



Modeling Sustainable FNS

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METRICS, MODELS AND FORESIGHT FOR
EUROPEAN SUSTAINABLE FOOD AND
NUTRITION SECURITY - SUSFANS
H2020-SFS19A
Grant 633692
to the start of ESF
over 2015 to 2019

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

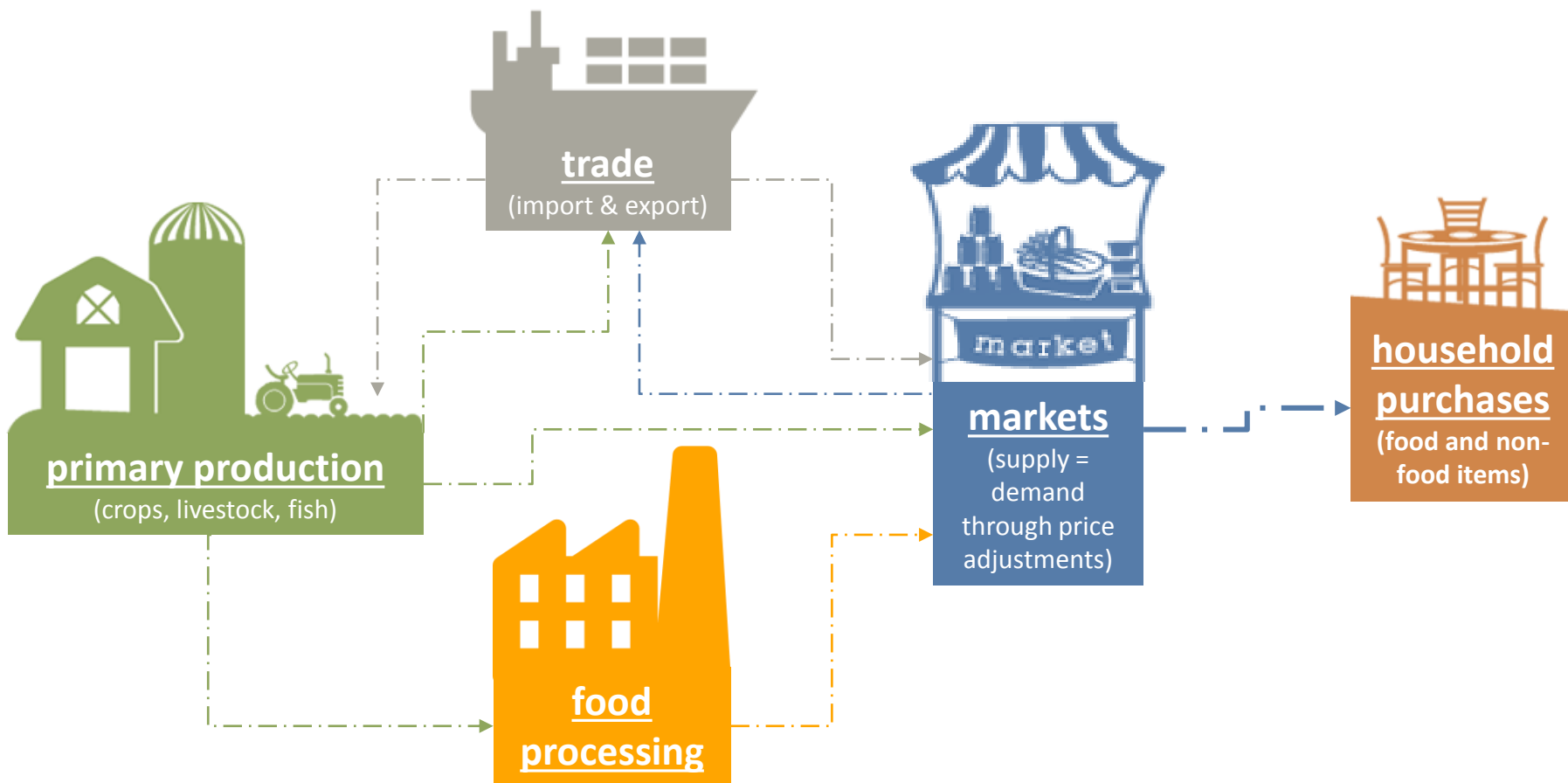
EU3

Agricultural production

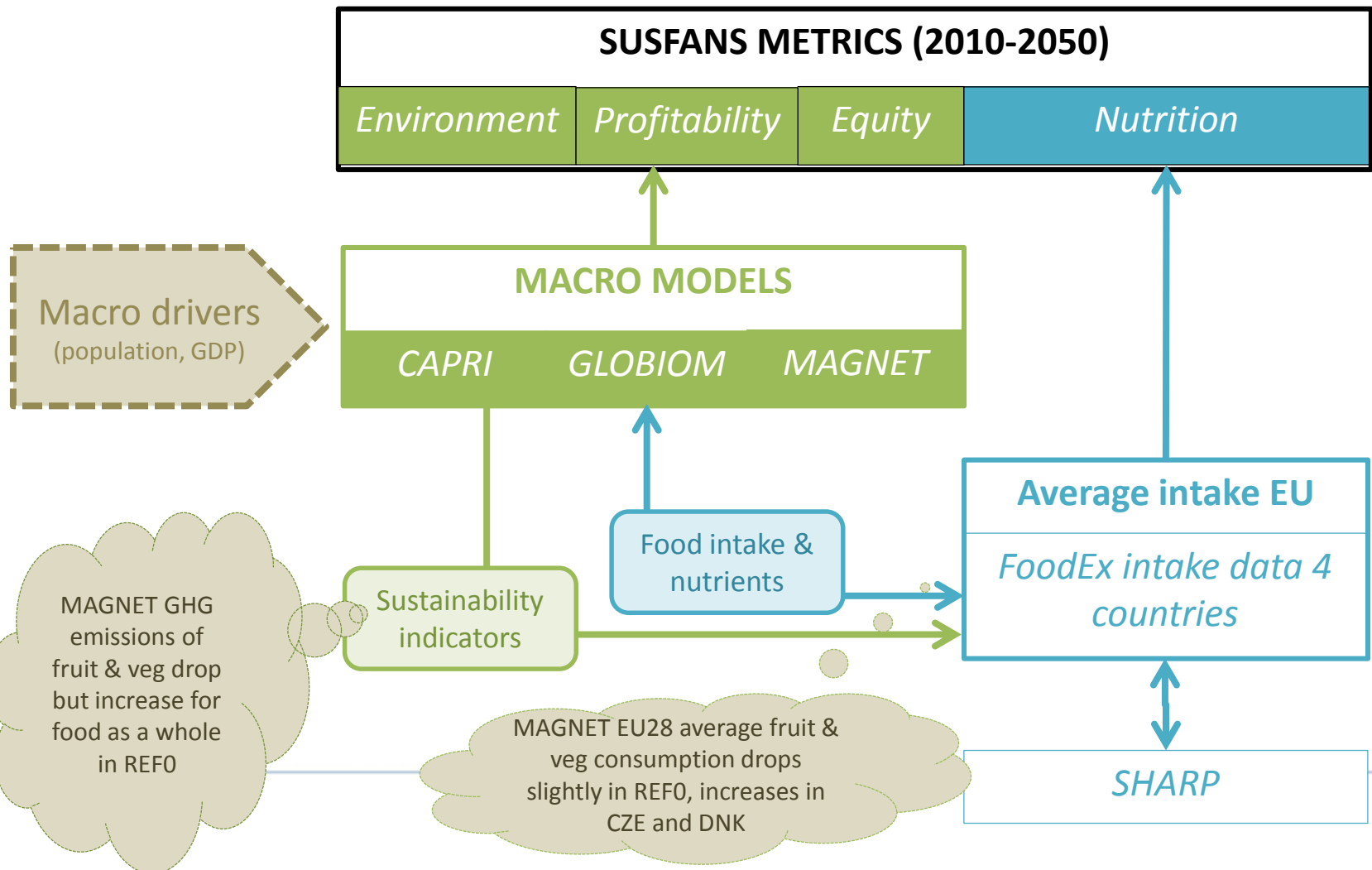
GLOBIOM
Spatial detail
Environmental impacts
Long run
Global, grid

