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Whose European Bioeconomy? The Orientation of EU Bioecon- omy Policy Following its Update

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Whose European Bioeconomy? The Orientation of EU Bioeconomy Policy Following its Update

Abstract

In recent years, the EU has established its own bioeconomy policy. An important step in this process has been the development of a bioeconomy strategy, which was launched in 2012. In this strategy, the EU-Commission formulated guiding principles for the bioeconomy in Europe, with major emphasis on research and innovation. In the course of 2017 a review of the strategy was launched, leading to the publication of an updated document in October 2018. The review-process entailed the possibility to reassess the overall direction in this policy field. Political actors from different sectors of society and with diverging views on the bioeconomy have taken part in these developments. They brought their positions into the review of the strategy. However, the range of positions has not led to a fundamental debate on the aims and the substance of the strategy. As a result, the bioeconomy policy remains unchanged in terms of its orientation. In this paper, these findings are explained based on the in-sights of neo-Gramscian international political economy (IPE) about the character of European integration. Involved political actors, the role of hegemonic narratives and ideas, as well as the relations of forces in European society are taken into account.

Biographical Note

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Keywords: Bioeconomy, biotechnology, EU, Europe, hegemony, participation, relations of forces, research policy, strategy, technology and innovation

Malte Lühmann

Wessen Bioökonomie für Europa? Die Ausrichtung der EU-Bioökonomiepolitik nach ihrer Aktualisierung

Abstract

In den vergangenen Jahren hat die EU eine eigene Bioökonomiepolitik etabliert. Ein zentraler Schritt dabei war die Erarbeitung einer Bioökonomiestrategie, die im Jahr 2012 veröffentlicht wurde. Darin formulierte die EU-Kommission Leitlinien für die Bioökonomie in Europa mit dem Schwerpunkt auf Forschung und Innovation. Im Laufe des Jahres 2017 begann eine Überarbeitung der Strategie, die zur Veröffentlichung eines aktualisierten Papiers im Oktober 2018 führte. Der damit verbundene Review-Prozess beinhaltete die Möglichkeit einer Neubestimmung der Ausrichtung in diesem Politikfeld. An der Entwicklung einer europäischen Bioökonomiepolitik haben sich politische Akteur*innen aus verschiedenen Gesellschaftsbereichen mit teils sehr unterschiedlichen Positionen beteiligt. Ihre Positionierungen sind auch in den Review-Prozess der Bioökonomiestrategie eingegangen. Die Breite der eingebrachten Positionen hat allerdings nicht zu einer grundlegenden Debatte über Ziele und Inhalte der Strategie geführt. Im Ergebnis blieb die Ausrichtung der bisherigen Bioökonomiepolitik im Wesentlichen unverändert. Dieser Befund wird im vorliegenden Papier erklärt. Als Ausgangspunkt dienen dabei Erkenntnisse der neogramscianischen Internationalen Politischen Ökonomie (IPÖ) zum Charakter der europäischen Integration. Die beteiligten politischen Akteur*innen, hegemoniale Narrative und Ideen, sowie soziale Kräfteverhältnisse in der EU spielen darin eine Schlüsselrolle.

Kurzbiographie

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Schlagnworte: Bioökonomie, Biotechnologie, EU, Europa, Forschungspolitik, Hegemonie, Partizipation, soziale Kräfteverhältnisse, Strategie, Technologie und Innovation

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1 Introduction: The formation of an emerging policy field

'The basic thing is: The bioeconomy is inevitable. What kind of bioeconomies we are developing is the question.' - John Bell, Director for Bioeconomy DG RTD European Commission, 7.11.2017

Since 2012, the European Commission's bioeconomy strategy has been an official part of EU policy. Given the multi-year lead-up to the formulation of the European Commission's first strategy paper and the activities that have followed, it is now possible to speak of an established bioeconomy policy in the EU. Key elements of this policy include support for research and development through the EU Framework Programmes for Research and Innovation (FP7 and Horizon 2020), and the establishment of institutions and bodies for discussing and funding bioeconomy in Europe such as the Bioeconomy Knowledge Center and the Bioeconomy Stakeholders Panel. 2017 saw the initiation of a review process to evaluate the measures that have been undertaken thus far and develop an updated strategy. This process entailed the possibility that the course of EU bioeconomy policy would be reassessed. At its conclusion in the fall of 2018, the European Commission presented an updated bioeconomy strategy which outlined the direction to be taken in this policy field for the foreseeable future.

The European Commission's prior strategy paper, 'Innovating for Sustainable Growth – A Bioeconomy for Europe' (2012), marked the first time a political line on bioeconomy had been defined. It argued for an all-in-one approach for addressing various social challenges from food security, to resource scarcity, to climate change and fossil fuel dependency (cf. European Commission 2012: 9). As its title suggests, its strategy aimed to tackle these challenges primarily by promoting growth in the knowledge economy by subsidising a broadly defined bioeconomy sector. Included in this sector by the Commission were agriculture, farming, fishing, the production of food, cellulose and paper and segments of the chemicals, biotechnology and energy industries (cf. *ibid.*: 9). Essentially, with bioeconomy as a catch-all term, the EU's bioeconomy strategy was designed to use existing regulations, initiatives and funding programmes such as the Renewable Energy Directive, the Common Agricultural Policy and the Framework Programmes to promote innovative growth. This paper will present and analyse the decisions regarding the direction of future policy contained in the updated EU bioeconomy strategy from 2018. This will be done with reference to the constellation of political actors involved and the broader politico-economic context.

The emergence of an EU bioeconomy policy has been accompanied by a small number of interested actors, some of whom are closely linked to the leading Directorates-General of the European Commission. Foremost among these are the governments of EU member states whose own interests stand to benefit. Here, the Netherlands, Finland and Germany are leading the way, but Italy, France and the United Kingdom (whose

government will likely exercise only an external influence on EU bioeconomy policy following Brexit) have also been involved (cf. Patermann/Aguilar 2018: 23). From the beginning, the concept of bioeconomy has also been shaped in part by various European industrial associations including CEPI (the association for the paper industry), EuropaBio (the association of the biotechnology branch) and EUBA (European Bioeconomy Alliance). In particular, civil society groups and NGOs such as FIAN have voiced criticisms in the debate on bioenergy and the use of biomass for agricultural fuels (cf. Huebner 2014: 52ff.). Ultimately, a series of public, semi-public and private research institutions have been involved in creating bioeconomy policy principally focused on innovation and knowledge-based progress. Moreover, the formation of a specific constellation of actors around the EU's bioeconomy strategy was actively promoted by the European Commission, particularly through consultations and the creation of relevant fora during certain Council presidencies (cf. European Commission 2012: 18f.).

Within this field of action, participants have been engaged in a struggle around the future direction of EU bioeconomy policy. In this context, the question posed by John Bell and cited at the beginning of this paper, i.e., the question of what kind of bioeconomy will be developed in the EU, must be reformulated. Given the divergent interests and critical positions with respect to the previous EU bioeconomy policy, what is really at stake is by whom and under what conditions the planned transformation of the European economy can be taken in a sustainable, bio-based direction. Accordingly, the question is not so much which bioeconomy will emerge, but rather whose bioeconomy will win out. What thus needs to be worked out is which actors will be able to influence of the European Commission's bioeconomy strategy and why. In order to help answer this question, the political process in which the strategy was evaluated and revised will be examined from the perspective of critical political economy. Decisions regarding the direction of the EU's bioeconomy policy will be analysed with respect to the prevailing power relations and context-specific politico-economic conditions.

The rest of this paper is divided into five sections. The first section will outline a theoretical perspective that will serve as a basis for analysing EU bioeconomy policy. The second section will then present the European Commission's bioeconomy strategy thus far and the resulting EU-wide activities relating to bioeconomy policy. The third section will focus on the positions of the various actors who have participated in the review process. In the fourth section, this process will be reconstructed on the basis of three central papers and the final form of the EU's reworked strategy examined. In the fifth section, this result will be related back to the previously developed theoretical perspective as the positions of various actors are analysed. Finally, conclusions will be formulated with regards to the question formulated above.

