A circular bioeconomy: Providing solutions to the EU Green Recovery Plan

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Hosted by MEP Franc Bogovič

Chair of the "Bioeconomy" Working Group
of the European Parliament Intergroup on 'Climate Change, Biodiversity and Sustainable Development'

Webinar report

Speakers:

- **Franc Bogovič**, MEP
- **Marie-Christine Ribera**, President, EUBA & Director-General, CEFS
- **Anne-Katrin Bogdanski**, 'Climate, Biodiversity, Land and Water Department', FAO
- **Marco Rupp**, EUBA & BIC
- **Lorenzo Valtieri**, Energy Manager and R&D Project Manager, Caviro Group
- **Peep Pitk**, R&D Manager, Graanul Invest
- **Alarik Sandrup**, Director Public & Regulatory Affairs, Lantmännen and President of ePURE, the European renewable ethanol association
- **Geert Maesmans**, Regional R&D Leader, Cargill EMEA, & Global R&D Leader, Cargill Starches, Sweeteners and Texturizers

Opening remarks

MEP Franc Bogovič

In his opening remarks, **MEP Franc Bogovič** mentioned that for the past weeks close discussions were held with the European Commission Executive Vice President Mr. Timmermans' cabinet regarding this online event. Although thoroughly exploring his participation, moreover then his Cabinet Members' closest to the topic, the intervention of the European Commission did not succeed in its materialization. However, **Mr. Bogovič** underlined that he remains convinced that given the growing significance and recognition of the webinar's nexus, circular bioeconomy remains as a key priority within the European Commission's Green Recovery Plan for the years to come. At the same time, this can be seen as an opportunity for change, to achieve economic recovery and climate neutrality by 2050. **MEP Franc Bogovič** also insisted on the challenge to do so without endangering the competitiveness of the European economy and industry. In order to contribute to this objective all sectors of the economy must be involved, by providing incentives for the development of sustainable practices and technologies. Moreover, this should apply to bioeconomy as it is a crucial sector towards the transition to a circular and carbon-neutral economy. Indeed, bioeconomy plays a key role in the substitution of intensive carbon-based industries by using sustainable and renewable materials. He stressed that bioeconomy was essential for European Circular Economy and the security of supply of raw materials. To achieve this, according to **MEP Franc Bogovič**, the Farm to Fork Strategy, the Biodiversity Strategy and the European Industrial Strategy will be key elements to the further development of the bio-based sector in the European Union. However, he pointed out that some elements in the current European Strategies were against this goal, a point which ought to be addressed in order to further support bioeconomy. **MEP Franc Bogovič** concluded his remarks by insisting on the need to find a proper balance between the three pillars of sustainable development, as well as on the need for all sectors in society to be greener.

EUBA view: Green Deal and bioeconomy

Marie-Christine Ribera, EUBA President & CEFS Director-General (European Committee of Sugar Manufacturers)

Within her intervention, **Ms. Marie-Christine Ribera** presented an overview of the European Bioeconomy Alliance (EUBA) views on the Green Deal and on bioeconomy. In addition, she pointed out to the EUBA mission to help lead the transition away from a fossil-based economy by raising awareness with the European, national and regional leaders on the benefits of the bioeconomy. She introduced the 12 organizations part of the alliance: Bio-based Industries Consortium, Forest-based Sectors, Confederation of EU Forests Owners, Copa-Cogeca, Primary Food Processors, Starch Europe, ePURE, CEFS EU Sugar, FEDIOL, European Bioplastics, EuropaBio and CEPI. Then, **Ms. Ribera** presented some figures about bioeconomy, explaining that it has a turnover of 2.3 trillion euros. As highlighted by **Marie-Christine Ribera**, Europe is a leader on bioeconomy and there are synergies and links between bioeconomy and the European Green Deal policies. However, she stressed the need for increased funding and financing mechanisms for circular economy in the frame of the European Green Deal, as well as support in education and training to further develop it. Summing up her intervention, **Marie-Christine Ribera** said that the Green Deal was both an opportunity and a

challenge for the bioeconomy. It will be an opportunity, if the European Union intends to continue leading the green transition and committing more to unlock the potential of the bioeconomy and implement the Bioeconomy Strategy Action Plan. It can also be a challenge, as the ultimate objective of climate neutrality is very ambitious and it needs strong accompanying measures to secure renewable energy supplies of sufficient quality, as well as to enable scale-up of innovative solutions in the bioeconomy.

