



**IEA Bioenergy**  
Technology Collaboration Programme



# Highlights of the IEA Bioenergy Triannual Conference 2021

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*IEA Bioenergy Conference: Closing panel*

*9 December 2021*

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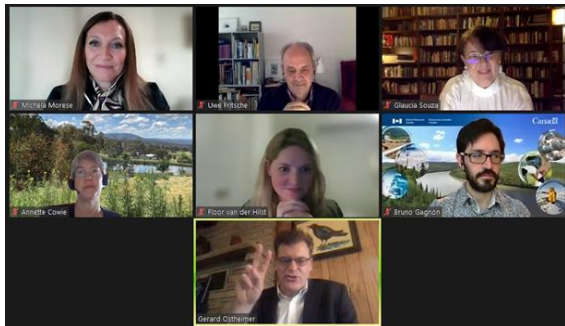
# 14 sessions between 29 November and 9 December 2021

Date & timing (UTC)		Session
29 Nov 2021	2-4 pm	Implications of COP26 for future bioenergy & bioeconomy
30 Nov 2021	7-9 am	Setting up regional biohubs to enhance biomass mobilisation
	8-10 pm	Realising sustainable bioenergy pathways towards climate goals
1 Dec 2021	2-4 pm	Emerging biofuels markets and the importance of LCA and certification
	8-10 pm	The potential of drop-in biofuels to decarbonise aviation
2 Dec 2021	7-9 am	State of the art and innovation in Green Gas
	2-4 pm	Green Gas perspectives
3 Dec 2021	8-10 am	Long term markets for biomass and biofuels (Industry panel)
6 Dec 2021	2-4 pm	Waste and residue valorisation in a circular economy
	8-10 pm	Industrial symbiosis and biorefineries in a circular economy
7 Dec 2021	7-9 am	Biomass and renewable heat
	2-4 pm	Bioenergy's contribution to low-carbon energy systems
9 Dec 2021	12-2 am	Closing panel 1 (with focus on East Asia/Oceania & North America)
	12-2 pm	Closing panel 2 (with focus on Europe, Africa, South-America & India)

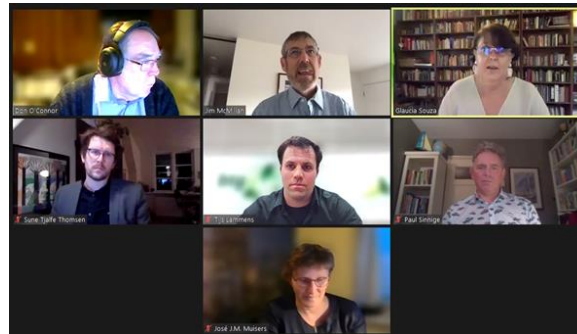
# A big thanks to all moderators, speakers & panellists!



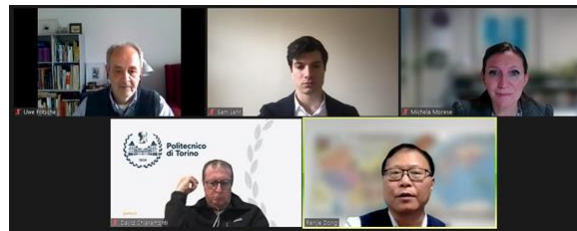
Opening panel



Feedstock mobilisation & sustainability



Transport biofuels



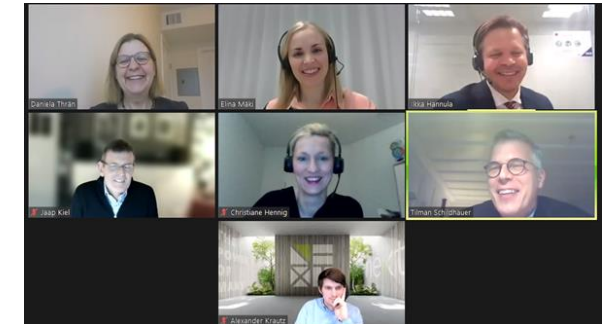
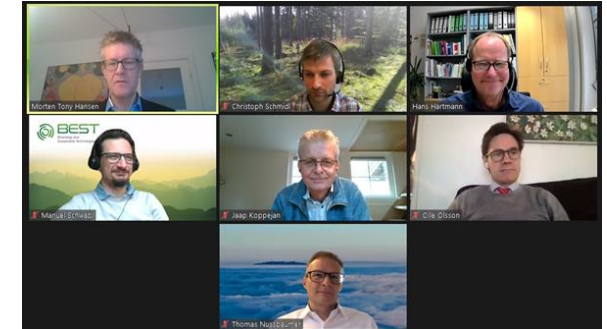
Green gas