CAPRI
EU detail
Production detail
Long run
Global, EU, NUTS2

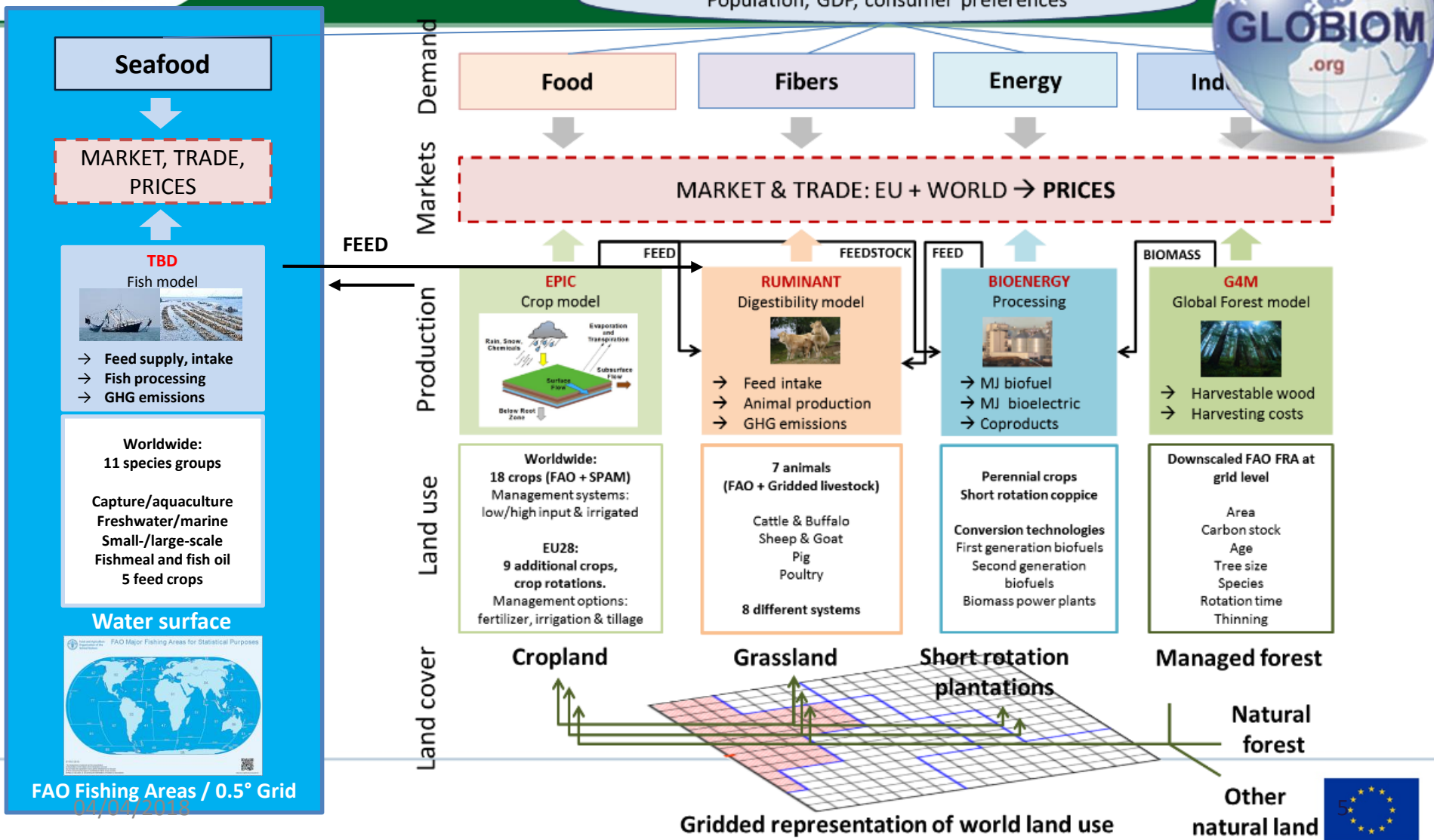
What key elements for SFNS are inside the macro models?



How to link between the macro models and micro diets?



Modelling tools in SUSFANS



Foresight on sustainable food and nutrition security (SFNS) in the EU, based on:

- Future scenario narratives and their translation into quantitative model drivers
- Assessment of the challenges for SFNS in the EU
- Assessment of a range of agro-food-nutrition policies
- Comprehensive assessment of selected holistic future scenarios developed along main challenges, policy responses, and innovation pathways



SUSFANS European SFNS foresight approach

SCENARIO NARRATIVES REVIEW

EU FOOD SYSTEM CHALLENGES

AGRO-FOOD-
NUTRITION
POLICIES

CONTEXTUAL
SCENARIOS

INNOVATIONS

SUSFANS FORESIGHT

FINAL
FORESIGHT
& POLICY
GUIDANCE

SUSFANS
EUROPE
TOOLBOX
TOUR
(CZ, DK,
FR, IT)

CLOSING
SEMINARS
(Brussels)



Challenges to sustainable FNS in Europe

Contextual scenarios *building on the stakeholder consultation in WP6* 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



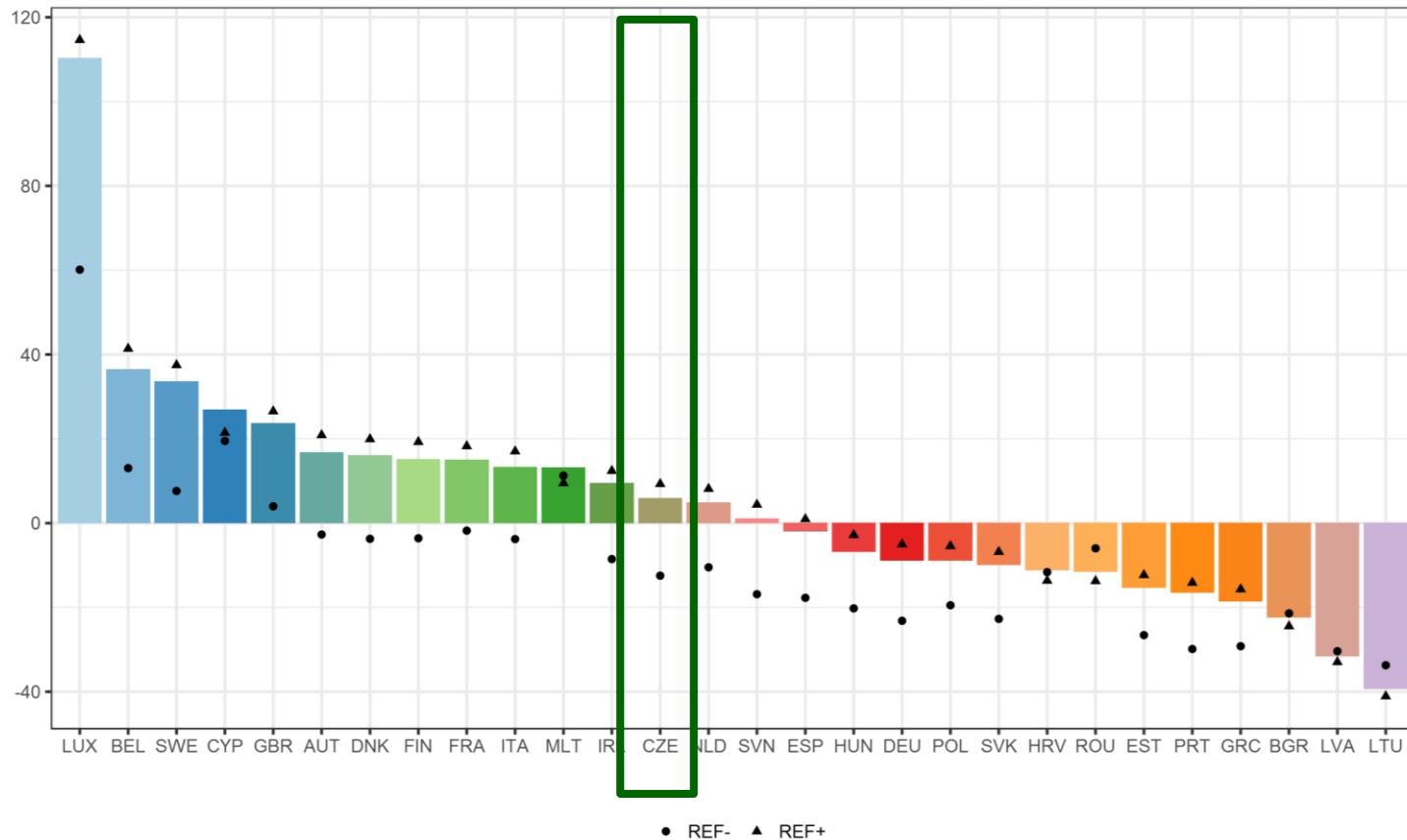
Contextual scenarios

Focus on 3 contextual scenarios

	High challenges (REF-)		Moderate challenges (REF0)		Low challenges (REF+)	
	EU	World	EU	World	EU	World
POP	↓	↑↑	↑	↑	↑	↑
GDP	↑	↑	↑	↑	↑	↑
TEC	↑	↑	↑	↑	↑	↑
TRD	+100%	+100%	0	0	-100%	-100%

