



Biofuels Cooperation in the Asia Pacific

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Collaborative International Activities
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Long-term trends will expand worldwide biofuel potential

- The gradual depletion of easily recoverable oil reserves is causing an **upward long-run trend in real, inflation-adjusted oil prices**.
- Growing concerns over global warming may yield **a clear market value for carbon**.
- RD&D is rapidly bringing down the cost of **abundant lignocellulosic feedstocks** like farm and forest residues and grasses that have much lower carbon emissions than the current generation of biofuel crops.

Biofuels development and use depends on several key factors:

- **Biofuel Economics** (cost of ethanol vs. petrol and biodiesel vs. diesel)
- **Biofuel Trade Opportunities** (created by production cost differentials)
- **Biofuel Infrastructure** (cost and time to build biofuel filling station network)
- **Fuel-Flexible Vehicles** (practical path of uptake into the automobile market)
- **Biofuel Resources** (current and potential availability of biofuel feedstocks)

APEC Accounts for Half the World's Economic Output and Energy Use





How the APEC Biofuels Task Force Fits into the Overall APEC Framework

- Annual Leaders Summit
- Periodic Energy Ministers Meetings (EMM)
- Energy Working Group and Expert Groups
 - Energy Efficiency and Conservation
 - New and Renewable Energy Technology
 - Clean Fossil Energy
 - Energy Data and Analysis
 - Biofuels Task Force
- Other Interested Working Groups
 - Transportation Working Group
 - Agricultural Technical Cooperation Working Group
 - APEC Automotive Dialogue
- Asia Pacific Energy Research Centre

APEC Energy Ministers and Leaders on Biofuels to Reduce Oil Dependency

- Alternative fuels a component of [APEC Energy Security Initiative](#), reaffirmed annually since 2001.
- [Alternative transport fuels](#) noted by EMM-7 (Korea, 2005) as vital to reducing oil import dependency.
- [Report of the Biofuels Task Force](#) welcomed by ministers at EMM-8 (Darwin, Australia, 2007)

Seventh Energy Ministers Meeting (Gyeongju, Korea, October 2005)

- *"We agreed that **effective responses to high and increasingly volatile oil prices require** a broad range of supply and demand-side measures, for example, strategic oil stocks for supply disruption response, facilitation of investment in oil exploration, production and refining, and measures to promote energy efficiency and diversification, including **vehicle fuel efficiency and alternative transport fuels**. . . ."*
- "To respond to high oil prices and reduce our oil dependency, . . . we direct the EWG to develop practical measures to enhance cooperation supporting the development of alternative transport fuels, including the establishment of a **Biofuels Task Force**."



Policies for Fuel-Efficient Transport

- Draft report available:
 - Survey completed July 2008
 - Follow up workshop March 2009
- Describes policies and programs to:
 - Increase fuel economy of new vehicles
 - Encourage purchase of efficient vehicles
 - Improve vehicle operational efficiency
 - Reduce road congestion
 - Boost efficiency and use of mass transit
 - Reduce traffic through better urban planning
 - Promote efficient modes of freight transport

Biofuels Task Force Report to EMM-8 (Darwin, Australia, May 2007)

- *“We welcomed the report of the APEC Biofuels Task Force. Among its key findings are that biofuels from several crops **are cost-competitive** at current oil prices, that biofuels **can lower greenhouse gas emissions** and that biofuels **can displace a sizeable share of oil use** over time.*
- *“Biofuels production should be advanced in line with sustainable development objectives. We encourage intensified efforts to develop and deploy techniques for the cost-effective use of non-food feedstocks, such as farm and forest residues and grasses, which hold the greatest potential for expanded biofuels production and greenhouse gas reductions.”*

