



Rural climate action through bio-based value chains

Background paper for the

ENRD Thematic Group

‘Bioeconomy and Climate Action in Rural Areas’

Working draft - September 2019

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Preamble

This paper provides the ENRD Thematic Group ‘Bioeconomy and climate action in rural areas’ a contextual background and initial orientations. The aim of the Thematic Group (TG) is to identify incentives and support measures to upscale climate action in bioeconomy value chains, in the framework of the Rural Development Programmes and the Common Agricultural Policy post 2020. In order to do this the TG will discuss and try to break down climate action in rural bioeconomy, the need along the value chain to deliver change, the tools available and how these might be applied in the future.

The paper focuses on climate change mitigation. Whereas adaptation to the impacts of the climate change is of primordial importance for rural economies, mitigation activities are considered to have more potential to contribute to rural economic activities, hence integrally forming an element of rural *bioeconomy* and the focus of the TG.

1. Introducing the bioeconomy and its role in rural climate action

‘The production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products as well as bioenergy’¹.

‘The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles....to be successful, the European bioeconomy needs to have sustainability and circularity at its heart’².

The bioeconomy is seen as integral to wider European goals aiming to deliver a green, circular economy³ and a sustainable, low-carbon future for society. However, shifting to bio-based materials alone does not guarantee significant climate benefits – they need to be aimed at and worked for.

Tailored support for the bioeconomy can contribute to climate action through the reduction of greenhouse gas (GHG) emissions (compared to current levels), or the sequestration and storage of carbon in soils and in biomass or in products made thereof. Carbon can be locked up in soils and biomass when it is growing (particularly in long-lived species such as trees) or during biomass use in products. The length of time the carbon is locked up depends on its lifetime, which for a single use bio-products may be a matter of months, while for wood used in constructing buildings may be hundreds of years.

¹ Definition of the bioeconomy from the EU’s 2012 Bioeconomy Strategy - <https://publications.europa.eu/en/publication-detail/-/publication/1f0d8515-8dc0-4435-ba53-9570e47dbd51>

² Statement on the bioeconomy’s coverage - 2018 revision of the EU’s Bioeconomy Strategy - https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none

³ Lessons for delivering a climate action through the bioeconomy can be learnt from earlier analysis on the transition to the green economy completed by ENRD – see annex II.

Given the bioeconomy's integral links to land use, land management, farming and forestry, innovation in this space offers the opportunity not only to reduce negative emissions of GHGs, but to positively impact the carbon balance i.e. locking emissions up in soils and biomass by transforming land management, land use and the use of resulting biomass materials.

In previous work, the ENRD TG on '[Mainstreaming the Bioeconomy](#)' noted that opportunities for developing a sustainable resource base and added value solutions are only fully realised if you start from the bottom up in the value chain⁴. The same is critically true for climate action: climate benefits are maximised when land use and land management are fully integrated into the value chain to mitigate risks and seize opportunities. The role of land managers and rural actors, in addition to that of processors, retailers and consumers, is key to driving climate action through bio-based value chains. It is important to recognise this when connecting delivery of climate action to economic and societal recognition for rural actors.

Work by the 'biogas done right'⁵ initiative demonstrates that integrated, bottom up approaches can work effectively to deliver economic benefits in combination with climate action. To achieve this sustainably the engagement of rural actors is key to enabling innovation to be tailored to support improved land and soil management needs, maximising synergies in terms of sequestering carbon, protecting soils, producing biomass, supporting rural development and diversification of farm income.

In the context of the TG work it is important to note that the biomass producing sectors are facing challenges associated with climate change impacts in parallel to pressure to reduce GHG emissions. A bioeconomy that innovates, establishes and valorises links between consumers and producers, products and land management offers the agricultural and forestry sectors the opportunity to adapt to climate impacts and reduce GHG emissions. Actions aimed at mitigating GHG emissions can often be implemented together with – or in support to - actions aiming at increasing agriculture's resilience to the impacts of climate change.

The previous ENRD TG on 'Mainstreaming the Bioeconomy' studied sustainable bioeconomy value chains that create jobs and income in rural areas while preserving eco-systems. It established a set of recommendations on the coordinated use of the Rural Development Programme measures to promote the development of such value chains⁶. The TG 'Bioeconomy and Climate Action' will build on this work and take it further, identifying how the rural bioeconomy can deliver more for the climate.

