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***20 May 2014***

# Australian Energy System

- Net energy exporter of energy – coal, uranium, gas; 13,300 PJ
- Prodigious domestic dependence on fossil energy
- Net importer of crude oil and refined petroleum products; 2,200 PJ
- Energy intensive transport sector – within country distances, geographic isolation
- Consumption per annum by transport sector – 290 million barrels oil or 40% of final energy use; annual outlay of \$73 B or 5% GDP; 90% dependent on imports
- Aviation consumes 17% transport fuels; increasing year on year

# Australian / NZ SAF Roadmap (May 2011)



## Barriers and Challenges

- Aging refineries, trend to move offshore
- Oil price uncertainty. Investment and commercialisation of new value chain
- Competition for available biomass
- Sustainability: Water, biosecurity

## Conclusions

- SAF represents a significant opportunity
- Favorable climate, large land base, stable geopolitical environment, efficient agriculture
- Sufficient biomass
- Reduce aviation emissions; regional development/ 'green' jobs, reduce dependence on foreign oil

## Recommendations include

- Innovative risk sharing arrangements
- Harmonised sustainability certification
- National Strategy (AISAF)



Rolls-Royce

THE CLIMATE GROUP





- Founded August 2012 by consortium of leaders in the public and private sectors
- Strategic direction-setting group aiming to
  - facilitate the development and growth of SAF industry in Australia
  - create a platform of robust collaborations throughout the entire SAF value chain, including civil and military aviation
  - work collaboratively with international partners, including CAAFI under the US Australia MOU signed in Sep 2011
- Joined forces with Aviation Aerospace Australia August 2013, in part to extend regional and global engagement

# AISAF Steering Committee



BAKER & MCKENZIE



THE UNIVERSITY  
OF QUEENSLAND

**AIBN** Australian Institute for  
Bioengineering and Nanotechnology



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# Australian SAF Industry Headwinds

- Slower growth of Australian economy, incl. mining boom brake
- Oil majors' focus on capital efficiency leading to sell off of refineries and distribution infrastructure
- Continuing economic turbulence & structural reform affecting airlines, manufacturing, construction challenging for long-term investment decisions
- Confidence in stability of government policy compatibility with growth of renewable energy industry

# Tailwinds – SAF Industry Leadership



Fuel costs: Qantas, \$4B; Virgin, \$1B

ADF, premium, boutique, low volume fuels

Low Carbon Jet Fuel: The Industry Flight Path Conference at AIRSHOW 2013

ATSE Green Growth Energy Industry Opportunities Report

Qantas Shell SAF feasibility study

Virgin Australia Bioport

Advanced Biofuels Industry Day, PACIFIC2013

<http://www.aisaf.org.au/events/low-carbon-jet-fuel-the-industry-flight-path>

<http://www.aisaf.org.au/events/advanced-biofuels-industry-day>

# Collaboration Across Transport Sector



## Australia's Liquid Fuel Security Part 2

A report for NRMA Motoring & Services

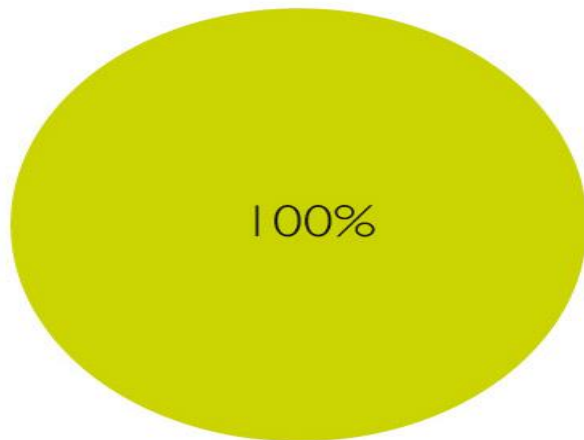
Prepared by John Blackburn AO  
February 2014