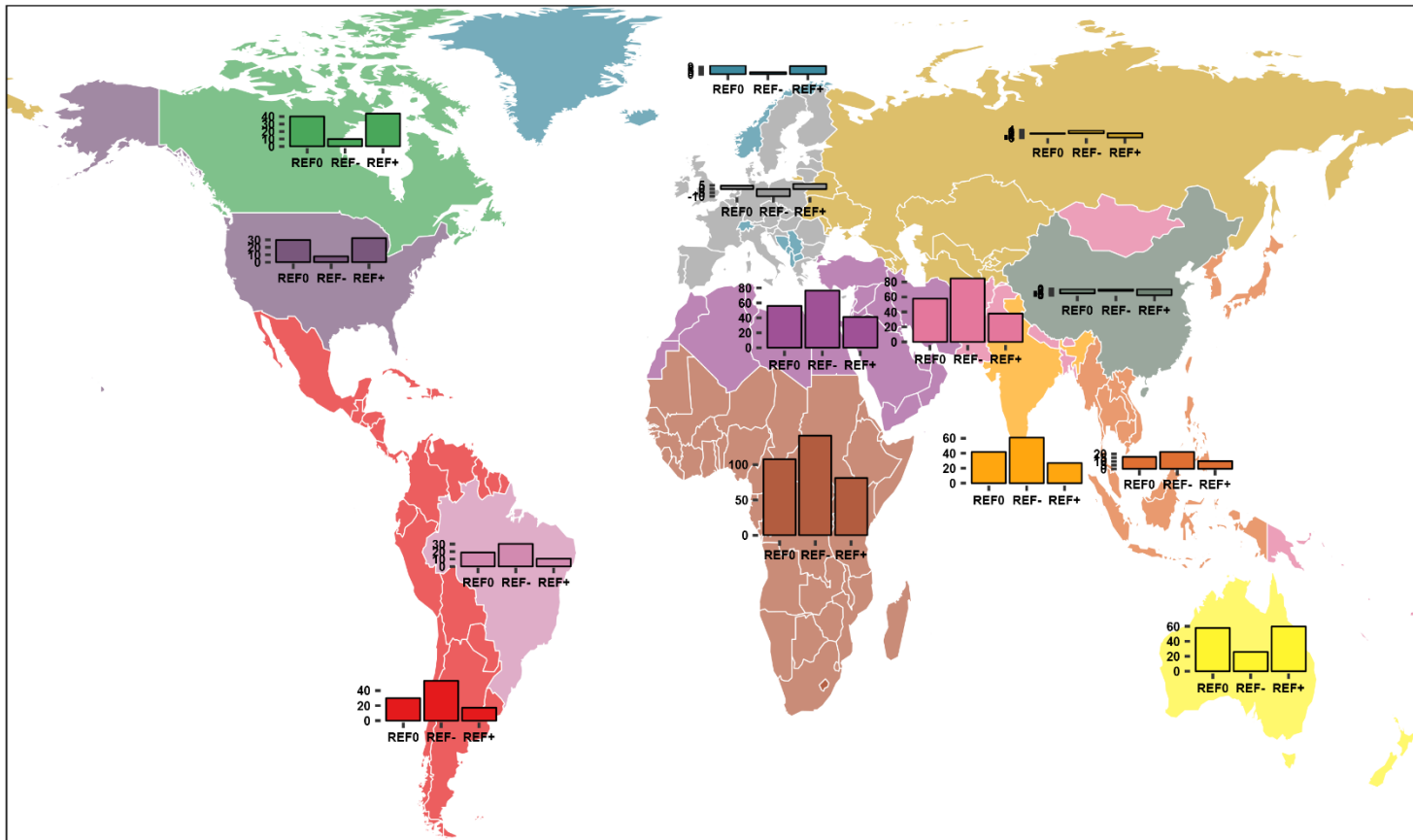
Population growth: EU

Total population change between 2010 and 2050 in REF0 (bars) [%]



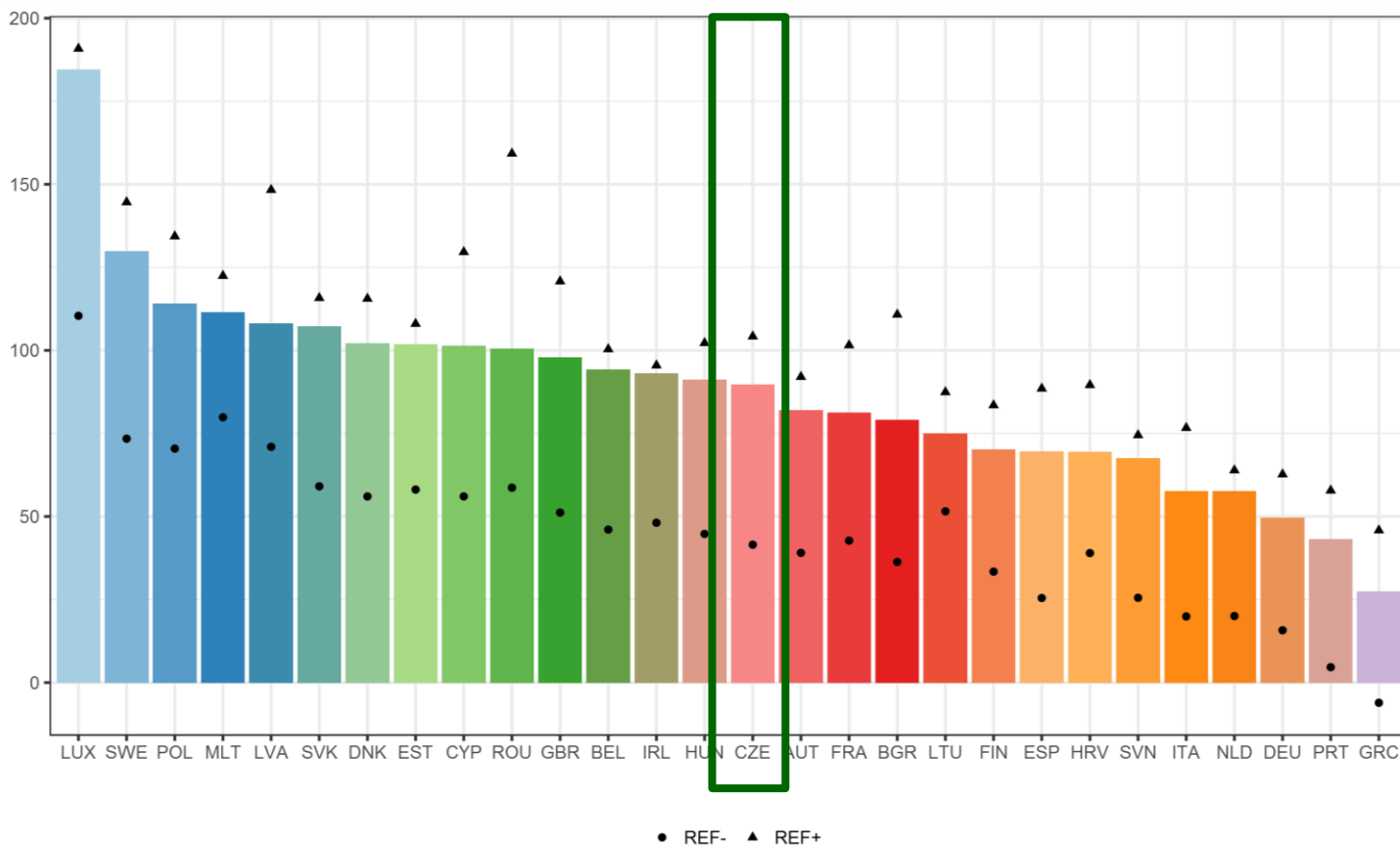
Population growth: World

Total population change between 2010 and 2050 [%]



