

# Training Webinar 5: Supporting policies for bioeconomy - focus on biochemicals

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Training Material based on Task 4.2



# Overview

1. Overview of bio-based economy (BBE) and policy instruments
2. EU policy instruments supporting biochemical sector and link to national and regional policy implementation
3. Barriers and opportunities related to policy development and implementation
4. Good policy examples
5. Conclusions and recommendations

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# Policy instruments for the bioeconomy

- ▶ The bioeconomy is defined as *the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food, and pulp and paper production, as well as parts of chemical, biotechnological and energy industries* (Bioeconomy strategy, EC, 2012).
- ▶ **5 objectives of the revision of the Bioeconomy Strategy (EC, 2018)**
  1. - Ensuring food security
  2. - Managing natural resources sustainably
  3. - Reducing dependence on non-renewable resources
  4. - Mitigating and adapting to climate change
  5. - Creating jobs and maintaining European competitiveness.
- ▶ To understand how policies can regulate the development of a bioeconomy in a direction that is environmentally and economically sustainable, a **bioeconomy system overview** is required.

# Bio-economy system overview

## Socio-economic drivers

Markets



Policies



Science & technology



Social organisations



Individual actors



## Bioeconomy activities

Enabling environment (transport infrastructure, R & D, Regulations,

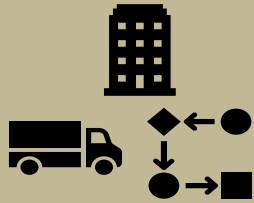


Food environment (food labelling & promotion, quality & taste, access to food)

Industrial environment (product quality, labelling, promotion, standards)



Biomass



Logistics, pre-treatment, storage & trade



Processing & conversion



Market, retail & distribution



End products/uses

Business services



Consumer characteristics/ preferences



## Environmental drivers

Minerals



Climate



Water



Biodiversity



Fossil fuels



Land Soils



# Policies in the bio-economy system: chain

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
Biomass supply	<ul style="list-style-type: none"> <li>• Waste regulations (waste management, waste separation, classification, landfill restrictions, recycling rules, end-of-waste criteria, waste hierarchy).</li> <li>• Forest regulation: sustainable forestry rules</li> <li>• Ecological zoning &amp; restrictions (in relation to EU Natura2000 &amp; Habitat Directive) in forests or to grow crops</li> <li>• Food safety rules</li> </ul>	<ul style="list-style-type: none"> <li>• Support of sustainable forestry management</li> <li>• Rural development support, e.g. for on-farm bioenergy, or energy crop premium (in relation to EU-CAP);</li> <li>• Support for establishment of forest roads</li> <li>• Waste fees, return fees e.g. bottles</li> <li>• RDP measure supporting agroforestry</li> <li>• RDP measure for afforestation</li> </ul>	<ul style="list-style-type: none"> <li>• Voluntary standards (FSC, PEFC)</li> <li>• Forest harvesting guidelines</li> <li>• Product labels at farm level (e.g. organic farming)</li> <li>• Capacity building on good agricultural practices and specific farming techniques</li> <li>• Guidelines and advisory support for avoiding waste, waste recycling, reuse (e.g. plastic bottles)</li> <li>• Low ILUC certification</li> </ul>

# Policies in the bio-economy system: chain

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
<b>Logistics</b>	Phytosanitary requirements	Support of infrastructure development such as forest roads, biomass hubs or yards	Setting up collection systems (separated streams) Creating standards for commodities
<b>Conversion</b>	Renewable energy mandates CHP mandates Requirement of Best Available Technologies (BAT) Zoning rules (industry park, ...) Product norms & fuel standards Requirements/restrictions for the use of co-products & residues (e.g. for compost/digestate)	Subsidies / loans for conversion installations <b>Producer tax incentives</b> Taxes for fossil fuels in energy production Tradable certificates for biofuel/bioenergy producers Emission Trading Scheme <b>CO2 tax</b> R&D support for process development, demo and scale-up installations	Guidelines how to use standards <b>SMART specialisation clusters/platforms</b>