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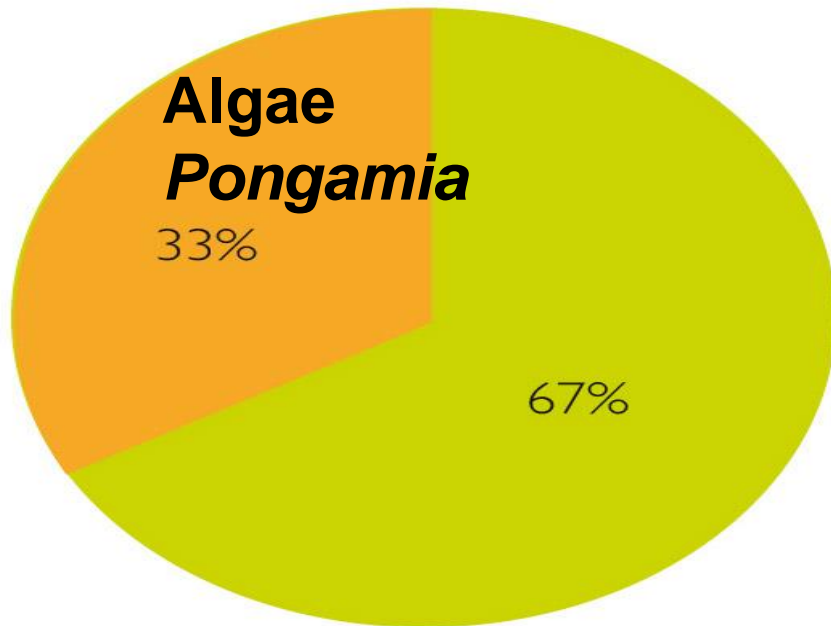
# SAF Road Map - Feedstocks for SAF

Currently available



Total = 4.5 GL jet fuel

Available long term

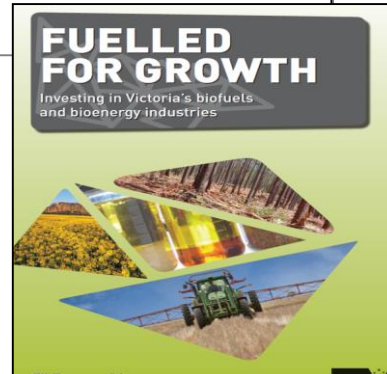
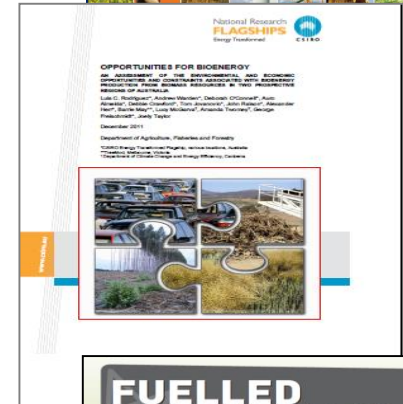
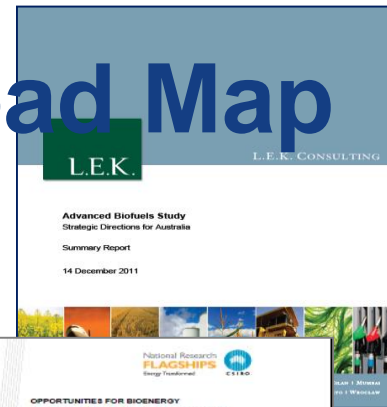


Total = 15.6 GL jet fuel

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-  Lignocellulose
  -  Biologically-derived oils

# Feedstock Assessments post Road Map

- CSIRO National biomass assessment & GHG mitigation
- ARENA Advanced Biofuels Study
- CSIRO Gippsland & Central Western NSW Green Triangle
- University of Queensland, Bagasse, sugar, *Pongamia*
- CRC-Airbus-Virgin - Biomass Alliance/Mallee production system
- Qantas-Shell SAF Feasibility Study
- Victorian Government – Fuelled for Growth
- CSIRO-Boeing Far North Queensland Study





**A long-term future for aviation powered  
by sustainable fuels**

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