IEA Bioenergy Task 39 “Liquid Biofuels”

BioEconomy 2017

Arlington, Virginia, USA

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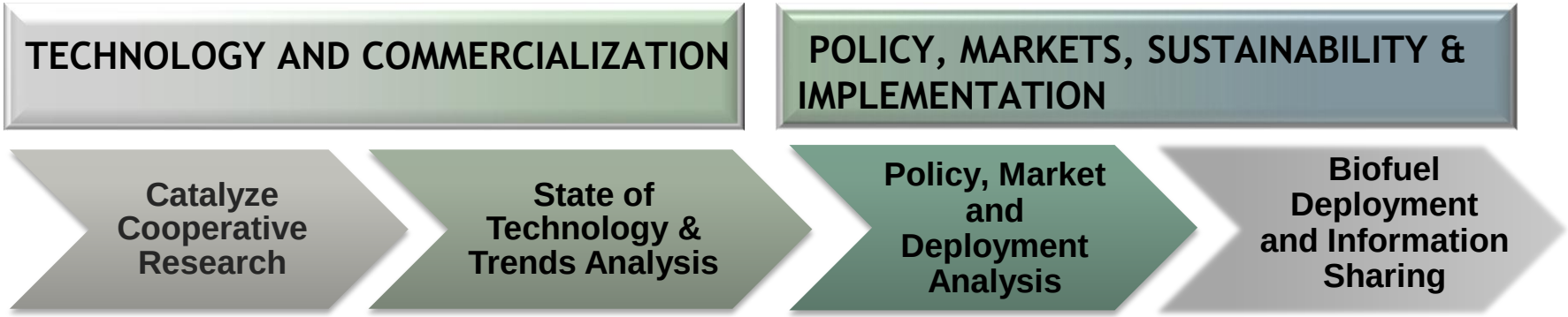
IEA Bioenergy Task 39 – Objectives

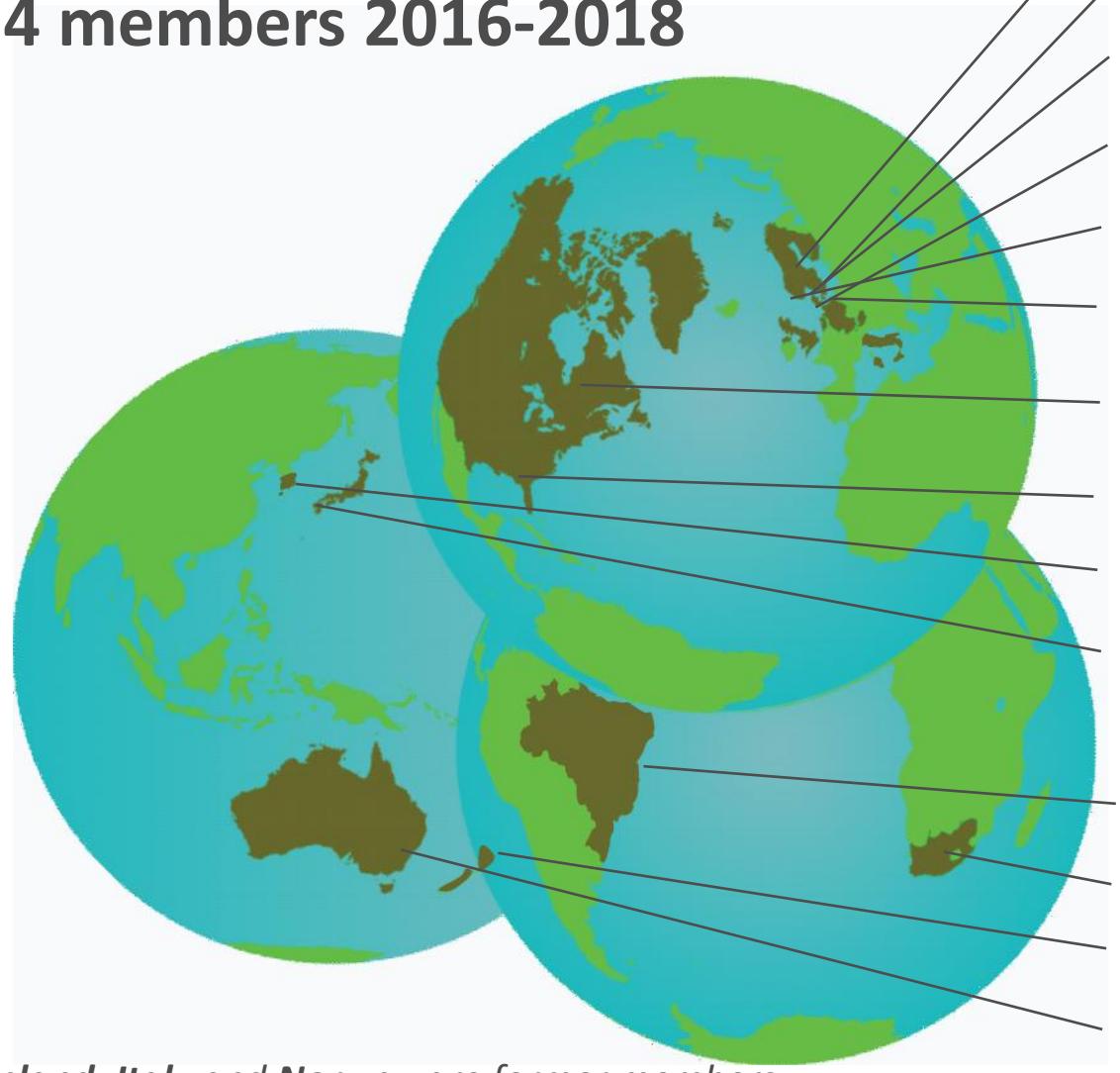
- Facilitate commercialization of conventional and advanced liquid biofuels. Website: http://task39.ieabioenergy.com/

