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

Agora Agriculture

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:**

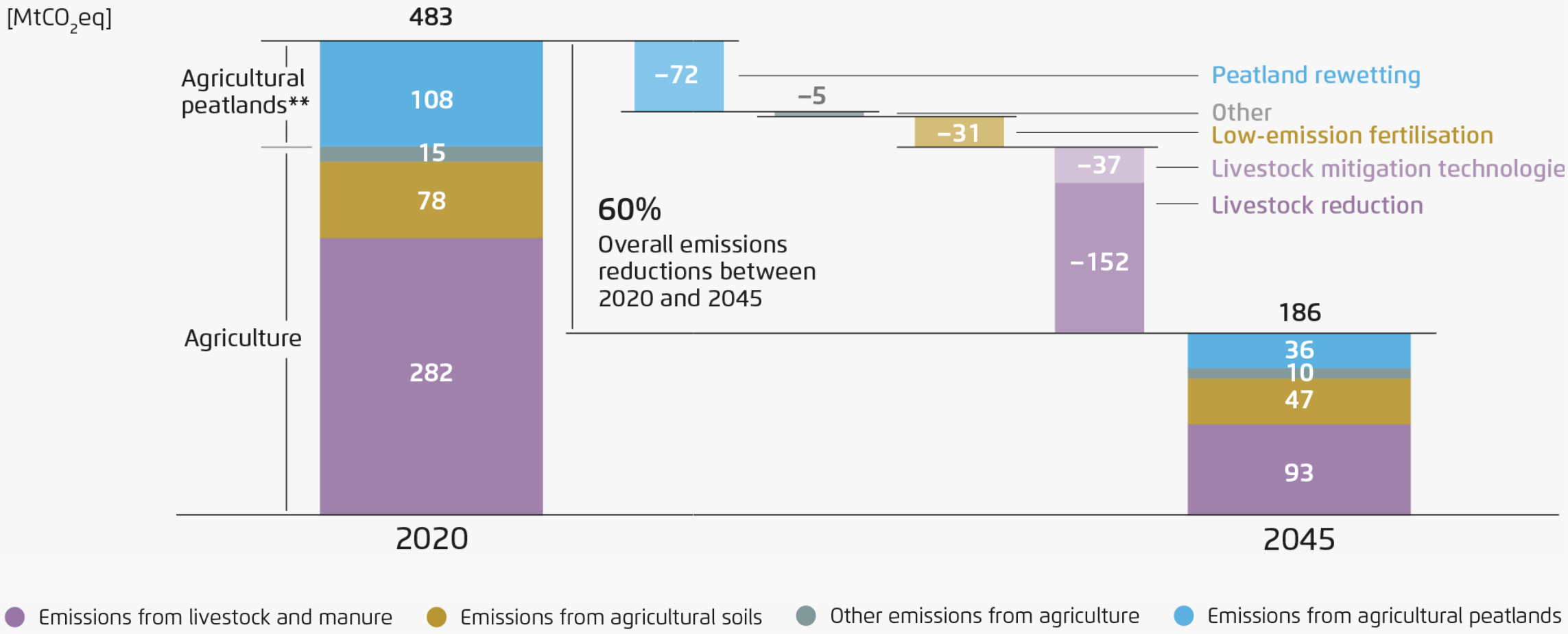
→ ensure the consistency of our assumptions.

→ derive economic & environmental results.

3. **Several side calculations for woody biomass and GHG emissions (e.g. for forests).**

