IEA Bioenergy

IEA Bioenergy highlights

Highlights of Bioenergy Research 2020
Graz, 24 January 2020

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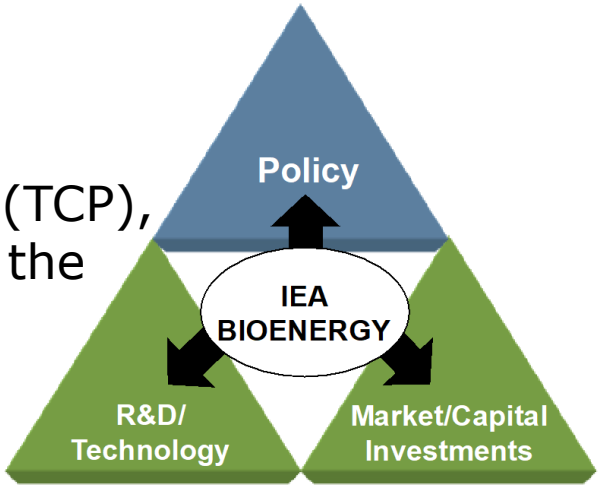
IEA Bioenergy TCP



Technology Collaboration Programme (TCP), functioning within a framework created by the **International Energy Agency** (IEA)

Goal:

- International **collaboration** and **info exchange** on bioenergy research, technology development, demonstration, and policy analysis
- Facilitate the commercialization and market deployment of **environmentally sound**, **socially acceptable** and **cost-competitive** bioenergy systems

Work programme carried out through **Tasks** and **Special Projects**, covering the full value chain from feedstock to final energy product

IEA Bioenergy TCP Membership - 25 Contracting Parties

ASIA/OCEANIA/AFRICA

- India
- Japan
- Korea
- Australia
- New Zealand
- South Africa

AMERICA'S

- Brazil
- Canada
- United States

EUROPE:

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

25 contracting parties

Budget in 2019: 1,9 Million US$

11 Tasks + Special projects

Task participation: 106
Direct participation: > 200 persons

Unique role for sustainable bioenergy

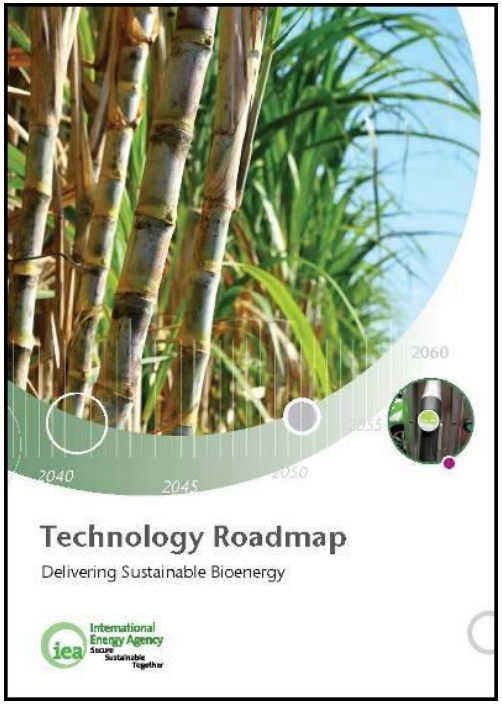
- **Available** now
- **Versatile**: including heavy transport, machinery, aviation
- Readily integrated with **existing infrastructure**
- **Storable** - can support expansion of intermittent renewables
- Can deliver **negative emissions** when linked to CCS: BECCS / Bio-CCS

Bioenergy contributes to climate change mitigation when:

- Biomass is **grown sustainably**
- **Converted** to energy products **efficiently**, possibly in conjunction with biobased products
- Used to **displace GHG-intensive fuels**

