SUSFANS
Food systems for health - environment - enterprise

What challenges and opportunities for climate change, biodiversity, sustainable & healthy diets

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European Commission

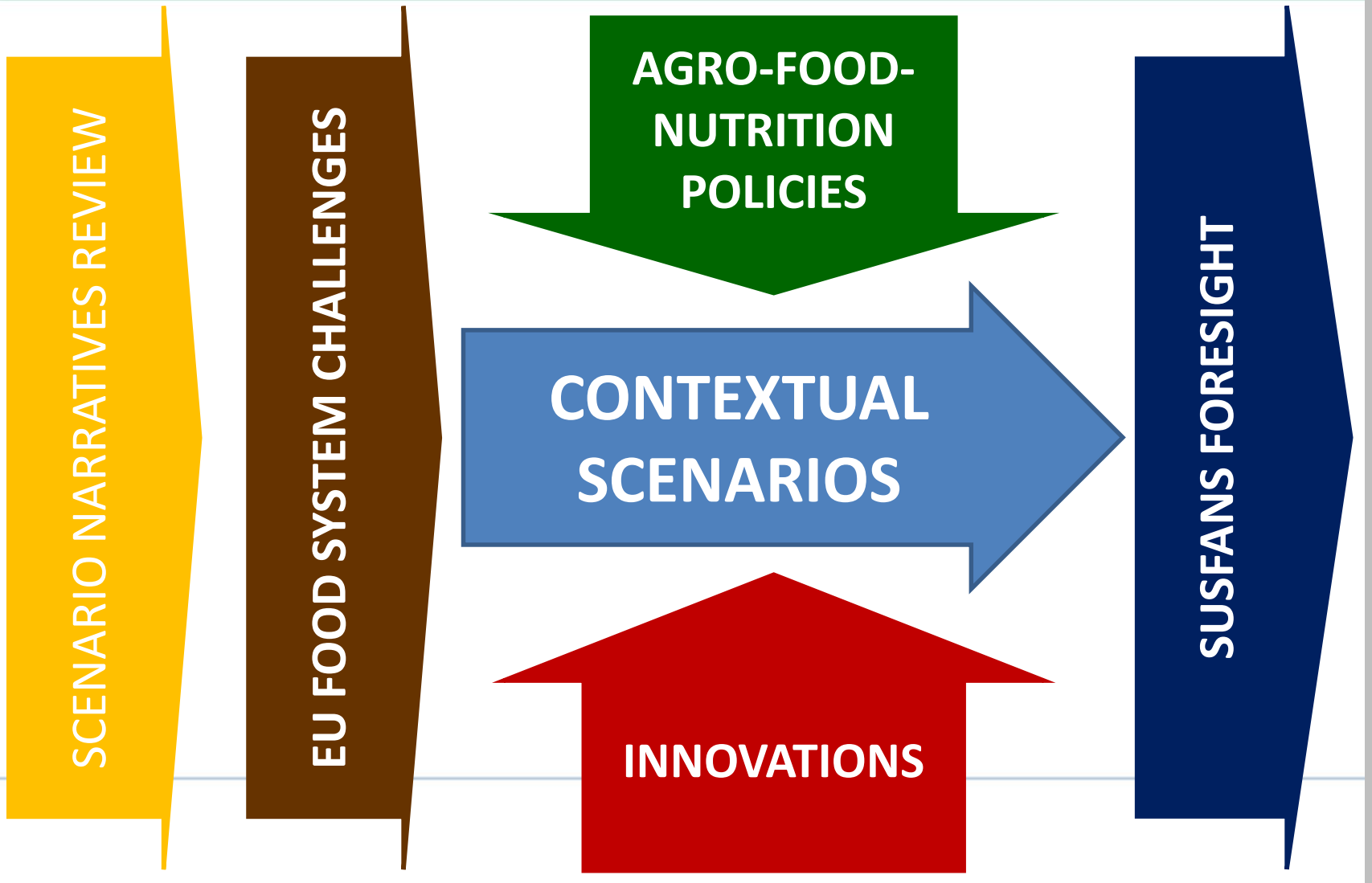
HORIZON 2020

METRICS, MODELS AND FORESIGHT FOR EUROPEAN SUSTAINABLE FOOD AND NUTRITION SECURITY - SUSFANS

H2020-SFS19A

Grant 633692
to the sum of €5M
over 2015 to 2019

SUSFANS European SFNS foresight approach



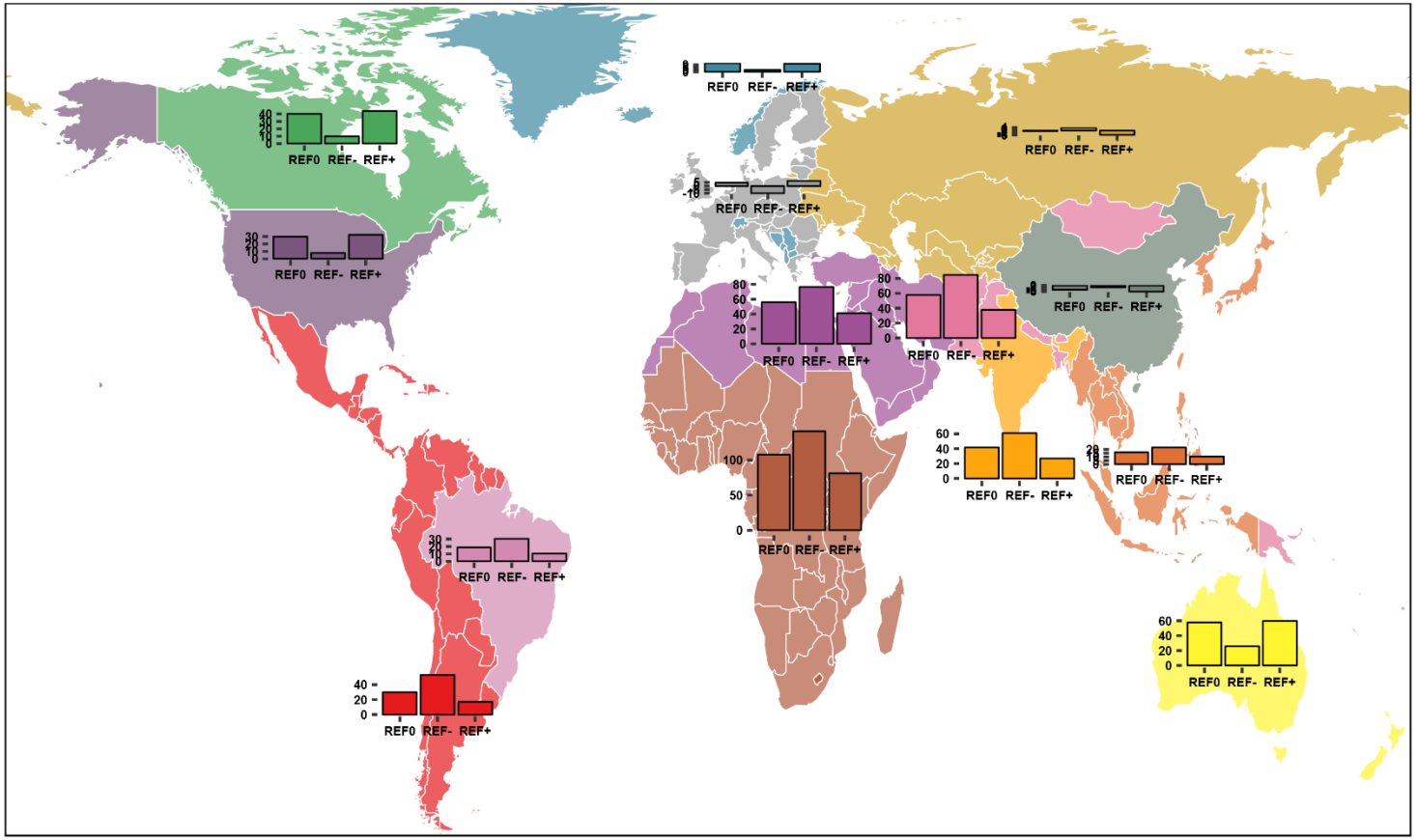
Challenges to sustainable FNS in Europe

Contextual scenarios *building on the stakeholder consultation* focusing on the main challenges and drivers for the sustainable FNS in Europe

- Demographic and income trends
- Technological change
- International trade policies
- Climate change: Impacts & Mitigation
- Policy context: Current agricultural and fisheries policies