# Policies in the bio-economy system: chain

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
<b>Distribution</b>	<p>Substitution mandates (quota) for fuel &amp; energy distributors</p> <p>Grid connection requirements (electricity, natural gas grid, district heating)</p> <p>Obligations to develop alternative fuel infrastructure</p>	<p>Feed-in tariffs / feed-in premiums</p> <p>Support for grid development (e.g. district heating)</p> <p>Subsidies to develop alternative fuel infrastructure</p> <p>Trade import tariffs</p>	<p>Labelling / certificates of origin</p> <p>D.O.P. certificates</p>
<b>End use/markets</b>	<p>Obligations for renewable energy in buildings</p> <p>Green public procurement</p>	<p>Promotion of clean and energy efficient vehicles</p> <p>Taxation - tax differential for (energy) products according to renewable and/or CO2 advantage</p> <p>User incentives (tax incentives biofuel vehicles, free parking, exemption of congestion charge / road tax, ...)</p>	<p>Green procurement (private)</p>



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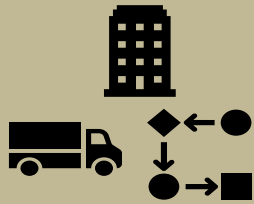


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# Policies in the bio-economy system: chain environment

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
<b>Enabling environment</b>	Requirements for good agricultural practices, GAEC and Greening Regulation on organic production	Direct payments and Cross Compliance RDP agrienvironment and climate measures RDP measures supporting organic farming practices Research programmes/Support to R&D for sustainable innovations	RED I and II targets Bioeconomy action plans & roadmaps Environmental action plans Circular economy action plans and road maps Innovation action plans Public private partnerships
<b>Food environment</b>	Food quality requirements Food safety requirements	Research programmes/Support to R&D for sustainable food production	Voluntary standards Product labels Clustering, cooperation, networking facilitation
<b>Industrial environment</b>	Product quality requirements Product safety requirements Rules for fair competition	Research programmes/Support to R&D for innovations in industries	Voluntary standards Product labels Clustering & cooperation, networking facilitation

# Policies in the bio-economy system: chain environment

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
<b>Business services</b>		<p>Soft loans</p> <p>Support knowledge/advice in adaptation processes towards more bio-based, circular, climate and/or energy efficiency in businesses/buildings/industrial production processes</p>	Information sharing
<b>Consumer preferences &amp; behaviour</b>	Public procurements rules	<p>Taxation - tax differential for energy products according to renewable and/or CO2 advantage (e.g. wind mills, PV, electric cars etc.)</p> <p>User incentives (tax incentives biofuel vehicles, free parking, exemption of congestion charge / road tax, ...)</p>	<p>Private/public procurement</p> <p>Information sharing</p>

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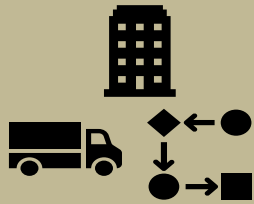


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Land Soils



# Policies in the bio-economy system: wider environmental and socio-economic environment

Supply chain	Regulations	Economic instruments	Other 'soft instruments'
<b>Environmental drivers</b>	Emission legislation Habitat and Birds Directives Nitrate Directive Sewage sludge Directive Water Framework Directive		Climate agreements Sustainable Development goals
<b>Socio-economic drivers</b>		Import tax Employment stimulation schemes European Development Fund	Sustainable Development goals Innovation action plans Public private partnerships

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# EU bio-economy policy strategies & action plans I

- ▶ **EU White Paper (1993):** the need for non-physical, knowledge-based investments, and the role of biotechnology in innovation and growth
- ▶ **Lisbon Agenda in 2000:** called for ‘global leadership in the knowledge-based economy to secure competitiveness and economic growth’ and life sciences and biotechnology were seen as most promising to reach these objectives.
- ▶ **Bioeconomy Action plans (2012):** main actions in bioeconomy sectors: 1) investments in research, innovation and skills; 2) reinforced policy interaction and stakeholder engagement; and 3) enhancement of markets and competitiveness
- ▶ **7th environment action plan (EC 2013) & Circular Economy Package (EC, 2015):** *‘In 2050, we live well, within the planet’s ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society’s resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society’*

# EU bio-economy policy strategies & action plans II

- ▶ **2018 update of the Bioeconomy Strategy:** maximise its contribution towards the Paris Agreement & the 2030 Agenda and the Sustainable Development Goals (SDGs).
  - ▶ Recommended to Member States (MSs) to develop own **bioeconomy strategies**
  - ▶ Encouraged At regional level the elaboration of research and innovation strategies for **SMART specialisation**
- ▶ **Green Deal (GD)** (December 2019): providing the key ambitions en instruments to reach in fields of climate neutrality, circular economy, increased economic growth and strong research and innovation leadership by European institutions and industries in these fields. All EU actions and policies will have to contribute to the European Green Deal objectives.
- ▶ **Circular Economy Action Plan (COM(2020) 98 Final):** further then GD ambitions - transition to further circularity as an instrument to reach climate-neutrality.
  - ▶ 50% of GHG emission come from resource extraction and processing
  - ▶ introduces legislative and non-legislative measures and targets areas where action at the EU level brings added value mostly through existing sectorial policies.
  - ▶ to reduce the EU's consumption footprint and double the EU's circular material use rate in the coming decade, while boosting economic growth through measures for products, on design, for consumers and public buyers.



