

IRENA INNOVATION WEEK 2020

SUMMARY OF KEY INSIGHTS FROM THE SESSION 4: GROWING THE BIO-ECONOMY: SOLUTIONS FOR THE SUSTAINABLE SUPPLY OF BIOMASS AND BIOFUELS

ORGANISED IN PARTNERSHIP WITH THE GLOBAL BIOENERGY PARTNERSHIP.



SESSION OVERVIEW

Session 4 took place on the 6th of October under the theme **Growing the bio-economy: Solutions for the sustainable supply of biomass and biofuels**. The panels brought together from across the globe had an interactive, in-depth discussion, that showcased best practices and innovative approaches to secure sustainable biomass and to turn it into valuable feedstocks indispensable for the decarbonisation of transport and industry sectors. The panel also discussed new and emerging approaches to maximize biomass value streams through co-processing and co-production in biorefineries or in the biomass industry cluster as innovative solutions toward the bio-based economy. A key question explored by the panels was how these experiences can be replicated and further expanded at scale in a sustainable fashion to make extensive use of modern bioenergy potential as alternatives for fossil-based feedstocks and fuels in order to make zero emission a reality.

2 Panels

13 Expert speakers

349 Participants

SUMMARY OF KEY INSIGHTS

- Bioenergy has a key role to play in the energy transition and is expected to play an expanded role in the decarbonization of hard-to-abate sectors: technologies are developing rapidly and have a significant potential to scale up by 2050.
- Confidence in the sustainability of biomass is a key requirement for its contribution to energy and environmental objective, its widespread use, its public acceptance and investors' confidence.
- A holistic approach is key to maximise synergies across the entire biomass value chain (land-use, agriculture, forestry, processing, conversion, waste streams, and end-use) and biomass use for industry and transport sectors should be seen in the context of the entire bioeconomy
- Supportive policy and regulatory frameworks are key to scaling up the deployment of bioenergy

Scene Setting

Dr. Maria Michela Morese (Executive Secretary of GBEP) opened the Session 4 by presenting the key role of bioenergy in decarbonising the economy. Bioenergy presents excellent opportunities but is not without challenges. Bioenergy should not be looked at in isolation as increasing demand brings pressure on natural resources. Sustainable bioenergy and the integration of biomass conversion through innovative approaches need to be considered as part of the broader bioeconomy which makes it possible to create synergies and trade-offs between different demands of biomass. The sustainability

indicators are a tool that provides guidance and informs policies for further deployment of bioenergy and decarbonising industry and transport sectors.

Mr. Toshimasa Masuyama (Bioenergy Analyst, IRENA) provided a scene setting presentation with the objective to highlight the essential role of bioenergy in decarbonising industry and transport sectors, based on the key findings of IRENA's Global Renewables Outlook 2020 and Reaching Zero with Renewables reports. In IRENA's Paris compliant scenario, a dramatic expansion of biomass supply is expected not only to displace fossil energy but also to substitute fossil-based hydrocarbon feedstocks. Effective bioenergy policies would drive the bioenergy deployment by creating an enabling environment for investments and encouraging off-takers. It should be also recognized that the real benefits of using bioenergy go beyond the decarbonization spectrum as it provides several externalities such as rural development, farming and forestry practice improvement, waste management, job creation and so forth.

Panel I:

The first panel discussion provided an overview of strategies for diversifying biomass feedstock production and outlined key challenges for its scale-up, as well as solutions to overcome them based on experiences and innovative approaches from different regions. The discussion was moderated by **Dr. Gerard J Ostheimer**, Chief Sustainability Officer for the Global Bio-future Solutions and leading experts were brought together from four different regions: Africa, Europe, Latin America and North America. The following expert panelists joined the discussion:

- **Dr. Rainer Janssen** Managing Director Projects, WIP Renewable Energies
- **Dr. Phosiso Sola** Scientist, World Agroforestry Centre (ICRAF)
- **Dr. Carolina Grassi** Business Development Lead - Latin America & Sector Lead - Ground Transport Roundtable on Sustainable Biomaterials
- **Mr. Keith Kline** Distinguished Researcher, Environmental Sciences Oak Ridge National Lab US DoE.