IEA Technology Roadmap: Delivering Sustainable Bioenergy

cooperation between IEA & IEA Bioenergy

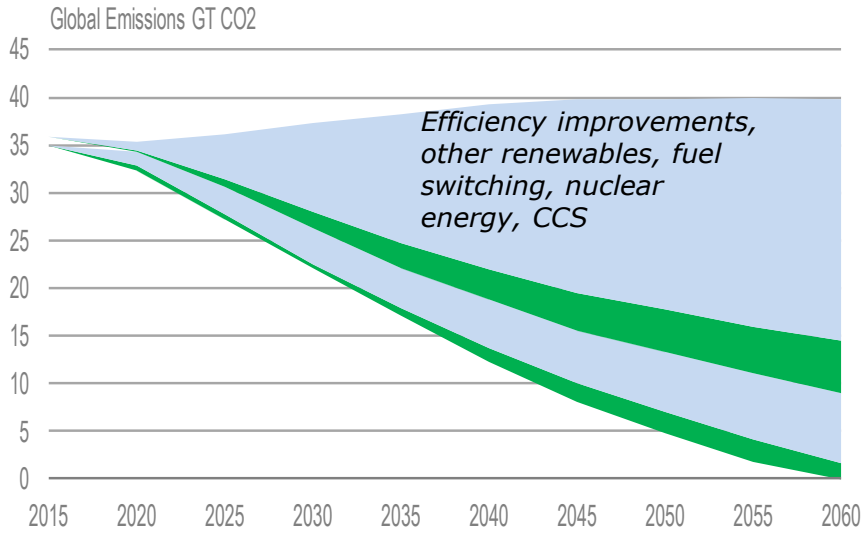


Published November 2017

http://www.ieabioenergy.com/publications/technology-roadmap-delivering-sustainable-bioenergy/

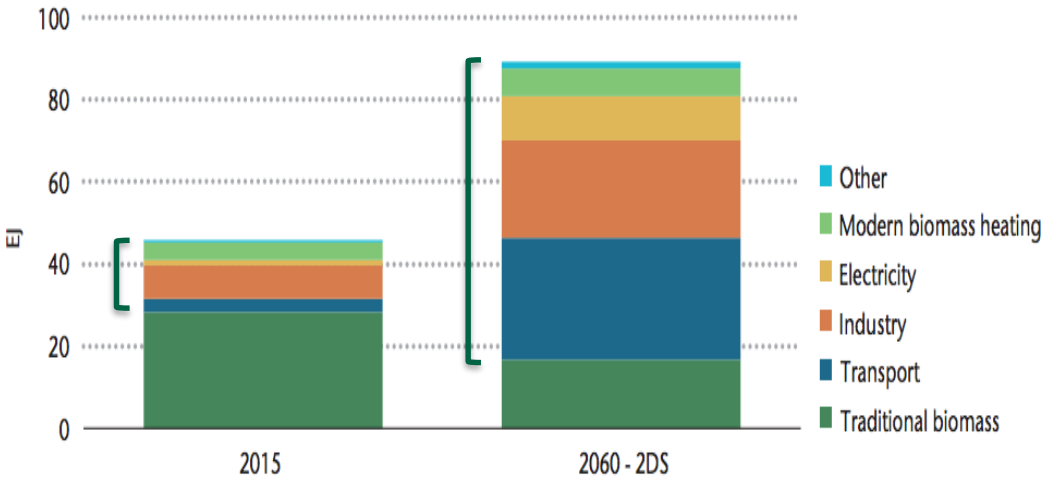
The Technology Roadmap provides **technology milestones** and **policy actions** needed to unlock the potential of bioenergy in a sustainable energy mix

Bioenergy roadmap: Role of Bioenergy in Decarbonisation Scenarios



Bioenergy to provide some 17% of cumulative carbon savings to 2060 in the 2DS and around 22% of additional cumulative reductions in the B2DS, including an important contribution from BECCS

Modern bioenergy to provide almost 17% of final energy demand in 2060 in the 2DS compared to 4.5% in 2015



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Main conclusions of the roadmap

= basis for IEA Bioenergy work !

- Sustainable bioenergy = essential element in the portfolio of measures needed for a low carbon scenario.
- Biofuels can play particularly important role in transport (complementing energy efficiency measures and electrification, and with a special role in aviation, shipping and other long haul transport), but also grows in industry, electricity and buildings.
- Progress in bioenergy is much slower than necessary so need to
  - Expand deployment of existing technologies
  - Commercialise new technologies
  - Develop sustainable supply chains and appropriate sustainability governance systems
  - Build technical and regulatory capacity in a much wider range of countries and regions
- Putting in place suitable policy frameworks = vital step in accelerating deployment