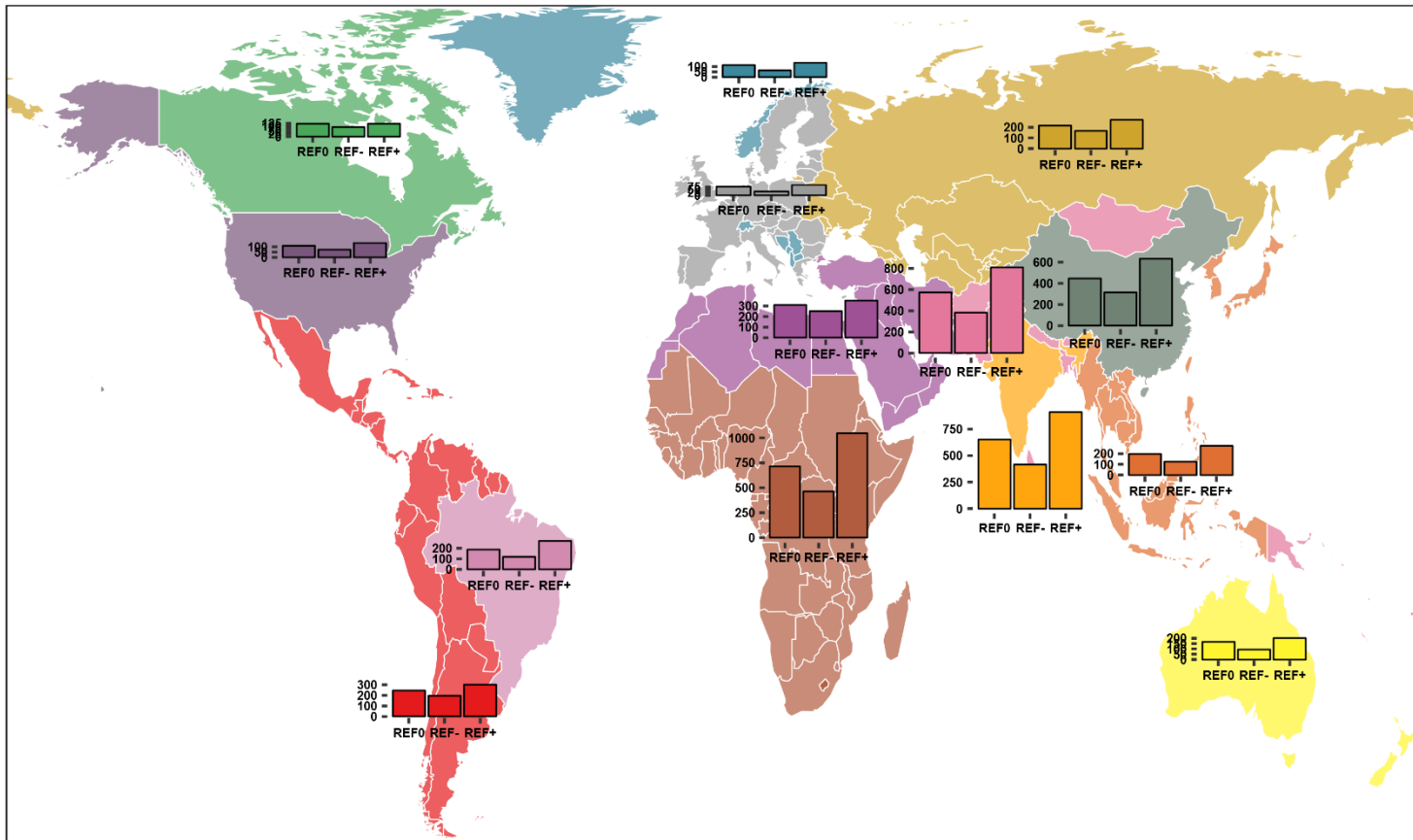
Economic growth: EU

GDP change between 2010 and 2050 in REF0 (bars) [%]



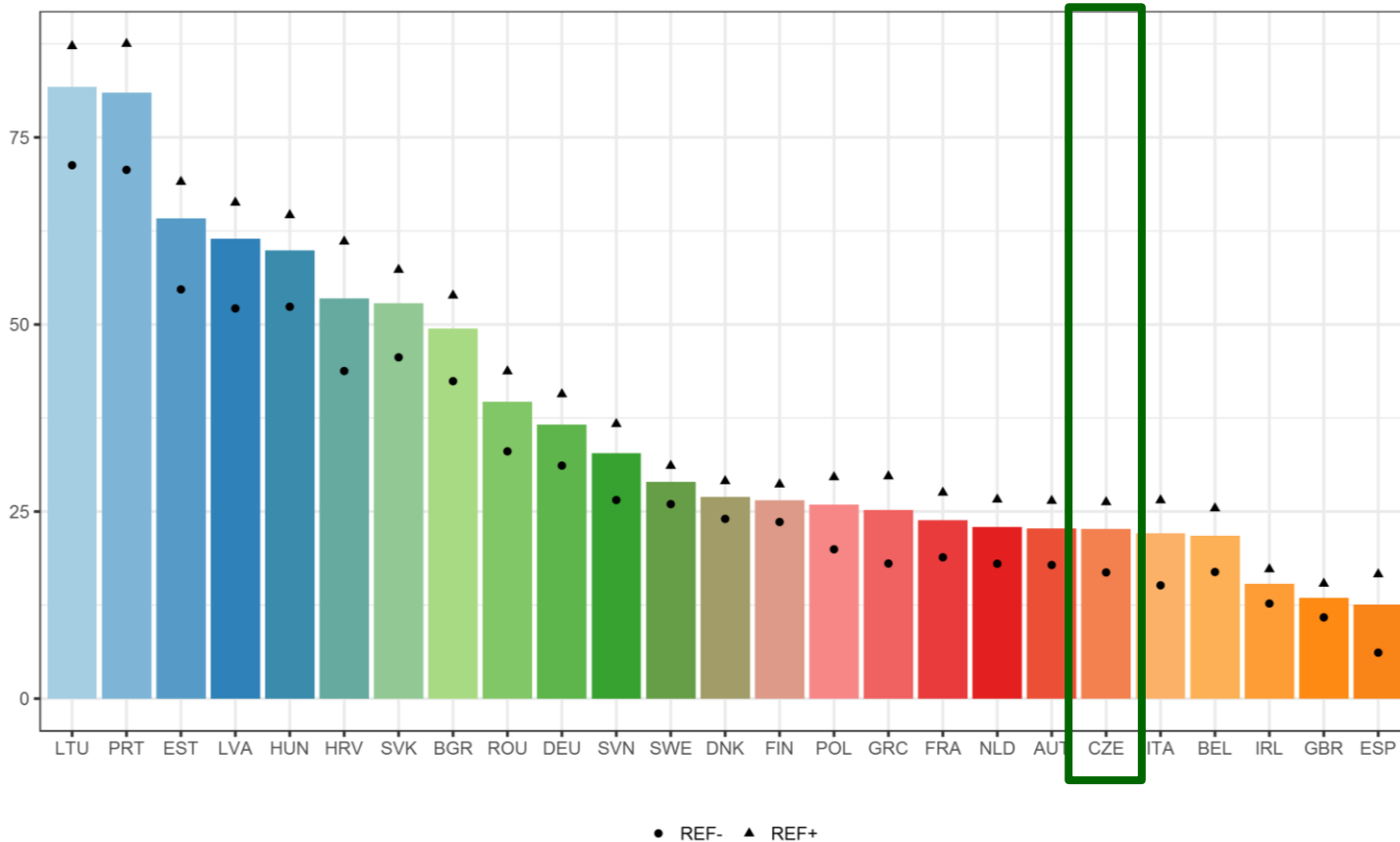
Economic growth: World

GDP change between 2010 and 2050 [%]