- An international collaboration between participating countries
  - Analyze policy, markets and sustainable biofuel implementation
  - Focus on technical and policy issues
  - Catalyze cooperative research and development
  - Ensure information dissemination & outreach with stakeholders
    - 3 newsletters per year; see website to subscribe



IEA Bioenergy Task 39 - Membership

14 members 2016-2018



European Commission - Luisa Marelli*, Jacopo Giuntoli

Sweden - Tomas Ekbom*, Leif Jönsson

Denmark - Claus Felby*, Henning Jorgensen, Michael Persson, Anders Kristoffersen

Germany - Franziska Mueller-Langer*, Nicolaus Dahmen

The Netherlands - Timo Gerlagh*, Johan van Doesum

Austria - Dina Bacovsky*

Canada - Jack Saddler*, Warren Mabee, Stan Blade

United States – Jim McMillan*

South Korea - Jin Suk Lee*, Kyu Young Kang, Seonghun Park

Japan - Satoshi Aramaki*, Shiro Saka

Brazil - Paulo Barbosa*, Antonio Bonomi, Eduardo Platte

South Africa - Emile van Zyl*, Bernard Prior

New Zealand - Ian Suckling*

Australia - Steve Rogers*, Les Edye

Finland, ***Italy*** *and* ***Norway*** *are former members; may rejoin in the future/next triennium.*
Also actively inviting other key countries to join IEA Bioenergy TCP, e.g., ***China***, ***India***, ***Mexico****.*