Circular bioeconomy good practices for a green recovery from the COVID-19 crisis *Anne-Katrin Bogdanski, 'Climate, Biodiversity, Land and Water Department', FAO*

Anne Katrin Bogdanski started her presentation on the FAO's perspective regarding circular economy good practices by stressing that we are currently within a triple crisis, as prior to COVID-19 we were already facing challenges with climate change and air pollution. After providing some key figures regarding the deaths caused by each issue, she highlighted the link between all three phenomena, as air pollution aggravates the consequences of COVID-19 and contributes to climate change. **Ms Bogdanski** moreover outlined the originality of the recent call from health leaders for green recovery to the G20. Looking at agriculture and food production, she explained that the agriculture and forestry sectors accounted for 24% of global greenhouse gases emissions. According to **Anne Katrin Bogdanski,** those emissions come mostly from livestock production, paddy rice farming, and land use change including the burning of biomass. There are a lot of cases of farmers burning their crop residues to maintain crop productivity in countries like India and this is a serious issue that should be addressed. Carrying on to the potential solutions, **Ms. Bogdanski** pointed out that green recovery in the food and agriculture sector needs to be built on three pillars: the economic recovery, but also on an increased resilience and a mitigation of health risks. A sustainable and circular economy can and should contribute to these goals. To illustrate her point, she presented two national programmes occurring in Malaysia and China to tackle respectively the problem of biomass burning and methane emissions with a panel of varied measures from subsidies to training and technical advises. She also mentioned the development of a FAO-led programme in favour of circular bioeconomy and the formation of a FAO-led International Sustainable Bioeconomy Working Group as well as the current joint programmes and missions with the EU. To conclude, **Ms. Bogdanski** stressed the fact that a resilient food system is needed more than ever, and that the COVID-19 made us aware of the synergies and trade-offs between our health system, the ecosystem services, our consumption patterns and planetary boundaries, as well as of the true cost of food. Towards this direction, the next UN Food System Summit in 2021 could also be another milestone on the way to more resilient and circular food systems, as has the European Green Deal been.

Bioeconomy in the context of Green Deal and Green Recovery - The example of the biorefinery

Moderator: Marco Rupp, European Bioeconomy Alliance & Bio-based Industries Consortium

Before introducing and moderating the panel of speakers on behalf of EUBA, **Mr. Marco Rupp** addressed a first question raised by the audience to **Ms. Anne Katrin Bogdanski**. Asked about the status of the work led by FAO on sustainability assessment of bioeconomy, she responded that there is undergoing work with the EU Research Centre to develop guideline notes on how to undertake these assessments. So far there are many countries concerned and they need to look at the progress,

the productivity but also at sustainability aspects. Therefore, it is not an easy task, however **Ms. Bogdanski** was happy to share any progress on this guidelines' note any time soon. Until then, she welcomed the participants' reading of the most-relevant publication on sustainability monitoring for the bioeconomy, available on the FAO website. Following that, **Marco Rupp** outlined that the rationale of this webinar was to dedicate the next part on concrete examples on how bioeconomy can operate. There are many more topics to address, and which can be considered for one of the next EP Intergroup meetings to follow.

From sustainable sourcing of feedstock to bringing products to the market

Lorenzo Valtieri, Energy Manager and R&D Project Manager, Caviro Group

The panel discussion began with the intervention of **Mr. Lorenzo Valtieri**. *Caviro* is a second-level cooperative, composed of 12.500 wine growers with 29 member wineries producing grapes and about 10% of Italian wine. Two of the companies of the group, *Caviro Extra* and *Enomonde*, are specialized in bioeconomy. **Lorenzo Valtieri** first explained the functioning of these companies that are collecting all the by-products and waste from wine and food industries to transform it into worthy products. *Caviro* is developing circular- and bioeconomy in the wine industry since 2016 and has four business units: Alcohol, Must and Extracts, Tartaric and Energy. These four units describe the four steps of their circular bioeconomy and the four main products obtained from waste, the last ones being biogas and fertilizers from the remaining biomass. Their products are used in various sectors: food, pharma, chemicals, building, cosmetics, etc. **Lorenzo Valtieri** demonstrated that *Caviro* has a long experience with biogas and that the group is able to fill 18.000 vehicles with biomethane every year. According to **Mr Valtieri**, the advantage of "advanced biofuels" compared to classical ones is that they are produced from waste and therefore do not require land to grow up crops. The last step of the biomass transformation is the conversion into fertilizers which come back to the field and close the circle. Another positive element outlined by **Mr. Valtieri** is the production of 100.000 MWh of energy that can be used for the factory, while the rest is sent to the national grid. *Caviro* was at first only collecting waste of wine industry but with its development, it is also now recovering the waste of dairies and milk factories, as well as sweet factories. In the end, the factory is able to recycle 99.3% of what they collect. **Lorenzo Valtieri** admitted in his conclusions that circular economy was a long path but it is possible to innovate and make new progresses every year.