Population growth: World

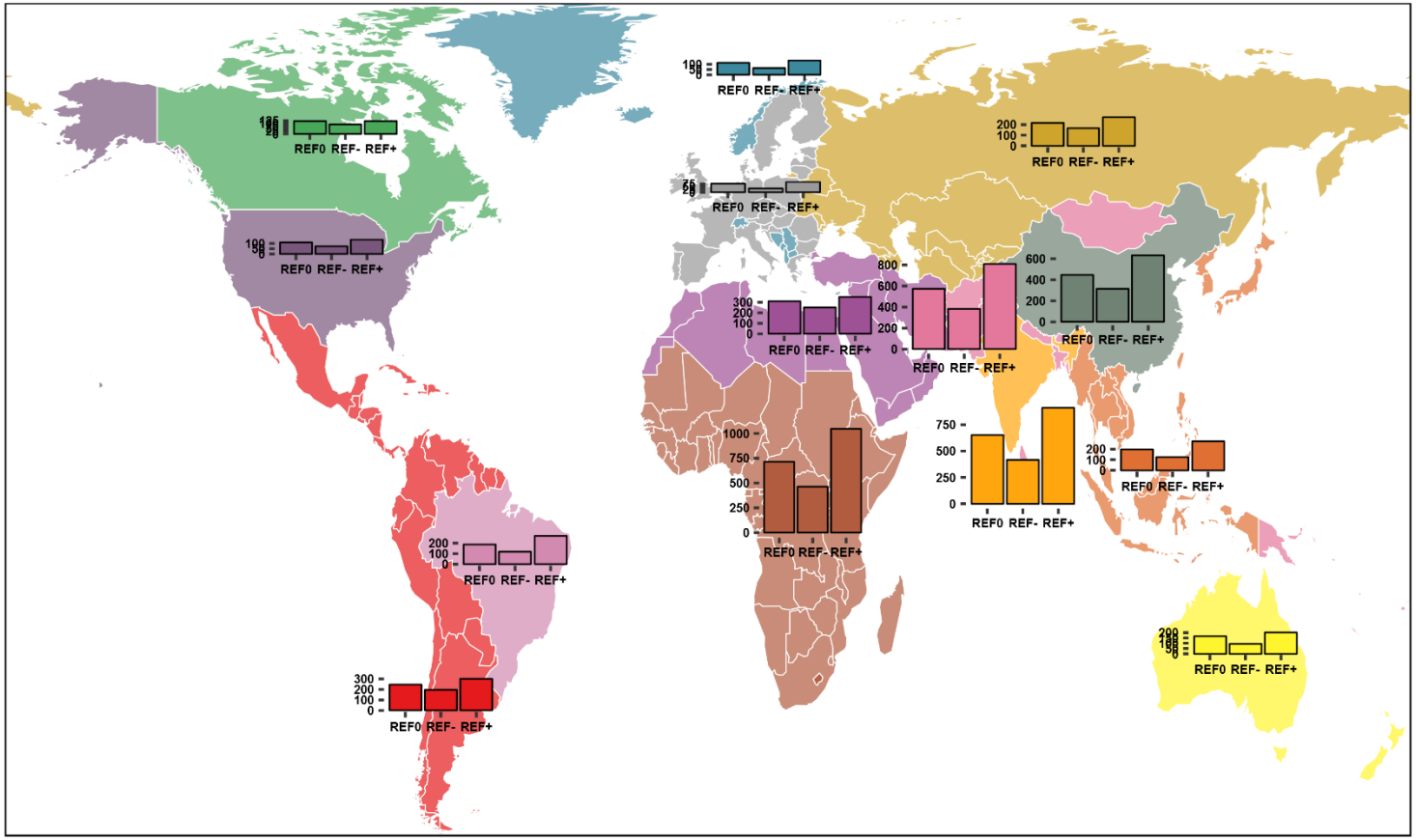
Total population change between 2010 and 2050 [%]



Source: Own calculations based on EC (2016a), KC and Lutz (2017, IIASA SSP Database)

Economic growth

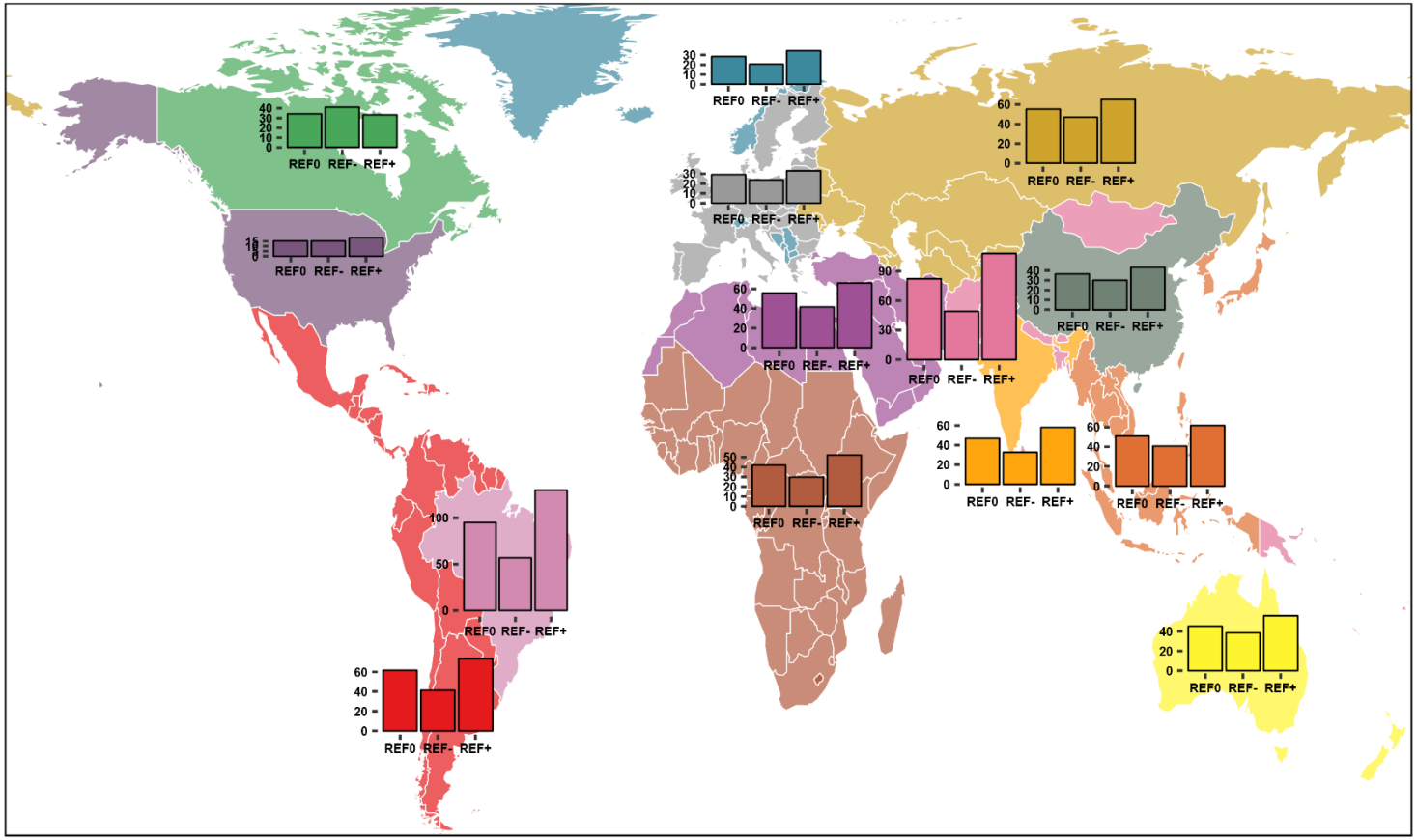
GDP change between 2010 and 2050 [%]



Source: Own calculations based on EC (2016a), Dellink et al. (2017, IIASA SSP Database)

Crop yields

Wheat yield change between 2010 and 2050 [%]



Source: Own calculations based on CAPRI model baseline and Havlík et al. (2012)

