

## BIOENERGY FOR SUSTAINABLE DEVELOPMENT

Thematic Meeting at Eighth IRENA Assembly

Abu Dhabi, 12 January 2018

### BRIEF SUMMARY

1. Leading international organisations that promote sustainable use of bioenergy presented their activities during a two-hour meeting with about 40 participants from a range of IRENA member countries and discussed areas for collaboration in a two-hour follow-up meeting. Strong interest was expressed in collaboration on public outreach to explain sustainable bioenergy potential, on understanding advanced liquid biofuels, and on effective scale-up policies.
2. Participating organisations included, in addition to IRENA (DDG Sakari Oksanen and Senior Programme Officer Jeff Skeer), GBEP – Global Bioenergy Partnership (Michela Morese, Executive Secretary), IEA Bioenergy Technology Collaboration Programme (Kees Kwant, Executive Committee Chair – by amplified cellphone link), ICRAF – World Agroforestry Center (Programme Officer Craig Jamieson), Biofuture Platform (Luiz Barroso, President, Brazil Energy Planning Agency), World Bioenergy Association (Remigijus Lapinskas, President), Alternative Renewable Transport Fuels Forum (Theodor Goumas, Project Manager), SE4All - Sustainable Development for All (Gerry Ostheimer, Bioenergy Accelerator Lead) and below50 (also Gerry Ostheimer).
3. **IRENA** has a lot of work underway on sustainable biomass resources, cost-effective bioenergy technologies, and strategies for bioenergy scaleup. These three pillars of effort are described in two annexes, *IRENA Work on Bioenergy for Sustainable Development: Accomplishments and Findings 2014-2017* and *Proposed IRENA Work on Bioenergy 2018-19*, which were made available to participants to consider activities on which they might usefully cooperate.
4. A brief on ***Bioenergy for Sustainable Development*** has been jointly prepared by IRENA, the Food and Agriculture Organisation of the United Nations (FAO) and the IEA Bioenergy technology cooperation programme (IEA Bioenergy). The brief notes that large amounts of land could be made available for bioenergy crops through sustainable intensification of agriculture (closing the gap between actual and potential yields for food crops on farmland and raising feed more efficiently for livestock on pastureland), reducing waste and losses in the food chain, and restoring degraded landscapes. It also notes that large

amounts of biomass could be made available for bioenergy by making more thorough use of available farm and forest residues.

5. **GBEP:** The Global Bioenergy Partnership has 38 partners and 41 observers (governments and international organisations). GBEP strives to promote sustainable bioenergy development and harmonize bioenergy policies. GBEP sustainability indicators (GSIs) cover environmental, economic and social aspects of bioenergy for electricity, heat and transport; they have been applied so far in 16 countries (Argentina, Brasil, Colombia, Egypt, Ethiopia, Germany, Ghana, Indonesia, Italy, Jamaica, Japan, Kenya, Netherlands, Paraguay, Uruguay and Viet Nam), and an implementation guide is being prepared. GBEP capacity building activity groups promote sustainable modern bioenergy in West Africa, share experience with use of sustainability indicators, review bioenergy development activity in different regions (including Central Europe and South Asia in 2016, Africa in 2017, Latin America in 2018), examine the nexus between bioenergy and water, and examine the potential of biogas.
6. **IEA Bioenergy** has 24 contracting parties that cooperate on a variety of tasks. A bioenergy technology roadmap looks at opportunities to develop sustainable biomass supplies, commercialise new technologies, and mobilise investment – much along the lines of IRENA’s three pillars. Collaboration with GBEP on bioenergy and water has shown that good management of land resources can provide energy, food and materials while improving water supply; case studies document positive energy-water relationships in 11 countries on 6 continents.
7. **ICRAF** works to disseminate information on the potential for growing food and fuel together. One major opportunity is gliricidia for feed and fuel, which can be grown along with food crops like maize and coconut, boosting food output because its roots fix nitrogen in soil. Smallholders in Africa and Asia can use the wood for cooking and sell the surplus for use in cities or electricity supply. Another major opportunity is rice straw, of which 300 million tonnes each year are burned in the fields as waste, with associated carbon emissions and serious health impacts. Rice straw can be used for agroprocessing and biogas plants. To attract investment in such opportunities, countries need to conduct feasibility analyses of pilot plants and develop public-private partnerships.
8. Panelists were asked their views on **priority actions** to promote sustainable development of bioenergy resources, and what they see as important gaps in our understanding of sustainable feedstock supply. GBEP responded that

