Biofuels for Transport in Australia

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f3 – Swedish Knowledge Centre for Renewable Transportation Fuels

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LUND UNIVERSITY

Purpose

- To provide an overview of ongoing activities, policies and actors related to biofuels for transport in Australia.
- To identify and explore possibilities for cooperation between Sweden and Australia in the field of biofuels for transport.

Methodology

- Literature review of reports, articles and websites.
- Informal discussions with stakeholders from industry, government and academia at the Bioenergy Australia annual conference.
- Formal meetings and interactions with experts on biofuels and bioenergy.

Background on Australia

- 22 million people
- National, State and Local Governments with 6 States and 2 Territories
- 7.2 million people in NSW and 5.6 million people in VIC

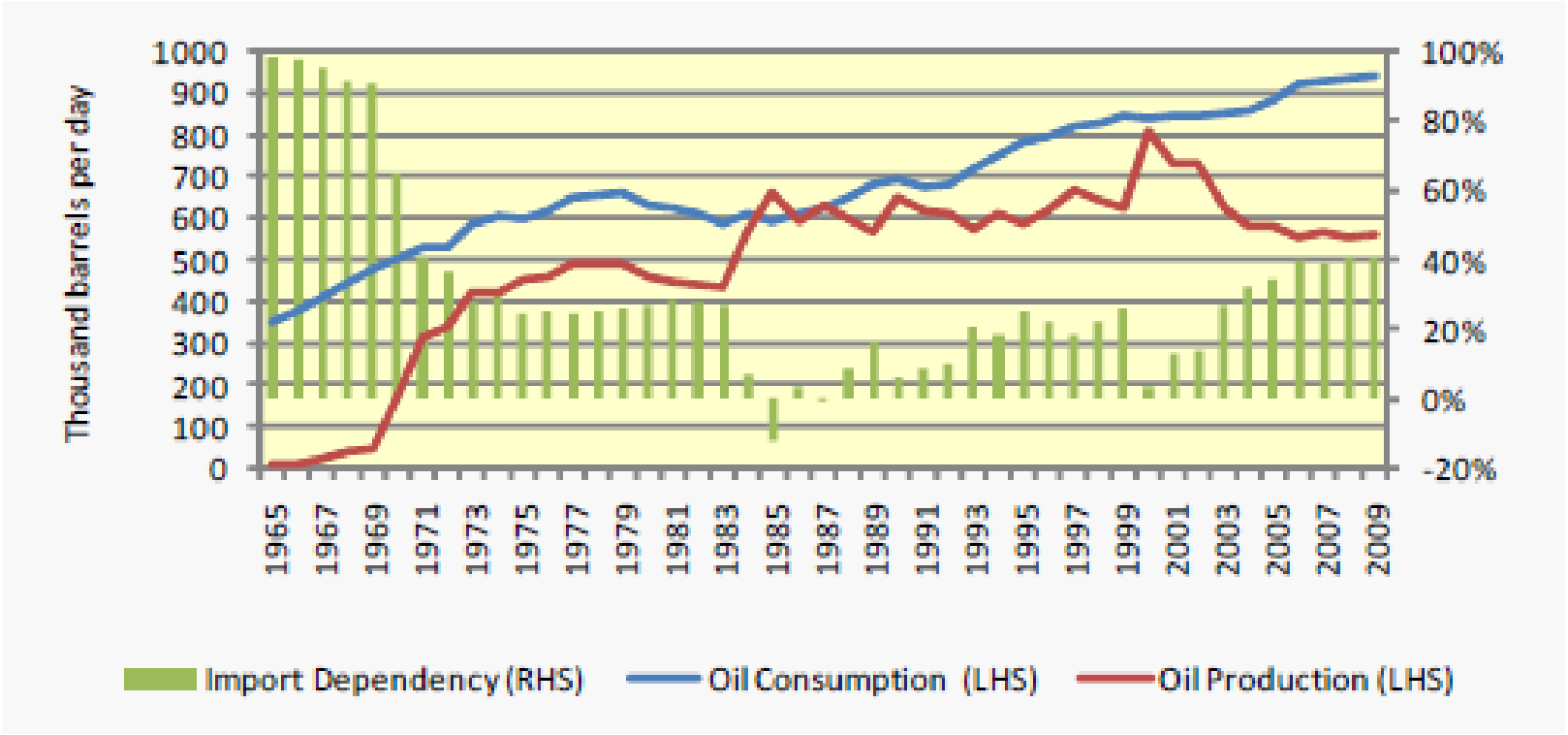
- Victoria (VIC), New South Wales (NSW), Queensland (QLD), South Australia, (SA), Western Australia (WA), Tasmania (TAS)
- Northern Territory, (NT) Australian Capital Territory (ACT)

