IEA Bioenergy
Technology Collaboration Programme

Sustainable Low Emission Wood Stoves - welcome and introduction

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IEA Bioenergy Task 32/Ea Energy Analyses

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On the agenda

- **Welcome and short introduction**
  Morten Tony Hansen, Task 32
- **Policy update on the EU Ecodesign directive**
  Irene di Padua, Bioenergy Europe
- **Danish market surveillance of ErP directive, Lot 20**
  Jes Sig Andersen, DTI
- **Inventory of national strategies for reducing the impact on air quality from residential wood combustion**
  Hans Hartmann, TFZ
- **Emission levels and emission factors for modern wood stoves**
  Øyvind Skreiberg, SINTEF
- **Stove Design Guide by IEA Bioenergy Task 32**
  Morten Gottlieb Warming-Jespersen, DTI
- **User influence on stove performance**
  Claudia Schön, TFZ & Christoph Schmidl, BEST

IEA Bioenergy

IEA Bioenergy in brief

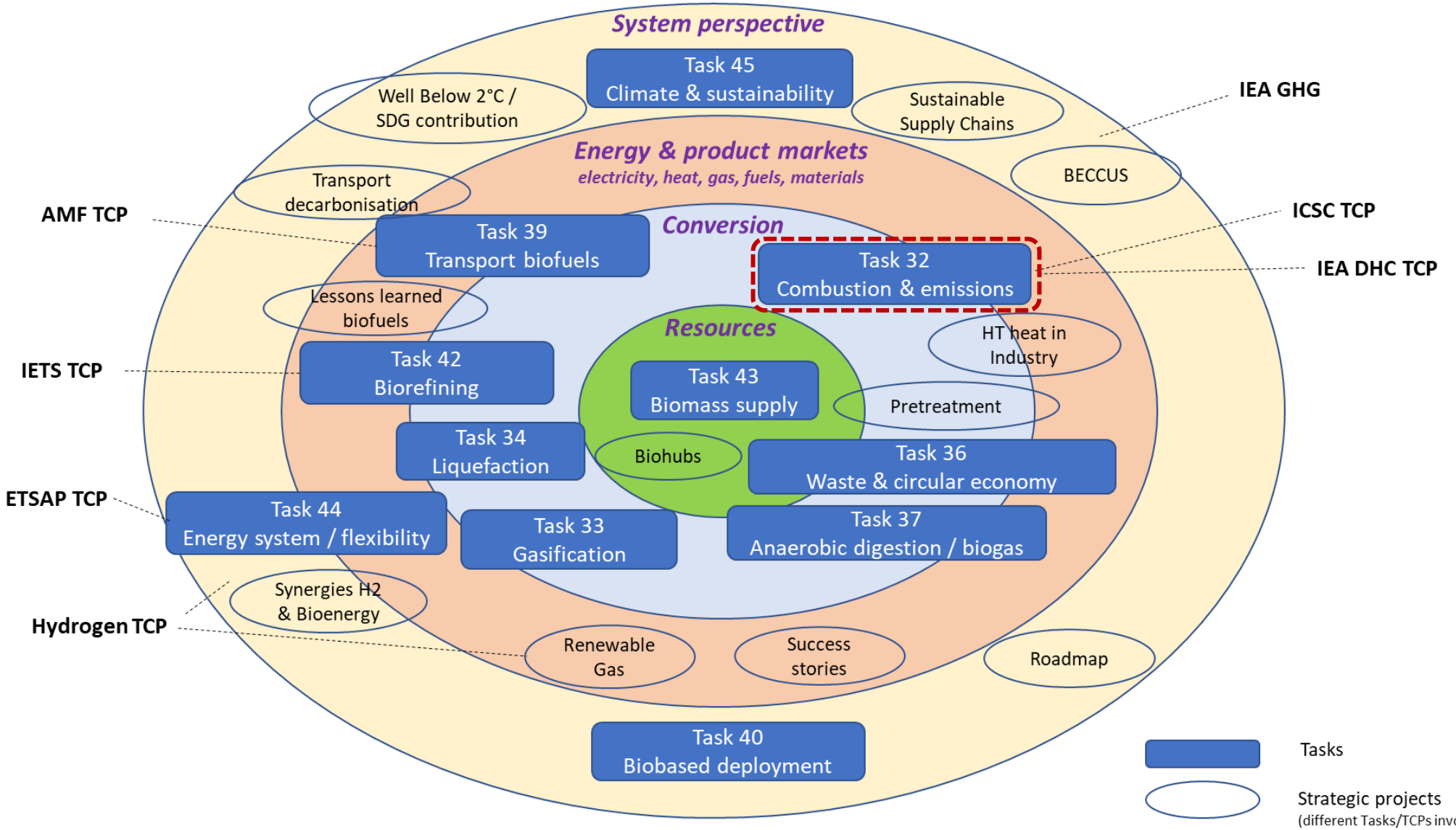
Technology Collaboration Programme (TCP), functioning within a framework created by the **International Energy Agency** (IEA)

