

GBEP Working Group on Capacity Building for Sustainable Bioenergy (WGCB)

GBEP 6th Bioenergy Week - Summary
Buenos Aires, Argentina, 16-18 October 2018



The sixth Bioenergy Week of the Global Bioenergy Partnership (GBEP) was successfully held from 16 to 18 October 2018 in Buenos Aires, Argentina, as part of efforts of the GBEP Working Group on Capacity Building for Sustainable Bioenergy (WGCB) to facilitate cooperation and capacity building on the potential benefits of sustainable modern bioenergy.

The event was kindly organized by the Secretary of Agroindustry and the Secretary of Energy of Argentina in collaboration with GBEP and the Food and Agriculture Organization (FAO). The event gathered over 170 participants from four continents; the participants included scientists and government officials, as well as representatives from the private sector and civil society organizations.

The event represented a follow up to the first GBEP Bioenergy Week held in 2013 in Brazil, the second Bioenergy Week held in 2014 in Mozambique, the third Bioenergy Week held in 2015 in Indonesia, the fourth Bioenergy Week held in 2016 in Hungary and the fifth Bioenergy Week held in 2017 in Ghana, which represented the beginning of the second round of Bioenergy Weeks organized in different regions of the world. The Argentina event presented positive experiences and initiatives in the sustainable production and use of bioenergy that could guide the design and implementation of bioenergy policies in the interested region (Latin America). Furthermore, it provided the opportunity to continue a dialogue with the private sector and stakeholders on ways to improve mutual cooperation towards a more sustainable production and use of bioenergy.

Day 1 – Tuesday 16 October 2018

Opening session

The sixth bioenergy week was opened with welcome speeches by H.E. Secretary of State Luis Miguel Etchevehere, State Secretariat of Agroindustry, Argentina; Alejandro Sruoga, Secretary of Energy

Policies, State Secretariat of Energy, Argentina; João Genésio, Director of the Department of Energy, Ministry of Foreign Affairs, Brazil and Co-Chair of the Global Bioenergy Partnership (GBEP); Miguel Gutierrez, CEO of YPF, Argentina; and Francisco Yofre, Official in Charge, Food and Agriculture Organization of the United Nations (FAO).

H.E. Luis Miguel Etchevehere addressed the importance of renewable energy for sustainable development. Projects, such as PROBIOMASA in Argentina, are integral to ensure that countries take advantage of all of the possibilities that are available with regards to bioenergy. Secretary Etchevehere stressed that the work of the government is to facilitate the functioning of the private sector to create the best possible conditions to use the many benefits that are offered by bioenergy.

Alejandro Sruoga shared some reflections on where Argentina is and their future plans. In working towards greater inclusion of renewable energy in the electricity production they are supporting the private sector to pass from 'normalisation to innovation'. This innovation includes regional and local projects in bioenergy to promote the production of bioenergy in the areas where the energy will be used.

João Genésio expressed his pleasure that the 6th Bioenergy Week was taking place in Latin America, as a region with favourable conditions for the sustainable development of bioenergy; many countries have historical use of bioenergy, as well as being at the forefront of policy development to promote its future use. Mr. Genésio also addressed the intrinsic link between energy access and socioeconomic development – access to energy through the use of bioenergy bring many benefits – social, economic and environmental, whilst socio-economic development also increases demand for modern energy. However, the success of bioenergy requires many context-specific solutions to feedstock and technology challenges. Mr. Genésio went on to discuss bioenergy in the context of climate change and the great potential of bioenergy to aid in the difficult task of decarbonising the energy sector. GBEP has a key role in this mission: to share state-of-art and policy experiences.

Miguel Gutierrez expressed YPF's ambition to increase the share of renewable energy (currently 20 percent) in the nation's electricity production matrix. He noted that Latin America is lucky that has the available resources for bioenergy production to support the energy transition and bioenergy was a topic recently discussed during the G20, for which Argentina currently holds the presidency. However, coherent development requires harmonised policies across countries, including certification to ensure quality. He recognised that forums such as GBEP provide the opportunity for these dialogues, and wished the participants a successful meeting.

Session 1: Global, regional and national policy

Andrés Murchison, Secretary of Food and Bioenergy, State Secretariat of Agroindustry, Argentina, talked about the importance of bioenergy as part of the renewable energy policy in order for Argentina to meet international emissions reductions commitments, create a society that is less dependent on fossil fuels and contribute to sustainable development. Bioenergy is an integral component of the circular economy, reducing pollution, use of land, amongst others. Bioenergy lends itself to a territorial approach, due to difficulties in transport, which facilitates the development of regional sectors for bioenergy production, creating competition and skilled jobs. However, he noted that one remaining challenge is the further implementation of effective policies. Therefore, GBEP is important for being able to benchmark and monitor the bioenergy sector and its sustainable development in order to better understand policy requirements.

[Maximiliano Morrone](#), Director of Renewable Energy Promotion, State Secretariat of Energy, Argentina, addressed the participants on Plan RenovAr in Argentina, the objective of which is to increase the participation of renewable sources in the national power grid. He noted that we should be mindful of the context of climate change, and how we must prepare ourselves for a different world where renewable energy will have a key role.