Source: DFAT (2013) www.dfat.gov.au

Energy in Australia

- Australia has considerable energy resources in uranium, coal and natural gas.
- Coal dominates electricity production supplying about 75% and natural gas about 15%.
- No nuclear power in Australia. But there are exports of uranium.
- Oil resources are more limited and Australia is becoming reliant on imported oil.

Oil in Australia



Source: APAC (2009) www.eccoaustralia.com

Bioenergy in Australia

- Bioenergy currently provides 4% of total primary energy in Australia, and makes up 78% of renewable energy.
- Abundant feedstocks are available to significantly expand bioenergy.
- But growth is slow, compared with wind and solar at present.

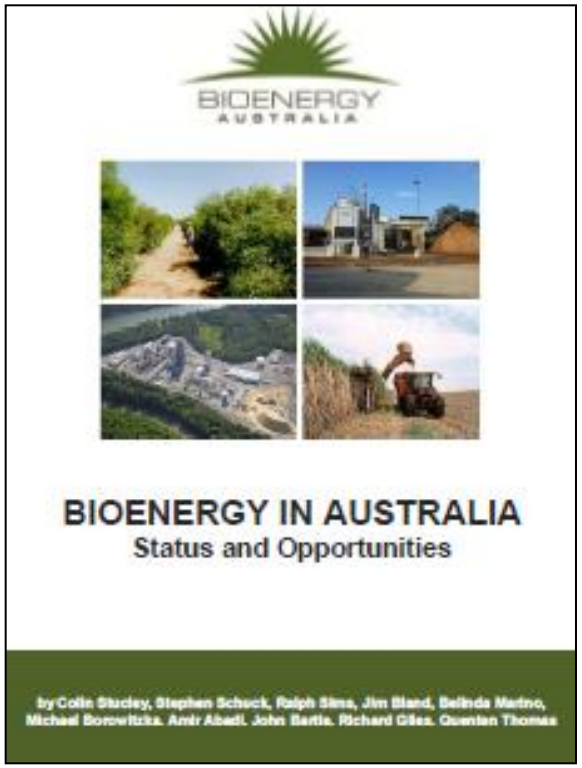
Biofuels in Australia

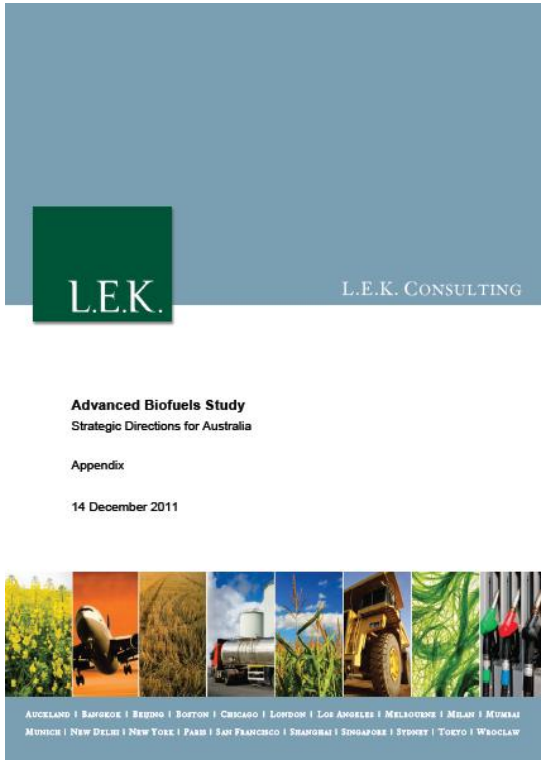
- Large potentials for growth of biofuels for transport.
- Small market presently and limited momentum.
- But there are expectations the market for biofuels will expand and investments will increase based on recent reports.

