



CAP – opportunity or obstacle for transitioning to a bio-economy?

A discussion note for the workshop “CAP, en möjlighet att utveckla en bioekonomi – eller ett hinder” November 26th 2014, prepared by Stockholm Environment Institute and KSLA Committee for Green Economy

Scene setter

Acknowledging that transformative change is needed in order to respond to societal challenges¹ (e.g. food security, natural resource scarcity, job creation and climate change), the EU has adopted a strategy for shifting its fossil fuel dependent economy to one in which food, health, fibre, industrial products and energy are derived from renewable biomass – a bio-economy². This is outlined in the Strategy and Action Plan “*Innovating for Sustainable Growth: A Bio-economy for Europe*”, and the White Paper “*The European Bio-economy in 2030: Delivering sustainable growth by addressing the grand societal challenges*”.

Demand for a sustainable supply of food, fuels and raw materials, is the main driver of transition. As this supply is threatened by increasing global populations, depletion of natural resources, increasing environmental pressures and climate change, the bio-economy’s potential to reduce dependency on fossil fuel and greenhouse gas emissions, enable sustainable use of natural resources and create new jobs, is an attractive development pathway for the EU. Moreover, the economic incentives should not be underestimated. The market size of the bio-economy in Europe is over €2 trillion and it provides 22 million jobs, a considerable share of the EU economy (McCormick et al, 2013).

A bio-economy has potential to respond to requirements of sustainable development by delivering food security, nutrition and health, biofuels, and help agriculture and forestry adapt to climate change (EC, 2013a), but there are also trade-offs and risks associated with a transition. McCormick et al (2013) suggest that the key challenge is to increase biomass production while meeting sustainability goals; the output of raw material for a EU bio-economy will need to double before 2100, while its environmental impact will need to be halved (EC, 2013a). Much attention has been given to technical solutions, and in theory, the technology needed to substitute fossil fuels with biomass in all (or almost all) petroleum-based products is available (Vinger et al, 2005, McCormick et al 2013). Technical innovation for production increases is however not enough to enable transition. There is, for example, strong resistance in Europe towards some of the technical solutions, such as genetically modified crops. For transition to be politically feasible, participatory governance will be required in addition to technological and market development, industrial process and production and consumption patterns, and changes to market, development and trade policies (McCormick et al, 2013).

The changes to production of biomass, which a transition entails, put the agricultural sector in the spotlight. As worded in the White Paper; while the bio-economy is a “way to secure a sustainable future” the “origins of bio-processing are as old as human society” (EC, 2013a) and the bio-economy has its foundations in agricultural, aquaculture and forestry ecosystems. In order to realize the ambitions that the EU vision for a bio-economy sets out, these sectors must deliver sufficient biomass for both food and non-food products.

As agricultural, trade and environmental policies influence primary production methods, markets and the quality and quantity of products, the European Common Agricultural Policy (CAP) can become a critical tool for facilitating a transition. This was also the conclusion of a public consultation, in which 86% of respondents said agriculture and rural development are important to foster the bio-economy (EC 2012b). Stating to contribute to “a more competitive and sustainable EU agriculture” (EC, 2013b) the CAP need not only to focus on the production side but address social and environmental issues of competition between uses of biomass, including handling impacts on food prices and food security.

¹ The White Paper lists six “Grand Challenges”: sustainable management of natural resources; sustainable production; improving public health; mitigating climate change; integrating and balancing social developments; and global sustainable development.

² Also referred to as “bio-based economy” or “knowledge based bio-economy”

The bio-economy strategy suggests that a bio-economy is an opportunity to address interconnected challenges, and calls for a strategic, comprehensive and coherent approach to dealing with those. Ensuring coherent and integrated policy direction is also a key message of the White Paper (EC, 2013a). A Staff Working Document (EC 2012b), accompanying the Strategy and Action Plan, states specifically that the Strategy will seek synergies with the CAP (EC, 2012b). A quick screening of CAP documents and perceptions of a few experts however show that there is currently little coupling between CAP and the bio-economy vision. A public consultation by the EC in 2011 (predating the Strategy and White paper) further identified policy coherence as a barrier to developing a bio-economy. This poses the question if and in what ways the CAP and EU's ambition for a bio-economy are aligned and what options emerge for better coherence as the CAP is being reformed.