IEA Bioenergy objectives 2020-2025

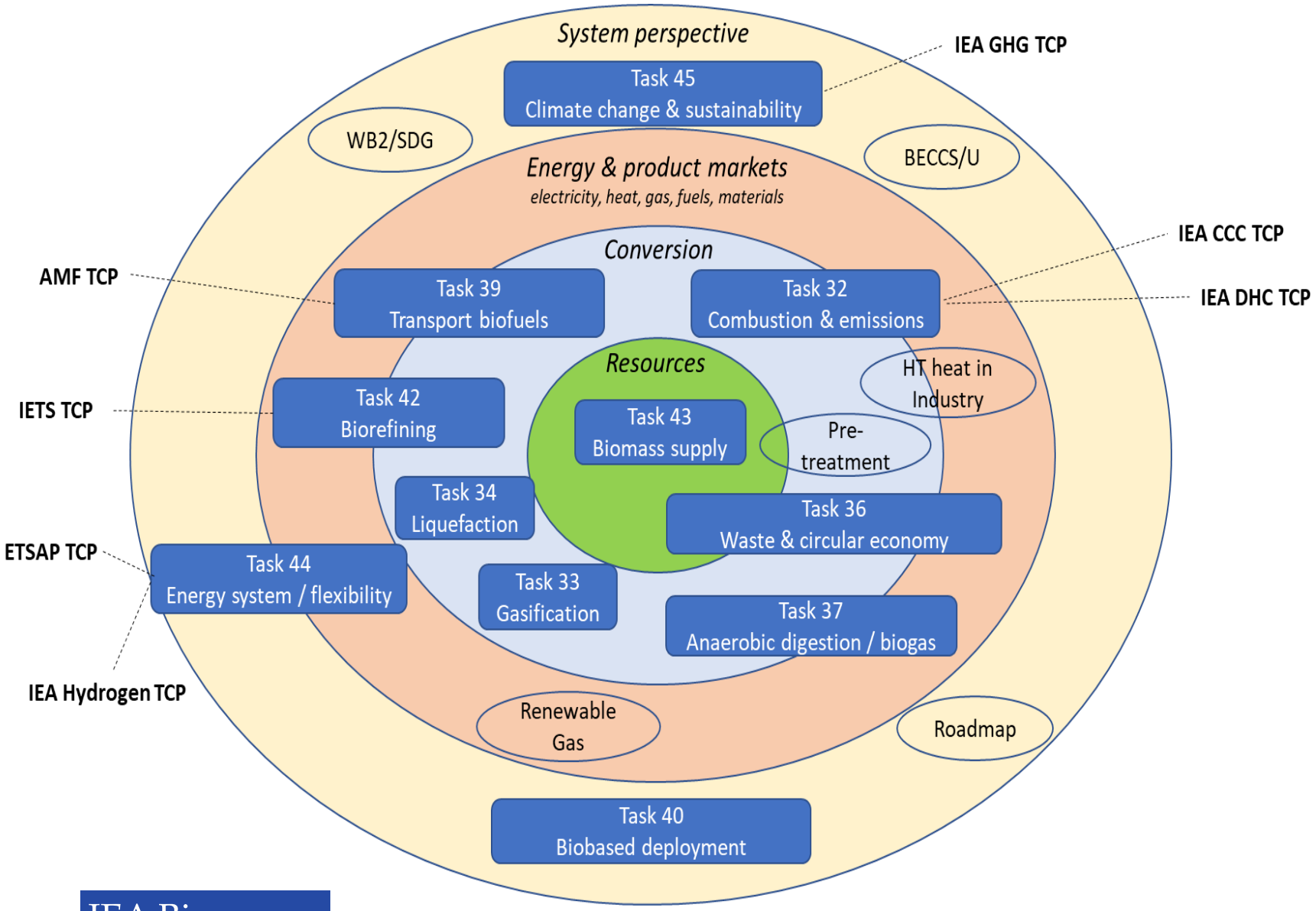
1. Enable the development and application of innovative bioenergy **technologies**

2. Support increased sustainable **biomass** production and efficient biomass supply chains

3. Explore bioenergy's potential to **climate change mitigation** across all energy sectors & **SDGs** (sust. development goals)
   - capacity to deliver negative emissions, e.g., through BECCS/U !