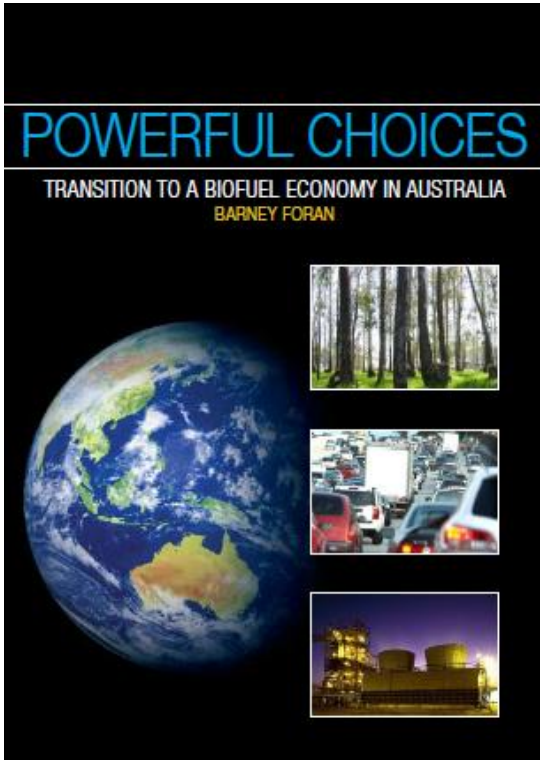
Key Actors

- Bioenergy Australia
  - http://www.bioenergyaustralia.org/
- Biofuels Association of Australia
  - www.biofuelsassociation.com.au
- Rural Industries Research and Development Cooperation (RIRDC)
  - www.rirdc.gov.au

Key Reports


BIOENERGY
AUSTRALIA
BIOENERGY IN AUSTRALIA
Status and Opportunities
by Colin Stucley, Stephen Schuck, Ralph Sims, Jim Bland, Belinda Marino, Michael Borowitzka, Amir Abadi, John Bartle, Richard Giles, Quentin Thomas