This background note reviews the interconnections between EU's strategy for a bio-economy and its agricultural policy (CAP). The aim is to identify key areas of interaction and discuss potential areas of conflict and synergy that these imply. This note aims to stimulate and guide discussion at a workshop on November 26th 2014, the outcome of which will serve as input to a comprehensive scoping study.

Policy overview of EU's vision for a bio-economy and the CAP

EU's Vision for a Bio-economy³

The EU envisions an innovative, resource efficient and competitive society that is capable of delivering food security, nutrition and health, smart bio-based products and biofuels, and help ecosystems adapt to climate change. This society is resource efficient and has improved food supply chains, adopts ecosystem based management that can reverse declining biodiversity, has production systems that emit less greenhouse gases and is low-carbon. Biomass availability, demand and competition are well understood and high quality biomass is produced at competitive prices without negative impacts on food security, primary production or the environment. Jobs have been created in rural, coastal and industrial areas and EU's competitiveness has been maintained. Transition to this society rests on an agenda focused on research, innovation, markets and competitiveness of sectors that contribute to the bio-economy, policy interaction and stakeholder engagement (EC 2012a, 2012b, 2013a).

Setting out to tackle challenges of sustainable management of natural resources, sustainable production, public health/food security, climate change, social developments, and global sustainable development, some concrete approaches are presented, although the strategy remains largely visionary at this stage. For example, in addressing management of natural resources focus is on sustainable intensification including mixed production systems and optimized use of genetic diversity. Biotechnology and modern technologies would support improved productivity, efficiency and resilience, while reducing footprints. New plant varieties along with improved management would allow for crops that are better adapted to growing conditions and improved yields, while e.g. irrigation needs, soil erosion, and salinization can be reduced. Ideally, production of goods and services would take place in closed loop systems, where waste is avoided and new sectors emerge from use of by-products (EC 2012b, 2013a).

As for climate change, the EU sees great opportunity in the bio-economy to minimize greenhouse gas emissions. New products would replace fossil fuel-based products, and sustainable intensification of agriculture and forestry would help to protect carbon stocks in

³ This section is based on "Innovating for Sustainable Growth: A Bio-economy for Europe" (Strategy and Action Plan), "The European Bio-economy in 2030: Delivering sustainable growth by addressing the grand societal challenges" (White Paper)

soils and forests. Rural bio-refineries⁴ support greater integration of activities and ensuring efficient use of energy, water and transport between farms and other sectors. Toxic organic solvents could also be substituted with bio-based products, and biofuels replace petrol and diesel by biofuels. Moving to next generation bioenergy that is based on agricultural and forestry residues and waste is another opportunity (EC 2012b, 2013a).

For food security, new foods would contribute to nutrition and health. Advances in plant breeding that allow plants to photosynthesize more efficiently and capture more carbon dioxide could positively effect climate change mitigation, yields and nutrition but also reduce pressure on land. Building consumer trust in such products is however a challenge. Better breeding, farm management, feeding systems and data availability would improve animal resistance to disease and make societies more capable of handling disease outbreaks if they occur. Advances in crops and animals would need to be adapted to growing conditions, and education and knowledge transfer to developing countries needed for innovation to develop successfully. The shift to a bio-economy also offer opportunity to support improvement of agriculture in developing countries and accessing new markets, for example export of biofuels and bio-energy. This would however require that trade regulation and distribution issues are addressed in parallel, highlighting the strong linkages between the bio-economy to many other policy areas (EC 2012b, 2013a).

The EU expects the bio-economy to be a driver of rural and coastal development and in creating an innovative society. The suggested shifts would impact patterns of employment; some sectors will become more efficient and reduce jobs, while new sectors create new ones.