Highlights from the discussion:

- **Bioenergy has strong synergies with land management, forestry and agriculture. Exploiting these synergies can have wider benefits for the economy, society and environment.** This aspect was highlighted by three speakers:
 - Dr. Janssen presented two EU-based projects, funded under the EU Horizon2020 programme, which assessed the sustainable bioenergy production potential on "MUC (Marginal, Underutilized and Contaminated) lands" in Europe at a local and site-specific level. The projects' innovative approaches showed that bioenergy feedstock production could be a remedy for bringing MUC lands back to productive use and it doubles the positive impacts of bioenergy.
 - Dr. Sola shared her experience in the Kenyan context, where the eradication of an invasive plant species could be done by converting it into biomass feedstock. This is good example of how bioenergy could be expanded in ways that would bring positive synergies with agriculture and pastoralism. However, the interaction of technology with society is fundamental and the lack of community acceptance, engagement and understanding of its beneficial effects and consequently the lack of demand are key challenges hindering the success of this approach.
 - Dr. Grassi presented energy cane as an example of how improved species can create synergies in the ecosystem. Energy cane doesn't only offer higher energy yield but also its root helps to increase carbon sequestration and improve soil stability.

- **Certification is key for ensuring the sustainability.** As highlighted by Dr. Grassi, sustainability schemes should be strengthened with the implementation of internationally recognised certification mechanisms, based on clear indicators and principles.
- **Having a holistic approach is key to scale up biomass feedstock production.** As highlighted by Mr. Kline, feedstock production improves ecosystem services and food security. However, priorities for the achievement of a successful synergy include: systematic monitoring and analysis to support adaptive management, stakeholder engagement from the beginning and throughout the whole value chain, and creation of a market for biomass and bioenergy feedstocks. Potential synergies could be further explored to address emerging challenges such as increasing risks of forest fires and insect infestation. In this context, the complexity around the sustainability of biomass industry in the face of rampant wildfires across the globe was also addressed in the following panel discussion.

Panel II:

The second panel showcased innovative technologies and approaches to maximize the biomass value streams while ensuring the sustainable production of biomass for its applications. The panel was moderated by **Mr. Bharadwaj Kummamuru**, Executive Director, World Bioenergy Association and leading experts were brought together from four different regions: Asia, Europe, Oceania and North America. The following expert panelists joined the discussion:

- **Mr. Henrik Brodin** Strategic Business Development Manager, Södra
- **Mr. Timothy Ong** Senior Vice-President, Agensi Inovasi Malaysia
- **Mr. Geoffrey Bell** CEO, Microbiogen
- **Mr. James Spaeth** Programme Manager, Bioenergy Technologies Office, U.S. Department of Energy.

Highlights from the discussion:

- **Innovative technology provides added-value to biomass and enhances the sustainability.** Mr. Brodin presented how the new innovative technology created new biomass value stream by upgrading pulp mill residues to useful bioenergy. The mission is to create more value with maximising the use of biomass and it can be only achieved by making innovations. Such innovation increases the sustainability of final products together with a sustainably managed biomass supply. Financial support mechanism such as carbon tax would enhance the economic competitiveness of biomass products and keep innovation forward.
- **A circular bioeconomy creates synergies in the entire biomass value chain.** In this context, Mr. Ong presented the bio-hub concept in Malaysia where all stakeholders in the ecosystem from downstream to upstream are brought together and create a symbiotic relationship. This innovative approach gives a greater flexibility and dynamism that can diversify biomass feedstock, applicable technologies and products. It thus eventually creates multiple biomass value streams throughout the entire ecosystem. The government plays a role to provide the platform with a strategy covering different aspects such as economy, society and environment.
- **An innovative approach for the scale-up of biomass includes taking established knowledge and applying it in the context of new technology applications.** Mr. Bell outlined two innovative approaches for the biomass application technologies in the Australian context: the use of next generation biocatalysts for second generation biofuels and the use of lignin as a metallurgical coal replacement. These applications both showed higher revenues, as well as successful replacement of conventional resources and improvements of sustainability. Lignin from biomass wastes at ethanol biorefinery could provide an opportunity for maximizing the value of biomass and present a good example of the bioeconomy approach.

- **There are several biomass feedstocks available, besides traditional ones and their production must be handled sustainably and used accordingly.** As pointed out by Mr. Spaeth, each type of biomass feedstock has different characteristic. The biorefinery concept is thus critical for maximizing the use of biomass by diversifying both biomass feedstock and products. The biotechnology has been a tremendous source of propelling the development of new biomass value chains.

Closing Remarks

The closing remarks were delivered by **Dr. Paul Durrant**, Head of End-use Sectors and Bioenergy team at IRENA. Dr. Durrant welcomed the session's discussions, the complementarity of the two panels and the insightful interventions from the distinguished speakers. Today's discussions were summarised by reiterating:

- The indispensable role of biomass and bioenergy in delivering deep decarbonization goals
- The proven ability to sustainably source biomass if managed and monitored carefully.
- The broader benefits of a holistic approach where bioenergy is seen in the context of the bio-economy.
- The growing range of innovative solutions that can support the decarbonisation of all sectors of the economy.