2 Explaining decisions regarding the direction of the EU's bioeconomy policy

The term 'bioeconomy' has been used in various contexts and at various times to designate a number of different economic activities, perspectives on economic transformation and visions of future economic systems. For example, the bioeconomy strategy of the EU is substantively different from that of the United States, even though both the EU and the US papers on bioeconomy strategy use the same term (cf. Backhouse et al. 2017: 20f.). While the strategy of the EU up until now has broadly pertained to the use of biogenic raw materials in different economic sectors, that of the US is tailored more narrowly around subsidising biotechnologies. Due to the broadness (or vagueness) of the term 'bioeconomy', the existence of a bioeconomy strategy alone reveals little about the objectives of the political actors involved. Instead, it makes sense to understand the development of bioeconomy policy not least as a kind of definitional work that is itself responsible for bringing bioeconomy into existence as a distinct political and social field.

Moreover, among the peculiarities of the political field of bioeconomy is the fact that it is conceptualised as transformative and future-oriented, even while it is referred to as being composed of already existing bio-based economic sectors (cf. Besi/McCormick 2015: 10462). For example, in its reports on the topic, the European Commission's Joint Research Centre (JRC) estimates that the bioeconomy of the 28 EU member states had a revenue of 2.2 billion euro and employed 18.6 million workers in the year 2014, thus valuing it at 9 percent of the entire EU economy (cf. Lusser et al. 2017: 6).

Therefore, the political process in which bioeconomy emerged and developed in Europe has a relevant economic dimension in addition to a discursive one – what is at stake is not only the defining and shaping of the concept of bioeconomy in the European context, but also the prospects for development and growth of the implicated sectors. Both aspects can be integrated in an analysis of European bioeconomy policy through the lens of neo-Gramscian international political economy (IPE). Founded in political economy, this approach has been well-established for years in critical research on European integration (cf. Bohle 2013). Neo-Gramscian analysis is based upon locating political processes and actors within the context of social power relations, a context in which social forces stand in confrontation with each other due to the process of social production (cf. Apeldoorn 2002: 45; cf. Gill 2000: 28). Taking these forces into account alongside the predominant ideas and world views within a society, as well as its institutions and state apparatuses, a picture of a field of action emerges upon which political actors must navigate (cf. Cox 1998: 43ff.). At the same time, neo-Gramscian IPE emphasises that this field of action must perpetually be reproduced through the actions of the actors, meaning that it is in principle open for change.

Building upon these basic assumptions, neo-Gramscian IPE mainly focuses on the alliances among dominant social forces that exert control in society as a 'hegemonic bloc' (cf. Bieling/Steinhilber 2000: 104ff.). Following Antonio Gramsci's concept of hegemony, control and dominance are founded not simply upon an excess of material power and control of the state's apparatuses of coercion, but also upon the ability of social

forces in civil society and in the state to universalise their own interests in the form of general ideas and world views, to form alliances and to anchor these in the institutions and apparatuses of the state (cf. Overbeek 2000: 167). Thus, neo-Gramscian IPE allows the analysis of social power relations to be connected to the study of discursive narratives that are significant within the struggle for hegemony.

Regarding the bioeconomy policy of the EU, the positions ultimately anchored in its strategy can be used to clarify which political actors and coalitions exercise control in this field. In addition to the concrete demands which have been achieved, of particular significance here are the ideas and narratives used to justify a particular bioeconomy orientation. These can be compared with the positions and world views articulated by the actors involved in the struggle around bioeconomy strategy. The success of particular political actors in shaping bioeconomy policy can in turn be clarified in view of both the prevailing power relations in this field and of the hegemonic bloc on the EU level. Also relevant is the question of the relationship these actors and their conceptions of bioeconomy have to hegemonic ideas and world views predominant in the broader EU.

In terms of methodology, these questions will be pursued on the basis of a qualitative content analysis of select documents. In the process, both the substantive points of the review process and the significance given to bioeconomy by various actors will be presented in detail. This will be supplemented by the results of background interviews conducted in February 2017 with representatives of organisations involved in the review process. Included in the documents analysed are position papers of select political actors who made statements during the revision of the EU's bioeconomy strategy. The review process itself will be reconstructed on the basis of the contents of the updated strategy and three further central documents by the European Commission and its designated committees.

3 The strategic promotion of bioeconomy in the EU

Currently, EU bioeconomy policy is founded on the strategy adopted in 2012. This strategy contains both an all-in-one vision for bioeconomy in Europe as well as a plan of action complete with concrete measures to be implemented. It is the result of a long process of development going back to efforts to promote biotechnology research in the 1980s. Only in the 2000s was the strategy expanded to include other sectors of the economy under the auspices of the term 'bioeconomy' (cf. Meyer 2017: 4f.). In accordance with this expansion, the EU's bioeconomy strategy addresses wide-ranging social problems and concerns including climate change, food security and promoting employment and competitiveness (cf. European Commission 2012: 9ff.).

In spite of its scope, the strategy generally lacks an interdisciplinary character. Rather, it is managed solely by the Directorate-General for Research and Innovation (DG RTD). Here, the bioeconomy subdivision is responsible among other things for implementing

the strategy's plan of action. This plan contains 54 concrete measures across three topic areas: 1) investment in research, innovation and training; 2) improved policy interaction and stakeholder involvement; 3) subsidising markets and competitiveness in the bioeconomy (cf. *ibid.*: 42:ff). Recent years have seen the enactment of a number of these measures. On the basis of the plan of action's three areas of focus, it is possible to both reconstruct what happened between 2012 and the beginning of the EU's review of its bioeconomy strategy in 2017, and to depict the conditions under which a potential reorientation of the strategy five years after its adoption was possible.

In the first area, investment in research, the primary focus aside from subsidising local and regional bioeconomy clusters was incorporating bioeconomy in EU Framework Programmes: the seventh Framework Programme for Research and Technological Development (FP7), which ran from 2007–2013, and the Programme Horizon 2020, which runs from 2014–2020. While 1.9 billion euro were mobilised in the context of FP7 for projects pertaining to bioeconomy, this figure has gone up to 4.52 billion in the currently running Horizon 2020 (cf. European Commission 2017: 11). This money has been used to fund several thousand research projects in all areas of bioeconomy, projects ranging from new methods of plant breeding to the development of indicators for measuring reductions in CO₂ emissions resulting from bio-based production processes. Important instruments for subsidising research not only pertaining to bioeconomy are the so-called European Technology Platforms (ETP) (Interview CEO 13.02.2018). Currently, there are 38 ETPs in the EU. Formed on the initiative of the European Commission, ETPs are fora that exist to make it easier for businesses and other actors to become involved in specific research fields and to push for projects within the Framework Programmes (cf. European Commission 2013: 2ff.). In the official area of bioeconomy alone, there are seven ETPs. ETPs also deal with issues relating to biofuels (cf. ETP Biofuels) and to designing sustainable heating and cooling systems (cf. ETP RHC) – issues that can be viewed as being part of bioeconomy.

With regards to the second area, improving policy interaction and stakeholder involvement, the European Commission has made efforts since 2012 to create broad political structures within bioeconomy. First, on the European level, the Commission founded the 'European Bioeconomy Panel' in 2013, a sort of civic advisory board whose purpose was to submit suggestions for shaping bioeconomy to the Commission. After this committee was relaunched in 2016 in a slightly modified form under the title 'EU Bioeconomy Stakeholders Panel', its members produced a joint position paper. This paper was supposed to be incorporated into the revised strategy (see below). In addition to the work of the panels, interested actors were involved in events such as the fourth Bioeconomy Stakeholders Conference held in Utrecht in 2016 (cf. European Commission 2017: 58). Under the auspices of the DG RTD, the Commission established the Bioeconomy Observatory, a central organ intended to provide a solid basis of information for European bioeconomy policy and to help keep interested members of the public informed.