http://task39.ieabioenergy.com/

*** National Team Leader / Lead country representative**

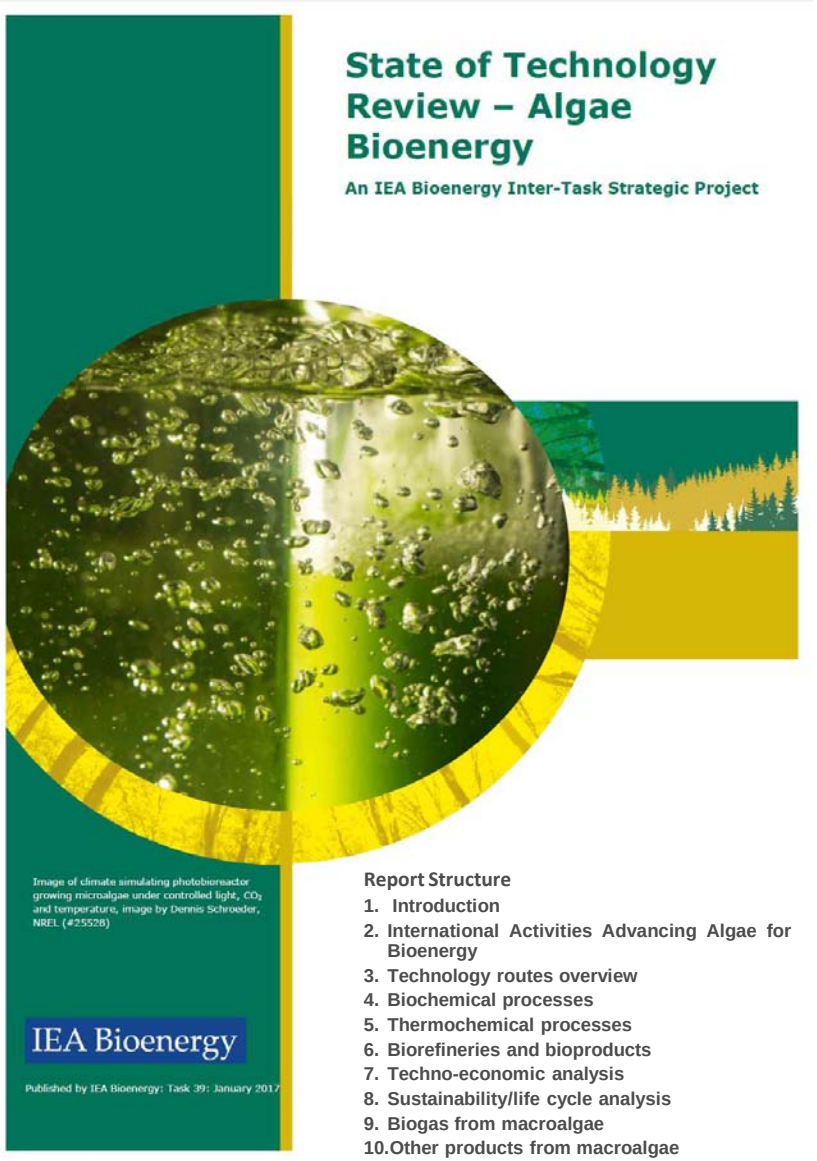
IEA Bioenergy Task 39 – Recent Task Meetings

- Rotterdam/Delft, the Netherlands, March 2016
  - In conjunction w/ ECO-BIO 2016 conference
  - Task 39 organized 2 sessions within this conference (presentations from Brazil, Canada, European Commission, New Zealand, Sweden, USA members)
- Rotorua, New Zealand, Nov., 2016
  - In conjunction w/ ExCo78 meeting and NZ's ABRN Science Symposium
- **Gothenburg, Sweden, May 2017**
  - In conjunction with ExCo79 meeting and Advanced Biofuels Conference (ABC) 2017
  - Task 39 organized session within ABC conference (presentations from Brazil, Canada, New Zealand, USA members)

Task 39 group at Chalmers House
Gothenburg, Sweden, May 15, 2017

Recent Accomplishment – Algae Report Update

- **An Inter-Task strategic project** to update the status and prospects for algal-based liquid biofuels / bioenergy production
- **Scope broadened from Task 39's 2010 report published to also include macroalgae, thermochemical pathways, non-liquid fuel biorefinery products and sustainability**
- Task 39-led collaboration between five (5) IEA Bioenergy tasks: Tasks 34 (pyrolysis), 37 (biogas), 38 (LCA), 39 and 42 (biorefineries)
- **Project leader**: Dr. Lieve Laurens (NREL)
- **Critical review of recent literature**, >150 pp, 11 ch., >475 references, summarizes global research operations and >400 companies focused on commercial applications
- IEA Bioenergy webinar launch Jan. 25, 2017
- http://www.ieabioenergy.com/publications/state-of-technology-review-algae-bioenergy/

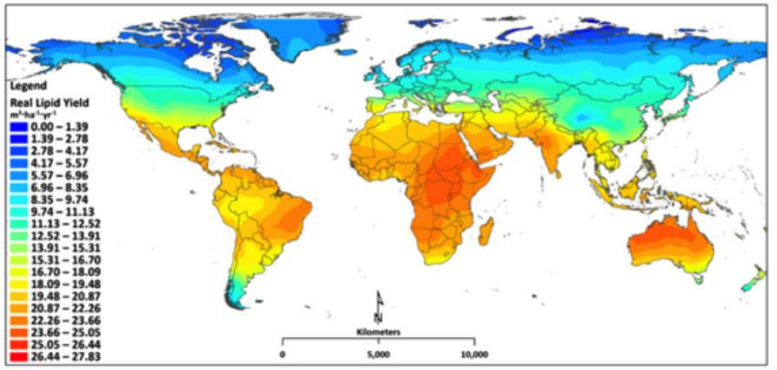


Algae Bioenergy – 2017 State of Technology Review

Key Message 1 (of 11)