Approach

EU's vision builds on the understanding that the bio-economy rests on integrated systems and networks that use biological resources, maximize value creation and ideally works in closed loops with regards to raw materials, water, nutrient, by-products and energy. This involves mutually dependent sectors,⁵ creating what is referred to as the "bio-economy web" (EC 2013a). Great emphasis is put on the need for these sectors to jointly develop so that the bio-economy becomes robust and can deliver its expected benefits. The White Paper concludes that the bio-economy web makes a useful basis for addressing inter-connected societal challenges, and that transition therefore requires coherent and integrated policy development. The Strategy states that it will seek synergies and respect complementarities with other policy areas, instruments and funding sources that share the same objectives. This includes the CAP (EC 2012b).

To date, activities for supporting a bio-economy have taken place primarily at national level. This has limited economies of scale to develop and made it difficult to capture synergies (EC, 2013a). Coordinated action across Europe is therefore called for in addition to the cross-sector linkages across the bio-economy web. Implementation and action will vary at EU, member state and local levels, but to optimize flows of materials and energy within and between processing systems, networks that link those are needed. Such links can ensure that the value that is generated is shared equitably across the supply chain and that resources are used sustainably (EC, 2013a). This requires coordination, and the EU consequently approaches transition by getting science, industry, governments and civil society to work together in order to accelerate development of knowledge and new technologies. Developing new products that can compete with fossil-fuel based products in both price and quality would require establishing the appropriate (cyclic and interdependent) economic structures; clear policy that give support to institutions, make regulatory changes to remove barriers; and

⁴ Sustainable and efficient production of biomass into food, feed, materials, chemicals, fuels, power, heat. See e.g.Papandiek et al (2012)

⁵ Including arable and livestock farming, forestry, food, aquaculture, chemical industry, materials manufacturing and energy.

achieving consent and support of society, e.g. to address concerns for biological and genetic information (EC 2012a, 2012b, 2013a).

Including a wide range of established and emerging policy areas at global, EU, national and regional level, the policy framework for a European bio-economy is complex and fragmented. The vision builds on FP7 and Horizon 2020, and aims to contribute to the objectives set out in the EU2020 flagship initiatives “Innovation Union” and “A resource efficient Europe” and to be in line with the “Blue Growth Initiative”. The “European Innovation Partnership” and “Joint Programming Initiatives” will support that policy processes take innovation into account early on as they drive the transformation. Being very much a vision at this stage, the concrete mechanisms are few, but include a Bio-economy panel and Observatory created for the purpose of policy interaction and stakeholder engagement.

EU’s Common Agricultural Policy⁶

The overarching objective of the Common Agricultural Policy (CAP) is to ensure that consumers have a stable supply of affordable food and that EU farmers can make a reasonable living. It also aims to stabilize markets and increase agricultural productivity through technical progress and good use of production factors (European Parliament, 2014). In achieving this, the CAP rests on the guiding principles of a common agricultural market, that products produced in Europe are bought in preference to imported products and that all member states share responsibility for the financial consequences of a common agricultural market. It is further structured around two pillars; Pillar 1 offers annual direct payments and market measures for encouraging market oriented reforms for enhancing competitiveness of the sector; and Pillar 2 offers multi-annual rural development measures aiming to promote competitiveness, sustainable management of natural resources and to balance development of rural areas. Pillar 2 instruments and measures are adjusted to member state needs and priorities. Together, the rural development policy and the market measures aim to respond to the multifunctional nature of farming, and hence support the rural sector to provide ecosystem services beyond food (EC, 2012c, European Parliament, 2014). However, the CAP has traditionally had strong focus on market measures and if it were to deliver more public benefits it would need to be coupled with a strong public policy.

The CAP has been on a reform path since the 1990’s and its structure has changed considerably since it was first launched. Reforms have addressed issues of productive capacity, diversity following EU enlargements, biodiversity and climate change, and new expectations on environmental, social and safety standards that have led to a decoupling of grants from volumes of production (EC 2013b, 2012c, European Parliament, 2014). The latest round of reform took place in 2013 in preparation for the 2014-2020 financial period, called “CAP towards 2020”. The Parliament’s priorities for the CAP after 2013 included food security, fair trade, maintaining farming activity across Europe, food quality, biodiversity and protection of the environment, fair remuneration for the public goods supplied by farmers, and rural development based on the creation of green jobs (European Parliament, 2014). Reform of the instruments particularly focused on shifting the aid system away from generic income support into a multifunctional support system where support is coupled to specific objectives or functions. Secondly, on introducing safety nets in case of price crises or market disruption, and thirdly adopting a more integrated and targeted approach to rural development that focus on competitiveness, innovation, knowledge-based agriculture, sustainable management of natural resources and balanced regional development (European Parliament, 2014). As a result, new economic, environmental and territorial objectives have been set for