bioenergy is very complex, so each proposed bioenergy pathway should be separately assessed to understand how much it can sustainably supply. IEA Bioenergy responded that forests should be managed so that wood harvests do not exceed wood growth, farms should be managed to maintain the quality of the soil, more biomass should be grown on land that is not in use, and land should be used in a more efficient and effective way without touching nature conservation areas, tropical forests, or threatened species. ICRAF suggested that where sustainable approaches to producing bioenergy are available, it is important to avoid paralysis by analysis. IRENA added that in this light, it makes sense to pursue “no-regrets” strategies that improve crop yields, reduce food waste, or restore degraded land, without getting stuck in an argument over how just the benefits would be shared between food and fuel.

9. The floor was opened to questions and comments. One participant pointed that many of the most sustainable bioenergy systems are also the most economically efficient; use of residues and co-production of food and fuel crops are obvious examples. GBEP noted that countries may not score equally well on economic, social and environmental indicators. ICRAF noted that the share of residues required to maintain soil carbon is typically 20% to 80% depending on crops and local soil conditions. GBEP suggested that to respond to worries that bioenergy competes with food and water needs, it is necessary to communicate that bioenergy is not always good or bad. IRENA pointed out that bioenergy faces a much more complex economic and political setting than other forms of renewables, involving stakeholders and ministries of agriculture, forests, land use and development as well as of energy.
10. The **Biofuture Platform** has 20 member countries including many important drivers of bioenergy technology, investment and policy. A report on *The State of the Bioeconomy* is to be finalized by November 2018. The *Biofuture Declaration* on scaling up the low-carbon Bioeconomy, issued at COP23 in November 2017, sets forth ambitious bioenergy targets and an action plan for achieving them, which are intended provide a strong signal to markets and policy makers that investments in the bioeconomy need to accelerate.
11. **IFAD**, the International Fund for Agricultural Development, intends to intensify its focus on renewable energy options to boost productivity across the entire agricultural value chain from production to processing to distribution. It has suggested that IRENA and partners could lead the technical evaluation of these options on a systematic basis for IFAD’s members in Africa and beyond.

12. The **World Bioenergy Association** has over 240 members from more than 50 countries, including many bioenergy companies and associations. It works on global bioenergy statistics, is developing a bioenergy equipment directory, publishes a variety of factsheets and reports, and is putting together a sustainability certification scheme. WBA sees that bioenergy has greatly reduced energy costs and atmospheric emissions in several countries, but a market carbon price and other tools are needed to scale up and sustainably mobilise the amounts of biomass required to exit from fossil fuel.
13. The **Alternative Renewable Transport Fuels Forum** has planned over a dozen events about bioenergy policies and markets in 2018, each one with a distinct geographical or technological focus. It also intends to update the assessment of advanced biofuels costs, to elaborate light vehicle industry position on EC proposal on CO<sub>2</sub> regulation for Passenger Cars and RED II, to promote power-to-X market opportunities, and to review the potential of sustainable feedstock from crops cultivated in marginal degraded land in the Mediterranean region. Furthermore, it is developing a strategy for policy and market outreach of alternative renewable transport fuels throughout Europe.
14. **SEforAll** has a Bioenergy Accelerator that fosters public-private partnerships to promote sustainable production and use of biopower from agricultural residues and municipal solid waste, on-farm bioenergy to boost agricultural productivity, and low-carbon fuels for aviation and road transport. SEforAll's **Africa Biomass Data Initiative** (ABDI) will inventory data sources, identify data gaps, evaluate data challenges and how they are affecting energy sector management and performance, and seek resources to fill the gaps identified. Since it is hard for governments to improve and regulate what they don't understand, ABDI will work to improve bioenergy statistics continent-wide.
15. **below50** is growing the global market for fuels that have less than 50% of the carbon emissions of fossil fuels. It is linking low carbon fuel initiatives to NDCs (nationally determined contributions under the climate convention), creating business-to-business opportunities across the low-carbon fuel chain, and recruiting corporate fuel buyers. It is working in partnership with the World Business Council for Sustainable Development, has national outposts in Brazil and North America, and is setting up new outposts in countries like Argentina, China and Indonesia. Below50 wants private companies to step forward and use renewable fuels – like many already use renewable power; if people see companies they trust using low carbon fuels, it will boost public acceptance.