The DG RTD promoted the development of bioeconomy policy on the national and international level as well. On the national level, it supported setting up context-specific strategies in EU member states. Since 2012, the governments of Germany, Finland, France, Ireland, and Italy among others have enacted comprehensive bioeconomy strategies (cf. Bioökonomierat 2018: 72ff.). Even though the extent of the European Commission's influence on the formulation of national bioeconomy strategies cannot currently be determined, the existence of a European bioeconomy strategy, along with the work which has gone into promoting bioeconomy in the EU, must be viewed as significant here. Finally, the European Commission only recently intensified its efforts to promote bioeconomy on the international level as well. Included in these efforts was the Commission-led founding of the International Bioeconomy Forum, a forum in which a series of national governments active in the field of bioeconomy are represented alongside the EU itself (cf. European Commission 2017: 63).

The third and final topic area of the action plan, subsidising markets and competitiveness in bioeconomy, encompasses measures intended more or less to directly subsidise businesses and their investments in bioeconomy sectors as well as the creation of a market for new bioeconomy products. A central element of this is the Bio-Based Industries Joint Undertaking (BBI JU), which was founded in 2014 (Interview BIC 14.02.2018). The BBI JU is a public-private partnership (PPP) for subsidising innovation in bioeconomy. It is being funded with 975 million euro from the budget of Horizon 2020 and with 2.7 billion euro from a group of companies known as the Bio-Based Industries Consortium (BIC). Within the framework of the BBI JU, 82 projects submitted in response to four calls for proposals have been subsidised until the end of 2018 (cf. Mengal 2018: 15). The main focus of these calls for proposals was research into innovative products and materials, the business models relevant for them and the implementation of these business models through so-called 'flagship initiatives'. Serving an important role in both the BBI JU and in bioeconomy strategy more broadly as a concrete example of implementing bioeconomy are high duty plants called biorefineries. Such plants – which, in addition to using biomass (such as wood) to create traditional products (such as lumber and paper), produce bioenergy, new kinds of textile fibres and base products for the chemicals industry while also recovering waste and byproducts – are currently being developed with the support of the EU in Finland (MetsäFibre, Äänekoski)¹ and Italy (Matrica S.p.A., Sardinien)², among other places.

As this overview shows, the bioeconomy policy of the EU has unfolded on multiple levels since 2012. At the same time, it was shaped by a focus on technical, product-based research and innovation. Overall, it can be observed that the European Commission created concrete structures for the implementation of bioeconomy, and that bioeconomy was thereby established as a relevant subfield of European research policy. Accordingly, other policy initiatives within the EU are now also making reference

¹ Cf. <https://www.metsafibre.com/en/about-us/Bioprodukt-mill/Pages/default.aspx> (last accessed 19.12.2018)

² Cf. <http://www.matrica.it/default.asp?ver=en> (last accessed 19.12.2018)

to bioeconomy. With initiatives such as the circular economy package and the new waste directive, the regulative milieu of bioeconomy has in turn developed in key respects (cf. Bourguignon 2017: 5). From 2017 onward, the European Commission considered updating the strategy to be necessary not only to reflect the latest advances in bioeconomy, but also to take into account such developments in adjacent policy fields (cf. European Commission 2017: 7).

4 Positions of select actors

The political process in which the EU's bioeconomy strategy was revised took place in a field of action which was consolidated during the years in which the strategy emerged. Through consultations, international conferences, the participation of groups of experts and other forms of interaction in bioeconomy policy, various actors were involved time and again. The circle of participating actors includes organisations, institutions and associations which can be assigned to the following groups: primary producers, industry, science, public administration and civil society. Actors from these groups made statements during the process of elaborating an updated bioeconomy policy and contributed their positions within the framework of the normal consultation procedures.³ Also involved in the field of action of bioeconomy are the state apparatuses of the EU itself which play an active role with regards to bioeconomy policy. This includes especially the DG RTD but also other Directorates-General as well as members of the European Parliament organised in the Bioeconomy Working Group, which is located within the Climate Change, Biodiversity and Sustainable Development Inter-group.⁴

The formulation of an updated EU bioeconomy strategy offers the opportunity to examine which political actors in this milieu are in a position to gain a hearing for their suggestions and positions and substantively shape bioeconomy together with the state apparatuses mentioned above. Additionally, several of the in some respects quite different positions of the actors involved will be compared with the result of the review process. Here, paradigmatic positions from the following groups of actors will be selected and portrayed: the agricultural association Copa-Cogeca for the primary producers, the industry association EuropaBio for industry, the NGO Fern for civil society, the communal development promotional association Region Värmland for public administration and the University of Hohenheim for academia.

³ Cf. https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-975361_en (last accessed 19.12.2018)

⁴ Cf. <http://ebcd.org/intergroup/structure/bioeconomy> (last accessed 19.12.2018)

4.1 Copa-Cogeca

Together, the sister associations Copa (Comité des organisations professionnelles agricoles) and Cogeca (Comité général de la coopération agricole de l'Union européenne) form the largest European association of farmers' organisations and agricultural cooperatives.⁵ Within the European Union, they represent the majority position of primary producers within agriculture. During the consultation process for revising EU bioeconomy strategy, the two associations put out brief, identical-sounding statements (cf. Copa 2018) and a substantively similar paper which was composed in cooperation with European forestry associations (CEPF, ELO, USSE) (Copa-Cogeca et al. 2018).

In their statements, the agricultural associations call for the priorities of European bioeconomy policy to be expanded beyond their previous focus on research and innovation (cf. *ibid.*: 1). Particularly important for Copa-Cogeca and its allies is the production of sustainable biomass within the EU, which they view as the 'backbone' of bioeconomy value chains. Thus, they demand that primary producers be more closely involved in the decision-making processes behind 1) promoting the mobilisation of additional biomass and 2) stimulating demand for bio-based products and raw materials especially in the energy sector, but also in the packaging, auto and textile industries. In order to achieve this, they argue for the creation of incentives such as preferential treatment of bio-based products in public procurement, and for tax breaks (cf. *ibid.*: 3). Furthermore, Copa-Cogeca advocate for a market-oriented approach – in particular, they reject as overly regulatory the cascading use principle often cited in the bioeconomy debate (cf. Copa 2018).⁶ Also of central importance to the associations is improving the integration of bioeconomy strategy with the EU's Common Agricultural Policy as well as with other policy fields such as EU regional policy, cohesion policy and forestry policy.

Overall, bioeconomy is seen by Copa-Cogeca as a tool for using new ways of producing and processing biomass to solve structural problems in rural areas. These problems range from the modernisation of agriculture, to the creation of jobs, to generational change in agricultural enterprises (cf. Copa-Cogeca et al. 2018: 2). Therefore, in the view of Copa-Cogeca, EU bioeconomy strategy after its revision should move past its focus on promoting research and innovation, and become at its core a modernising policy for rural areas and the agricultural enterprises located in them.

⁵ Cf. <https://copa-cogeca.eu> (last accessed 19.12.2018)

⁶ The cascading use principle is not uniformly defined in the European debate (cf. Essel/Reichenbach 2016: 4ff.). The German Environment Agency recommends the following comprehensive definition: "A strategy for using raw materials and the products manufactured from them in consecutive steps as frequently, as efficiently and for as long a time as possible, only recovering the material at the end of the product's life cycle. This involves so-called usage cascades, which flow from higher levels of added value to lower ones. By doing this, the productivity of raw materials is increased." (Kosmol et al. 2012: 10. Tr. A. Baltner).

4.2 EuropaBio

The industrial association EuropaBio represents the interests of the European biotechnology industry in Brussels. Its members include both national industrial associations as well as companies such as Bayer and BASF.⁷ In light of both the EU bioeconomy's prior focus on biotechnology research, as well as of bioeconomy's historical roots in this area (see below), the industrial association of the biotechnology industry can be viewed as a particularly relevant actor here. As another active participant in the consultation process around the EU's bioeconomy strategy, EuropaBio also released its own statement (EuropaBio 2018).