# Sectorial EU policies -national & regional actions I

Topic	Main EU policy instruments	Description	Type of actions required at national/regional level
Climate & Energy	2003 European Union (EU) Energy Tax Directive	National emission reduction targets for 2030 for all MSs, from 0% to -40% from 2005 levels (and reductions between 20%-0% for 2020, except for Croatia & Bulgaria). These targets concern emissions from most sectors NOT included in the EU Emissions Trading System (EU ETS), such as transport, buildings, agriculture and waste.	<ul style="list-style-type: none"> <li>MS are responsible for national policies and measures to limit emissions</li> <li>MSs had to submit National Energy and Climate plans NECPs 2021-2030 to EC (31 December 2018).</li> <li>Member States were then required to submit their final NECPs (31 December 2019).</li> <li>MS also need to submit 2-year progress report</li> <li>MSs are also required to submit national long term strategies looking forward to 2050 (January 2020).</li> </ul>
	New Renewable Energy Directive (RED II)	New binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.	
	Effort sharing Regulation (2018)	One of the first instruments that resulted was the the 2003 European Union (EU) Energy Tax Directive.	
	Emission Trading System (ETS)	EU emission trading system (ETS) set a cap on GHG emissions from large-scale facilities in the power and industry sectors and the aviation sector. Companies receive or buy emission allowances which they can also trade. Emission caps become smaller every new phase	This is entirely organised at EU level, without putting any requirements of MSs.

# Sectorial EU policies -national & regional actions II

Topic	Main EU policy instruments	Description	Type of actions required at national/regional level
<b>Waste</b>	<b>Packaging Directive</b>  <b>Waste Framework Directive (2008/98/EC),</b>  <b>Landfill Directive (1999/31/EC)</b>	Since 2012 there are three main principles guiding waste management in the EU which is the waste hierarchy and the Polluters Pay principle and the extended producer responsibility.	<ul style="list-style-type: none"> <li>• MS are responsible for national policies and measures to apply the requirements of the directives.</li> <li>• MSs also need to verify compliance with targets set regarding the re-use, recycling and recovery of waste.</li> <li>• 3-year reporting on waste management incl. information on how they manage hazardous waste, how they collect and treat waste oils, and how they collect and treat biowaste.</li> </ul>
	<b>Sewage sludge Directive</b>	Specifies how sludge must be treated, under what requirements it can be used as fertiliser on agricultural land and what reporting and monitoring obligations are regarding production and use of sewage sludge.	<ul style="list-style-type: none"> <li>• Need to do 3-year reporting on waste management incl. on sludge management</li> </ul>

# Sectorial EU policies -national & regional actions III

Topic	Main EU policy instruments	Description	Type of actions required at national/regional level
<b>Industry, bio-chemicals &amp; materials</b>	<p><b>REACH, EU 2006</b></p> <p><b>Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC)</b></p> <p><b>Directive on industrial emissions 2010/75/EU (IED)</b></p>	<p>Only for the Bio-based chemicals and materials specific EU legislation to comply with regulatory framework for the management of chemicals applies.</p> <p>A more general IPPC framework applies to industrial activities with a high pollution potential. Issuing permits for existing and new installations to prove that requirements are followed to ensure the protection of soil and groundwater and set emission limits for pollutants.</p>	<p>No MSs requirements. The <b>European Chemicals Agency</b> manages this integrated system for the registration, evaluation, authorisation and restriction of chemicals.</p> <p>The Directive on industrial emissions entered into force in January 2011 and was to be transposed into national legislation by Member States by January 2013.</p>

