

# Agriculture, forestry and food in a climate neutral EU

The land use sectors as part of a sustainable food system and bioeconomy

Christine Chemnitz 19th June 2024

#### **Objective of the study**

Show that agriculture and forestry in the EU can contribute substantially to sustainability objectives such as:

- → climate neutrality,
- > biodiversity protection in the agricultural landscape and forests,

#### while:

- → allowing a healthy diet for all EU citizens,
- producing more biomass than today for the bioeconomy,
- → avoiding leakage to non-EU countries.

This is feasible, if land is used efficiently and biomass is consumed sustainably.



#### Methodology

- 1. Sketch a future scenario for agriculture, forestry, food, and biomass demand for the bioeconomy.
- → biodiversity protection in the agricultural landscape and forests,
- 2. Use of a quantitative model (CAPRI) for agriculture and food demand to:
- $\rightarrow$  ensure the consistency of our assumptions.
- → derive economic & environmental results.
- 3. Several side calculations for woody biomass and GHG emissions (e.g. for forests).



### **Ecological potentials**

### **Greenhouse gas emissions reductions from EU agriculture and agricultural peatlands between 2020 and 2045**



5 | Agora Agriculture based on CAPRI results. \* N<sub>2</sub>O emissions from manure application under "livestock and manure", N<sub>2</sub>O emissions from organic soils under "agricultural peatlands"; \*\* estimate for emissions from agricultural peatlands with CAPRI data on organic soils and emission factors from IPCC (2014), see Annex Chapter 7

#### Peatland – land use and greenhouse gas emissions in the EU in 2020





#### Greenhouse gas emissions from livestock in 2020 and 2045



7 | Agora Agriculture based on CAPRI results and further literature (see study). Note: the percentages for all mitigation technologies do not sum to 100% due to rounding. (1) 3-nitrooxypropanol feed additive; (2,3) feed additive; (4) dicyandiamide, slurry additive.



#### Share of arable land allocated for semi-natural landscape features







#### EU net virtual land trade based on world average yields





### Realising the potential – key elements

#### Food groups in average EU food consumption in 2020 and 2045

#### 2020 Eggs Staples (e.g., cereals, Legumes Vegetables Fruit 2% Oils (e.g., olive oil, Sugar Meat Dairy Fish potatoes, rice) rapeseed oil) products products 12% 24% 16% 21% 18% 3% 2% 3 1% Animal-based 38% Plant-based 62% 2045 Fish Eggs Staples (e.g., cereals, Fruit Legumes (e.g., Oils (e.g., olive oil, Meat Dairy Sugar Vegetables products potatoes, rice) peas, lentils, rapeseed oil) 6% 7% Dro-27% soy, beans) 20% ducts 11% 15% 7% 2% 1% 4% ► Animal-based 21% -► Plant-based 79%

- → Food group shares based on calories.
- → Average daily intake per capita: 2 140 kcal



#### EU livestock densities 2020 and 2045





12 | Agora Agriculture based on CAPRI results. 1) LSU = Livestock Unit; 2) UAA = Utilised Agricultural Area; 3) Other = waste, industrial and other uses.

#### Demand and supply of biomass in the bioeconomy in the EU



13 | Agora Agriculture based on Agora Energiewende (2023), Dahms et al. (2017), European Commission (2021k), Eurostat (2023h), Material Economics (2021). \*e.g., short rotation coppices, agroforestry, Miscanthus



# The way forward – most important policy levers at EU level

#### **Key policy measures**





# Thank you for your attention!

#### Do you have any questions or comments?

Christine Chemnitz christine.chemnitz@agora-agrar.de

www.agora-agrar.de