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



What is Task 32?

- Task 32 focuses on biomass combustion
  - Design, operation, efficiency, emissions etc.
  - From wood stoves to large power plants
- Task 32 members are experts from
  - Austria - Canada - Denmark - Germany - Japan - Netherlands – New Zealand - Norway - Switzerland
- Activities include
  - Collect/generate and disseminate expert knowledge for the benefit of interested people in the target group
  - Exchange experiences between member countries as well as with groups inside and outside of IEA Bioenergy
- More information
  - Task 32 website
  - IEA Bioenergy website

Task 32 work programme

Background in clear challenges for biomass combustion:

- Conversion of industries from fossil fuels
- Emissions (particles + NOx) - from smaller plants
- Sustainability
- Integration of biomass combustion in future energy in energy systems
    - Especially with capture, sequestration and use of carbon from the flue gases (BECCUS)

Task 32 projects - industry

- Biomass for HT Heat in Industry
  - An intertask project
  - Case studies with good examples of transitions
  - Policy report
- More case studies coming up
  - Where biomass combustion has replaced fossil fuels
- Assist decision makers
  - Database of case studies and references

Task 32 projects - negative emissions

Biomass combustion with negative CO_2 emission

- Overview of technical options for CO_2 capture
- Case studies of BECCUS projects
- Modeling of the consequences of carbon capture on an existing Danish biomass-fired cogeneration plant
- Overview of opportunities for BECCUS on small biomass combustion plants
- Workshop on biomass consumption and BECCUS (held on 21st September 2023)

Task 32 projects – medium sized plants

Innovative biomass combustion with low emission

- State-of-the-art biomasse combustion district heating plants with low NO_x emission (recent development and cases)
- Study of the nitrogen cycle in biomass combustion plants (Netherlands + Austria)
- Report on how heat storage and boilers in cascade provide low emissions (Swiss study)

Task 32 projects – stoves and boilers

- Testing methods and real-life performance for pellet stoves (Report)
- Guideline for the design of low-emission wood-burning stoves (Guide)
- Study of national strategies to reduce emissions from biomass combustion (Report)
- Report on state-of-the-art biomass boilers
- Workshops and webinars on wood stoves and boilers (Events)
- Highlighting benefits for carbon balances and sustainability when using wood stoves

Thanks for your attention!

