-the-net-position-under-the-kyoto-protocol/>

[84] Ministry for the Environment "About the net position under the Kyoto Protocol" (17 June 2022) New Zealand Government <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-targets/about-the-net-position-under-the-kyoto-protocol/>

[85] Marta Torre-Schaub "Dynamics, Prospects, and Trends in Climate Change Litigation Making Climate Change Emergency a Priority in France" (2021) German Law Journal, 22(8), 1445-1458. Available online.

[86] Paris Agreement, Art 2

[87] Marta Torre-Schaub "Dynamics, Prospects, and Trends in Climate Change Litigation Making Climate Change Emergency a Priority in France" (2021) German Law Journal, 22(8), 1445-1458. Available online.

[88] Marta Torre-Schaub "Dynamics, Prospects, and Trends in Climate Change Litigation Making Climate Change Emergency a Priority in France" (2021) German Law Journal, 22(8), 1445-1458. Available online.

national circumstances. [89] In New Zealand, International law like the Paris Agreement and related commitments have been linked to domestic law via the Climate Change Response Act (2002).[90]

New Zealand's first Nationally Determined Contribution (NDC) was updated on 31 October 2021 (to NDC1). The new NDC sets a headline target of a 50 percent reduction of net emissions below gross 2005 level by 2030.[91] This represents a 41 net reduction on 2005 gross emissions by 2030.[92] The 2050 target is net zero greenhouse gas (excluding methane) emissions and a 24 percent to 47 percent reduction from 2017 levels of biogenic methane by 1 January 2050.[93] The energy and industry sectors make up just over a quarter of New Zealand's total gross greenhouse gas emissions.[94] Therefore, decarbonisation of the energy sector is fundamental to the current government strategy and features heavily in New Zealand's emissions reduction strategy. The Government has committed to setting a target of 50 of total energy consumption coming from renewable sources by 2035.[95] This includes a goal for 100 percent renewable electricity generation by 2030.[96] Currently 40 percent of total energy consumption in New Zealand is

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[89] Paris Agreement, Art 4, Art 11

[90] Paris Agreement, Art 4 (other sections Articles 4, 7, 9, 10, 11 and 13),
Climate Change Response Act 2002 No 40 (as at 03 November 2021), s 5O, s 5K and s 30GC of the CCRA

[91] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[92] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[93] Climate Change Response Act 2002 No 40 (as at 03 November 2021), s 5Q

[94] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[95] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[96] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

renewable and just over 80 percent of electricity generation.[97] This extends the previous New Zealand Energy Efficiency and Conversation Strategy 2017-2022 target of 90 percent of renewables in the power mix by 2025 (primarily hydro and geothermal) which is unlikely to be achieved in less than 3 years.[98]

The 100 percent renewable electricity generation target has proved controversial. Due to the inherent nature of renewable electricity generation ample redundancy will need to be included in the generation network to address low yield when if weather or climate regimes are unfavourable for generation. Experts have stated this is not economic and that technical changes will be required to meet this target.[99] Those in the sector suggest 95-98 percent renewable electricity generation is a more appropriate target.[100] This will also require "non-technical solutions, such as shifting human behaviour in terms of how and when we use our energy."[101] Regardless of these cautions New Zealand's target of 100 percent reliance on renewable methods for energy supply is under eight years away, considerable consenting and investment is required now to build the necessary generation projects to meet demand needs. These arguments do not even consider exposure to global resource markets (e.g., steel, minerals etc.) required for building this infrastructure, all of which were interrupted during the Covid-19 Pandemic.

New Zealand's emissions reduction budgets received scathing reviews by the Climate Action Tracker.[102] Who assessed New Zealand's 2020 NDC(1) architecture as "deeply

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[97] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[98] Ministry of Business, Innovation and Employment "Unlocking our energy productivity and renewable potential - New Zealand energy efficiency and conservation strategy 2017 – 2022" (June 2017) New Zealand Government. Available online.

[99]E.g. Rebecca Peer "Reality Check: How Achievable is 100% Renewable Energy for the Energy Sector by 2030?" (30 May 2022) University of Canterbury. <
https://www.canterbury.ac.nz/engineering/schools/cnre/news/2022/rebecca-peer-renewable-energy.html>

[100] E.g. Rebecca Peer "Reality Check: How Achievable is 100% Renewable Energy for the Energy Sector by 2030?" (30 May 2022) University of Canterbury. <
https://www.canterbury.ac.nz/engineering/schools/cnre/news/2022/rebecca-peer-renewable-energy.html>

[101] Rebecca Peer "Reality Check: How Achievable is 100% Renewable Energy for the Energy Sector by 2030?" (30 May 2022) University of Canterbury. <
https://www.canterbury.ac.nz/engineering/schools/cnre/news/2022/rebecca-peer-renewable-energy.html>

[102] Sophie Boehm, Louise Jeffery, Kelly Levin, Judit Hecke, Clea Schumer, Claire Fyson, Aman Majid,

flawed" and found that "the country's net emissions could be 4 percent above 2005 levels in 2030, and more than 44 percent above 1990 net emissions" under the current targets,[103] if they are achieved. It is becoming increasingly unlikely sustainability goals for the energy sector will be achieved as energy infrastructure investment lags to meet 2030 and 2035 domestic energy sector emissions reduction targets.

There are strong interconnections between environmental and energy law.[104] Energy projects need to be conceptualised and structured with a balance between environmental protection, economic viability, and public concerns in mind to underpin the core aspects of energy justice.[105] Consent to develop energy projects stems from a relatively complex domestic framework which has evolved with changing priorities, norms, and requirements. In all cases, projects are consented and regulated across several Acts and regulatory bodies.[106] The Resource Management Act (RMA) is the primary regulatory tool for consenting projects, it seeks to take a version of an earth systems governance

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and Joel Jaeger "State of Climate Action 2022" (2022) Bezos Earth Fund, Climate Action Tracker, Climate Analytics, Climate Works Foundation, New Climate Institute, the United Nations Climate Change High-Level Champions, and World Resources Institute. Available online.

[103] Climate Action Tracker "New Zealand" (15 October 2021) <
https://climateactiontracker.org/countries/new-zealand/>

[104] Arnold, Craig Anthony, and Lance H. Gunderson. "Adaptive law and resilience." Envtl. L. Rep. News & Analysis 43 (2013): 10426. Available online.

[105] Schumacher, Kim. "Approval procedures for large-scale renewable energy installations: Comparison of national legal frameworks in Japan, New Zealand, the EU and the US." Energy Policy 129 (2019): 139-152. Available online.

The concept of Energy justice derives from concepts like social justice, environmental justice and climate change movements. It attempts to provide an ethical framework for discussing issues of fairness between people, on both local and global scales, in relation to energy supply, production and consumption. Literature to date has focussed on energy burden – energy expenditure relative to overall household income, energy security – energy access, energy poverty – lack of access to energy, energy democracy – community influence over energy future including project development and in some instances the effectiveness of energy policy.

See: Ray Galvin "Inequality and Energy: How Extremes of Wealth and Poverty in High Income Countries Affect CO2 Emissions and Access to Energy" (2020). Available online.

[106] Councils (all energy project), EPA (all energy projects), MBIE (oil and gas permitting), DoC (where a project relates to the conservation estate), WorkSafe (all energy projects), Maritime (marine energy projects) etc

RMA, EEZ, CMA, MMPA, HSWA, etc

approach to promote the sustainable management of natural and physical resources.[107] Reform of the RMA in 1991 altered the environmental assessment process to facilitate accreditation procedures and project planning, it also centralised most environmental laws.[108] This aimed to expedite project development in the frame of sustainable resource management. Today, most small renewable energy projects can be approved by the appropriate regulatory bodies within a few months.[109] However, large-scale energy projects can face greater challenge.[110] The regime's structure, which is unintentionally better at facilitating smaller, distributed projects over larger projects poses a risk to progressing increased renewable generation goals. This is reflected in the courts, where larger commercial projects have greater representation. At a planning level the community is empowered to contribute to decision making and plans through consultation both with the general community and iwi (Māori).[111] This may be reflective that planning has always been responsive to the needs of society and is characteristically in a state of constant evolution as it reorients itself to changing circumstances.[112] However, through project consenting stages meaningful community engagement can be

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[107] Resource Management Act 1991, s 5(1)

> S5(2) "manag[e] the use, *development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*
>
> *a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; an*
> *b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
> c) *avoiding, remedying, or mitigating any adverse effects of activities on the environment*."

[108] Schumacher, Kim. "Approval procedures for large-scale renewable energy installations: Comparison of national legal frameworks in Japan, New Zealand, the EU and the US." Energy Policy 129 (2019): 139-152. At 3.2 Available online.

[109] At Table 4.

[110] At Table 4.

[111] Local Government Act 2002, s. 91

[112] Claire Freeman "Sustainable development from rhetoric to practice? A New Zealand perspective" (2004) International Planning Studies, 9:4, 307-326. Available online.

more restricted.[113] As such the only route to changing project parameters or challenging a project may take the form of a judicial review.

[113] Cheyne, Christine. "Changing urban governance in New Zealand: Public participation and democratic legitimacy in local authority planning and decision-making 1989–2014." Urban Policy and Research 33.4 (2015): 416-432.

IV International litigation trends linking climate change and the energy sector

Internationally, the amount of climate change litigation is increasing.[114] This has given rise to an expansion of relevant legal theory, case law and precedent across jurisdictions. The evolution of climate law represents a convergence of top-down and bottom-up legal guidance where the interaction of the Paris Agreement, its targets and other relevant international law, meets domestic laws and nationally determined contributions, emissions reduction strategies and technological advances in the effort to transition to a low emissions future. However, there is no formally agreed definition of what constitutes a climate change dispute. Some have been proposed for instance the International Chamber of Commerce has proposed it would include "*any dispute arising out of or in relation to the effect of climate change and climate change policy, the United Nations Framework Convention on Climate Change ("UNFCCC") and the Paris Agreement*."[115] Alternatively, the United Nations Environment Programme defines climate litigation as "*cases that relate specifically to climate change mitigation, adaptation, or the science of climate change.*"[116] Both definitions are rather broad to capture disputes arising out of the rapid and deep transition currently being attempted across all sectors including the energy sector.[117] A hybrid of these definitions has been adopted to integrate climate specific claims and energy project specific claims. Because energy is a high emitting sector and emissions reductions within the sector are fundamental to NDC1 and emissions reduction

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[114] United Nations Environment Programme "Global Climate Litigation Report 2020 status review" (2020) United Nations Environment Programme Sabin Center for Climate Change Law. Available online.

[115] International Chamber of Commerce "Resolving Climate Change Related Disputes through Arbitration and ADR" (November 2019) ICC publication 999 ENG. Available online.

[116] Mark Bakeer, Kevin O'Gorman, Edward Clark Lewis, Dylan McKimmie, Tamlyn, Holly Stebbing, Martin Valasek and Ray Chartier "Climate change and sustainability disputes: Energy sector perspectives" (July 2021) Norton Rose Fulbright <https://www.nortonrosefulbright.com/en/knowledge/publications/5a4387f4/climate-change-and-sustainability-disputes-energy- perspective>

[117] Mark Bakeer, Kevin O'Gorman, Edward Clark Lewis, Dylan McKimmie, Tamlyn, Holly Stebbing, Martin Valasek and Ray Chartier "Climate change and sustainability disputes: Energy sector perspectives" (July 2021) Norton Rose Fulbright <https://www.nortonrosefulbright.com/en/knowledge/publications/5a4387f4/climate-change-and-sustainability-disputes-energy- perspective>

strategy, it is taken as a key assumption that all climate specific and energy related claims have a strategic relationship with one another.

