

**DIGITALISATION AND CIRCULAR ECONOMY:
forestry and forestry based industry implications**

12th International Scientific Conference WoodEMA 2019

Varna, September, 11-13, 2019

▶

**SUSTAINABLE
BIOENERGY POLICY
FOR THE PERIOD
AFTER 2020**



Authors

**Mikuláš Šupín,
Erika Loučanová,
Miriam Olšiaková**

Department of Marketing,
Trade and World Forestry,
Faculty of Wood Sciences
and Technology,
Technical University,
Zvolen, Slovakia

INTRODUCTION

- The main objective of this paper is to describe, analyze and forecast the development of the EU's bioenergy policy beyond 2020.
- Bioenergy is the form of renewable energy used most in the EU and it is expected to continue to make up a significant part of the overall energy mix in the future. Wood biomass is main source of bioenergy.
- The development of bioenergy needs to be seen in the wider context of a number of priorities for the energy union, including the ambition for the EU to become the world leader in renewable energy, to lead the fight against global warming, to ensure security of supply and integrated and efficient energy markets, as well as broader EU objectives such as reinforcing Europe's industrial base, stimulating research and innovation and promoting competitiveness and job creation, including in rural areas.

INTRODUCTION

- "**Bio-economy**" is possible define as "the knowledge" based production and use of renewable resources to provide products, processes and services to all sectors of future sustainable economy".
- The bio-economy utilizes new knowledge of life sciences to produce a wide range of products from the living organisms and the waste they generate, and is a major component of sustainable development.
- The bio-economy covers all sectors and systems that rely on biological resources.
- To be successful, the European bio-economy needs to have sustainability and circularity at its heart.

INTRODUCTION

- The global energy system depends on fossil fuels. Coal, Oil and Natural Gas constitute 81% of the total primary energy supply of the world.
- Renewables (RES) account for only 14% and have seen an increase of 1% share since 2000.
- Bioenergy is renewable energy made available from materials derived from biological sources. Biomass is any organic material which has stored sunlight in the form of chemical energy.
- Total Primary Energy Supply of biomass resources is cca 70% of the share among all renewable energy sources.