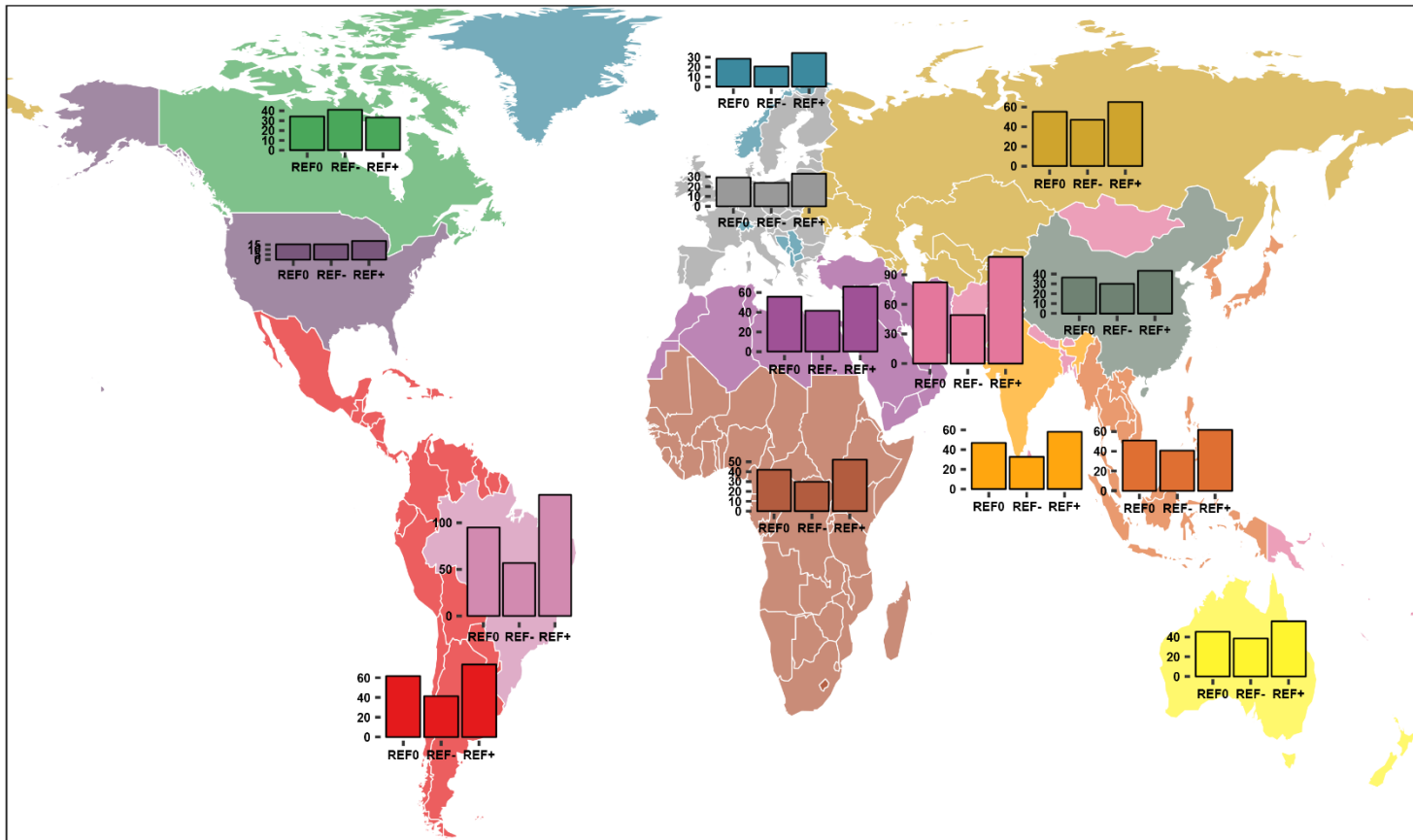
Crop yields: EU

Wheat yield change between 2010 and 2050 in REF0 (bars) [%]



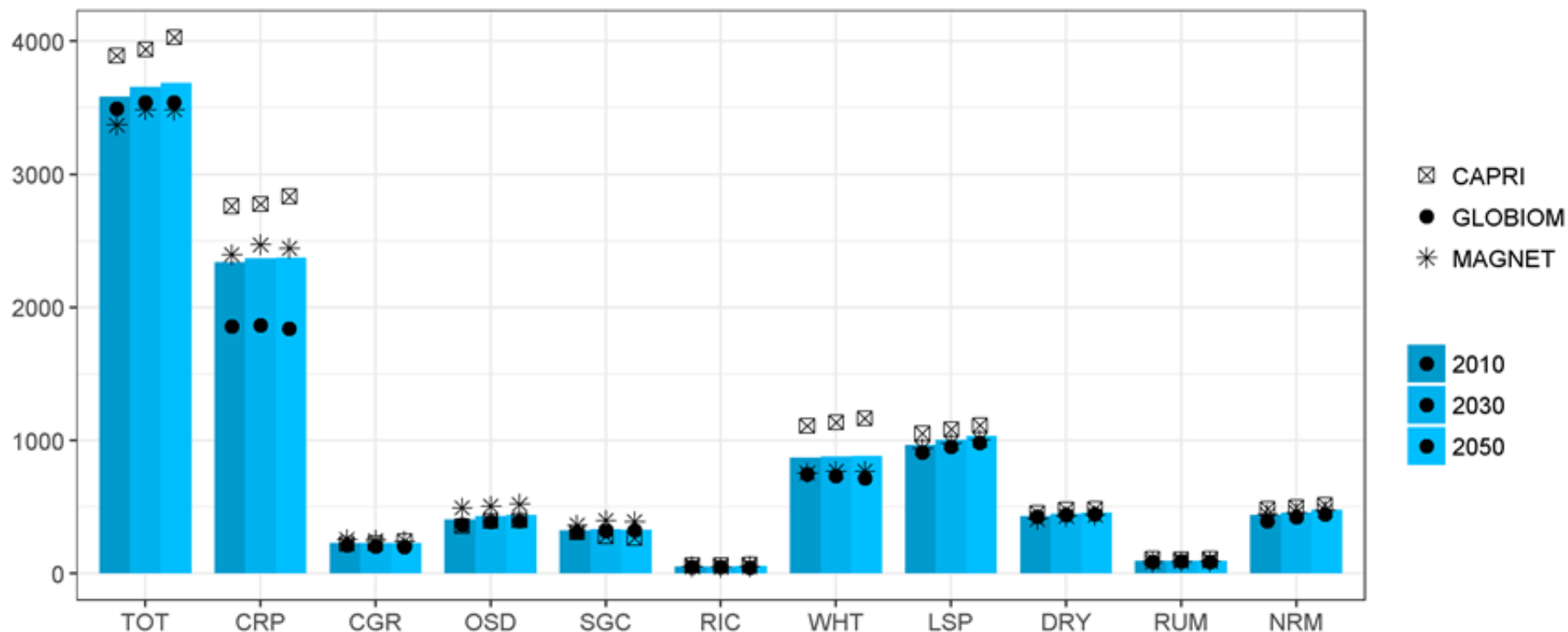
Crop yields: World

Wheat yield change between 2010 and 2050 [%]



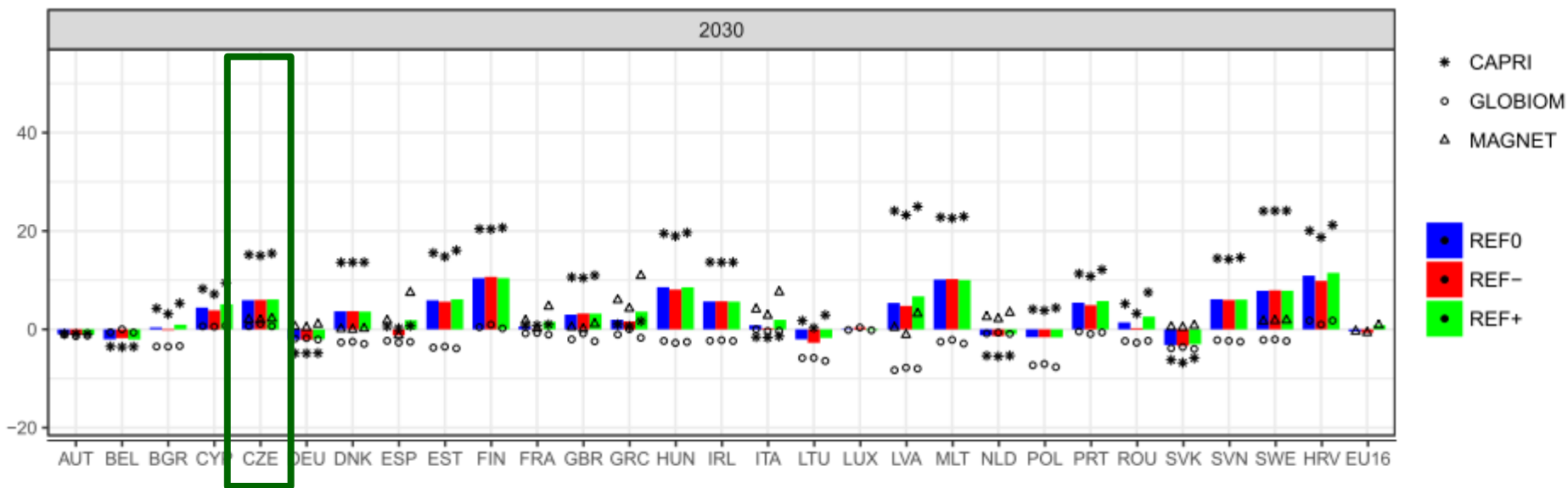
Baseline scenario: EU28

Calorie consumption [kcal/capita/day]