2. Opportunities for climate action in bioeconomy value chains

Development of the 'bioeconomy offers' can contribute to climate mitigation in three ways.

⁴ Ensuring a shared understanding of what the bioeconomy opportunities in a given territory or value chain are, and addressing all stakeholders', even small ones', interest when designing related support approaches and strategies, are central principles in the recommendations established by the Thematic Group: https://enrd.ec.europa.eu/sites/enrd/files/s11_bioeconomy-handout_how-to-mainstream-bioeconomy.pdf

⁵ For further information see <https://www.eusew.eu/sites/default/files/programme-additional-docs/EBA%20Final%20Presentation%20Biogas%20Done%20Right.pdf>

⁶ https://enrd.ec.europa.eu/publications/recommendations-use-rdps-mainstream-bioeconomy_en

- **Replacement of carbon intensive and fossil resources** – The focus on innovation in the bioeconomy emphasises the possibility for new value chains that can replace more carbon intensive alternatives and hence cut overall GHG emissions. Products made from biomass also inherently lock up carbon for their life span (this may be a matter of months or hundreds of years, depending on the product and its use). However, when validating the lower carbon credentials of the end product, it is key to consider the overall land use and management used to generate the original biomass. Land use and management changes arising from the demand for new bio-based products may reduce carbon sinks or increase GHG emissions - for example when a forest area is reduced to grow crops for the needs of the bioeconomy. Consequently, ensuring sustainable sourcing of the primary resources, minimising waste and utilising residues and wastes throughout the chains is important.
- **Reducing GHG emissions** along the whole value chain – The agricultural sector contributes significantly to emissions of non-CO₂ GHGs - approximately 10 % for the EU as a whole, although with significant variation between Member States (3–32 %). Key sources include agricultural soils linked to the mineralisation of nitrogen fertilisers and the livestock sector linked in particular to manure management⁷. Changing land and farm management and enhancing opportunities for change should be considered within bioeconomy value chains. In addition, every stage of a value chain (including biomass production) has its own emission profile that should be reviewed with alternatives and opportunities for energy and resource efficiency maximised.
- **Sequestering carbon in soils and biomass** – Soils under grassland and forests are a carbon sink (estimated as up to 80 million tonnes of carbon per year) while soils under arable land are a carbon source (estimated as between 10 and 40 million tonnes of carbon per year). These figures highlight the need for a two-pronged approach to simultaneously protect and increase the storage of organic carbon. This can be achieved through the adoption of more sustainable management regimes, e.g.. adapting existing production methods on both agricultural and forest land, integrating alternative production methods (such as the increased use of permanent crops in agriculture and agro-forestry), and changing land use, e.g. to incorporate additional landscape features, wooded areas or permanent grasslands, or afforestation (increasing forest biomass through sustainable management).

There are, however, risks to carbon sinks associated with unsustainable intensification of both agricultural and woodland/forest management. Changing land or forest management can promote or reduce sequestration, hence the need to involve land managers when defining a sustainable resource base for value chains⁸.

⁷ For more details on the role of agriculture in climate action see ENRD rural review 23 on the Green Economy and opportunities for rural Europe, chapter 2 on moving to a low carbon economy: https://enrd.ec.europa.eu/publications/eu-rural-review-23-green-economy-opportunities-rural-europe_en

⁸ For more details on the soil and soil carbon, the opportunities and risks see Rural Review 25 on Resource Efficiency which includes a details analysis on the subject: https://enrd.ec.europa.eu/publications/eu-rural-review-25-resource-efficiency_en

Reducing emissions from agriculture - A review for the European Commission assessing the potential agricultural interventions focused on GHG mitigation⁹ identified the following interventions as having the potential to support emission reductions:

- Land use i.e. changing land cover or use of land including conversion of arable land to grassland, restoration of wetlands, integration of agro-forestry and permanent crops, maintenance of hedgerows and other woody landscape features;
- Crop production i.e. reduced or zero tillage, leaving crop residues in field, use of cover and catch crops, extension of the perennial phase of crop rotations, delaying the application of mineral N fertilisers;
- Livestock production i.e. disease management, use of sexed semen in dairy, breeding lower methane ruminants, feed additives, anaerobic digestion;
- Nutrient and soil management i.e. soil and nutrient management plans, use of nitrification inhibitors, improved nitrogen efficiency, biological nitrogen fixation in rotations and in grass mixes;
- Energy i.e. carbon audit tools and improved on-farm energy efficiency

Consideration should be given to how the bioeconomy could promote and support such activities.