Modelling tools in SUSFANS

Macro-economy

MAGNET
Complete economy
Income effects
Long run

Global, countries

Diet & health

SHARP
Product detail
Specific diet needs
Short run

EU4

DIET
Consumers preferences
Health & environment
Short run

EU3

Agricultural production

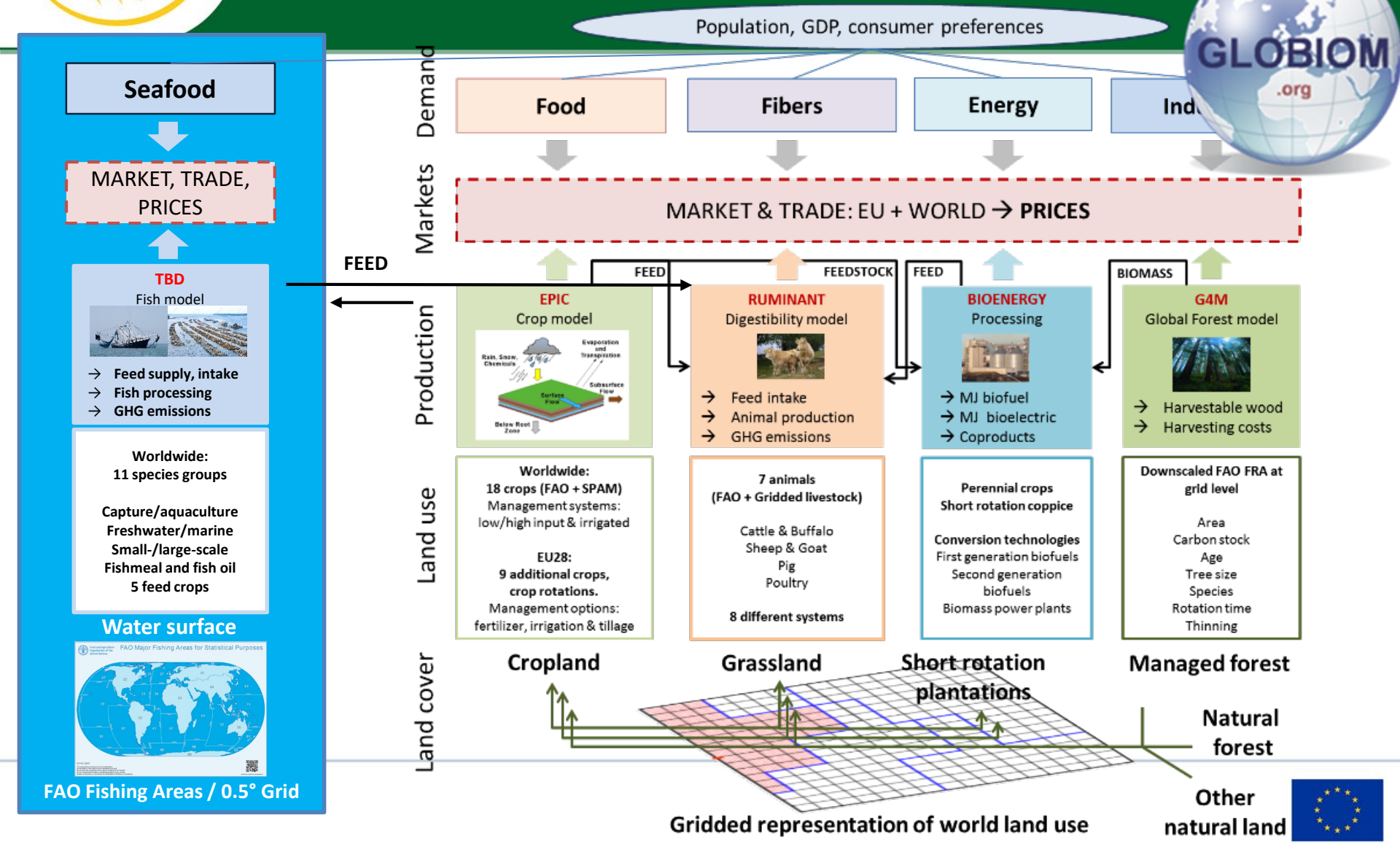
GLOBIOM
Spatial detail
Environmental impacts
Long run