Industry panel



Circular economy and industry



Bioenergy in the energy system

& 2 closing panels



# ... and thanks to the audience of course for your participation and input to the Q&A

>1100 people attended one or more conference sessions

from around 90 countries => real global participation

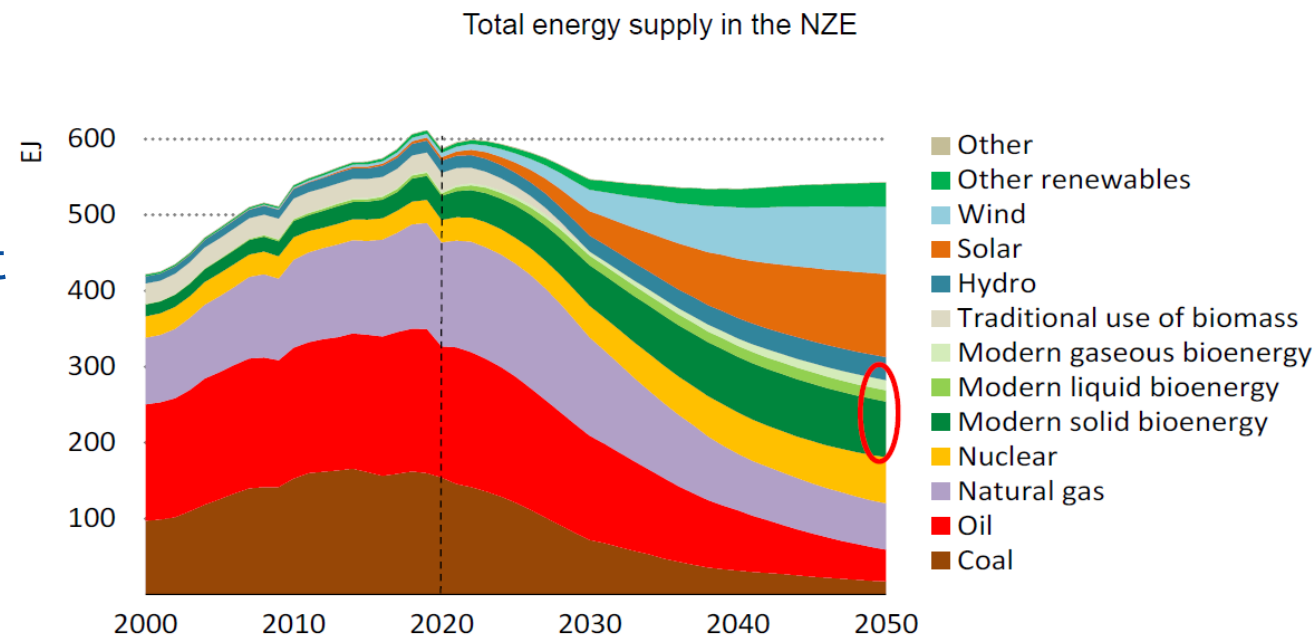
150-400 live participants per session

(+ *several watched the recordings at the session pages @ <https://www.ieabioenergyconference2021.org/>*)

# Some highlights

# Energy transition

- Reaching net-zero CO<sub>2</sub> emissions globally by 2050 requires an unprecedented transformation of the energy system
- A portfolio of options will be needed to limit climate change; there are no silver bullets and we don't have the luxury to dismiss good options.
- Substantial role for bioenergy in net zero scenarios - up to 20% of total energy supply in 2050. Role of biomass will evolve in the coming decades, e.g. towards sectors that are difficult to electrify.
- CO<sub>2</sub> removal from the atmosphere (CDR) will be absolutely necessary to limit global warming. BECCS is one of the critical CDR options.
- A strong boost is needed to put bioenergy on track to net zero roadmaps. Urgent, strong and credible policy actions from governments are needed to attract investment at scale and foster required innovation.