- The on-going decline in petroleum and natural gas prices coupled with a lack of carbon pricing are challenging the ability for algal routes to be cost-competitive for production of liquid fuels and other bioenergy products

➢ *Macroeconomic conditions will prohibit economically viable production of algae-based fuel(s) as a primary product in the near- to mid-term*

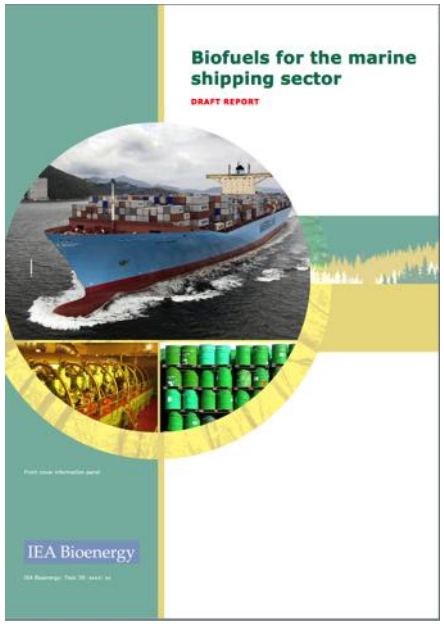


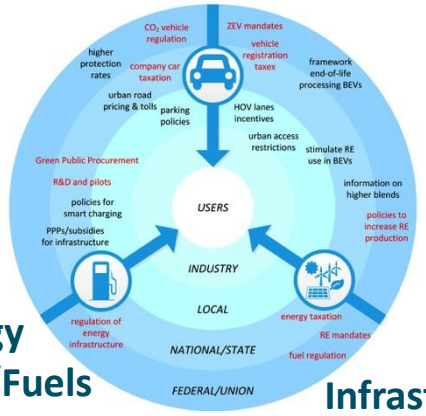
IEA Bioenergy Task 39 – On-going Projects

- **Comparison of leading LCA models for evaluating GHG reduction and environmental performance of biofuels**
  - Led by Antonio Bonomi et al., CTBE, Brazil
  - Phase 1 complete; journal articles submitted (1 published, 1 in review)
- **Assess commercial opportunity for marine biofuels**
  - Led by Prof. Claus Felby et al., U. Copenhagen, Denmark
- **Survey of advanced biofuels for advanced engines**
  - Led by Dr. Franziska Mueller-Langer et al., DBFZ, Germany
  - Build collaboration with IEA Advanced Motor Vehicles TCP
  - Leverage developments coming out of USDOE's Co-Optima initiative

GHG impacts [g CO2eq per MJ of fuel]

	GREET	BioGrace	GHGenius	CTBE VSB
Gasoline	90.2	83.8	95.0	87.5
Sugarcane ethanol	25.3	24.0	43.3	16.0
GHG savings	72%	71%	54%	82%

