IEA Bioenergy Technology Collaboration Programme (TCP)

Mission:
To increase knowledge and understanding of bioenergy systems in order to facilitate the deployment of:
- environmentally sound
- socially acceptable and
- cost-competitive bioenergy systems

Key Role:
Independent collaborative body focused on delivering clear and verified information on bioenergy
Membership - 24 Contracting Parties

EUROPE:
- Austria
- Belgium
- Croatia
- Denmark
- European Commission
- Estonia
- Finland
- France
- Germany
- Ireland
- Italy
- Netherlands
- Norway
- Sweden
- Switzerland
- United Kingdom

ASIA/OCEANIA/AFRICA
- Australia
- Japan
- Korea
- New Zealand
- South Africa

AMERICA’S
- Brazil
- Canada
- United States

In discussions:
- China
- India
- Mexico

2018 Budget: US$1.8 Million
Tasks: 10 + 6
Task participation: 98
Direct participation: > 200 persons
Tasks

Task 32 - Biomass **Combustion** and Co-firing

Task 33 - **Gasification** of Biomass and Waste

Task 34 - Direct Thermochemical **Liquefaction**

Task 36 - Integrating Energy Recovery into Solid **Waste** Management Systems

Task 37 - Energy from **Biogas**

Task 38 - **Climate Change Effects** of Biomass and Bioenergy Systems

Task 39 - Commercialising Conventional and Advanced **Liquid Biofuels**

Task 40 - Sustainable Biomass **Markets** and International Bioenergy **Trade** to Support the Biobased Economy

Task 42 - **Biorefining** in a Future BioEconomy

Task 43 - Biomass **Feedstocks** for Energy Markets
IEA Bioenergy – Depth and Breadth

Sources
- Task 43 Feedstocks & Socio-Economics

Processes
- Task 32 Combustion
- Task 33 Gasification
- Task 34 Liquefaction
- Task 36 MSW
- Task 37 Biogas
- Task 39 Liquid Biofuels

Products
- Task 42 Biorefining

Horizontal / Systems
- Task 38 Sustainability
- Task 40 International Markets & Trade
- Task 41 Systems Analysis
Collaboration with other TCPs

- Clean, energy-efficient and sustainable fuels and related vehicle technology
- Improved life cycle efficiency
- Reduced GHG emissions
- Fuels contributing to sustainability transportation
- Specific developments of process or energy technologies
- Industry based biorefineries
- Energy use in industry sectors

IEA Bioenergy

- Operational issues
- Mathematical modelling
- Different clean coal technologies
- Overall system aspects
- Mitigation options

IEA FBC

- Input from the end-use side with focus on internal combustion engine processes
- Lower pollutant emissions
- Reduced fuel consumption
- Analytical and experimental methods

IEA Combustion

- Use of synthetic and renewable fuels in engines

Clean energy production by fluidized bed conversion

IEA GHG R&D

- Reduction of GHG emissions by CCS
- Technologies for reduction of carbon emissions, and for mitigation of climate change and global warming

Clean and efficient uses of coal

IEA Clean Coal Centre

IEA AMF

IEA IETS
Opportunities for Growth: Linking Multi-lateral Efforts
TCP Benefits

- Strengthen national R&D capabilities
- Share research costs
- Pool technical resources
- Network researchers
- Enhance the quality of R&D outputs
- Build common understanding of technical basis for issues
- Avoid duplication and unproductive research paths
- Standardise methodologies
- Harmonise technical standards
- Disseminate information on technology capabilities
- Accelerate the deployment of new technologies
- Contribute to energy policy development
End of Triennium Event 2018

- San Francisco, November 5-9, 2018
  - Monday - IEA Bioenergy Task Meetings
  - Monday/Tuesday - IEA Bioenergy Executive Committee

- ABLC Conference Events – November 7-9
  - Wednesday - IEA Bioenergy - End of Triennium Program
    - Evening International Session with Biofuture Platform, below50, IRENA, ...
  - Thursday - ABLC Program
  - Friday - US DOE Bioenergy Program
Thank you for your consideration
Additional Information
Annual Budget: 2018

The currency for the Technology Collaboration Programme is US dollars

<table>
<thead>
<tr>
<th>Fund</th>
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<tr>
<td>Task Funds (10 Tasks)</td>
<td>1,368,990</td>
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<tr>
<td>Strategic Fund #</td>
<td>115,210</td>
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<td>ExCo Secretariat Fund</td>
<td>219,000</td>
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<tr>
<td>Technical Coordinator Fund</td>
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<td><strong>Total</strong></td>
<td><strong>1,789,000</strong></td>
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# the Strategic Fund is a component of the Task Funds.
Inter-Task Projects

- Fuel pretreatment of biomass residues in the supply chain for thermal conversion
- Measuring, governing and gaining support for sustainable bioenergy supply chains
- Bioenergy Success Stories
Special projects (Task 41)

- Bio-CCS and Bio-CCUS
- Bioenergy - Balancing the Grid and providing Storage Options
- Bioenergy - Renewable Energy System Hybrids
- Contribution to IEA Technology Roadmap on Bioenergy
2017 Publications

