



Introduction

- Mazda New Zealand (MMNZ) welcomes the opportunity to provide feedback on biofuels and alternative fuels. Our submission covers three (3) Alternative Fuels: (1) eFuel, (2) Hydrotreated Vegetable Oils (HVO), (3) Biofuels. [We are also aware of a Green Hydrogen initiative from Meridian Energy and Contact Energy]. We are available for further consultation and have colleagues in Japan and Europe who specialise in Alternative Fuels who can assist.
- It is our belief that **Alternative fuels** are a **practical, effective** and **cost-effective solution**, where EV has shortcomings (refer to point #2 below). The narrative focusing on engines needs to change. It's not the engine/motor that influences CO₂ emissions, it's the fuel (liquid, gas, electricity) that influences CO₂.
- Our objective with this submission is for Government to conduct **in-depth viability studies** into local Alternative Fuel production, as we see the key benefits as follows:
 1. Practical CO₂-reduction solution for current car parc of 4.35 million vehicles, which has an average age of 14.2 years (Dec 2020 Car parc data).
 2. Practical solution for current impediments to Electric Vehicle uptake. These main impediments to EV are as follows: (1) 'dirty'* electricity (*note: coal produces 30% more CO₂ than ICE), (2) price/affordability – battery prices have been rising sharply of late, and not falling as forecast: [INFORMATION HERE](#), (3) charging infrastructure, (4) end-of-life disposal, (5) concerns about battery materials extraction, (6) vehicle capability (towing, payload etc.), (7) industry capability (shipping, aviation, agriculture, heavy transport, machinery etc.).
 3. Revenue Channel for NZ. We strongly believe that, with vision and comprehensive planning, eFuel could transform NZ into the "Middle East of the South". We believe that Tiwai Point could be re-purposed for eFuel production, which could be exported globally to countries* with Alternative Fuel needs (*every country).
 4. Due to NZ's location being remote, we heavily rely on the shipping and aviation industries. This is a major impediment to our 2050 CO₂ neutrality goal. Alternative Fuels provide a workable solution to this for NZ's goal achievement.
 5. We already have the infrastructure for fuel delivery in place (fuel stations).
 6. There is no Plan B if/when Electricity Infrastructure is compromised (e.g. natural disasters and accidents). Alternative fuels provide this contingency.

Mazda Company Overview

- Mazda Motor Company (MMC) is based in Hiroshima, Japan, with annual sales volumes of approximately 1.5 million vehicles (approximately 2% of global volumes). We are inextricably linked to Hiroshima, as evidenced by Mazda business contributing over a third of the city's annual GDP.
- In 2020 Mazda Motor Corporation (MMC) celebrated its centenary; a major milestone, especially when one considers that the Mazda brand is regarded as "niche" in a global context.
- We believe that the core reason for our 101 years of operation is due to our company's values. These values include an ingrained (1) Respect for People as well as a (2) Challenger Spirit.
- The evidence of these core values is plentiful and includes these milestones:
 - Both our 'Challenger Spirit' and 'Respect for People' were at the forefront of the rebuilding of Hiroshima after the devastation of the 1945 atomic bombing. Within 4 months, Mazda was producing the Mazda "Go" truck, which was an integral vehicle used for the rebuild of the city's infrastructure, as well as the lives of the survivors.
 - The only automotive company to commercialise production of the rotary engine.
 - The re-birth of the open-top 2-seater sports car, with the MX-5 in 1989, at a time when this type of vehicle was thought to be over. The MX-5 is a Guinness Book of Records holder with over a million sales globally.
 - The world-first and revolutionary Skyactiv-X petrol engine (launched in 2019); being the first commercially-produced compression ignition petrol engine (attempted by various other global automotive companies, without success).

- In short, Mazda is focused on people and believes in bringing joy to people’s lives through driving. Our view is that driving is not just about getting “from A to B”, it’s about an emotional and invigorating connection between man and machine. And it’s this people-focus that underpins our Sustainable Zoom-Zoom 2030 plan, which includes [practical solutions](#) to tackle various environmental and societal issues.

Mazda’s Philosophy

- Mazda Motor Corporation (MMC) has an ingrained culture of respect; respect for people, which covers the driver and wider society, as well as respect for our environment. It’s also a respect for doing the right things, in the right manner. When Mazda is faced with a problem or challenge, we always look at the bigger picture, as this is what respect demands. It means that any solution/s is thorough.
- With regard to Climate Change, Mazda’s goal is the same as New Zealand’s: [CO₂ neutrality by 2050](#). [INFORMATION HERE](#). Our second phase in this quest is covered in our Sustainable Zoom-Zoom 2030 plan, which is based on a **multi-solution approach**. The multi-solution approach recognises that there is no single technology or solution – we actually need a suite of solutions that are best-suited to each individual CO₂ challenge.
- However, Mazda’s approach is to understand our contribution to CO₂ and then plan on how to solve it, thoroughly, with the most effective outcome. Mazda is not about “ticking boxes”. Any solution/s has to be done right.
- Mazda’s core belief is that the Vehicle/Engine/Motor should not be in the spotlight, it’s the **FUEL** that powers them that must be **ASSESSED**. **EVs are not emissions-free**, unless the electricity that powers them is 100% renewable/clean. Even then, manufacturing EV vehicles produces many times the CO₂ of an ICE vehicle, so lifecycle assessment CO₂ calculations must also be considered.
- Mazda’s multi-solution plan covers 4 key pillars, which includes Alternative Fuels as one of the pillars. Our multi-solution plan is as follows:
 1. New Vehicles. A multi-solution approach covers various powertrain technologies; including BEV, PHEV, Hybrid, Petrol and Clean Diesel. We understand that Electric Vehicles are not yet the silver bullet globally. Of note, with regard to Mazda BEV/PHEV development, we’ve adopted a “right-size” philosophy for battery size. In short, we intend to keep the battery size as small as practical, to minimise CO₂ in production, as well as environmental harm during materials extraction and disposal.
 2. Alternative Fuels will increase the speed and effectiveness of achieving the Mazda’s 2050 target, by improving the [current vehicle fleet/carparc](#).
 3. Supply Chain. To achieve Mazda’s 2050 target, [all elements](#) of our operation must be considered: materials extraction, vehicle manufacturing, shipping, vehicle usage, maintenance and disposal. Mazda is ISO 14001 certified.
 4. Ecosystem Regeneration. This is about giving back to nature. There are multiple initiatives globally, but locally Mazda works with Trees That Count (since 2004) to plant native New Zealand Trees that not only improve air quality, but also soil, water, insects/wildlife as well as social benefits for people interacting with these environments. [INFORMATION HERE](#) and [HERE](#).