In New Zealand litigation ranges from project-specific procedural litigation related to discrete projects, typically comprised of judicial reviews challenging consenting decisions, through to strategic climate litigation aimed at influencing decarbonisation strategies and policy. [118] Torts-based strategic climate litigation actions are also beginning to be taken against private companies.[119]

Litigation themes in New Zealand are consistent with global litigation trends which often fall into one or more of six categories: (1) climate rights; (2) domestic enforcement; (3) keeping fossil fuels in the ground; (4) corporate liability, responsibility, and contractual disputes; (5) failure to adapt and the impacts of adaptation; and (6) climate disclosures and greenwashing.[120]

The ultimate goal of the litigation ranges from changing to mandating climate-related policies (both for government and private actors) to seeking redress for damages as a result of an actors perceived contribution to climate change.[121] Like international trends, climate litigation cases focussed on statutes and policies are more common in New Zealand and most claims aim to influence policy or statutory decision making. Judicial reviews[122] remain the most common form of proceedings challenging government decisions in New Zealand courts which is a function of the legal structure.[123]

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[118] E.g. Lawyers for Climate Action New Zealand (LCANZI) v The Climate Change Commission and the Minister for Climate Change [2021] CIV 2021-485-341. Available online.

[119] E.g. Smith v. Fonterra Co-O perative Group Limited, royal dutch shell case

[120] United Nations Environment Programme "Global Climate Litigation Report 2020 status review" (2020) United Nations Environment Programme Sabin Center for Climate Change Law. Available online.

[121] E.g. Smith vs Fonterra

[122] The Ministry of Justice "starting a proceeding in the High Court" [20 October 2021] The New Zealand Government <https://www.justice.govt.nz/courts/going-to-court/without-a-lawyer/representing-yourself-civil-high-court/starting-a-proceeding-in-the-high-court/>

[123] Caroline Foster "Climate Change Litigation in New Zealand" in Ius Comparatum - Global Studies in Comparative Law book series (GSCL,volume 47, Springer, Cham, 2021) at 225–239. Available online.

A Strategic litigation climate claims in New Zealand

In New Zealand strategic climate claims have seen mixed results, Thomson v. Minister for Climate Change[124] was the first notable claim of this kind in New Zealand. It represents a kind of hybrid between a strategic and a procedural claim. The judicial review related to the New Zealand Governments response to climate change. The claim asserted that the Minister had breached the Climate Change Response Act (2002) by failing to review New Zealand's 2050 greenhouse gas emissions target following the release of the 2015 AR5 International Panel of Climate Change report. In their ruling the courts declined to make a declaration of lawfulness, as the ruling had been overtaken by events as the newly elected Government had already announced intentions to review the 2050 target. The remaining three claims challenged the ambition of New Zealand's NDC in the exercise of the Crown's prerogative powers, these claims failed.[125] This was seen as a landmark case in New Zealand, largely due to its partial success. Like many cases of this kind, it also garnered significant media and public attention at the time, bringing with it increased public interest, reputational risks and thus increased pressure to make good on climate change commitments. This attention for all strategic cases has historically been seen as a win even if the case is lost on its legal merit. [126]

Recent evolution has seen greater emphasis on broader domestic law and its interaction with the Paris Agreement and the Climate Change Response Act. Lawyers for Climate Action New Zealand (LCANZ) vs. the Climate Change Commission and Minister of Climate Change[127] aim to increase ambition emissions reduction targets. Their claim alleges that domestic targets to reduce emissions under the Climate Change Response Act

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[124] Caroline Foster "Climate Change Litigation in New Zealand" in Ius Comparatum - Global Studies in Comparative Law book series (GSCL,volume 47, Springer, Cham, 2021) at 225–239. Available online.

[125] Sarah Thomson vs. The Minister for Climate Change Issues [2017] CIV 2015-485-919 [2017] NZHC 733. Available online.

[126] Mark Bakeer, Kevin O'Gorman, Edward Clark Lewis, Dylan McKimmie, Tamlyn, Holly Stebbing, Martin Valasek and Ray Chartier "Climate change and sustainability disputes: Energy sector perspectives" (July 2021) Norton Rose Fulbright <https://www.nortonrosefulbright.com/en/knowledge/publications/5a4387f4/climate-change-and-sustainability-disputes-energy- perspective>

[127] Lawyers for Climate Action New Zealand (LCANZI) v The Climate Change Commission and the Minister for Climate Change [2021] CIV 2021-485-341. Available online.

are not consistent with the Climate Change Response Act or the Paris Agreement. The claim challenges an alleged mathematical error in the NDC1 carbon accounting whereby emissions reduction targets were set against 2010 gross carbon dioxide emissions (35.0 Mt) rather than 2010 net carbon dioxide emissions (5.0 Mt). The claim alleges that based on the Climate Change Commissions approach "net carbon dioxide emissions will be allowed to increase to 17.9 Mt" an increase of over 250 percent.[128] Thus, LCANZ do not consider the NDC(1) is "consistent with the IPCC's analysis or with contributing towards limiting global warming to 1.5 degrees."[129]LCANZ also emphasise the need for domestic laws to be interpreted consistently with the Paris Agreement, the right to life (in the New Zealand Bill of Rights Act), Te Tiriti o Waitangi principles (in particular the exercise of rangatiratanga) and tikanga Māori.[130] The claim is novel in drawing upon a range of international and domestic law to influence NDC(1) targets.

The Climate Change Commission remit under the Climate Change Response Act is to give advice that is based on delivering an economically and technically achievable, and socially just transition to net zero by 2050.[131] As such its advice aims to balance the many factors, across all facets of New Zealand life. In energy, this includes the three metrics of the trilemma. The LCANZ claim, takes a strong view to emissions reduction (i.e., increasing sustainability under the trilemma framework) without apparent consideration of the practicalities of what these reductions mean to deliver other government commitments.[132] The LCANZ right to life claim when framed in the context of current energy policy and under current energy infrastructure and planned new renewable generation investment could cut both ways. Access to energy can be a life-or-death

[128] Lawyers for Climate Action New Zealand "Press release: Statement of Claim Amendment - Climate Change Commission Judicial Review" (4 November 2021) < https://www.lawyersforclimateaction.nz/news-events/press-release-ccc-statement-of-claim-amendment>

[129] Lawyers for Climate Action New Zealand "Press release: Statement of Claim Amendment - Climate Change Commission Judicial Review" (4 November 2021) < https://www.lawyersforclimateaction.nz/news-events/press-release-ccc-statement-of-claim-amendment>

[130] Lawyers for Climate Action New Zealand "LCANZI sues Climate Change Commission over errors in its Advice to Minister" (2 July 2021) <https://www.lawyersforclimateaction.nz/news-events/ccc-jr>

[131] Climate Change Response Act 2002, s 5ZC

[132] Lawyers for Climate Action NZ Incorporated v The Climate Change Commission and Minister for Climate Change, (1 July 2021) CIV 2021 , Available online.

prospect for vulnerable people and communities.[133] Building new commercial generation capability can take years progressing through feasibility, consenting, construction to operation.[134] That is if approvals are achieved quickly. Generally, the more generation capability an individual project can offer the longer the feasibility to operation period will be.[135] In the context of declining gas supply[136] there is already significant investment required to offset market share with renewables rather than imported coal, oil or Liquified Natural Gas.

Access to energy, and thus electricity, is not explicitly considered a basic human right under the Universal Declaration of Human Rights[137] or the New Zealand Bill of Rights

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[133] E.g. "Power-cut tragedy: the facts". The Press. 06/06/2007. Archived from the original on 14/06/2007. Retrieved from https://web.archive.org/web/20070614163545/http://www.stuff.co.nz/4085705a11.html on 10/10/2022.

[134] Notional project development timeframes per renewable generation type:

Hydro – feasibility and planning assessments + consenting + about 5 years construction (size dependent) + filling period (size and fill rate dependent)

e.g. lake Onslow proposed pumped hydro

Ministry of Business Innovation and Employment "Lake Onslow Option"(2022 September 2022) < https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/nz-battery/lake-onslow-option/>

Geothermal – feasibility and planning assessments + consenting + about 3 years construction

Alexander Richter "NZ-based utility Top Energy has successfully commissioned the Ngawha geothermal power plant in New Zealand, adding 32 MW in power generation capacity to its portfolio and New Zealand's geothermal market" (January 2021) Think Geo Energy < https://www.thinkgeoenergy.com/top-energy-kicks-off-commercial-o peration-of-32-mw-ngawha-3-geothermal-power-plant/>

Wind – feasibility and planning assessments + consenting + 6 months to 3 years construction depending on project size and location

New Zealand Wind Energy Association "Hosting a wind farm on your land" (Accessed October 2022) < https://www.windenergy.org.nz/resources/for-develo pers-and-landowners/how-to-host-a-windfarm>

Tilt Renewables "Wind Farms frequently asked questions" (October 2021) < https://www.tiltrenewables.com/about-tilt-renewables/#faqs>

Power plant - feasibility and planning assessments + consenting + about 3 years construction

[135] i.e. generally individual geothermal and hydro projects generate more energy than wind farm projects, but take longer to consent and build.

[136] Ministry of Business, Innovation and Employment . Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 2. Available online.

[137] The Universal Declaration of Human Rights proclaimed by the UN General Assembly in Paris 10 December 1948 (General Assembly resolution 217 A). Available online.

Act.[138] Regardless, commentators argue that access to electricity, and thus energy, is in the very least a derived right.[139] Arguments vary, but generally agree that access to electricity (and therefore energy) can be established either implicitly as an attribute of pre-existing rights,[140] or explicitly within existing rights, such as implied within the context of eliminating discrimination against women.[141] The Paris Agreement[142] and the International Just Transition Declaration[143] preambles imply support for this interpretation in the context of the energy transition. The purpose statement of the Declaration defines the Just Transition process towards an environmentally sustainable economy, highlighting the requirement for the transition "needs to be well managed and contribute to the goals of decent work for all, social inclusion and the eradication of poverty."[144] The Ministry of Business, Innovation and Employment have taken this further, stating that "Transitions have traditionally disadvantaged some groups more than others."[145] The Government are working to make the "transition more fair, equitable and inclusive."[146]

Insufficient energy supply invokes economic principles of supply and demand resulting in higher prices which has been demonstrated to have negative impacts on the right to life

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[138] New Zealand Bill of Rights Act 1990, Part 2, Section 8

[139] E.g. Stephen Tully "The Human Right to Access Electricity" (2006) The Electricity Journal, Volume 19, Issue 3 at 30-39. Available online.
Lars Löfquist "Is there a universal human right to electricity?" (2020) The International Journal of Human Rights, 24:6, 711-723. Available online.

[140] (e.g. non-discrimination, adequate living standards, housing, health, sustainable development and access to the internet)

[141] Stephen Tully "The Human Right to Access Electricity" (2006) The Electricity Journal, Volume 19, Issue 3 at 30-39. Available online.

[142] Paris Agreement Under the United Nations Framework Convention on Climate Change 3156 UNTS (done at Paris 12 December 2015, entered into force 4 November 2016), at the Preamble.

[143] Signed by New Zealand on 04/11/2021 during Cop26 Hon James Shaw "New Zealand commits to a just transition" (5 November 2021) Beehive Releases <https://www.beehive.govt.nz/release/nz-commits-just-transition>; The International Just Transition Declaration done at Glasgow 4 November 2021. Available online.

[144] The International Just Transition Declaration done at Glasgow 4 November 2021. Available online.

[145] The Ministry of Business Innovation and Employment "Just Transition" (15 November 2021) < https://www.mbie.govt.nz/business-and-employment/economic-development/just-transition/>

[146] The Ministry of Business Innovation and Employment "Just Transition" (15 November 2021) < https://www.mbie.govt.nz/business-and-employment/economic-development/just-transition/>

for some vulnerable groups. For example, after the Fukushima nuclear disaster, the Japanese Government decided to decommission all nuclear power plants which, at the time, produced over 30 percent of Japan's electricity supply.[147] Nuclear energy market share was largely offset through the import of fossil fuels,[148] whose power generation market share rose from 62 percent to 88 in the four years following the earthquake.[149] Consequently, this had the effect of increasing domestic energy sector emissions (reducing sustainability), increasing energy price by up to 40 percent[150] and reducing energy security due to reliance on other jurisdictions for the raw materials for that energy generation.[151] As a result, many people reduced their energy use. This resulted in an "increase in mortality from cold temperatures mainly due to cardiovascular disease"[152] and an estimated extra[153] 4,500 deaths, primarily of the elderly.[154] There has not been any deaths directly attributed to radiation exposure,[155] although it is projected radiation exposure may result in up to 130 deaths,[156] the evacuation is estimated to have resulted in 1,232 deaths.[157] Estimated deaths as a result of higher electricity prices were expected to grow while high prices continued.[158] While this case saw a lower emissions electricity generation source displaced by higher emitting sources, it does demonstrate that access to energy is intrinsically linked to poorer health outcomes which can consequently result in

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[147] Neidell, M., Uchida, S., & Veronesi, M. (2021). The unintended effects from halting nuclear power production: Evidence from Fukushima Daiichi accident. Journal of Health Economics, 79, 102507 at 3.