Ecological potentials

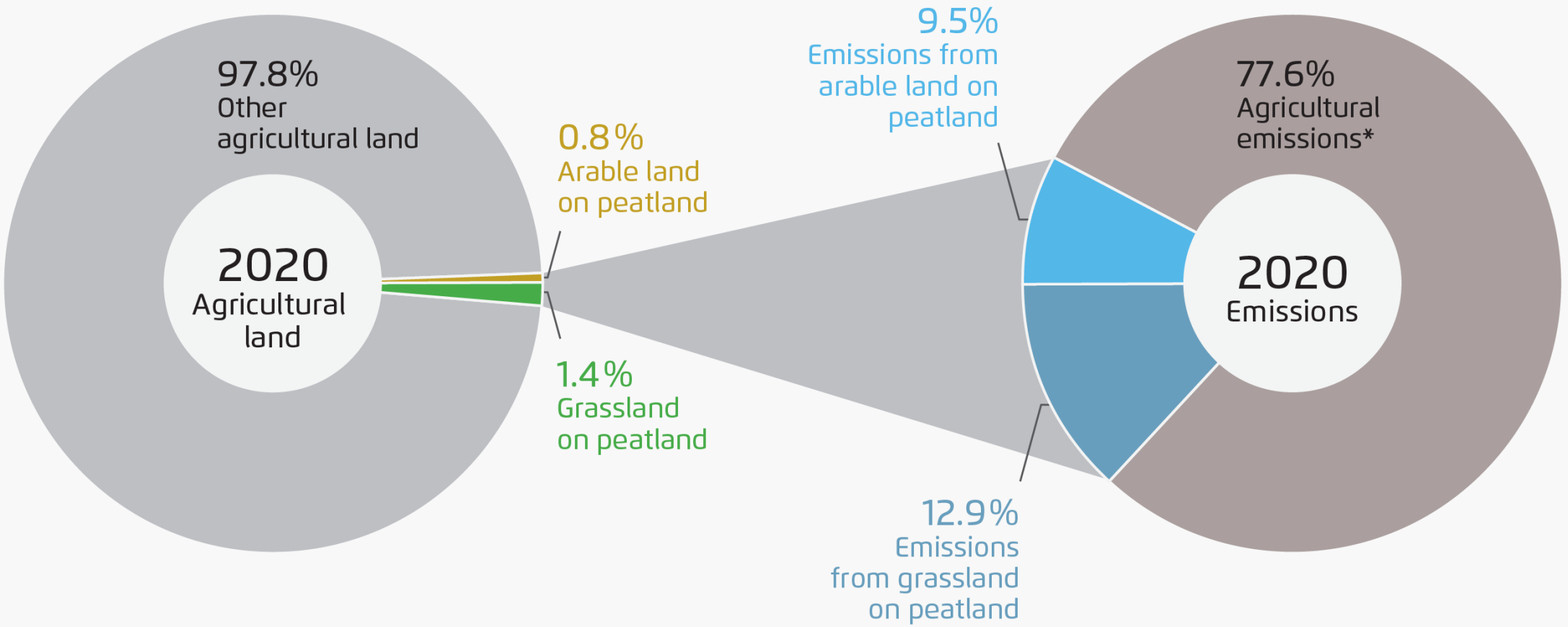
Greenhouse gas emissions reductions from EU agriculture and agricultural peatlands between 2020 and 2045



 Agora Agriculture based on CAPRI results. * N_2O emissions from manure application under "livestock and manure", N_2O 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