⁶ This section builds on the “Overview of CAP reform 2014-2020”, EC (2012c) “The Common Agricultural Policy – an overview”, “The CAP towards 2020: Meeting the Food, Natural Resources and Territorial Challenges of the Future”, and information provided at the website of the European Parliament; “Sectoral Policies: 5:2 Common Agricultural Policy (CAP)”

the CAP: i) Ensuring food security through stable agricultural production, increasing competitiveness and the distribution of value across the food chain; ii) Sustainable use of natural resources and addressing climate change, and; iii) Ensuring economic and social diversity in rural areas. Relating to the second objective, the EU Communication “CAP towards 2020” included direct reference to a bio-economy; *“to foster green growth through innovation which requires adopting new technologies, developing new products, changing production process and supporting new patterns of demand, notably in the context of the emerging bio-economy.”*(EC, 2010).

Approach

EC (2010) argued that the CAP would contribute to the EU2020 through “smart, sustainable and inclusive growth”. CAP would stimulate increased resource efficiency and competitiveness through technological knowledge and innovation, including developing high value added and quality products, green technologies, and investments in training, social innovation in rural areas and improved uptake of research (EC, 2010). To maintain food, feed, and the renewable production base the CAP would support sustainable land management, environmental public goods, addressing biodiversity loss, promoting renewable energy, animal and plant health, and increased resource efficiency through technological development and research. Further, it would aim to reduce emissions, and enhance carbon stocks, and to unlock the economic potential in rural areas by developing local markets and jobs, restructuring agriculture and supporting farmers’ income (European Parliament, 2014).

The objectives and measures put forward reflect an idea of green growth, much in line with the bio-economy vision. The Parliament has also suggested explicitly that the CAP should promote *“a shift towards a low-carbon economy in the agricultural, food and forestry sectors”* (European Parliament, 2014). Pillar 2 would be the key area for further integration of environment and climate change issues, which is needed to allow the agricultural sector to remain competitive while managing natural resources sustainably and achieve equitable development across the EU in the long-term. Concrete initiatives include the “European Innovation Partnership on Agricultural Productivity and Sustainability”, which aims to strengthen cooperation between agriculture and research to support technology uptake with the aim to promote resource efficiency, productivity and development of low-emission agriculture (European Parliament, 2014).

Points of Alignment and Contradiction⁷

The discussion presented below focuses on how the objectives and interests of the two policy areas interact, with the aim to better understand if/how the CAP supports or could support transition to a bio-economy. The discussion is based on the policy overview and input from experts at Jordbruksverket, LRF and SEI. It considers issues of the bioeconomy as a concept, if the CAP makes reference to a bio-economy, how objectives are aligned and whether the CAP offers any mechanisms for supporting transition.

One fundamental issue is a perceived lack of clarity around “bio-economy” as a concept. There is much rhetoric of the bio-economy, but a lack of shared approaches and action. What is a bio-economy responding to and what new challenges does it pose? Is it simply an agenda for substituting fossil fuels so that we can continue consuming the way we do? Will technology save us, or is the bio-economy more about changing consumption patterns and attitudes? Is it about avoiding climate change impacts or responding to them? Is it an equity agenda? Who benefits from it and who loses out? Arguably, the bio-economy is about all of these issues, but the responses to the questions will impact the priorities and choices of instruments as well as the uptake. The conceptual understanding will also reflect and impact

⁷ This section builds on the policy overview and input from experts based in Sweden.

the way in which we relate to “environment” and the role ascribed to the agricultural sector. The responses are likely to vary across EU member states or regions, depending on their potential for transition. In Sweden, for example, where the potential for transition is good, the overarching objectives of a bio-economy has been defined as reducing climate impact and use of fossil raw materials, and optimizing the value of ecosystem services and their contribution to the economy (Formas, 2012). On the other hand, in the case of Sweden, the forestry sector offers perhaps the greatest potential, but falls outside of CAP. Where is the conversation taking place at the EU and national level of what the bio-economy sets out to address and achieve, and how does this conversation interact with policy and action?

