

# Training Webinar: Supporting policies for bioeconomy - focus on bioenergy

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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 bioenergy sector and link to national and regional policy implementation
3. Good policy examples
4. Conclusions and recommendations

# 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

# Bio-economy system overview

## Socio-economic drivers

Markets



Policies



Science & technology



Social organisations



Individual actors



## Bioeconomy activities

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

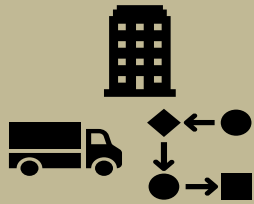


Food environment (food labelling & promotion, quality & taste, access to food)

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



# Example of Policies in the bioenergy chain

| Regulations (Law)   | Economic instruments   | Other 'soft instruments'   |
|---|--|--|
| <ul style="list-style-type: none"><li>• Renewable energy mandates</li><li>• CHP mandates</li><li>• Fuel standards</li><li>• Grid connection requirements (electricity, natural gas grid, district heating)</li><li>• Obligations for renewable energy in buildings (relation to EU EPBD)</li><li>• Green procurement rules</li><li>• Emission legislation</li></ul> | <ul style="list-style-type: none"><li>• Rural development support, e.g. for on-farm bioenergy, or energy crop premium (in relation to EU-CAP);</li><li>• Feed-in tariffs / feed-in premiums</li><li>• Support for grid development (e.g. district heating)</li><li>• Taxation - tax differential for energy products according to renewable and/or CO2 advantage</li><li>• User incentives (tax incentives biofuel vehicles, free parking, exemption of congestion charge / road tax, ...)</li></ul> | <ul style="list-style-type: none"><li>• Voluntary standards RED I and II targets</li><li>• Bioeconomy action plans &amp; roadmaps</li><li>• Circular economy action plans and road maps</li><li>• Low ILUC certification</li><li>• SMART specialisation clusters/platforms</li></ul> |

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# Bioeconomy & circularity introduced in EU policy

- ▶ **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 & circularity introduced in EU policy

- ▶ **Bioeconomy Action plans (2012):** 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 [the] chemical, biotechnological and energy industries’*.
- ▶ **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



# Bioeconomy & circularity introduced in EU policy

- ▶ The central bioeconomy perspective in EU policy was further widened in 2013 in the **7th Environment Action Plan** (EC 2013) in which circularity was incorporated in the main vision of the EU:

*‘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’.*

- ▶ In 2015 the **Circular Economy Package** (EC, 2015a) was introduced which was the basis of our current EC ambitions regarding bio-economy and circular economy further worked out in:
  - 1) **2018 update of the Bioeconomy Strategy**
  - 2) **EU Green Deal**
  - 3) **Circular Economy Action Plan**

# EU Bioeconomy Strategy 2018

- 1) maximise its contribution towards the Paris Agreement & the 2030 Agenda and the Sustainable Development Goals (SDGs).
  - 2) Sustainability and circularity are now integrated with the bioeconomy objectives
  - 3) Central is the need to reconcile the competition of different sectors (food, feed and industrial uses) for biomass.
  - 4) 14 measures to be launched in 2019 are proposed, based on three key priorities:
    - ▶ Strengthen and scale up the bio-based sectors, unlock investments and markets
    - ▶ Deploy local bioeconomies rapidly across the whole of Europe
    - ▶ Understand the ecological boundaries of the bioeconomy
- ▶ Actions for countries and regions:
- ▶ Member States to develop own **bioeconomy strategies**
  - ▶ At region level: research and innovation strategies for **SMART specialisation**