4. O**utreach**:
   - Engage stakeholders in dialogue
   - collaboration with emerging countries
   - enhance and optimise communication channels => policy makers, decision makers, and wider stakeholder community

Activities in IEA Bioenergy



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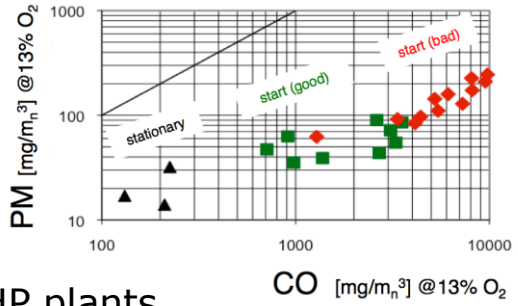
Task highlights

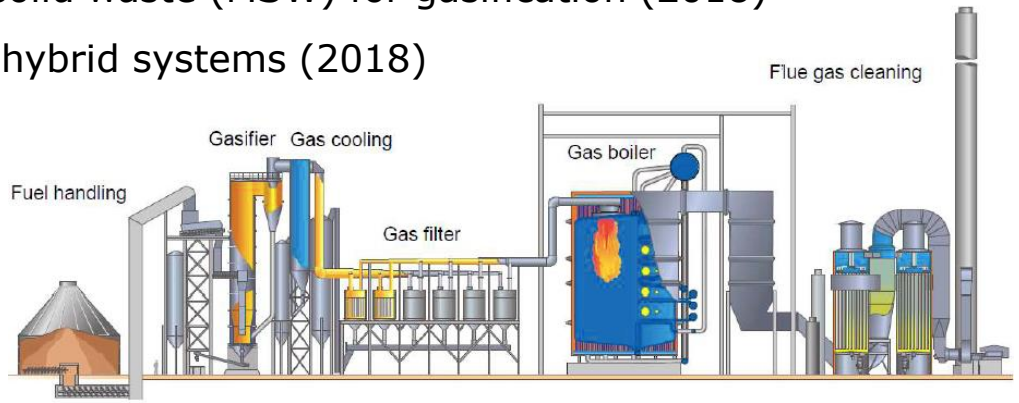
Task 32: Biomass **Combustion**



- Aerosols from biomass combustion (2017)
- Advanced Test Methods for Firewood Stoves (2018)
- Best practise report on decentralized biomass fired CHP plants (2019)
- The future role of thermal biomass power in renewable energy systems - a study of Germany (2018)

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

- Status report on thermal gasification of biomass and waste (2019)
- Pretreatment of municipal solid waste (MSW) for gasification (2018)
- Thermal gasification based hybrid systems (2018)



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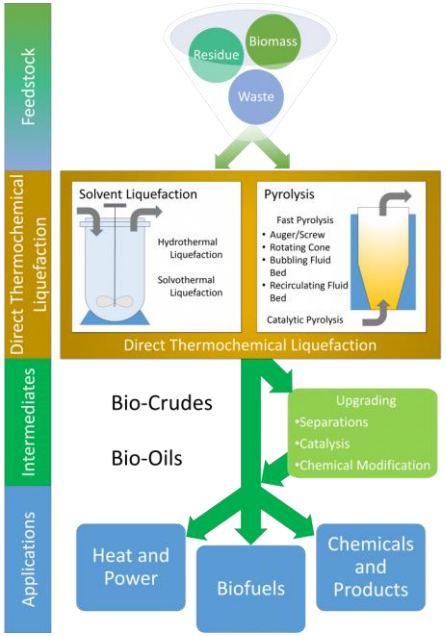
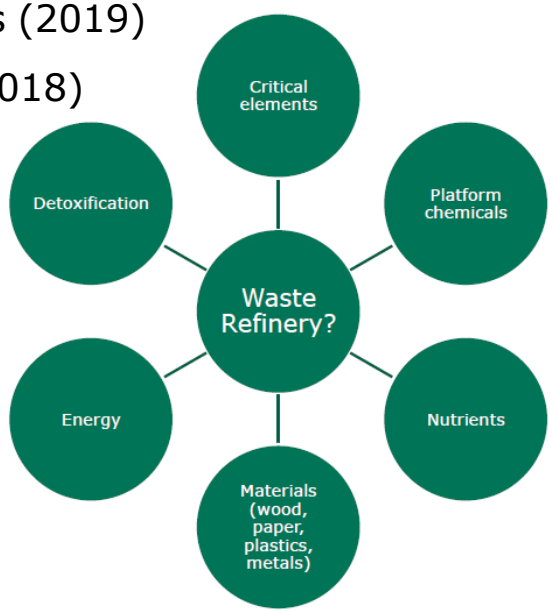
Task 34: Direct thermochemical **liquefaction**