[Maria Michela Morese](#), Executive Secretary of GBEP gave an overview of the role of GBEP, which was established to implement the commitments taken by the G8 in the 2005 Gleneagles Plan of Action to support “biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent”. Since then its mandate has been renewed many times both by G8/G7 and G20. Globally, GBEP has 38 Partners and 40 Observers from public and private sector, and civil society. GBEP has two principle priorities: to facilitate the sustainable development of bioenergy (through its Task Force on Sustainable Development); and to facilitate the development of capacities for sustainable bioenergy (through its Working Group on Capacity Building). Dr. Morese gave details of the GBEP Sustainability Indicators for Bioenergy developed in 2011, and their implementation in 12 countries. GBEP is currently developing an Implementation Guide to provide more guidance on measuring the indicators and facilitate their implementation in further countries. She stressed the interlinkages between bioenergy and the 2030 Agenda, along with commitments towards the Paris Agreement. Monitoring the sustainability of the national bioenergy sector is a necessary step in order to understand, evaluate and improve the performances of the sector. Dr. Morese noted that GBEP represents an important forum for policymakers to discuss and harmonise policies.

[Jeffrey Skeer](#), IRENA, began his presentation by discussing the [Roadmap to 2050](#), in light of the climate targets of the Paris Agreement. IRENA envisages that 222 EJ of renewable energy use in 2050, of which: 7 percent for bioenergy in buildings, 10 percent for bioenergy to provide industrial process heat, 2 percent for renewable district heat, 3 percent for biomass power, and 10 percent in the form of liquid biofuels or biogas, mainly for transport. They see an important role for both electric vehicles and biofuels for decarbonizing the transport sector. He presented some pockets of sustainable bioenergy that can be obtained without reducing food supplies or emitting GHGs from changes in land use, for example, residues from agriculture and forestry, higher yields on cropland and planted forests, efficient livestock husbandry (freeing up pasture land), reduced food losses and waste, and afforestation. Mr. Skeer made reference to the joint paper from IEA Bioenergy, IRENA and FAO on [Bioenergy for Sustainable Development](#) to demonstrate how some of these pockets of sustainable bioenergy could be utilized. Policies should be shaped to: encourage bioenergy options with low indirect land use change (ILUC); reward reductions in carbon emissions per unit of energy produced; and provide predictable, long-term policy support.

[Glaucia Souza](#), University of São Paulo and FAPESP Bioenergy Research Program, Brazil, presented the [SCOPE Report on Bioenergy Sustainability in Latin America and Africa](#), which reviews scientific evidence in order to put forward policy recommendations. It includes contributions from 154 experts from 32 countries. The focus of the report was Latin America and Africa because it is estimated that, without compromising food security or biodiversity, Sub-Saharan Africa and Latin America together have an estimated 500 to 900 million hectares of land available for bioenergy, whilst Latin America currently produces more food than it needs and exports food products to the rest of the world. The SCOPE Report concludes that bioenergy is critical to meeting the NDCs and commitments under the Paris Agreement. Dr. Souza noted that, although energy from hydro, solar and wind can provide electricity, bioenergy’s unique characteristics make it an especially interesting options, for instance:

biomass can be stored to produce continuous energy; it uses locally available resources; it can provide fuels that fit in the present infrastructure; and it comes in many forms, thus giving versatility for various applications. Multifunctional landscapes are an important aspect, as they can provide many co-products as part of the bioeconomy, including bioenergy. Monitoring is important to understand the impacts and benefits of these landscapes and how they develop. International cooperation holds promise for monitoring and assessing projects, and Dr. Souza noted the key role of GBEP in this regard.

[Christoph Ernst](#), International Labour Organization (ILO), presented on green jobs in the bioenergy sector. He began by addressing the related social, economic and environmental goals with regards to bioenergy in the context of climate change: reduce greenhouse gases to limit climate change; guarantee sustainable energy supply for all to ensure economic growth; and create decent jobs in the bioenergy value chain. Green jobs are those which satisfy by the environmental and decent work conditions. A 2018 report by FAO and ILO, *Manual of Methodology for Estimating Green Employment in Bioenergy (Manual de Metodología de Estimación de Empleo Verde en la Bioenergía)*, concludes that, in Argentina alone, there were over 8 000 green jobs. Dr. Ernst noted that most of the direct jobs created by, for example, the biodiesel sector are formal and require qualifications, although along the value chain as a whole (e.g. agriculture and transport) there are also informal jobs with low working conditions. Although the sector currently has a low impact on employment in general, there is high potential for growth in the sector. Future development needs to consider the challenge of expanding labour competencies for the bioenergy sector, whilst improving the gender balance.

Miguel Almada, Director of Bioenergy and National Coordinator of the project PROBIOMASA, Secretariat of Agroindustry, Argentina, in his role as moderator concluded the session by reiterating that Latin America has a large potential to sustainably produce bioenergy as part of the broader circular bioeconomy. Stable policies are required to promote bioenergy, and GBEP is a great platform to facilitate policy discussion and harmonisation.

Session 2: Promotion of Bioenergy in Argentina

This session on the promotion of bioenergy in Argentina focused on the PROBIOMASA project – Project for the promotion of energy derived from biomass. Its main objective is to increase the production of thermal and electrical energy derived from biomass to ensure an increasing supply of clean, reliable and competitive energy, while opening new agro-forestry opportunities, stimulating regional development and contributing to mitigate climate change.

The session began with a short video on bioenergy in Argentina. More detailed videos on the PROBIOMASA project can be found on their [YouTube channel](#).