[148] At 3

[149] At 3

[150] World Energy Council "Energy Trilemma Index – Japan Country Profile" 2022 https://trilemma.worldenergy.org/#!/country-profile?country=Japan&year=2021

[151] World Energy Council "Energy Trilemma Index – Japan Country Profile" 2022 https://trilemma.worldenergy.org/#!/country-profile?country=Japan&year=2021
Falling more than 20 percentage points according to the World Energy Council metrics.

[152] At 14

[153] Additional deaths not expected by previous trends.

[154] At 15

[155] At 15

[156] J.E. Ten Hoeve and M.Z. Jacobson "Worldwide health effects of the Fukushima Daiichi nuclear accident" Energy and Environmental Science, Issue 9, 2012 At 1

[157] Tokyo Shimbun Newspa per "Fukushima-related death reaches 1368, with an annual increase of 136 in 2015." March 6, 2016 (in Japanese).

[158] Neidell, M., Uchida, S., & Veronesi, M. (2021). The unintended effects from halting nuclear power production: Evidence from Fukushima Daiichi accident. Journal of Health Economics, 79, 102507 at 15

higher mortality. There is a body of international work which supports these findings in other jurisdictions.[159] In the absence of policy change to better support vulnerable communities in an environment of higher energy prices and progress in building sufficient renewable generation and storage capability, the right to life argument used in the LCANZ claim could equally apply in support of continuation of fossil fuels for energy generation.

B Energy project specific procedural claims

Many rights-based cases are strategically designed to attempt to increase ambition and hasten New Zealand's transition to a low carbon economy. Procedural claims are less systematic in their sustainability emphasis, perhaps reflecting that all types of energy projects have an unavoidable environmental impact.[160] Thus, claims can either support or oppose new generation capability consenting and development, including for new renewable generation. Generally, the Crown is the sole defendant, however, claimants can either represent project development or non-proliferation. Claims against windfarms have been particularly common and demonstrate the subjectivity in the energy transition with proponents citing arguments like the national need for sustainable and renewable energy sources and the reduction of harmful greenhouse gases which will result from project construction.[161] Windfarm detractors argue that projects would have adverse visual effect on the landscape, local community and cultural values.[162]

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[159] E.g. Chirakijja, J., S. Jayachandran, and P. Ong. 2019. "Inexpensive heating reduces winter mortality," NBER Working Pa per No. 25681.
He, G., & Tanaka, T. (2019). Energy Saving Can Kill: Evidence from the Fukushima Nuclear Accident.
Bhattacharya, J., DeLeire, T., Haider, S., & Currie, J. (2003). Heat or eat? Cold-weather shocks and nutrition in poor American families. American Journal of Public Health, 93(7), 1149-1154.

[160] Including mined materials for all types of projects, ecological impacts, visual impacts

[161] E.g. Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council, Meridian Energy Ltd. v. Wellington City Council, Motorimu Wind Farm Ltd. v. Palmerston North Council,

[162] E.g. Maniototo Environmental Society Inc. v. Central Otago District Council; Meridian Energy Ltd. v. Central Otago District Council and Others, Outstanding Landscape Protection Society Inc. v Hastings District Council, Unison Networks Ltd. v. Hastings District Council

The impact of claims during the consenting phase can have an impact on project viability even when consents are retained or gained after the court's decision. The court process, costs, project delays and reputational impacts can be more than a mere interruption and can mean that development is not completed. For example, in the judicial review Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council.[163] The Franklin District Council refused consent for the project on the basis that would have an adverse visual effect on the landscape, local community, and equestrian activities. Project supporters cited reduction in emission of harmful greenhouse gases and a national need for sustainable and renewable energy sources as support for the project. The court determined that the purpose of the Resource Management Act 1991 would be better served by granting the wind farm proposal. The court found that the benefit of the wind farm proposal, when seen in a national context, outweighed the site-specific effects and the effects on the surrounding area. The court also rejected the council's argument that because the wind farm was relatively small, its climate change benefits were not relevant. Genesis Energy planned to commission the 18-turbine Awhitu wind farm, which would provide enough electricity to power about 7500 homes, in November 2007. However, after the litigation Genesis divested and on sold to Trust Power, which, after a de-merger of the Trust Power entities in 2016, the prospective project was on sold to private developer, and only a single turbine had been erected by 2019.[164]

Commercial wind farms have been some of the most common new energy projects, and therefore have been subject to judicial reviews both in support and opposition. Maniototo Environmental Society Inc. v. Central Otago District Council; Outstanding Landscape Protection Society Inc. v Hastings District Council; and Meridian Energy Ltd. v. Central Otago District Council and Others, and Motorimu Wind Farm Ltd. v. Palmerston North Council developments were commercial wind farms which were subject to judicial review proceedings which the claim related to balancing emissions reduction and environmental impact. Outcomes in terms of courts decisions and project development

[163]Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council 2005) Decision Number A148/2005.

[164] Last reported status of the project

varied between projects,[165] but undoubtedly consenting challenges have impacted project development outcomes. Meridian Energy Ltd. v. Wellington City Council is a notable exception, the Court found that the emissions related to generation was a relevant consideration for the consent and required the Council to remake their decision.[166] A consent was subsequently issued, and the West Wind Farm located at Terawhiti Station and Mākara was developed. There are apparent inconsistencies both with Court[167] and between Courts[168] when balancing emissions and environmental considerations.

C Claims against private actors

New Zealand is also beginning to see torts claims against private actors. In the case of Smith v. Fonterra Co-Operative Group Limited (and others[169]). Smith sought the courts support to issue a directive to reduce polluting activities of seven high-emitting New Zealand companies in the agriculture and energy sectors, including Genesis Energy Limited, Dairy Holdings Limited, New Zealand Steel Limited, Z Energy Limited, New Zealand Refining Company Limited, and BT Mining Limited SC. [170] This case is considered a rare deviation from typical claims in New Zealand Courts on matters like this which tend to focus on Crown actions. It is not clear how tort law in New Zealand

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[165] In the case of:
Maniototo Environmental Society Inc. v. Central Otago District Council; Meridian Energy Ltd. v. Central Otago District Council and Others consent application withdrawn prior to final court decision
Outstanding Landscape Protection Society Inc. v Hastings District Council; and Meridian Energy Ltd. v. Central Otago District Council and Others Windfarm unable to be developed
Motorimu Wind Farm Ltd. v. Palmerston North Council 48 proposed turbines not constructed
Unison Networks Ltd. v. Hastings District Council Windfarm unable to be developed

[166] Ministry of Business, Innovation and Employment. Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 2. Available online.

[167] E.g. Environment Court – see Meridian Energy Ltd. v. Wellington City Council vs Outstanding Landscape Protection Society Inc. v Hastings District Council

[168] Environment Court, High Court, Supreme Court.

[169] Genesis Energy Limited, Dairy Holdings Limited, New Zealand Steel Limited, Z Energy Limited, New Zealand Refining Company Limited and BT Mining Limited SC

[170] Michael John Smith v. Fonterra Co-Operative Group Limited, Genesis Energy Limited, Dairy Holdings Limited, New Zealand Steel Limited, Z Energy Limited, New Zealand Refining Company Limited, And B T Mining Limited SC 149/2021 [2022] NZSC 35. Available online.

will treat claims against private entities as the Supreme Court of New Zealand deliberates on arguments of causation.

The High Court held that tort law was not the appropriate vehicle for dealing with climate change, noting that "every person in New Zealand — indeed, in the world — is (to varying degrees) both responsible for causing the relevant harm, and the victim of that harm.[171] The court held that a determination that the conduct of the respondent companies was unlawful would introduce an "ad hoc" and "arbitrary regime", which would lack legitimacy.[172] The Court of Appeal did, however, note that the courts have some role in climate action: "in holding the government to account".[173]

[171] At [18]

[172] At [27]

[173] At [35]

V The interaction of law, litigation, and the parameters of the energy trilemma

Social and environmental goals of the Paris Agreement and the Just Transition captured within the concept of energy justice[174] and the framing of the energy trilemma. The "energy trilemma index" was introduced by the World Energy Council, it can be used as a relative metric to compare a state's performance in each of the three dimensions of the trilemma: Energy Security, Energy Equity, and Environmental Sustainability.[175] All countries have their own set of practical national trilemma problems. New Zealand has been a strong performer in all metrics, and as such, it is currently ranked ninth globally in the World Energy Councils index.[176] However, New Zealand is beginning to see declining performance in energy security and equity metrics with stable performance in sustainability metrics.[177] The World Energy Council have found that:

> "New Zealand's Energy Sustainability score has improved as thermal generators slowly retire and are replaced by geothermal and wind. However, this trend has led to a lower energy diversity which, paired with an increasing reliance on fuel imports, resulted in a decline in New Zealand's energy security score."[178]

Because the Energy Trilemma Index is a relative performance index set against a 1990 baseline, the stabilisation of sustainability performance since 2008 is a representation of failure to improve energy market sustainability since 2008.[179] Price hikes and energy shortages during winters have highlighted concerns over energy access and affordability

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[174] Energy Justice defined above see footnote 105.

[175] See appendix 2 (WEC, 2019)

[176] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

[177] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

[178] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

[179] Appendix 1 and 2

in recent years.[180] Low hydro generation and tight gas supply, coupled with tight international markets and supply chain disruptions caused by the Covid-19 pandemic and other international events has resulted in increasing energy and electricity prices. This is contributing to increased living costs, as well as placing pressure on industry which lead some major industrial users, including Tiwai Aluminium Smelter, Tasman pulp and paper mill, New Zealand Steel mill and MethanEx, to reduce activity in 2021.[181] Included amongst this was idled production so gas could be diverted for electricity generation and reduced production to trade electricity at a low, fixed rate to ensure other consumers had access. Due to the relatively high portion of renewable electricity generation in the New Zealand energy system, strong environmental protection legislation and through novel product development processes, New Zealand Steel and Aluminium has some of the best environmental performance in their sectors globally.[182] These companies are expected to wind-down business in the coming years so electricity may be diverted to consumers, with steel and aluminium supply to be source internationally. Additional electricity supply deficits were offset by coal thermal generation. Some 92 percent of that was imported coal used for electricity generation was low-grade, high-sulphur, high-emissions, sub-bituminous coal imported from Indonesia.[183]

Gas is still quite important in New Zealand's energy system; as it provides primary energy for about 20 percent of New Zealand's electricity generation, as well as providing feedstock for industrial uses (e.g., fertiliser and steel production). There is limited opportunity for new gas discoveries to meet future and ongoing demand following the

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[180] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

[181] Ministry of Business, Innovation and Employment . Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 2, 16 and 17. Available online.

[182] E.g. BlueScope "Sustainability Report 2020/21" (2021) at 19 <https://s3-ap-southeast-2.amazonaws.com/bluescope-corporate-umbraco-media/media/3368/_bsl9129e-sustainability-report-2021-fa2a-online.pdf >

[183] Jordan Bond "New Zealand imported more than a million tonnes of 'dirty' coal last year" (14 July 2021> Radio New Zealand < https://www.rnz.co.nz/news/national/446845/nz-imported-more-than-a-million-tonnes-of-dirty-coal-last-year>

government decision to limit permit tender rounds to onshore Taranaki for three years from 2018, with a decision whether to offer further acreage to be decided after those tender rounds. To hold environmental performance and energy security at least at current levels, considerable investment in new renewable generation is required to offset most of the energy generated through gas combustion in New Zealand and increases in demand. If not, it can be reasonably expected that all metrics of the energy trilemma framework will decline in performance as natural gas market share is offset by internationally sourced oil and coal, such as we saw in 2021.[184] While higher prices will likely incentivise building new renewable generation if market conditions are sufficiently favourable to justify investment. The market will not be able to react immediately due to the long (several year) lead time of building generation capability.[185] Therefore, in the near term it can be expected that emissions will continue to increase until market corrections are made to offset natural market share and increases in consumption while managing natural variation in the renewable energy system associated with variable

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[184] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.