# Green Deal: Energy

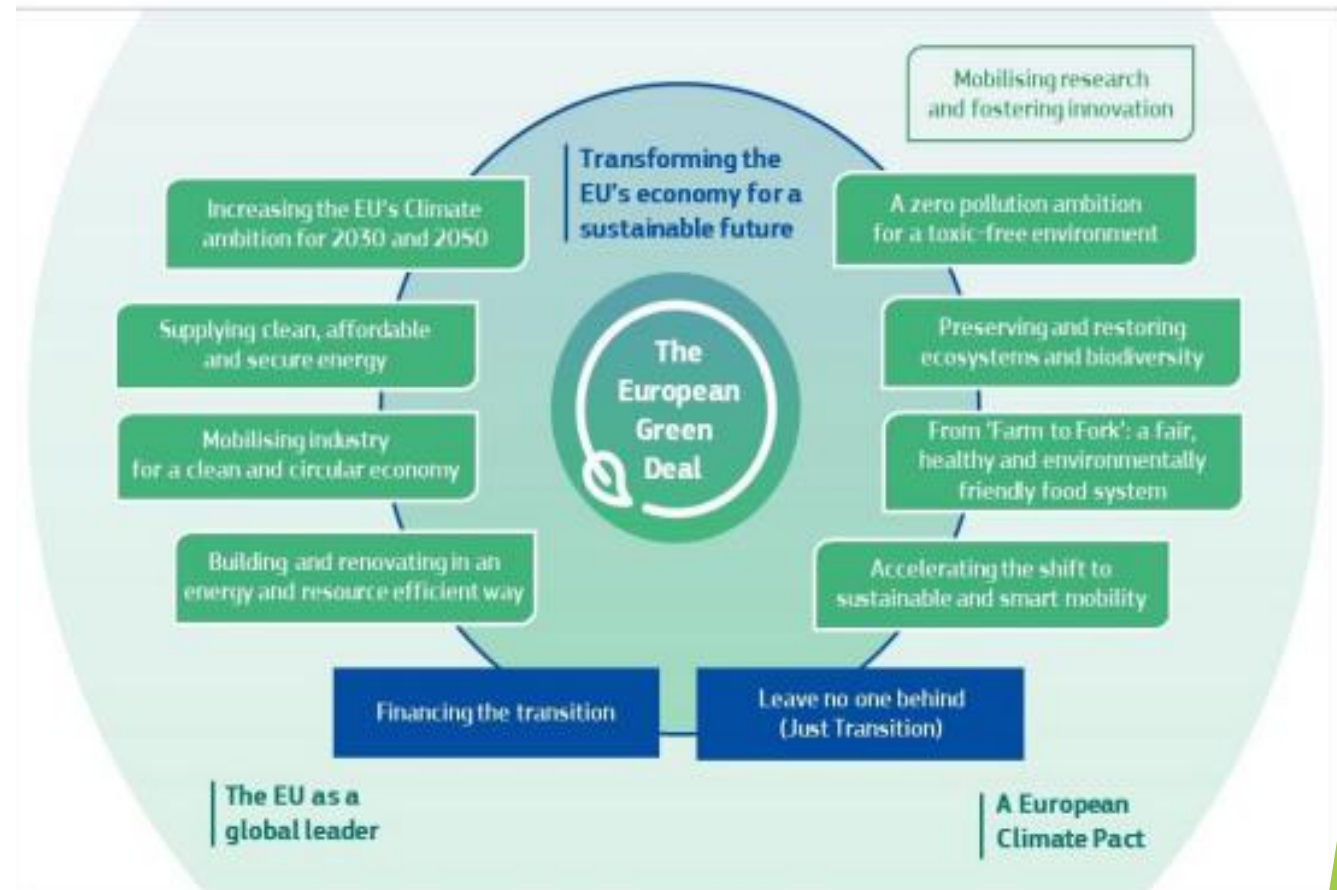
A new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of green-house gases in 2050 and where economic growth is decoupled from resource use (EC, 2019).

