



## IEA Bioenergy activities in relation to solid biofuels

### Who is IEA Bioenergy?

IEA Bioenergy is an organisation set up in 1978 by the International Energy Agency (IEA) with the aim of improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment.

The International Energy Agency acts as energy policy advisor to 28 Member Countries plus the European Commission, in their effort to ensure reliable, affordable, and clean energy for their citizens. Founded during the oil crisis of 1973-74, the IEA's initial role was to co-ordinate measures in times of oil supply emergencies. As energy markets have changed, so has the IEA. Its mandate has broadened to incorporate the "Three E's" of balanced energy policy making: energy security, economic development, and environmental protection. Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major producers and consumers of energy like China, India, Russia and the OPEC countries.

Activities are set up under Technology Collaboration Programmes. These are independent bodies operating in a framework provided by the IEA. There are 42 currently active Technology Collaboration Programmes, one of which is IEA Bioenergy.

IEA Bioenergy offers opportunities to coordinate the work of national programmes across the wide range of bioenergy technologies.

IEA Bioenergy provides an umbrella organisation and structure for a collective effort where national experts from research, government and industry work together with experts from other member countries. Resources are provided in two main ways:

- Cost Sharing – participants contribute to a common fund for conducting research projects and information exchange.
- Task Sharing – participants devote specified resources and personnel to conduct an agreed work programme.

### IEA Bioenergy and Australia and New Zealand

It is the primary international research entity for the New Zealand and Australian bioenergy sectors.

#### Representatives

##### New Zealand

Dr Paul Bennett, Science Leader Clean Technologies, Scion - [Paul.Bennett@scionresearch.com](mailto:Paul.Bennett@scionresearch.com)

- Paul Bennett is also the current ExCo Chair of IEA Bioenergy

##### Australia

Prof Mark Brown, Director of the Forest Industries Research Centre, University of the Sunshine Coast.  
[mbrown2@usc.edu.au](mailto:mbrown2@usc.edu.au)

- Mark Brown is the ExCo Head of Communications Team

## Contracting parties

The Contracting Parties to a Technology Collaboration Programme (eg IEA Bioenergy) nominate an Executive Committee which acts as the ‘board of directors’ of the TCP.

Australia - Bioenergy Australia (Forum) Ltd

New Zealand – SCION

## Activities

The work of IEA Bioenergy is structured in a number of Tasks, which have well defined objectives, budgets, and time frames.

Tasks relating to solid biofuels are:

### 1. Task 43: Biomass supply

<https://task43.ieabioenergy.com/>

Task 43 explores technical and economic strategies to increase the quantity of biomass available, improve the quality of biomass delivered for different energy purposes, and explore strategies to increase the value and foster confidence in biomass supply for both direct and cascade use of biomass for energy.

Through deployment, application and management of best practice in technology and economic systems in integrated biomass production and supply chains systems this task aims to:

- Develop, refine, compare and promote sustainable integrated land management strategies that contribute to increased, competitive biomass mobilisation through engaged stakeholder groups in existing and emerging agriculture and forestry lignocellulosic systems.
- Develop, refine, compare and promote innovative biomass supply chain and logistics systems through engaged stakeholder groups that more efficiently recover and deliver more high-quality biomass for multiple products and markets including bioenergy.
- Explore emerging bioeconomy supply chain and logistics systems to develop integrated solutions for the production and supply of more high-quality biomass.
- Foster international collaboration and shared views on strategies to increase the quantity, quality, value, and reliability of biomass supply and logistics

### *Work packages*

WP1 – Biomass production systems for sustainable bioenergy within the bioeconomy

WP2 – Integrated supply chain and logistics for sustainable bioenergy within the bioeconomy

### 2. Task 32: Biomass combustion

<https://task32.ieabioenergy.com/>

Task 32 Biomass Combustion works on further expansion of the use of biomass combustion for heat and power generation. Task 32 puts special emphasis on small scale heating units and medium to large scale CHP plants as well as co-firing biomass with coal in traditional coal-fired boilers. This is done by generating and disseminating information on technical and on non-technical barriers and anticipated solutions.

Enhancement of industrial participation is realised by formulating joint projects between participating members and industry. The emphasis of the activities in the Task is on:

- market introduction for expanding the use of Biomass Combustion at a short term;
- optimisation of biomass combustion technology to remain competitive at a longer term

Recent reports - <https://task32.ieabioenergy.com/upcoming-reports/>

### **3. Task 40: Deployment of biobased value chains**

<https://task40.ieabioenergy.com/>

The core objective of Task 40 is to support the deployment of viable, efficient and biobased value chains in the context of:

- sustainable regional, national and international markets
- reflecting on policy developments, and economic aspects, including financing
- international, national and regional trade of biomass
- recognising the diversity in biomass resources, value chains and competitive applications for bioenergy, biobased materials and products (bioeconomy context).

