Submission by

to the

Ministry of Transport

on the

Green Paper:
Hīkina te Kohupara – Kia mauri ora ai te iwi - Transport Emissions: Pathways to Net Zero by 2050

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GREEN PAPER: TRANSPORT EMISSIONS – PATHWAYS TO NET ZERO BY 2050
SUBMISSION BY BUSINESSNZ ENERGY COUNCIL[1]

INTRODUCTION

1. The BusinessNZ Energy Council (the 'BEC') is pleased to have the opportunity to provide a submission to the Ministry of Transport (referred to as 'the Ministry') on its Green Paper: Hīkina te Kohupara – Kia mauri ora ai te iwi – Transport Emissions: Pathways to Net Zero by 2050, published in May 2021 (referred to as 'the paper').

2. The BEC is a group of New Zealand energy sector organisations taking a leading role in creating a sustainable, affordable, and secure energy future for all New Zealanders. BEC is a division of BusinessNZ, New Zealand's largest business advocacy body and a member committee of the World Energy Council (WEC).

3. BEC members are a cross-section of energy businesses, government, and research organisations. Together we seek to shape the energy agenda for New Zealand.

4. With transport responsible for almost half New Zealand's total domestic CO_2 emissions, we do not underestimate the challenges ahead and welcome the Ministry's paper on how to accelerate transport emission reductions.

5. This submission provides some general, as well as some detailed, comments on the Ministry's consultation questions.

6. Given the diversity of our membership, some members will have specific issues which they may wish to comment on in more detail. Therefore, we have encouraged individual members to make their own submissions raising issues specific to their areas of expertise.

GENERAL COMMENTS

7. **Role of Business in achieving a 'net' zero emissions future:** We support the objective of transitioning New Zealand to a 'net' zero emissions future. We do not see emissions reduction targets as solely government targets, but rather as the basis for a partnership between government and all society's actors who, in order to achieve those targets, will need to commit capital, take risks and change how they behave.

8. **Flexibility and stability can be friends:** There is no 'one-size-fits-all' policy solution for the transport system as it cuts across the entire economy and effective change may require multiple, unique means of transition. Nevertheless, stable market

[1] Background information on BusinessNZ Energy Council (BEC) is attached as Appendix One.

frameworks create a good place for business to invest. Unfortunately, growing uncertainty, combined with rapidly evolving technology in the drive to decarbonise, create not just opportunities but also risks, with implications across the whole transport value chain. Now more than ever, long-term policy coherence, yet allowing for flexibility on our way to carbon zero, will be crucial for an inclusive, cleaner, and resilient transport system.

9. **A transport trilemma framework might be useful:** The energy trilemma[2] enables us to take a holistic approach to improving energy-system-related policy. The multidimensional framework that considers sustainability, equity, and security simultaneously, helps decision-makers navigate towards a more balanced energy transition. A similar framework could be implemented for our transport system to give effect to the Government Policy Statement on Land Transport 2021/22-2030/31, strategic priority 4: *"Transforming to a low carbon transport system that supports emissions reductions aligned with national commitments, while improving safety and inclusive access".* This kind of framework is more direct and better focused on outcomes than the themes approach used in the paper.

10. **A market-led approach:** Furthermore, we think the ETS should be allowed to do its job and other interventions should follow only where there is a clearly articulated positive net benefit. Any additional policies should focus on outcomes and promote efficiency. Those should not involve specific regulation that disincentivises innovation or picks winners but instead allowing market participants to choose the least cost option(s) that best meet their unique circumstances.

CONSULTATION QUESTION 1 & 2: PRINCIPLES AND THE ROLE OF GOVERNMENT

11. **Systems-level approach:** We support the Ministry's Principle 4 *"Co-ordinated action is required across the transport system to avoid and reduce emissions".*[3] Siloed thinking risks unintended consequences and poorly allocated resources, made worse by not explicitly focusing on costs and benefits. The principles should acknowledge this. Interconnectivity between the energy and transport markets is already emerging, and throughout the economy the carbon price is binding decision-making together.