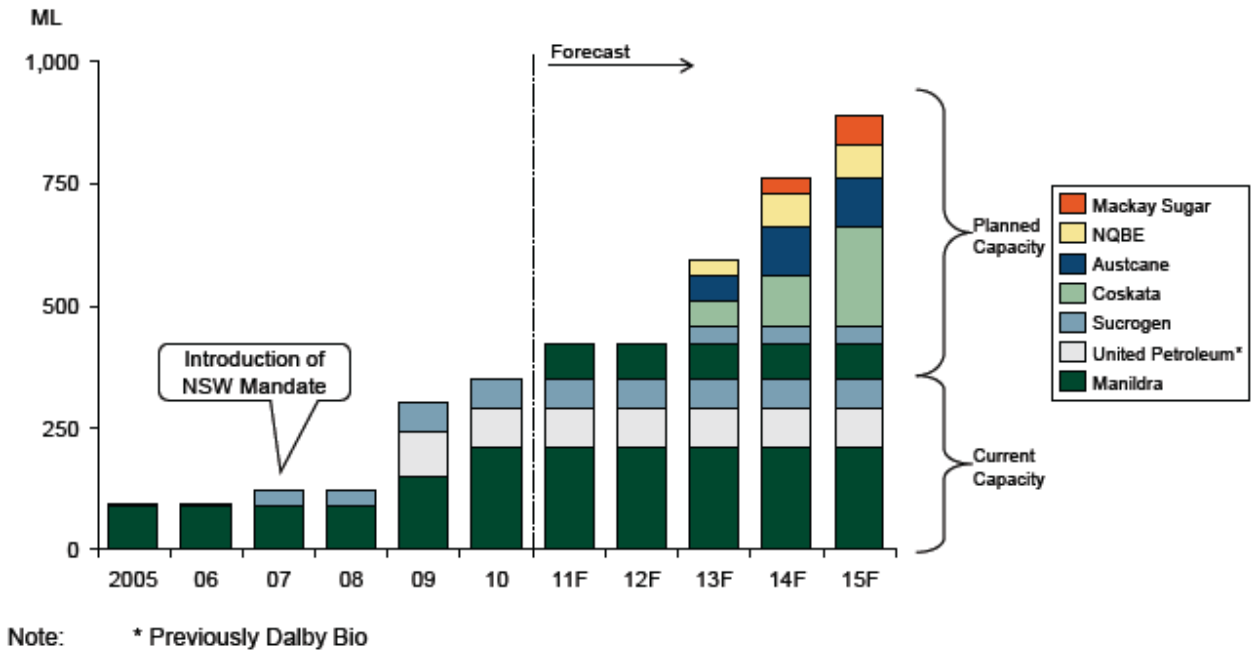

L.E.K.
L.E.K. CONSULTING
Advanced Biofuels Study
Strategic Directions for Australia
Appendix
14 December 2011
AUCKLAND | BANGKOK | BEIJING | BOSTON | CHICAGO | LONDON | LOS ANGELES | MELBOURNE | MILAN | MUMBAI
MUNICH | NEW DELHI | NEW YORK | PARIS | SAN FRANCISCO | SHANGHAI | SINGAPORE | SYDNEY | TOKYO | WROCLAW


POWERFUL CHOICES
TRANSITION TO A BIOFUEL ECONOMY IN AUSTRALIA
BARNEY FORAN

Production of Biofuels

- Ethanol (E10 and E85) and biodiesel are produced commercially in Australia.
- Currently, production represents about 2% of transport fuels (petrol and diesel).
- Ethanol capacity is 440 ML/year from 3 plants.
- Biodiesel capacity is 200 ML/year from 7 plants.

