IEA Bioenergy
Technology Collaboration Programme

Workshop on biomass combustion and CCUS

Morten Tony Hansen
IEA Bioenergy Task 32/Ea Energy Analyses

Copenhagen, Denmark/online

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Warm welcome to speakers and audience!

- Seven speakers will take us into their projects on CCUS
- Over 80 registered participants from around the World
- Together we will have an opportunity to discuss the experiences and to focus on which questions to ask when considering CCUS

- BECCUS has become an important means in some countries to mitigate GHG emissions and to create negative emissions
- Focus of workshop is on consequences for the operation of combustion plants when installing carbon capture

Biomass combustion and CCUS - Agenda

13:30 Demonstration and full-scale CC at WtE plant by Jannik Kappel, ARC

13:50 CCS at Klemetsrud WtE plant in Oslo by Michael Becidan, Task 36/SINTEF

14:10 CCS at small scale WtE plant in Thisted by Morten Pipper, SEG

14:30 Modelling CCS at large wood chip fuelled CHP plant by Jesper Werling, Ea Energy Analyses

Short break

15:00 Full-scale CCS at Värtanverken by Fabian Levihn, Stockholm Exergi AB

15:20 CC technologies for small-scale plants by Sebnem Madrali, Natural Resources, Canada

15:40 CC at wood chip fuelled Amagervaerket in Copenhagen by Anders Evald, HOFOR

16:00 Moderated panel debate with speakers with questions from the audience

17:00 Concluding remarks

IEA Bioenergy in brief

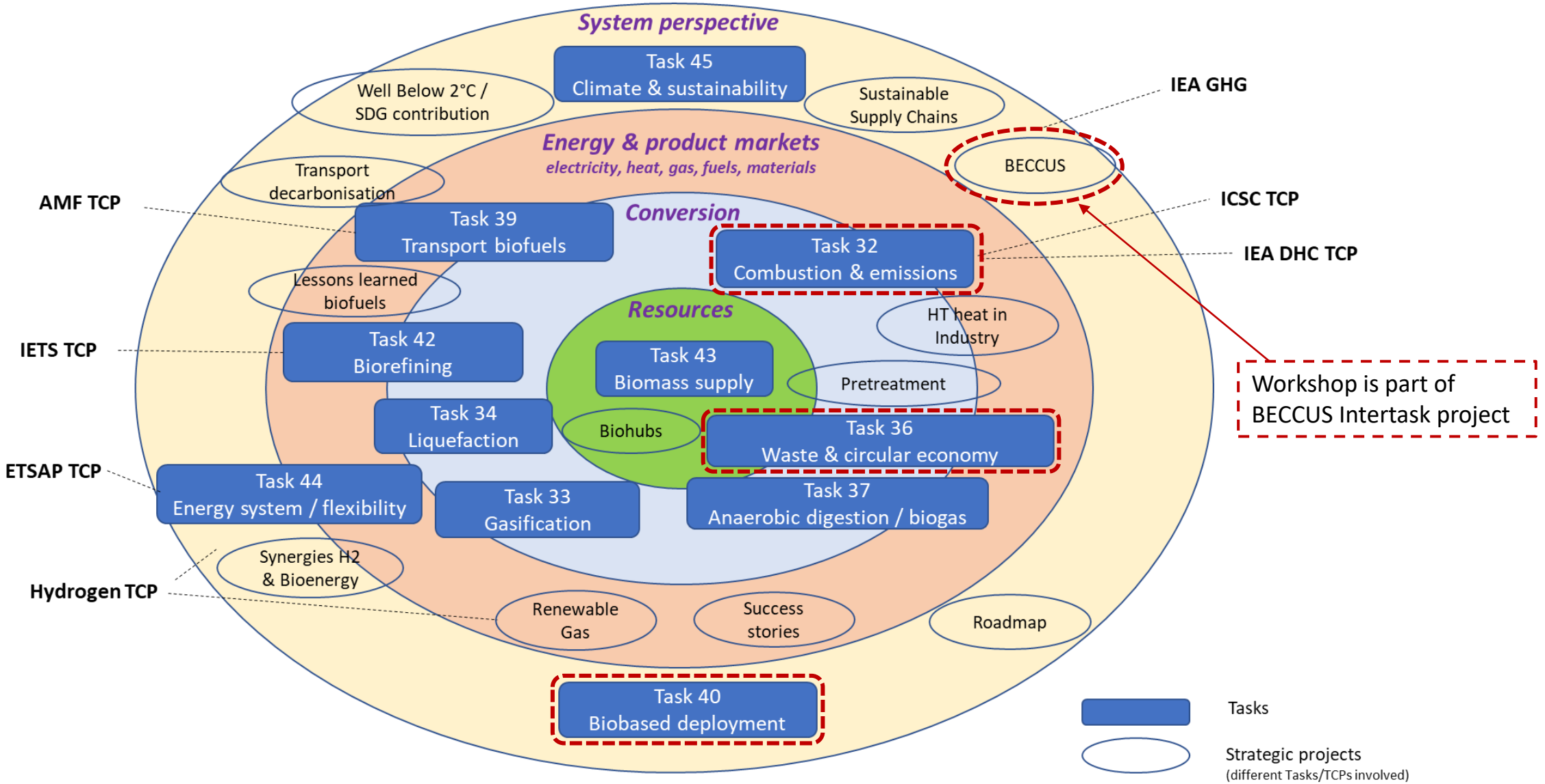
Technology Collaboration Programme (TCP), functioning within a framework created by the **International Energy Agency** (IEA)