[185] Notional project development timeframes per generation type:

Hydro – feasibility and planning assessments + consenting + about 5 years construction (size dependent) + filling period (size and fill rate dependent) e.g. lake Onslow proposed pumped hydro

Ministry of Business Innovation and Employment "Lake Onslow Option"(2022 September 2022) < https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/nz-battery/lake-onslow-option/>

Geothermal – feasibility and planning assessments + consenting + about 3 years construction

Alexander Richter "NZ-based utility Top Energy has successfully commissioned the Ngawha geothermal power plant in New Zealand, adding 32 MW in power generation capacity to its portfolio and New Zealand's geothermal market" (January 2021) Think Geo Energy < https://www.thinkgeoenergy.com/top-energy-kicks-off-commercial-o peration-of-32-mw-ngawha-3-geothermal-power-plant/>

Wind – feasibility and planning assessments + consenting + 6 months to 3 years construction depending on project size and location

New Zealand Wind Energy Association "Hosting a wind farm on your land" (Accessed October 2022) < https://www.windenergy.org.nz/resources/for-develo pers-and-landowners/how-to-host-a-windfarm>

Tilt Renewables "Wind Farms frequently asked questions" (October 2021) < https://www.tiltrenewables.com/about-tilt-renewables/#faqs>

Oil and Gas – from discover highly project dependent – exploration and appraisal (7-20 years) + consenting + development (up to 5 years)

Coal - highly project dependent – appraisal (5-10 years) + consenting + development to extraction (a couple of years?)

Power plant - feasibility and planning assessments + consenting + about 3 years construction

weather and climate patterns. This is required only to offset natural gas market share, additional construction and investment will be required to displace the current market share of oil and coal as well. It is clear that current emissions reduction strategies and NDC(1) targets are ambitious in the energy space given current constraints to be able to deliver on new renewable generation. Particularly when the current market structure of the energy sector encourages a model where energy demand slightly exceeds supply. While policy settings may be able to be altered to expedite efforts and balance current market incentives, the world is still experiencing delays in getting necessary supplies and equipment because of Covid-19 Pandemic disruptions.[186] Social engineering efforts may also help, but are expected to make insufficient gains in energy use reduction.[187] As electrification increases across various sectors, further strain will be placed upon the ability to generate sufficient electricity by renewable means.

There is clear tension between energy supply and demand, which is directly linked to the cost-of-living and decarbonisation. If this is thought of through the lens of 'energy equity' and 'energy sustainability' then it is clear there will be trade-offs, at least in the near term. On this basis, it is expected that climate litigation as a form of cultural action, aimed at influencing the ideas and social behaviour of society, will continue to increase as activist groups seek to hold governments and companies to their decarbonisation commitments. As the global litigation playbook expands, it is expected that further novel claims will be developed to hasten the transition.[188] Even when litigation sees mixed results or fails by points of law cases are seen as a win for the intangible effects of attention and influencing normative change even for groups unrelated to the case. For instance, in an unsuccessful claim the Students for Climate Solutions Incorporated v The

[186] E.g. Tarek Sultan "5 ways the COVID-19 pandemic has changed the supply chain" (14 Jan 2022) DAVOS Agenda 2022 < https://www.weforum.org/agenda/2022/01/5-ways-the-covid-19-pandemic-has-changed-the-supply-chain/>

[187] Moser, Susanne C. "Communicating climate change: history, challenges, process and future directions." Wiley Interdisciplinary Reviews: Climate Change 1.1 (2010): 31-53. Available online.

[188] Joana Setzer and Catharine Higham "Global trends in climate change litigation: 2021 snapshot." Grantham Institute on Climate Change and the Environment (GRI) (2021) at 7. Available online.

Minister of Energy and Resources,[189] challenged decisions to issue new exploration permits for gas. The Court found that

> "that climate change issues were not relevant considerations under the Crown Minerals Act, the purpose of which was specified to be to promote mining (s 1A). It accordingly dismissed the challenge based on relevant considerations and unreasonableness."

The claim was perceived as a public interest claim which focussed public attention on the issue of climate change, Te Tiriti o Waitangi and inconsistencies between Government actions.[190] Like other cases, it was somewhat presented as a partial win for the media exposure it gathered.[191] In some ways regards, this attitude highlights the juxtapositions present in the debate, including the practicalities inherent in the transition, the need to meet energy needs and to decarbonise. The actions of strategic litigants to hasten the ambition of emissions reduction targets is in contrast with other local environmental advocates who challenge new renewable generation projects without recognition of overarching emissions reduction goals. There is subjectivity in the debate, as well in the narratives related to opposing discourses, where private actors cite persecution and interest groups claim victimhood.[192] There is subjectivity in the claim that wind infrastructure would have significant adverse effects on "outstanding natural landscapes"; however, the emissions a windfarm offsets can be quantified and contributes to incremental progress between meeting international climate goals and targets. As a result of challenge, more than half of wind projects which were subject to judicial review have not been developed, despite consents which would allow for development.

Increasing, and in some instances convergent litigation pressure might bring unintended consequences. These consequences impact both government and private sector, where

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[189] Students for Climate Solutions Incorporated v The Minister of Energy and Resources [2022] NZHC 2116. Available online.

[190] Declaring a "climate crisis" while permitting fossil fuel extraction

[191] Nicole Rogers "If you obey all of the rules you miss all the fun: Climate change litigation, climate change activism and lawfulness" (2015) *NZJPIL*, *13*, 179. Available online.

[192] Nicole Rogers "If you obey all of the rules you miss all the fun: Climate change litigation, climate change activism and lawfulness" (2015) *NZJPIL*, *13*, 179. Available online.

increasing challenges to Government decision making has the effect of diluting resources required to achieve ambitious transition targets to prepare and defend the Crown's position in court. Faced with litigation, private actors may redirect capital to less controversial projects, which may not be in New Zealand.

Hydroelectric generation comprises about 50 percent to 60 percent of New Zealand's electricity generation over the past decade.[193] Public resistance to large-scale hydroelectric generation has been notable since the 1960's, and it is unlikely that any new consenting for large-scale hydro-generation could be achieved without a legislated Resource Management Act amendment. No new major hydro-dams have been constructed since the Clyde Dam in 1993.[194] The dam was only able to proceed because the then government passed the Clutha Development (Clyde Dam) Empowering Act 1982 (No. 20 of 1982).[195] This section was amended in 1988 prior to development and was subsequently repealed from 14 May 1999 after the dam's construction. This is significant because hydro-generation is one of the major baseline electricity generating sources in New Zealand. Excluding the potentially large incremental gains that could be made through new projects means that offsetting carbon-emitting energy generation will need to be achieved using other technologies like wind, geothermal, solar, and biofuels etc.

Procedural litigation may also grow due to structural challenges in the Resource Management Act, and other relevant Acts like the Crown Minerals Act (minerals, coal, and petroleum extraction) and the Exclusive Economic Zone Act (offshore operations – potentially including offshore wind farms). The structure of public consultation can leave little opportunity for meaningful contribution to public works which may affect individuals. If these concerns are sufficient to meet requirements of a judicial review, this can be the only mechanism to influence a project or consents. Moreover, decisions on

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[193] Ministry of Business, Innovation and Employment. Energy in New Zealand 20 – 2019 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2020) at 11. Available online.

Or see Appendix 1.

[194] Institution of Civil Engineers "Hydroelectric power New Zealand" (2022) <https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do/hydroelectric-power-new-zealand/

[195] The Clutha Development (Clyde Dam) Empowering Act 1982 (No. 20 of 1982)

projects under the Crown Minerals Act and the Exclusive Economic Zone Act do not have sustainability goals set out in their purpose statements, thus with respect to emissions are only subject to section 5ZN of the Climate Change Response Act which only provides discretionary requirements for a decision maker to consider if they see fit the 2050 target; an emissions budget; or an emissions reduction plan. These discretionary terms and the lack of consistency between legislative regimes was the reason claims like Students for Climate Solutions Incorporated v The Minister of Energy and Resources[196] ultimately failed. The RMA does provide for sustainable development of all projects onshore and within the territorial sea in its broader role as environmental legislation.[197] Courts have supported that emissions are considered relevant when claims related to new renewable generation are brought to the courts via the Resource Management Act.

New Zealand's Courts have taken a highly nuanced approach to determining which types of applications should consider the effects of climate change. In strategic climate litigation the court has emphasised its specialty in fact finding and application of the law to make rulings. Even in Thomson v the Minister, the Court refrained in ordering a revision to the NDC. While their ruling made clear that the case did not "step outside the core role of the judiciary to decide".[198] The judgement recognises the "the nature of the decision involved a balancing of competing factors" and the government of the day emphasis on economic factors, were not unreasonable although a different government may "have balanced the competing factors differently".[199] By recognising that "The Paris process envisages a 2018 facilitative dialogue intended to assess the collective progress towards the long-term temperature goal."[200] These judgements indicate that claims brought closer to 2050 could result in different rulings and outcomes from the court as progress towards NDC's, and decarbonisation as well as social context becomes evident.

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[196] Students for Climate Solutions Incorporated v The Minister of Energy and Resources [2022] NZHC 2116. Available online.

[197] Resource Management Act 1991, Section 9 and Section 12

[198] Sarah Thomson v The Minister for Climate Change Issues [2017] CIV 2015-485-919 [2017] NZHC 733 at [17].
Available online.

[199] At [160]

[200] At [159]

Reflecting that NDC's should be updated in tandem social and climate considerations. However, this clearly separates the Courts from the inherently political decision of setting NDCs and their impacts across all facets of society.

The court focus on nuance is carried to procedural claims related to projects. This has given apparent rise to inconsistencies of the view for how overarching climate goals inter-relate with local sustainability. Court rulings, and differing perspectives have left councils charged with consenting and developing local renewable energy generation in a dilemma. Councils are at as much risk of litigation for work they undertake as for what they do not undertake in climate adaptation[201] and new project development in communities. Setting precedent through litigation is an extremely expensive and divisive way to respond to challenges posed in transitioning to a low carbon economy.[202] This is particularly evident in judicial reviews for wind farms. This is best exemplified by comparing two cases: Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council which was heard in the Environment Court in 2005 and Outstanding Landscape Protection Society Inc. v Hastings District Council which was heard in the Environment Court in 2007. Both claims followed a similar argument balancing visual and cultural effects on the landscape and emissions reductions through the introduction of this type of energy generation.[203] Where Judge R G Whiting (presiding) over the Genesis Case found that "the benefits of the proposal, when seen in the national context, outweigh the site-specific effects, and the effects on the local surrounding area"[204] the judgement did impose conditions to minimise effects. Judge C J

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[201] Local Government New Zealand (LGNZ) "Community engagement on climate change adaptation – case studies" (August 2020) At [12], < https://www.lgnz.co.nz/assets/Uploads/LGNZ-Climate-Change-case-studies-FINAL.pdf>

[202] Dave Cull "Council case studies highlight need for speed on climate change adaptation" (11 August 2020) LGNZ News and Media < https://www.lgnz.co.nz/news-and-media/2020-media-releases/council-case-studies-highlight-need-for-speed-on-climate-change-adaptation/>

[203] Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council at [43]

Environment Court in 2005 and Outstanding Landscape Protection Society Inc. v Hastings District Council at [6-7]

[204] Genesis Power Ltd. and the Energy Efficiency and Conservation Authority v. Franklin District Council at [230]

