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The bioeconomy will contribute to addressing the challenges of climate change

The physical basis of climate change was the focus of the recent contribution from Working Group 1 to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IIPCC, 2021). Alarming information was presented concerning the current state of the climate, the human influences affecting climate and the potential deleterious impacts on life in the biosphere. The report notes that carbon dioxide levels in the atmosphere exceed levels at any point over the past 2 million years, global surface temperatures have increased by over 1.1 ˚C (compared to the period 1850-1900), and global sea levels have risen by more than 200 mm (since 1901). Extremes of heat and heavy precipitation events are more frequent. Extreme weather events and the risk of compound extreme events have also increased. The scale of the changes in the climate system that have already occurred are unprecedented in recent human history (IIPCC, 2021).

The IPCC report also identifies that climate impacts will increase with increasing global warming driven by increased concentrations of carbon dioxide in the atmosphere. Conversely, and encouragingly, however, we can limit future temperature increases by limiting increases in global carbon dioxide concentrations and stabilise future impacts by achieving net zero carbon emissions (IIPCC, 2021).

Climate change has many pervasive effects that severely endanger agriculture, forests, and fisheries, and consequently endanger food security in many areas of our planet and threatens the geobiological preconditions for healthy life in earth. This is most acute in those areas where a combination of high population and historical agricultural practices have placed ecosystems under stress. These circumstances will lead to large areas of our planet becoming uninhabitable provoking displacements of large human populations.

The bioeconomy has a central role to play in creating an environmentally, socially, economically sustainable and healthy future. Renewable carbon from biological resources will play a critical role in sustainably producing food, materials and energy. The bioeconomy will be central to successful mitigation and adaptation efforts. Through growing a bioeconomy founded on science, knowledge and innovation, we can transform the existing fossil-derived economy based on the sustainable use of renewable materials and biomass to produce the products we need for society while respecting the ecological limits of our planet. So far with the existing offer of biobased solutions.

However, consumers are increasingly demanding bio-based, sustainable products, and the bioeconomy will directly contribute to the development of new value chains for products and processes across many sectors. But we cannot simply replace fossil-based resources in our current linear (take, make and dispose) economy with bio-based resources. The future sustainability of the world economy depends on also reducing our gross demand for raw materials, and rebalancing consumption through reducing, reusing and recycling materials. World consumption of raw materials is predicted to double by 2060 (OECD, 2019). A sustainable and circular bioeconomy protects natural capital, biodiversity losses and rebuilds degraded ecosystems.

The bioeconomy will also contribute to global development and advance the UN Sustainable Development Goals through creation of jobs and new manufacturing processes, benefiting rural economies. Globally, the circular economy is predicted to be worth $4.5T by 2030 (Lacy et al., 2016). In 2017, EU businesses engaged in the bioeconomy contributed €2.4T in turnover and supported 18.5M jobs (European Bioeconomy in Figures 2008–2017, 2020). Developing a vibrant bioeconomy will impact positively on all sectors with society benefiting from an improved environment, more jobs, and a stronger economy

The UN Climate Change Conference of the Parties (COP) 26 being held in Glasgow in late 2021 will be a critical opportunity for the global community to come together to achieve real progress in limiting future global warming. It is essential that more ambitious targets are set by all countries to enable the greatest chance of meeting the goals to secure global net zero by mid-century and keep warming of 1.5 ˚C in reach (https://ukcop26.org/, accessed 8/10/21).

Given its importance in helping to achieve climate targets, it is critical that the bioeconomy receive greater recognition and a more prominent role in the climate action plans of individual states. There is as yet no appropriate international global bioeconomy forum, neither on scientific, economic nor political grounds, which could serve as a contributor to the IPCC or a partner to the COP. If the considerable potential of the bioeconomy is to have impact in combating climate change within the COP process, there is an urgent need for greater integration of bioeconomy within these processes.

The EFB Bioeconomy Journal has been established to advance our knowledge and understanding of bioeconomy by publishing high quality peer-reviewed research from all disciplines and all regions of the globe. While the bioeconomy is founded in innovative science and technology, we are aware that a flourishing bioeconomy would only be realised through public and private initiatives at regional, national and global levels. It is here that learned journals such as the EFB Bioeconomy Journal can make an impact by advancing our understanding of biobased technologies and the significant impact they can have on environmental sustainability and the future economy.

We, members of the Editorial Board of the EFB Bioeconomy Journal, are convinced that the bioeconomy can and must play a signifi-

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cant role in contributing to global efforts in climate change mitigation and adaptation. We invite all bioeconomy stakeholders to join their efforts in this endeavour and call urgently on all delegates at COP26 in Glasgow to pay more and appropriate attention to the potential of the global bioeconomy to advance progress toward the UN Sustainable Development Goals and climate action to limit global warming and climate change.

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