SWEETWOODS project

Peep Pitk, R&D Manager, Graanul Invest

Mr. Peep Pitk introduced the *SWEETWOODS* project as the first-of-a-kind wood fractionation flagship plant being built in Estonia. The main objective of the project is to demonstrate high wood to useful non-energy products wood valorisation process. **Mr. Pitk** presented the project as a two layer-project, the first one being the biomass primary products production. According to the speaker, the cornerstone of biorefinery is sustainable biomass resource; for this project, hard wood (birch) processing residues are used. In addition, **Mr. Pitk** mentioned the need for a certified raw material, as well as a fully traceable supply chain that is resource-efficient. From the biomass conversion viewpoint, the approach of the *SWEETWOODS* project is to target minimizes CO2 and environmental footprint of the wood fractionation process with maximized resource use efficieny by converting over

90% of wood into useful products. Fractionation process allows to obtain high-purity near native lignin and low-inhibitors cellulosic sugars. Lignin has direct applications as biocomposites and in phenol replacement, while sugars are used in material and chemical industries after fermentation and chemical conversions. Therefore, the first layer of the project, which focuses on sustainable biomass supply chain and resource efficient processing of wood into primary products, can be used as a basis for promoting biobased economy development globally. The second layer of the project focuses on primary products and their transformation into intermediate products. Here, the company *Metgen* is taking care of lignin when the company *Global Bioenergies* is undertaking the conversion and fermentation of low sugars into chemicals used for the cosmetics industry among other sectors. **Mr. Pitk** insisted on the fact that in order for the second layer to succeed, then resource efficient primary layer has to be in place. **Peep Pitk** concluded his intervention underlining that there were some conflicts between the Green Deal ambitions and some sector regulating strategies, and those should be solved in order to have a stable and long-term investment environment to support development of biobased economy. He also declared that it was important to have a more holistic view of bioeconomy in general, not just about the CO2 emissions reduction, but focus needs to be targeted on the product design having in mind the long life span of the end-products and their circularity.

A EU 13 biorefinery and value-chain approach: the primary sector as a strategic partner

Alarik Sandrup, Director Public & Regulatory Affairs at Lantmännen (Swedish farmers' cooperative), President of ePURE (European renewable ethanol association)

Within his intervention, **Mr. Alarik Sandrup** presented successively *ePURE* and *Lantmännen*. *ePURE* is the European renewable ethanol association composed by 36member companies including cooperatives, refiners and biotech companies. *ePURE* has in particular 50 biorefineries in 16 EU Member State and its members use 99% of feedstock from Europe to produce ethanol with an average of 71% greenhouse gases savings compared to fossil fuels. At the same time, **Alarik Sandrup** also presented *Lantmännen, which* is a farmers' cooperative in Sweden. *Lantmännen* has operations in agriculture, machinery, bioenergy and food and is made up 20.000 Swedish farmers and 10.000 employees in more than 20 countries. **Mr. Sandrup** also shared the fact that bioenergy represented almost 40% of the total energy used in Sweden and that *Lantmännen* was the largest bioenergy company in Sweden, producing bioheat, solid biofuels and ethanol. According to the speaker, their current ethanol production was partly made of residues from the food industry, while a potential production from straw technically works as well, however not yet on commercial level. The main feed stock being grain, the biorefinery is using wheat of feed quality as it is cheap and of better quality than milling wheat when it comes to producing ethanol. With reference to energy, the biorefinery is working with the heat and electricity produced by a nearby biomass-based combined heat and power plant. Among the by-products, there is also protein feed that is used as food for cattle, closing the loop on the fields where the manure from the cattle is used for the crops. However, the main sub-product is still ethanol allowing to reduce GHG emissions by at least 95% compared to fossil fuels. Some tests were also conducted with biomaterials and bioplastics, but *Lantmännen* is not ready to shift its production from ethanol. One other interesting food product that is being tested is fungal protein. It is a type of meat substitute for human consumption that could be largely commercialized in the future. Last but not least, **Mr. Alarik Sandrup** pointed out the

new process of capture of CO2 from the production that they developed. The CO2 can be liquefied into carbonic acid and then sold to the drink industry, food industry, or even used in hospitals. In **Mr. Sandrup**'s opinion, biofuels can be also an important tool to decarbonize the sector of transport. Finalizing his intervention, **Mr. Sandrup** mentioned that it is possible to produce very sustainable biofuel and very sustainable protein while contributing to the incomes of rural areas. Therefore, it is important to place the farmers at the heart of the Green Deal, the Green Recovery as well as circular bioeconomy, to ensure local food and energy security.