In this statement, EuropaBio puts forth concrete measures in five areas for the purpose of updating the strategy (cf. *ibid.*). First, it calls for the creation of a transparent framework of political priorities and incentives that would remain in place for an extended period of time. The purpose of this framework would be to ensure the coherence of bioeconomy policy and its coordination with other policy fields as well as with the policymakers and participants within them. As a related initiative, EuropaBio recommends a common EU strategy for pursuing the Sustainable Development Goals (SDGs) which would be related to bioeconomy strategy.

Along with Copa-Cogeca, EuropaBio also advocates for expanding the production and possible applications for the base materials of bioeconomy. Included here is the demand that bioeconomy should play a role in the modernisation of the EU's Common Agricultural Policy where it would help promote the 'smart and sustainable use of biomass' (cf. *ibid.*). This formulation parallels that of Copa-Cogeca insofar as both represent alternatives to a mandatory commitment to cascading use, which, in the view of the EuropaBio members, cannot do justice to the diversity of possible applications for biomass (cf. Interview EuropaBio 16.02.2018). Yet as an association of companies involved in the processing of biomass, the focus of EuropaBio's statement differs somewhat from that of the agricultural associations. For example, it emphasises the securing of fair prices for the base materials of bioeconomy as well as the necessity of maintaining a balanced dialogue on the use of land and biomass among all parties involved (cf. *ibid.*).

The statement's third area of focus is the maintenance of a well-trained bioeconomy labour force, for which it suggests measures such as targeted course offerings. Also suggested here are subsidies for local and regional business clusters in order to promote bioeconomy and create a specialised labour reserve.

EuropaBio's fourth area of focus is increasing subsidies and improving funding mechanisms. To these ends, three concrete measures are named: mobilising research funds in the upcoming ninth EU Framework Programme, continuing to finance the European joint venture for bioeconomy in the form of a BBI JU 2.0 (Bio-based Industries Joint

⁷ Cf. <https://www.europabio.org/about-us/members> (last accessed 19.12.2018)

Undertaking 2.0) and introducing a strategic investment fund for bioeconomy (European Bioeconomy Strategic Investment Fund, EBSIF). However, specific figures regarding the amount of support expected by the association are not given. Somewhat less concretely, the creation of subsidies and tax breaks to incentivise bioeconomy are also called for.

Fifth, EuropaBio joins Copa-Cogeca in arguing that the introduction of bio-based products to the market must be promoted. Among other ways, this is to be done by raising awareness among consumers of the role of bioeconomy in achieving the SDGs. Further suggestions include giving preferential treatment to bio-based products in public procurement, developing and advertising standards for these products and higher taxes for fossil-based materials and products.

All in all, EuropaBio does not fundamentally critique prior bioeconomy policy and its orientation. Rather, its demands tend in the direction of continuity with previous forms of research promotion combined with intensified efforts to introduce products developed within this paradigm to the market and to provide companies producing in the bioeconomy with base materials. Thus, in the view of EuropaBio, bioeconomy policy should continue to be conducted as research-based industrial policy. This position is argued for and legitimated particularly with reference to bioeconomy's contribution to fulfilling the SDGs.

4.3 Fern

The non-governmental organisation Fern advocates on the European level for the protection of forests and their residents.⁸ Due to the connections between forestry, bioenergy and bioeconomy, the NGO became active in the bioeconomy debate several years ago and has since navigated this field in coordination with other organisations (Interview Fern 15.02.2018). Fern also introduced positions for consultation into the review process via a statement (Fern 2018) among other ways.

In its statement, Fern adopts a reserved tone regarding EU bioeconomy policy, pointing out that land and biomass are fundamentally limited resources and that bioeconomy cannot necessarily be seen as an ecological alternative to the current way of doing business (cf. *ibid.*). The development of bioeconomy is faced by the same major challenges such as global population growth, the negative effects of climate change on ecosystems, the loss of biodiversity and the dwindling of fertile cropland and deforestation, and does not necessarily contribute to solving them. Accordingly, the statement urges caution be taken in a number of ways as bioeconomy develops. First, it must be recognised that European forests currently absorb more CO₂ than they release. However, the intensified use of wood biomass in the bioeconomy would mean reducing their function as carbon sinks. Bioenergy from wood is therefore not carbon

⁸ Cf. <https://fern.org/about-us> (last accessed 19.12.2018)

neutral. In order to fight climate change, it is necessary to implement forms of forest management in which less instead of more wood is harvested.

Fern demands a carefully controlled and regulated approach to bioeconomy to ensure that it does not counterproductively affect environmental goals: 'The EU Bioeconomy Strategy must recognize that something "bio" is not necessarily good for the environment.' (Fern 2018). Hence, the organisation concludes that the replacement of non-renewable raw materials with biological ones should not be the central goal of bioeconomy strategy. Instead, policy should be directed towards keeping total raw material consumption within the planetary boundaries and towards producing in line with the 'less is more' principle. Promotion of research under the framework of EU bioeconomy policy should be organised accordingly.

Furthermore, Fern presents a series of concrete demands. These include the reduction of incentives for using primary raw materials and the prioritisation of long-term material use of biomass over the use of biomass for energy. This corresponds with the approach of cascading use for biomass. Fern demands additional safeguards to ensure that the promotion of bioeconomy by the EU and its member states does not result in environmental damage. Accordingly, investments in bioeconomy should be made with more prudence to prevent them leading to intensified logging among other things. On the other hand, the organisation demands more funds from the EU to protect and recover intact ecosystems within and beyond the EU and to better implement European environmental laws and biodiversity strategy.

Overall, significant differences can be identified between the position of Fern and the positions portrayed previously. Instead of formulating a strategy for growing the bioeconomy in one direction or another, Fern emphasises risks and contradictions. In doing so, it questions the narrative that bioeconomy growth should necessarily be supported in light of major social challenges such as climate change. For the revision of EU bioeconomy strategy, Fern thus suggests a re-evaluation of bioeconomy that would entail a reduction and strong regulation of raw materials use from all sources while highly prioritising environmental and particularly forest ecosystem protection.

4.4 Region Värmland

'Region Värmland' is an organisation composed of the sixteen municipalities in the province of Värmland in central Sweden. Its goal is to promote economic development in the region. Similarly to Fern albeit from a different perspective, Region Värmland deals with the issue of forestry in the context of its importance to EU bioeconomy. One of its projects is to establish a 'bioeconomy region' based on wood biomass.⁹ Beyond

⁹ Cf. <http://www.regionvarmland.se/utveckling-tillvaxt/bioekonomi/bioeconomy-region> (last accessed 19.12.2018)

the local level, Region Värmland represented the governments of its municipalities in shaping EU bioeconomy policy by releasing a statement during the consultation process (Region Värmland 2018).

In this statement, Region Värmland first welcomes the efforts to update EU bioeconomy strategy and emphasises the particular importance of the regional level in supporting and coordinating a bio-based economy (cf. *ibid.*: 1). Next, it formulates demands for the updated strategy. Some of these focus on regional issues, while others reference general topics pertaining to bioeconomy. Generally speaking, Region Värmland demands that European regions be supported in developing 'smart specialisation strategies' to promote bioeconomy in their specific contexts (cf. *ibid.*: 2f.).

According to Region Värmland, the local embedding of bioeconomy should be supported through EU subsidies and aid for the creation of regional strategies. Furthermore, inter-regional cooperation on bioeconomy should be promoted through a harmonised methodology for measuring bioeconomy sectors which would allow different regions to be compared with each other. Measures to increase investment in a competitive bioeconomy with corresponding global value chains and resource flows are explicitly welcomed (cf. *ibid.*: 4). It is argued that innovation should be supported through public investment and EU policy aimed at acquiring new bio-based products (cf. *ibid.*: 4f.).