- Integrated Bioenergy Hybrids – Flexible renewable energy solutions
- Global wood pellet industry and trade study 2017
- Biofuels for the marine shipping sector
- Methane emissions from biogas plants
- Aerosols from Biomass Combustion
- Bioenergy’s role in balancing the electricity grid and providing storage options – an EU perspective
- State of Technology Review – Algae Bioenergy
- The Potential of Biofuels in China
- Others – see http://www.ieabioenergy.com/iea-publications/
Communications

- Cooperation with other international organizations:
  - IRENA, FAO, GBEP, BioFutures Platform, Mission Innovation, SEforAll/Below50

- Position papers
  - ‘Bioenergy for Sustainable Development’
  - Chatham House Report Response

- Bi-Monthly Webinars
- Workshop Reports
- Success Stories
- Summaries of Technical Reports
- Twitter (@IEABioenergy)

www.ieabioenergy.com
Webinars

- Aerosols from Biomass Combustion, 22-Mar-18
- The IEA Bioenergy Roadmap: Delivering Sustainable Bioenergy, 21-Feb-18
- Methane emissions from biogas plants – Methods for measurement, results and effect on greenhouse gas balance of electricity produced, 18-Jan-18
- The Hotspots of the Global Wood Pellet Industry and Trade 2017, 1-Dec-17
- Integrated Bioenergy Hybrids – Flexible Renewable Energy Solutions, 14-Sep-17
- Others – see http://www.ieabioenergy.com/iea-publications/webinars/
Bioenergy for Sustainable Development

- Options for **sustainable bioenergy expansion**
  - Multiple-functional land use
  - Sustainable intensification, landscape planning, forest management
    - with better information and digitalisation
  - Restoring degraded or marginal lands
  - Using waste and organic residues
  - Reducing losses in the food chain

- Bioenergy is **part of a larger bioeconomy**.
  - Biorefineries: integrated production systems

http://www.ieabioenergy.com/publications/bioenergy-for-sustainable-development/
Recent and Upcoming Events

BIO-CCS AND BIO-CCU Workshop, Brussels
- January 16, 2018

Task 43 Spring Workshops
- The Nordic Forest Model
- Attractive Systems for Bioenergy Feedstock Production
- Governing sustainability of bioenergy, biomaterial and bioproduct supply chains

International Conference on Negative CO$_2$ Emissions
- Chalmers University, Gothenburg, Sweden
- May 22-24, 2018

Next IEA Bioenergy ExCo Meeting (ExCo81)
- Ottawa, Canada, May 29 – June 1, 2018
IEA Bioenergy Task 39 - objectives, 2016-2018

- “To facilitate commercialization of conventional and advanced liquid biofuels”
- Collaboration between 14 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
IEA Bioenergy Task 39
Liquid biofuels focus
14 member countries 2016-2018
www.Task39.org
State of Industry Updates

- International Civil Aviation Organisation (ICAO)
  - Global agreement on first regulation of emissions within sector
- Global wood pellet production and consumption grew
- Brazil - Created a new national biofuels policy, RenovaBio
- China – 10% Ethanol blending by 2020
- India – 5 - 10% Ethanol blending plans
- Europe
  - Clariant to build new plant in Romania
  - Enerkem to build in Netherlands
  - Silva Green Fuel AS to build in Norway
- USA
  - POET-DSM
  - New Plants - Aemetis, Red Rock Biofuels, Fulcrum
- USA/North America/Brazil - Refinery Co-processing
  - DOE/NREL - Petrobras
  - Honeywell/UOP/Ensyn - Envergent
POET-DSM

Aerial view of POET-DSM’s Project Liberty cellulosic ethanol plant in Emmetsburg, Iowa
# ExCo Meetings for 2015-2018

<table>
<thead>
<tr>
<th>ExCo</th>
<th>Location</th>
<th>Date</th>
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<tr>
<td>75</td>
<td>Ireland</td>
<td>May 2015</td>
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<td>76</td>
<td>Germany</td>
<td>October 2015</td>
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<td>Italy</td>
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<td>80</td>
<td>Switzerland</td>
<td>October 2017</td>
</tr>
<tr>
<td>81</td>
<td>Canada</td>
<td>May 29 - June 1, 2018</td>
</tr>
<tr>
<td>82</td>
<td>San Francisco, USA</td>
<td>November 5-9, 2018</td>
</tr>
</tbody>
</table>
Preparations for Next Triennium – 2019-2021

- **Surveys**
  - To stakeholders: on-line, received 358 replies
  - To ExCo members and Task leaders

- **In 2018, need to decide on**
  - **Current Tasks, new Tasks or Intertask projects or special projects to operate in next triennium**
    - **Likely additions**
      - New Task on Integrating bioenergy and other renewable energy forms, BioCCU/S
    - **Intertask work on**
      - Sustainability governance, techno-economics, acceptance/socio-economic impacts, ...
Conclusions

• Bioenergy has an important role to play
• in expanding availability and access to robust and reliable energy systems
• and realising low carbon transportation

• IEA Bioenergy continues to provide crucial science based analysis to inform the international community

• Methods for disseminating IEA Bioenergy messages are expanding via increased use of webinars & social media

• Collaboration with relevant international bodies is developing strongly