Thompson found that the Unison wind farm "proposal [did] not promote the sustainable management of natural and physical resources, as that phrase is explained in s5 of the Act".[205] Stating that "Important as the issues of climate change and the use of renewable sources of energy unquestionably are, they cannot dominate all other values."[206] The judge suggested that "[w]hile relocating some turbines or even eliminating a few might fall within the ambit of this hearing it is not open to us to embark on a major redesign of the project. Redesign of the project would need to be undertaken by Unison and fresh applications made."[207] Cases like these exemplify that building precedent may not be so efficient, where a nuanced interpretation may be taken. Of six claims related to new wind farm development reviewed in this work, two were determined not appropriate to consent, one was allowed to be consented with reduced capacity, one had its consent application withdrawn prior to hearing the court's decision, one was divested and subsequently has seen minimal development (only a single turbine), and only one windfarm was built. There is a strong implication here that the legal process has likely had a negative response on project delivery. Notably, geothermal projects have avoided significant project-related legal challenge in New Zealand. There has been one judicial review against the Waikato Regional Council's decision to grant various resource consents to Rotokawa Joint Venture Limited (RJVL) in 2017 which resulted in Ngāti Tūwharetoa and Ngāti Tahu-Ngāti Whaoa being acknowledged as having a kaitiaki [guardianship] role at Rotokawa, near Taupō.[208] This is despite development of geothermal projects in 2008 and further development currently being undertaken at the Tauhara Power Station in Taupō,[209] Somehow avoiding litigation after poor reservoir

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[205] Environment Court in 2005 and Outstanding Landscape Protection Society Inc. v Hastings District Council at [118]

[206] At [116]

[207] At [117]

[208] Towharetoa Maori Trust Board and Rotokawa Joint Venture Limited and Ngati Tahu - Ngati Whaoa Runanga Trust Decision No. [2018] NZEnvC 093 at [129]
(Env-2016-Akl-000267) V Waikato Regional Council

[209] Contact Energy "Tauhara" (2022) <https://contact.co.nz/aboutus/our-story/our-projects/tauhara#:~:text=We%20are%20currently%20building%20Tauhara,complete%20and%20operational%20late%202023>

management at the Wairakei-Tauhara geothermal system consequently resulting in up to 14 metres of localised ground subsidence impacting local infrastructure.[210]

Additional market factors, such as volatility are also contributing to concerns which include the solvency and divestment of more carbon intensive energy assets from some companies to mitigate risk. In most cases when large public companies divest assets, these assets do not cease production, they are acquired and operated generally by smaller and sometimes less financially capable operators. New Zealand has seen an example of this in the Tui Oilfield in Taranaki. In this instance, Tamarind acquired all the outstanding shares of AWE New Zealand Pty Ltd and AWE Taranaki Limited, which together own 57.5 percent of Tui, for US$1.5m.[211] Tamarind subsequently acquired the additional 42.5 percent from New Zealand Oil & Gas and Pan Pacific Petroleum subsidiaries. Gaining the entirety of permit interest in 2017. Acquisitions were subject to regulatory approval under section 41 of the Crown Minerals Act, however despite solvency concerns, the law of the day prevented the decline of the application.[212] After a technical failure of a well during a development drilling campaign, the Tamarind subsidiary which operated Tui was put into liquidation and receivership, consequently resulting in the New Zealand Government undertaking the decommissioning of the Tui field.[213] After these events the New Zealand Government responded with a law change to impose perpetual liability to larger companies who divest from assets and to impose stricter tests for demonstrating financial capability, including contributions to an inaccessible decommissioning fund while oil and gas fields are still operating. Whilst this

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[210] Rick Allisa, Chris Bromley, Steve Currie" Update on subsidence at the Wairakei–Tauhara geothermal system, New Zealand" Geothermics, Volume 38, Issue 1, March 2009, Pages 169-180. Online.
J.W.Hatton "Ground subsidence of a geothermal field during exploitation" Geothermics, Volume 2, Part 2, 1970, Pages 1294-1296. Online.

[211] AWE Limited "ASX Announcement - AWE completes divestment program with Tui sale" (13 December 2016) < https://www.asx.com.au/asxpdf/20161213/pdf/43dny9v58zl8d0.pdf>

[212] This was subsequently amended in the 2018 amendments to the act

[213] Office of the Minister of Energy and Resources Chair, Cabinet Business Committee "Cabinet Pa per to Hon Dr Megan Woods - The Crown's Approach to Decommissioning the Tui Oil Field in Response to Operator Tamarind Liquidation" (26 June 2020) < https://www.mbie.govt.nz/dmsdocument/11505-the-crowns-approach-to-decommissioning-the-tui-oil-field-in-response-to-o perator-tamarind-liquidation-proactiverelease-pdf>

is an isolated occurrence, these same challenges apply for all large infrastructure schemes, which are not subject to such comprehensive liability legislation. End of life costs can be relatively large. Mines, windfarms, hydro schemes all require substantive decommissioning and rehabilitation schemes and programs. The frequency with which this occurs is project specific, although to reference frames, for windfarms it is about 20 years,[214] dams 50-70 and up to 100 years,[215] solar 5-25 years,[216] whereas mines and oil and gas and geothermal developments are dependent on resource size and development strategy. All energy sources including renewable technologies[217] are also subject to widescale mining and quarrying, therefore decommissioning would also apply in an upstream context. This requirement is not currently well reflected in the sustainability metric of the energy trilemma, or in terms of broader sustainability as well as decarbonisation goals. There is considerable opportunity in policy frameworks to ensure liability carries in all types of large infrastructure projects and to emphasise integrated sustainability concepts like reusing and recycling decommissioned materials. The Tui case exemplifies, that courts are limited to enforcing the law-of-the-day and that improper or insufficient legal instruments can have large costs for society, for all kinds of large infrastructure projects. Risks associated with liability of aging large scale infrastructure decommissioning will be exacerbated as the transition progresses. Legal risk and litigation may in some cases compound this risk, especially when jurisdictional enforcement is a challenge.[218]

Sustainability has recently been the first parameter of the energy trilemma to be compromised when strong performance in all metrics of the trilemma cannot, or are not

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[214] Pu Liu and Claire Y. Barlow "Wind turbine blade waste in 2050" (April 2007), Waste Management Volume 62, April 2017, Pages 229-240 at 236. Available online.

[215] E.g. Bridget M. Rule, Zeb J. Worth, and Carol A. Boyle "Comparison of Life Cycle Carbon Dioxide Emissions and Embodied Energy in Four Renewable Electricity Generation Technologies in New Zealand" (24 June 2009), Environmental Science and Technology, 2009, 43, 6406–6413 at 6408. Available online.

[216] E.g. Solar Wise Wagga "What is the lifespan of a solar power system?" (February 2022) < https://solarwiseww.com.au/what-is-the-lifespan-of-a-solar-power-system/>

[217] E.g. Steel, aluminium, aggregate, Rare Earth elements for microchips, batteries etc.

[218] I.e. While energy companies are required to have a New Zealand registered company, that company may not hold the funds to undertake specific works. Circumstance may arise where international companies are unable to be held to account for their liabilities in New Zealand under domestic law.

being achieved. Specifically, energy production from imported fossil fuels is used to offset supply deficits. This was also seen in Japan in 2011 and more recently during the German energy crisis. The narrow timeline for the changes sought for 2030 targets is already technically ambitious, particularly if energy security and equity are to be managed. Deep emissions reductions just to energy production faces its own challenges; for example many of the assumptions of weather-related renewable generation[219] capability principally influenced by hydroelectric generation[220] is based on "a normal hydrogeologic year".[221] By definition, a normal hydrogeological year is a changing value, so it is likely to change with climate. This is not just the anthropogenic effects of increased greenhouse gas concentrations in the atmosphere, but also weather systems and several known climate drivers such as the Southern Annular Mode, or El Niño Southern Oscillation. Moreover, other forms of renewable generation like wind and solar are subject to intermittency of weather and climate conditions, so New Zealand's relative isolation and small size can mean that periods of unfavourable generation conditions can affect the entire country at once. As we have seen in the frame of the energy trilemma, the impact of a strong and narrow focus on greenhouse gas emissions has the potential to produce negative impacts on each of the metrics of the trilemma including emissions reduction.[222]

A transition to a low emissions future has brought a lot of uncertainty, this is reflected in changing goals, laws, and regulation. There is a lack of single or widely recognised standard in achieving net zero emissions targets, which has increased greenwashing disputes, but also leads private actors to set more general policy to net zero 2050 to mitigate risk. To test corporate emissions reduction targets against responsibility to shareholders, ClientEarth have taken a case against the Board of Directors of Shell under the Companies Act 172 and 174 in the United Kingdom. ClientEarth UK are arguing that the board has not implemented a climate strategy that is in keeping with the Paris

[219] Hydroelectric, wind and solar

[220] Most important because it provides a large portion of NZs base load electricity generation

[221] Based on a weighted arithmetic mean. i.e. the mean fluctuates on an annual basis weighted to more recent rainfall in the prior reporting periods.

[222] E.g. the mining required for materials for batteries for energy storage to bridge differences in timing between supply and demand cycles.

Agreement goal.[223] It is expected that a "win for ClientEarth and a judgment might make the clearest actionable connection between director's duties and [Environmental, Social and Governance] in this jurisdiction yet". Similar interpretation is possible in the New Zealand Courts as well. Domestic claims like Thomson v. the Minister for Climate Change, Lawyers for Climate Action New Zealand (LCANZI) Judicial review, or Smith v. Fonterra Co-Operative Group Limited could have similar effects as well. With increasing court involvement in government and private company climate policy through litigation raises the question: are courts the appropriate mechanism for this kind of decision making?

In New Zealand slipping performance in the energy equity and security metrics, as well as stagnation in the sustainability metrics may be indicative of impending challenges in the energy system and its journey to decarbonisation. This is particularly poignant as New Zealand is a geographically isolated market which is currently a net importer of energy. Near-term additional complexity can also be expected in relation to the international post-pandemic economic recovery process in the context of simultaneous transition to a low carbon economy and, commodity price pressures which have been exacerbated by Pandemic disruptions and Russia's war on Ukraine. More renewable generation capability is required to achieve strong, ongoing performance in energy trilemma metrics. Like many jurisdictions, the New Zealand Government has been investing to provide incentives for new community-based renewable generation capability.[224] Despite this investment, energy costs have continued to rise, and reliance on coal to meet domestic energy needs has increased.[225] This is consistent with international findings that "policies that mandate renewable use have driven up the retail price of electricity and have been an expensive way to achieve greenhouse gas reductions – often an implicit reason for those mandates, despite reducing cost of new renewable

[223] ClientEarth v Board of Directors of Shell (2022). Available online.

[224] E.g. Are Ake, Lake Onslow pumped hydro scheme.

[225] See Appendix 1 chart and data tables
Ministry of Business, Innovation and Employment. Energy in New Zealand 22 – 2021 Calendar Year Edition (Ministry of Business, Innovation and Employment, Annual Report, August 2022). Available online.

generation".[226] Despite the need for additional commercial generation to meet Paris and NDC(1) targets, as well as domestic need, it is common for new commercial renewable generation projects to face challenge under judicial review, which appears to be acting as a barrier to meet "just transition" goals.

The public movement to see action in addressing emissions has been highlighted by the media and advocacy groups. However, concerns of the rising cost of living are now reported to be New Zealand citizen's most important issue.[227] A recent poll found 56 percent ranked the cost-of-living issue the most important issue facing the country - well above climate change (12 percent).[228] While the current cost-of-living is impacted by a range of factors including the inflationary pressures. Energy costs is a key influencer. There will be considerable political pressure to mitigate impact of the cost-of-living crisis it remains to be see how this will pair with decarbonisation goals and meeting NDC1 targets. Particularly in the short term. Compromise and trade-offs will be a feature of the transition to a low carbon economy, experience suggests that where trade-offs between metrics of the energy trilemma must be made, sustainability often sees the largest compromise. The energy sector is a high emitting sector with considerable opportunity for decarbonisation. However, the transition to a low carbon economy and litigation is creating risks, uncertainty, and challenges in the sector. In combination with a market structure which incentivises approximately balancing energy supply and demand there is risk in New Zealand that the metrics of the energy trilemma will follow their current negative trend. Reduced access to energy has implications under the New Zealand Bill of Rights Act[229] and Te Tiriti o Waitangi principles. It is also inconsistent with the intentions of the Paris Agreement and related climate law since vulnerable communities

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[226] Michael Greenstone and Ishan Nath "Do Renewable Portfolio Standards Deliver?" (May 2019) WORKING Pa per · No. 2019-62 Energy Policy Institute at the University of Chicago. Available online.