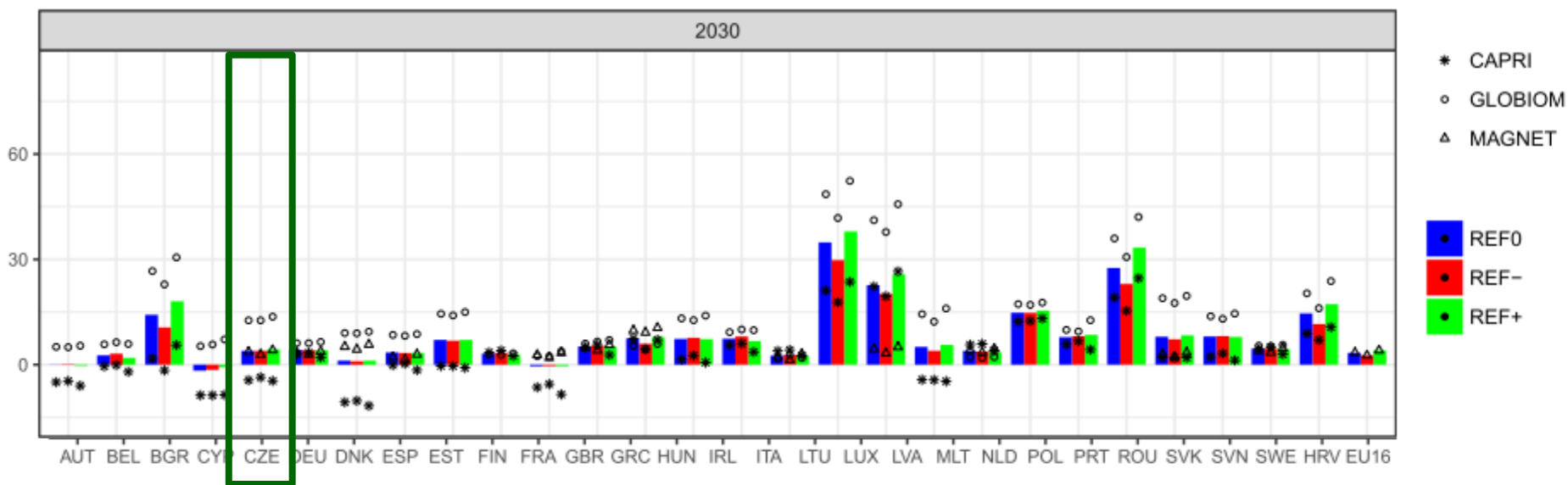
Baseline scenario: EU28

Calorie consumption [kcal/capita/day]: Wheat



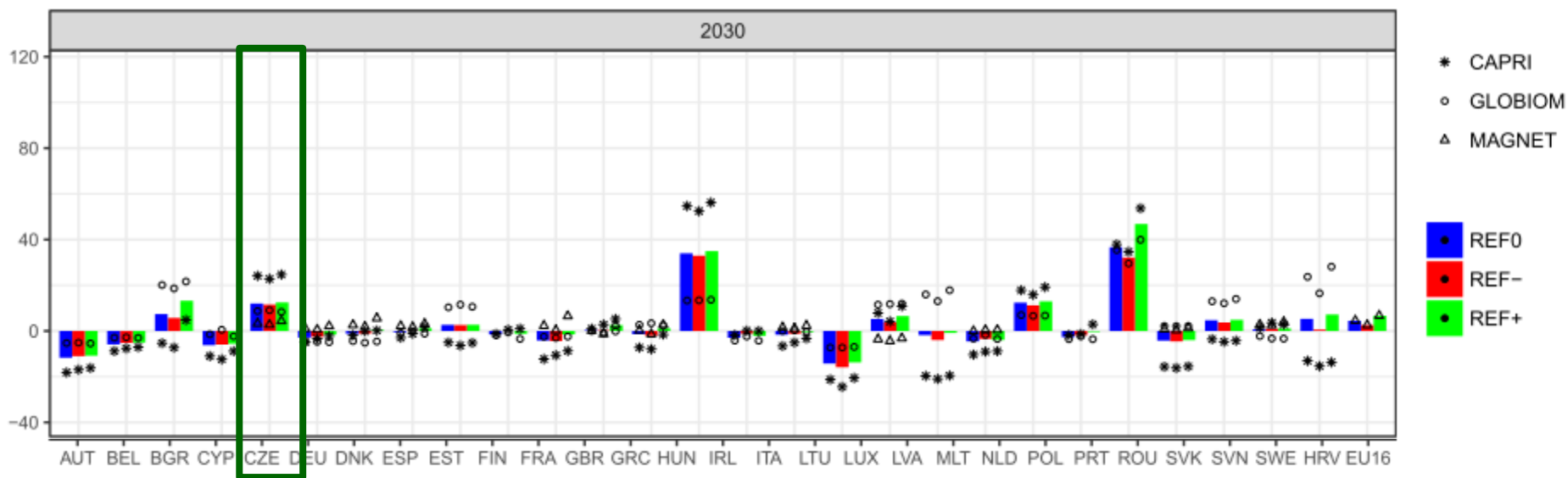
Baseline scenario: EU28

Calorie consumption [kcal/capita/day]: Pigs & Poultry



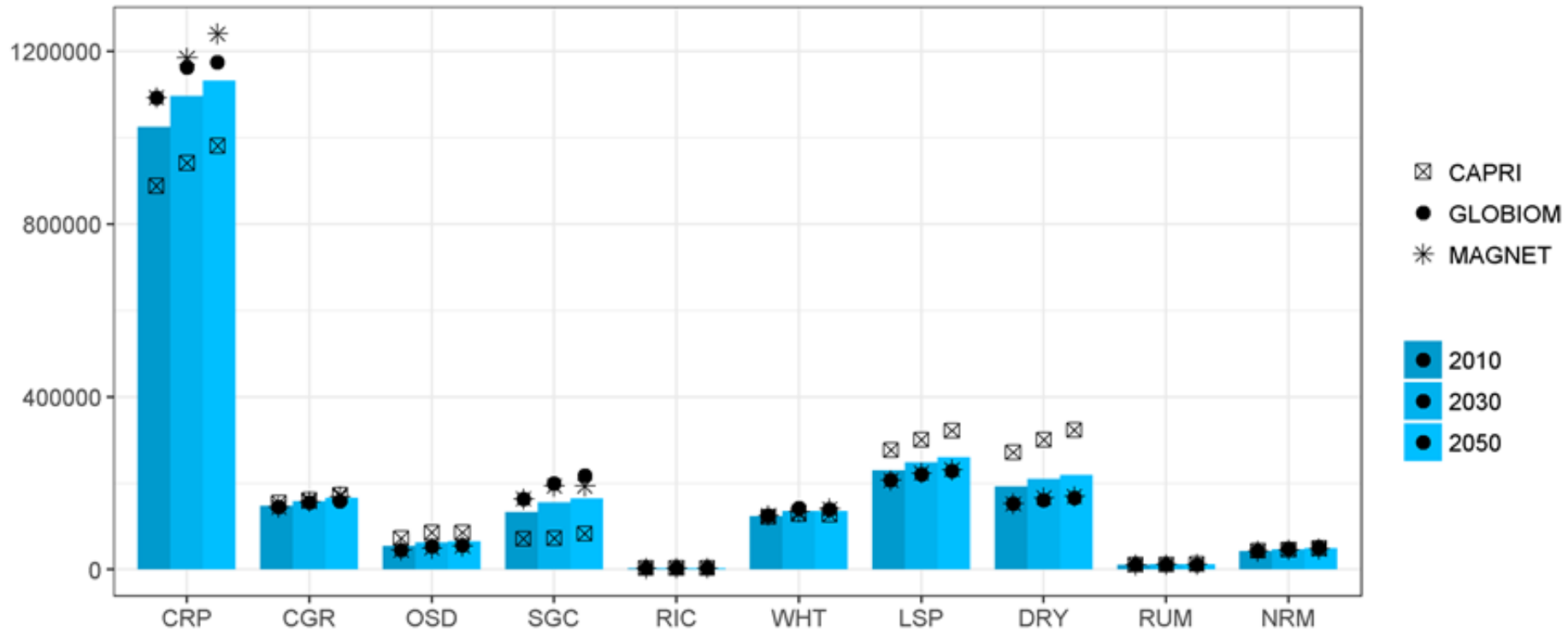
Baseline scenario: EU28

Calorie consumption [kcal/capita/day]: Beef