- Round Robin on Fast Pyrolysis Bio-oil Production (2018)
- Input to standards development
- PyNe newsletter (biannual)



Task 36: Material and energy valorisation of **waste** in a circular economy

- Waste Incineration for the Future – Swedish scenarios (2019)
- Transboundary shipments of woody biomass waste (2018)
- Trends on the use of SRF (2019)



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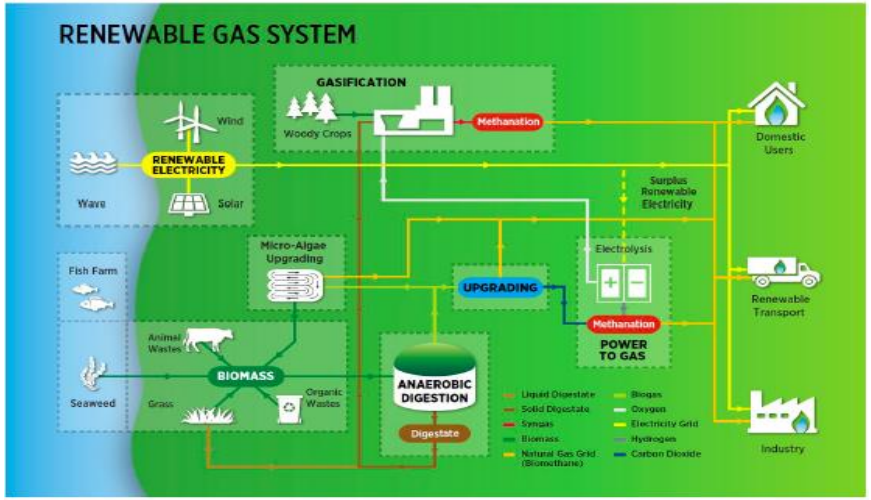
Task 37 – Energy from **biogas**

- Green Gas / future gas grids (2018)
- Methane emissions from biogas plants (2017)
- Anaerobic Digestion and Biogas in the Circular Economy (2018)
- Integrated biogas systems (2018)



Task 38 - **Climate Change** effects of biomass and bioenergy systems

- Reference systems for evaluating climate effects of bioenergy (2018)
- Quantifying the Climate Effects of Forest-Based Bioenergy (2018)
- Harmonizing tools for biofuel assessment (2018-2019)
- Challenging misconceptions

From 2019 this topic is continued in Task 45

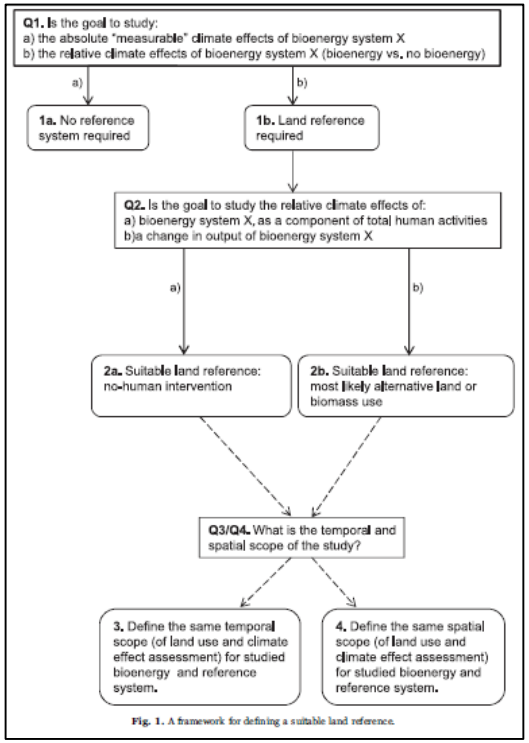


Fig. 1. A framework for defining a suitable land reference.