The **EIP-Agri network** has done extensive work to innovate on agricultural and forestry activities with potential to contribute to climate change mitigation. Specific Focus Groups have explored practices for example on:

- Agro-forestry <https://ec.europa.eu/eip/agriculture/en/focus-groups/agroforestry-introducing-woody-vegetation>
- Carbon Sequestration in arable farming <https://ec.europa.eu/eip/agriculture/en/focus-groups/moving-source-sink-arable-farming>
- Forest and climate change <https://ec.europa.eu/eip/agriculture/en/content/focus-groups/new-forest-practices-and-tools-adaptation-and>
- Grazing for carbon https://ec.europa.eu/eip/agriculture/en/focus_groups/grazing-carbon
- Livestock emissions <https://ec.europa.eu/eip/agriculture/en/focus-groups/reducing-emissions-cattle-farming>
- Nutrient recycling <https://ec.europa.eu/eip/agriculture/en/focus-groups/nutrient-recycling>
- Renewable energy on farm <https://ec.europa.eu/eip/agriculture/en/focus-groups/enhancing-production-and-use-renewable-energy-farm>

⁹ Effective performance of tools for climate action policy - meta-review of Common Agricultural Policy (CAP) mainstreaming for DG Clima of the European Commission (2016) - https://ec.europa.eu/clima/sites/clima/files/forests/lulucf/docs/cap_mainstreaming_en.pdf

3. Opportunities offered by the RDPs and the CAP

As shown above, practices to mitigate climate change are known within the different areas of the bioeconomy, not least related to land management and production. More awareness and promotion is needed, though. How can these practices be better disseminated, promoted and upscaled throughout the rural economy and bio-based value chains?

The EU Common Agricultural Policy (CAP) is and will remain the central tool to upscale climate action in the rural and agricultural part of the bioeconomy.

An evaluation of the CAP¹⁰ looking at support for climate action completed in 2018 noted that opportunities had been missed in the current CAP programming period (2014-2020) to contribute more coherently and with greater relevance to climate objectives. It noted that the potential of CAP measures had not been realised due to choices made both at the Member State level and by farmers. This was in part due to the complexity of issues faced and understanding of the best pathways for support, and it was noted that in some instances potential for climate action is being limited by the availability of expertise. This also translated into farmers not fully understanding options available and perceiving climate focused interventions to be damaging to economic performance or reducing production.

Rural Development Programmes (RDPs) under the CAP 2014-20 still offer an opportunity to promote all aspects of rural bioeconomy¹¹ as well as climate action. Analysis has shown that the vast majority of measures could be adapted and tailored to promote climate mitigation, although currently climate action may not be expressly the goal of the RDP measure (see detailed analysis in Annex I). Importantly **the rural development focus means that RDPs can support activities beyond land-focused interventions**, including renewable energy installation, processing facilities, or support at community level to change. This enables more strategic interventions along rural value chains.

In RDPs, or indeed any policy intervention, making connections between the steps in the value chain and the different opportunities for climate action can be challenging. Policies need to integrate replacement of fossil resources with the promotion of soil carbon sequestration and simultaneously support agricultural and forest adaptation to climate impacts. This takes coordination across different areas of expertise and funding streams, combined with political will and an external driver to promote change. A challenge for the future is how to deliver such an integrated approach to climate action through bio-based value chains, and how to use CAP post-2020 support to do this.