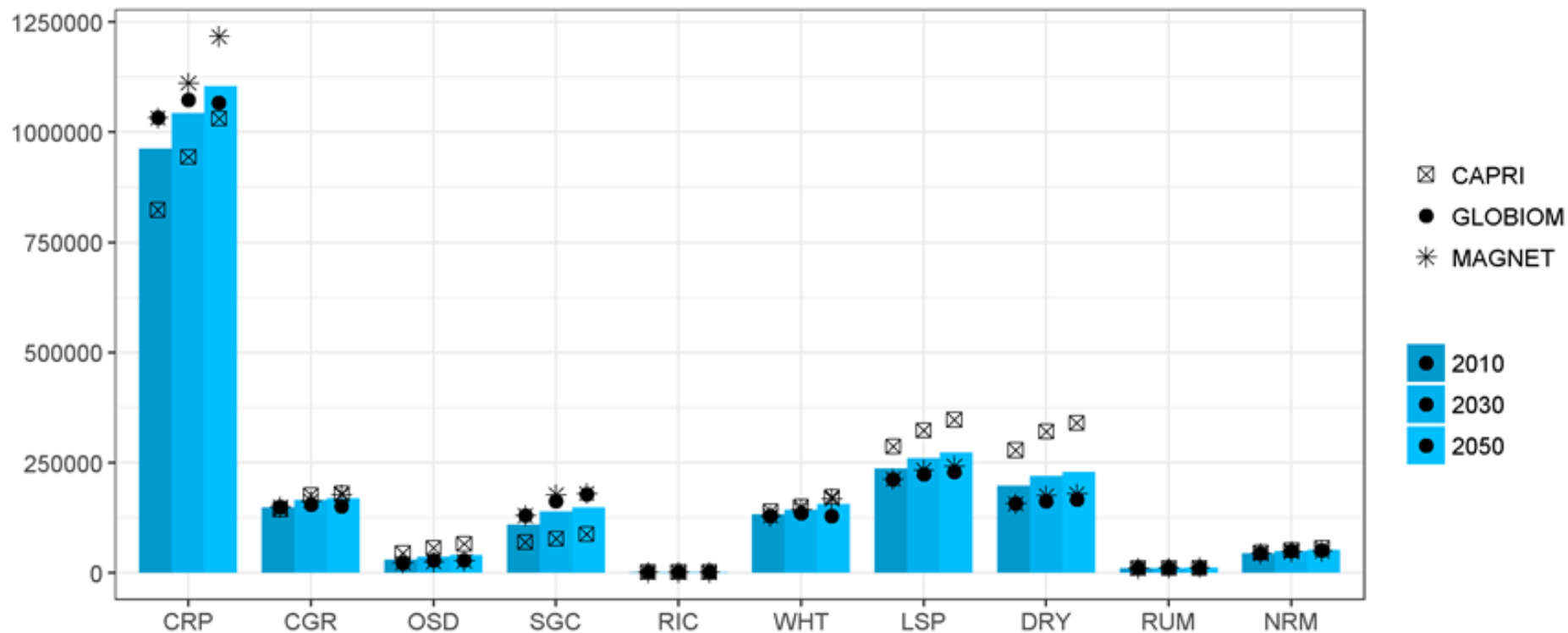
Baseline scenario: EU28

Crop and livestock consumption [1000 t]



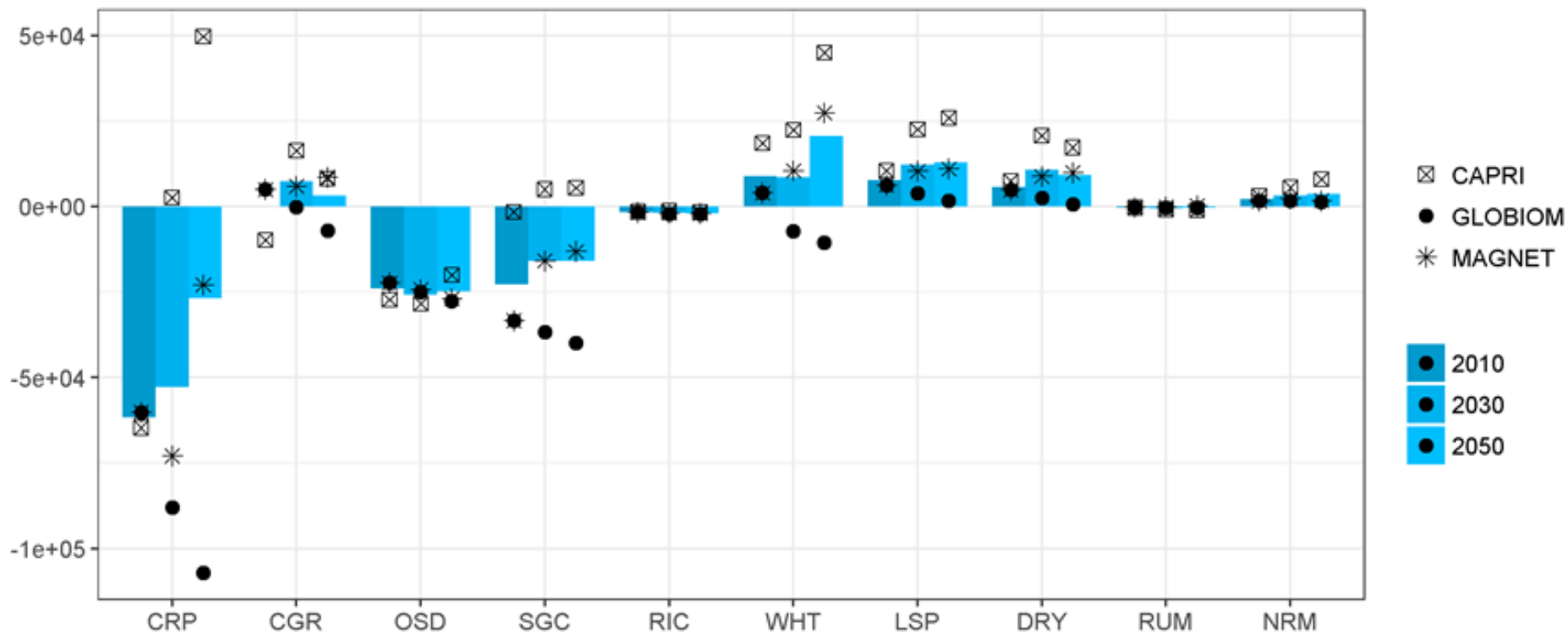
Baseline scenario: EU28

Crop and livestock production [1000 t]

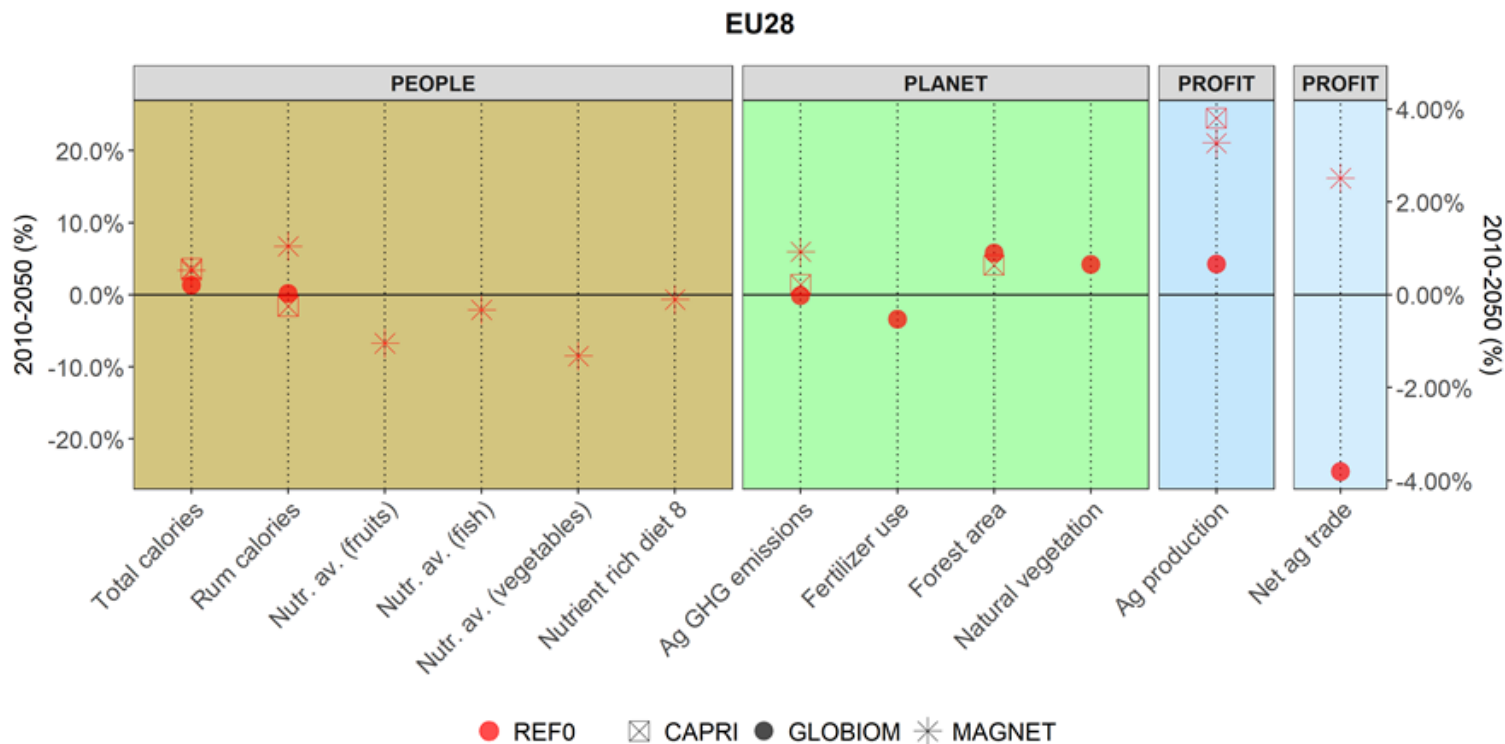


Baseline scenario: EU28

Crop and livestock net trade [1000 t]