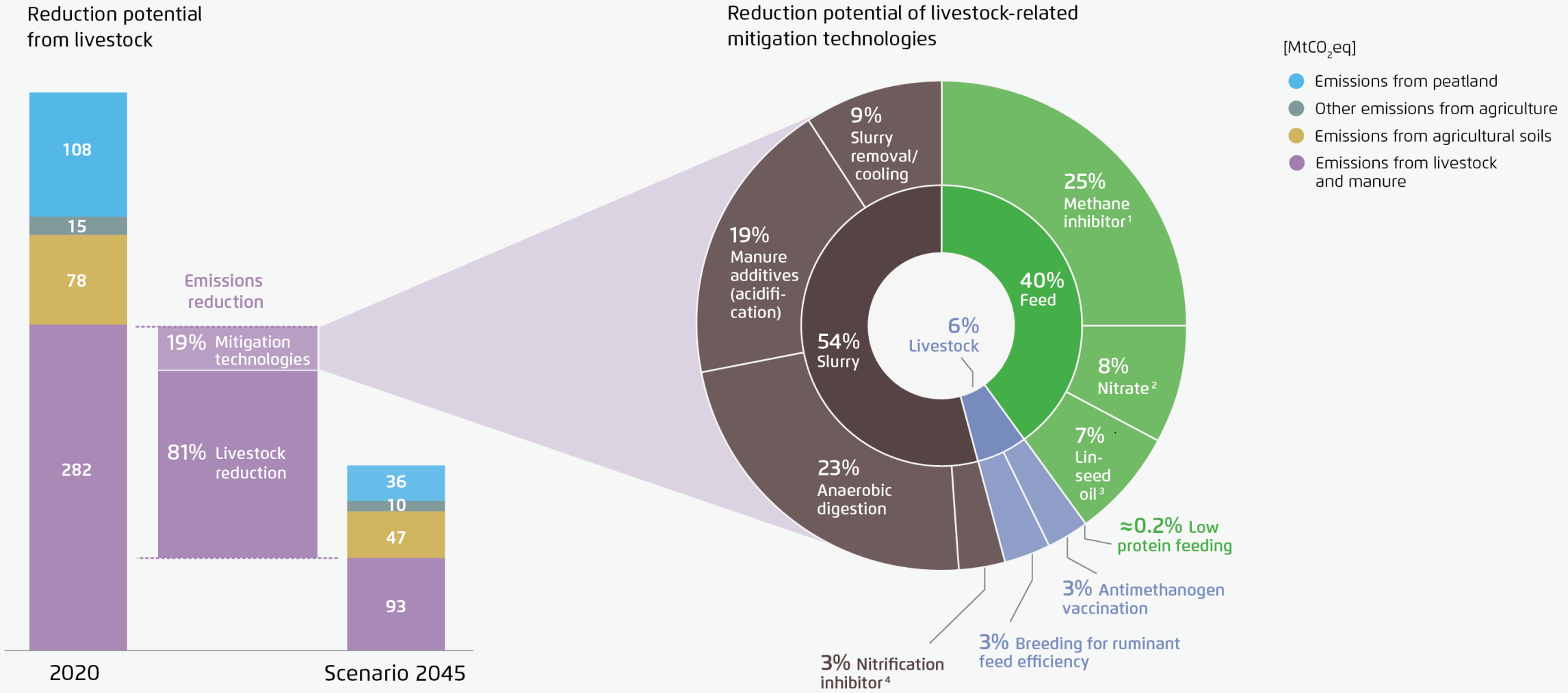
Agora Agriculture

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



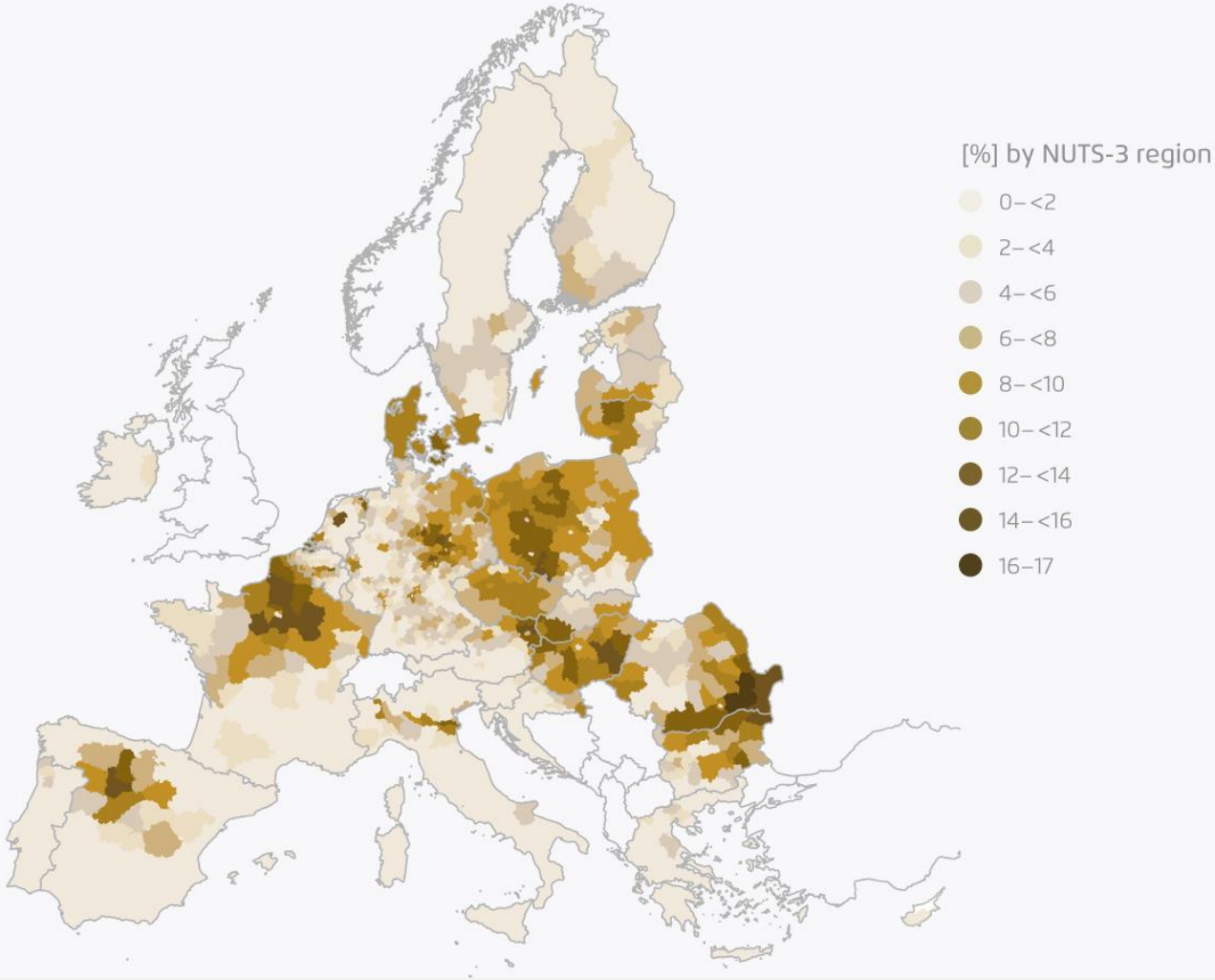
 Agora Agriculture based on CAPRI results, IPCC (2014), Martin & Couwenberg (2021). *without N_2O-emissions from organic soils

