Policies for promoting the production and consumption of biojet fuels

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International Energy Agency Bioenergy Task 39 (Liquid biofuels)

Task 39
IEA Bioenergy

Forest Products Biotechnology at UBC

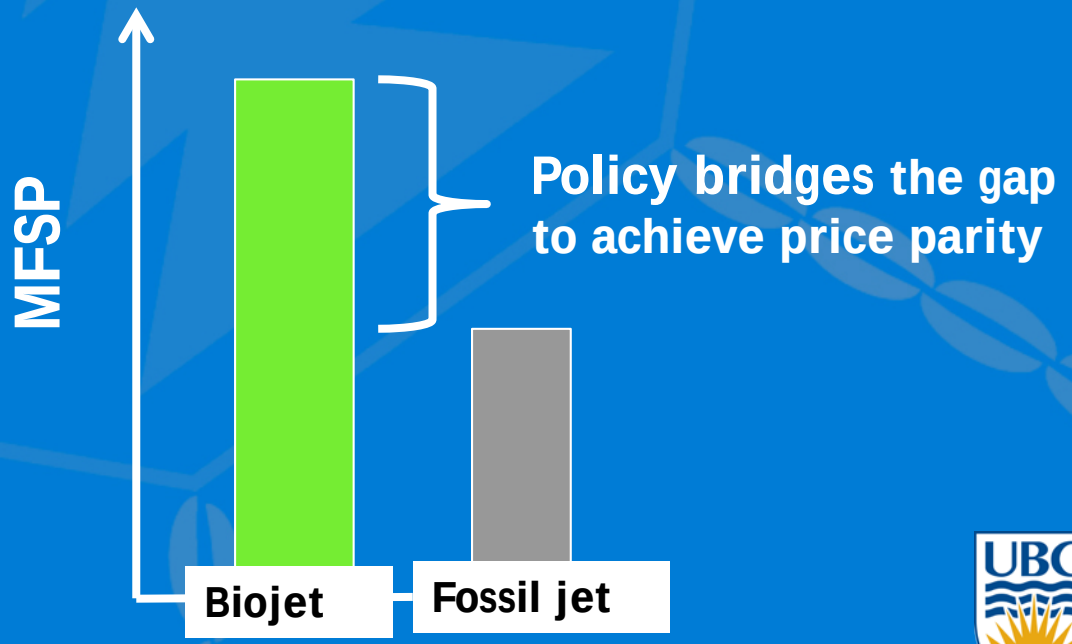
UBC

Biojet supply and feedstocks

- Biofuels will be the only alternative for significant carbon reduction until well after 2050
- Currently, 99% of biojet fuels derived from oleochemical pathway based on upgrading of oils and fats
- This pathway will continue to be the main source of biojet for the next 10 years
- In the long-term biojet fuels will be derived from lignocellulosic feedstock and thermochemical technologies

Key obstacle – higher price of biojet

- Jet fuel is a high specification fuel yet does not earn a premium
- Price of biojet will be higher than fossil jet for the near future
- Estimates vary but 2-7 times more than fossil jet



“The transition to a low-carbon economy depends upon overcoming current challenges and giving the right signals to innovators and financiers within an appropriate market structure.

Government intervention is needed:

- **to create sustainable markets for low-carbon technologies,**
- **fill in RD&D funding gaps,**
- **create the enabling infrastructure and**
- **encourage international collaboration.”**

(IEA, 2015, WEO Special Report on Energy & Climate Change)

Road transportation vs aviation

- National scope
- Multiple policy options
- Biofuel not the only solution, e.g. electric vehicles
- Regulation by governments

- International scope
- Limited policy options
- Biofuel only solution – high specification fuel
- Voluntary development driven by industry
- Impact of International Organisations (ICAO)

Mandates

- Mandates have been the driving force of biofuels development
  - Indonesia (2% mandate but not implemented)
- Emission reduction as a key metric

- Application in aviation challenged by:
  - Current low production volumes/capacity
  - International competitiveness
- Biojet produced with other fuel co-products,
  - e.g. HEFA: 4-5 tonnes of renewable diesel for every tonne of biojet
  - Co-products important for economics

Fiscal incentives

- Greatest potential to increase investment in carbon reduction in aviation
- For supply chain members & airlines
- Bridging the price parity gap