Global, grid

CAPRI
EU detail
Production detail
Long run

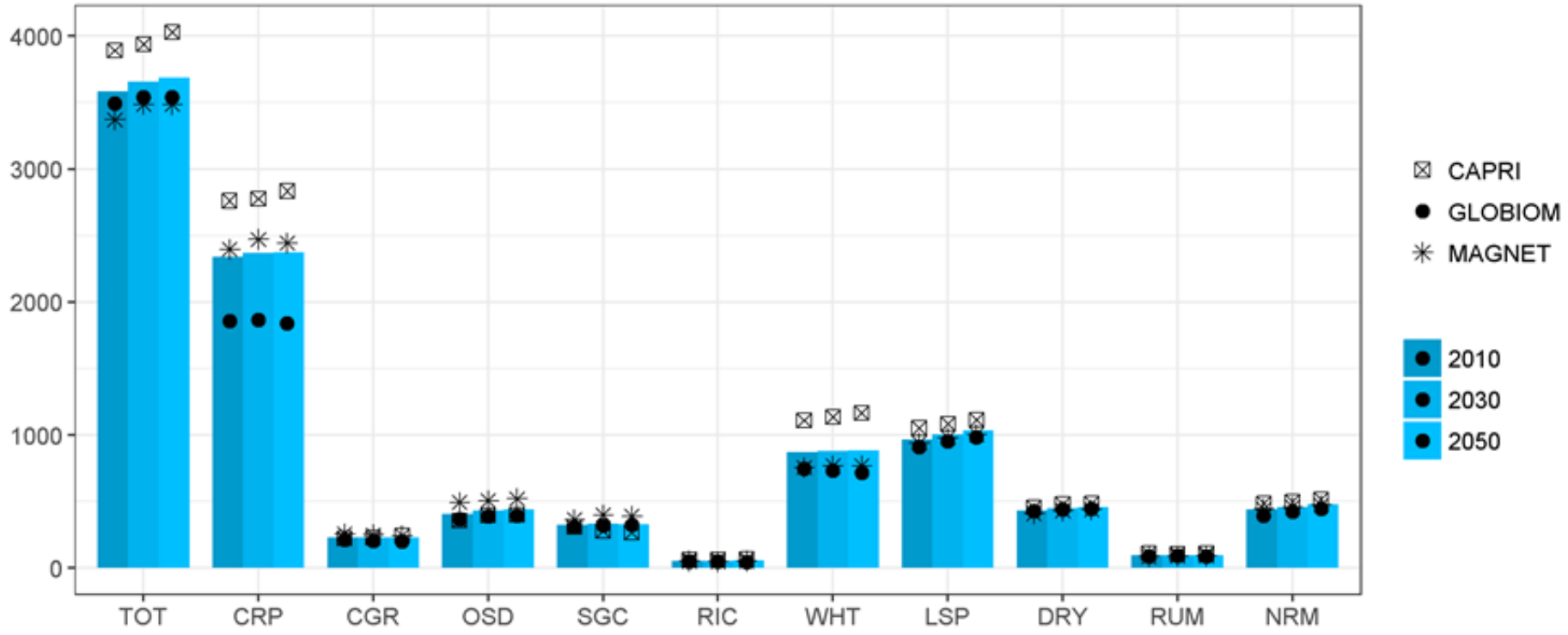
Global, EU, NUTS2

Modelling tools in SUSFANS



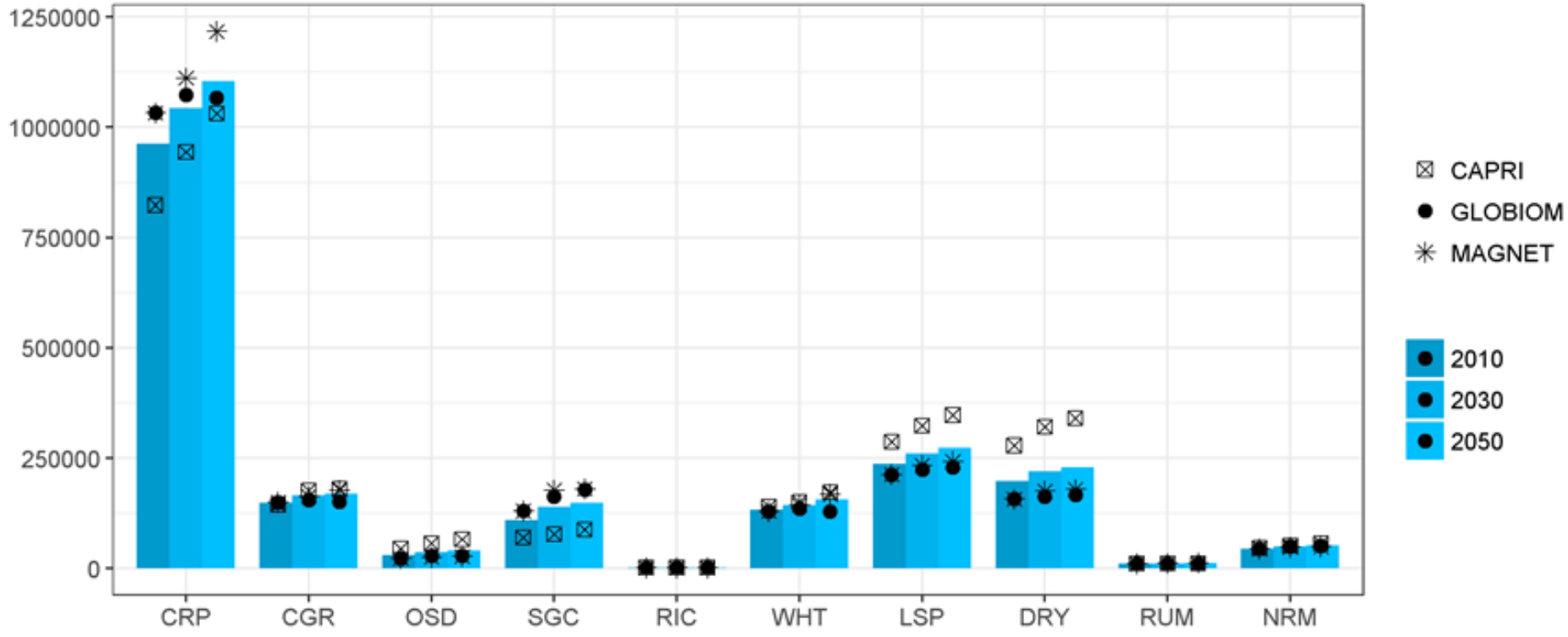
Baseline scenario: EU28

Calorie consumption [kcal/capita/day]



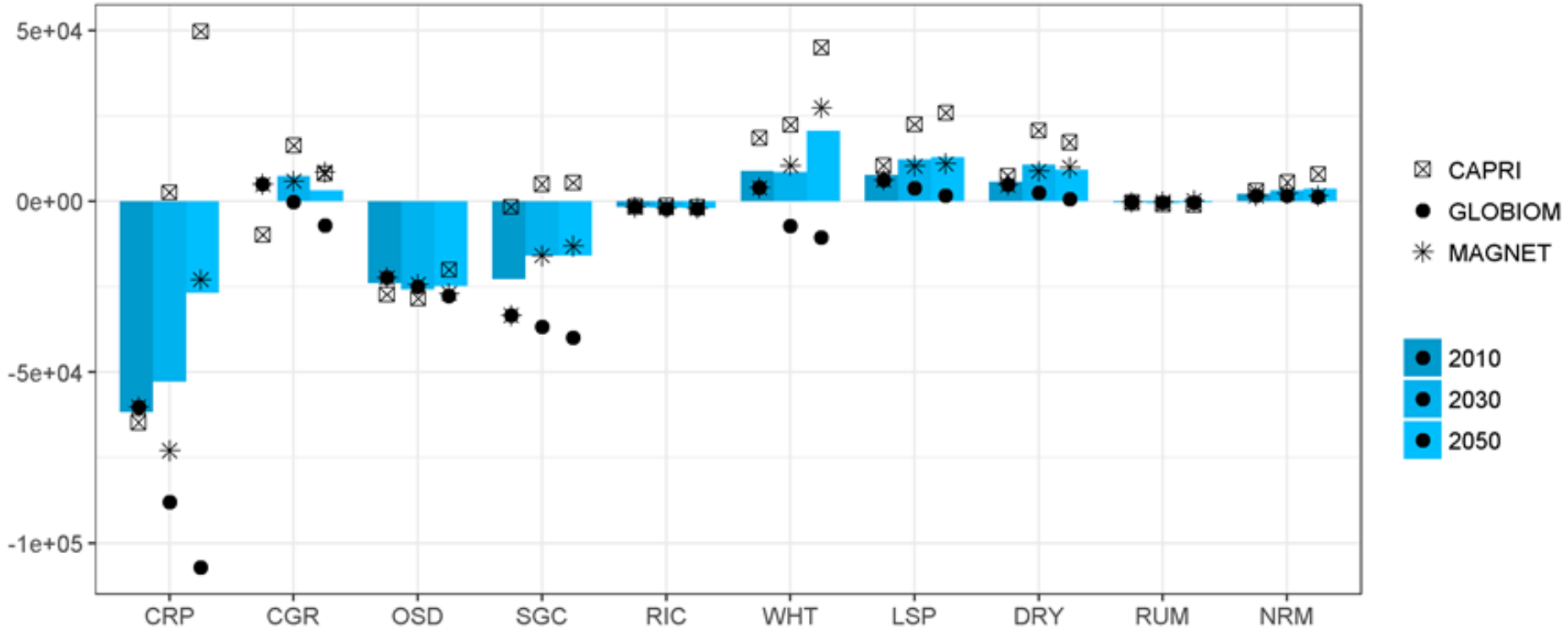
Baseline scenario: EU28

Crop and livestock production [1000 t]



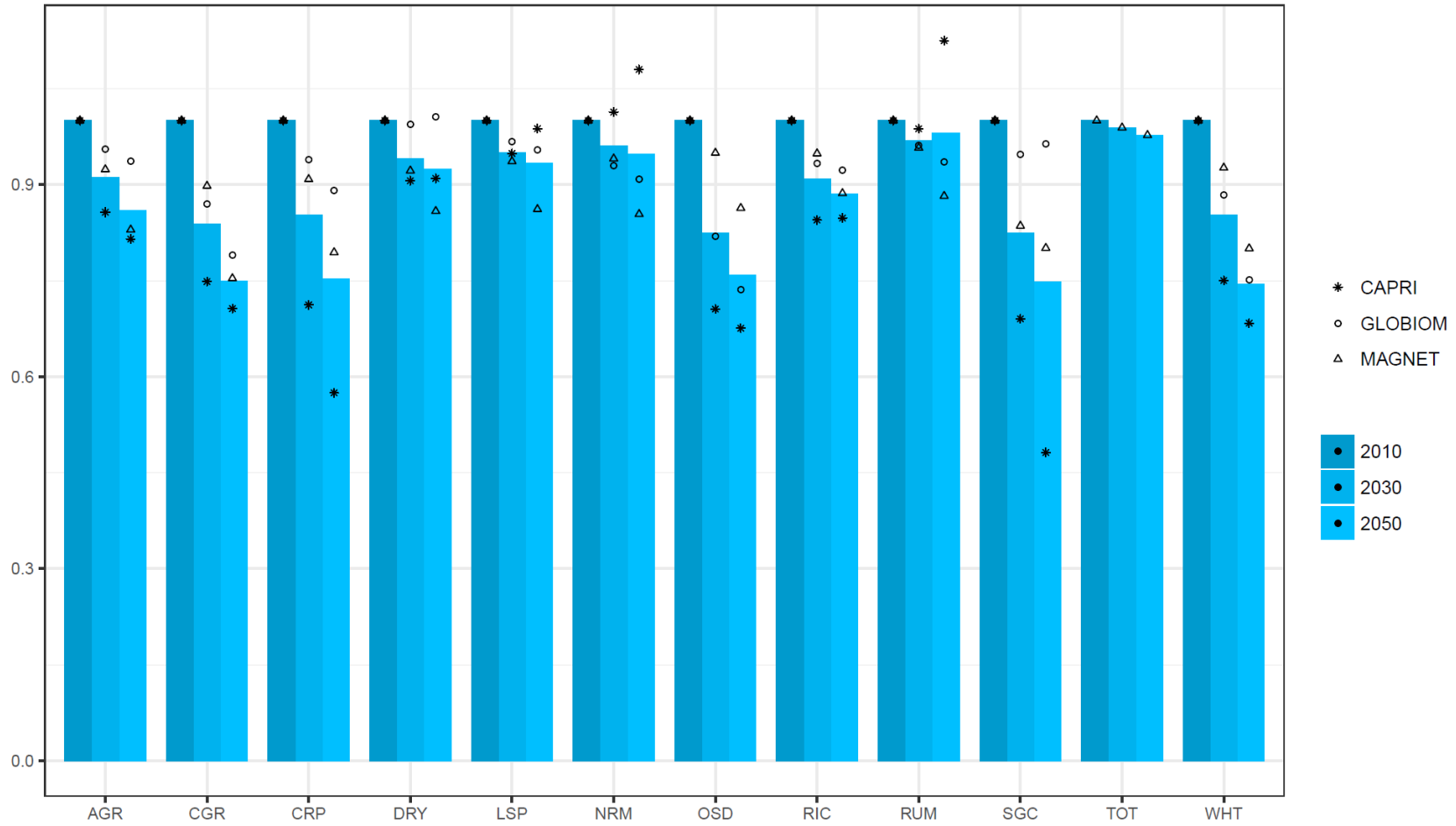
Baseline scenario: EU28

Crop and livestock net trade [1000 t]