Moreover, Region Värmland demands increased efforts to embed bioeconomy in Europe's higher and vocational education systems with the goal of providing labour power for the relevant sectors (cf. *ibid.*: 5). The conclusion of its statement emphasises the necessity of developing sustainable forestry in the context of bioeconomy, which would allow forests to yield more biomass while enhancing biodiversity and ecosystem services. Likewise, Region Värmland voices its opposition to a more strictly regulated application of cascade use in bioeconomy and in the forestry sector, arguing that only a flexible, market-based distribution of biomass for different applications can guarantee innovation and thus the continued development of bioeconomy in the future (cf. *ibid.*: 2).

In summary, it can be established that the demands of Region Värmland aim to expand activities to promote economic development in the bioeconomy. Moreover, the organisation is less focused on promoting research than on implementing innovations in companies and value chains starting at the local level. However, the demands are not connected with a critique of the prior orientation of EU bioeconomy policy. Region Värmland is less concerned with a change in course than with the expansion of a particular area of bioeconomy policy, something which does not necessarily require sidelining other emphases.

4.5 University of Hohenheim

As part of the German bioeconomy research community, the University of Hohenheim is represented in the German Bioeconomy Council.¹⁰ It coordinates the research network Bioeconomy Research Program Baden-Württemberg on the regional level¹¹ and is also involved in several EU-wide research projects.¹² The university defines bioeconomy as the main topic of its future research profile. As its inclusion in bodies such as the Bioeconomy Council illustrates, this has to do not only with its own research activities, but also with the formation of networks in the bioeconomy field. Accordingly, the University of Hohenheim also participated in the consultation process (University of Hohenheim 2018).

In its statement, the university adopts a fundamentally positive stance on EU bioeconomy strategy and its updating. According to this stance, the EU should continue to play a major role in bioeconomy policy and expand its leadership and coordinating function with respect to national and regional strategies (cf. *ibid.*: 1). However, the statement mentions several difficulties which must be addressed by EU bioeconomy policy in the future. Regarding the debate on biofuels, it argues that the ecological, social and ethical effects of bioeconomy policies should be evaluated prior to their adoption. Only then can negative consequences pertaining to the acceptance of bioeconomy be avoided, such as those which appeared in the case of biofuels. In this context, a distinct food resources strategy is called for as part of bioeconomy. At the same time, the university demands support for improving the integration of sustainable production of foodstuffs, biomaterials and bioenergy.

Concerning priorities in research promotion, the university urges an orientation around the specific capabilities of Europe in bioeconomy (cf. *ibid.*: 1). These are said to lie particularly in the area of biotechnology and in biorefineries. While the university calls for the increased prioritisation of these topics, it also foresees problems with public perception and acceptance that would need to be overcome. Relevant measures to inform and educate consumers would be necessary: 'To avoid that Bioeconomy becomes loaded with prejudices a timely Bioeconomy dissemination strategy is required.' (University of Hohenheim 2018: 1).

In contrast to its technological capacity, the EU's ability to supply its own bioeconomy with enough biomass is estimated to be insufficient. In the university's view, this necessitates a two-pronged strategy which both exhausts the available possibilities for increasing agriculture and forestry production in the EU through research and development, while also increasing cooperation with countries rich in biodiversity and bio-

¹⁰ Cf. <http://biooekonomierat.de/biooekonomierat/ratsmitglieder> (last accessed 19.12.2018)

¹¹ Cf. <https://biooekonomie-bw.uni-hohenheim.de> (last accessed 19.12.2018)

¹² Cf. https://biooekonomie.uni-hohenheim.de/beispiele#jfmulticontent_c263469-1 (last accessed 19.12.2018)

mass. This cooperation would be organised through mechanisms for ensuring sustainability, which would also involve further research topics such as ecosystem resilience (cf. *ibid.*: 1f.).

The University of Hohenheim's statement concludes with calls to promote sustainable consumer behaviour more intensely than had been done so before, and to support higher and vocational education in the area of bioeconomy. For its own part, the university has begun offering a master's degree in bioeconomy (cf. *ibid.*: 2).

In the view of the University of Hohenheim, prior EU bioeconomy policy should generally be continued and in some areas intensified. These areas include the subsidisation of research particularly on biotechnologies as well as the promotion of communication and education, which among other things is seen as means of increasing the awareness and acceptance of bioeconomy. Negative perceptions of bioeconomy in particular should be countered with educational measures and research on its ecological and social effects. This will help bioeconomy strategy to become deeply rooted in society as a research programme.

The positions represented here are held by a wide range of actors in various groups. Hence, they give an impression of the diversity of perspectives in the debate on the EU bioeconomy strategy's update. Differences and similarities can be recognised on various levels ranging from fundamental assessments of the bioeconomy policy, to priorities in the review process, to concrete demands. Some of the demands and positions can be directly attributed to actor self-interest, such as demands for more financial resources for one's own sphere of activity. Furthermore, it can be seen that the positions do not all have the same priorities regarding bioeconomy policy in general. Table 1 depicts these differences in orientation.

Table 1: Overview of positions represented

Political actor examined	Priorities for the updated strategy	Further direction for the strategy
Copa-Cogeca	Bioeconomy as modernisation policy for rural areas	<i>reorganisation</i>
EuropaBio	Bioeconomy as research-based EU industrial policy	<i>continuation</i>
Fern	Bioeconomy is problematic except as resource conservation policy taking into account planetary capacity and environmental protection	<i>reassessment</i>
Region Värmland	Bioeconomy as innovation-oriented economic development at the regional level	<i>expansion</i>
University of Hohenheim	Bioeconomy as socially-anchored research programme	<i>expansion</i>

Bound up with the different orientations of the actors are perspectives on the future of the EU strategy, represented here as 'reorganisation', 'continuation', 'expansion' and 'reassessment'. These perspectives reveal that some of the individual priorities appear compatible with each other while others tend to be mutually exclusive. This is where the basic structure of the compromise on the substantive configuration of bioeconomy may lie. In what follows, the extent to which individual positions were able to leave their mark on the review process will be explored.

5 Steps for revising EU bioeconomy strategy

Over the course of 2017, the review of EU bioeconomy strategy finally gained momentum as it worked towards the goal of developing suggestions to adapt said strategy during the following year (cf. European Commission 2018b: 3). For this purpose, eleven experts commissioned by the European Commission produced an evaluation of the strategy and the plan of action associated with it in the first half of 2017 (Newton et al. 2017). Taking this document into account, the European Commission subsequently produced its own retrospective of prior bioeconomy policy (European Commission 2017). Additionally, from the middle of 2016 onward, the newly formed Bioeconomy Stakeholders Panel began meeting so that a wide range of interested actors could produce further suggestions for revising the strategy. Several of the positions represented above proved influential here. The result of the meetings, the Bioeconomy Stakeholders Manifesto, was presented to the public in November 2017 (EU Bioeconomy Stakeholders Panel 2017).

All of these three papers reveal important elements of opinion formation in the European Commission regarding the orientation of an updated EU bioeconomy strategy. This strategy will in turn form the framework of future EU bioeconomy policy. The contents of the three papers together with the final strategy adopted provide information on the positions discussed and the thrust of future bioeconomy policy.

Table 2: The papers examined and their origins

Paper	Origin	Authors
Expert Group Review ^a	H2020 Commission expert group on the Review of the Bioeconomy strategy	11 individual experts, 6 from universities, 5 from private think tanks/consulting firms/research institutes; selected by DG RTD from the Commission's database of self-registered experts
EC Review	European Commission	DG RTD, Directorate F – Bioeconomy, Unit F.1 – Strategy
Bioeconomy Stakeholders Manifesto ^b	EU Bioeconomy Stakeholders Panel	28 organisations signed the paper, among which 25 were appointed by DG RTD in an open application process. Among the signatories were 2 primary producers, 5 universities and private researchers, 9 companies and industrial associations, 3 NGOs and trade unions; 9 state institutions and business clusters, 2 additional members of the panel did not sign the paper (Fern, Copa-Cogeca)
Updated Bioeconomy Strategy	European Commission	DG RTD, Division of Bioeconomy

a: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3479> (last accessed 19.12.2018);

b: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=2859> (last accessed 19.12.2018).