¹⁰ Evaluation study of the impact of the CAP on climate change and greenhouse gas emissions, Alliance Environnement, October 2018 - https://ec.europa.eu/agriculture/sites/agriculture/files/evaluation/market-and-income-reports/2019/cap-and-climate-evaluation-report_en.pdf

¹¹ See the publication How to use RDPs to support rural bioeconomy? Recommendations from the ENRD Thematic Group on 'Mainstreaming the bioeconomy' https://enrd.ec.europa.eu/sites/enrd/files/s11_bioeconomy-handout_how-to-support-bioeconomy.pdf

4. Mapping climate goals along value chains

The TG discussion will focus on opportunities for integrating climate action into bioeconomy value chains, and the tools and support mechanisms needed. It is first helpful to set out some principles for defining climate action in the context of bioeconomy value chains. Such principles could include the following:

- For bioeconomy value chains to deliver on climate they need to take into consideration emission reduction, carbon sequestration and the opportunity for innovations in terms of bio-based products.
- The opportunities for mitigation that also support adaptation to climate change and could help promote long term security in the face of a changing climate should be considered.
- The needs, opportunities and specific climate-related goals may differ depending on the link in the value chain (production, processing, recycling and distribution), the relationship to land management and the flexibility of delivery.

To identify the potential of a given value chain to successfully deliver on the above principles for climate action, the following elements need to be understood and defined:

- a. The ultimate goal of the value chain in relation to climate action;
- b. The opportunities and commitments needed at each stage to deliver on that goal and the associated risks involved;
- c. The proofs of success needed to demonstrate achievement of that goal;
- d. How information on success and delivery will be communicated along the value chain, i.e. how to communicate that a material or product is compliant with the stated goal;
- e. How consumers and end users will be informed about the achievements within the value chain and against the goal, i.e. demonstrating added value and validating the value chain's contribution to climate action; and
- f. How actors throughout the value chain will be rewarded for meeting their commitments and ultimately contributing to the achievement of the value chain's climate goal.

RDP support, and other public measures, are potentially available to help kick start both the conceptualising and delivery of the goals along the different steps of a value chain. There are also tools that would need to be adapted or developed to support decision making and communication both to end users and along the value chain in relation to delivery of climate action. This transition should be part of a wider transition in terms of moving towards a green economy and as such lessons can be applied from work already done on this issue by the previous ENRD TG (see Annex II).

5. Possible outputs of the Thematic Group

The ENRD Thematic Group 'Bioeconomy and Climate Action in Rural Areas' can add value through the identification of the incentives and support approaches to upscaling climate action in rural bioeconomy value chains. The TG's work can help orient the use of RDPs and other support to rural activities that effectively deliver on the climate objectives of the CAP post-2020.

The work of the TG will explore pragmatic ways to facilitate climate action along bioeconomy value chains, developing practical ideas and guidelines to facilitate future interventions. The intention is that such activities would enable the steps a to f mentioned above to be realised, i.e. identifying the tools and mechanisms that can help transform value chains to promote climate action and be rewarded for doing so.

The TG might focus its efforts on discussing experiences and good practices for a number of key areas, including:

- **Monitoring and reporting approaches applicable to the different stages of the value chain, recognising the roles of different actors and the risks faced** - Monitoring, reporting and verification (MRV) systems provide evidence of the performance of different elements of the value chain, that can be communicated to other actors and consumers to demonstrate compliance/achievement of set goals. MRV can also support improved advice and understanding, leading to a positive cycle of delivering increasing levels of ambition. As noted in the earlier ENRD TG looking at resource efficient water and soil management, effective MRV is key to communication and trust in the value chain¹².
- **Community-level approaches to mainstream climate action and develop value chains that generate value for the rural community** - Community-driven approaches are a possible mechanism for promoting added value and value chains that deliver on climate mitigation and adaptation goals. Collective or collaborative/cooperative approaches have merit not just for achieving environmental objectives, but also for social and economic reasons. The main added value of promoting collective action from an environmental perspective is that it allows improved environmental outcomes across a wider geographic area or throughout a value chain. Collective action involves dialogue between multiple actors, often with different perspectives, and this leads to common debate and agreement on the objectives for a particular area. The synergies and trade-offs between different objectives can be identified and action agreed to maximise those synergies and minimise the trade-offs¹³.
- **Decision support tools to help define and balance the needs of actors at different steps of the value chain, identify the climate interventions to be prioritised and the consequent opportunities and risks** – What is best for me? How can I contribute? Where should I start? What are the trade-offs I need to consider? What are the impacts on others in my value chain? Who do I need to support my idea? As can be seen from the different needs set out in this paper, addressing climate action often involves making complex decisions about the interventions required, taking into account needs, understanding, risks and limitations along value chains of society and different individual actors. Different tools and approaches exist to help different actors - from farmers to managing authorities to coordinators of public procurement processes - make climate-friendly choices.
- **Valorising climate action along the value chain and just rewarding of all actors**, taking into account added value for society, the risks they face and/or the level of transformational