[227] Julia Gabel "Parent struggling to make ends meet as cost-of-living crisis bites" (05 November 2022) New Zealand Herald < https://www.rnz.co.nz/news/national/478097/parents-struggling-to-make-ends-meet-as-cost-of-living-crisis-bites#>

[228] Julia Gabel "Parent struggling to make ends meet as cost-of-living crisis bites" (05 November 2022) New Zealand Herald < https://www.rnz.co.nz/news/national/478097/parents-struggling-to-make-ends-meet-as-cost-of-living-crisis-bites#>

[229] New Zealand Bill of Rights Act 1990, Part 2, S8 – Right not to be deprived of life, S19 – Freedom from discrimination, and possibly 20 the Rights of minorities.

are more likely to be negatively impacted by lack of access to energy broader implications for reducing poverty, increasing opportunity, and improving health outcomes, productivity and living standards. [230] At least in the near term.

How to balance cost of living and energy trilemma metrics in the short term while still achieving climate goals and NDC targets is ultimately a political decision. But to ensure a smooth transition which maintains public support a clear and cross-sector integrated policy framework for climate change is required.

VI Conclusions

In the context of energy, there is a twin challenge to reduce carbon emissions to at least net zero, but also to achieve energy security and equity. This paper has focused on supply-side decarbonisation challenges in the energy sector. Demand-side policy and behaviour also have a strong influence New Zealand's ability to meet NDC1 targets, however, were beyond scope. Implications of insufficient energy generation in New Zealand are large, including increasing energy prices, reduced energy security and equity (energy poverty), increasing living costs, potential job losses and industry withdrawal from New Zealand. Unlike other international jurisdictions, New Zealand does not have the benefit for relying upon surplus generation from neighbouring countries to meet demand when weather is not supporting sufficient generation and is currently a net importer of energy.

Currently 40 percent of total energy consumption and just over 80 percent of electricity generation in New Zealand is renewable.[231] All renewable energy generation is already utilised. With New Zealand Government NDC1 targets of 50 percent of total energy

[230] Mike Hughes "Why Access To Energy Should Be A Basic Human Right" (Dec 10 2018) Forbes < https://www.forbes.com/sites/mikehughes1/2018/12/10/why-access-to-energy-should-be-a-basic-human-right/?sh=490012a545f2>

[231] World Energy Council "World Energy Trilemma Index" (2021) published by the World Energy Council in partnership with Oliver Wyman. Available online.
New Zealand country profile available online as well.

consumption coming from renewable sources by 2035 and 100 percent renewable electricity generation by 2030, less than 13 and 8 years away, respectively. Considerable investment and likely under expedited consenting and development timeframes will be required to achieve the rapid decarbonisation required for the energy sector under current goals. This investment will need to offset declining natural gas availability in New Zealand and include the overcapacity which is a feature of the transition to a renewables dominated system.

The framework of the Energy Trilemma was used to compare New Zealand efforts to meet NDC1 targets, while ensuring consistency with domestic and international law. Access to energy is considered a derived right in recognition that access to all energy and thus electricity as a right might clash with environmental sustainability. Assessment found that rights-based claims which focus on emissions reduction may not reflect practical considerations of decarbonisation across sectors like energy which may subsequently result in breaches of rights under the New Zealand Bill of Rights Act, and the principles of Te Tiriti O Waitangi in the near term. Failure to deliver a just transition will certainly have a greater negative implication for vulnerable people and communities.

Claims aimed at influencing government transition policy and, or strategy, decision-making and processes as well as holding private actors to account for their contribution to greenhouse gas emissions are creating increased investment risk, particularly in the thermal and fossil fuel arenas. This not only includes potentially costly litigation, but also public perception damage as well as other economic costs and risks like the possibility of stranded assets. This impacts new projects, but also to some extent influences maintenance programmes for aging assets which are expected to be phased down or out. Climate change and sustainability disputes and litigation are expected to continue to be a part of corporate and government reality. However, claims have implications which may not be directly apparent like lack of new project development. There is no doubt that the impacts of anthropogenic-derived climate change are a source of near-term risk, but it is only one source among many. To achieve a successful transition, social licence needs to be in support of projects which achieve intended goals, or reliance on energy needs to fall or a combination of the two. The courts have taken a nuanced approach to all types of

claims, so the approach of setting precedent in the climate change arena within energy systems, as defined in this piece, appears to be an expensive and ineffective route to take. The courts have highlighted their role in fact finding and applying the law as written, distancing themselves from the inherent political decision making required in the transition to a low carbon economy. Although rulings such as Thomson v the Minister for Climate Change has demonstrated willingness for greater exertion of powers in the future as 2050 deadlines approach.

Energy supply shortages internationally and in New Zealand winter 2021 and 2022 have demonstrated that sustainability is likely see greatest compromise in the event of supply short falls. There is a growing global trend of using increasing volumes of higher carbon emitting fossil fuels to bridge supply deficits in favour of protecting energy equity. As such it is important to ensure that sufficient renewable generation capability and appropriate policy settings are in place to protect energy equity especially. Protecting energy equity may slow decarbonisation efforts, however, it will ensure public support for the transition. This sentiment is reflected in the New Zealand Government low emissions future for Aotearoa strategy[232] which finds "*moving too slowly [in the transition] will push the burden of addressing climate change onto young people and future generations".*[233] However, *"moving too fast will result in impacts such as unnecessary job loss, and risk of lost businesses and industries which may have been able to adapt if sufficient time was allowed*".[234] As was demonstrated in the winter of 2021/2022, and ongoing cost of living crisis there are immediate equity challenges but also risks undermining public support for the transition which may further delay the transition. If energy accessibility is impacted through the transition, energy equity and security is undermined and ultimately sustainability and emissions reduction goals will be

[232] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[233] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

[234] Ministry of Climate Change "Te hau mārohi ki anamata - Towards a productive, sustainable and inclusive economy – Aotearoa New Zealand's first emissions reduction plan" (June 2022) the New Zealand Government. At chapter 11. Available online.

too. To achieve this New Zealand's energy transition must be well planned, signalled and provided sufficient support to maximise performance in energy trilemma metrics, but also to ensure progress is made against decarbonisation goals.

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Appendix 1 – New Zealand Energy Data Summary 1990-2021

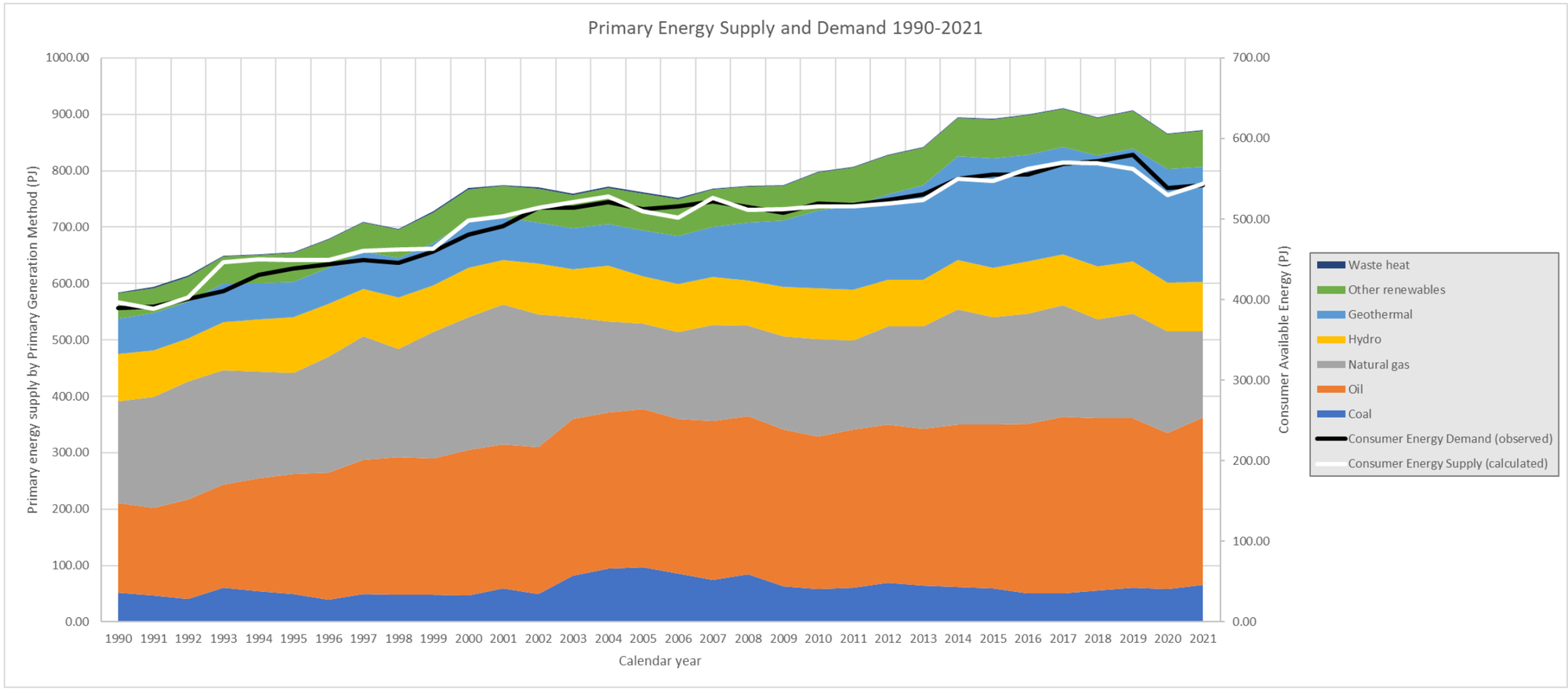
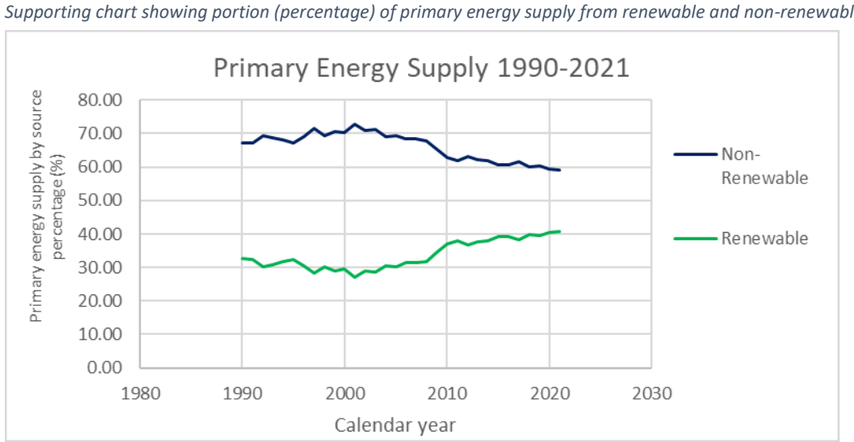


Figure 1 – Chart summarising energy in New Zealand. The primary axis shows energy supply by primary generation method in PJ, where relevant conversion to petajoules has been undertaken using fuel calorific value. Energy supply capability has generally increased since 1990 with largest increase in gross production seen in oil and geothermal volumes Other renewable sources (solar, wind, biofuels) as a portion of energy supply has slightly increased since 1990. Hydro-power and natural gas contributions have slightly declined as a portion of the energy supply. Gas is expected to substantially decrease year on year into the future.

The secondary axis shows the relationship between consumer energy supply and demand, in 1990 New Zealand's energy supply generally exceeded energy demand, however since the mid-2000's energy demand has exceeded supply.

Supporting data are provided in the table on the following page. Data Sourced from The Ministry of Business Innovation and Employment – Energy In New Zealand Page: https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-publications-and-technical-pa pers/energy-in-new-zealand/

Supporting chart showing portion (percentage) of primary energy supply from renewable and non-renewable sources between 1990 and 2021...