5.1 Expert Group Review

In the lead-up to its own review of EU bioeconomy strategy, the European Commission commissioned a group of eleven experts to produce an independent evaluation of progress in bioeconomy policy along with recommendations for how bioeconomy strategy should be shaped in the future.¹³ The group was composed of six people with backgrounds in university research and knowledge management as well as five participants from private think tanks, consulting firms and private research institutes. Meeting several times in the first half of 2017, they formulated a report based on the questions specified by the European Commission and in ongoing interaction with authorities from DG RTD.

¹³ Unless indicated otherwise, all information on the expert group is taken from the Commission's official register of expert groups: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3479> (last accessed 19.12.2018)

In this report, the expert group first deems EU bioeconomy strategy to be highly relevant and judges the implementation of the plan of action as generally satisfactory (cf. Newton et al. 2017: 4f.). In particular, the promotion and financing of research in this area are viewed as a success, as is the interaction between relative state apparatuses on the EU level and the involvement of additional actors from the policy field. The successful implementation of the Bio-Based Industries Joint Undertaking is highlighted especially: 'The setting-up of the public-private partnership BBI JU is one of the most successful actions implemented. The BBI JU is a world leader in upscaling bio-based demonstration projects.' (Newton et al. 2017: 5).

The experts see a further strength of the strategy and plan of action in bioeconomy's overarching perspective, which stimulates collaboration between actors in various ways: between several Directorates-General of the European Commission (DG RTD, GD AGRI, GD GROW, GD ENVI), between policy levels in the EU all the way down to the municipal level and between different economic sectors (cf. *ibid.*: 22f.). Ultimately, through bioeconomy, new sustainable and resource-efficient approaches such as linking primary production with ecosystem services were promoted, while the competitiveness and technological leadership of European bioeconomy industries was strengthened.

In addition to the successes, the experts also point to weaknesses in the prior bioeconomy strategy. Their criticism centres on the unclear relationship between the overarching vision of bioeconomy and the implementation of concrete measures in the plan of action (cf. *ibid.*: 23f.). The group takes issue with the strategy's lack of an explicit and discrete definition of bioeconomy. Furthermore, it sees the strategy as lacking a clear objective and a corresponding approach towards intervention regarding policy measures in the sector. On this point, it also complains that there are too few indicators for evaluating and assessing advances in bioeconomy policy. While collaboration among different actors is praised in other parts of the paper, here the experts note that the involvement of various Directorates-General has taken place quite unevenly, with some DGs hardly being involved at all and most of the measures implemented coming from the DG RTD. Finally, it is claimed that the investments in upscaling newer processes are insufficient for the mass market.

Based on the evaluation, the expert group proposes an update to EU bioeconomy strategy that would first aim at its optimisation and second at its improved implementation (cf. *ibid.*: 41ff.). With the catchword optimisation, it is suggested that the bioeconomy strategy should be oriented around clear goals and priorities which would be measurable and evaluable. However, what exactly this orientation should be is only implied with reference to a wide range of continuing challenges such as food security, fighting climate change, adjusting agriculture to climate change, the rural areas 'renaissance', energy security, industrial growth, ensuring an adequate carbon supply for material production, sustainable use of natural resources, etc. As a further reference, other political developments such as the SDGs, the reform of the Common Agricultural

Policy and the Paris Agreement are also invoked. For shaping a sustainable bioeconomy policy, the experts point to the importance of all three 'pillars of sustainability': the economical, the environmental and the social (cf. *ibid.*: 41). Finally, the group urges a greater focus on formulating measures for an updated plan of action. Here, connections and synergies with other policy fields such as forestry and climate policy should be taken greater advantage of.

Under the second catchword 'improved implementation', the experts link two main issues (cf. *ibid.*: 42f.). The first among these is strengthening coordination between European Commission actors in the area of bioeconomy, which they view as necessary and believe should be brought under the auspices of several Commissioners and Members of the European Parliament. This should be coupled with an intensified involvement of member states and regions, which, with the help of structural and investment funds, would play an important role in financing the bioeconomy transformation. The involvement of additional interested actors and of civil society is called for, but primarily for the purpose keeping the public informed. The second issue named by the experts is improving bioeconomy industries' access to resources for funding. Various measures to achieve this goal are suggested, including tax incentives, improved market conditions as well as more direct investment. This could happen through a yet to be founded 'European BioEconomy Strategic Investment Fund', such as is advocated for by EuropaBio among others.

In summary, it can be observed that the experts consulted appear to be largely satisfied with the state of EU bioeconomy policy. Thus, their recommendations have little to do with the basic substantive orientation of the bioeconomy strategy and instead focus mainly on the structures pertaining to their implementation and involve isolated measures. The successful funding of research in bioeconomy through measures such as the BBI JU is especially emphasised.

At the same time, the experts call for more investment in innovation and the introduction of new bio-based products to the market. The fact that several members of the group such as Dirk Carrez (at the time of writing the director of the Bio-Based Industries Consortium) and Michael Carus (managing director of the nova-Institute) work in these areas outside of their capacity as independent experts might also play a role in the report's focus here.

5.2 European Comission Review

In its own evaluation of the EU's bioeconomy strategy and plan of action, the bioeconomy division of the DG RTD adopts a similar focus to the expert group. Looking back, it first determines that central measures were successfully implemented. Amongst these, the authors include above all the mobilisation of funds for research and innovation under the framework of Horizon 2020 and the support of private investments

from the BBI JU (cf. European Commission 2017: 40). A more critical view is taken regarding the concrete products produced by this research: 'whilst technologies are being researched and developed, it remains difficult to predict whether (and when) some of these will reach the market.' (European Commission 2017: 13). The authors see a further success in the development of numerous national and regional bioeconomy strategies in the EU and around the world which have followed the EU's bioeconomy strategy (cf. *ibid.*: 40f.).

In four areas, the European Commission sees a need to improve its own strategy (cf. *ibid.*: 41f.). The first involves the further mobilisation of investments in order to make concepts such as biorefinery ready for the market. According to the Commission, this goal necessitates in particular a stable legal situation which would incentivise private investment as well as direct support from the EU. Second, in general, a closer relationship between the strategy's goals and the actions it contains is called for. This is seen as a means of potentially increasing the coherence between neighbouring policy fields. Third, it is argued that the changed political context should be taken into account by the SDGs, the Paris Agreement and other initiatives. Fourth, the Commission also emphasises the importance of indicators and appropriate methods of measurement in order to ensure the sustainability of bioeconomy production and consumption.

In contrast to the report by the expert group, the European Commission's evaluation of EU bioeconomy strategy contains few detailed suggestions for improvement. Rather, it is much more focused on representing and evaluating past measures and on ordering bioeconomy strategy within the changed political environment of 2017. Here, its overall evaluation of the strategy comes up positive, with more substantial changes in direction not being envisaged. Instead, the paper recommends an intensification of the prior course in the area of financing for research and development.

5.3 The Bioeconomy Stakeholder Manifesto

In comparison to both of the papers that have been presented, the Manifesto addresses questions of a more fundamental nature. It concerns itself less with evaluating the existing political framework and the measures undertaken within it than with the common perception held by various actors of what EU bioeconomy should be and which steps should be taken to promote it. Only shortly after the EU's bioeconomy strategy took effect, a panel of interested actors and stakeholders was set up in 2013, as was specified in the strategy.¹⁴ The committee, which was initially founded under the name European Bioeconomy Panel, was supposed to consist of representatives of

¹⁴ Unless indicated otherwise, all information on the panel is taken from the Commission's official register of expert groups: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3479> (last accessed 19.12.2018).

various social groups: primary producers, companies and industry, academia, public administration, civil society.