¹² For more details on ideas relating to MRV needs and how to relate this to delivering results and developing payment regimes see 'Result-based payment schemes (RBPS) for Soil and Water in Europe', ENRD Thematic Group (TG) on sustainable management of water and soils, Sept 2018 - https://enrd.ec.europa.eu/sites/enrd/files/tg_water-soil_report-rbps.pdf

¹³ For more detail on collaborative approaches and their potential application see https://enrd.ec.europa.eu/sites/enrd/files/tg2_water-soil_briefing_collective-approaches.pdf

change required – Opportunities to valorise climate action along the value chain, including both public and market based rewards, will be considered. When market failures for rewarding public environmental goods, such as carbon sequestration, persist, how to ensure sufficient economic incentives for ecosystem services or climate friendly investments throughout the value chain? How can support be linked to delivery and what are the most effective ways of doing this so as to reward efforts of different actors?

The first TG meeting will further explore areas that could be considered in its further work and discuss whether these proposals are appropriate.

Annex I – Measures within the 2014-20 RDP framework and their relationship to climate mitigation activities

The following table was extracted and adapted from the evaluation of the CAP in relation to climate action. It highlights how different RDP measures could be used to mitigate against GHG emissions. Measures highlighted in green specifically contain climate mitigation as part of their intervention logic, where as those highlighted in blue have the potential to be used for climate mitigation but it is not an explicit requirement in the regulation¹⁴. ‘Sustainable management of natural resources and climate action’ is one of the CAP 2014-20 general objectives; however, CAP measures have mostly not been designed specifically to respond to climate objectives.

The table can be cross-read with the recommendations on using the RDPs to support sustainable bioeconomy, established by the previous ENRD Thematic Group ‘Mainstreaming the Bioeconomy’: https://enrd.ec.europa.eu/sites/enrd/files/s11_bioeconomy-handout_how-to-support-bioeconomy.pdf

Measure / instrument	Theoretical effects on mitigation
M1: Knowledge transfer and information actions	The measure can be used to spread knowledge and improve access to information about climate mitigation, although Member States are not required to use it for this purpose.
M2: advisory farm management and relief services	By requiring the provision of knowledge and information services on cross-compliance and more broadly on environmental issues such as climate change (which is required by EU regulation), this measure is expected to contribute to the diffusion of practices beneficial to climate mitigation.
M3: Quality schemes	It is theoretically possible that low GHG intensity, or the use of specific management practices linked to climate benefits, could be adopted as quality criteria and that this could incentivise reductions in emissions by farmers participating in a scheme.
M4: Investments in physical assets	Non productive investment support is linked to agri-environment-climate schemes - Productive investments contributing to climate mitigation can include: animal housing and equipment including manure and slurry storage/ processing; farm buildings in plant production (facilities for post-harvest treatment and storages for field crops); support and cover constructions for perennial crops; biomass processing for energy and biogas stations and food processing equipment. Non-productive investments contributing to climate mitigation include: capital works within the framework of an Agri-environment and climate contracts and restoration of wetlands and moorland. The GHG impacts of many investments are complex and can include negative ones.
M5: Disaster risk reduction	Landscape features (e.g. hedges) created as part of preventative or restorative action may also increase carbon stock.
M6: farm business and development	Identified in the EAFRD regulation as a measure with the potential to contribute to climate action, although not explicit in the wording of the article. Further detail is provided in the delegated act detailing the content of the business plans required as part of this measure (Art. 5). It must include the details of the actions, including those related to environmental sustainability and resource efficiency.
M7: Basic services and village renewal	Under 7.2 (including investments in renewable energy and energy saving), investments can include: - facilities to produce and use regenerative energy in rural municipalities (e.g. district heating networks to use and process heat of bioenergy plants); - establishing distribution networks for heat/ electric/ gas power from biomass or other renewable sources; While 7.6 (for the maintenance, restoration and upgrading of the cultural and natural heritage of villages, rural landscapes and high nature value sites including related socioeconomic aspects and environmental awareness actions) may support studies relevant to climate mitigation such as territorial studies
M8: forest investments	Afforestation and agroforestry affect carbon stock (in soil, biomass and dead organic matter).
M10: Agri-environment-climate	Examples of mitigation activities funded include: Maintain permanent pasture; Restriction on peat cutting; No grazing; No fertiliser application; Limits to fertiliser application; Grass cover; Green cover; Erosion prevention strips; No tillage; Ploughing-in of crop; Buffer strip; Fallow; Rotation with legumes; No burning of straw, stubble or cut residue; Management