12. We agree with the Ministry's view that "*there is a very close relationship between transport and energy. The shift to cleaner fuels in the transport system will have significant implications for the energy sector. In particular, the shift towards electric vehicles will significantly increase the demand for electricity (which needs to come from renewable energy sources), as well as the capacity for electricity storage. Increasing demand for biofuels will also affect the energy sector. If hydrogen is used*

[2] New Zealand remains in top 10 for energy balance - BusinessNZ Energy Council (bec.org.nz)

[3] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 10

for transport, this will also impact the electricity system (if electricity from renewable sources is used to produce the hydrogen)."[4]

13. **Collaboration between government and the private sector:** Many of the actions New Zealand must take to achieve emissions budget levels will be made by the private sector. Businesses will have to change their behaviour, make new investments with different criteria, and take the commercial risk that will arise from the quest to meet the emissions budgets.

14. A vision for New Zealand should represent an informed, sequenced, and holistic approach, developed jointly by the relevant government agencies, the private sector and the relevant communities. The most value to New Zealand will be gained by using this model to move boldly and smartly together to engage effectively with many diverse stakeholders during the energy and transport system transition.

15. **Market-led approach:** There are several clean fuel options and emerging vehicle technologies that could address current environmental concerns. We agree with Ministry's Principle 3 *"We need to take a strategic approach to reducing transport emissions"* .

16. We believe that a strategic approach to decarbonising the transport sector is important, however, we must be wary of `betting the house' on any one technology. The Government should be careful about picking winners. Robust trialling, piloting, and clear policy frameworks will level the playing field for technology development and adoption and help increase our options in the face of uncertainty. As mentioned earlier in this submission, we think the ETS should be allowed to do its job and other interventions should follow only where there is a clearly articulated positive net benefit.

17. **The role of Government:** The Government should focus on creating on an outcome-based regulatory environment that enables the private sector to innovate and forge a market-led path to 2050. It is vital that we allow for flexibility on how to decarbonise the New Zealand economy. The Government should not be too prescriptive.

18. We agree with the Ministry's view that "*Analytics and modelling plays a key role in understanding the expected effects of different measures on emissions outcomes, and the interactions between different transport and other non-transport measures."*[5]

19. The prospect of increasing complexity suggests caution in designing policy frameworks. More transparency is required. To address this increased complexity, for some time now, the BEC has collaborated with businesses, academia, and government

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[4] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 21-22

[5] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 26

on a continuous basis to further develop and improve the New Zealand Energy Scenarios – TIMES-NZ 2.0.

20. The purpose of this ongoing project is to provide the public and private sectors with a robust but explorative analysis to get a better idea of how our future energy supply and use might look and test the range of trade-offs and choices we might make along the way.

21. While most modelling defines a destination, indicating what needs to change to get there, our scenarios explore the 'what-if stories' rather than the 'what-musts'. TIMES is an economic model that is built around comparing fuels and technologies to achieve the lowest cost option. It does not consider taxes, charges, or levies such as the Road User Charges (RUC) in the Total Cost of Ownership. The model does however include a carbon price.

22. Throughout the project we have been grateful for the input of organisations across the sector, including input from the Ministry. This continuous collaboration is important to us.

CONSULTATION QUESTION 3: ENCOURAGING EMISSION REDUCTIONS IN TRANSPORT

23. In general, we strongly caution the Ministry against being too prescriptive on the de-carbonisation options for different transport uses. We would like the tone of the Ministry's advice to be technologically neutral and to focus much more on a transport sector that is able to adapt to change in the face of uncertainty.

24. We would like the Ministry to focus on opportunities and increasing options, and to give more clarity to how trade-offs can be made between these various options for transport decarbonisation, and the cost implications of such decisions. Typically, marginal abatement costs (MACs) are used to determine least-cost abatement options. The following will provide the Ministry with some suggestions for further improvement.

The role of flexible working arrangements

25. The role of flexible working arrangements and working from home to reduce transport emissions could be further explored by the Ministry. In its final advice the Climate Change Commission (CCC) encourages higher rates of working from home and flexible work arrangements to reduce travel demand and associated emissions (see CCC recommendation 17 and 24).

26. We agree with the Ministry that the *"The use of data, information and communication technologies holds another key opportunity for substituting physical travel in cities with digital communication and virtualisation. This means less commuting and more flexible working arrangements such as working from home or community 'satellite*

offices'. Data, analytics and digital innovation also have a significant role in transitioning the transport system to low emissions."[6]

27. The application of ICT is already having a significant impact on logistics i.e., the efficiency of freight movements. Optimised deliveries are one example, another is the use of online shopping. These trends will continue with improving virtualisation likely to increase confidence in retail purchases; developments in the first and last km using more flexible transport modes (e.g., drones) overcoming congestion and speeding up fulfilment; the Internet of Things enabling intelligent consignments to optimise their own routes making use of transport infrastructure much better optimised to that task etc. Even 3D printing and flexible manufacturing are helping to reduce the transport component in products. This is an area that would benefit from more analysis of its potential for New Zealand on the timeframes being considered.