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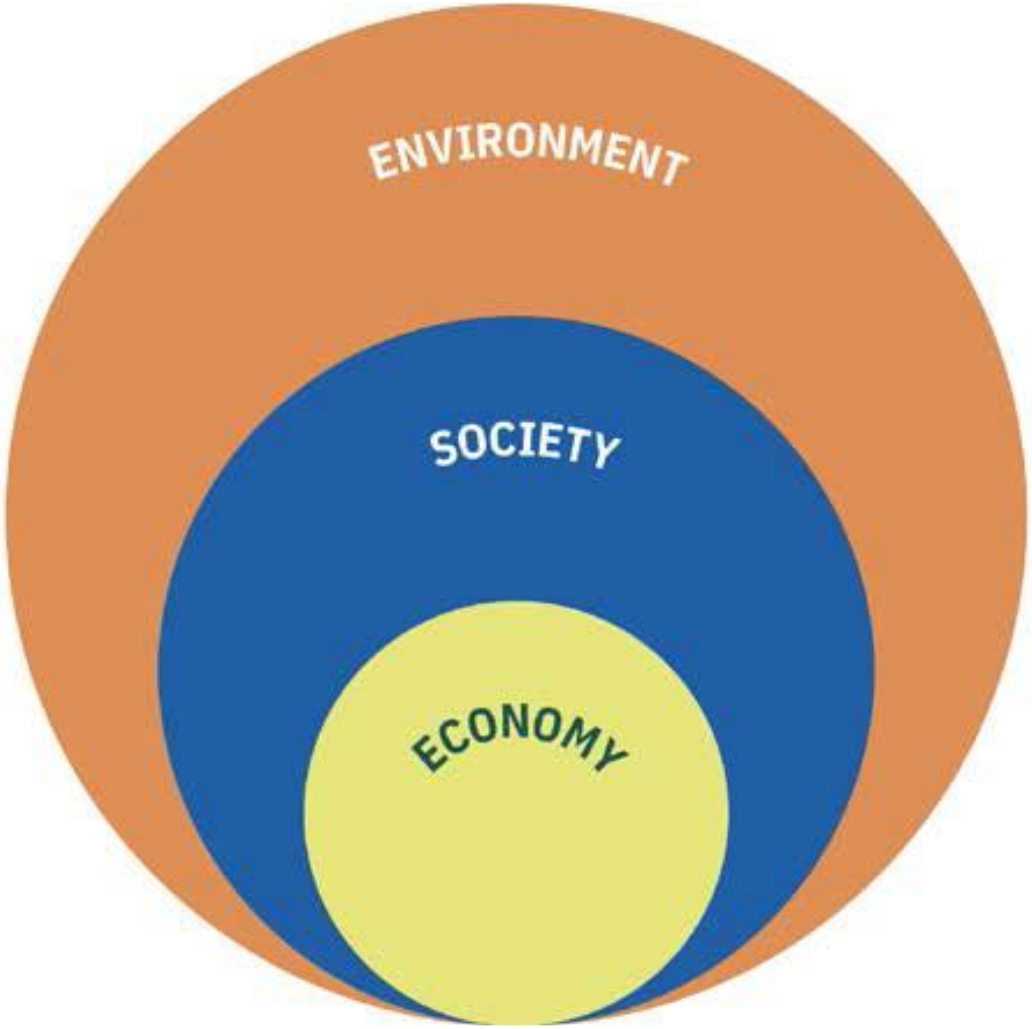
Extra slides: Why biomass is such a good idea