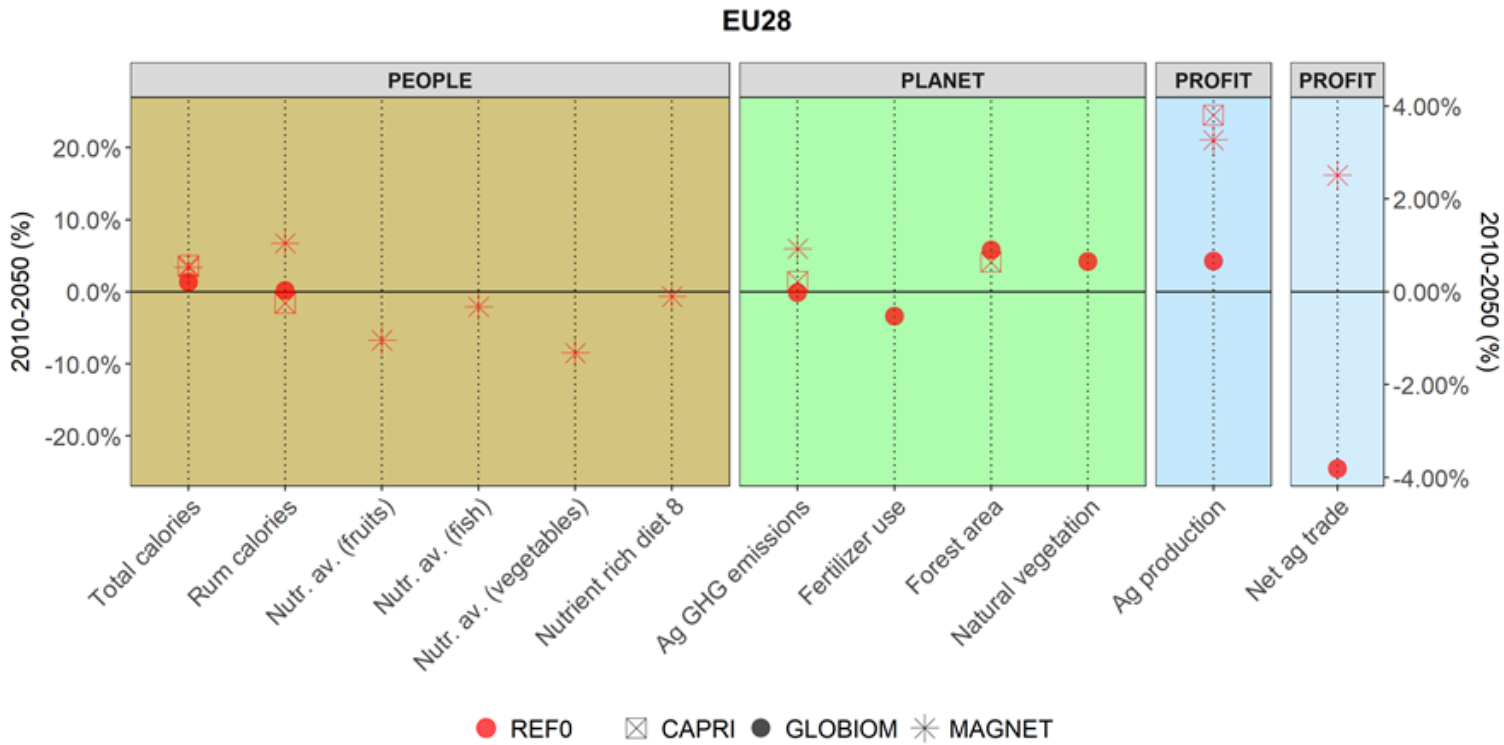


Baseline scenario: EU28

Producer prices [2010 = 1]