28. However, while the Ministry refers to flexible working arrangements as an outcome of improved transport systems, we suggest that more work could be done on how flexible working arrangements can contribute to emissions reduction (as a driver rather than an outcome). Encouraging remote working would be a good, least cost option for achieving net zero emissions, particularly for employees in larger cities.

29. Encouraging the uptake of remote work might also be a lever to avoid or defer congestion charging. Some of our members, for example Contact Energy[7] and Flux Federation[8] have recently showcased the positive impact of flexible working arrangements not just on reducing emissions but also on reducing hours of travel with consequently a positive impact on productivity. Both show commute related emissions reduction between 70-75%.

30. Although we support in principle the advice on encouraging working from home arrangements, such decisions need to consider the social and wellbeing impacts of reduced social interaction. Policies may be required to facilitate the development of localised co-working spaces to mitigate the loss of social interaction, and to help build a sense of community and social connectedness. We also need to think of long-term impact on commercial leasing with more people working from home. or employers, there are also health and safety implications since it is employers' responsibility to ensure their employees have a safe working environment.

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[6] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 31

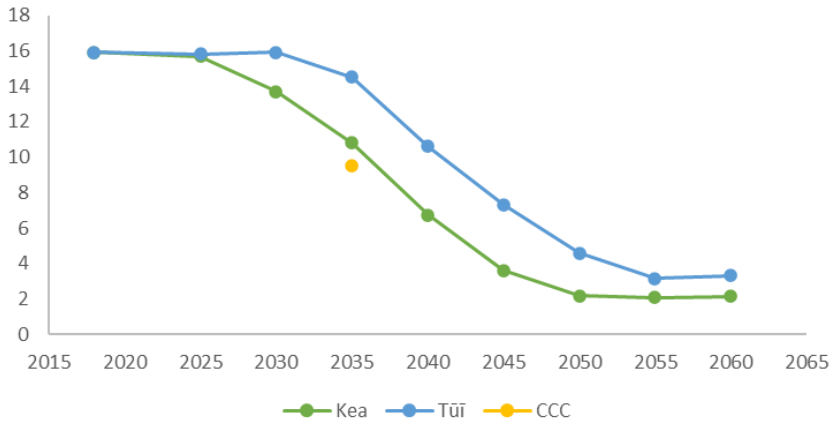
[7] Contact Energy's Transformation Ways of Working (TWOW)

[8] How we saved money and cut carbon emissions by going remote-first (fluxfederation.com)

Pace of EV uptake and decarbonisation of our transport system

31. The TIMES-NZ model shows transport emissions falling dramatically in line with the fall in fossil-fuelled road transport by 2050. In Kea and Tūī, the residual emissions are from marine and aviation transport. The final advice of the CCC suggests that transport emissions must fall around 40% by 2035 to keep us on track. By comparison, in our model, Kea transport emissions fall 33% by 2035 and 11% in Tūī – see Figure 1.

Figure 1: Transport Emissions (Mt CO_2-e)



32. The steeper reduction in Kea's transport emissions is driven by a faster uptake of EVs and lower growth in vehicle numbers compared with Tui. Emissions begin to fall immediately as the emissions from internal combustion engines fall as electric and hybrid vehicle uptake accelerates and slowly transport modes change in overall vehicle-kilometers travelled. Hybrid vehicles act as a transition technology, peaking in 2030 before reducing to zero by 2050. Both internal combustion and hybrid vehicle emissions drop to zero by 2050. In Tūī, overall emissions remain steady to 2030. This plateau in Tūī is attributed to the reduction in emissions from electric and hybrid vehicles being offset by the increasing vehicle fleet. There are more than double the emissions from hybrid vehicles in Tūī compared with Kea as these are more widely adopted in Tūī due to carbon price, technology costs and performance assumption differences between the two scenarios.