Goal:

- International **collaboration** and **info exchange** on bioenergy research, technology development, demonstration, and policy analysis
- Facilitate the commercialization and market deployment of sustainable bioenergy systems = **climate positive, environmentally sound**, **socially acceptable** and **cost-competitive** (incl. external costs)

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

Activities in IEA Bioenergy



Practical notes

- We have four speakers present and three online
- The audience is online
- A team of three from Ea to handle practicalities
- There will be a break halfway through

- Please ask questions using the Q&A space
- We hope that speakers will check the Q&A and assist in responding to questions (when not presenting)
- The presentations will be recorded and published on the Task 32 website

Thank for your attention

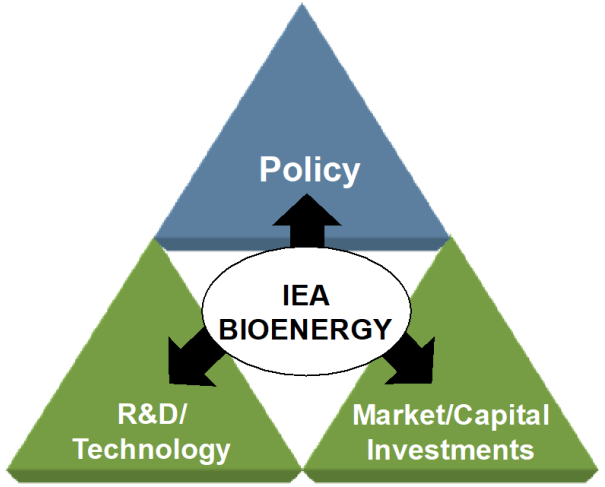
Morten Tony Hansen
Telephone: +45 31393992
E-mail: mth@eaea.dk
www.task32.ieabioenergy.com

IEA Bioenergy
Technology Collaboration Programme

www.ieabioenergy.com

Extra slides: IEA Bioenergy

IEA Bioenergy TCP Overview



25 Contracting Parties

Budget in 2022: 2 Million US$
Tasks: 11 + Strategic Projects
Participation: 111
Direct participation: > 200 persons

Turkey is in the process of joining IEA Bioenergy
US Grains Council recently joined Task 39 as a Limited Sponsor

Unique role for sustainable bioenergy in the transition away from fossil energy

- **Available now** to phase out fossil fuels in existing energy infrastructure
- **Versatile:** role in different sectors – heat, power, transport fuels
- **Storable/dispatchable:** complements intermittent/seasonal renewables in power systems
- Next to producing energy, it can **remove atmospheric CO_2** ("negative emissions") via deployment of Carbon Capture & Storage (CCS) : BECCS / Bio-CCS
- Provide **atmospheric CO_2** for carbon-containing e-products/e-fuels via Carbon Capture & Utilisation (Bio-CCU)
- **Enable biomass supply chains & sustainability governance systems** for the biobased economy

Bioenergy contributes to climate change mitigation when:

- Biomass is grown **sustainably** or based on waste/residues
- **Converted** to energy products **efficiently** (often together with other biobased products)
- Used to **displace fossil fuels**

Current strategic action areas

A sustainable system for energy and materials supply with biomass

- Demonstrating the key role of bioenergy in a decarbonising world, the complementary role with other renewables, and the potential to provide negative emissions (BECCUS)
- Contribution to Sustainable Development
- Embedding bioenergy into the broader bio-economy
- Incorporating the security, flexibility and stability provided by bioenergy in the fuels, electricity, gas and heating systems

Innovative Technologies

- Enabling the development and application of innovative technologies (collaboration & best practices)
- Developing advanced biofuels from lignocellulose and waste & consider their role in hard-to-abate transport sectors (aviation, marine, long-distance transport)

Current strategic actions areas

Sustainable Supply Chains

- Mobilize biomass resources through landscape management, reuse of abandoned agricultural lands; sustainable sourcing in agriculture and forestry; logistics to mobilize underutilized residues
- Support sustainability governance & certification
- Promote market deployment of efficient biobased value chains

Operational Optimisation

- Engaging relevant stakeholders in a dialogue & science based analysis to inform political/public debates
- Expanding collaboration with emerging and developing countries
- Ensuring the optimal use of communication channels

Extra slides: Ea Energy Analyses

Ea Energy Analyses

- Consulting company operating in the field of **energy and decarbonization**
- Established in **2005**
- Based in **Copenhagen**, Denmark
- The founding partners were managers in the TSO of Eastern Denmark

52 people

Projects in 20+ countries

3.5 m$ yearly turnover

18y experience within the energy sector

For any inquiry, contact:
info@eaea.dk

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