The **Programme of Work** will have three core areas of operation:

#### WP1: Market developments

New regional bioenergy markets – key actors, policies and regulation, and technological challenges regarding deployment, and trade

Market perspectives and deployment guidance for aviation and marine biofuels (Collaborative Inter-Task project)

Globalised sustainable biobased value chain, including market perspectives and synergies between bioenergy and the bioeconomy

#### WP2: Industrial Heat and Processes

Industrial heat (technologies, markets, and deployment) and processes, considering bioenergy pathways as alternatives/complements to CC(U)S (Strategic Inter-Task project, lead: Task 32)

BECCS/U – industries and technologies suitable for BECCS applications, considering deployment requirements (Collaborative Inter-Task project, lead: Task 40)

#### WP3: Deployment Strategies

Deployment guidance on technological barriers, economic aspects & financing

Renewable gas – deployment, markets and sustainable trade (Strategic Inter-Task project, lead: Task 40)

Role of bioenergy in a Well-below-2 °C/SDG world (Strategic Inter-Task project, lead: Task 45)

### **4. Task 33: Gasification of Biomass and Waste**

<http://task33.ieabioenergy.com/>

Task 33 is a working group of international experts with the aim to promote the commercialization of efficient, economical and environmentally preferable thermal biomass gasification processes.

The Task monitors the current status of the critical unit operations and unit processes that constitute biomass and waste gasification (BMG) process, and identifies hurdles to advance further development, operational reliability, and reducing the capital cost of BMG systems. The Task meetings provide a forum to discuss the technological advances and issues critical to scale-up, system integration, and commercial implementation of BMG processes. Generally, these discussions lead to selection of subtask studies and/or technical workshops that focus on advancing the state-of-the-art technology and identify the options to resolve barriers to technology commercialisation.

Projects - <http://task33.ieabioenergy.com/content/Task%2033%20Projects>

## **5. Task 45: Climate and Sustainability Effects of Bioenergy within the broader bioeconomy**

<https://www.ieabioenergy.com/blog/task/climate-and-sustainability-effects-of-bioenergy-with-the-broader-bioeconomy/>

The objective of Task 45 is to identify and address critical issues related to the climate and other sustainability effects of bioenergy and biobased products and systems. The aim is to promote sound development for bioenergy as an integral component of the overall bioeconomy. This objective will be achieved by providing analyses that support well-informed decisions by land owners, communities, businesses, governments and others. A key goal is to increase understanding of the environmental, social and economic impacts of producing and using biomass for bioenergy, within the broader bioeconomy. A central aspect concerns the development and application of science-based methodologies and tools for assessing the effects of biobased systems.

Three work packages as follows:

WP1 – Metrics, methods, and tools for assessing climate change effects of bioenergy,

WP2 – Metrics, methods and tools for assessing sustainability effects of bioenergy (excluding climate change effects),

WP3 – Sustainability stakeholders and implementation approaches (governance),

## **6. Bioenergy for High Temperature Heat in Industry**

<https://itp-hightemperatureheat.ieabioenergy.com/>

This inter-Task project, involving Tasks 32, 33, 34, 36 and 40, will result in four separate case study reports that illustrate good examples of integration of bioenergy in industry for the delivery of high temperature heat, and a policy strategy report that provides information on market opportunities/potential and effective ways to address existing technical and non-technical barriers.

Four case studies were prepared on the use of bioenergy in industry to supply process heat.. The cases were selected carefully to illustrate that a wide diversity of bioenergy conversion technologies is readily available for market application, the optimum configuration depending on local availability of biomass resources, characteristics of the heat demand, availability of space, capital, etc. The cases are:

1. [Combustion of wood chips and composting residues for process steam generation in a potato processing industry](#)
2. [Gasification of paper reject to displace natural gas usage in a pulp and paper process](#)
3. [Process steam in a dairy factory via fast pyrolysis bio-oil](#)
4. [Waste-to-Energy for production of steam for paper production](#)

## 7. The Role of Bioenergy in a WB2/SDG world

This 3-year project started in the first quarter of 2019 and includes four activity areas. Studies are underway, including one on ‘forests as long-term C sinks’ which will address the view that forests should remain uncut. The project is expected to be completed in the 4th quarter of 2021.

1. [Roles of bioenergy in energy system pathways towards a WB2 world Workshop](#)
2. [Roles-of-bioenergy-in-energy-system-pathways-towards-a-WB2-world-Workshop-Report-Summary](#)

### Completed Tasks and projects

Task 29 [Socio-Economic Drivers in Implementing Bioenergy Projects](#)

Task 30 [Short Rotation Crops for Bioenergy Systems](#)

Task 31 [Biomass Production for Energy from Sustainable Forestry](#)

Task 35 [Techno-economic Assessments for Bioenergy Applications](#)

Task 38 [Climate Change Effects of Biomass and Bioenergy Systems](#)

Inter-Task Projects

- [Measuring, governing and gaining support for sustainable bioenergy supply chains](#)
- [Fuel pre-treatment of biomass residues in the supply chain for thermal conversion](#)
- [Bioenergy success stories](#)
- [Mobilising sustainable Bioenergy Supply Chains](#)
- [Monitoring sustainability certification of bioenergy](#)

### Special Projects

- [Special Project 9: The potential for cost reduction for novel and advanced renewable and low carbon Fuels](#)
- [Special Project 8: Technology roadmap – delivering sustainable bioenergy](#)
- [Special Project 7: Bioenergy RES Hybrids](#)
- [Special Project 6: Bioenergy in Balancing the Grid & Providing Storage Options](#)
- [Special Project 5: Bio-CCS and Bio-CCUS in Climate Change Mitigation](#)