# Sectorial EU policies -national & regional actions IV

Topic	Main EU policy instruments	Description	Type of actions required at national/regional level
<b>Research and innovation</b>	<p><b>SMART Specialisation regional policies</b> –</p> <p><b>EU research and development framework programmes (e.g. FP7, H2020)</b></p> <p><b>BBI-JU European Structural and Investment Funds (ESIF) which consist of five main funds</b></p>	<p>SMART specialisation encourages and facilitated the setting up of Technology and Innovation clusters at regional level</p> <p>Research, development and innovation in the BBE is facilitated through several EU wide programmes: Horizon 2020, the European Structural Funds and the European Fund for Strategic Investment</p> <p>EU encourages strongly the <b>Public Private Partnership</b> constructions. The <b>BBI</b> is an example particularly focussed on BBE in which EC and companies participate and finance research and Innovation.</p>	<ul style="list-style-type: none"> <li>• No obligation to EU countries and regions exist but involvement is logical in setting up <b>SMART technology and innovation clusters</b>.</li> <li>• As to other research and innovation countries and regions are challenged to involve as much as possible local companies, research institutions to participate in <b>H2020 &amp; BBI research and innovation</b>. This requires streamlining national and EU research and innovation strategies and funding (co-financing from national funds) and information and communication activities.</li> <li>• For the spending from regional and structural funds every MSs has to specify its own spending targets in plans and adopt and translate these in national actions and legal framework.</li> </ul>

EU policy in development in near future  
Green Deal (GD) (December 2019)  
Circular Economy strategy (March 2020)

# Relevant elements of Green Deal for biochemical sectors

- ▶ More ambitious EU strategy on climate change mitigation:
  - ▶ Climate Law: 2050 climate neutrality is anchored in legislation also at national level
  - ▶ Adjustment in the **Emission Trading System**
  - ▶ Adjustment in Regulation on land use, land use change and forestry (LULUCF)
  - ▶ Carbon pricing instrument introduced throughout the economy, incl. a carbon border adjustment mechanism, to reduce 'carbon leakage' risk
- ▶ Higher ambitions for clean energy:
  - ▶ In line with REDII Renewable energy targets of at least 32% by 2030
  - ▶ National Climate Plans (NCPs), submitted in 2019, reviewed. If ambitions too low adaptation is required in re-submitted 2023 NCPs

# Relevant elements of Circular Economy Action plan for biochemical sectors I

- ▶ Details of action beyond GD are worked out in Circular Economy Action plan (*'For a Cleaner and more competitive Europe'* )
- ▶ Mobilising industry for a clean and circular economy:
  - ▶ Decarbonize and modernise energy intensive sectors (e.g. steel, chemicals, cement industries)
    - ▶ A High Level Group of Energy Intensive Industries made recommendations
    - ▶ Finances from **EU Emissions Trading System Innovation Fund** which will help to deploy large-scale innovative projects
  - ▶ Follow-up on 2018 Plastics Strategy
    - ▶ tackle intentionally added micro plastics and unintentional releases of plastics (e.g. from textiles and tyres)
    - ▶ provide a regulatory framework for biodegradable and bio-based plastics, and it will implement measures on single use plastics.
    - ▶ Sustainable package legislation on the way: all packaging in the EU market is reusable or recyclable by 2030.
  - ▶ Important Projects of Common European Interest: new forms of collaboration with industry and investments in strategic value chains for example through large-scale pooling of resources

# Relevant elements of Circular Economy Action plan for biochemical sectors II

- ▶ **A sustainable product policy legislative initiative (widened Ecodesign Directive):**
  - ▶ improving product durability, reusability, upgradability and reparability,
  - ▶ addressing hazardous chemicals in products, and increasing their energy and resource efficiency;
  - ▶ increasing recycled content in products, while ensuring their performance and safety;
  - ▶ enabling remanufacturing and high-quality recycling;
  - ▶ reducing carbon and environmental footprints;
  - ▶ restricting single-use and countering premature obsolescence;
  - ▶ introducing a ban on the destruction of unsold durable goods;
  - ▶ incentivising product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle;
  - ▶ rewarding products based on their different sustainability performance, including by linking high performance levels to incentives.
- ▶ Measures to avoid false green washing through introduction of standard methodologies to assess products impacts on environment, digitalisation and information access on sustainable and circular characteristics of products



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# Main barriers hampering BBE development

- ▶ Absence of bioeconomy strategy
- ▶ Lack of transparency and policy coherence
- ▶ Fragmentation of policy instruments
- ▶ Timeframe of policy is uncertain: Long term vision and policy continuity are needed to build up investor confidence and to catalyse investment.
- ▶ Biomass availability: The sustainable mobilisation of sufficient and good quality biomass is essential to build the bio-based economy. Obstacles are among others low cooperation of farmers and foresters, absence of whole-year availability of the biomass (seasonality), uncertain provenance, challenging logistics, low quality and sustainability.
- ▶ Need for research and innovation that are required to design a bioeconomy that fits to the regional potentials
- ▶ Vague goals and no operationalisation in policies
- ▶ Public awareness and stakeholder acceptance, and lack of demand-side policy.