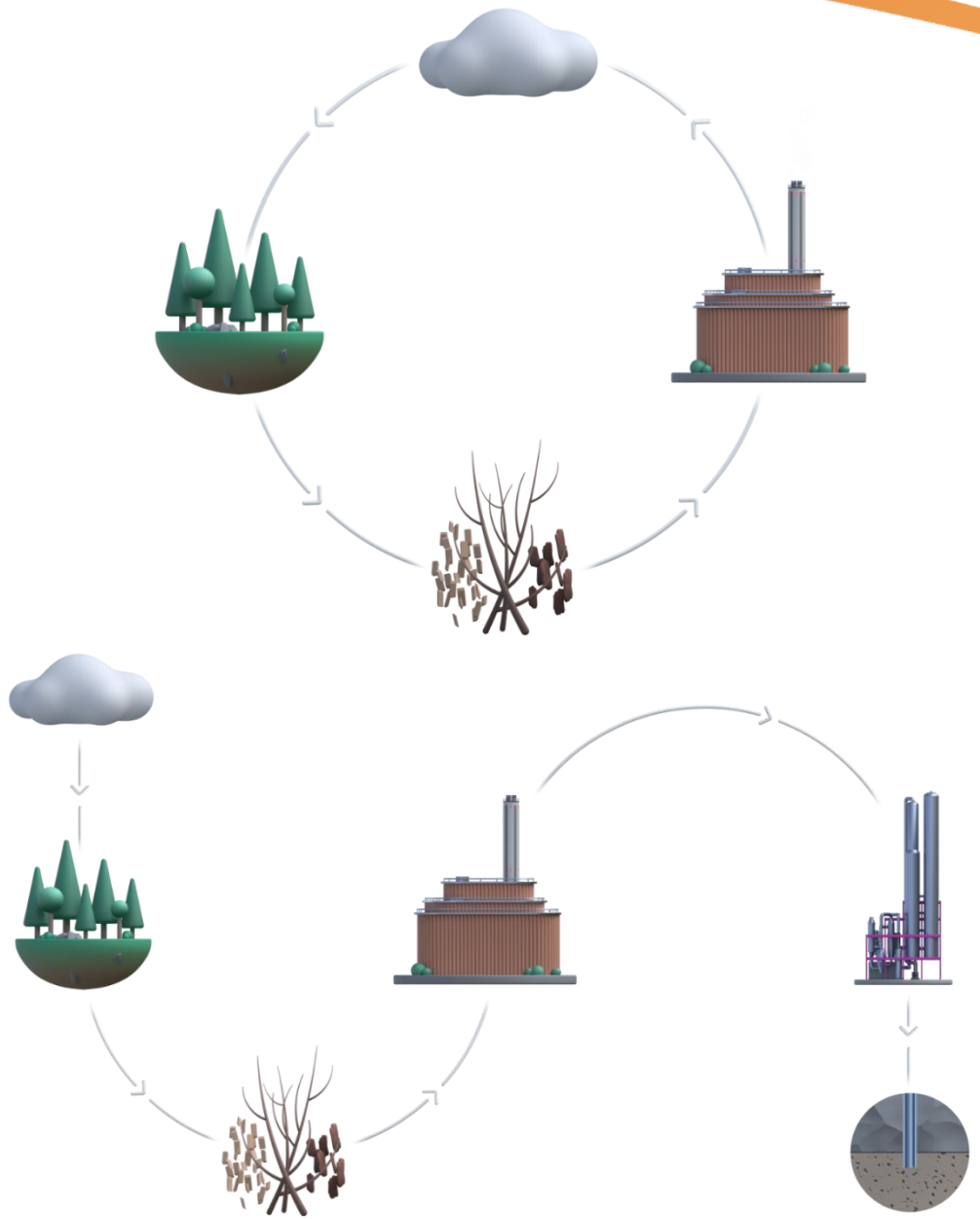
Why we think biomass is such a good idea

- Transition to sustainability is the main focus
- ”Meeting current needs without compromising future generations”
- Biomass is a renewable source of energy that can deliver on all three sustatainability pillars
  - Economic
  - Social
  - Environmental