Being a vision at this stage, few instruments are in place for facilitating development of a bio-economy and there is little direct coupling to the current CAP. However, through its objectives and instruments, the CAP impacts the production of biomass and agricultural products. These dynamics in turn interact with the societal challenges that the bio-economy vision responds to; sustainable management of natural resources; sustainable production; improving public health; mitigating climate change; integrating and balancing social development; and global sustainable development. Vice versa, an increase in demand for biomass for industry and rising food demand can be expected to create a supply reaction in European agriculture - the biggest supplier to world agricultural markets (EC, 2013c). The challenge at hand is, hence, one of integrating a broader range of policy areas, including energy-, climate and agricultural policy, supply- and security issues. The vision for a bio-economy strongly emphasizes such inter-linkages and was developed based on a scenario that maximizes coordination with other sectors and policies, including the CAP (EC, 2012b). It states to look both for policy interaction, and research and innovation efforts that could reconcile competing activities and demands. However, achieving this is restricted by the lack of a common EU stand on instruments to implement, taxes being one example. Instruments have often addressed single sectors or parts of production chains but will in this case need to address transition of a whole system by stimulating change in the functionality of products and consumer behavior. The challenge is to develop dynamic and cost-efficient instruments that encourage actors to develop and implement new technologies, products and innovations. Although there are challenges in developing measures that are acceptable across the EU, the CAP is one of few policy areas in the EU that is harmonized; i.e. where the long-term and framework decisions are taken jointly in the council (Einarsson, 2012). Also, budgetary support to agriculture is predominantly at the EU level and the agricultural negotiations in the WTO are coordinated by the EC. This should make an opportunity for better oversight, coordination and coherence that could help facilitate transition.

Looking at the objectives of the two policy areas, the bio-economy vision states with regards to agriculture that the aim is to provide knowledge and tools for productive, resource-efficient and resilient systems for food, feed and bio-based raw materials, without comprising ecosystem services and in conjuncture with policies that support rural livelihoods to prosper. This is in line with the objectives of the CAP, which in its post-2013 reforms even includes statements such as “multifunctional EU agriculture that provides ecosystem services and open new non-food markets for farmers”; where “technology, social and management innovation supports rural development”. “Close interaction of research and policy” is further a shared approach for stimulating uptake (European Parliament, 2014). CAP post-2013 and the vision for bio-economy both focus on resource efficiency, competitiveness through technological knowledge and innovation, and training and social innovation and aim to achieve those objectives through supporting sustainable land management, addressing biodiversity loss, promoting renewable energy, animal and plant health, reduce emissions, and enhance carbon stocks, and to unlock the economic potential in rural areas by developing local markets and jobs.

Food security is a primary objective of the CAP, and the bio-economy strategy repeatedly mentions it as an area to be protected and respected, as well as an area to which the bio-

economy would contribute by providing new types of foods. In that sense, the policies are aligned, but in achieving its objectives the approaches vary considerably. The bio-economy strategy relies heavily on solutions in biotechnology, GM and new crops and foods, for which there is currently strong skepticism amongst the European public and less focus on in the CAP. Thus, while the objectives are aligned, the solutions may not be. Food security is further a useful example of the need for understanding how conflicts or trade-offs resulting from intensive production of biomass, are linked across scales. For example, in Sweden the forestry sector offers great potential to contribute to biomass production, whereas a shift to biomass crops on agricultural land would further reduce the responsibility Sweden takes for its ecological footprint of food consumption. On the other hand there is much land that is not developed, as profitability is perceived low, with good potential for growing energy crops (e.g. willow). Related to the question of benefits at different scales, the vision for a EU bio-economy is foremost a vision for ensuring the long-term well-being of the EU society and its citizens. However, it also claims to address global sustainable development challenges, for example by supporting improvement in agriculture in developing countries and transfer skills and knowledge that facilitates innovation and open new markets, e.g. in bioenergy exports (EC, 2012b, 2013a). In conjunction with this it is briefly stated that this could only be achieved if trade and distribution issues were addressed. This is however a major “but”. The CAP is heavily criticized for its effect on agricultural production in developing countries. The protectionist principles and measures influence world market prices and their variability, and increases the costs of market access (Trinity College Dublin, 2014). Would CAP ever be reformed to accept free trade in agricultural surpluses for the benefit of developing countries, as suggested by the bio-economy vision? And if that is as far as the bio-economy vision goes in terms of addressing global development challenges, it also raises the question if a shift to a EU economy that is increasingly reliant on the agricultural sector would also be increasingly discriminating against developing countries.