# General opportunities for the BBE development

- ▶ Mobilisation of biomass: create a good understanding of the unutilized biomass potential in agriculture, forestry and industry.
- ▶ Commodities from biomass have to be created. They have the advantage of being fully tradable, of stable quality, complying with storage facilities, with shipping and conversion processes. As a result, contracting is easier, markets open faster and more options to finance become available.

# Opportunities for the BBE policy development

- ▶ Established governance mechanisms support supply and demand side policy instruments, create policies for innovation, align principles of different policies, prioritise thematic areas or values chains/cycles, take decisions on investments.
- ▶ General support on behalf of existing policy framework Provides a stable regulatory framework while remaining neutral concerning choices of technologies and promoting competition both with existing technologies and other sectors. A supportive policy framework is also able to bring bio-based economy closer to society.
- ▶ Follow the EU's bioeconomy and circularity strategies as much as possible as they already build on established policy frameworks and give solid guidance taking account of policy integration needs.
- ▶ The goals of the bioeconomy strategy can be achieved only by tackling existing policy fragmentation, engaging the civil society to a greater extent and putting in place the national and regional strategies.
- ▶ Good collaboration networks and tradition help: Close cooperation and adaptation of the new research outcomes, new innovative business opportunities, in (existing) BBE networks and platforms such as the BBE-JU, BIC, BioEast (in CEEC).

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## 2 good policy examples

Title	Country/ region	Sector	Purpose of the instrument with regard to the biomass value chain	Other policies described in same fact sheet
<b>Bioeconomy Technological Platform Piemonte (Smart Specialisation Strategy)</b>	<b>Italy Piemonte</b>	- Agriculture, Industry (chemistry), R&D	Enabling environment: Fostering industry - research collaboration particularly in bio-materials and chemicals	There are many smart specialisation cluster initiatives in EU such as the other example presented as good example policy in Bavaria, Bio-based Delta in the Netherlands, BioVale in the UK, IAR in France.
<b>Cluster Initiative Bavaria</b>	<b>Germany Bavaria</b>	- Industries, R&D	Enabling environment: Fostering research collaboration	

# Policy integration of 2 good policy examples

- ▶ SMART Specialisation - regional policies: Smart specialization promotes regional economic transformation particularly in innovation and investment through innovative activities in selected domains, which often overlap with the domains covered by the BBE.
- ▶ EU research and development framework programmes (e.g. FP7, BBI, H2020)
- ▶ For Bavaria cluster (2006): EU SMART specialisation framework has been helpful to get better access to EU funds.
- ▶ For Piemonte (2018): direct follow-up of the EU SMART specialisation policy and facilitation of funding sources. This Technological Platform is funded through European Regional Development Fund (ERDF) and supports the implementation of the Regional Smart Specialisation Strategy

# Impact and evaluation of 2 good policy examples

<b>Cluster Bavaria</b>	<b>Initiative</b>	<ul style="list-style-type: none"><li>• Since 2006 the government has invested 63 million euro in the cluster initiative. Furthermore, more than 248 million euro federal funds were acquired and this was added with over 39 million euro of EU funding.</li><li>• By April 2017, over 10,000 events were organized, in which 562,000 participants took part.</li><li>• 1,500 projects were initiated and 9,900 participants collaborated in these projects.</li><li>• The clusters have proven to be effective in national cluster competitions and have received Bronze, Silver or Gold Label of the European Cluster Excellence initiative.</li></ul>
<b>Bioeconomy Technological Platform (Smart Specialisation Strategy) Piemonte</b>	<p>The impact between 2018 and spring 2019 is :</p> <ul style="list-style-type: none"><li>- 9 projects approved (out of 11 submitted)</li><li>- 2/3 of approved projects (6 out of 9) focused on Circular Economy</li><li>- 46,6m€ total value of approved CE projects (out of 66m€)</li><li>- 20,2m€ ERDF contribution granted to CE projects (out of 29,2 m€)</li><li>- 112 partners involved in approved CE projects: 87 companies (both large, leading companies and SMEs), 33 Research Organizations</li></ul>	