[Miguel Almada](#), Director of Bioenergy, State Secretariat of Agroindustry, Argentina, gave an overview of the energy matrix of Argentina. They are currently dependent on fossil fuels; only 9 percent of energy supply comes from renewable sources and biomass only makes up 0.25 percent of the electricity production. In this context, PROBIOMASA aims to promote energy derived from biomass through three main components: awareness raising, extension and training; institutional strengthening; and energy strategies. Mr. Almada went on to describe the activities already carried out under the project: they have trained a total of 6750 people through face-to-face and distance courses; they have produced educational materials for schools; they have commissioned research studies (including a report on green jobs previously presented by Christoph Ernst); and have provided direct support to other projects, including collaborating with the Energy Secretariat in the bioenergy aspects of RenovAr. He also described the WISDOM methodology for spatial analysis of energy balances and production potential.

Mariela Beljansky, PROBIOMASA project, presented the component of the project on bioenergy strategies. Under this component they provide both technical and administrative assistance to bioenergy projects. They are also working to develop pilot plants so that they can show plants that are working so that people can visit and learn from challenges that had to be overcome. Ms Beljansky also discussed their work on identifying the environmental, social and economic aspects of three case studies, especially in vulnerable communities. To better inform on the environmental aspects, they are developing technical guides and training so that projects can be evaluated for their environmental sustainability. Furthermore, they are making recommendations and facilitating the effective implementation of a National Bioenergy Strategy.

Federico Moyano, PROBIOMASA project, discussed the potential for thermal energy generation from biomass in Argentina. The country has a large potential from residues from e.g. forestry, agriculture, agroindustrial livestock, which amounts to 25 million tonnes per year that could be transferred to energy; the thermal potential is therefore 6200 MW, which will only grow as the sector develops. There is also an actual production of pellets and chips, although there are a number of barriers to these. Under PROBIOMASA, they are analysing five business models for thermal energy generation with private sector stakeholders.

Juan Prioretta, Director of Economic and Regulatory Studies, State Secretariat of Energy, Argentina, as moderator of the session concluded by emphasising that there is a major need to promote and study the use of biomass in all of its forms, because each project is different from all others (in comparison to standardised wind and solar projects).

Session 3: Exchange of experiences and opportunities on wood energy

[Manuel Ron and Marcelo Otero](#), Bioeléctrica, Argentina, presented a project to produce energy from wood in the north of Argentina, in Formosa. In Formosa, they have involved the relevant stakeholders, including indigenous communities, to create a multifunctional landscape that produces chips for electricity generation as well as animal protein. The project creates jobs and social development in the region – there are 100 new jobs in harvest of biomass and 50 service jobs indirectly created; 100 jobs in the plants; and 7500 homes with electricity from the project. Long term commitment secures investment, farmers, employers, suppliers, authorities and the community.

[Daniel Barrera](#), Ministry of Agriculture, Chile, presented the experience of Chile. He detailed the public policies, such as the non-conventional renewable energy law (NCRE). In Chile, the current energy use of biomass is equivalent to 24 percent of the National Primary Energy Matrix and 3 percent of the National Electricity Matrix (industrial use). There is an important consumption of wood and wood pellets, especially in the domestic sector in the central-southern regions for heating and cooking – 70 percent of households use wood. Mr. Barrera explained that the objectives in Chile are to move from an informal sector to a regulated, formal sector, where efficiency and quality can be certified and standardized.

[Justo Vargas](#), Director of International Cooperation, Ministry of Agriculture, Paraguay, presented the experience of Paraguay. In Paraguay, their electricity production is 100 percent renewable from hydropower but on the other hand, they are very dependent on solid wood biomass in both the industrial and domestic sectors. They are at a critical point where demand for solid wood biomass is about to overcome supply. That is why the implementation of the GBEP Indicators in Paraguay was very opportune as it allowed them to understand the needs, identify the data, install the capacity in the country and improve relationship with the research sector; it also helps towards the implementation of a

monitoring system to monitor bioenergy in Paraguay. They have also just begun a new GCF project (PROEZA) that combines objectives of poverty reduction, reforestation, renewable energy and climate change based on an integrated strategy of sustainable development.

[Bah Saho](#), ECOWAS/ECREEE, presented the experiences and opportunities for wood energy in the ECOWAS countries within sustainable bioenergy development. Mr. Saho introduced wood energy utilization in Africa, where they are very dependent on the traditional use of biomass. This has negative consequences for the environment, human health and food security. He gave some background on ECREEE – the ECOWAS Centre for Renewable Energy and Energy Efficiency. Their overall objective is to contribute to the sustainable economic, social and environmental development of West Africa by improving access to modern, reliable and affordable energy services, energy security and reduction of energy related GHG emissions and climate change impacts on the energy systems. They have therefore developed the ECOWAS Bioenergy program to assist the ECOWAS member states to transition away from the traditional use of biomass to a modern and sustainable production, transformation and utilization of biomass resources for electricity generation, cooking and heating and transportation.

Session 4: Exchange of experiences and opportunities on liquid biofuels

[Augustín Torroba](#), Director of Biofuels, State Secretariat of Energy, Argentina discussed policies to facilitate the development of biofuels in Argentina. The premises of these policies are to develop a competitive sector that does not require stimulus from the state. Mr. Torroba demonstrated that Argentina is in a unique position of being able to promote both biodiesel and bioethanol; both ethanol from corn and biodiesel from soya are cost-competitive compared with crude oil in Argentina. However, Argentina is currently dependent on natural gas, and they have the objective to double the production of gas in the next five years, thus reducing prices; this will have important implications also for energy prices across the sector. Mr. Torroba went on to convey the overall message of the policy in Argentina, namely to introduce greater competitiveness in the market for biofuels, and to take into account the positive externalities of the sector.