However, while companies, industry representatives and public administrators were strongly represented in the original committee, NGOs and other actors from civil society were absent. For this reason among others, the committee was relaunched in mid-2016 with a new structure. Maintaining its considerable surplus of members from business and administration but now also including the NGOs Transport & Environment and Fern as well as the Danish trade union 3F, the panel set out to create the Bioeconomy Stakeholders Manifesto. This was supposed to unify the voice of the panel's actors as well as their suggestions for updating EU bioeconomy strategy. Accordingly, the document is the result of a process of negotiation between a wide range of different actors, from the aforementioned NGOs all the way to the agricultural association Copa-Cogeca and the biotechnology industry association EuropaBio. While most of the participants could ultimately agree on the final version of the text, Fern and Copa-Cogeca did not sign because they took issue with various statements it contained and could not reach a compromise before the end of the negotiating process (Interview Fern 15.2.2018).

The resulting paper is not aimed directly at the revision of EU bioeconomy strategy. However, as the discussions in this context aim to stimulate the review process, the paper can be viewed as a step on the path to an updated strategy: 'It [the manifesto] should provide food for thought and a key contribution towards the development of more specific recommendations, from different stakeholders, which can then contribute towards the development of a number of relevant policy initiatives, including a revised EU Bioeconomy Strategy' (EU Bioeconomy Stakeholders Panel 2017: 3).

At the beginning of the document, the authors make clear why it makes sense in their view to promote bioeconomy: 'Advancements in bioeconomy research and innovation uptake will allow Europe to improve the management of natural resources and to open new and diversified markets in food and bio-based products.' (EU Bioeconomy Stakeholders Panel 2017: 2). Further on, explicit reference is made to Europe 2020, the strategy for European competitiveness and growth, while it is claimed that bioeconomy could contribute to 'smart' and green economic growth (cf. *ibid.*: 2). According to this view, bioeconomy could contribute to a series of EU policy goals from fighting climate change to promoting resource efficiency, environmental protection, growth and job creation.

Still further on, the paper outlines guiding principles for bioeconomy and measures for promoting them that can be implemented by the signatories. Finally, seven concrete recommendations are made for the EU and its member states (cf. *ibid.*: 9f.). First, public institutions should actively support the creation of markets for new bio-based products by setting up certification processes or similar legal guidelines, among other ways. Second, EU Common Agricultural Policy should be reformed so that it can play

a role in a sustainable EU bioeconomy. Third, environmental protection and maintaining biodiversity should be viewed as a part of bioeconomy, not least of all to promote public acceptance of bioeconomy. Fourth, the authors urge that investments in research and innovation be increased. To this end, the Manifesto proposes a European 'bioeconomy investment programme'. Fifth, as a further step to promote bioeconomy innovation, it is suggested that regulative and financial hurdles be rolled back for pioneers putting new concepts into practice such as the biorefinery. Sixth, the authors speak of creating a 'level playing field' for bioeconomy in Europe. With this, they mean both that individual usage categories for biomass should not be given preferential treatment over others, and also that the competitiveness of bio-based alternatives should be promoted against that of traditional fossil-based products. Seventh and last, more coherence and coordination on bioeconomy between the European Commission's various divisions is called for.

The Bioeconomy Stakeholders Manifesto is primarily a position paper of various interested actors on EU bioeconomy policy. Thus, the positions elaborated within it are somewhat more diverse than in the reports by the expert group and the Commission – for example, the Manifesto's emphasis on environmental protection and biodiversity is much greater than in the other papers. However, on many other points, there is clear agreement between all three, particularly regarding demands for increasing investments in research and innovation as well as the importance of coherence on the EU level. That being said, the how much direct influence this positioning had on the revision of the strategy is unclear: 'The main objective of these bodies is to support the implementation process of the strategies and to facilitate interactions between different policy areas, sectors and stakeholders in the bioeconomy. Their influence on the alignment of overall strategic goals is therefore unclear.' (Meyer 2017: 15).

5.4 The updated bioeconomy strategy

At the end of October 2018, the European Commission finally presented its revised bioeconomy strategy to an interested public at a conference in Brussels. Bearing the title 'A sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment', the updated strategy begins similarly to its predecessor from 2012 by invoking global challenges such as limited resources, climate change, land and ecosystem destruction and global population growth in order to justify the necessity of new methods of production and consumption which respect the ecological limit of the planet (cf. European Commission 2018a: 4f.). The necessity of a sustainable economy is simultaneously presented as an opportunity to modernise industry in the EU, thereby increasing its global competitiveness and creating new jobs particularly in the biotechnology sector. Sustainability and circularity are characterised as the 'European way' when it comes to bioeconomy. A bioeconomy policy based on these premises should contribute to reducing CO₂ emissions and achieving the Paris

Agreement (cf. *ibid.*: 5ff.). Moreover, bioeconomy could contribute to solving other environmental problems such as ecosystem destruction and increasing plastic waste in the oceans, thus helping to achieve the SDGs. It is repeatedly emphasised that economic feasibility in addition to the principles of sustainability and circularity have always been part of the 'European way' in bioeconomy (cf. *ibid.*: 6).

As was already the case, the role of research and innovation for achieving these goals is portrayed as central (cf. *ibid.*: 7f.). In addition to financing from other sources such as the Regional Development Fund, the strategy calls for funding in the amount of 10 billion euro to be set aside in the budget of the Framework Programme for 2021-2027, under the title 'Food and Natural Resources'. Furthermore, there is an explicit mention of smart specialisation strategies as advocated by Region Värmland and other forms of regional support for research. Moving beyond the prior strategy, it is announced that measures will be taken to expedite the introduction of innovations to the market, including networking with other policy fields such as the Common Agricultural Policy and the Common Fisheries Policy (cf. *ibid.*: 8).

The 2018 strategy preserves the five main goals from 2012: food security, sustainable natural resource management, reduced dependence on non-renewable raw materials harvested domestically and abroad, fighting climate change and adapting to its consequences, as well as strengthening European competitiveness and creating jobs (cf. *ibid.*: 8ff.). To achieve these goals, fourteen measures in three areas are announced in line with its focus on research and innovation.

The first area aims to 'Strengthen and scale-up the bio-based sectors, unlock investments and markets' and primarily involves supporting the market introduction of new processes through measures to promote standards and labels for the bio-based economy and its products, such as an investment platform that would be endowed with 100 million euro (cf. *ibid.*: 11f.). Further measures include promoting new biorefineries and supporting the plastics industry in transitioning away from fossil-based raw materials and towards bio-based and biodegradable alternatives, an important goal in light of the plastic contamination of the oceans.

The second area, aiming to 'Deploy local bioeconomies rapidly across Europe', unifies measures representing pilot projects into a 'Strategic Deployment Agenda' (cf. *ibid.*: 12:ff). The goal of this agenda is to locally implement bioeconomy production methods in numerous areas ranging from forestry to the planting of algae to capture CO₂. Furthermore, it includes steps to support member states in developing their own bioeconomy policies and in establishing new offerings in vocational and higher education relating to bioeconomy.

The third area aims to 'Understand the ecological boundaries of the bioeconomy' and addresses the necessity of learning more about the effects of bioeconomy on the environment (cf. *ibid.*: 14f.). In particular, it summarises measures to increase knowledge on bioeconomy, such as gathering and systematically processing data on the state of ecosystems, in order to discover more about their utility not only as carbon sinks but

also as sources of sustainable biomass. Here, the stated goal is a bioeconomy operating within secure ecological boundaries. To this end, agroecology also plays a role. Among other things, it should help to integrate ecosystems rich in biodiversity into primary production.