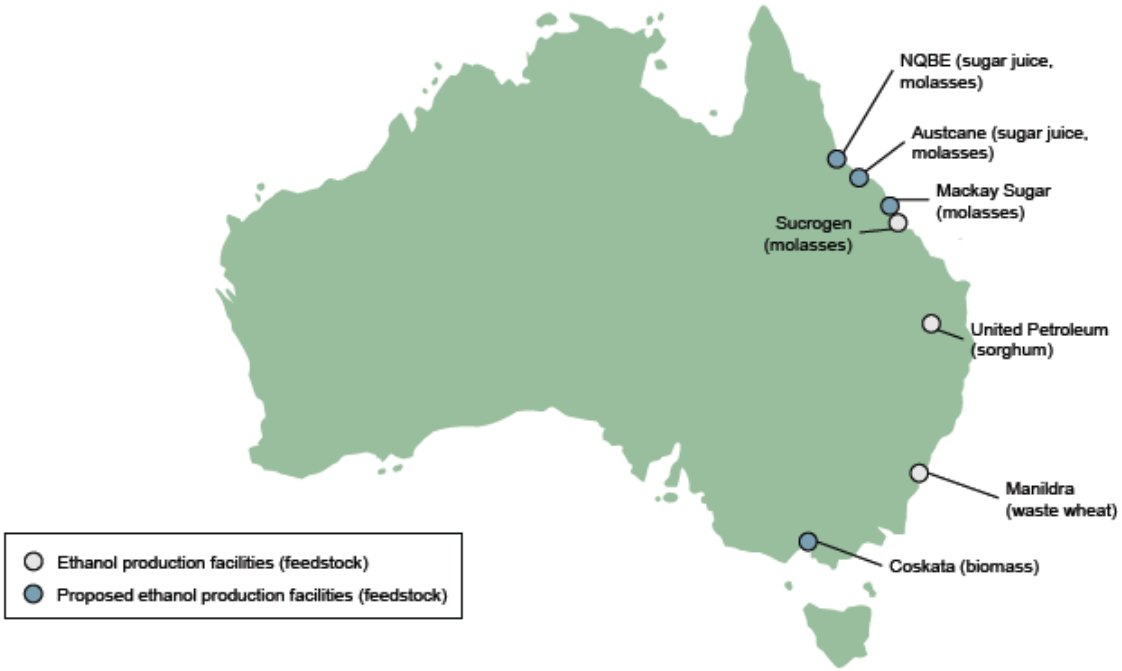
Ethanol Capacity



Note: * Previously Dalby Bio

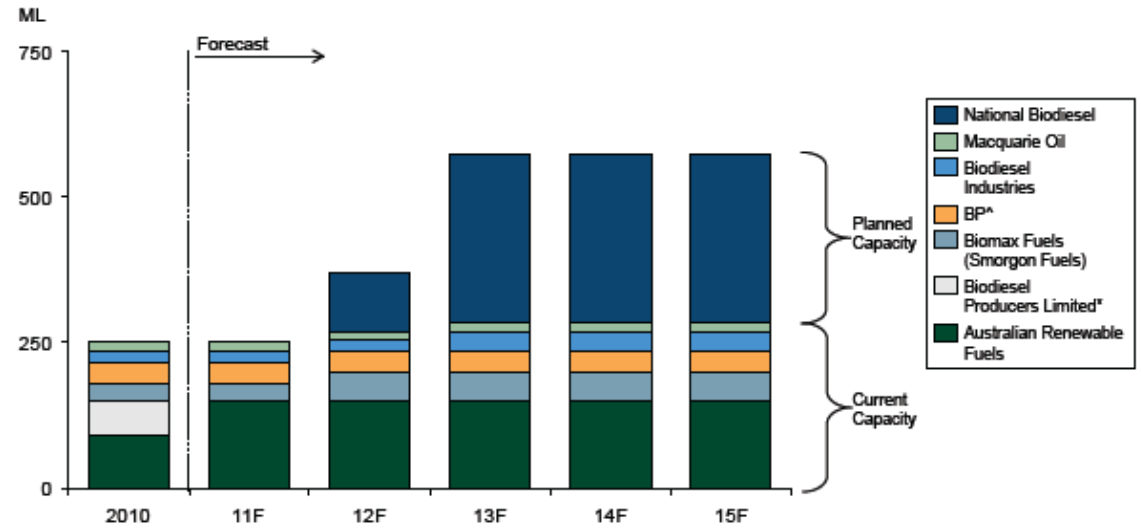
Source: ACCC (2010) www.accc.gov.au

Ethanol Plants



Source: ACCC (2010) www.accc.gov.au

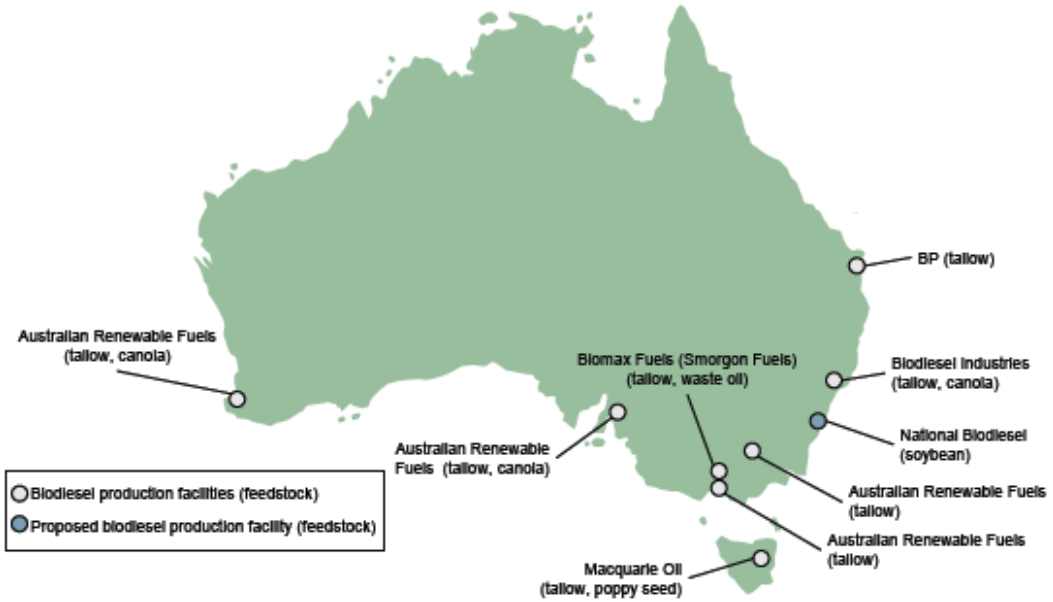
Biodiesel Capacity



Note: ^ Renewable diesel, *Acquired by Australian Renewable Fuels in 2011

Source: ACCC (2010) www.accc.gov.au

Biodiesel Plants



Source: ACCC (2010) www.accc.gov.au

Recent Developments

- Based on discussions with experts there are several key points that contradict recent reports.
  - The Coskata ethanol plant is not going ahead.
  - The Biomax Fuels biodiesel plant is closed.
  - Current capacity for both ethanol and biodiesel is not being utilised.
  - Further capacity expansion is therefore not expected before 2015.
  - Policy conditions are fundamental to biofuels for transport.

National Initiatives

- Introduction of a price on carbon, establishment of key organisations and increased funding for renewable energy are all positives for biofuels for transport.

- Clean Energy Finance Corporation
- Clean Technology Investment Program
- Clean Technology Innovation Program
- Australian Renewable Energy Agency

National Biofuels Policies

- No National mandate for biofuels.
- Ethanol Production Grants Program and Cleaner Fuels Grants Program offset fuel tax for ethanol and biodiesel (extended to 2021).
- Active support for research, development and demonstration.

State Biofuels Policies

- NSW has a 6% ethanol mandate and a 2% biodiesel mandate, and it is expected to increase to 5%.
- Plans to introduce a 5% ethanol mandate in QLD suspended in 2010.
- VIC and WA conducted reviews of mandates for biofuels. But no State mandates in place.