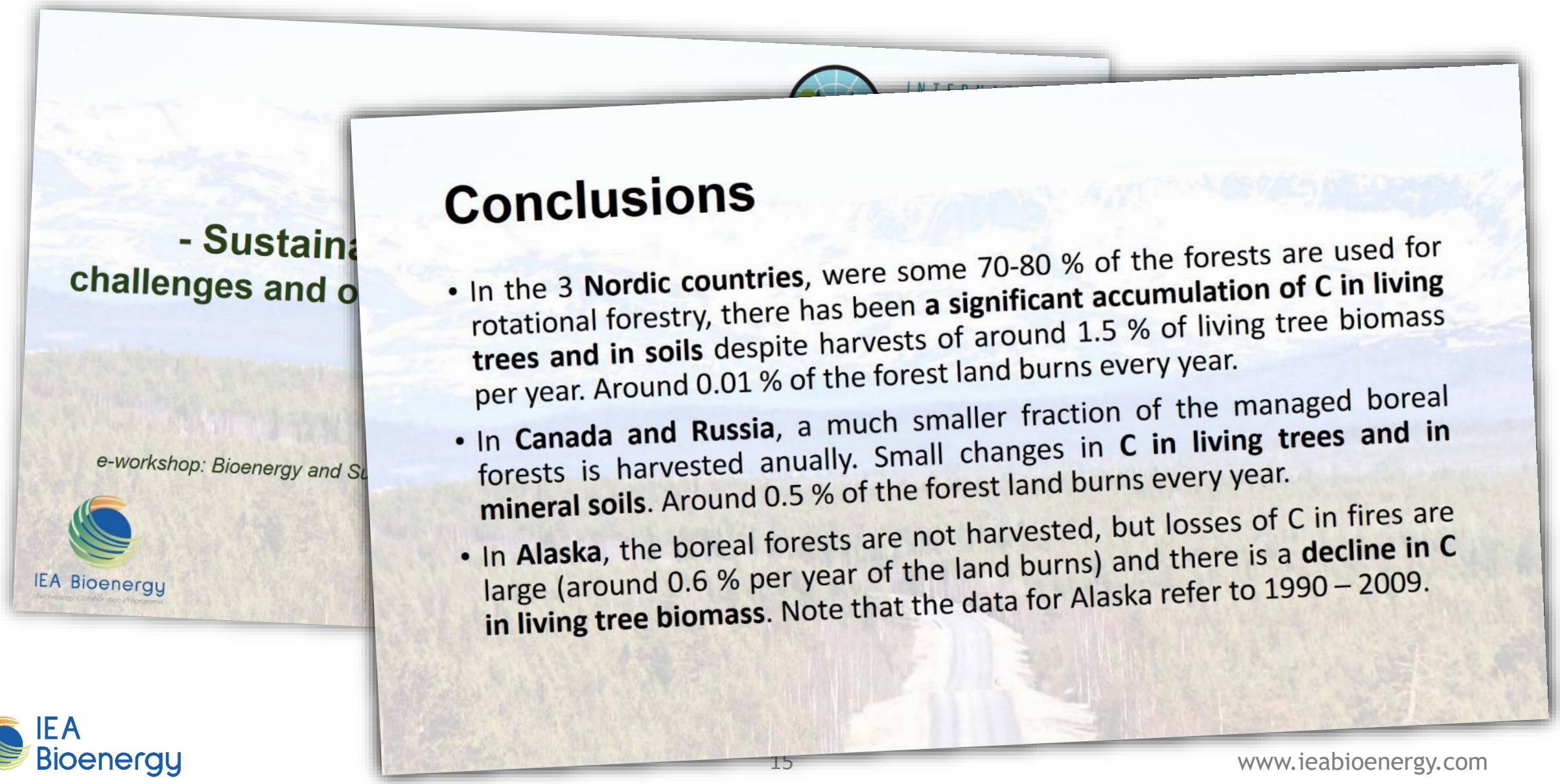
Biomass to mitigate GHG emissions

- By using biomass to generate bioenergy you can replace fossil fuels
- Thereby you put an end to adding fossil carbon to the atmosphere
- If you add carbon capture and storage, bioenergy becomes a way to remove carbon dioxide from the atmosphere



Illustrations by Stockholm Exergi AB

Managed boreal forests store more carbon



Social benefits from biomass

- Creating local/regional jobs
- Keeping economy local
- Equalizing access to energy
- Support resilience of forests, reducing risks of losses due to
  - Storms
  - Insects
  - Wildfires