Figure 1 – Renewable energy sources, technologies and applications







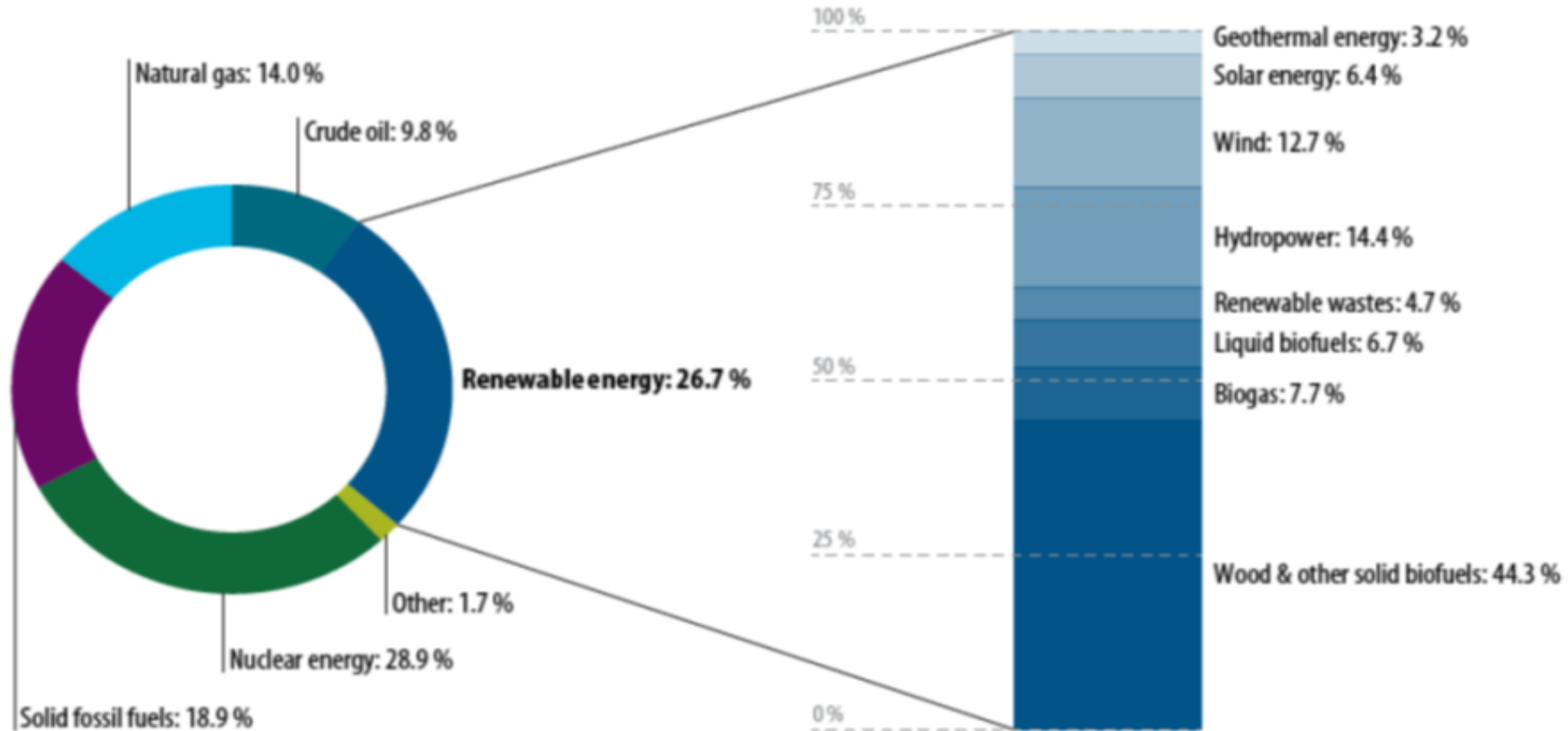
<p>Solar energy</p>  <p><i>Source:</i> Sun</p> <p><i>Technologies:</i> Photovoltaics, Solar thermal</p> <p><i>Applications:</i> Electricity, Heating and Cooling</p>	<p>Wind energy</p>  <p><i>Source:</i> Wind</p> <p><i>Technologies:</i> Wind turbines</p> <p><i>Applications:</i> Electricity</p>	<p>Marine energy</p>  <p><i>Source:</i> Waves, tides</p> <p><i>Technologies:</i> Dams, tidal barrages</p> <p><i>Applications:</i> Electricity</p>	<p>Hydropower</p>  <p><i>Source:</i> Water</p> <p><i>Technologies:</i> Hydropower plant</p> <p><i>Applications:</i> Electricity</p>	<p>Geothermal energy</p>  <p><i>Source:</i> Earth</p> <p><i>Technologies:</i> Geothermal and heat pumps</p> <p><i>Applications:</i> Electricity, Heating and Cooling</p>	<p>Bioenergy</p>  <p><i>Source:</i> Biomass, waste</p> <p><i>Technologies:</i> Biomass combustion, biogas plants, biofuels</p> <p><i>Applications:</i> Electricity, Heating and Cooling, Transport</p>
---	---	---	--	---	---