In conclusion, it can be observed that while the updated bioeconomy strategy sets new emphases, it does not fundamentally alter the focus of EU bioeconomy policy. Instead, shifts can be seen between the two main areas of research/innovation and implementation. On the one hand, research remains central to bioeconomy policy, with 10 billion euros of funding being announced in the coming EU Framework Programme. On the other hand, relative to this and other measures announced, the implementation of innovations on products and the introduction of these to the market is foregrounded. Provided that the goals of the strategy are achieved, bioeconomy in the EU is likely to experience a growth in bio-based production and concrete applications. As was the case with its predecessor, the updated strategy contains many references to environmental problems and to climate change, including the assertion that bioeconomy with limited renewable resources can only operate within planetary limits. In spite of this assertion, the concrete measures announced continue to give the general impression that the strategy aims at growth in bio-based sectors without clearly defined limits. Overall, the further expansion of bioeconomy is seen as a means to solve environmental problems, while the logic of growth reproduced by this position and its ecological consequences are never fundamentally questioned.

5.5 Summary and evaluation of the review process

After a lengthy review process involving consultations, the solicitation of expert opinions and an internal evaluation, the updated strategy ultimately presented by the European Commission resembles the prior strategy in many areas. Its focus on promoting research has been expanded to include the market introduction of innovations in bioeconomy on the local and the EU level. Divergent positions were expressed over the course of the review process, among which only some influenced the final strategy. In the Bioeconomy Stakeholders Panel, there were controversies over whether there are in principle limits to the availability of biomass given that it is a renewable resource, and over how strict these limits are. While the agricultural association Copa-Cogeca viewed the increase of biomass production as an important goal for bioeconomy, the Bioeconomy Stakeholders Manifesto problematised the limits of biomass availability, a point that is taken up by the strategy as well. A further example is the cascading use principle, which was advocated for by Fern and other environmental organisations while being explicitly rejected by Copa-Cogeca, EuropaBio and Region Värmland. The experts of the European Commission also expressed opposition to regulation according to cascading use (cf. Newton et al. 2017: 38). Thus, while the principle is mentioned in the new strategy, it is not declared as binding (cf. European Commission 2018a: 53).

In papers by the European Commission and its experts, discussed in Sections 5.1 and 5.2, fundamental questions concerning the orientation of the strategy were hardly addressed. At the same time, such questions were definitively part of discussion processes elsewhere. For example, during the consultation and the drafting of the Bioeconomy Stakeholders Manifesto, far-reaching risks for biodiversity posed by the expansion of bioeconomy were discussed.

Viewed systematically, a strong correspondence can be established between the updated strategy and the positions of those actors advocating a continuation or expansion of the original strategy. In the survey presented here, these were represented by EuropaBio, Region Värmland and the University of Hohenheim. Their prioritisation of a research-based EU industrial policy, innovation-oriented economic development at the regional level and a socially-anchored research program are generally reflected in the strategy, while additional demands emerge as measures in the plan of action. In contrast, demands for a reorganisation of bioeconomy policy, such as were advocated by Copa-Cogeca, and for its fundamental reassessment, such as were raised by Fern, are hardly reflected. In particular, these objections and doubts were not translated into concrete measures.

6 Conclusion - Structural limits of participation

Between the state apparatuses involved and the constellation of actors from industry, research and regional/public administration backgrounds, a broad consensus was formed within European bioeconomy policy which substantively shaped the policy. Other actors could hardly question this orientation fundamentally. Previously, the decision-making process regarding the first bioeconomy strategy had been limited to a coalition of elites: '[B]ioeconomy was described as an elite master narrative that is entrenched in EU-wide and national policy frameworks configured by particular research and innovation policy elites and/or bureaucracies' (Meyer 2017: 14). This limiting can also be seen in the process of the new bioeconomy strategy's preparation.

According to neo-Gramscian IPE, this finding can be explained given the structure of bioeconomy as a field of action which does not guarantee the same conditions for all actors. Instead, positions close to industry and research are structurally advantaged. From the perspective of social power relations, particular contextual factors are relevant here. These are 1) the historical development of EU bioeconomy policy out of earlier biotechnology research and 2) the existing links to the hegemonic world view in the EU, according to which competition and (knowledge-based) growth are of central importance.

In light of the historical context, it must be observed that EU bioeconomy policy was not first initiated as a new, inter-sector approach but rather has a specific prehistory. It is rooted in a process underway for 30 years which began with the establishment

and advancement of biotechnology research out of which the concept of bioeconomy was gradually developed (cf. Patermann/Aguilar 2018: 21). This process involved an interim stage at the start of the 2000s in which debates on the 'knowledge-based bioeconomy' took place at the EU level, leading to the emergence of the 2012 bioeconomy strategy (cf. *ibid.*: 23f.). This process saw a shift in focus from direct subsidies for biotechnology to addressing broadly conceived social challenges through new forms of biomass production and application (cf. Meyer 2017: 5), yet the fundamental orientation around research and technological solutions remained constant. John Bell, the DG RTD Director in charge of bioeconomy, summarises this shift thusly: 'We are not actually building a biotechnology economy, we are building a bioeconomy using the technology to support the aims that we have for sustainability, for jobs, for growth.' (John Bell, speech at Bioeconomy Policy Day 16.11.2017, Brussels). The locating of bioeconomy policy under the auspices of the DG RTD happened against this historical background, which – in comparison to the DG ENVI for example, which primarily deals with questions of environmental protection – is the institutional embodiment of the view expressed here.

Another central aspect is the relationship of EU bioeconomy to the hegemonic world view in the EU, which at least since the portending neoliberalism of the Lisbon Strategy in 2000 has been shaped by the core concepts of competition and (knowledge-based) growth (cf. Apeldoorn et al. 2009: 28ff.). With the current strategy Europe 2020, the EU has set upon a course of smart (i.e., innovation-based and knowledge-based) and sustainable (i.e., resource-efficient) growth as its main policy priorities (cf. European Commission 2010: 3). Since then, the growth imperative and the goal of competitiveness form the fundamental meta-narrative in the EU around which policies and initiatives such as the bioeconomy strategy must be oriented. In view of the hegemonic anchoring at play, a substantive orientation not based on and subordinated to these principles would have little chance of success. Corresponding to this, it can be observed that bioeconomy strategy contains references to the overarching strategy Europe 2020 and that its contents are structured according to this strategy's principles (cf. Meyer 2017: 15f.).

While actors in the field of European bioeconomy policy can position themselves differently within the given contextual conditions, they cannot simply change these. Therefore, it is systematically easier for actors to introduce their positions into the contested field of bioeconomy policy when their interests correspond to the focus on research and technological innovation anchored in EU state apparatuses, and when they share the overarching prioritisation of promoting growth and competitiveness. Other positions that are oriented for example around EU goals on environmental protection or climate, do find their way into the bioeconomy discourse from time to time. Yet the influence of these positions on measures implemented remains marginal as long as their goals are not reflected within the structure of the field of political action. In order for them to achieve greater influence, fundamental changes would have to happen

such as shifts of power between Directorates-General or the introduction of binding goals for reducing the EU's raw material consumption.

The review of the EU's bioeconomy strategy should therefore not be understood as an open process in which the orientation of this policy could simply be negotiated. Rather, the field of action is shaped by pre-existing structural restrictions on both the institutional and discursive level. As long as such restrictions remain unchanged, they will continue to largely determine whose bioeconomy will ultimately be promoted and implemented in the EU. Thus, it appears doubtful that the orientation of bioeconomy can be modified in the future without significant shifts in social power relations.

Another open question is whether bioeconomy can assert itself against competing concepts as a model for a future form of economy, such as when it comes to reforming the Common Agricultural Policy or reorganising the European electricity market (cf. Haas 2017). After all, even though the DG RTD and other interested actors are trying to establish a broad legitimation and purview for bioeconomy, the limited nature of the positions they consider are bound to make it difficult for EU bioeconomy policy to take effect beyond the core areas of research policy and innovation promotion.

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