33. We note that the CCC's chosen path to 2035 is more ambitious than our most ambitious scenario, Kea. The CCC's final advice suggests that 36% of light vehicles will be electrified by 2035 (with a carbon price of \$160/tCO_2-e). Kea reaches 34% of the light vehicle fleet electrified by 2035 (\$120/tCO2-e), and Tui 13% (\$60/tCO2-e). Furthermore, the CCC suggests that 50% of our light vehicle imports will made up of EVs by 2029, in Kea this would be 40% and in Tui 20%. The decarbonisation of the transport sector relies heavily on the switch from ICE to BEV light vehicles, yet we see real risks in securing the EV supply the CCC trajectory relies on. This may potentially mean higher marginal abatement costs, thus affecting long-term GPD.

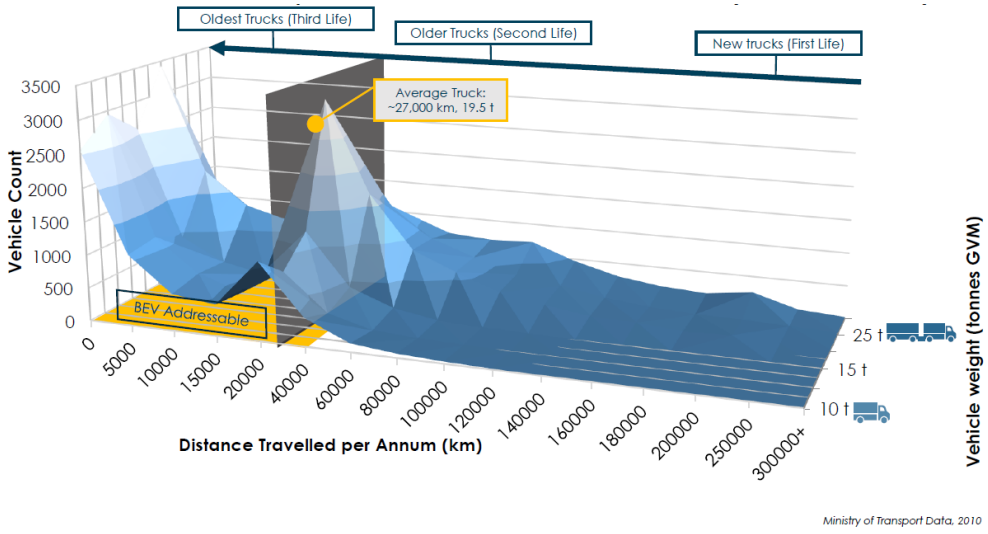
34. While we are not disputing the CCC's estimates, we would like the Ministry to ensure all key risks that come with greater ambition have been uncovered so that all actions fully take account of costs, benefits, and potential trade-offs. What are the low-cost options and what needs to be done to make sure they are available?

Further modelling opportunities

35. We have noted that the Ministry's current model combines all heavy trucks (>10 tonne) in a single technology group. However, the heaviest trucks (up to 50 tonnes) travel the longest distances and contribute by far the most emissions and therefore, an average-based approach might not consider the real spread of emissions. For immediate policy analysis and future model iterations this segment needs to be disaggregated to provide a more accurate emissions profile and contain a portfolio of technologies available to reduce emissions.

36. Modelling is a very useful tool when trying to understand how best to tackle heavy transport emissions. However, we need to be mindful when basing assumptions on applying averages. For example, an 'average truck' based on the 2010 Ministry of Transport dataset and often used in analysis travels ~27,000km per year, with a GVM of 19.5t – see Figure 2.

Figure 2: Vehicle count by truck size and annual distance travelled (Truck >10 t GVM)



37. This approach fails to account for the actual emissions of the different truck sub-classes and the actual lifecycle of a truck. A new truck typically enters the fleet at the high end of km service and/or payload where it can be commercially justified, it then generally goes through 3 'lives' with disproportionately high kilometres and emissions in its first 'life'. When emissions are accounted for in heavy vehicle modelling, a very different pattern emerges:

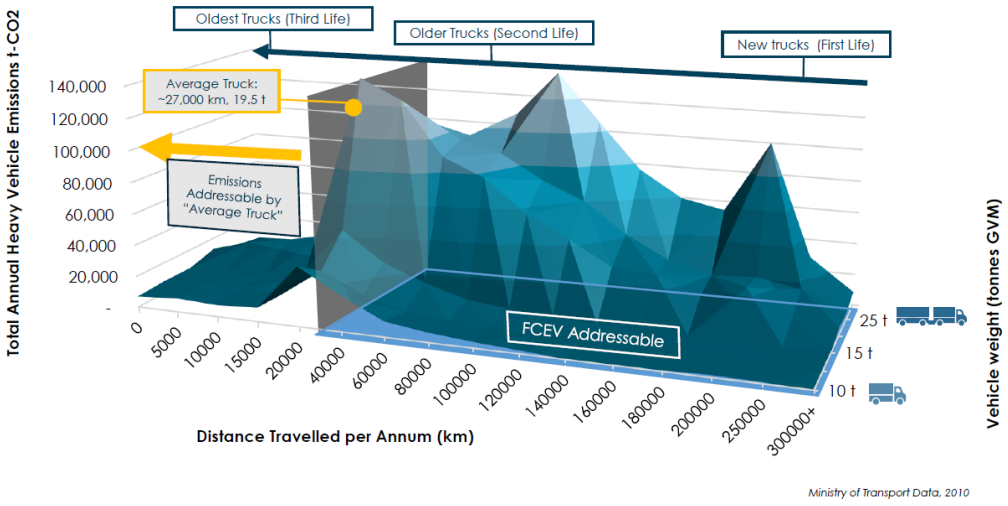
    (a) Over 80% of heavy trucking transport emissions originate from trucks that are heavier and drive further than the 'average truck'.

(b) Less than 20% of emissions addressable with a zero-emission truck based on the 'average' heavy truck.

(c) A heavy trucking decarbonisation strategy should introduce new zero emission vehicles in the 1st life and leverage the 'trickle-down' effect.

38. The bulk emissions being produced in its first and second life – see Figure 3.

Figure 3: Cumulative Emissions by truck size and annual distance travelled



CONSULTATION QUESTIONS 4 & 5: AN INTEGRATED TRANSPORT SYSTEM; MODE SHIFT

39. Changing behaviour involves a deliberate choice informed by the alternative infrastructure that might or might not be expected to become available. Although we generally agree with the CCC recommendation of improving mobility outcomes (CCC recommendation 17), the transformational element of this change needs to be highlighted more strongly.

40. We consider a shift from the historical focus on supply-side interventions (e.g., an increased supply of infrastructure) to demand response is inevitable simply because it will produce lower cost solutions that still meet user needs. Actions will potentially need to facilitate and accelerate moves to increase vehicle occupancy and provide reliable and integrated services for urban mobility through intelligent transport systems. This is a change that will require the Ministry's and others involved in the provision of transport infrastructure to rethink how New Zealand's transport system will operate, as it becomes smarter and more integrated. This kind of strategic thinking around mobility needs to be engaged in now, as capital investment decisions are being made nationally and locally. Expedience is also required as the needed behavioural change will take time to occur.

41. We also note that the Ministry acknowledges "*different approaches to managing the transport system will also be important, including how urban design and placemaking*

can be used to support emissions reductions."[9] However, while urban design options need to be taken into consideration, they are likely to take much longer to have a positive impact than changing the composition of the vehicle fleet.

42. To facilitate the above changes and to aid users to exploit them, a good understanding will be required of the factors that drive mobility choices in the New Zealand context, and how these differ by location and personal circumstances. The Ministry should commission relevant research to ensure measures designed to shift demand or modal choices are effective.

CONSULTATION QUESTION 6: THE ROLE OF PRICING

43. We agree with the Ministry that "*Transport demand management, including transport pricing, is critical for supporting more liveable cities and encouraging people to make sustainable transport choices."*[10]

44. We generally support the Ministry's idea of getting the price right by better enabling demand to be managed, particularly in respect to congestion pricing. It is important that we continue improving the pricing system for transport, so that costs associated with vehicle use are internalised along with other transport modes, whether these be public transport, cycling or walking. By providing a more direct pricing signal of the real costs of all mobility choices, such a system would create stronger incentives to support low-carbon user choices while considering individuals' and households' unique preferences.

45. For example, congestion pricing might encourage desired behaviour with fewer cars on the road at peak time, potentially resulting in a reduction in transport-related emissions. However, we agree with the Ministry that "*Transport pricing can be a strong signal to change people's behaviour, but it can have material impacts on household budgets and access to essential goods and services. It is important that we clearly understand the distributional impacts of pricing mechanisms, before imposing costs on users that could have unintended social consequences."*[11]

46. Pricing mechanisms such as congestion pricing are most effective if enough flexibility exists to avoid travel during peak hours (e.g., flexible working arrangements) and/or if alternative services are available (e.g., public transport, carpooling). There is otherwise a risk of charges adding to the household bill while the suggested reduction in traffic and emissions does not occur.