Flagship Initiatives

- There are some flagship initiatives that are drawing attention to biofuels in Australia.
  - Australia-USA navy agreement on biofuels.
  - Commitment for an Australian Biofuels Research Institute.
  - Holden is producing E85 compatible vehicles.
  - Establishment of the Australian Initiative for Sustainable Aviation Fuels.
  - Pilot facilities for advanced biofuels.

Navy Agreements

- Australia-USA navy signed an agreement on cooperation in 2012 to develop and utilise drop-in biofuels in their fleets.
- USA navy aims to supply 50% of their fuel requirements from alternative sources by 2020.
- The focus is on drop-in biofuels that suit existing distribution networks and engines.

Research Institute

- Commitment for an Australian Biofuels Research Institute.
  - $20 million from National Government
  - Focus on next generation of biofuels
  - Academia and industry collaboration
- Initial $5 million investment in macroalgal biofuels and bioproducts project at James Cook University in QLD.

Holden Vehicles

- Since 2011, the Commodore Sedan, Sportwagon, Ute and Captiva Petrol model range are factory fitted with E85 capability.
- E85 is promoted as a ‘fuel of the future’ by Holden.
- Additionally, V8 Supercars Australia switched to E85 at the beginning 2009 providing a visible use of E85.

Aviation Fuels

- Inaugurated in 2012, the Australian Initiative for Sustainable Aviation Fuels is a public-private initiative that aims to facilitate the sustainable growth of the aviation industry.
- It brings together leaders in the aviation industry to develop the supply chain for sustainable aviation fuels, particularly biofuels, which draws attention to biofuels generally.