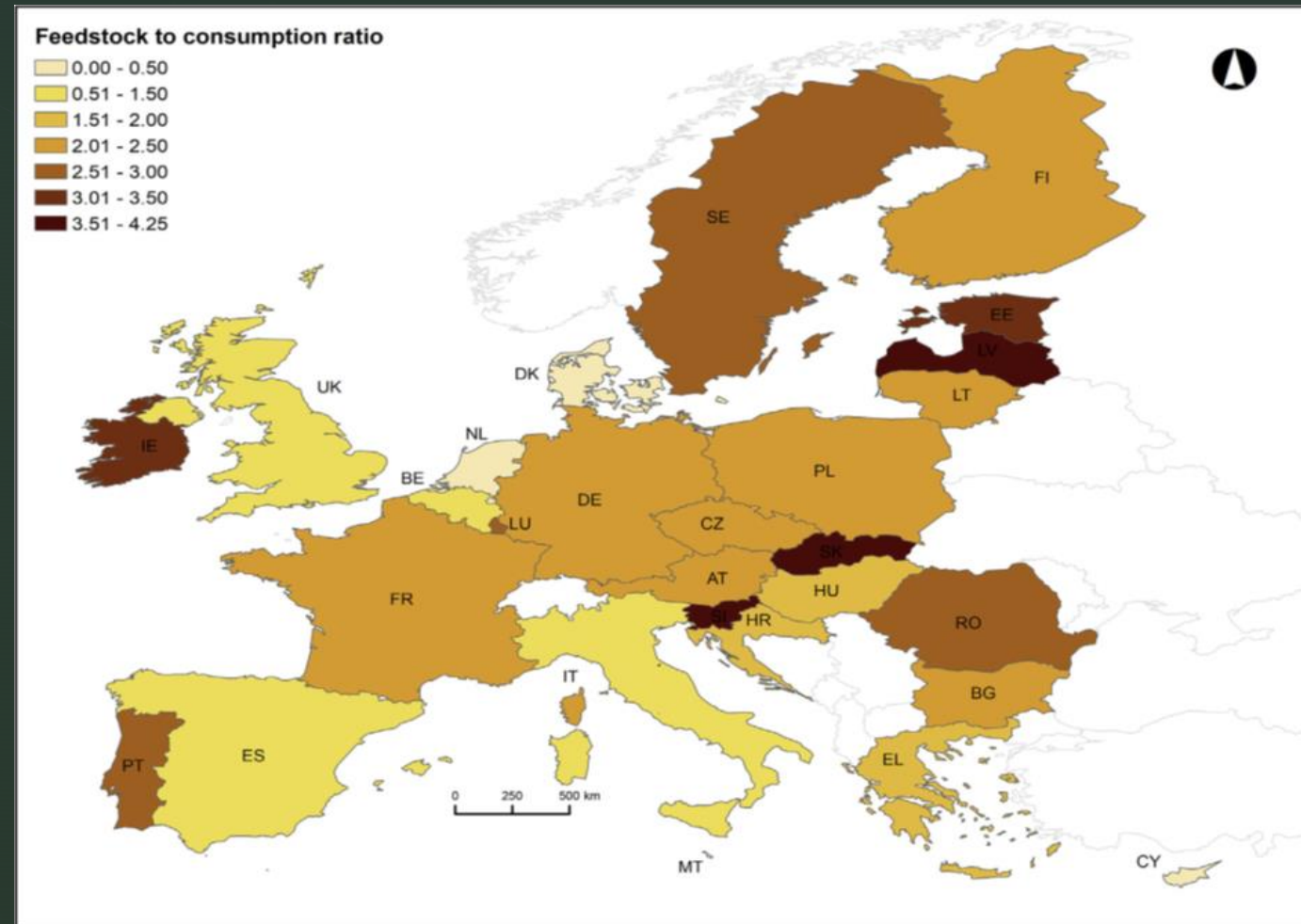
Figure 2 – Production of primary energy, EU-28, 2015 (% of total, based on tonnes of oil equivalent)



INTRODUCTION

- Biomass supply comes from a variety of feedstock – fuelwood, forestry residues, charcoal, pellets, agriculture crops and residues, municipal and industrial waste, biogas, biofuels etc. Broadly, the supply can be classified into three main sectors – forestry, agriculture and waste.
- 87% of the supply is in the form of solid biomass - wood chips, wood pellets, fuel wood etc. 5% of the supply is from waste sources - both municipal and industrial waste. Biofuels and biogas shares are at 6% and 2%.
- The total primary energy supply of biomass is about 56.5 EJ.

Fig. 3. Ratio between biomass potentials and biomass gross inland consumption for EU28





METHODS

The analytic and synthetic methods were used to assess situation. Analysis of market development was done based on the data from EUROSTAT, FAOSTAT, statistical offices and institutes of the international organizations selected countries regarding productions, exports, imports, consumptions and the most significant countries with which renewable resources, mainly wood solid biomass are traded. Secondary sources of the data from reports of international organizations and associations referring to wood biomass were also used in this paper.



METHODS

The first section of the paper identifies major features of sustainable development's economic perspectives and presents tools to analyze and quantify the bioeconomy. The second section introduces economic research on measuring the bioeconomy and designing policies to steward it towards sustainable development objectives. The final section outlines the research for resource economics aimed at pursuing sustainable development.