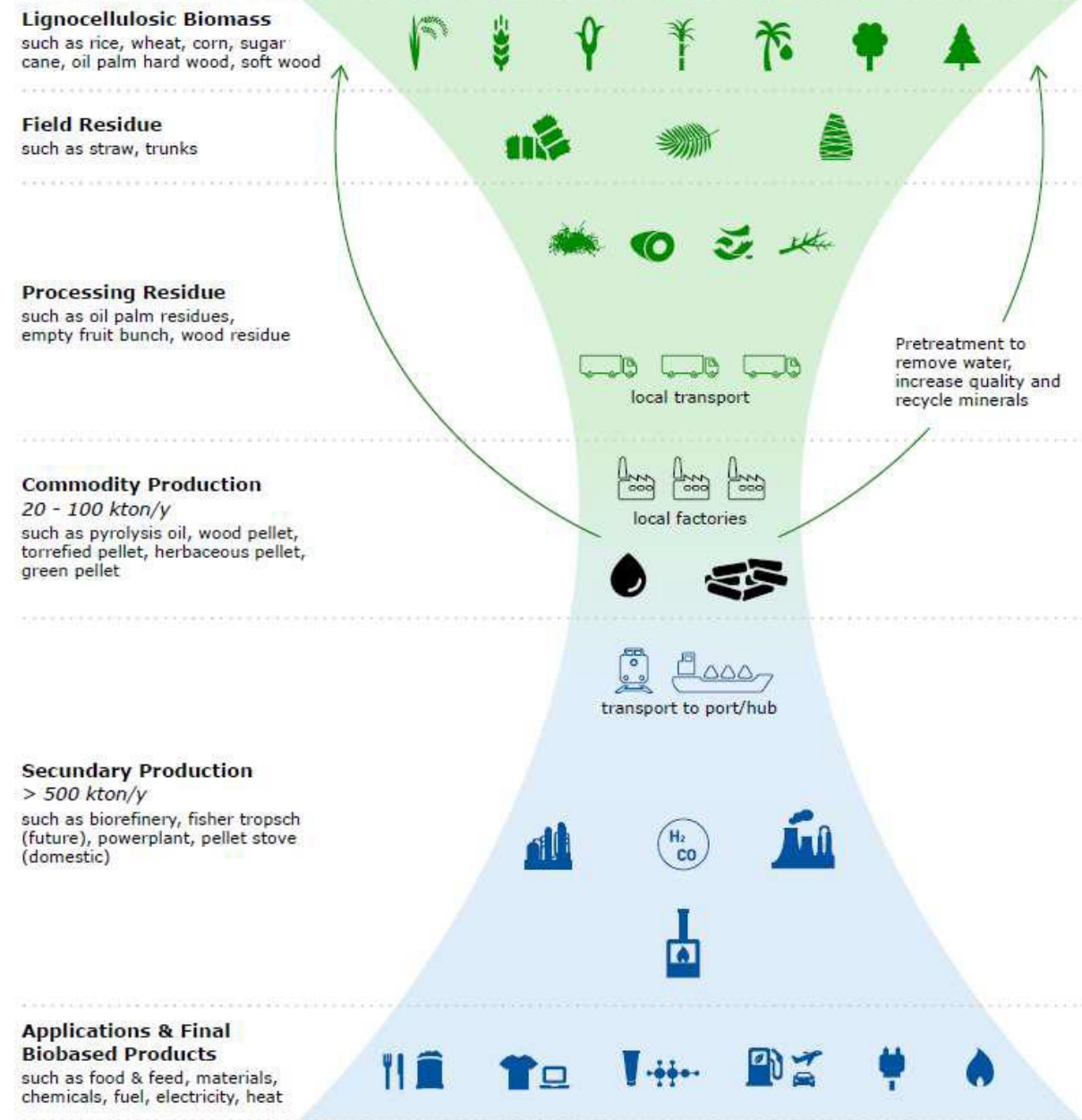
Source: presentation Paolo Frankl, IEA

# Transition is accelerating

- Company/sector ambitions in terms of decarbonisation goals are growing fast.
- Focus is moving from roadmaps to how companies can handle the transition in practise.
- Growing recognition in industries that we need to look beyond ‘simple’ solutions like sun and wind, which can’t solve everything
- In transition periods companies are vulnerable => need stable policy framework, also protecting from carbon leakage (*= move production to countries with laxer emission constraints*)