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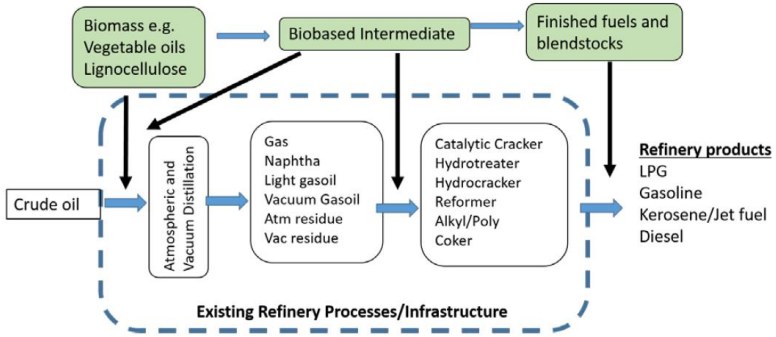
Task 39: Commercializing conventional and advanced **transport biofuels**

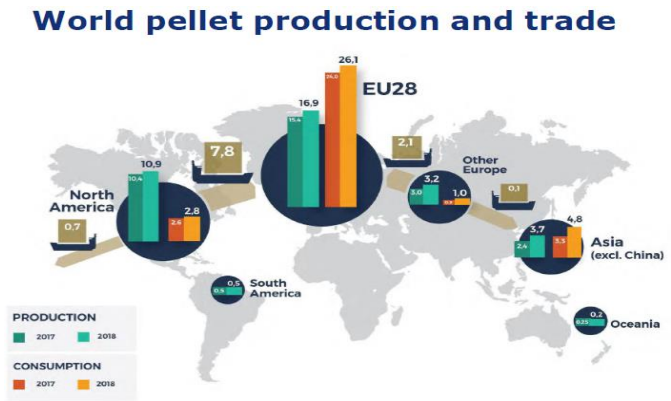
- Compare and contrast international biofuel policies (2019)
- Drop-in Biofuels & the key role of co-processing (2019)
- Biofuels in Marine Shipping (2017)
- Algae bioenergy (2017)



Task 40: D**eployment** of biobased value chains*

**New name from 2019. Previously 'Sustainable biomass markets and international trade to support the biobased economy'*

- The future of biomass and bioenergy deployment and trade (2019)
- Margin potential for a long-term sustainable wood pellet supply chain (2019)
- Global Wood Pellet Industry and Trade (2017)



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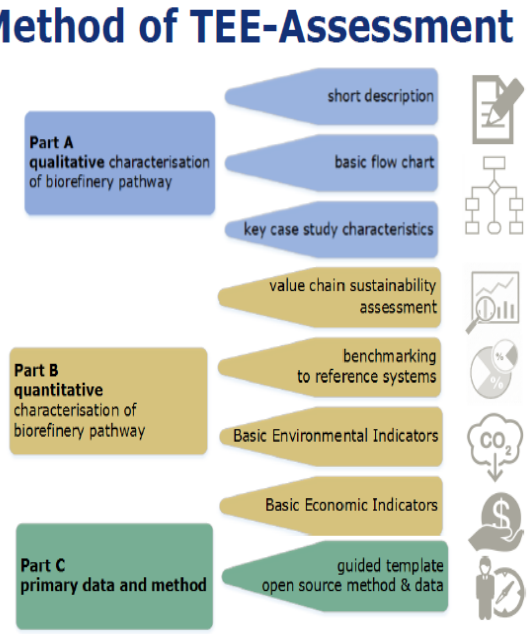
Task 42: **Biorefining** in a circular economy

- Biorefineries expert system & Biorefinery Factsheets (2019)
- Natural Fibers and Fiber-based Materials in Biorefineries (2018)
- Bioeconomy and biorefining strategies in the EU Member States and beyond (2018)
- The role of industrial biorefineries in a low carbon economy (2017 - workshop report)



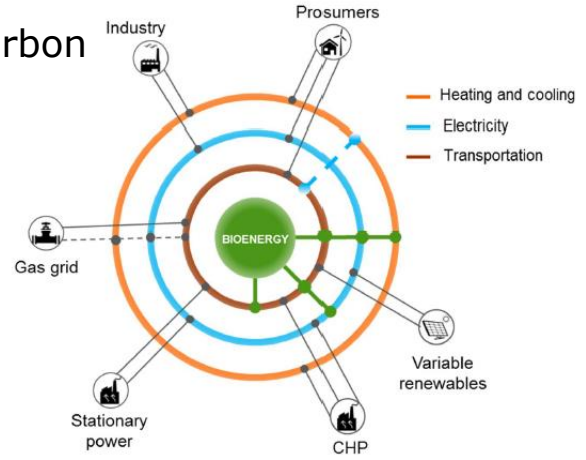
Task 43: Sustainable **biomass supply**

- Attractive systems for bioenergy feedstock production in sustainably managed landscapes (2019)
- Innovative approaches for mobilization of forest biomass for bioenergy (2018)
- How to analyse ecosystem services in landscapes (2018)