Greenhouse gas emissions from livestock in 2020 and 2045



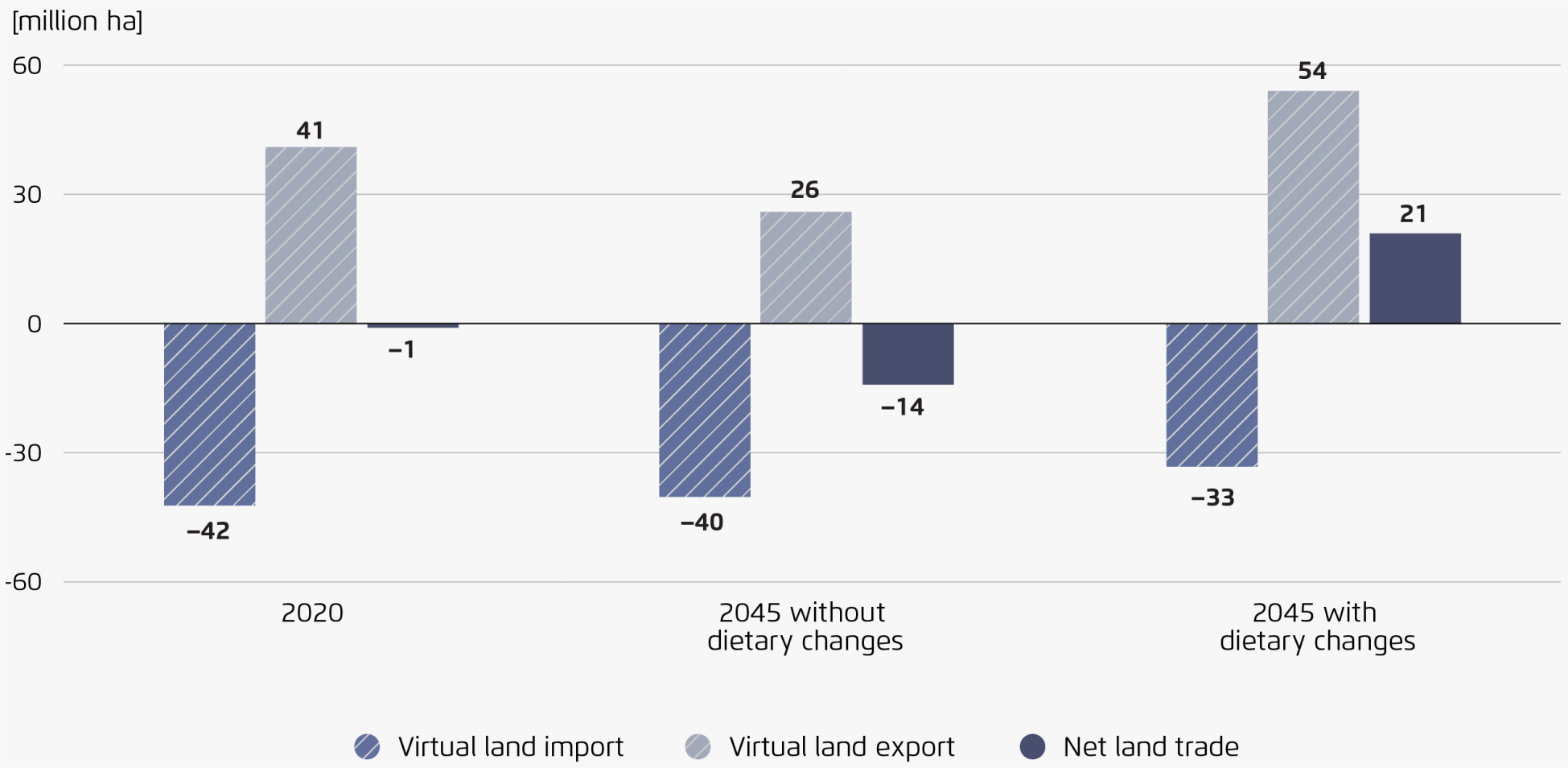
Agora Agriculture based on CAPRI results and further literature (see study). Note: the percentages for all mitigation technologies do not sum to 100% due to rounding. (1) 3-nitrooxypropanol feed additive; (2,3) feed additive; (4) dicyandiamide, slurry additive.