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[9] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 29

[10] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 35

[11] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 57

CONSULTATION QUESTION 7: TRANSITIONING NEW ZEALAND'S VEHICLE FLEET

Charging Infrastructure

47. As discussed earlier, to encourage the uptake of EVs, not only do we need sufficient supply volumes but also sufficient access to public charging. While there has been some good work done in building a network of publicly accessible charging sites, these are predominantly slow charging and located at places where there are limited opportunities for EV owners to avail themselves of other services while they wait for their EV to charge.

48. It will be important for EV uptake to be supported by smart charging capability. Smart charging can shift EV charging demand away from peak demand periods enabling higher network utilisation and deferring network upgrades, resulting in lower electricity prices to consumers. Electricity networks will be required to manage the associated increase in demand for electricity.

49. However, it should be noted that to time-shift the charging of a medium/heavy EV truck away from peak demand times may be impractical in most cases as there is less operational flexibility for commercial freight operations. Smart charging of medium/heavy vehicles in this way would effectively extend the charging time for these platforms, resulting in less time on the road. To fast charge a commercial medium/heavy vehicle will require chargers in the order of 1000KW, which is a significant step up from New Zealand's fastest chargers (currently around 180KW) and might require grid capacity upgrades wherever they are installed. In comparison, clean fuels refuelling station (for example hydrogen) will charge a heavy vehicle in 15 mins.

50. We support the Ministry's initiative of developing a roadmap for charging infrastructure and would like to reiterate the point made earlier of taking a system-based approach to doing so. We suggest that this development aligns with the work currently being undertaken by one of our members – Wellington Electricity.

51. As the EV uptake increases, electricity networks will be required to manage the associated increase in demand for electricity. Wellington Electricity has held multiple workshops to engage with stakeholders on how to move energy use to less congested times on the network. Discussion predominantly focussed

52. The project refers to a the *EV Connect – Draft Roadmap*[12] is co-sponsored by EECA as part of the LEVCF program. The purpose of the project is to support the EV adoption while maintaining network supply security, reliability and providing new benefits to consumers and across the electricity supply chain. Wellington Electricity found that a

[12] EV Connect - Stakeholder Consultation | Wellington Electricity (welectricity.co.nz)

small EV will increase household electricity use by 35%. As energy bills make up a larger proportion of low-income household expenses, households stand to gain a great deal from reduced energy bills.

53. The roadmap development requires collaboration across policy, standards, regulation and both the electricity and transport sectors to enable support of EV adoption in a managed way which ensures security and affordability are well managed as part of achieving sustainability. The consultation is open until 15 July.

Equitable transition

54. Actions for an equitable transition are time critical. The timeline for electrifying light passenger vehicles is ambitious and as we accelerate to reach the target, we cannot afford to turn the corner without taking due consideration of equity impacts along the way.

55. The Government must ensure that low-income households, people with disabilities, and those who live in remote areas can also benefit from electrified passenger transport. We do not want the transformation in transport to perpetuate existing inequality. Instead, we want it to be an opportunity to improve the relative position of those parts of society that have previously been disadvantaged.

Refurbishment, disposal/recycling at the end of life

56. We support a collaboration between the public and private sectors to roll out EV battery refurbishment, collection, and recycling to ensure the electrification of the fleet is sustainable. Furthermore, consumers need to understand the options and processes involved to enable good decisions to be made.

57. The disposal of cars and car parts needs overall coordination as there are many small organisations of different capacity engaged in this activity all around the country and much automobile waste ends up in landfill.

58. We should note that there is already some good work underway. The Motor Industry Association and its members have committed to a code of practice to have suitable systems in place to tackle this issue. In Addition, the Battery Industry Group (B.I.G) is working to design a 'circular' product stewardship scheme. B.I.G includes over 140 organisations across the energy, waste, transport, and battery sectors.