# Biomass mobilisation

- Higher move to low-value/underutilised heterogeneous biomass resources. Agri residues are important resource (*e.g. stop burning on the field in certain regions*)
- Need to connect local and dispersed biomass with central processing at commercial scale
  - biohubs / regional biomass depots can make this connection -> provide intermediate storage as well as pretreatment to tradable commodities
  - adds value to residues and allows for income diversification of farmers & small companies



Source: presentation Wolter Elbersen, WUR



# Sustainability governance

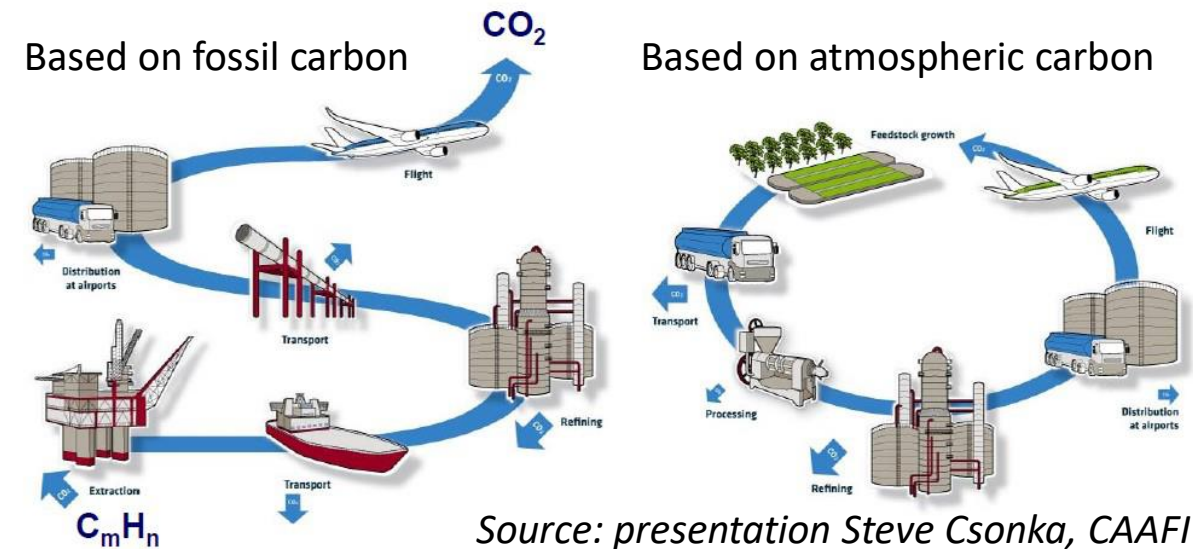
- Don't consider bioenergy in isolation, but as part of broader bioeconomy!
- Good practices show multiple co-benefits (*not only energy/climate*) => consider different Sustainable Development Goals for synergies and trade-offs
- More work needed on global/regional sustainable biomass availability and sustainability governance to derisk new investments in the bioeconomy
- High debate on the climate impacts of using forest biomass for energy. Need to consider proper system boundaries and counterfactuals

=> dedicated webinar on 10 Dec 2021, 10-12 am CET

<https://www.ieabioenergy.com/blog/ieaevent/biomass-for-energy-purposes-true-and-false-about-climate-impact/>