New Zealand Energy Overview

All values given in PetaJoules (PJ)

Converted into Petajolues using Gross Calorific Values where relevant

For more information about this data and its source refer to the inventory on the Ministry of Business, Innovation and Employment, Energy in New Zealand website:

https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-publications-and-technical-papers/energy-in-new-zealand/

Notes:

The amount of primary energy supply, energy transformation, and energy consumption is given in petajoules, where necessary conversion to petajoules using gross calorificvalues where relevant

	Calendar Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Domestic Energy Production by Primary Generation Method	Coal	52.22	46.71	40.04	60.08	54.82	49.55	39.49	49.30	48.73	48.16	47.32	59.50	48.83	81.95	94.38	96.77	85.41	74.06	84.26	62.94	58.40	60.67	69.42	64.95	61.34	59.85	50.47	50.98	55.84	60.28	58.14	65.14
	Oil	158.65	156.03	177.73	183.88	199.53	212.23	225.63	238.40	243.54	242.00	257.06	255.14	260.70	277.94	276.59	281.10	274.31	281.99	280.27	278.30	270.17	281.11	280.37	277.36	288.77	289.54	301.07	312.55	304.99	301.39	277.23	296.91
	Natural gas	180.60	196.50	208.55	203.01	189.51	179.01	204.41	219.09	191.74	224.41	236.16	248.44	236.23	180.30	162.03	150.99	154.81	170.25	160.63	165.16	173.46	157.16	173.98	181.12	204.52	190.73	194.92	197.79	175.51	185.01	179.49	153.44
	Hydro	*83.46*	*82.41*	*75.93*	*84.57*	*93.00*	*99.12*	*94.25*	*83.72*	*91.14*	*82.50*	*87.96*	*78.04*	*89.53*	*85.03*	*98.05*	*83.97*	*84.86*	*85.10*	*80.44*	*87.17*	*89.01*	*90.39*	*82.42*	*82.90*	*87.54*	*88.30*	*93.36*	*90.62*	*94.51*	*92.15*	*87.35*	*87.24*
	Geothermal	62.49	65.60	65.10	68.43	63.99	63.07	64.14	66.62	70.54	74.84	82.01	76.31	73.16	73.41	74.12	81.52	84.81	88.81	102.43	117.98	138.75	148.46	152.55	168.16	184.01	193.40	188.97	190.48	196.39	200.98	200.69	203.68
	Other renewables	44.81	44.89	44.68	47.61	49.33	50.76	49.59	51.02	49.46	54.17	56.79	56.03	59.62	58.27	64.14	65.15	65.79	66.84	63.50	62.03	67.07	68.17	68.78	66.89	67.22	69.14	69.60	67.26	66.26	65.68	62.09	64.67
	Waste heat	1.61	1.61	1.61	1.61	1.61	1.61	1.62	1.61	1.61	1.61	1.61	1.21	2.39	2.17	2.13	1.95	1.83	1.36	1.44	1.37	1.47	1.19	0.91	1.14	1.22	1.26	1.31	1.19	1.27	1.17	1.02	1.11
	Total	**583.83**	**593.75**	**613.63**	**649.18**	**651.80**	**655.35**	**679.13**	**709.76**	**696.76**	**727.70**	**768.91**	**774.67**	**770.46**	**759.07**	**771.45**	**761.44**	**751.82**	**768.40**	**772.97**	**774.96**	**798.31**	**807.16**	**828.44**	**842.52**	**894.60**	**892.22**	**899.70**	**910.89**	**894.76**	**906.66**	**866.01**	**872.18**
Domestic Energy Production by Type	Non-renewable (coal, oil and natural gas)	391.47	399.24	426.32	446.97	443.86	440.79	469.53	506.79	484.01	514.57	540.53	563.07	545.76	540.19	533.01	528.86	514.53	526.30	525.16	506.40	502.02	498.94	523.78	523.43	554.62	540.12	546.46	561.33	536.34	546.68	514.87	515.48
	Renewable (hydro, geothermal, other)	190.76	192.90	185.70	200.60	206.33	212.95	207.98	201.36	211.14	211.52	226.76	210.39	222.31	216.71	236.31	230.64	235.46	240.74	246.36	267.19	294.82	307.03	303.75	317.95	338.76	350.84	351.93	348.36	357.15	358.81	350.13	355.59
	Waste heat	1.61	1.61	1.61	1.61	1.61	1.61	1.62	1.61	1.61	1.61	1.61	1.21	2.39	2.17	2.13	1.95	1.83	1.36	1.44	1.37	1.47	1.19	0.91	1.14	1.22	1.26	1.31	1.19	1.27	1.17	1.02	1.11
	Total	**583.83**	**593.75**	**613.63**	**649.18**	**651.80**	**655.35**	**679.13**	**709.76**	**696.76**	**727.70**	**768.91**	**774.67**	**770.46**	**759.07**	**771.45**	**761.44**	**751.82**	**768.40**	**772.97**	**774.96**	**798.31**	**807.16**	**828.44**	**842.52**	**894.60**	**892.22**	**899.70**	**910.89**	**894.76**	**906.66**	**866.01**	**872.18**
Total Energy Supply by Source	Indigenous Production	523.26	549.20	558.87	582.46	564.76	564.73	610.96	643.88	589.21	623.73	641.22	645.57	655.24	593.05	589.11	571.22	587.91	630.41	665.27	677.20	738.27	704.10	700.31	702.55	741.07	724.37	703.25	691.67	671.97	679.68	652.59	631.05
	Imports	169.64	176.39	168.95	185.56	208.51	217.04	232.78	239.90	262.10	275.88	268.60	272.60	289.52	314.65	331.05	335.13	337.84	339.82	339.84	332.55	319.40	330.29	331.50	350.43	346.27	351.04	378.73	388.96	388.60	384.49	329.55	332.03
	Exports	73.55	93.51	75.27	86.28	93.27	88.15	113.99	128.15	114.69	125.29	112.04	117.61	121.35	115.41	97.20	108.65	120.63	144.22	207.27	183.26	191.50	176.92	168.81	146.07	147.65	146.61	118.01	109.07	98.18	100.62	75.96	73.99
	Stock Change	1.68	6.34	8.27	0.92	(9.63)	(0.98)	11.92	6.61	(0.81)	7.19	(7.64)	(13.63)	12.49	(7.72)	9.03	(11.77)	7.34	10.69	(24.70)	5.47	19.70	0.99	(15.25)	14.85	(5.42)	(17.44)	3.36	(5.49)	(2.27)	(13.46)	9.38	(1.24)
	International Transport	33.85	31.99	30.66	31.64	37.83	39.25	38.71	39.26	40.69	39.44	36.50	39.52	40.45	40.93	42.48	48.03	45.95	46.91	49.57	46.06	48.16	49.32	49.81	49.55	50.51	54.03	60.91	66.15	69.90	70.35	30.80	18.15
	Total Primary Energy Supply	**583.83**	**593.75**	**613.63**	**649.18**	**651.79**	**655.34**	**679.12**	**709.75**	**696.75**	**727.68**	**768.91**	**774.67**	**770.46**	**759.07**	**771.45**	**761.44**	**751.82**	**768.40**	**772.97**	**774.96**	**798.31**	**807.16**	**828.44**	**842.52**	**894.60**	**892.22**	**899.70**	**910.89**	**894.76**	**906.66**	**866.01**	**872.18**
Transformation and Losses	**Energy transformation**	**-162.51**	**-175.18**	**-183.25**	**-173.21**	**-165.05**	**-159.22**	**-171.39**	**-188.56**	**-177.26**	**-199.96**	**-198.10**	**-208.63**	**-189.24**	**-202.84**	**-201.23**	**-228.82**	**-222.78**	**-215.17**	**-229.41**	**-226.11**	**-247.71**	**-254.78**	**-264.75**	**-267.21**	**-272.43**	**-279.83**	**-262.93**	**-266.24**	**-263.74**	**-274.89**	**-275.69**	**-273.60**
Non-energy Use	**Non-energy Use**	**-24.53**	**-29.76**	**-27.38**	**-29.44**	**-36.66**	**-46.83**	**-58.39**	**-60.92**	**-57.12**	**-64.08**	**-72.64**	**-62.52**	**-66.79**	**-35.00**	**-42.45**	**-22.83**	**-26.84**	**-26.75**	**-31.86**	**-36.76**	**-35.13**	**-36.92**	**-44.11**	**-51.83**	**-72.15**	**-65.36**	**-74.67**	**-74.52**	**-61.86**	**-69.78**	**-60.90**	**-54.95**
	Total Consumer Energy Supply (calculated)	**396.79**	**388.80**	**403.00**	**446.53**	**450.09**	**449.30**	**449.35**	**460.28**	**462.36**	**463.65**	**498.17**	**503.53**	**514.44**	**521.23**	**527.77**	**509.79**	**502.20**	**526.47**	**511.70**	**512.09**	**515.47**	**515.45**	**519.57**	**523.47**	**550.01**	**547.02**	**562.10**	**570.12**	**569.16**	**561.99**	**529.42**	**543.63**
Domestic Energy Demand by Sector	**Agriculture, Forestry and Fishing (combined)**	**20.76**	**19.19**	**20.83**	**21.15**	**22.31**	**23.36**	**24.11**	**26.06**	**27.11**	**27.94**	**27.12**	**27.89**	**29.91**	**31.53**	**28.91**	**31.36**	**32.27**	**32.01**	**31.61**	**28.75**	**27.23**	**28.38**	**31.11**	**33.10**	**32.25**	**31.09**	**29.35**	**28.39**	**27.82**	**32.24**	**33.08**	**31.07**
	Agriculture	14.20	14.11	14.16	14.64	15.56	16.22	16.40	17.38	17.29	17.94	18.19	19.24	20.83	21.61	21.81	23.59	25.21	25.10	24.77	21.81	20.82	22.02	24.52	26.55	25.99	25.55	24.43	24.35	23.11	26.71	27.46	25.65
	Forestry and Logging	0.62	0.63	1.01	1.19	1.11	1.33	1.28	1.28	1.28	1.46	1.75	1.99	1.81	1.71	1.66	1.68	1.82	2.09	1.93	1.98	1.79	1.86	1.99	2.43	2.13	2.19	1.99	2.01	1.84	2.40	2.22	2.23
	Fishing	5.95	4.45	5.65	5.32	5.64	5.81	6.44	7.40	8.54	8.55	7.18	6.66	7.26	8.21	5.44	6.09	5.24	4.82	4.91	4.96	4.62	4.49	4.58	4.07	4.13	3.34	2.93	2.03	2.87	3.12	3.40	3.18
	Industrial (combined)	**149.26**	**152.67**	**155.48**	**162.16**	**166.52**	**164.07**	**167.02**	**164.63**	**157.19**	**162.50**	**174.22**	**180.14**	**193.09**	**178.54**	**179.32**	**166.65**	**164.66**	**170.67**	**165.75**	**161.81**	**172.88**	**170.17**	**174.21**	**180.00**	**193.99**	**191.10**	**192.70**	**191.42**	**190.51**	**197.60**	**177.56**	**171.66**
	Mining	2.34	2.47	3.37	3.78	3.72	4.35	4.25	4.16	3.77	3.58	4.10	4.38	4.56	4.65	4.53	4.75	5.02	5.63	6.04	6.53	5.78	5.89	6.30	7.34	5.79	5.99	5.79	6.41	6.03	7.50	6.89	7.01
	Food Processing	24.47	24.68	24.32	25.05	26.12	26.63	26.56	27.69	27.16	26.13	25.34	26.28	27.98	28.09	29.15	29.52	27.96	30.46	29.19	30.09	37.18	36.13	37.90	35.93	38.97	42.84	39.30	41.68	46.69	48.64	46.42	45.19
	Textiles	2.22	2.15	2.11	2.23	2.31	2.25	2.28	2.30	2.18	2.19	2.07	1.98	2.03	1.92	2.00	1.92	1.68	1.55	1.47	0.98	0.96	0.83	0.76	0.88	1.00	0.98	0.90	0.82	1.01	1.23	0.90	0.95
	Wood, Pulp, Paper and Printing	25.67	17.63	17.05	18.11	18.44	18.91	18.30	18.73	17.67	19.18	20.34	20.42	21.39	19.53	22.50	21.93	20.06	18.87	18.15	18.63	18.99	19.16	18.37	14.41	14.15	14.15	13.91	15.00	39.14	37.99	32.31	30.02
	Chemicals	37.37	38.66	40.32	40.34	41.57	39.19	40.25	35.99	33.18	36.10	41.12	37.83	41.81	23.24	22.16	12.46	13.81	13.93	16.79	22.45	21.40	21.49	25.36	30.90	42.62	37.30	42.74	38.64	35.01	37.45	34.37	28.65
	Non-metallic Minerals	6.26	5.13	3.58	5.96	6.63	7.62	6.76	7.20	6.85	6.93	6.95	6.95	7.04	7.11	7.11	7.48	7.02	8.24	7.49	5.82	5.90	5.48	5.95	9.40	8.10	7.31	5.50	5.86	6.17	7.28	3.69	5.17
	Basic Metals	22.68	24.04	22.07	23.72	23.82	23.46	24.84	25.15	25.67	26.06	25.68	26.05	25.83	26.32	27.69	27.44	26.95	27.73	25.70	23.08	27.30	27.81	26.67	28.30	27.34	26.08	25.60	25.66	25.55	26.39	25.00	23.96
	Mechanical/Electrical Equipment	1.93	1.73	1.90	2.12	2.31	2.38	2.38	2.12	1.94	1.83	1.90	2.05	2.03	1.82	1.81	1.79	1.87	1.61	1.51	1.21	2.05	2.16	2.25	2.25	1.27	0.97	0.90	0.79	0.76	0.74	0.77	0.75
	Building and Construction	3.89	3.60	3.72	4.01	4.47	4.68	4.72	4.63	4.21	4.28	4.02	4.08	4.49	5.02	5.45	5.57	5.28	4.60	5.04	5.13	4.49	4.61	4.80	4.76	5.34	5.58	6.51	7.97	8.98	9.75	8.19	9.40
	Unallocated	22.44	23.91	27.13	25.44	24.26	20.71	22.23	21.05	20.04	17.53	23.11	27.96	28.51	32.73	27.02	24.72	26.39	29.95	29.64	25.97	23.84	21.97	20.85	22.27	25.71	24.88	25.81	23.36	21.15	20.61	19.02	20.56
	Commercial	**34.81**	**35.20**	**36.94**	**32.90**	**37.16**	**36.66**	**35.65**	**37.22**	**37.67**	**38.61**	**39.94**	**39.87**	**41.39**	**43.87**	**47.34**	**48.46**	**48.99**	**49.21**	**48.59**	**47.92**	**48.44**	**47.96**	**50.91**	**50.92**	**51.82**	**53.32**	**52.84**	**53.32**	**53.24**	**56.77**	**54.32**	**54.96**
	Transport	**119.58**	**118.96**	**124.07**	**130.36**	**139.79**	**148.88**	**150.40**	**153.84**	**156.63**	**160.50**	**167.93**	**169.29**	**175.83**	**183.23**	**187.58**	**188.73**	**190.70**	**192.19**	**192.04**	**189.15**	**192.68**	**192.55**	**187.71**	**188.95**	**192.69**	**199.65**	**201.77**	**214.96**	**219.59**	**212.59**	**191.25**	**200.82**
	Residential	**64.78**	**65.32**	**64.05**	**64.04**	**65.11**	**65.45**	**66.84**	**67.59**	**67.38**	**70.06**	**71.94**	**74.21**	**74.21**	**76.52**	**77.98**	**76.94**	**79.60**	**78.20**	**76.84**	**80.15**	**77.87**	**78.06**	**79.54**	**78.15**	**78.91**	**80.07**	**78.62**	**80.12**	**80.90**	**80.75**	**82.12**	**83.39**
	Total Consumer Energy Demand	**389.19**	**391.34**	**401.37**	**410.60**	**430.89**	**438.42**	**444.03**	**449.34**	**445.98**	**459.61**	**481.14**	**491.39**	**514.44**	**513.68**	**521.13**	**512.15**	**516.21**	**522.28**	**514.83**	**507.77**	**519.10**	**517.12**	**523.48**	**531.11**	**549.65**	**555.22**	**555.28**	**568.22**	**572.05**	**579.95**	**538.33**	**541.89**
	Difference Between Supply and Demand	**7.60**	**-2.54**	**1.63**	**35.93**	**19.20**	**10.88**	**5.33**	**10.93**	**16.38**	**4.04**	**17.03**	**12.13**	**0.00**	**7.55**	**6.64**	**-2.36**	**-14.01**	**4.19**	**-3.13**	**4.32**	**-3.64**	**-1.67**	**-3.91**	**-7.64**	**0.36**	**-8.20**	**6.82**	**1.91**	**-2.89**	**-17.96**	**-8.91**	**1.73**