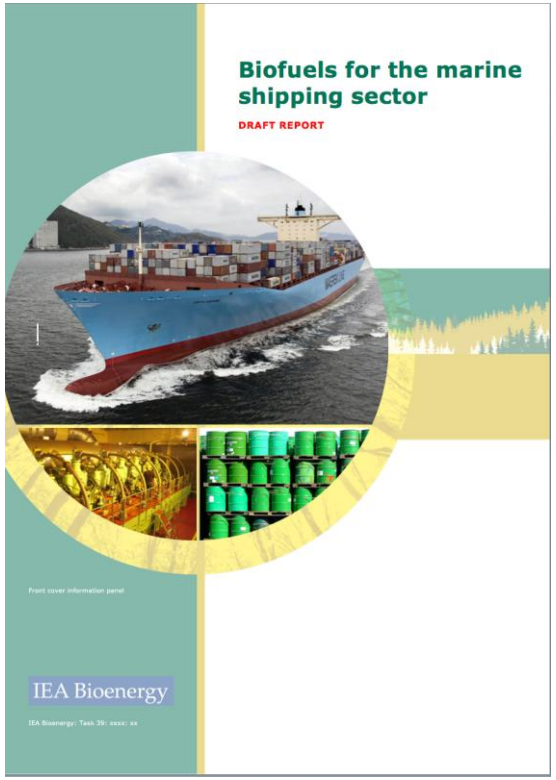




IEA Bioenergy Task 39 – Future Plans

- Next business meetings:
  - September, 2017 in Brussels, Belgium
    - Member country reports
    - Project updates
    - To be held in conjunction with 6th International Conference on Lignocellulosic Ethanol (6ICLE)
  - April, 2018 in Beijing, China (tentative)
    - China hosts, Chinese attendees participate, and we identify / convince policy makers / government officials to get China to join

- Technical focus: Progressing projects/completing reports
  - Marine Biofuels report (2017)
  - Advanced Biofuels for Advanced Engines Survey Report (2017)
  - Implementation Agendas report (early 2018)
  - Phase 2 of LCA model comparison project (early 2018)

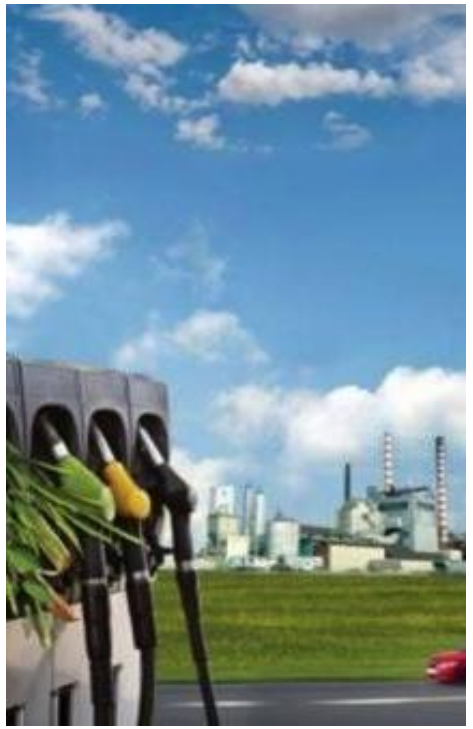


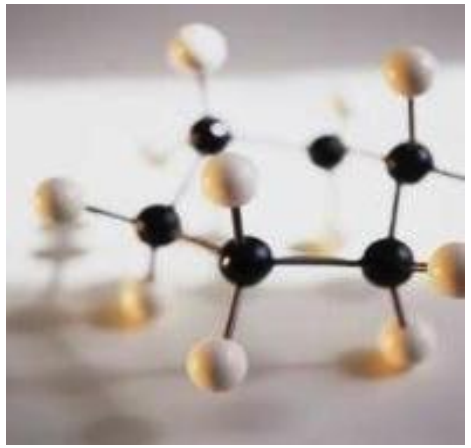
- Planning focus: Propose priorities for continuing in 2019-2021 triennium
  - Anticipate increased focus on aviation and maritime biofuels
  - Continued improvement in understanding of environmental and socio-economic sustainability, how best to grow biofuels

IEA Bioenergy Task 39 – Final Remarks

- IEA Bioenergy provides a forum for international information exchange and research collaborations
- IEA Bioenergy Task 39 helps its members work smarter and more efficiently to develop and deploy liquid biofuels
- Members benefit and learn from each others' related biofuels research, development, demonstration and deployment (RDD&D) history, both successes and areas of difficulty
- Many feedstocks **x** pathways **x** biofuels combinations are under study globally; more technical routes and implementation policies are being funded/researched/evaluated than is possible in one country; enables more/faster learnings and progress to identify/verify viable, scalable solutions

➔ *Drop-in biofuels remain economically challenged by low oil prices, hampered by unclear moderate/long-term policy regarding biofuels. Greater policy certainty is needed, e.g., a meaningful price on carbon (GHG) pollution mitigation, to achieve aggressive growth/deployment of advanced biofuels.*





Acknowledgements

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- Jim Spaeth (DOE EERE BioEnergy Technologies Office), USA's lead executive committee member for the IEA Bioenergy TCP