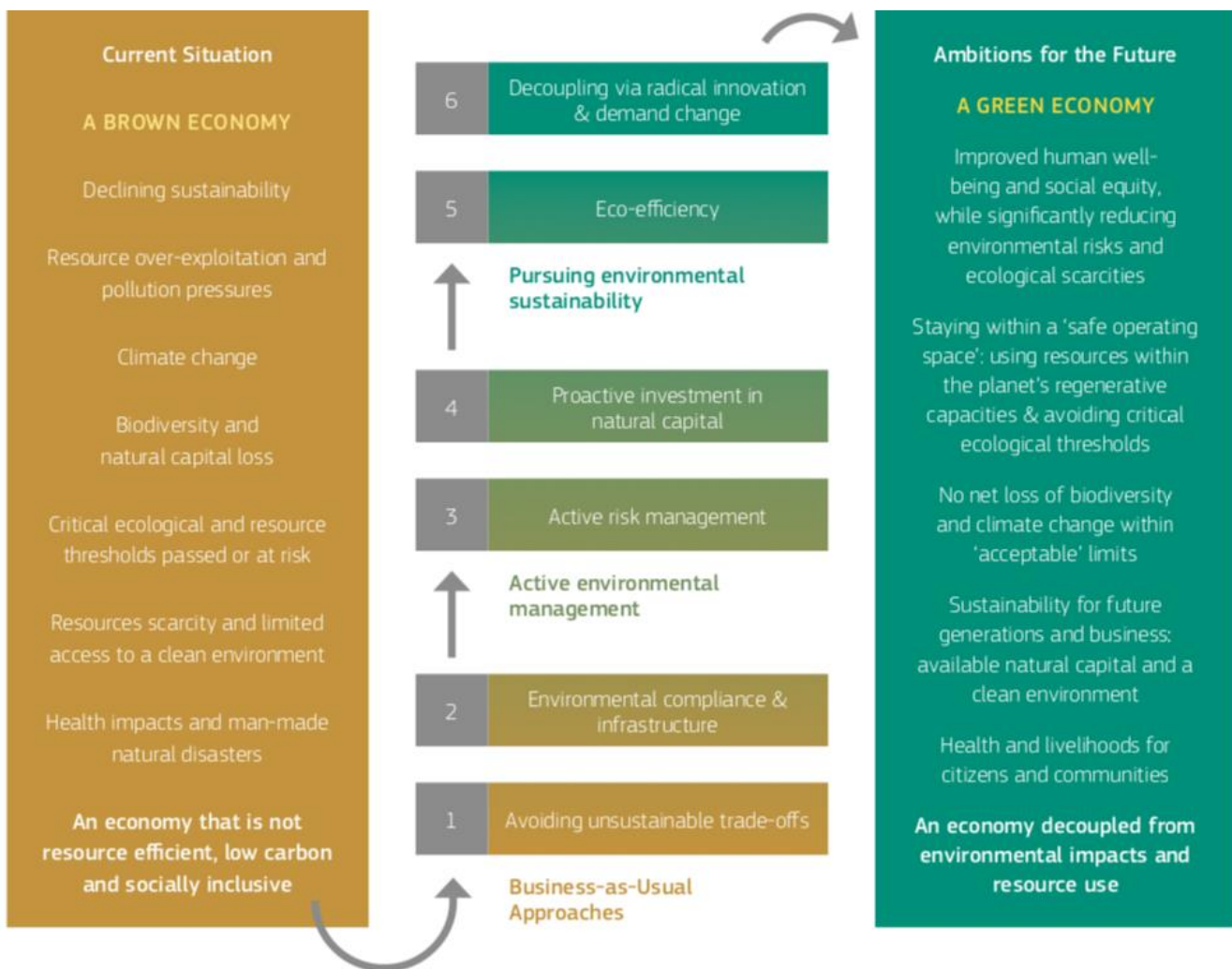
¹⁴ To note that the table excludes M9 and M18 as these were deemed outside the scope of the evaluation.