New Tasks (from 2019)

Task 44: Flexible bioenergy and system integration

- Flexible bioenergy concepts for supporting low-carbon energy systems
- Acceleration of implementation
- System requirements for bioenergy concepts



Task 45 - **Climate and sustainability** effects of bioenergy within the broader bioeconomy

- Metrics, methods, and tools for assessing climate change effects of bioenergy
- Metrics, methods and tools for assessing sustainability effects of bioenergy (excl. climate)
- Sustainability stakeholders and implementation approaches (governance)

Special projects (Task 41)

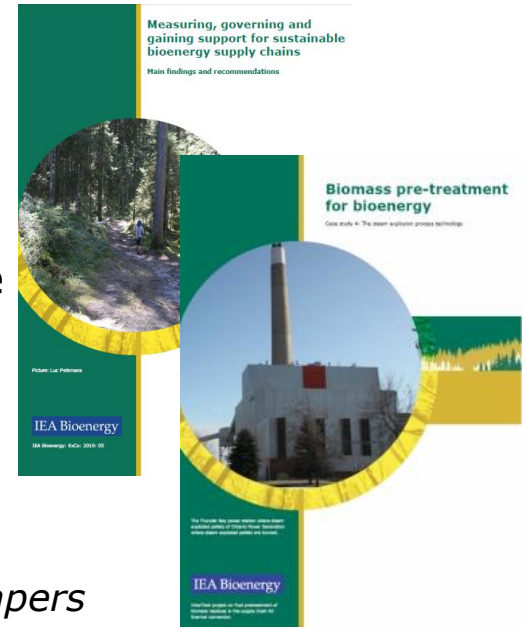
= initiative of 2 or more IEA Bioenergy member countries

- Bioenergy in **balancing the grid** & providing storage options *(2017)*
- Bioenergy **RES Hybrids** *(2017)*
- Contribution to IEA Technology **Roadmap** on Bioenergy *(2017)*
- **Bio-CCS and Bio-CCUS** in climate change mitigation and extended use of biomass raw material *(2018)*

- The potential for **cost reduction** for novel and advanced renewable and **low carbon fuels**
- The contribution of Advanced Renewable Transport Fuels to **transport decarbonisation** in 2030 and beyond (with IEA AMF)
- **Renewable Gas** – Hydrogen in the grid

Inter-Task projects

- Bioenergy **success stories** (2018)
  - *10 factsheets*
- Fuel **pretreatment** of biomass residues in the supply chain for thermal conversion (2019)
  - *Strategic report + 5 case studies*
- Measuring, governing and gaining support for **sustainable** bioenergy supply chains (2019)
  - *Summary reports for the 3 objectives + several papers*



- The role of **bioenergy in a WB2/SDG world**
- **Renewable gas** - deployment, markets and sustainable trade
- Bioenergy for **high temperature heat** in industry
- **BECCS/U** - Bioenergy with Carbon Capture & Sequestration / Utilization

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Communication

- Cooperation with communication specialists to update / improve our communication strategy and aid implementation
- Logo, website and template re-design in next months
- Bi-monthly webinars
- Searchable library
- Position papers, e.g.
  - 'Bioenergy for Sustainable Development'
  - Is energy from woody biomass positive for the climate?
- Social media - Twitter (@IEABioenergy), LinkedIn
- Workshops / end-of triennium conference
- Cooperation with other international organizations:
  - IEA, IRENA, FAO, GBEP, BioFuture Platform, Mission Innovation, SEforAll/Below50

More information available at https://www.ieabioenergy.com/

Report on activities in 2016-2018:
https://www.ieabioenergy.com/publications/triennium-reports-on-iea-bioenergy-tasks-activities-2016-2018/

Work programme 2019-2021:
https://www.ieabioenergy.com/publications/new-publication-iea-bioenergy-work-programme-2019-2021-triennium/

Thanks for your attention

IEA Bioenergy

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