Alternative Fuel #1: eFuel

- Mazda was the first OEM Automotive brand to join the eFuel Alliance in Europe: [INFORMATION HERE](#). We understand that the eFuel Alliance has a local connection with the BusinessNZ Energy Council.
- eFuels are **carbon neutral** and can fuel **any current Internal Combustion Engine (ICE)**. This means, with eFuel, all ICE vehicles in the current NZ carparc would emit **net zero emissions** immediately if this fuel were available now.
- The strength of eFuel is that it can be delivered through the existing NZ infrastructure (fuel stations) and NZ consumers can obtain it easily and in time, at similar costs* to conventional fuel (*forecast).
- eFuel also is a workable solution for the aviation, shipping, heavy transport, agriculture and forestry industries, where EV and alternative engine technologies are currently unsuitable. We would also argue that EV suitability is highly questionable for these industries prior to 2050. NZ’s remote geographical location also means that we are dependent on long-haul shipping and aviation to connect with the world, where EV is unsuitable.
- We believe that the government, electricity sector and petroleum companies in NZ should immediately [work together](#) in researching the local production of eFuel, for these main reasons:
 - eFuel requires (1) clean energy and (2) water to manufacture. NZ has a competitive advantage in these areas.

- Rio Tinto will exit Tiwai Point in December 2024. Tiwai Point could be re-purposed for eFuel production.
- This local production will create jobs.
- With NZ government backing **and vision**, a New Zealand eFuel project would not only provide local employment and a solution to our current car parc emissions, but it would also provide an export revenue stream – with the potential of positioning NZ as the “Middle East of the South”. This vision cannot be underestimated; especially when one considers that our Australian neighbours are heavily reliant on fossil fuels for electricity generation (79% in 2019) and would welcome eFuels for their ICE fleet (i.e. Australia does not have a clear solution for reducing emissions other than alternative fuels). [INFORMATION HERE](#).
- eFuel also provides a petrol/diesel/kerosene contingency to wider NZ energy needs, should NZ electricity infrastructure be compromised in any way (e.g. extreme weather, earthquakes, accidents etc.). **This is a very real proposition and we do not have a clear Plan B for when electricity supply is compromised.**

Alternative Fuel #2: HVO

- Hydrotreated Vegetable Oils are a new generation of cleaner renewable fuels that are expanding rapidly on a global scale; across Europe, North America and now in Asia. HVO are already used in diesel cars and trucks and can be produced from different waste materials such as cooking oils, animal fats, wood lignocellulosic waste and residues.
- We see potential in NZ for lignocellulosic waste as a base for HVO production.
- HVO fuel complies with standard EN 15940.
- Technically, HVO has almost no sulphur or aromatics, which supports clean emissions. It has a higher cetan index than fossil diesel which offers a faster ignition, a quicker and more complete combustion and improved raw emissions.
- HVO is being used by many car OEMs, Heavy Truck OEMs, Marine, Tractor, Industrial companies.
- Environmentally, as a renewable fuel, CO₂ emissions during combustion are fully compensated by the CO₂ absorbed during the plant life. This results in a reduction of 50 up to 89 of the Well to Wheel CO₂ emissions compared to fossil diesel fuel.

Pollutants	CO ₂	Particulates	CO	HC
EM reduction vs. fossil diesel	-50% to -90%	-33%	-24%	-30%

Source: Neste

Alternative Fuel #3: Biofuel

- Cawthron (Nelson), MBIE and Mazda Corporation have been working on a microalgae biofuel project, which stems from our parent company’s partnership with Euglena Industries and Hiroshima University in Japan.
- Microalgae grows in waste water, has a very high lipid count, sequesters carbon during its growth, does not compete for food production (unlike other biofuels), and emits zero carbon.
- Microalgae biofuel could be harvested in NZ, delivered through current infrastructure at a low cost to consumers, and immediately mitigate current car parc emissions. [INFORMATION HERE](#)
- Additionally, biofuels B5, E10 etc. are already available and we should be educating consumers to increase their uptake - as well as preventing imports of Used Vehicles that are not B5, E10 compatible.

Summary

- We welcome open dialogue with officials. We also have colleagues (in Japan and Europe) who specialise in Alternative Fuels.
- Our strong recommendation is for NZ officials to **also consider (1) eFuel and (2) HVO** alongside Biofuels as not only practical solutions for reducing CO₂ emissions, but also an export revenue stream for New Zealand (especially eFuels).
- We recommend that in-depth studies into eFuel and HVO can also be undertaken.
- We view our position in the transport sector seriously and believe we have an active role to play in helping form solutions to achieve the net zero emissions target in 2050.

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