Share of arable land allocated for semi-natural landscape features



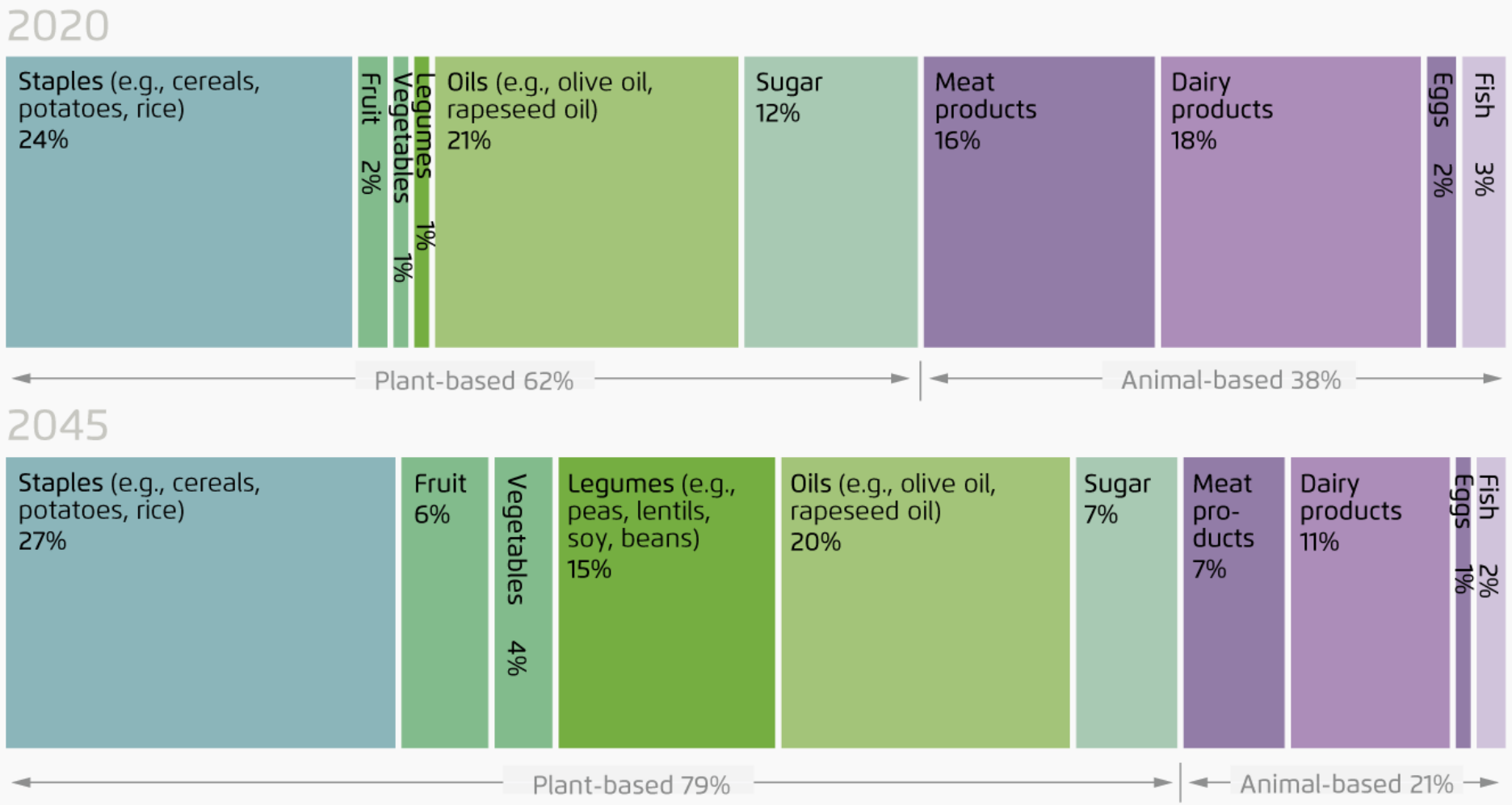
→ On average, about 5% of arable land in the EU in 2045

