



State of bioenergy in New Zealand webinar

Liquid Biofuels

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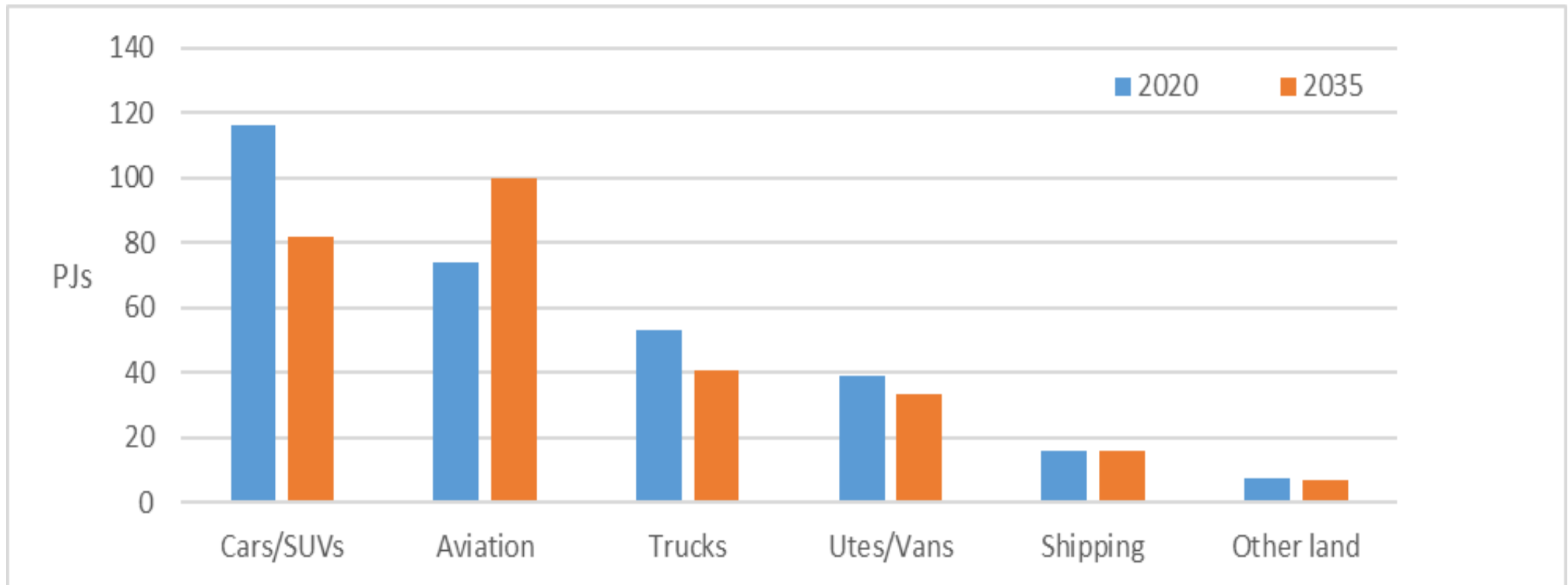


Why Liquid Biofuels?

- Relatively high specific energy (MJ/kg)
- Relatively high volumetric energy density (MJ/l) at ambient
- Can be made drop-in

Essential for clean high duty cycle transport

NZ BAU FF use 2020-35





Aviation (SAF 100PJs)

- Air NZ/Lanzajet have SAF feasibility study underway
 - Lanzajet use renewable ethanol to SAF
- Seadra Energy/Qantas/ChannelNZ are looking at reinstating the hydrocracker at Marsden Point for a biorefinery.
- Fortescue/ChannelNZ are also investigation e-SAF production at Marsden Point
 - e-SAF uses clean hydrogen and CO2 to synthesise to SAF



Marine Fuels (20PJs)

- Marine fuels can be less refined, and the demand is lower
- Again, NZ particularly exposed
 - Zespri and its shippers are investigating a green shipping corridor between Tauranga and Zeebrugge
 - FAME and HVO are being used in blends NZ e.g. BP/Strait Shipping
- Two other processes beyond FAME and HVO:
 - Fast catalytic pyrolysis of wood residues (a significant NZ resource)
 - Hydrothermal liquefaction of wet wastes (wastewater and food)



Pyrolysis of dryer wastes

- Becoming available at scale
- BTG Bioliquids Netherlands is building commercial scale plants in Europe
 - e.g. 24,000 tonnes pa of bio-oil pa (0.5PJ) from wood waste
 - Issue of competitiveness remains
- Scion developing bio-marine fuel plant



Hydrothermal liquefaction

- Needs to be wet wastes e.g. 20% solids
 - But process water can be added
- Commercial-scale plants being built
 - Licella, Steeper Energy in Canada both using wood wastes. Plastics too.
 - Modules around 25,000 dry t pa.
- Smaller plants suited for NZ scale wastewater now running, e.g. Circlia Nordic Denmark
 - 5,000 t dry solids pa
 - Big commercial advantage is being paid to dispose of the waste