CONSULTATION QUESTIONS 9, 10 & 11: AVIATION, FREIGHT AND FUELS

59. Clean fuels have a role to play in helping decarbonise the transport sector where alternative options are not available in the short and medium term, e.g., heavy trucks, marine and aviation. Each clean fuel has strengths and weaknesses. Currently, electric battery technologies have weight and operational downsides, hydrogen has an electrical efficiency downside and biofuels have a volume capacity downside.

Therefore, it is important that a fuel agnostic approach is taken and that the market is empowered to adopt the fuel best suited to their needs. For example:

1st Example: Heavy freight

60. For long-haul heavy freight, clean fuels such as hydrogen, biofuels and e-based synthetics look potentially more appropriate than battery technologies due to payloads, operational efficiencies, isolation from electrical grid demand peaks and troughs. Some of New Zealand's largest freight carriers have started procuring hydrogen fuel cell electric trucks.

2nd Example: Aviation

61. For commercial airlines and turbine engine operators, sustainable aviation fuel appears to provide the best alternative, coupled with ongoing improved designs of aircrafts and engine functioning. New engine designs could potentially provide considerable improvements in efficiency. For smaller operator though, there are potential issues operating sustainable aviation fuel mixed with existing fuels in piston engines. This is currently looked at more closely by Aviation NZ.

62. Over the course of the last two years, various useful reports have been produced by our members to get a better understanding of how clean fuels can assist us on our journey to decarbonise New Zealand's economy. Two examples below:

1st Example: FirstGas

63. FirstGas has done some work on zero carbon gases to demonstrate how existing gas infrastructure could be used to transport zero carbon fuels such as biogas and green hydrogen. This could become an attractive option for decarbonising some transport and industrial applications, including high temperature process heat, refining, the production of fertilizer and steel. FirstGas notes that developing these zero carbon fuels would reduce the burden on the electricity system, remove the need to overbuild renewable generation and could provide inter-seasonal and inter-year storage of energy for use in dry years.[13]

64. The FirstGas work highlights the need to think carefully about the linkage between transport and other parts of the energy system. While today's transport fuel (petrol and diesel) is primarily distributed by road, a net zero future is likely to see electricity and gas distribution networks used to fuel vehicles. Using these distribution channels reduces carbon and can provide a cost-effective way to transition to lower carbon transport fuels. A recent European report estimates that repurposing gas pipelines to transport hydrogen is expected to add less than 10% to the production costs of

[13] Transitioning To A Zero Carbon Future | Gas is changing

renewable or low-carbon hydrogen.[14] However, these networks need to be maintained and re-oriented towards zero carbon fuels.

2nd Example: EECA and Sapere Research

65. Sapere Research recently prepared an independent report for EECA referred to as *Biofuel Insights*[15]. The report aims to inform the discussions about potential pathways of biofuel uptake, associated emission reductions and related costs for New Zealand's light and heavy road transport, domestic aviation, and shipping. The report provides a summary of biofuel applications and limits – see Figure 4.

Figure 4: Summary of biofuel applications and limits

Fuel family	Conversion technology	Biofuel produced	Blend limits
Road diesel	Trans-esterification of lipds	FAME biodiesel	5% - 7%. Higher blends can be used depending on OEM specifications
	Hydro-treatment of lipids	Hydrogenated renewable diesel	There are no regulatory limits to blending HEFA in diesel. However, it is blended with conventional diesel fuel to meet fuel specifications.
	Gasification / Fischer-Tropsch	Drop-in diesel	EN 15940 does not apply regulatory limits to blending FT diesel
Aviation	Hydro-treatment of lipids	HAFE	Up to 50% HEFA in jet fuel
	Hydro-processing of bio-derived hydrocarbons	HH-SK / HC-HEFA	Up to 10%
	Fischer-Tropsch	Drop-in diesel	FT kerosene is certified for maximum 50% blends with jet fuel
	Cathalytic hydrothermolyosis	Drop-in diesel	Up to 50%
Marine	Trans-esterification of lipds	FAME biodiesel	Technically, up to 7% blends can be used. Standards being developed
	Bio-oil upgrading	Drop-in	Technically, can be used as a direct replacement for fossil marine fuel. Standards being developed
	Mild bio-oil upgrading	Drop-n	Can be used in a marine engine. Standards being developed