EU net virtual land trade based on world average yields



Realising the potential – key elements

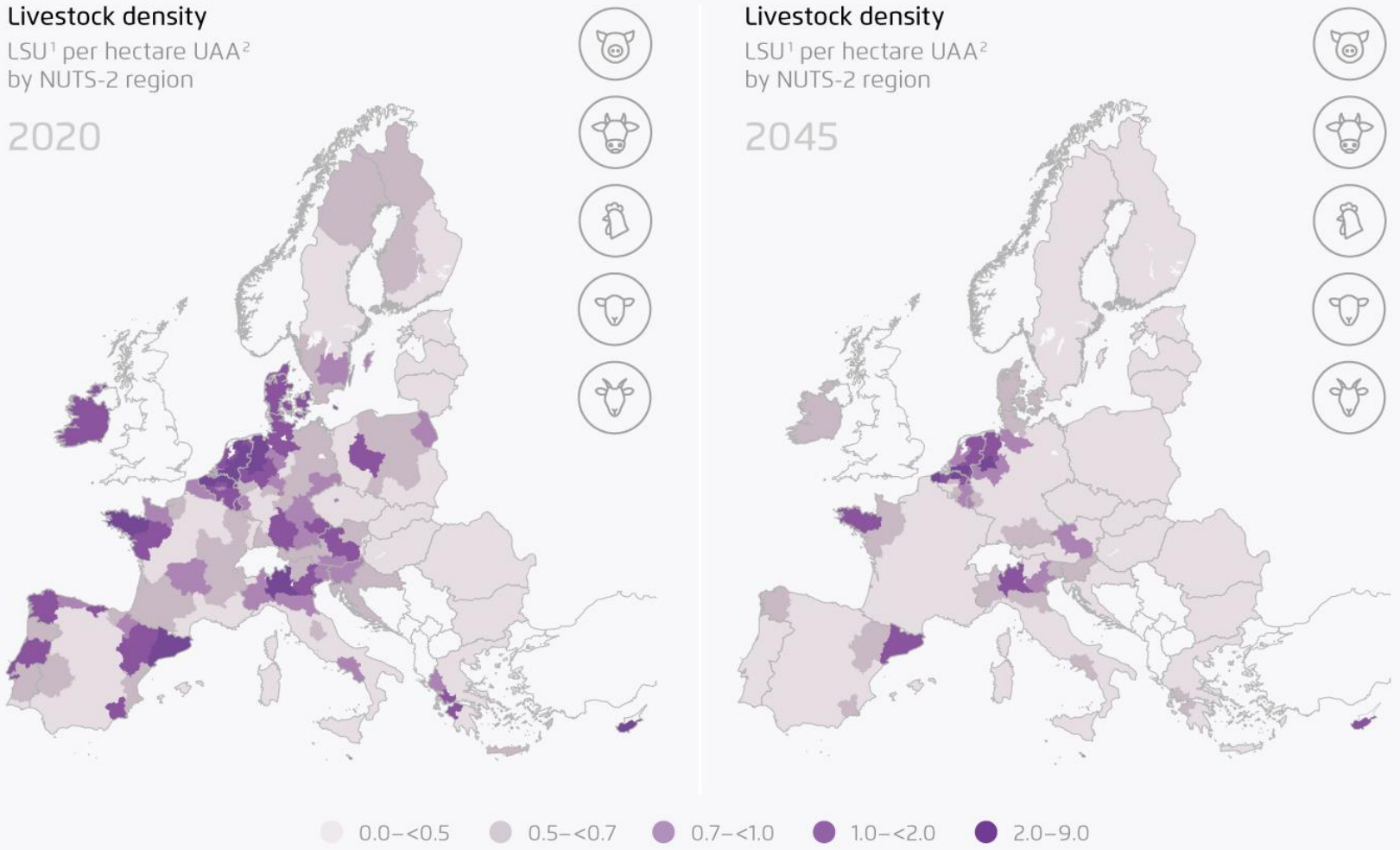
Food groups in average EU food consumption in 2020 and 2045