[Victor Castro](#), CARBIO, presented on the development of biofuels in Argentina. He focused on biodiesel, which has had a relatively stable production at the global level since 2013. Argentina ranks fifth in global production due to its extensive soya production and milling. Most of this is produced in Santa Fe, near to the main milling industries and shipping ports to improve efficiencies from reduced transport. Of the total produced, 60 percent is exported. Mr. Castro outlined the environmental benefits of biodiesel over fossil fuels, including the 70 percent GHG reductions achieved.

[Jorge Hilbert](#), INTA, presented the lifecycle analysis (LCA) calculator for the sustainability of biofuels. He focused on analysis carried out on biodiesel from soya in Argentina, the results of which demonstrated that the total production of biodiesel since 2008 saves the equivalent of what 5 (4.89) million Argentines emit in a year, which is the equivalent of what 4.2 million Spanish cars emit in a year.

[Patrick Adam](#), Biomaíz, Argentina, presented on corn ethanol in Argentina. Mr. Adam demonstrated that there has been an increasing sales volume of corn ethanol and installed capacity of ethanol plants will have to increase by 25 percent in the next year to keep up with demand; this will require investments of approximately USD 80 million. The price of ethanol in Argentina is competitive when compared with the US market, although economic devaluation is a problem. Mr. Adam concluded that all the necessary conditions are already met to launch a successful national bioethanol plan. He stated that the Corn Bioethanol Chamber supports the plan to stimulate more use of bioethanol, but it warns that, as

suggested by the scientific global community, the fossil fuels should pay a strong tax because of harmful and GHG emissions.

[Wilson Sierra](#), National Directorate of Energy, Ministry of Industry, Energy and Mining, Uruguay, presented on the experience of Uruguay. Mr. Sierra began by explaining that Uruguay is a food producing country – has a population of 3.3 million and produces food for 28-30 million – therefore, they can produce first generation biofuels. He discussed the ‘energy revolution’ that occurred in Uruguay in the last 10 years, where it transitioned from an importer to an exporter of energy, and currently 63 percent of energy supply comes from renewable sources, including hydro, solar, wind and biomass from residues and municipal solid waste (MSW). Most of the fossil fuel consumption (70 percent) is in the transport sector so they are not working towards developing biofuels and electric vehicles. As such, they introduced the Biofuels Law in 2005, which includes: mandates for both ethanol (E5) and biodiesel (B5); quality requirements; tax exemptions; and institutional arrangements. In 2018, production of biodiesel is sufficient for B5.5 blend and ethanol production is sufficient for an E8.7.

[José Fernando de la Torre Sánchez](#), INIFAP, Mexico, presented on the experience of Mexico. Mexico is in a primary phase of their biofuel sector development; as an oil exporting country, they have not been incentivised to investigate biofuel production before. Compared to the global average, they therefore have a low share of renewables in the energy mix (92.9 percent of energy supply is from non-renewable sources). They are now looking into alternative energy sources, such as nuclear, hydro, bioenergy, solar and geothermal. In Mexico, the transport sector accounts for 28.1 percent of GHG emissions. The programme of investigation in bioenergy of INIFAP is investigating the use of residues and alternative crops to soya and corn such as sorghum, palm and jatropha. In 2017, they received funds for the Centre for Innovation in Production of Bioenergy and Co-products (CIBIOC).

[Rodrigo Rodrigues](#), National Program of Production and Use of Biodiesel (PNPB), Brazil, presented the experience of Brazil. He began by giving an overview of the history and actual situation of ethanol and biodiesel in the country. RenovaBio is the national policy for biofuels. Mr. Rodrigues explained that it has led to a change in focus from social (in biodiesel) and economic (in bioethanol) aspects to the environmental aspects – to contribute to commitments under the SDGs and Paris Agreement, whilst providing efficient energy; the intention is to maintain the supply to cover the domestic demand for self-sufficiency and energy security. It includes a number of policy instruments: carbon credits; certification of biofuels; blending mandates; and fiscal, financial and credit incentives. He also discussed future opportunities, particularly in the field of alternative aviation fuels, where international cooperation is required to reduce GHG emissions through the production of biofuels.

[Flavio Castellari](#), APLA, Brazil, presented on Brazil’s experience in ethanol, the trends and technologies. Ethanol currently constitutes nearly 54 percent of Brazil’s sugarcane market (27.8 billion litres in 2016/17) and replaces around 40 percent of gasoline. Mr. Castellari outlined the benefits of sugarcane ethanol fuel in terms of the rural development opportunities, the reduced GHG emissions, better performance and lower petroleum usage. He noted that flex fuel technology was not invented in Brazil but has expanded because there have been public policies that incentivize flex fuel vehicles. He also mentioned innovative designs such as the Ipanema airplane, which is the first airplane in the world to be certified to fly with biofuel. Mr. Castellari concluded by highlighting that ethanol faces very high tariff and non-tariff barriers compared with oil, even though there are more opportunities for production and trade of biofuels (100 countries could supply biofuels to all nations whereas there are currently only 20 countries that can offer petrol to the world).