- Considerations:
  - Competition between biodiesel and biojet for incentives will drive allocation to diesel
  - Link incentives to carbon reduction potential
  - Co-processing strategies should qualify for incentives
  - More policy options for domestic aviation (tax rebates)

Current incentives to promote biojet production and consumption

- Current jurisdictions with biojet policies
  - USA
  - Netherlands

- An extension of road transportation policies
- Since 2013 biojet can earn RINs in the USA
  - Under categories: Advanced biofuel (D5), biomass-based diesel (D4) or cellulosic biofuel (D7)
- Biotickets (only in Netherlands for biojet)
  - Double counting to meet RED targets

Current policies create competition between road transportation and aviation

- Current biojet based on oleochemical feedstocks
  - Competition for feedstock with biodiesel/renewable diesel
- Biodiesel/renewable diesel cheaper to produce
- Competition between biojet or renewable diesel for the same incentive
  - RINs + biodiesel blenders credit

- Oil and fat feedstocks preferentially pushed towards biodiesel
- Policy can play a key role to resolve competition

Market based mechanisms

- Will achieve reduction in emissions through offsets, but will it stimulate biofuels development?
- ICAO's CORSIA - only applicable to international aviation emissions
- Will require additional policies
- Diverts money out of the industry which could be invested in industry-specific emission reduction projects /biojet

Environmental levies (green levies and taxes)

- E.g. per passenger
- Diverts money away from the industry which could be invested in CO2 reduction projects
- Limited effect on emissions
- Not favoured by airlines

The role of regional initiatives

- Multi-stakeholder initiatives on a regional basis
- Bioport concept
- Centered around a main airport/harbor
- Regional policy incentives
- Will play a key role in expansion of biojet

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Sea-Tac financing initiative aims to provide routine airport-wide sustainable aviation biofuel supply

Mon 31 Oct 2016 – The Port of Seattle has joined with Carbon War Room and SkyNRG to investigate long-term financing mechanisms that could provide a supply of cost-effective sustainable aviation fuels to all airlines serving Seattle-Tacoma International Airport (Sea-Tac). At present, point out the partners, supply agreements in the United States are being made through individual, expensive offtake contracts between biofuel producers and airlines. This new initiative aims to accelerate the transition of sustainable aviation fuel from an alternative product used by a few select airlines to a standard product available to all airlines at an airport, they say. Carbon War Room (CWR), founded by Richard Branson in 2009 and now a business unit of the Rocky Mountain Institute, and SkyNRG see airports as acting as a key orchestrator in the procurement and delivery process. Sea-Tac is currently assessing costs and infrastructure necessary to deliver sustainable aviation fuels to aircraft at the airport.

"The demand for sustainable aviation fuel is there, but right now it is more expensive and complicated to source," said Port of Seattle Commission President John Creighton. "We want to make it simple and cost-effective for all airlines to access sustainable aviation fuels and ideally

Global versus national

- International and domestic components subject to separate regulatory systems
  - ICAO regulates emissions from international aviation
  - Emissions from domestic aviation forms part of the COP21 commitments for each country
    - Fuel for domestic aviation can be taxed, providing more scope for fiscal incentives

- But harmonization to maintain competitiveness has limited domestic regulation while ICAO MBM resolved

Summary

- Policy support will be essential – built on road transportation policies, but taking into account unique aspects of aviation
- Fiscal incentives vital but should take into account competition with biodiesel/renewable diesel
- Drop-in biofuel technologies produce a blend of products and this should be considered
- Market based measures such as offsets will have a limited impact on biojet development
- Policies should target emission reductions
- Build on regional multi-stakeholder initiatives

Ongoing work in the Forest Products Biotechnology/Bioenergy group at UBC

- The ATM project

  Assessment of likely Technology Maturation pathways used to produce biojet from forest residues (2016-2018)

  (Susan van Dyk part of project management team)

- Policies required for development of biojet supply chains (link to Task 39 drop-in report and Implementation agendas)
- Feedstock sustainability and forest certification (link with Task 43)
- LCA and the GHG advantages of biojet pathways (link with Task 38/39 project)

The ATM project

Assessment of likely Technology Maturation pathways used to produce biojet from forest residues (2016-2018)