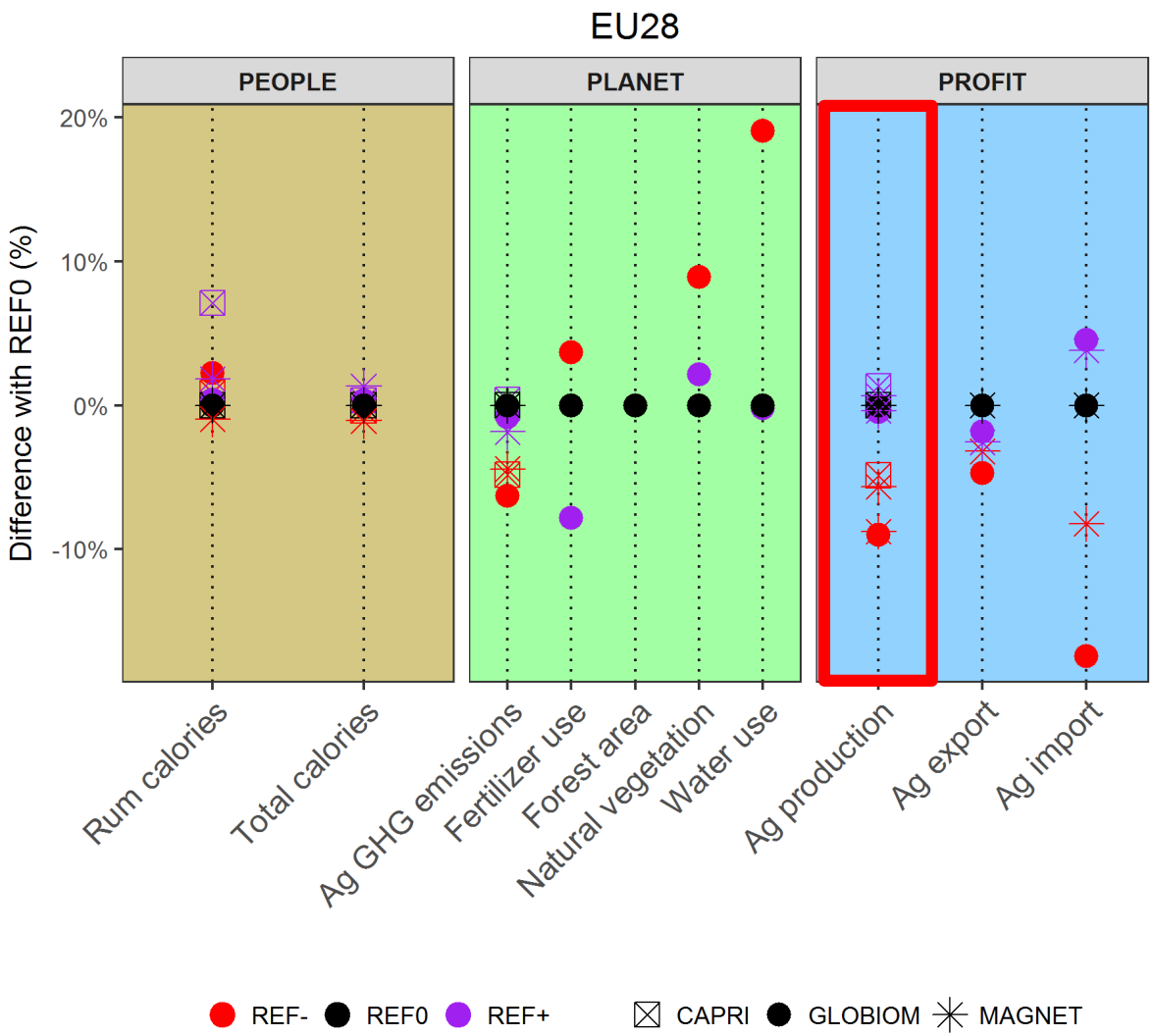


Baseline scenario 2050

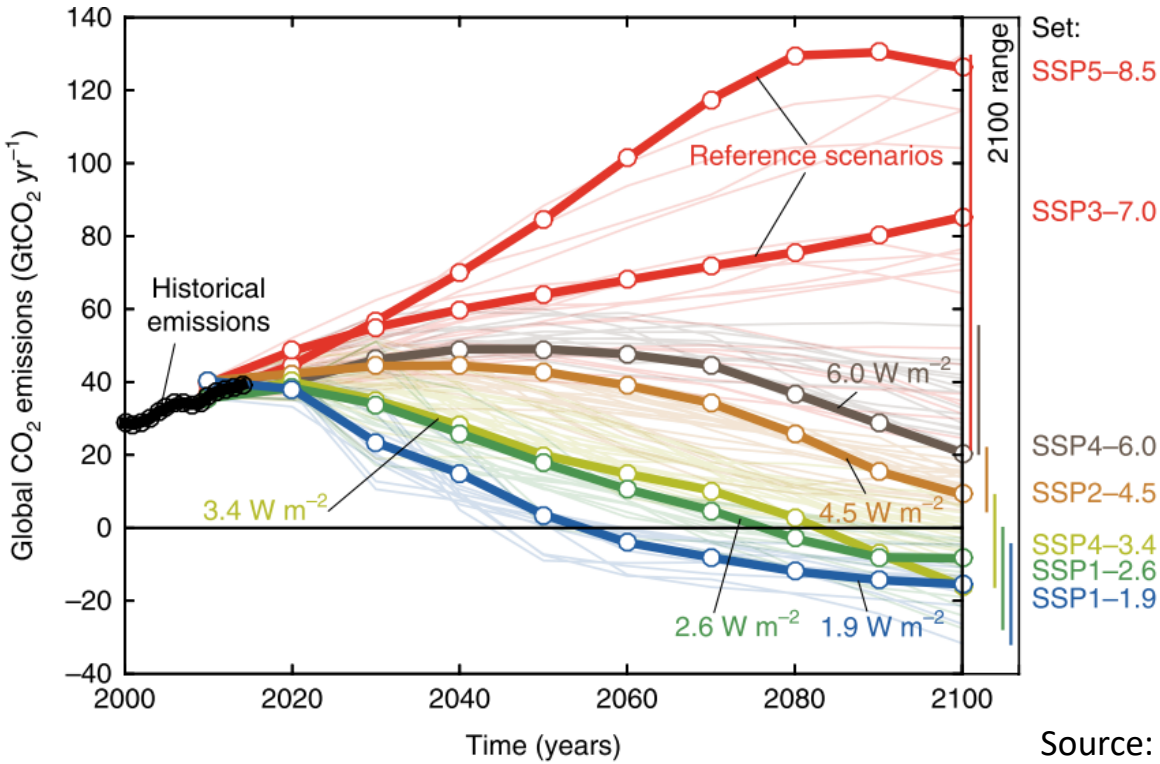


- Stagnation - economic, slightly deteriorating diets and improving environment

Contextual scenarios 2050



Climate mitigation challenge



Source: Rogelj et al. NCC 2018

Carbon neutraility compatible with 2 degrees: 2055-2080
1.5 degrees: 2045-2070

EU Longterm strategy

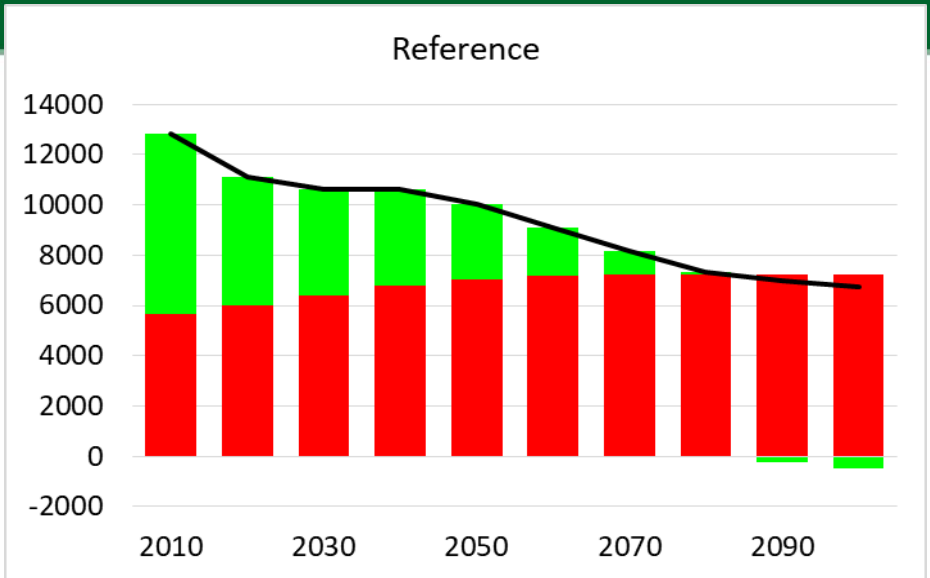
- 2020 targets: 20% GHG reduction, bioenergy and energy efficiency

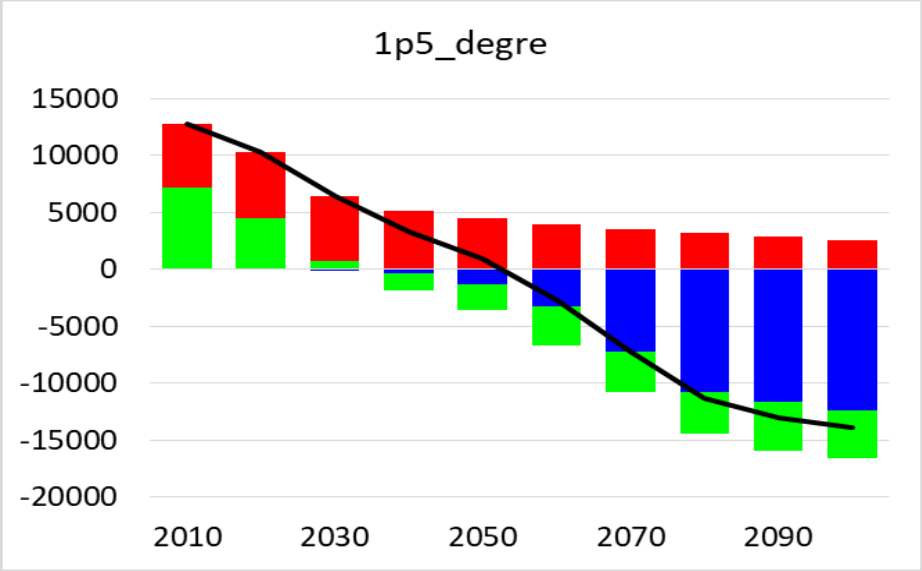
- 2030 targets/NDC: 40% GHG reduction
  - -43% ETS: covering power plants and large industrial installations
  - -30% non-ETS covering smaller industries, transport, ag. non-CO_2 …
  - Limited access to LULUCF credits
    No specific target for agriculture yet

- 2050 climate strategy: GHG neutral by 2050
  - Long-Term Strategy "A clean planet for all"

Total land use related GHG emissions

[MtCO2eq]