16. **Potential Collaboration on Sustainable Resources:** Participating organisations (IRENA, IEA Bioenergy, WBA, GBEP, ICRAF, SE4All and below50) expressed particular interest in working together on outreach to build support for sustainable bioenergy development. It was suggested to extend outreach to respected environmental NGOs that are ready to engage in constructive dialogue based on science, assembling a list of such NGOs to approach and organizing dialogue alongside major events they already plan to attend, such as the SDG7 preparatory meeting in Bangkok in February and High Level Political Forum (HLPF) in New York in July 2018. IEA Bioenergy also noted links between Task 43 (on biomass feedstocks) and proposed work on logistics of collecting sustainable feedstocks, as well as between Task 38 (on climate change impacts) and proposed work on carbon balances in forests.
17. **Potential Collaboration on Technology Pathways:** Participating organisations (IRENA, IEA Bioenergy, ART Fuels Forum, WBA, Biofuture Platform, GBEP and below50) expressed interest in proposed work to document technical case studies of advanced liquid biofuels and assess the economic potential of biorefineries with high-value chemicals and materials. IEA Bioenergy is developing technical case studies in Task 42 (on biorefineries), manages a database on advanced biofuel facilities through Task 39 (on liquid biofuels), and has a special project on cost prospects for advanced biofuels that is being undertaken with industry input, including through the ART Fuels Forum. WBA is developing a bioenergy equipment directory and internet tool on their website, aiming to gather information on all proven technologies in one place; the directory already includes over a hundred cases. Biofuture Platform is assembling a database of advanced liquid biofuel plants, building upon IEA and IRENA databases; WBA's directory could enrich and validate this database. The databases and directory could help identify suitable case studies.
18. Interest in proposed work on biogas power with variable wind and solar power was also expressed by GBEP, which has just started work on biogas, and by IEA Bioenergy, which has related work in Task 37 (on biogas) and a new task on integrating bioenergy with other renewable energy sources.
19. **Potential Collaboration on Scaleup Tools and Strategies:** Participating organisations (IRENA, IEA Bioenergy, Art Fuels Forum, WBA and Biofuture Platform) expressed strong interest in collaborating on effective bioenergy promotion policies. IEA Bioenergy is preparing a report on policies for aviation and marine markets in Task 39 (liquid biofuels) and will start a new task on

deployment. The ART Fuels Forum organizes events on bioenergy policies and markets in Europe. WBA is crafting a plan for bioenergy development in the Voivodina region of Serbia and foresees that regional plans like this could help a number of countries attract technology providers, investors, financiers and developers to bioenergy projects. The Biofuture Platform will analyse bioenergy targets, develop bioenergy action plans, organize workshops on targets and action plans, and establish a monitoring mechanism to track progress toward the targets; IRENA and partners would be welcome to assist.

20. Both IEA Bioenergy and ART Fuels Forum have activities related to work proposed about developing wood crops on degraded lands and utilizing municipal waste for heat and power. Work on wood crops could usefully link with activity in IEA Bioenergy Task 43 (on biomass feedstocks), a new IEA Bioenergy programme on biomass mobilization, and ART Fuels Forum's assessment of resources and availability in the dry marginal land around the Mediterranean. Work on municipal waste could link with the ART Fuels Forum's Mediterranean work and IEA Bioenergy Tasks 36 (on integrating waste recovery into solid waste management systems) and 37 (biogas).
21. Follow-up discussion indicated that proposed work on scaling up bioenergy from sugarcane is of interest to SEforAll with respect to heat and power and of interest to below50 with respect to ethanol production from sugarcane.