The challenge is to find viable solutions that are commercially, environmentally and socially attractive. Looking at existing CAP instruments, a primary objective of the annual direct payments (Pillar 1) is to encourage sustainable land use. Improving both the productivity and environmental management of agricultural land is a necessity for the bio-economy to sustain, and this is hence an objective in both policy areas’ interest. The annual direct payments are not conditioned on the type of crop that is grown, and is as such “neutral” in terms of stimulating production of certain crops. Pillar 1 is therefore neither a driver of transition, nor a barrier for farmers to shift the production of crops to those that would become more profitable given new markets of a bio-economy. Pillar 1 could make an efficient instrument in stimulating transition if income support was coupled to certain production objectives. The latest reforms did include a shift in this direction (European Parliament, 2014). Pillar 2 allows for more targeted measures that can steer the sector to become more environmentally friendly, encouraging protection of biological diversity, organic farming, energy efficiency requirements or specific investment support (e.g. regional or rural). This would be critical in parallel to stimulating increased production of biomass, as agriculture in the EU is amongst the most intensive in the world but the environment has often lost out. Pillar 2 also includes small support for capacity building, which could potentially be used to stimulate transition. Recent reforms offered opportunity to put greater emphasis on Pillar 2 and the rural development policy framework. Under the 2014-2020 financial framework member states have the opportunity to shift up to 15% of Pillar 1 to Pillar 2, and at least 30% of the rural development funds they receive must be spent on certain measures, e.g. organic farming, land management and climate change (European Parliament, 2014).

It deserves mentioning that the CAP has previously served as a tool for fostering technology development in the agricultural sector. It could play a similar role in this shift, and already claims to assist farmers to *“reduce greenhouse gas emissions of their agriculture; meet public health, environmental and animal welfare standards; and diversify the use of farm products for sectors like cosmetics, medicine and handicrafts”* (EC, 2012c). In the context of the EUs

vision for a bio-economy there is need to jointly identify instruments that can support implementation, monitor effects, and address the externalities of transition. Research needs to consider both economic and social costs and benefits, as well as non-market and non-material benefits (e.g. recreation and landscapes). Greater insight is further needed on what the current administrative, economic and cultural barriers are for uptake of bio-based products. There is certainly potential for a bio-based European economy considering that EU agriculture already provides more than 40% of the goods produced in OECD, but farmers, business, industry and consumers need to be provided with the solutions and incentives for transition.

Questions in Focus at the Workshop

1. *How can we understand bio-economy as a concept? What are its purposes and associated impacts (positive and negative)? How does this vary in different settings? Who benefits from transition?*
2. *What are important areas of interaction between the development of a bio-economy and agricultural politics and policy? What is the role of the agricultural sector in the EU in transitioning to a bio-based economy?*
3. *How could EU's agricultural policy (CAP) better support transition to a bio-based economy? What mechanisms does the CAP offer? Are there examples of alignment and contradiction between CAP and EUs vision for a bio-economy when it comes to objectives, solutions and mechanisms?*
4. *What changes/reforms to the CAP would be needed for it to better support transition? Can entry points be identified?*
5. *What is the potential for success of an agenda focused on innovation, research and stakeholder engagement? What is missing? What are critical administrative, economic and cultural barriers to transition?*

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