Emissions|non-CO2|Land Use

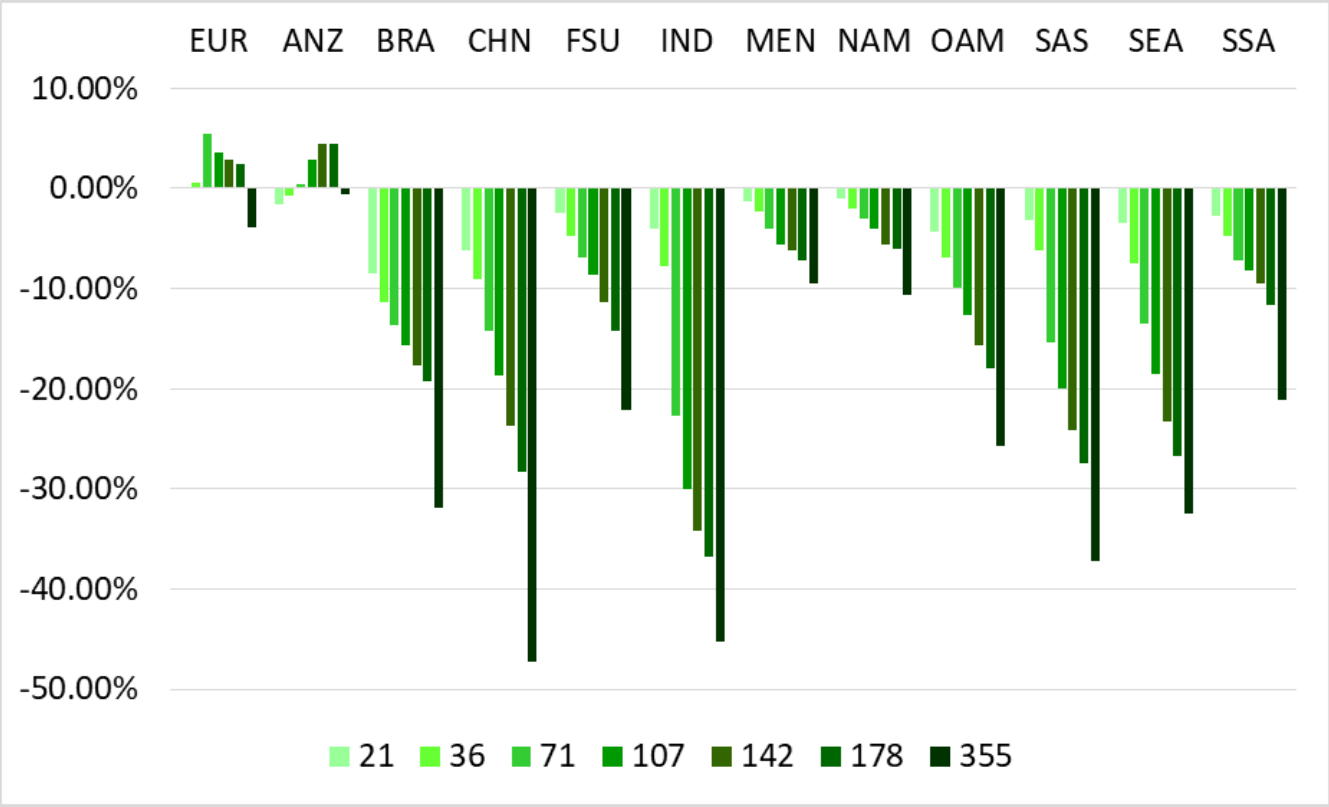
Emissions|CO2|Land Use

Emissions|CO2|Carbon Capture and Storage|Biomass

Emissions|GHG|AFOLU & BECCS

Climate mitigation & EU food system

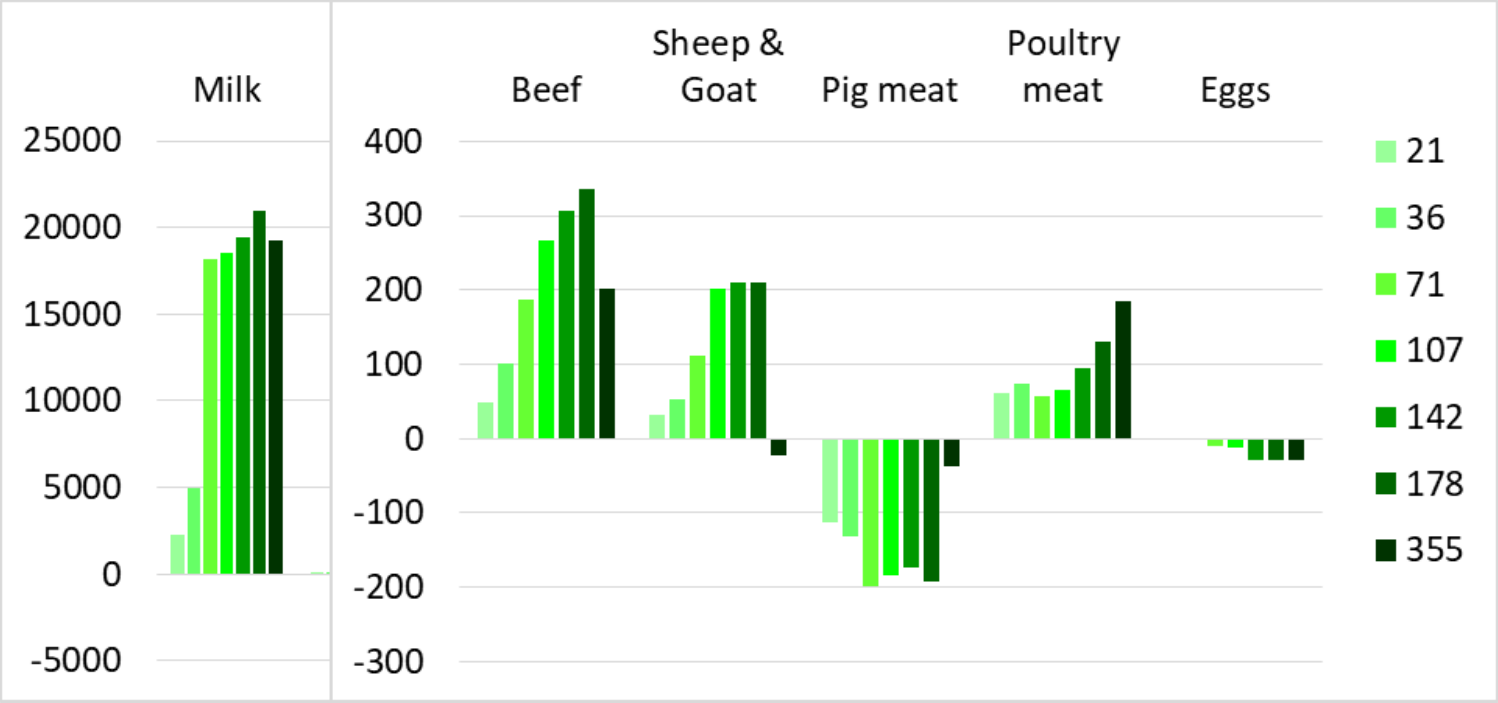
- Global milk production change compared to baseline by 2030 [%]



Source: AGCLIM50, Frank et al. 2018 NCC

Climate mitigation & EU food system

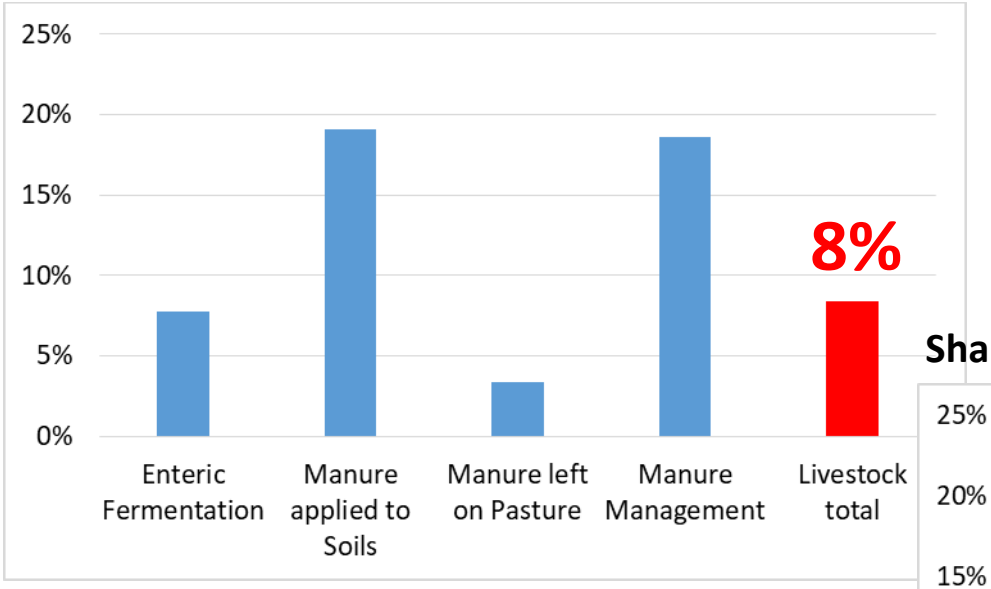
- EU net trade absolute difference compared to baseline by 2030 [1000 tonnes]