Four-Fifths of All APEC Economies Participate in the Biofuels Task Force

- **Australian** Department of Resources, Energy and Trade; Bioenergy Australia; Commonwealth Science and Industrial Research Organisation (CSIRO); Biodiesel Association of Australia; Queensland University of Technology
- **Canada** Agriculture and Agri-Food
- **Chile** Ministry of Agriculture
- **China** Energy Bureau and Energy Research Institute
- **Hong Kong** Electrical and Mechanical Services Dept.
- **Indonesia** Ministry for Economic Affairs, Ministry of Energy and Mineral Resources
- **Japan** Observers: New Energy and Industrial Technology Development Organization (NEDO); Institute of Energy Economics Japan (IEEJ)
- **Korea** Ministry of Commerce, Industry and Energy (MOCIE); Korea Institute of Energy Research; Korea Energy Economics Institute
- **Malaysia** Ministry of Plantation Industries & Commodities; Malaysian Palm Oil Board
- **Mexico** Secretariat for Energy (SENER)
- **New Zealand** Resource Development Limited
- **Peruvian** Association of Sugar and Biofuel Producers; Maple Corporation
- **Philippines** Department of Energy (DOE)
- **Russian** National Biofuels Association
- **Chinese Taipei** Industrial Technology Research Institute (ITRI)
- **Thailand** Dept. of Alternative Energy Development and Efficiency (DEDE); Thailand Institute of Scientific and Technological Research (TISTR)
- **United States** Dept. of Energy; Dept. of Agriculture, Argonne National Laboratory

Biofuels Task Force Report: Economics

- Rudimentary cost curve derived, equivalent crude oil cost calculated (based on feedstock costs in 2006):
 - Sugar (Brazil): \$28-50/bbl (\$0.20-0.30/l)
 - Corn (USA): \$50-68/bbl (\$0.30-0.37/l)
 - Palm (Malaysia): \$42/barrel (0.38/liter)
 - Jatropha (Indonesia): \$58/bbl (\$0.48/l)
 - Cooking Oil (ChTaipei): \$93/bbl (\$0.70/l)
 - Lignocellulose nth plant 2030: \$30/barrel (vs U.S. goal nth plant 2012: \$58/barrel)



Biofuel Task Force Report: Resources

- Available resource estimates were used to show that a substantial percentage of crude could be displaced - mainly by ethanol from farm and forest residues:
 - Indonesia: 56.0 Blpy – 59% of 2002 crude
 - Malaysia: 16.2 Blpy – 40% of 2002 crude
 - Philippines: 21.6 Blpy – 78% of 2002 crude
 - Thailand: 54.8 Blpy - 87% of 2002 crude
 - Viet Nam: 11.1 Blpy - 65% of 2002 crude
 - United States: 353 Blpy: 23% of 2002 crude

Projects Completed

- Survey of Biofuel Resource Assessments and Resource Assessment Capabilities
 - NREL study completed December 2008
 - Second-generation biofuels from farm and forest residues could displace 40% of gasoline use and 20% of crude imports APEC-wide
- Guidelines for Biodiesel Standards
 - Report issued by Hart November 2007
- Status of Liquid Biofuels
 - Report completed by NREL
 - APEC Biofuels website created



Projects Underway

- Potential of **Biofuels on Marginal Lands** in APEC Economies
 - National Renewable Energy Laboratory
- Assessment of **Biomass Resource Elasticity** in APEC Economies
 - Center for Agricultural Research and Development (CARD), Iowa State
- Study of **Employment Opportunities from Biofuel Production** in APEC
 - Doyletech, IBM Global Services Canada



Projects Starting or Proposed

- Biofuel Feedstock Costs, Technology and Economics in APEC Economies
 - Proposals requested by March 31, 2009
- Resource Potential of Algae for Biodiesel Production in APEC
 - Build on work by PNL, LANL, CSIRO
- Sustainable Biofuels Development Practices in APEC Economies
 - Build on work by GBEP and others
- Strategies for Developing Biofuel Transport and Distribution Infrastructure in APEC
 - Cooperation with APEC Auto Dialogue

Thanks for listening!