RESULT AND DISCUSSION

- The update to the 2018 Bio-economy Strategy maximise the contribution of the bio-economy to major European policy priorities.
- Sustainability is not only a legal obligation, it is an opportunity for all parts of Europe and underpins most EU priorities.
- The objectives of the 2012 Bio-economy Strategy remain still valid.
- On the other hand, concerns have been raised about the sustainability impacts and competition for resources stemming from the increasing reliance on bioenergy production and use.

RESULT AND DISCUSSION

- Bioenergy is unique as it is a low cost, low carbon renewable which can store energy until it is needed, which is crucial for the power, heat and transport sectors.
- Very few other technologies could remove as much geologic carbon from our generation mix as quickly.
- Furthermore, by promoting the use of forest products which would otherwise go unused, demand for biomass is creating far more effective carbon sinks and ensuring forests cover remains.

RESULT AND DISCUSSION

- The woody bioenergy sector is characterised by many small and medium enterprises, and the biomass is supplied by hundreds of thousands of forest owners, in addition to larger forest industries and forest owners (companies and state forests).
- These characteristics make it essential to reach a balanced approach to develop sustainability criteria that guarantee that the increased use of biomass is met with sustainably sourced biomass while minimising new administrative burdens and not blocking the use of biomass sources.

RESULT AND DISCUSSION

- Biomass from forests is used for wood products (sawn wood, panels, paper etc.) and for energy purposes (advanced biofuels, heat and electricity). When managing his / her forest, the forest owner doesn't know what the individual tree or tree part will finally be used for, as this depends on the market prices, and decisions later in the supply chain. To date, wood industry (sawn wood, panels, paper etc.) do not have to comply with EU sustainability requirements. In the medium-to-long term, it may be relevant to adopt a holistic approach.
- Forests are already subject to several sets of legislation and to voluntary SFM (sustainable forest management) certification. The new EU policy should take into account this existing framework.

Fig. 4. Gross inland consumption and share of the different end-uses of solid biomass for energy for EU28 in 2017.