Day 2 – Wednesday 17 October 2018

Session 5: Exchange of experiences and opportunities on biogas and biomethane

[Olivier Dubois](#), FAO, began the session by providing an overview of the global biogas status, challenges and opportunities¹. Currently, there is 1.27 EJ of biogas, 16.7 percent of which is in the Americas. In the last 15 years, biogas has increased by four times globally. The global potential for biogas could be as much as 6 percent of global primary energy supply, although currently only a fraction of this potential is exploited and the importance of biogas in global energy consumption is very small. Mr. Dubois outlined the advantages and constraints of both small- and larger-scale biogas systems, whilst also suggesting possible solutions to identified constraints. For example, for larger-scale biogas systems, one issue is the competition with other types of renewable energies. One solution is to consider the co-benefits of biogas compared to those of other types of renewable energies, such as bio-fertiliser. Mr. Dubois also described the key factors for the success of biogas projects, especially the need for them to be adapted to local circumstances and needs. Future considerations could be to combine biogas with other types of bioenergy and/or renewable energies, and the use of biogas by-products. He expressed FAO's readiness and willingness to provide more support in sustainable biogas development projects and policies.

[Betsy Bandy](#), Ministry of Science, Energy and Technology, Jamaica, presented an example of a regional initiative in biogas: the Latin American and Caribbean Bioelectricity Community of Practice (BioE-Cop), which was established in 2016 under the regional platform of LEDES-LAC. Their focus for advancing bioelectricity development are technical assessment, socio-economic analysis, and finance and policy assessment, in order to be able to make policy recommendations. Their work in 2018 on the policy and market environment for sustainable biogas investments covered both rural large- and small-scale biogas, as well as urban biogas opportunities.

[Lisandro Ferrer](#), Adecoagro, Argentina, presented the experience of biogas in the milk value chain at Adecoagro in Argentina. Their milk and energy project is located in Christophersen, Santa Fe. The waste of the dairy production system is used as feedstock for the biodigester, and the co-products are used for heat and electricity, and for biofertiliser. As the plant is located at the end of the electricity grid, the electricity produced from the biogas provides stability to the grid. Furthermore, the use of biofertiliser improves crop yields for the production of corn for feed in the system. Mr. Ferrer stated that, for biodigesters to make sense, there needs to be a mature regulatory framework in place, as well as project financing, sufficient returns and suppliers, and the correct project scale for the context.

[Marcelo Alves de Sousa](#), Parque Tecnológico Itaipu (PTI), Brazil and IEA Bioenergy Task 37, gave an overview of the experience both of Brazil and of IEA Bioenergy. [PTI](#) is a foundation belonging to Itaipu, Brazil. It is a connection of education, research, innovation and business, with research areas in renewable energy, water, technology and food production. It is located in Paraná state in Brazil, which has a high concentration of animals, which brings with it many environmental problems, such as water contamination. Therefore, PTI, Itaipu and CIBiogás are working in the Paraná region and have 11 demonstration utilities to prove biogas feasibility. They focus on combined solar and biogas micro-grid systems because biogas can be stored and released constantly over time to provide energy 24 hours a day, thus preventing energy interruption that have potentially very negative impacts on animal health. As Brazil increases its exports in meat protein, the number of animals will triple by 2025, with the consequential environmental problems; biogas can help with solutions to this. However, Dr. Alves de

¹ This presentation was pre-recorded.

Sousa explained that there was an urgent need to enhance the regulatory basis for rural microgrids in Brazil. [IEA Bioenergy Task 37](#) focuses on Energy from biogas, and has the objective to address the challenges related to the economic and environmental sustainability of biogas production and utilisation. They carry out technical work, provide expert technical support to assess the externalities of the biogas systems, provide guidance and advice on best practice to policy makers, and provide technical support to policy makers and the public. Their outputs include technical reports (e.g. *Methane emissions from biogas plants* and *Food waste digestion systems*) and case studies (e.g. *Biomethane demonstration: Innovation in urban waste treatment and in biomethane vehicle fuel production in Brazil*).

[Suani Coelho](#), USP, Brazil, also presented the Brazilian experience. Biogas in Brazil does not form a large part of the energy production. Most of the production is used to produce electricity (63 percent) and the most utilised feedstock is landfill waste (51 percent). However, there is a large gap between the existing biogas production and the biogas potential: the potential is 18 times greater than the production in the state of São Paulo. Prof Coelho gave some examples of existing experience from biomethane from landfill and sewage, and biogas and biomethane from vinasse. Biogas from vinasse has large potential because the digestate can be used for fertirrigation even where soils have high potassium content (whereas vinasse cannot). Furthermore, the sugarcane mills are already located very close to the current natural gas pipelines, meaning that biomethane can more easily be injected into the grid. Prof Coelho stressed the influence of legislation in the development of biogas, for example, the regulation of biomethane from urban residues due to siloxanes is an example of where regulation is creating a barrier to further development.

[Ahmed Abdelati](#), Egypt, presented the experience of Egypt, specifically the measurement of the GBEP Sustainability Indicators for Bioenergy (GSIs) in three regions of the country. This is the second time that the GSIs have been used to assess bioenergy in Egypt, the first only focusing on thermal gas in one agro-ecological zone. The measurement assessed: lifecycle GHG emissions; soil quality; change in income; jobs in the bioenergy sector; and change in consumption of fossil fuels and traditional use of bioenergy. The economic feasibility of household biodigesters was also assessed, and the biogas plant of 6m³ was the most viable from profitability, productivity and ability to tolerate risks that may arise in the production process; it was also the most prevalent size (70% of all plants).

Betsy Bandy as moderator concluded the session by expressing her satisfaction with the number and depth of experiences shared by the speakers. She asked the participants how we should properly share this technical information in a systematic way, and how we can move forward our capacity building at a regional level. She suggested that a regional platform, or knowledge base would be beneficial to collect all relevant information in one place.