More ambitious EU strategy on climate change mitigation:

Climate Law: 2050 climate neutrality is anchored in legislation also at national level

Decarbonisation of the energy system: 75% of EU's GHG emissions production and use of energy

Carbon pricing instrument introduced throughout the economy: a carbon border adjustment mechanism, to reduce 'carbon leakage' risk



# Green Deal: Energy

- ▶ **Further adapted energy legislation (June 2021)**
- ▶ **Climate Law: 2050 climate neutrality is anchored in legislation also at national level**
- ▶ **Review** revised national energy and action plans (NCPs) (submitted by the end of 2019)
- ▶ Critical evaluation:
  - ▶ In case the ambitions are too low and not in line with the increased climate ambitions for 2030, member states are to be forced to reflect these higher energy and climate ambitions in the National and Climate Plans (NCPs) that need to be re-submitted again in 2023 (following the 2-yearly reporting obligation set out in the *Regulation on the governance of the Energy Union and Climate Action*)
- ▶ A Trans-European Networks - Energy Regulation (TEN-E) (introduced in 2018) further strengthened: stimulates the cross-border cooperation to achieve the benefits of clean energy at affordable prices and deployment of innovative technologies and infrastructure that modernise and make the energy sector more renewable and efficient
- ▶ Solve the issue of energy poverty for households in certain regions that cannot afford key energy services needed to reach a minimum standard of living

# EU Circular Economy Action Plan (COM(2020) 98 Final)

- ▶ 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
  - ▶ boosting economic growth through measures for products, on design, for consumers and public buyers.

# First Climate and energy policies - EU

- ▶ **1991 EC Community strategy:** measures to limit GHG emissions and increase energy efficiency and renewable energy production
- ▶ **In 2000 first European Climate Change Programme:** policies worked out to to cut greenhouse gas emissions to ensure that the EU meets its target for reducing emissions under the Kyoto Protocol.
- ▶ **2003 European Union (EU) Energy Tax Directive,** which requires to set minimum rates for the taxation of energy products in EU member states
- ▶ **In 2005: second European Climate Change Programme** focus on cost-effective options for reducing greenhouse gas emissions in synergy with the **EU's Lisbon Strategy** for increasing economic growth and job creation.
  - ▶ Working groups in transport, energy supply, energy demand, non-CO<sub>2</sub> GHG gases, agriculture, aviation, CO<sub>2</sub> and cars, CO<sub>2</sub> and shipping, carbon capture and storage such as sinks in agricultural soils and forest, and adaptation to climate change

# Energy Tax Directive 2003/96/EC

The aim of this legislation was to reduce distortions caused by divergent national tax rates, remove competitive distortions between mineral oils and other (unlegislated) energy products, and create incentives for energy-efficiency and emission reductions:

- ▶ Widened the minimum tax rate system to all energy products: not only oil but also coal and coke, natural gas and electricity.
- ▶ Updated the minimum rates for mineral oils (not revised since 1992).
- ▶ A common EU framework for taxing motor fuels, heating fuels and electricity
- ▶ Minimum rates for energy products used as motor or heating fuel
- ▶ Minimum rates for commercial and industrial purposes (e.g. agriculture, stationary motors, machinery in construction and public works)

# In 2009: Renewable Energy Directive (REDI) *(2009/28/EC)*

- ▶ An overall policy for the production and promotion of energy from renewable sources in the EU.
- ▶ The EU to fulfil at least 20% of its total energy needs with renewables by 2020 and 20% improvement in energy efficiency.
- ▶ **Action for member states: National Renewable Energy Action plans (NREAPs):** to ensure that at least 20% of energy consumed and 10% of the transport fuels consumed in every EU country comes from renewable sources by 2020.



# In 2018: Recast Renewable Energy Directive (REDII) (I)

- ▶ 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).
- ▶ Focus only emission reduction in sectors NOT included in the EU Emissions Trading System (EU ETS), such as transport, buildings, agriculture and waste.
- ▶ New binding renewable energy target for the EU for 2030 of at least 40% (from 1990 levels)(before it was 32%). Also more ambitious GHG saving targets (-55%).
- ▶ Requirement for MS to introduce an obligation on fuel suppliers enabling the achievement of a 14% target for renewables including a sub target for advanced biofuels.
- ▶ The REDII also aims to phase out biofuels with a high ILUC risk and to promote biofuels with a low ILUC risk (Annex IX ).