	of non-aquatic landscape feature; Strips or patches for wildlife; Maintain area out of production; Take area out of production; Traditional grass management; Grazing regime; No machinery; Management plan; Overwinter stubbles; Mulching regime; Tillage regime; Runoff furrows Traditional crop management; Rotation; Traditional orchards; Pruning regime; Management of water features; Water level management
M11: Organic Farming	<p>Generally lower direct emissions per hectare farmed than conventional systems due to greater use of soil management systems and legumes. Longer rotations likely to increase sequestration where soil is a sink, but also may result in leakage of emissions linked to production shifts</p> <p>Organic systems avoid the use of mineral fertiliser and use biological N-fixing where appropriate, leading to a reduction in direct N₂O emissions compared to conventional systems.</p>
M12: Natura 2000 and Water Framework Directive	Payments to conserve and restore wetland and peatland in Natura 2000 areas will contribute to carbon sequestration where these areas have carbon rich soil. Possibility of ILUC if the payment helps to secure compliance with restrictions on production.
M13: Areas facing natural constraints	<p>High level of uncertainty in the outcome of this measure: on the one hand it can be seen to be preventing land abandonment and loss of grassland (with the result of protecting C stocks in soil); but on the other hand it can be seen to be driving grazing practices where the practice would otherwise be abandoned and/or preventing succession to forest or other wooded land.</p> <p>Land abandonment is implicated as a major cause of the increasing intensity of forest fires (through increased accumulation of fuel load, lack of actions that prevent fires, late detection and response to fires, etc.)</p>
M14: Animal welfare	Activities are detailed in the accompanying delegated act (Art. 10) and refer to water, feed and animal care, housing conditions, outdoor access and avoiding mutilation of animals.
M15: Forest-environment-climate	Likely to contribute to maintaining the status quo for removals by providing support to forested land and protecting carbon stock in soil and above ground biomass. Main mitigation activities supported include restructuring; low impact silviculture; and other practices such as leaving groups of trees after final felling, preservation of wetland habitats, repression of aggressively expanding non-indigenous tree and shrub species.
M16: Cooperation	Can contribute to driving research in climate mitigation actions with the result of improving the knowledge base and improving capacity to deliver them.
M17: Risk Management	No mitigation impact unless those providing insurance to farmers insist on risk prevention measures which have incidental benefits to mitigation. For instance, an insurer might insist on the planting of trees or hedges to manage floodwater which have the incidental benefit of adding to carbon stocks.
M19: Leader	CLLD strategies can include climate actions and support towards transition to a low carbon economy and reducing GHG emissions. However, this measure has a capacity strengthening role rather than driving the climate actions.

Annex II – Transitioning to a green economy – Lessons for bioeconomy transition

A previous ENRD Thematic Group examining how to transition to a green economy concluded that Rural Development Programmes (RDPs) can support low-carbon, resource-efficient and socially equitable investments in rural areas as well as sustainable management of natural resources in a wide range of economic sectors. Achieving the full scale of the potential transition to the green economy will mean adoption of current good practice on a much greater scale than is currently the case within the EU-28 and new ways of thinking and working across territories. Cooperation, innovation, rural entrepreneurship and knowledge transfer must be encouraged and supported¹⁵.

There are six building blocks in the transition to the green economy. When discussing climate action in the context of the rural bioeconomy we are essentially talking about the transformational end of the green economy spectrum i.e. from point 3 upwards: new value chains in bioeconomy offer greater opportunities for society and contribute to GHG mitigation and/or emission reductions.



Source: Fedrigo-Fazio and ten Brink, 2012

¹⁵ https://enrd.ec.europa.eu/publications/eu-rural-review-23-green-economy-opportunities-rural-europe_en