Session 6: Exchange of experiences and opportunities on advanced biofuels

Jeffrey Skeer, IRENA, opened the session as moderator. He began by explaining the overlapping definition of advanced biofuels. Mr. Skeer provided three criteria for classification of advanced biofuels: level of GHG emission reductions; technology that is in experimental or pilot phase; and use of non-crop feedstock, although he noted that there are many other definitions. He mentioned that this session on advanced biofuels is opportune due to the GBEP Working Group on Capacity Building (WGCB) provisional Activity Group 8 on Advanced Liquid Biofuels. Discussions will be useful for determining activities and making decisions in the context of the upcoming GBEP annual meetings.

[Jeffrey Skeer](#) went on to present the contribution of IRENA to the exchange of experiences and opportunities on advanced biofuels. Mr. Skeer presented the results of IRENA's [Innovation Outlook for](#)

[Advanced Liquid Biofuels](#). This report indicates that by 2045, advanced biofuels would likely cost between USD 0.60 and 1.10 per litre to produce, and suggests that if oil prices were below USD 80 per barrel, they would unlikely be able to compete. Feedstock cost are the greatest contributor to production costs for most advanced biofuel production pathways, representing between 40 and 70%. Therefore, Mr. Skeer noted that it is important to focus on the practicality and efficiency of feedstock supply. He also asserted that we will need much greater investment if biofuels (and especially advanced biofuels) are to meet their potential. Although electric transport will likely expand dramatically, liquid biofuels will still be key in the aviation and freight shipping industries, where required energy densities are high. Advanced biofuels are therefore critical for decarbonising the transport sector due to their large reductions in GHG emissions. To support the development of biofuels for aviation, Mr. Skeer suggested a number of support policies to consider: RD&D support for pilot plants with lignocellulosic feedstock; significant market value for carbon and methane; volumetric renewable fuel mandates; and limits on jet fuel carbon per person-km or tonne-km. He went on to detail three advanced liquid biofuel technology pathways: fermentation, gasification and pyrolysis.

[Fahran Robb](#), USDA, USA, presented the experience of the USA. In 2017, the USA produced 15.8 billion gallons of fuel ethanol, amounting to 58 percent of global production. Ms Robb noted that government policies have been instrumental in the growth of production and consumption of ethanol over time. She gave an example of oxygenated fuels requirement and the prohibition of MTBE as paving the way for the switch to ethanol as the oxygenate of choice after the establishment of the Renewable Fuel Standard (RFS). Ms Robb went on to discuss the RFS in detail; the RFS introduced in 2007 under the Energy Independence and Security Act defines four categories of biofuels based on their GHG reductions, for example, to be classified as cellulosic fuels, they must have 60 percent GHG reductions compared to a 2005 petroleum baseline. When determining the fuel mandates each year, there are a number of factors that are taken into consideration, in terms of equity, viability, and feasibility. Multiple agencies mean that interagency coordination of bioenergy policy is important for efficiency. Ms Robb also outlined the US regional approaches to bioenergy systems. She then provided some examples of policies to promote advanced biofuels production. For example, the Biorefinery Assistance Program, which has led to advanced biofuel production in California that helps to solve the problem of the disposal of orchard wood waste, thus reducing air pollution whilst producing low carbon ethanol. Another example is the Defense Production Act, which is an initiative targeted domestic biorefineries capable of producing drop-in transportation biofuels intended for military operational use.

[Guido Bonati](#), CREA, Italy, gave the experience of Italy on the Horizon 2020 Project FORBIO, investigating the potential for the production of sustainable feedstock production for advanced biofuels on underutilised land in Europe. FORBIO includes 11 partners, including FAO. It investigates sites in Italy, Ukraine and Germany. Dr. Bonati provided detail on the case study in Sardinia, Italy, where there are polluted areas as a result of mining and industrial activities that mean that agricultural production for food crops cannot take place. The project included an analysis of the agronomic feasibility, techno-economic feasibility, and a sustainability assessment. The sustainability assessment was based on the GBEP Sustainability Indicators for Bioenergy, modified for the purpose. A follow up to this project, BIOPLAT-EU, will begin in November 2018, expanding the coverage across the EU and developing further tools to aid with geographical and sustainability assessments of advanced biofuel crop production potential.

Jane Hupe, ICAO, presented the experience of ICAO on aviation biofuels². She focused on the advancements that have occurred on sustainable aviation fuels (SAF), demonstrating how quickly the industry is innovating and growing. Ms Hupe outlined the vision of ICAO, to achieve the sustainable growth of the global civil aviation system, and underlined that environmental protection is one of the key pillars of ICAO's strategic objectives. Under this objective, they focus on aircraft noise, local air quality, and climate change. The ICAO Global Aspirational Goals include the goal to reach carbon neutral growth (CNG) in the aviation sector from 2020 onwards. This will be achieved through a basket of measures, including sustainable aviation fuels, global market-based measures (e.g. Carbon Offsetting and Reduction for International Aviation – CORSIA), aircraft technology and operational improvements. Ms Hupe also mentioned the Global Framework for Aviation Alternative Fuels (GFAAF), a database for aviation and alternative fuels, including the 'live-feed' that displays all flights from airlines involved in on-going alternative fuel purchase agreements. Ms Hupe also provided information on the 2050 ICAO Vision for Sustainable Aviation Fuels (which calls for a significant proportion of aviation fuels to be substituted with SAF by 2050) and their technical support work to assist countries towards this vision.