# In 2018: Recast Renewable Energy Directive (REDII) (II)

- MSs had to submit **National Energy and Climate plans NECPs 2021-2030** to EC (31 December 2019):
  - 1) to explain through which measures MSs will reach their emission reduction targets for 2030 as set in the 'Effort Sharing Regulation' (set minimum rates for the taxation of energy products).
  - 2) to explain how MSs foresee to reach their renewable energy targets and emission reduction levels.
- MSs are also required to submit national **long term strategies 2050** (January 2020).
- Critical review by EC in light of Green Deal ambitions and if ambitions are too low and not in line with the increased climate ambitions for 2030, MS are to be forced to reflect these higher energy and climate ambitions in the National and Climate Plans (NCPs) that need to be re-submitted again in 2023
- Most of the other new elements in the new REDII need to be **transposed into national law** by Member States by 30 June 2021

# 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 to MSs.
- ▶ In Green Deal:
  - ▶ Adjustment in the **Emission Trading System** were announced
  - ▶ 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

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# 5 good policy examples

| Title   | Country/<br>region | Purpose of the instrument with regard to the biomass value chain   |
|---|--------------------|--|
| Stimulation of Sustainable Energy Production (SDE+)                                     | Netherlands        | Feed-in premium (FIP) system. Aim is to increase the renewable energy share in energy production and consumption.  |
| Ordinance on the Generation of Electricity from Biomass (Biomass Ordinance - BiomasseV) | Germany            | Regulates which substances are classed as biomass and how the related tariffs are calculated when used in bioelectricity generation  |
| Act on the Carbon Dioxide Tax on Certain Energy Products                                | Denmark            | The Act on the Carbon Dioxide Tax on Certain Energy Products and the Act on the Energy Tax on Mineral Oil Products oblige companies producing, processing, possessing, receiving or dispatching energy products to pay a defined amount of tax. Main aim is to reduce GHG emissions in energy systems. |
| Regulation on the use of biomass from forest for energy                                 | Spain - Andalucia  | The aim is to stimulate the sustainable production and harvesting of forest biomass used for bio-energy production.  |
| Biomethane Decree   | Italy              | Support to stimulate bio-methane injection (into the gas network), the electricity generation from bio-methane and the use of bio-methane in the transport sector  |

# Policy integration: Relation with EU policy

- ▶ Renewable Energy Directives (RED I and II)
- ▶ Effort sharing regulation
- ▶ Regulation on the governance of the energy union and climate action
- ▶ Emission Trading System (ETS)

# Why good examples?

## Stimulation of Sustainable Energy Production (SDE+)- NL - Feed-in premium

- ▶ The goal of the SDE+ is to increase renewable energy generation at the lowest possible cost.
- ▶ First technology neutral subsidy scheme in Europe and is open for renewable electricity, renewable gas and renewable heat or a combination thereof. Eligible technologies are biomass, geothermal, hydro, solar photovoltaics, solar thermal, and onshore wind energy, which all compete for the same budget.
- ▶ Gives opportunity to develop a competitive renewable energy sector which focuses on real market aspects (cost efficiency, sale of energy at the time interval of higher prices) while in the same time optimises expenditures of the government by supporting the most cost effective solutions.



# Ordinance on the Generation of Electricity from Biomass (Biomass Ordinance - BiomasseV)

- ▶ Positive already that biomass use in bioelectricity is regulated. Many countries in lower bioeconomy development stage have no such ordinance, which makes their development more difficult and less sustainable.
- ▶ Helps to avoid conflicts between bioenergy generation and food security and biodiversity by classifying energy crops (such as maize and sugar beets) in the group of substances with lower tariff thereby stimulating the processing of non-food substances.
- ▶ Next step to more strict requirements for energy efficiency and higher feed-in premium support for bioelectricity and heat produced from more sustainable biomass types, particularly those with no or low ILUC impacts.