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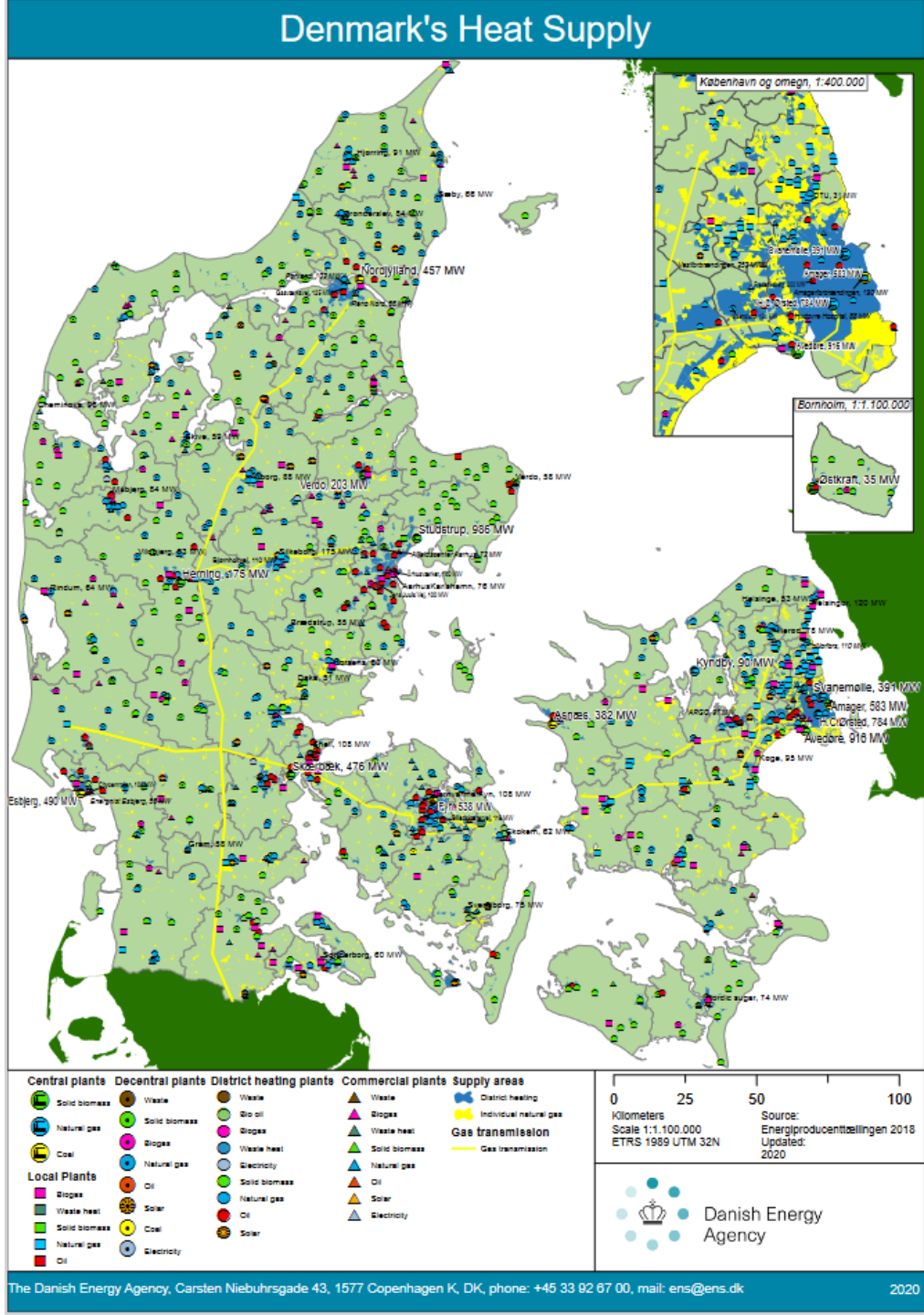
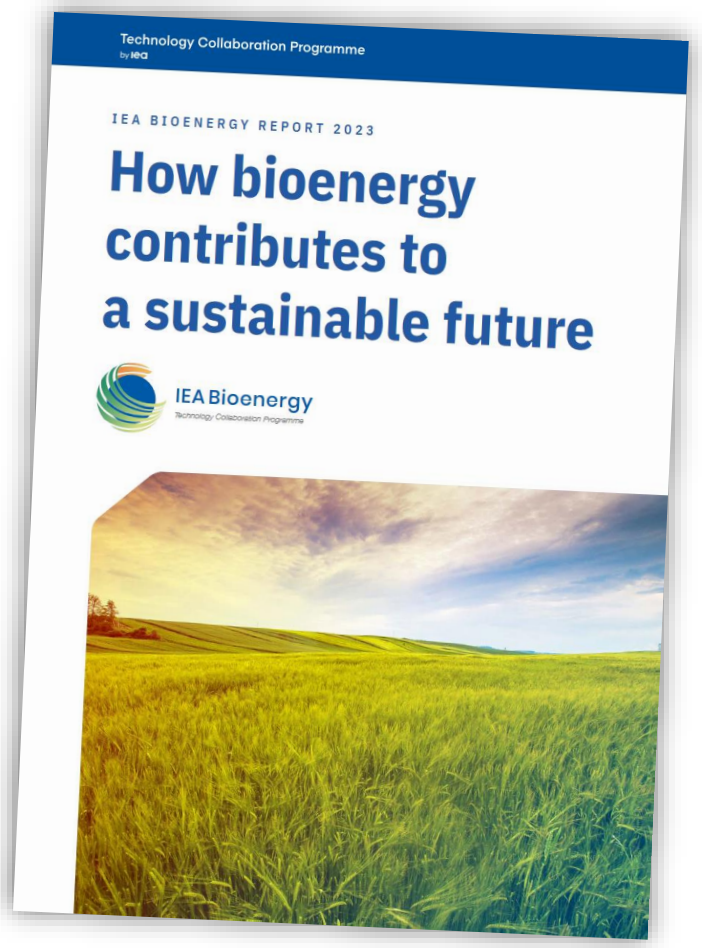
Economic perspectives