# What makes these 2 good policy examples?

<b>Cluster Bavaria</b>	<b>Initiative</b>	<p>It has already been proven in the Bavarian case how effective it has been in boosting the bioeconomy through the tremendous increase in clusters and collaboration projects in innovation and knowledge development.</p> <p>The high quality of the clusters set-up in Bavaria was confirmed by the several received Bronze, Silver or Gold Label of the European Cluster Excellence initiative. The instrument also supports the marketing and branding of a region, therefore attracting new companies to the regions and setting up international collaborations. This instrument plays an important role to drive regions to more mature bio-based development stages, create additional income and employment opportunities in innovate sectors of the bioeconomy.</p>
<b>Bioeconomy Technological Platform (Smart Specialisation Strategy) Piemonte</b>		<p>This instrument is a good policy example because the new explorative collaboration projects between research and industry may result in new products and technologies that can be sold on the bio-based market.</p> <p>The technology platforms are the arena where experimentation for new products and technologies take place, resulting in improved level of technological readiness.</p> <p>The platforms are the motors to bioeconomy development and play a major role in improving regional competitiveness and creating new jobs.</p>

# Barriers encountered in 2 good policy examples?

- Combining funds from ERDF, due to different rules and procedures, with EAFRD (that would have been useful in order to involve farmers) proved very difficult.
- Different State Aids rules applicable to industrial and agricultural activities make it almost impossible to fund a complete regional value chain with a single fund.
- The private funds were difficult to secure too, particularly during the initial stage as the cross sector transfers, respective methods and products were not yet developed.
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- Challenge to engage farmers and forestry sector as well as SMEs in the R&D projects
- Lack of training which was particularly an issue among stakeholders from the agricultural and forestry sectors and from SMEs in R&D which do not have the operational, financial, technical and planning capacity to carry-on projects with a mid/long-term vision.

# Opportunities for good policy examples

- ▶ Presence of an EU regulation or stimulation framework: SMART specialization, financing from ERDFs, EADR, D, etc.
- ▶ Political interest in bio-based development and reaching sustainability goals and/or new business opportunities, which can often be translated in several national and regional strategies
- ▶ Research programs available: EU: H2020, BBI research & innovation support and national & regional research programs

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# Conclusions

- ▶ The European policies that are mentioned to contribute to bioeconomy development at regional level are especially rural development policies, climate and energy policies, cohesion policies, in particular SMART specialisation policy, waste management policies and specific bioeconomy policies.
- ▶ regions that are in the early stage (low to medium maturity) of bioeconomy development, we observe policy instruments that are often oriented to renewable energy and energy production from biomass and recycled waste.
- ▶ Regions that are in medium to high maturity stage of bioeconomy development have often surmounted the stage of renewable energy production and are focussing on bio-based products of higher value like bio-based chemicals, bio-based materials.
- ▶ A whole range of policy instruments that can be applied in all stages of maturity such as instruments to mobilize and regulate biomass, instruments for waste management, regulation and support instruments to safeguard the environment and prevent environmental impact, financing instruments for pilots, loans to help companies to finance bio-based investments, funding for research and research agenda, strategy for further bioeconomy and circular economy development and instruments for monitoring progress of bioeconomy and circularity

# Conclusions

- ▶ SMART specialisation platforms are good examples in terms of number of clusters and research and innovation actions realised, amount of money spent, but also in rewards received. The latter was seen for the Bavarian Cluster initiative that received numerous rewards of Bronze, Silver or Gold Labels of the **European Cluster Excellence initiative**
- ▶ In SMART specialisation clusters collaboration challenges occur particularly in the first phase of the development
- ▶ Lack of training and knowledge among the crucial stakeholders is barrier
- ▶ Market barriers were also hampering some policies for reasons as complications with securing private funds during the initial stage of innovation development, commercialization of new bio-based products is a slow process which requires secure policy and financing conditions to minimize the investment risk, highly innovative products or components require long and consistent efforts for training, education and knowledge transfer to entrepreneurs prior to commercialization.
- ▶ In the bioenergy policies strong competition between bioenergy and fossil-based alternatives was a barrier, but not the only and main barrier overall.

# Recommendations

- ▶ Regions that have the ambition to transform their economy to a more biobased and circular economy need to develop regional strategies and road maps
- ▶ How? See D4.2 (Recommendations in chapter 7):

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 **POWER4BIO**  
REGIONS FOR  
BIOECONOMY

**An overview of suitable regional policies to support bio-based business models**  
(Deliverable 4.2)

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PUBLIC

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# Thank you for your attention!

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REGIONS FOR BIOECONOMY

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