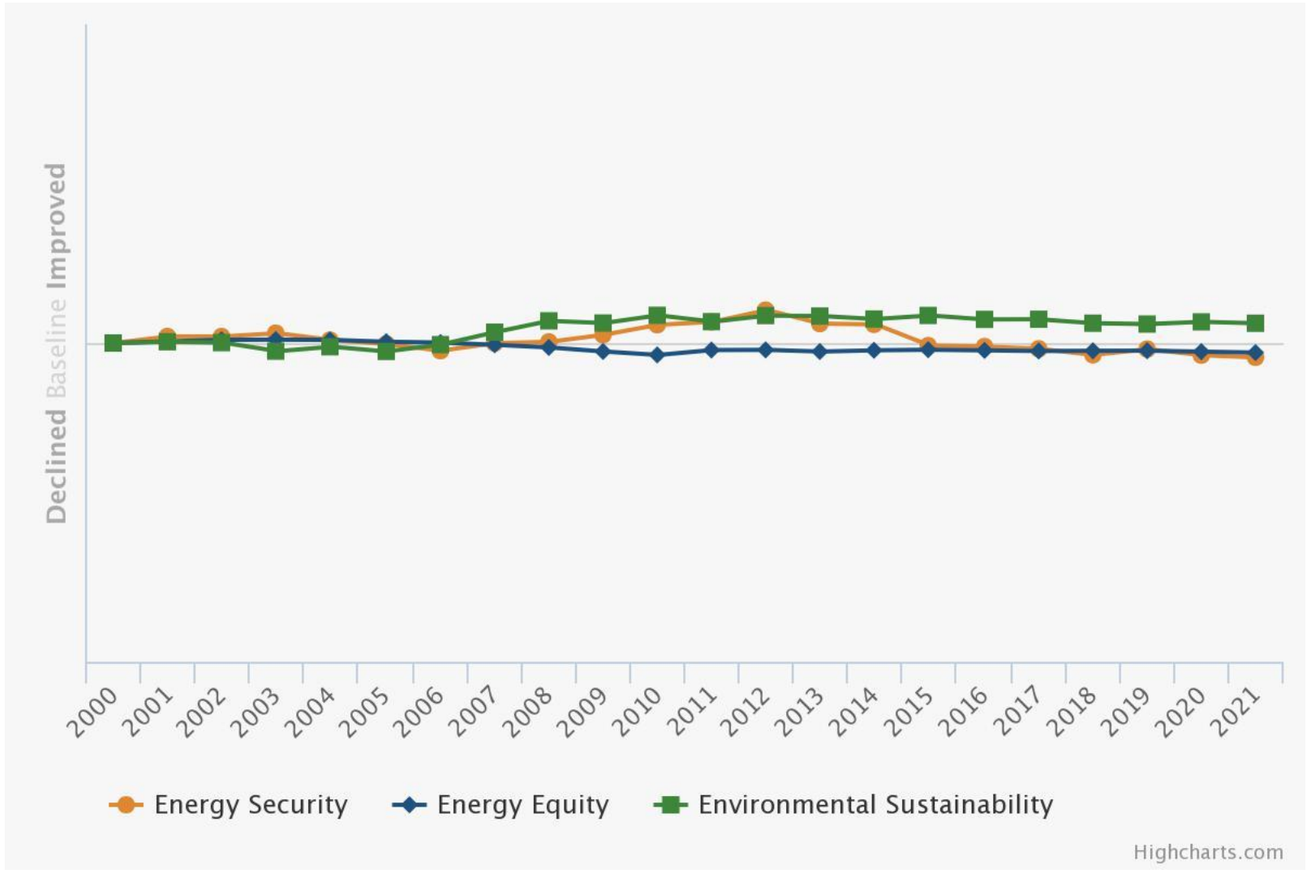
New Zealand's Greenhouse Gas Inventory published in 2021

Time series emissions data 1990 to 2019

For more information about this data and its source refer to the inventory on the Ministry for the Environment's website:
https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2019/
Notes:
All gases are expressed in kt CO_2 equivalent. CO_2 equivalent determined using global warming potentials and as stated in the Intergovernmental Panel on Climate Change's Fourth Assessment Report
Negatives represent removals from the atmosphere, while positives represent emissions to the atmosphere
To navigate, use the [+] or [-] controls in the left-hand margin to expand or close the groups.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Related Emissions in kilotonnes carbon dioxide equivalent (kt CO2-e)	23744.53	24126.11	25972.45	25397.99	25682.85	25668.79	27148.94	29059.82	27532.06	28976.76	29779.45	31790.78	31811.41	33227.47	32845.81	34313.98	34597.83	33305.38	34758.75	32072.54	32057.51	31300.18	32816.53	32025.91	32124.13	32527.83	31040.41	32600.49	32551.92	34263.06

Appendix 2 – World Energy Council trilemma index – New Zealand performance 2000-2021



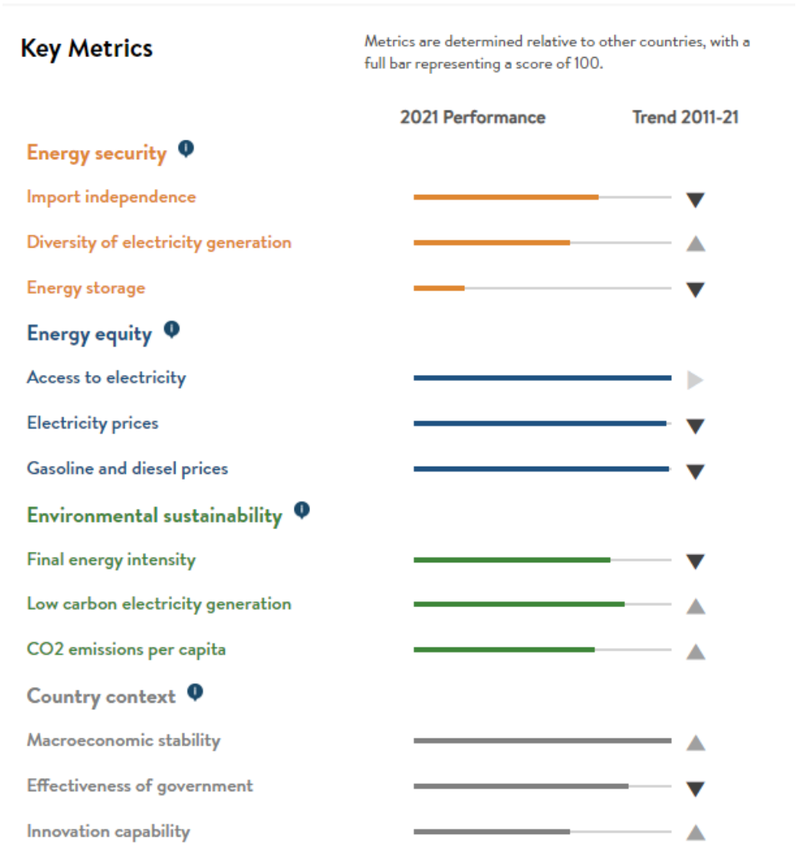


Figure 2 - Trend lines track New Zealand's energy trilemma index performance in each dimension (security, equity, and sustainability). Baseline year is taken at the year 2000 – all metrics are normalised to zero as at the year 2000. Points above the baseline indicate a relative improvement of performance, points below indicate a relative decline.

Compile from the World Energy Council (2022) https://trilemma.worldenergy.org/#!/country-profile?country=New%20Zealand&year=2021