- Biomass may be economic due to cheap sourcing or expensive fossil alternatives
- Involving negative externalities of fossil fuels in the equation, e.g., the environmental costs, may be necessary in some cases to develop a market
- Two good examples of this
  - Sweden; CO_2 tax on fuels for many years
  - Denmark; biomass excempted from energy tax



Read more



www.ieabioenergyreview.org

Extra slides: About IEA Bioenergy

IEA Bioenergy TCP Overview

ASIA/OCEANIA/AFRICA

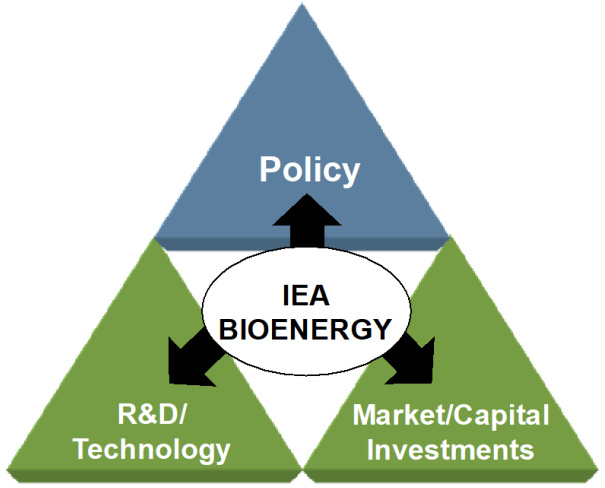
- China
- India
- Japan
- Korea
- Australia
- New Zealand
- South Africa

AMERICA'S

- Brazil
- Canada
- United States

EUROPE:

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



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: About 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

19y experience within the energy sector

For any inquiry, contact:
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Check out our website
or find us on LinkedIn