Knowledge exchange, education, training, skills

Geert Maesmans, Regional R&D Leader, Cargill EMEA, and Global R&D Leader, Cargill Starches, Sweeteners and Texturizers (based in Cargill's R&D Centre in Vilvoorde, BE)

The panel discussion was concluded by **Geert Maesmans**, who presented *Cargill* and a different topic related to bioeconomy; the one of skills and knowledge. *Cargill* is a family-owned company that works across the world, transforming raw material into finished goods for different types of applications. *Cargill* provides insights on data analytics, market expertise, financial solutions and risk management to their partners: farmers, business-to-business companies and business-to-customers companies. Within his speech, **Mr. Maesmans** summarized bioeconomy's logic to one key element: the use of 100% of the raw material obtained from farmers. However, this vision also poses a risk as whenever there is a change in the system, it should remain at least as much efficient. To do so, there is a need for skills and knowledge that can be represented in two-dimensions. There is what exists today and what should be developed in terms of new skills, and this can be expressed from an internal point of view of the company, but also from the point of view of the company's network. For the first dimension of the skills that exist today, sciences as agronomy, biology and biotechnology have a significant role to play. In terms of the whole network, there is a need for connection between factories and for creating a shorter supply chain that is additionally more flexible. Regarding the changes that can be observed globally, **Mr. Maesmans** noted the emergence of digitalization, artificial intelligence, material design and the acceleration of changes to achieve the Green Deal. There is also the need to educate the stakeholders on bioeconomy and how to best benefit from it. Furthermore, the last skills and knowledge that should be developed at the network-level, concern the creation of new supply chains with new intermediates. **Geert Maesmans** concluded his analysis by stating that what was developed in the past should be used as a solid basis to make the Green Deal come to life.

Q&A Session

During the Q&A session that followed the panel discussion, **Peep Pitk** was asked what would we need to make lignin economically viable instead of burning most of it. For **Mr. Pitk** the issue with lignin is that it has always been considered as problematic. However, their approach applied is different, as lignin is their main product and is extracted at the higher quality possible. According to the panelist, there is a need for a switch of mentality regarding how biomass is addressed, how it is pre-treated and what its targets are.

The second question addressed to **Mr. Alarik Sandrup** covered the subject of barriers regarding the use of straw for advanced biofuels. According to the speaker, many investments have been made, while plenty other companies are also working on the same topic. **Alarik Sandrup** confirmed that logistics was a problem, because of the density of energy or value in the straw that remains low, compared to the traditional type of feedstock. While it is possible to collect straw and transport it to the plants, it still remains a challenge. In fact, it is not possible to use all the straw that is produced because it will cause problems in the long-run, in terms of productivity and dry matter content of the soil.

The last question regarding *Caviro* touched upon the use of vineyards' pruning. **Lorenzo Valtieri** responded that there were thoughts about using cutting and pruning of the vineyards as well as the leaves of the grapes. However, the key issue remained to collect such huge amounts of matter in a very short period, as it should be collected immediately after the picking up of grapes. Therefore, the logistics are very complex; in consequence the current costs are as well too high. With regards to the above, a solution could be to create some small mobile plant that can go on field and work with these biomasses.

Prior to concluding the Q&As' session, **Mr. Marco Rupp** provided participants with the e-mail address of the EP Intergroup Secretariat, in case their questions were not addressed due to time constraint.

Take-away messages and conclusions

MEP Franc Bogovič

Summing up the event's discussion, **MEP Franc Bogovič** underlined that the main take-away message was that circular bioeconomy is not a new development, as it is constantly renewing itself, welcoming new initiatives and innovations. Circular bioeconomy will provide solutions to the European Green Deal and Green Recovery from COVID-19 crisis, as well as the climate crisis. At the same time, we must cooperate and find good solutions for the Green Recovery Plan. **MEP Franc Bogovič** concluded by affirming the essentiality of bioeconomy for rural areas and farmers, while they remain at the heart of bioeconomy, as demonstrated also during the webinar.