[Onofre Andrade](#), Boeing Research & Technology, Brazil, presented on sustainable aviation fuels (SAF) in Brazil. Boeing acts as an industry catalyst to accelerate commercialisation of SAF, through support and advocacy, feedstock and pathway R&D, and fuels approval. There are eleven Boeing Research & Technology centres worldwide for this purpose. Mr. Andrade discussed the partial decoupling of CO₂ emissions from traffic growth in the aviation sector in the last 20 years but said that in the future we need carbon-neutral growth, through airplane technology, operational efficiency, and sustainable biofuels. There is a strong demand from airlines for SAF but Mr. Andrade noted that it is important that their demonstrated life-cycle GHG reductions is measured and verified by an objective third party standard through certification of the supply chain. He noted that it has only been 10 years since the first flight with SAF, now we have had over 100 000 flights with SAF, and Brazil had good conditions for scaling-up production and use of SAF in the future.

Session 7: Roundtable on challenges and opportunities for the development of bioenergy

To begin the session, [Eduardo Trigo](#), Inter-American Institute for Cooperation on Agriculture (IICA), discussed the opportunities for bioenergy in the context of the bioeconomy. Dr. Trigo spoke about the concept of bioeconomy as a comprehensive concept that includes both the integral use of biomass and innovation based on cutting-edge technology that cross all sectors of the economy. Dr. Trigo stated that it is an opportunity for us to rethink the role of natural resources in the economy, discard the classic dichotomy between agriculture and industry, and regenerate rural economies through the 'biomass industry'. He noted that bioenergy is an important component as it represents the first step in this transformation. For many countries with abundant biomass, it is a response to the challenge of substituting fossil fuels. In the future, policies need to be designed not just to focus on the energy and environmental objectives, but on the conceptual basis of the contribution of bioenergy to the bioeconomy, the SDGs and human development as a whole.

[Renato Godinho](#), Ministry of External Relations, Brazil, presented the contribution of the Biofuture Platform to the challenges and opportunities for the development of bioenergy. He called modern bioenergy the 'overlooked giant of renewables', as the only renewable source that can provide

² This presentation was pre-recorded.

electricity, direct heat and transport fuels. Mr. Godinho showed that between 2018 and 2023, renewable energy consumption is expected to increase by almost 30 percent but in order to meet commitments under the Paris Agreement, bioenergy consumption needs to double by 2030 (for the 2DS scenario). Mr. Godinho went on to introduce the Biofuture Platform that was launched by 20 countries at COP22 in 2016. The Biofuture Platform has carried out many activities in the last two years, including the Biofuture Summit held in São Paulo, Brazil in October 2017. Their latest report “Creating the Biofuture” is to be launched at COP24 in December 2018 and will conclude that, in order to scale-up in a sustainable way, countries need to put in place a comprehensive policy framework tailored to their potential and realities; both ‘push’ and ‘pull’ policies are necessary.

[Martín Fraguío](#), Grupo de Países Productores del Sur (GPS), Argentina, discussed bioenergy value chains. Although bioenergy is important for human beings, Mr. Fraguío noted that we are still finding it difficult to develop it, and this is linked with bioenergy value chains. A competitive bioenergy value chain is made of hundreds of public and private decisions, and has five links: R&D; raw material; farming and agriculture; transformation industry and fuel production; trade and market access. These value chains need to be inserted into the global value chains, which depends not only on public opinion but also on public sector and the decision-making of governments. There are three main pillars of value chains: strategy (the overall aim); structure (the links in the chain that should be aligned with the strategy); and the institutional culture. Mr. Fraguío stated that we need to look at the overall strategy before we focus on competitive advantages in order to determine common goals of all actors. This will help to overcome the national and international barrier to bioenergy development.

[Gerard Ostheimer](#), Below50/SEforAll, presented the contribution of [Below50](#) and [SEforAll](#), and how we can create new paths to a renewable carbon economy. He provided a brief history of the biofuels ecosystem from 2008 to the present day: from 2008 to 2015, biofuels demand was entirely policy driven, which was gradually eroded over that time by NGOs concerned about fuel vs. food, and fossil companies. In 2015 the international community agreed to new Sustainable Development Goals and to work to combat climate change, leading to renewed interest, which requires political will and the engagement of the private sector to turn this interest into meaningful on-the-ground deployment. Dr. Ostheimer noted that there are numerous international technical agencies that are promoting increased bioenergy production and use by information sharing, but as well as policy advocacy, greater links with private sector are required to stimulate global demand. The SEforAll Bioenergy Accelerator connects leading renewable energy and climate change institutions to the private sector in order to foster enabling environments for bioenergy. Whilst Below50 works to grow the global market for sustainable fuels that have less than half of the emissions of fossil fuels.

[Candice Wilson](#), US Grains Council, presented on ‘Growing the Size of the Ethanol Pie: The Experience of the U.S. Grains Council in Building Ethanol Demand’. Ms Wilson noted that ethanol use remains concentrated among several countries, primarily USA and Brazil. She argued that countries leading in the adoption of ethanol practices should collaborate to grow the size of the pie instead of fighting over constant market share. She went on to dispel many of the myths of ethanol production and use, such as ethanol’s environmental impact, its negative effect on engine performance, and its contribution to food insecurity, all of which she countered with the facts that: ethanol can serve an integral role in mitigating GHG emissions and combatting the effects of climate change; virtually every car on the road today can run on E10 blends; and ethanol production accounts for less than 5 percent of the world’s total grain production. She showed that there are numerous economic, environmental and air quality benefits to the use of ethanol blends, when compared to fossil fuel alternatives. As such, US Grains Council’s goal is

to develop global biofuel alliances in order to develop policy support, highlight the benefits to society, and ultimately build demand.