Source: AGCLIM50, Frank et al. 2018 NCC

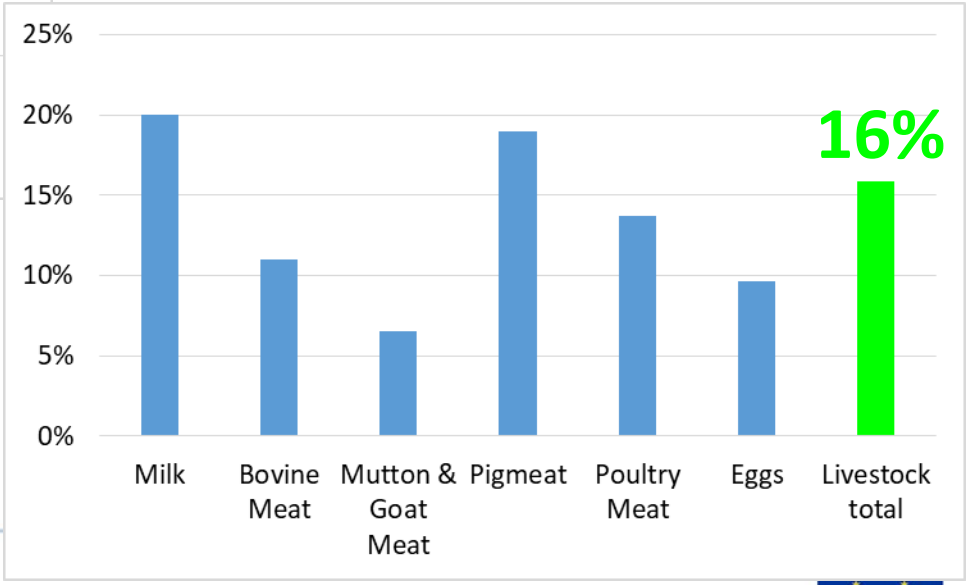
Climate mitigation & EU food system

Share of EU livestock emissions in Global emissions



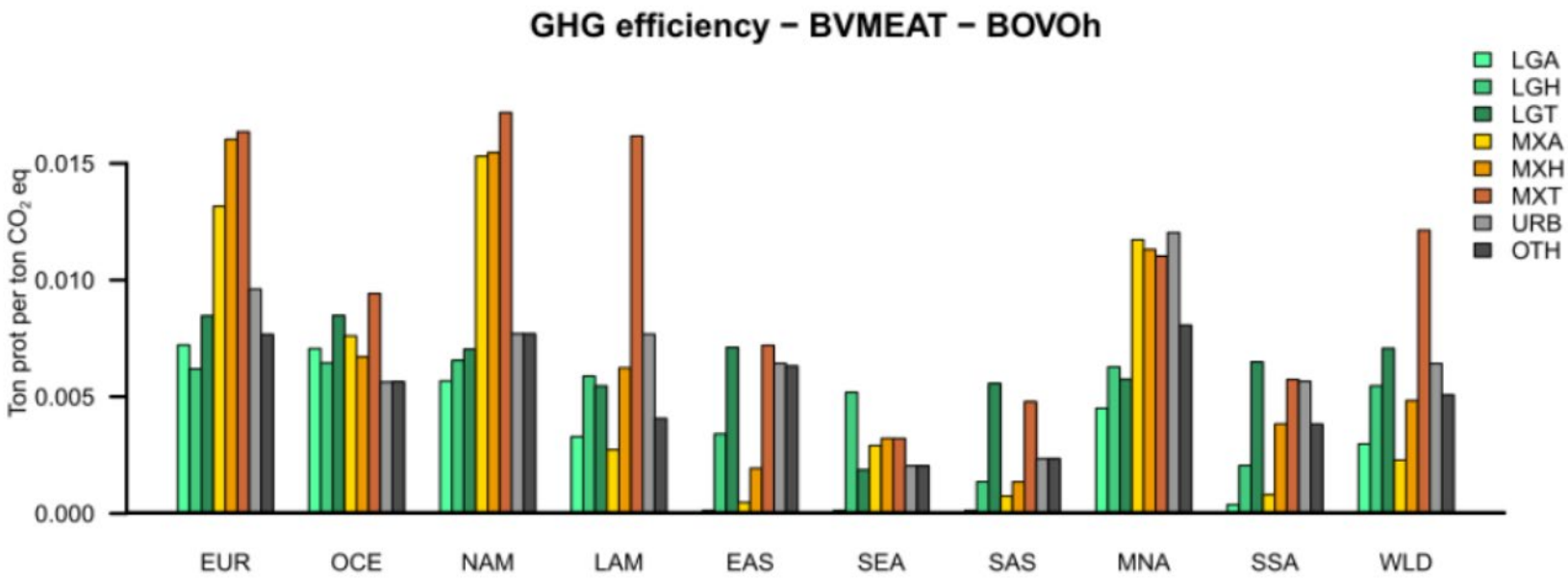
Source: FAOSTAT

Share of EU livestock production in Global production



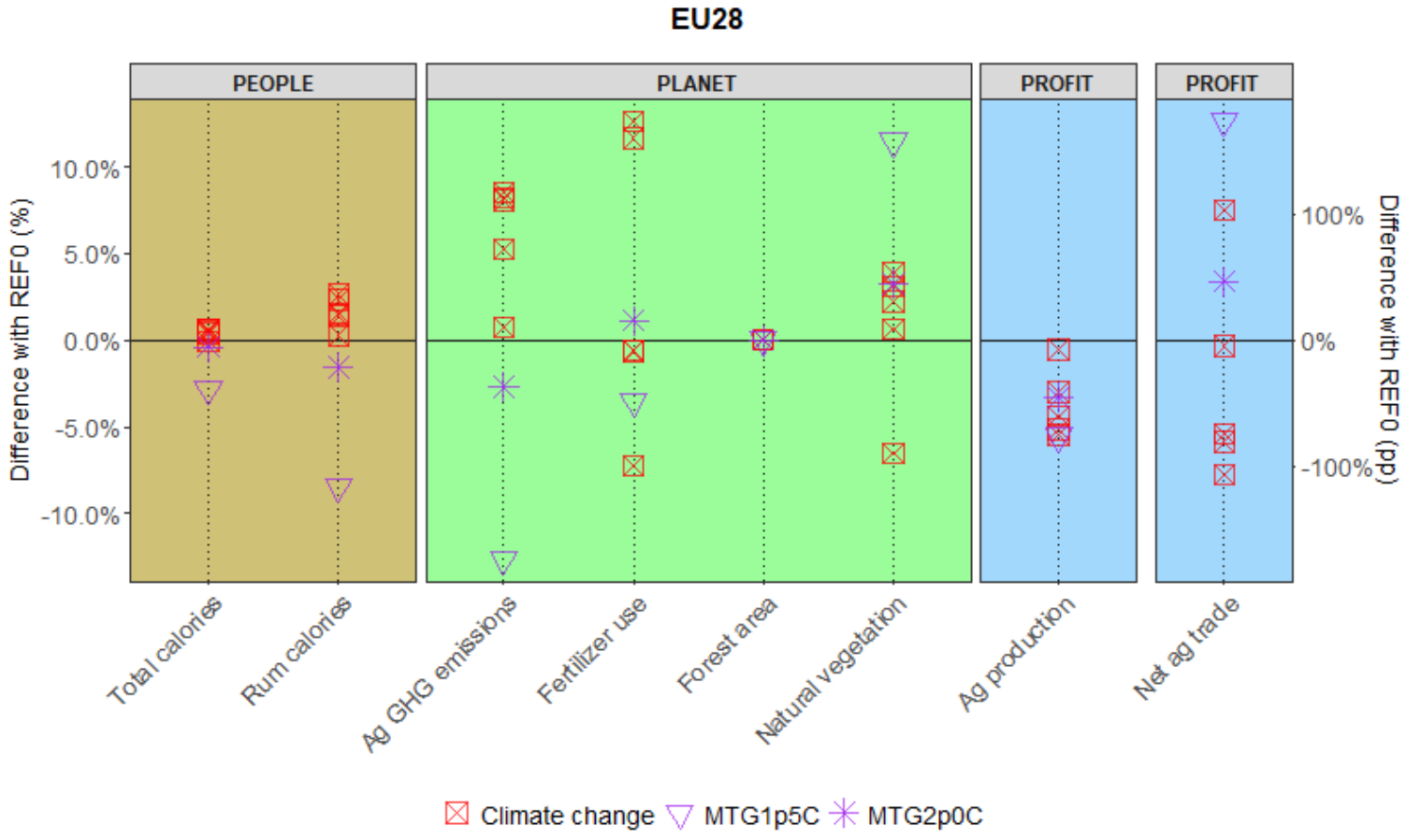
Climate mitigation & EU food system

- Large GHG efficiency differences between production systems and regions prevail



Source: Herrero et al. PNAS 2013

Climate mitigation & EU food system



Sustainable pathways for EU food system

- Pathway 1: “Quality for Europe”

- Pathway 2: “Safety for the World”

EU SFNS Pathway 1: "Quality for Europe"

- Decreasing domestic demand allows for extensification of agri production
- EU consumers supplied with organic farming-like diversified products
- Exports play a negligible role, limited to specialist markets
- Income growth in EU agribusiness through premium prices
- Benefits from reduced pollution for health and environment in the EU
- Limited contribution to the global sustainability challenges: food security, biodiversity, climate mitigation

EU SFNS Pathway 2: "Safety for the World"

- Next to the safety of EU agri/food products the exceptional environmental performance is recognized in international markets
- EU becomes the supplier No1 of standardized "clean" agri/food products and major contributor to the solution of global sustainability challenges
- Source of EU agri-business growth is volume sustained through export demand at reasonable prices
- Global solutions sometimes at the expense of EU consumers and EU environment

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Thank you!

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