66. The report found that by 2030, the implementation of biofuel could lead to a "*total lifecycle emissions savings per annum of 3.8%-5.4%, increasing to 9%-21% by 2035, and 38% by 2050".*[16] However, to achieve these emission reductions, significant capital investment would be required. In other words, *"through to 2025, the average annual investment cost would be between $39 and $93 million, primarily to scale up production of biodiesel and renewable aviation fuel (HEFA). Over the 2026-2030 and 2031-2035 periods in the progressive scenario, additional investment costs of $51-$116 and $115-$254 million per annum would be required respectively to scale-up production of drop-in fuels from biomass feedstock."*[17]

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1. [14] How to transport and store hydrogen – facts and figures (hydrogeneurope.eu)

[15] Liquid-Biofuel-Research-Report-March-2021.pdf (eeca.govt.nz), Page 79

[16] Liquid-Biofuel-Research-Report-March-2021.pdf (eeca.govt.nz), Page vi

[17] Liquid-Biofuel-Research-Report-March-2021.pdf (eeca.govt.nz), Page vi

67. We also note that assumptions on the blend rate, and suitability of types of biofuels (conventional versus advanced) remain subject to ongoing trials and testing, and will vary dependant on engine age and manufacturer, fuel type, and location of use relative to ambient air (and water) temperatures. A stated blend limit of 7% is reflective of the current New Zealand Legislation, and not related to fuel or engine specification(s).

68. We encourage the Ministry to make good use of the research already available and to join the dots between developments that are currently underway (e.g., Infrastructure Strategy development, Energy Road Map development, RMA reform).

CONSULTATION QUESTIONS 12: IMPACTS OF A JUST TRANSITION

69. We agree with the Ministry that there is a risk "*Government interventions that increase the cost of using vehicles, such as road pricing mechanisms, could have a disproportionate impact on low-income households who rely heavily on using a car.*"[18]

70. We note that the paper acknowledges distributional impacts of the proposed interventions and indicates it will take a system approach to considering the social impacts of its policies.

71. We encourage the Ministry to further investigate the impact of a just transition in conjunction with business and other agencies as some measures, if not correctly designed, will disproportionately impact low-middle income families.

CONSULTATION QUESTIONS 13 & 14: PATHWAY AND POLICIES FOR THE FIRST BUDGET

72. We support an effective and efficient decarbonisation of New Zealand's economy and suggest an economy-wide carbon price as a first-best solution. If an ETS complementary policy is to provide a positive net benefit, we encourage the Ministry to focus on the least-cost abatement options.

73. Again, we strongly caution the Ministry against being too prescriptive on the de-carbonisation options for different transport uses and would like the tone of the advice provided to be 'neutral'. The proposal that transport emission reductions can be driven by arbitrary pathways is flawed and should be put aside.

74. Taking a technology, fuel, and process agnostic approach is key to making the most of scarce resources, sending equitable pricing signals, and avoiding unnecessary controversy and excessive complexity.

[18] Hīkina te Kohupara - Kia mauri ora ai te iwi (transport.govt.nz), Page 103

APPENDIX ONE - BACKGROUND INFORMATION ON BEC

The BusinessNZ Energy Council (BEC) is a group of New Zealand's peak energy sector organisations taking a leading role in creating a sustainable energy future. BEC is a division of BusinessNZ, New Zealand's largest business advocacy group. BEC is a member of the World Energy Council (WEC). BEC members are a cross-section of leading energy sector businesses, government and research organisations. Together with its members BEC is shaping the energy agenda for New Zealand.

Our vision is to support New Zealand's economic wellbeing through the active promotion of the sustainable development and use of energy, domestically and globally. With that goal in mind, BEC is shaping the debate through leadership, influence and advocacy.

BusinessNZ is New Zealand's largest business advocacy body, representing:

- Regional business groups EMA, Business Central, Canterbury Employers' Chamber of Commerce, and Employers Otago Southland
- Major Companies Group of New Zealand's largest businesses
- Gold Group of medium sized businesses
- Affiliated Industries Group of national industry associations
- ExportNZ representing New Zealand exporting enterprises
- ManufacturingNZ representing New Zealand manufacturing enterprises
- Sustainable Business Council of enterprises leading sustainable business practice
- BusinessNZ Energy Council of enterprises leading sustainable energy production and use
- Buy NZ Made representing producers, retailers and consumers of New Zealand-made goods

BusinessNZ is able to tap into the views of over 76,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy.

In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation (ILO), the International Organisation of Employers (IOE) and the Business and Industry Advisory Council (BIAC) to the Organisation for Economic Cooperation and Development (OECD).