After the presentations from the panellists, there was a roundtable discussion moderated by Dr. Ostheimer. Some of the questions and related reactions included:

- **Advanced biofuels are better than conventional biofuels for GHG emissions – how do we measure the reductions to be able to compare the alternatives?**
Mr. Godinho highlighted that harmonization between different organisations and a consensus on methodology is required, also for the more methodologically challenging areas such as indirect land use change (ILUC).
- **What role do you see for ethanol in 20 years from now?**
Ms Wilson noted that bioenergy is essential for the bioeconomy, which in turn is essential for the global economy. Business as usual is not an option and ethanol will play a role in this.
- **What do you see as the projection of biofuel in the face of the development of electric vehicles that are expected to develop faster than previously thought?**
Mr. Fraguío noted that even if all vehicles were electric then the electricity would still need to be produced. In many countries, the primary source of electricity is still from a fossil fuel source. Although solar and wind are available they are not reliable and so bioenergy will still have an integral role.
- **How can fossil fuels and ‘green’ work together?**
Dr. Trigo noted that there are both upstream (exploitation of resources) and downstream (convincing consumers) actions that need to be undertaken to integrate biofuels, and other bioenergy, into current fossil fuel value chains.
- **How to stimulate the consumers?**
Ms Wilson stressed the need for an alliance of people across different actors in the value chain to bring validity to the arguments for biofuels, whilst Mr. Godinho emphasized the uptake of the national component as important for promoting biofuels.
- **What role should GBEP play going forward?**
Dr. Trigo highlighted that there is a role for GBEP (but also for all of the institutions) to get the facts out and clear the field of misguided facts and information. There is a lot of noise from political objectives from other fields and improved consensus around the facts is needed; GBEP just through these two days has been very enlightening in that sense. Ms Wilson agreed that we have the information, science and credibility and now it is about building partnerships. Mr. Godinho also noted how GBEP has been very successful in the past on finding consensus in the sustainability issue with the GBEP sustainability indicators. Now, certification is required and although certification is beyond the scope of GBEP, it may still play a role in helping to build consensus. Dr. Ostheimer concluded by suggesting that all initiatives need to come together to converse with leaders, critics, etc. to have these deeper conversations.

Conclusions and closing

Miguel Almada, Secretariat of Agroindustry, Argentina addressed and thanked the participants, GBEP, YPF as host and colleagues in the Secretariat for their work in preparation of the Bioenergy Week.

Maria Michela Morese, Executive Secretary, GBEP, addressed and thanked the participants, organisers and hosts of the Bioenergy Week, as it is through their contribution that we will meet our shared goals. She said that she was impressed by the experiences shared in these two days, both from the region and outside, as this is the reason for the events – to share experiences and best practices that can be replicated. Though the assembling of relevant stakeholders, the Bioenergy Week has helped to foster collaboration opportunities for the future. She mentioned the ‘food vs fuel’ debate and referred the many examples studied by FAO where this idea is not confirmed. Instead, it is up to us to make best use of our resources

using a coherent, context-dependent, flexible approach that includes bioenergy as part of the wider bioeconomy.

Andrés Murchison, Secretary of Food and Bioeconomy, Secretariat of Agroindustry, Argentina, thanked GBEP, YPF as host, and colleagues in the Secretariat for their work towards the Bioenergy Week, as well as participants, for making the event a success. Mr. Murchison expressed the importance for the Argentine government of events such as the Bioenergy Week as there is a lot of discussion on bioenergy and biofuels, and listening to other countries experiences –issues and policy solutions– helps in reaching better decisions, in collaboration with the private sector. He asserted that the GBEP forum is a bridge in the world that allows us to understand what others have to say. When the problems are so complex, there is no way to solve them simply, therefore this forum is paramount to find solutions, through sharing experience.

Field visit – Thursday 18 October 2018

Participants visited YPF Tecnología ([Y-Tec](#)) at their state-of-the-art building in La Plata. It is the largest research centre in the country, with a floor plan of 13 000 m² that hosts 47 labs and 12 pilot plants, and a workforce of 300. Y-Tec is jointly controlled by YPF (with 51 percent of the shares) and CONICET (with 49 percent). Y-Tec was built two years ago with a USD 50 million investment. Y-Tec explore opportunities in six main areas: mature oil fields, non-conventional resources, new energies, environmental sustainability, gas, and refinery and petrochemistry. Their research in the field of new energies is hoped to drive the YPF transition from an oil company to an energy company. They are highly committed to both national and international collaboration in order to strengthen capabilities and incorporate best practices.

The participants were shown, in particular, the [biogas pilot plant](#) on the site. Their research on biogas aims to develop the best technology for biogas production through the characterisation of inoculum and substrates, and improvements in production efficiency. In the lab, specifically designed equipment is used to test different inoculum, substrates and waste water, in order to predict their behaviour and evaluate their Biomethane Potential (BMP). These results are then implemented in the pilot plant on site, which has two biodigesters working in parallel to compare different scenarios. The pilot plant uses solar energy for heating during the process, as well as for drying of the resulting digestate. It is also equipped with an electricity generator.