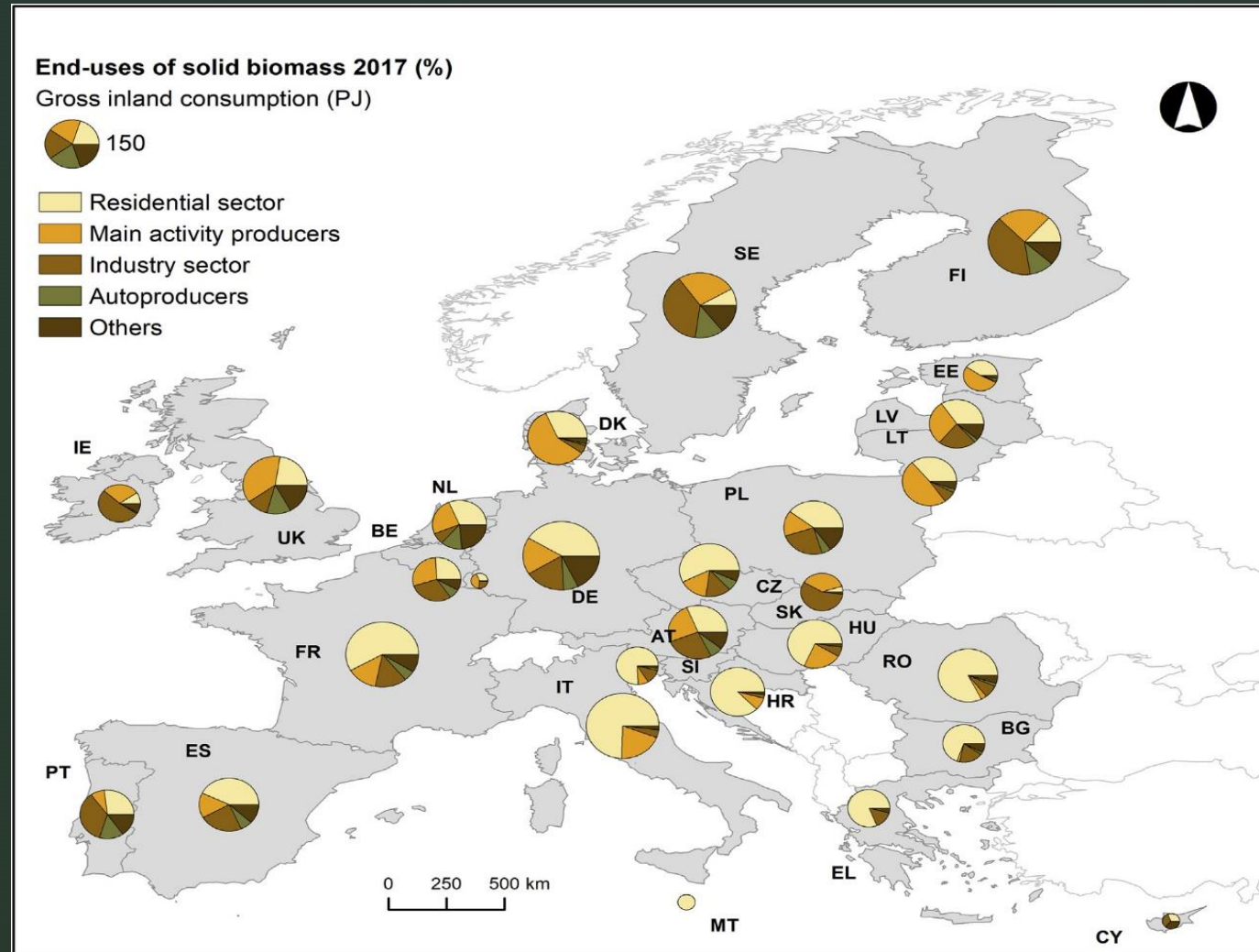
