



**ICAO AVIATION AND SUSTAINABLE
ALTERNATIVE FUELS
WORKSHOP**



ICAO Headquarters, Montréal, Canada

18 to 20 October 2011

Sustainable Aviation Fuel Development



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Virgin Australia Approach



- Work with the aviation industry to encourage development of sustainable aviation fuel industry
- Engage with Governments to identify and remove impediments to facilitate development and uptake of sustainable aviation fuels
- Support research that will accelerate the commercialisation of competitively priced sustainable aviation fuels
- Support the establishment of a fuel sustainability standard tailored to our region's conditions
- Strategically support sustainable fuel development projects that utilise realistic technologies fulfilling the industries requirements listed above and can demonstrate realistic timelines



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Roadmap



- Is there enough sustainable biomass available in the region?
- Will it be economically viable to produce bio-derived jet fuels?
 - **Refining pathways**
 - **Competition for biomass**
- What are the challenges?
- What are the benefits?



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Participants



Government:

DRET
DCCEE
Treasury
NZ Govt
NSW, SA, Qld & Vic

Invited speakers:

CleanStar
Aurora
Aquaflow
Algae R&D Centre, Murdoch
Roundtable on Sustainable Biofuels
Algal Fuels Consortium



Sustainable Biomass Resources

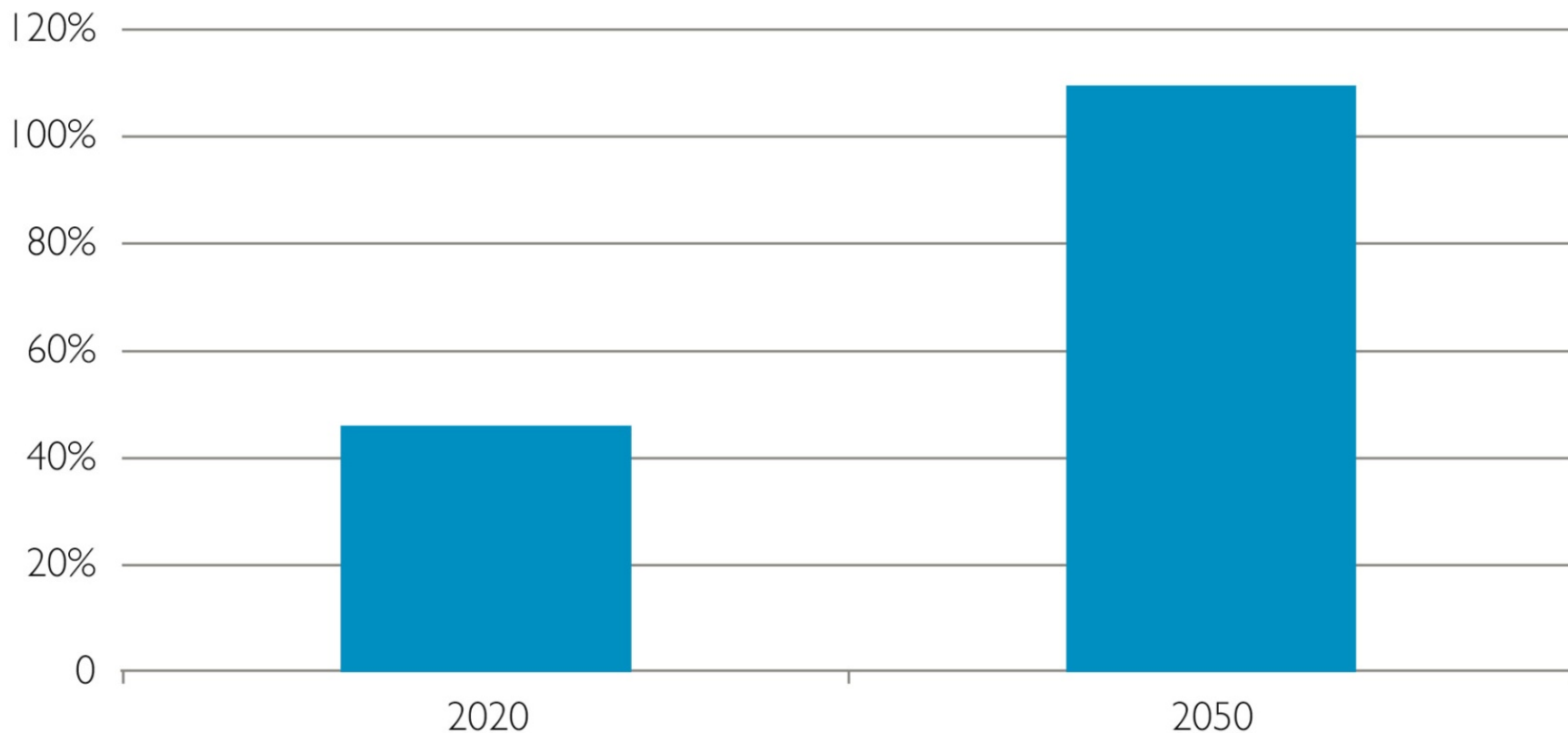


Feedstocks covered –

- Forest and forest residues, crop stubble, bagasse, tallow, oil seed crops, pongamia, algae, coppice eucalypts
- Others not suitable for Australia or not enough data