# Act on the Carbon Dioxide Tax on Certain Energy Products

- ▶ In the first place the carbon taxation turned out to indeed deliver to the objective of reducing GHG emissions and it did not hamper economic growth
- ▶ High benefits have been created with relatively low carbon tax cost.
- ▶ Wide coverage of sectors ranging from of natural gas, coal, electricity and light and heavy fuel oil.
- ▶ The policy was evaluated well and adjustments were made to the policy to integrate it with new EU policy developments such as the EU ETS and with market developments and energy taxing systems.
- ▶ Carbon tax revenues were not for the government budget but instead 40% of this tax revenue was used for environmental subsidies and 60% was returned to industry. These returned taxes were used to invest in for example industrial restructuring.
- ▶ The Danish government also offers 25% reduction of the tax to the companies that sign an energy savings agreement with the Ministry of Transportation and Energy. So, it keeps on encouraging companies to further increase energy savings and reduce GHG emissions.

# Regulation on the use of biomass from forest for energy (Orden 29/12/2011)

- ▶ Positive already that forest biomass use in is regulated. Many countries in lower bioeconomy development stage have no such ordinance, which makes their development more difficult and less sustainable.
- ▶ It provides clear guidance on which forest biomass can be used for energy production. This stimulates the use of forest biomass and is also providing some guidance on the sustainable production of biomass in forests planted for bioenergy.
- ▶ The regulation also wood harvested from forests to maintain fire breaks. This instrument is therefore not only focused on enhancing the residual woody biomass supply for energy, but particularly linking biomass provisioning with landscape fire risk reduction.

# Biomethane Decree Italy

- ▶ Connects to the EU level goals and policies (REDII), creating opportunities for economic sectors to step into biomethane market.
- ▶ The instrument helps the country to reach the EU level biofuel and environmental protection quotas and at the same time helps bio-based technologies to be more competitive and attractive on the market.
- ▶ The clear specification on what is to be considered biomass for advanced fuel generation also stimulates introduction of double-counting fuels in the biomethane supply.
- ▶ It stimulates the construction of new filling station for bio-CNG or bioLNG, which is a key aspect in the spreading of biomethane based transportation, because without enough specific filling stations the vehicle owners can't even think about that kind of transportation.

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# Conclusions

- ▶ 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**.
- ▶ The **energy sector is clearly the sector that gains most of the support** followed by agricultural, environment and the waste sector, the research and innovation sector
- ▶ The **three renewable energy policy examples (NL, DE & IT) evolved in time in line with the more ambitious EU wide targets set for reaching GHG mitigation**. The examples show how regulation has **shifted** from overall wide support to bioenergy production without putting very strict requirements on efficiency and type of biomass use, toward **stricter requirements** for energy efficiency and higher feed-in tariff support for the bioelectricity and heat produced from **more sustainable biomass types, particularly those with no or low ILUC impacts**.

# 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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The image shows the cover of a report titled "An overview of suitable regional policies to support bio-based business models (Deliverable 4.2)". The cover features the POWER4BIO logo at the top right, which consists of two hands holding a green leaf. Below the logo, the title is written in bold green text. Underneath the title, it says "(Deliverable 4.2)". The main authors are listed as WAGENINGEN RESEARCH: BEREN ELBERSEN, JOSIE HOUTAMP, INGRID CONIIX & MARTEN VAN DEN OEVER; BAI ZOLTÁN: NORA HATVANI, ÁKOS KÖCS & KORNÉL MATEFFY; and AKI: ISTVÁN KUUMANN & VIKTÓRIA VÁSÁRY. The date is 30 APRIL 2020, and it is labeled as PUBLIC. At the bottom, there is a disclaimer about agency responsibility and a note that the project received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 818351, accompanied by the European Union flag logo.

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REGIONS FOR  
BIOECONOMY

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

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# Thank you for your attention!

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