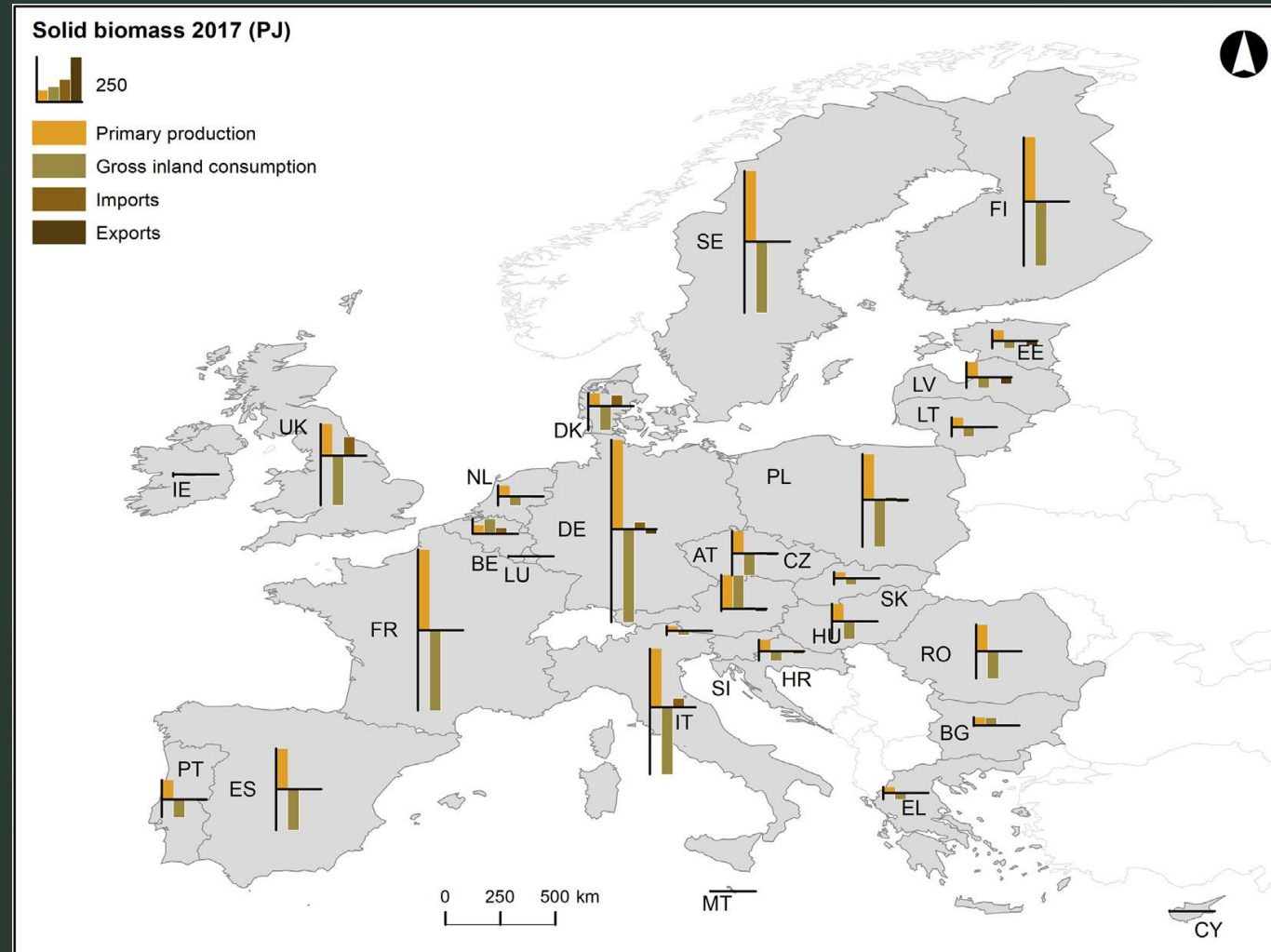