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

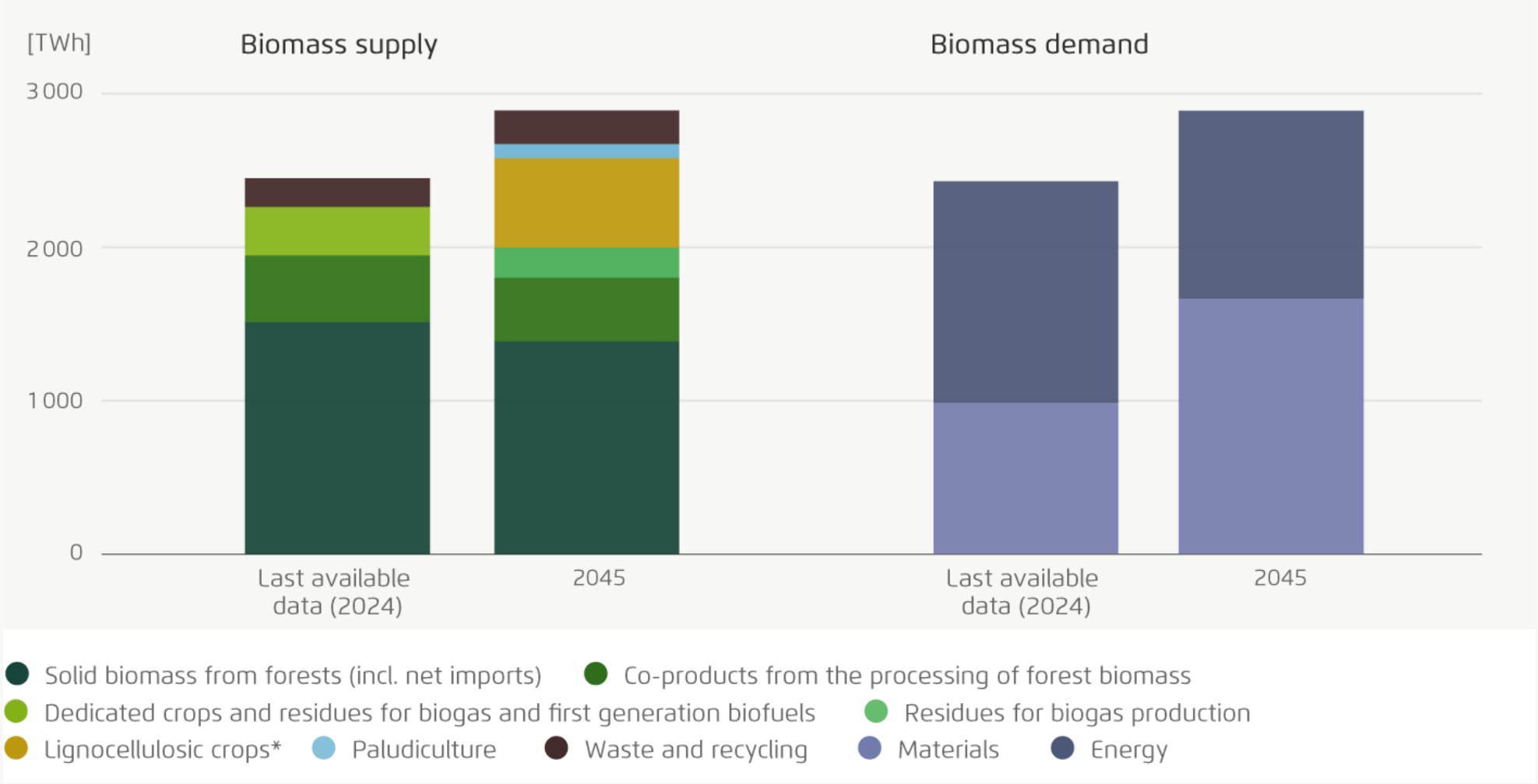
Agora Agriculture

EU livestock densities 2020 and 2045



 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

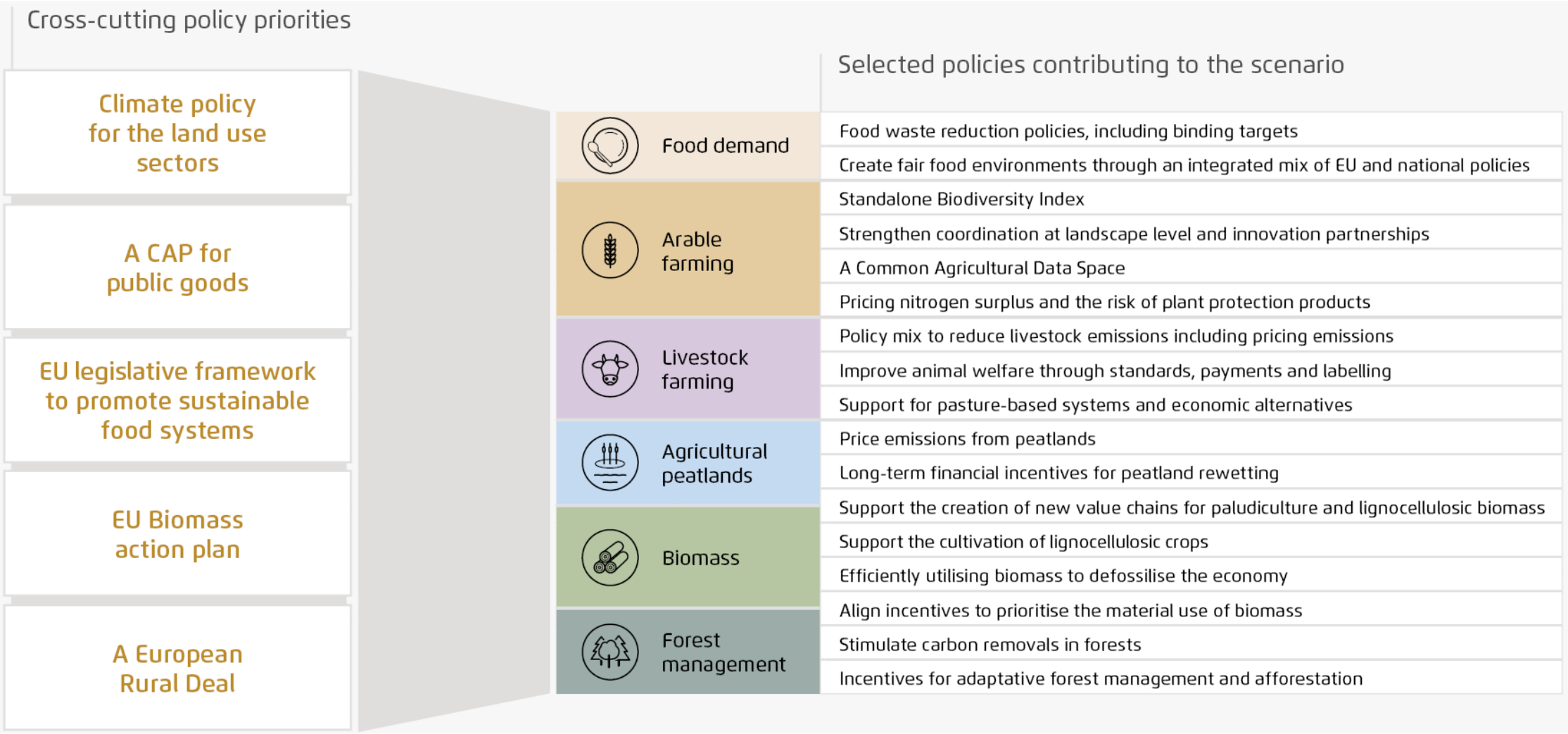


 Agora Agriculture based on Agora Energiewende (2023), Dahms et al. (2017), European Commission (2021k), Eurostat (2023h), Material Economics (2021). *e.g., short rotation coppices, agroforestry, Miscanthus

Agora Agriculture

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