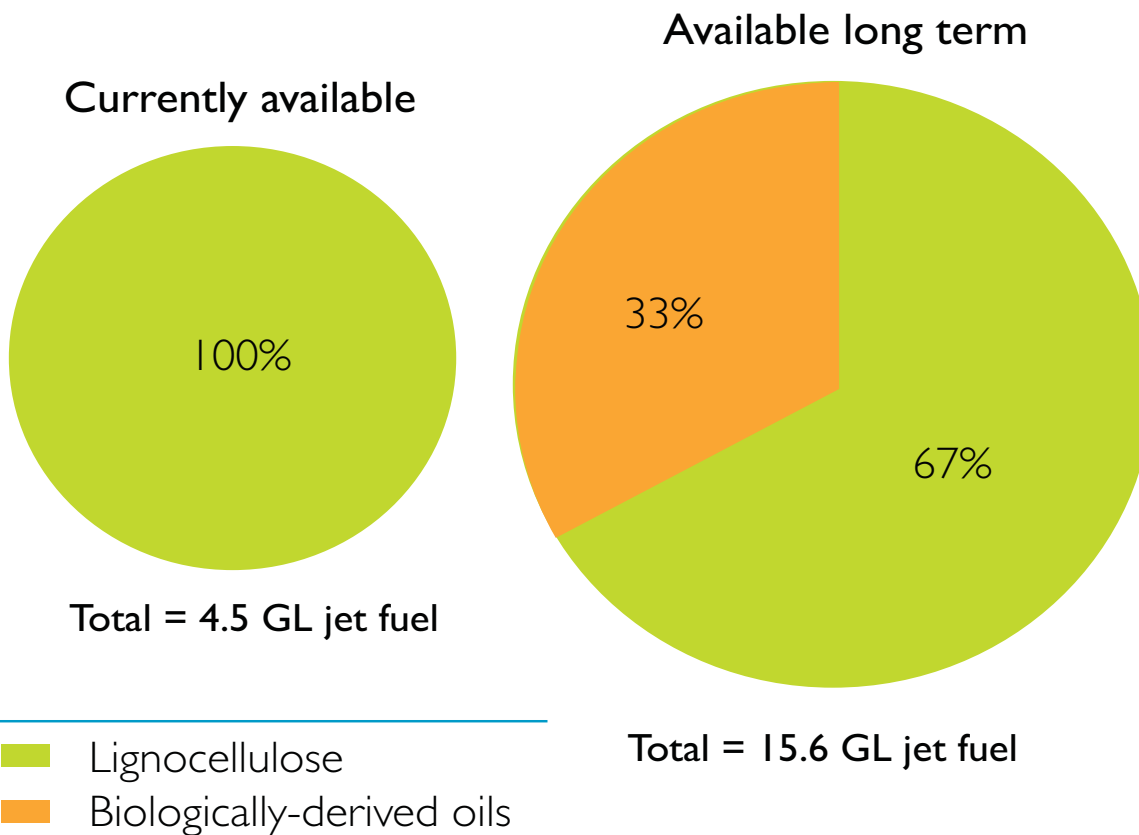


Scale of biomass resources relative to need





Scale and Type of Biomass





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Increasing Aviation Biomass Use



Higher aviation biomass use is driven by:

- The excise differences between the sectors becoming less over time
- The road sector partially electrifying over time
- Biofuel availability expanding
- The relative cost of refining jet fuels declining
- Use of LNG as diesel replacement in trucks
- Alternative low cost electricity generation technologies becoming available



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Challenges and Opportunities



- Sustainable aviation fuels derived from biomass are a feasible option
- There is sufficient existing sustainable biomass to support a local bio-derived jet fuel industry
- The region is strongly positioned to produce sustainable aviation fuels
- There will be challenges in the scale-up of economically viable feedstock production



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Challenges and Opportunities



- There will be high demand among industries for biofuels.
- Investment by the refining sector will be impacted by uncertainty.
- Aviation fuel distribution infrastructure will not require significant modification, however access arrangements for bio-derived jet fuel suppliers will need to be established
- A local production industry for sustainable aviation fuels will bring significant economic, social and environmental benefits.



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Actions Going Forward



Market Structure

Biomass supply

Refining, and certification

Certification



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Project



- Partnership with companies including Future Farm Industries Co-operative Research Centre and GE
- Conversion of Mallee grown in WA wheat belt to Jet Fuel via fast pyrolysis and upgrading
- Focus on supply chain costs
- Strong social, environmental and economic outcomes
- Virgin Australia providing – technical supports, facilitates industry linkages, sustainability framework, public relations, assistance with characterisation and testing of fuel