Fig. 5. Primary production, gross inland consumption, imports and exports of energy from solid biomass for EU28 in 2017



RESULT AND DISCUSSION

- One of the great misconceptions about bioenergy from biomass is that it is carbon neutral, meaning that any energy released from burning wood biomass is soon removed again by growing forests. The reality is far more complicated.
- The climate emergency is on the verge of becoming a climate crisis. Years of inaction have meant that climate scientists are no longer just discussing the need to reduce emissions, they are also talking about having to remove carbon dioxide from the atmosphere. Known as negative emissions, carbon dioxide removals are now at the centre of the climate conversation.

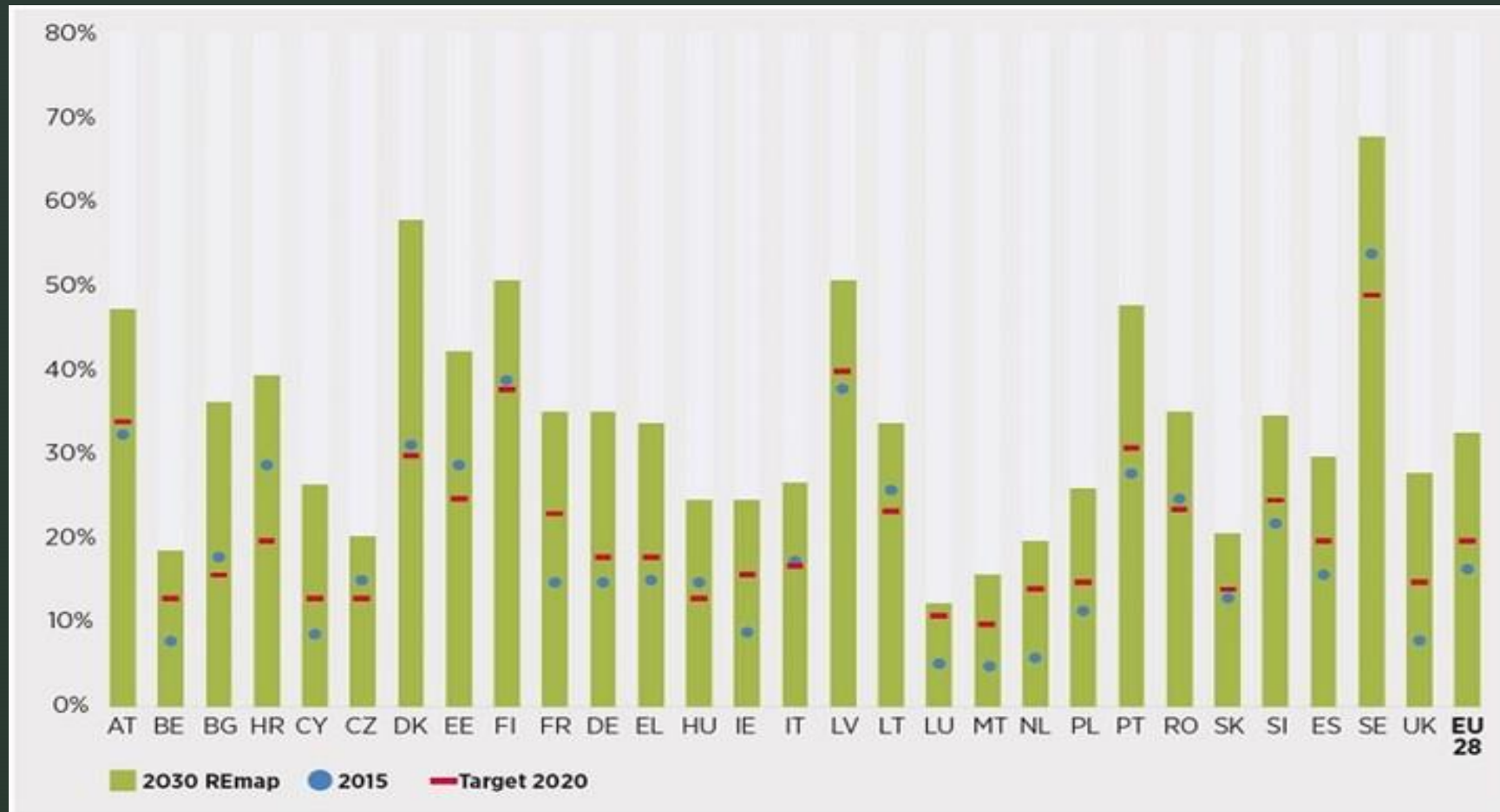
RESULT AND DISCUSSION

- Sustainable development has since long been at the heart of the European project. The EU Treaties give recognition to its economic, social and environmental dimensions which should be addressed together. The EU is committed to development that meets the needs of the present without compromising the ability of future generations to meet their own needs. A life of dignity for all within the planet's limits that reconciles economic prosperity and efficiency, peaceful societies, social inclusion and environmental responsibility is at the essence of sustainable development.

RESULT AND DISCUSSION

- There is a great potential for waste-derived fuels to provide a significant proportion of the EU's projected energy demand. Food waste produced by industry, businesses and in households is a readily available resource that is currently undervalued and underutilised. Wastederived fuels do not require land for production and can represent significant greenhouse gas emissions savings.
- For these challenges to become opportunities for new businesses and new jobs, a strong engagement in research and innovation is needed. EU states have respond to this by the 2030 Agenda for Sustainable Development.

Fig. 6 Renewable energy share in gross final energy consumption – 2015, 2020 and potential development to 2030 with accelerated uptake of renewables.



RESULT AND DISCUSSION

- The 2030 Agenda provides an opportunity for the EU to strongly anchor its strategic orientation in the global effort to build a sustainable future.
- The sustainable development goals are already being pursued through many of the EU's policies and integrated in all the Commission's ten priorities.
- The 2030 Agenda is based on a global partnership involving all stakeholders, requires mobilisation of all means of implementation and a strong follow-up and review mechanism to ensure progress and accountability.

RESULT AND DISCUSSION

- The European Commission, except for the 2030 Agenda, has set a long-term goal to develop a competitive, resource efficient and low carbon economy by 2050 and the bio-economy concept was incorporated into the general framework at different levels of EU policy.
- The contribution of biomass to energy generation in the EU is important and will further increase, as result of the renewable energy after 2020. Biomass will remain a key renewable energy source beyond 2020 and other.
- The EU could double the renewable share in its energy mix, cost effectively, from 17% in 2015 to 34% in 2030.



CONCLUSION

- The EU has a great potential to become a knowledge and technology leader in bio-economy.
- One of the priorities of the EU is the creation of a resilient Energy Union with a forward looking climate policy that is capable of delivering the adopted for the period after 2020.
- To achieve this, the EU has to decarbonize its energy supply, integrate the fragmented national energy markets into a smooth functioning and coherent European system, and set up a framework that allows the effective coordination of national states efforts.



CONCLUSION

- A bioeconomy has the potential to contribute significantly to the development of a green, low carbon economy due to the lower carbon footprint of bio-based products.
- The bio-based economy introduces a closed carbon cycle and prevents releasing more CO₂ in the atmosphere through to the extraction of carbon (oil, gas or coal) from the earth, as our current fossil-based system.
- However, this does not automatically mean that the bio-based economy is carbon neutral. Shifting towards a bio-economy creates new business and innovation opportunities in all European regions, but also the risks.



Thank you very much for your
attention.