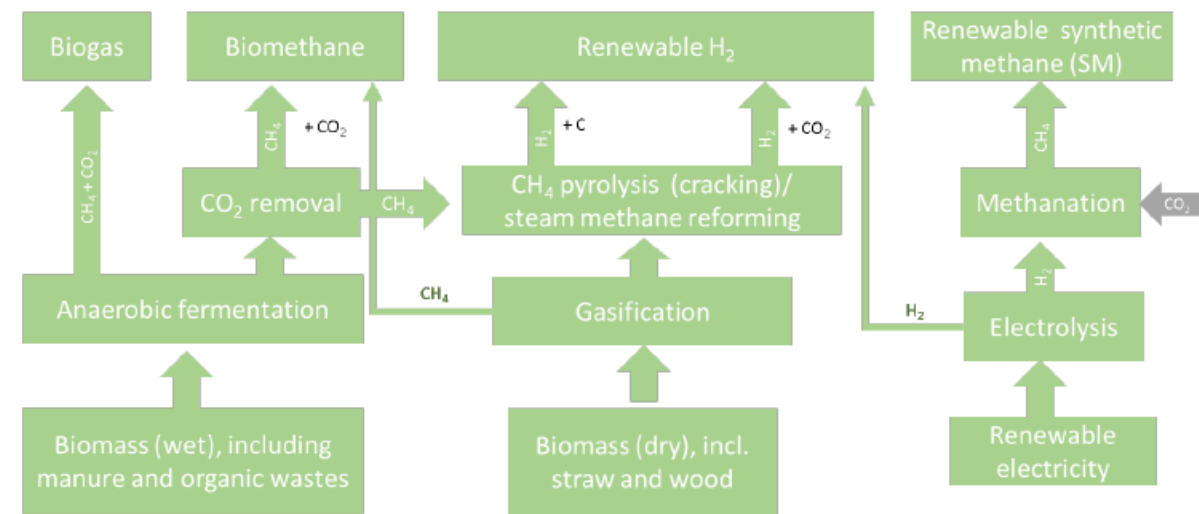
# Transport biofuels

- Gradual shift to difficult-to-electrify sectors - although short term displacement of fossil fuels in road transport is also needed.
- A lot is moving in aviation & marine markets. Sustainable Aviation Fuels (SAF) considered as the cornerstone of aviation decarbonisation.
- Refining sector also recognizes the need to transform and move away from fossil fuels.
- Transport biofuel volume mandates shifting to GHG emission reduction mandates => LCA becomes critical tool
- Certification of feedstocks and biofuel pathways can serve to monitor compliance for a policy framework



# Green gas

- Biomethane is fully compatible with the gas infrastructure and is one of the major components to decarbonize the gas system
- Biomethane can be produced from upgraded biogas (AD), through gasification of solid biomass (with methane synthesis) or from hydrogen & CO<sub>2</sub> (e-methane)
- In EU/US, energy from gas grid ~2 times energy from power grid => fossil gas replacement needs much more attention
- AD systems avoid methane leaching, substitute fossil fuel and chemical fertilizer & can increase soil carbon
- Multiple benefits in emerging economies to use farm, livestock waste & household waste for biogas
  - Need capacity building and training in rural areas, and international collaboration (*major opportunity to reduce methane emissions!*)



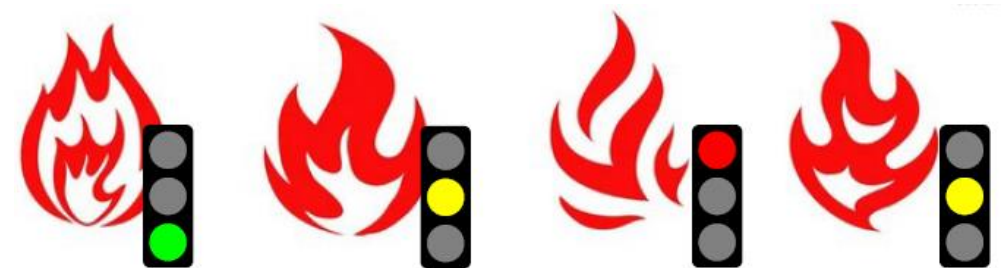
Source: presentation Uwe Fritsche, IINAS

# Circular economy / biorefining

- Processing of unrecyclable waste fractions no longer only about incineration with energy recovery (in power & heat). Real gains in emerging pathways, such as chemical recycling via gasification or liquefaction.
- **Industrial symbiosis** (*exchanging residual material and energy flows between companies*) has important economic, energetic and environmental advantages. Initiatives can grow bottom up, but important that municipalities enable this.
- **Biorefineries** in centre of the circular bioeconomy as they produce a range of bio-products (including energy carriers) in integrated way => can improve business case and efficient use of biomass.
- Policies needed to transform market environment for biorefineries (compared to fossil refineries), e.g. through CO<sub>2</sub> taxation.

# Biomass & renewable heat

- Biomass use for industry heat has mainly been in agro/forestry processing industries based on own process residues. Other industries now also considering biomass to replace their fossil fuel consumption.
- Choice of bioenergy solution depends on existing technology, amounts and type of biomass availability, and logistic options. There is a move to more challenging fuels (higher ash content) compared to clean wood chips or pellets.
- Residential wood combustion = important source of PM emissions.
  - Important to analyse efficient emission reduction strategies, e.g. strategies to replace old wood stoves, support emission reduction devices, regular on-site inspection, information campaigns for good operating practice.







Hope you enjoyed the conference sessions!

All presentations, recordings, session highlights and poll results are/will shortly be available at the session pages of the conference website

<https://www.ieabioenergyconference2021.org/>

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