Pilot Facilities

- Research and development of advanced biofuels extends across several universities and government research institutions at both State and National levels.
- There are pilot facilities for advanced biofuels spread across Australia, including the production of lignocellulosic ethanol, hydropyrolysis oil and algal biomass.

Key Challenges

- Limited social acceptance and political legitimacy of bioenergy and biofuels as a viable alternative to fossil fuels.
- Controversy over use of wood waste from native forests has tarnished all bioenergy and biofuels applications.
- There are efforts on developing an ISO sustainability standard for bioenergy and biofuels, which is important to help address environmental and social concerns.

Key Questions

- Australia is shifting from an oil exporter to importer. Will energy security concerns rise and increase interest in biofuels as an alternative fuel?
- It is suggested that LPG provides an alternative to petrol and diesel, and potentially a bridge to electric vehicles. Will LPG take the leading role as an alternative fuel?
- Further research looking at LPG, electric vehicles and biofuels in Australia is important.

Summary

- Policy at the National and State levels induces and blocks the development of biofuels. No strong, integrated and consistent policy framework.
- Market for biofuels lacks momentum and confidence of investors is weak. Current capacity is not utilised. Expansion is not expected before 2015.

Recommendations

- National Government needs to take leading role in stimulating market for biofuels.
  - Define ambition to break dependence on imported oil and expand locally produced alternatives.
  - National mandate needed for ethanol starting with E5 and increasing to E10, similar with biodiesel.
  - Support for E85 distribution and pumps, and potentially grants or rebates for purchase of E85 compatible vehicles.
  - Development of an ISO sustainability standard for biofuels, both domestically produced and imported.

Sammanfattning

- I Australien, på nationell såväl som delstatsnivå, finns policys som både främjar och hindrar utvecklingen av biobränslen. Ett integrerat och konsekvent ramverk saknas.
- Biobränslemarknaden har tappat fart och förtroendet för investerare är svagt. Nuvarande kapacitet utnyttjas inte, och någon expansion väntas inte före 2015.

Rekommendationer

- Den nationella regeringen behöver ta en ledande roll i att stimulera biobränslemarknaden.
  - Bryt beroendet av importerad olja, satsa på lokalt producerade alternativ.
  - Det behövs ett nationellt mandat för etanol och biodiesel.
  - Stöd för distribution av E85 och pumpar, inför ev. bidrag eller rabatter för E85-kompatibla fordon.
  - Utveckla en ISO-standard för hållbarhet för biobränslen, både inhemskt producerade och importerade.

Key References (1)

- LEK Consulting. 2011. Advanced Biofuels Study: Strategic Directions for Australia
- Graham, P. & Smart, A. (ACIL Tasman) 2011. Possible Futures: Scenario Modelling of the Australian Alternative Transport Fuels to 2050.
- Foran, B. 2009. Powerful Choices: Transition to Biofuels Economy in Australia.
- Rural Industries Research and Development Corporation. 2010. Overview of Bioenergy in Australia.
- Stucley, C. et al. 2012. Bioenergy in Australia: Status and Opportunities.

Key References (2)

- George, B. 2012. Towards 2012: Growing Our Sustainable Future. Biofuels, 3(2), 115-118.
- Mathews, J. 2007. Prospects for a Biofuels Industry in Australia.
- PAGE Research Centre Limited. 2010. National Implementation of Biofuels in Australia: A Policy Discussion Paper.
- Taylor, J. 2011. Growing a Green Fuel Industry in Australia.
- Puri, M. et al. 2012. Biofuels Production: Prospects, Challenges and Feedstock in Australia. Renewable and Sustainable Energy Reviews, 16, 6022-6031.
- Rodriguez, L. et al. 2011. Biofuels Excision and the Viability of Ethanol Production in the Green Triangle, Australia. Energy Policy, 39, 1951-1957.

Further Information

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