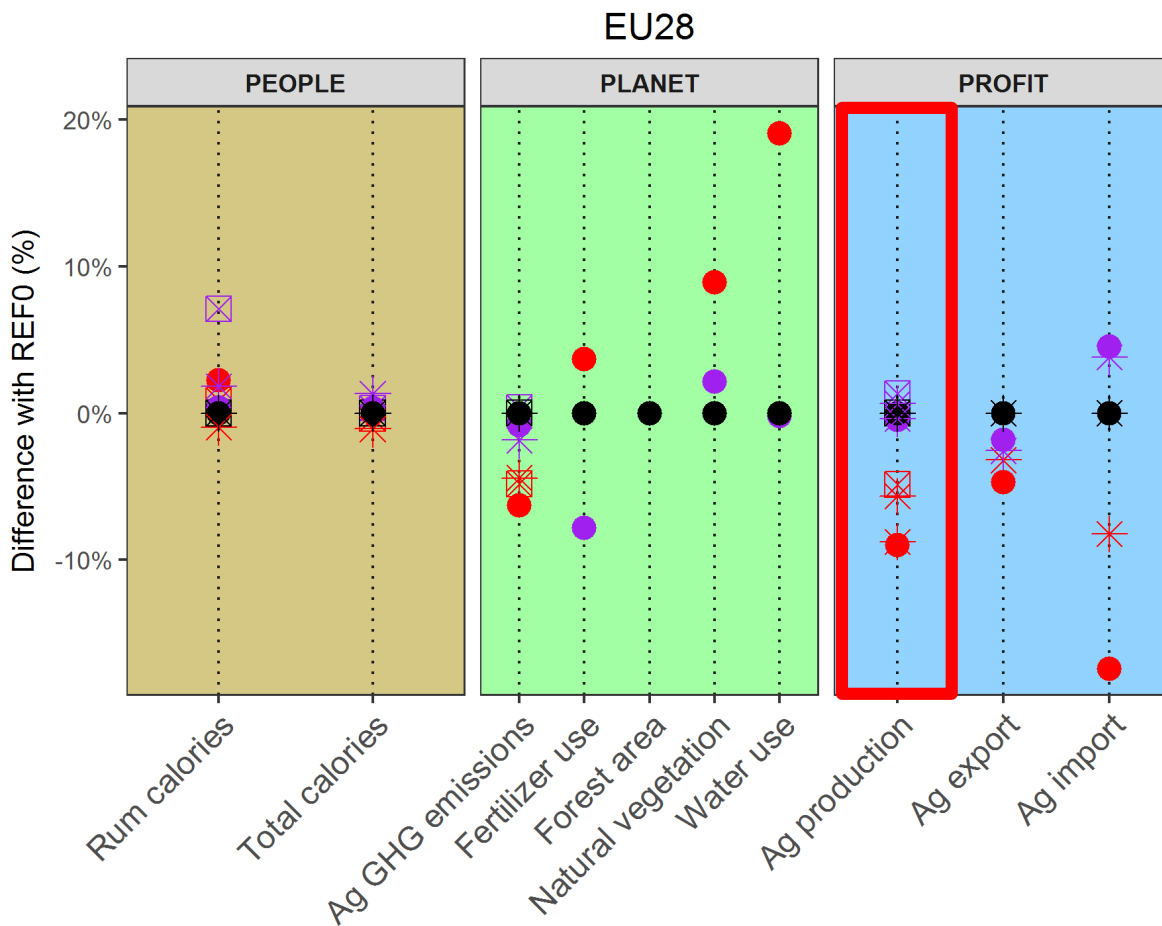


Baseline scenario 2050



- Stagnation - economic, slightly deteriorating diets and improving environment

Contextual scenarios 2050

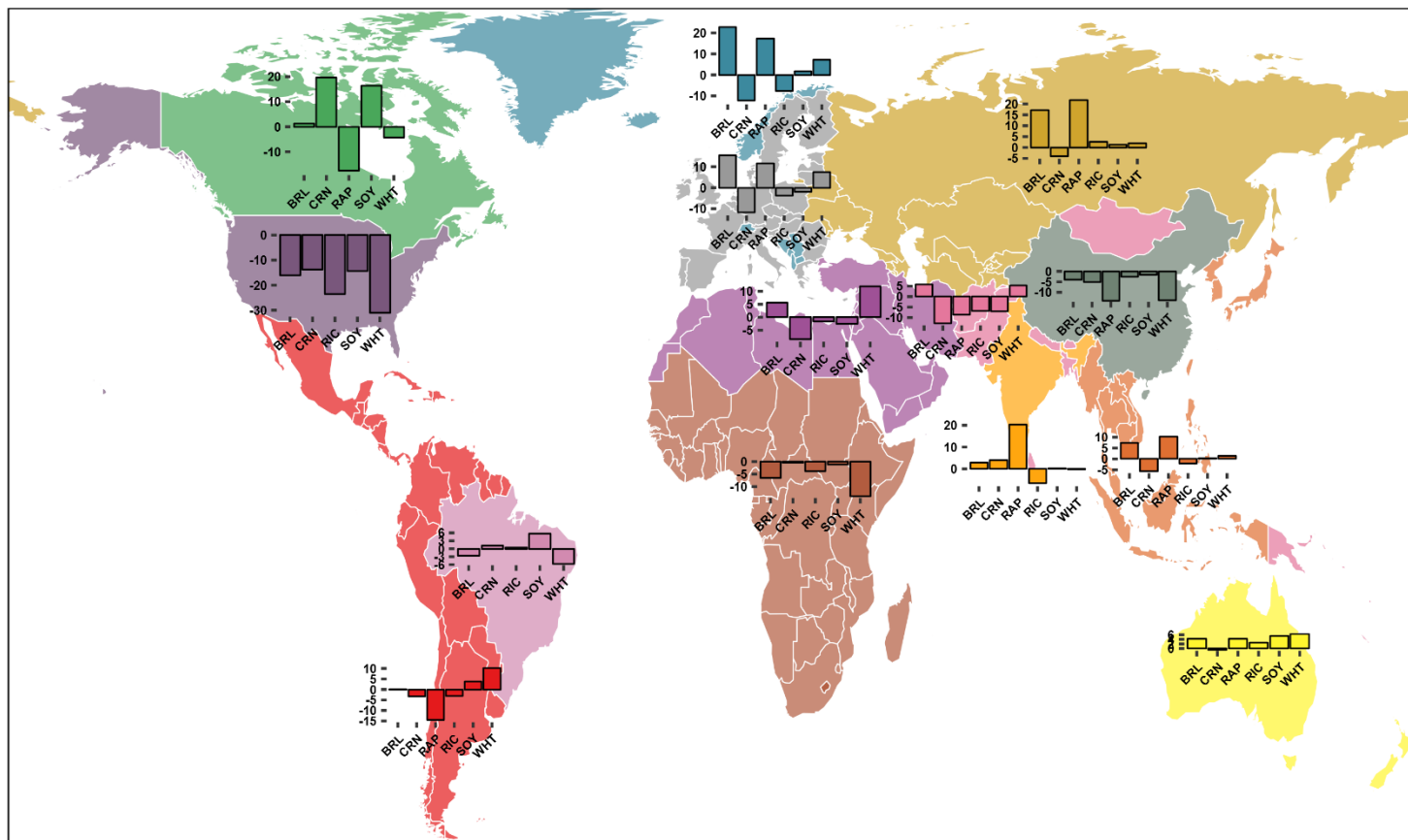


Baseline conclusions

- EU food system in the baseline
 - Stagnation in quantity and growth opportunities in quality
- Growth opportunity in trade
 - Quality again – food safety & env. sustainability
- Business as usual does not lead alone to sustainable diets
 - Policies in large sense required

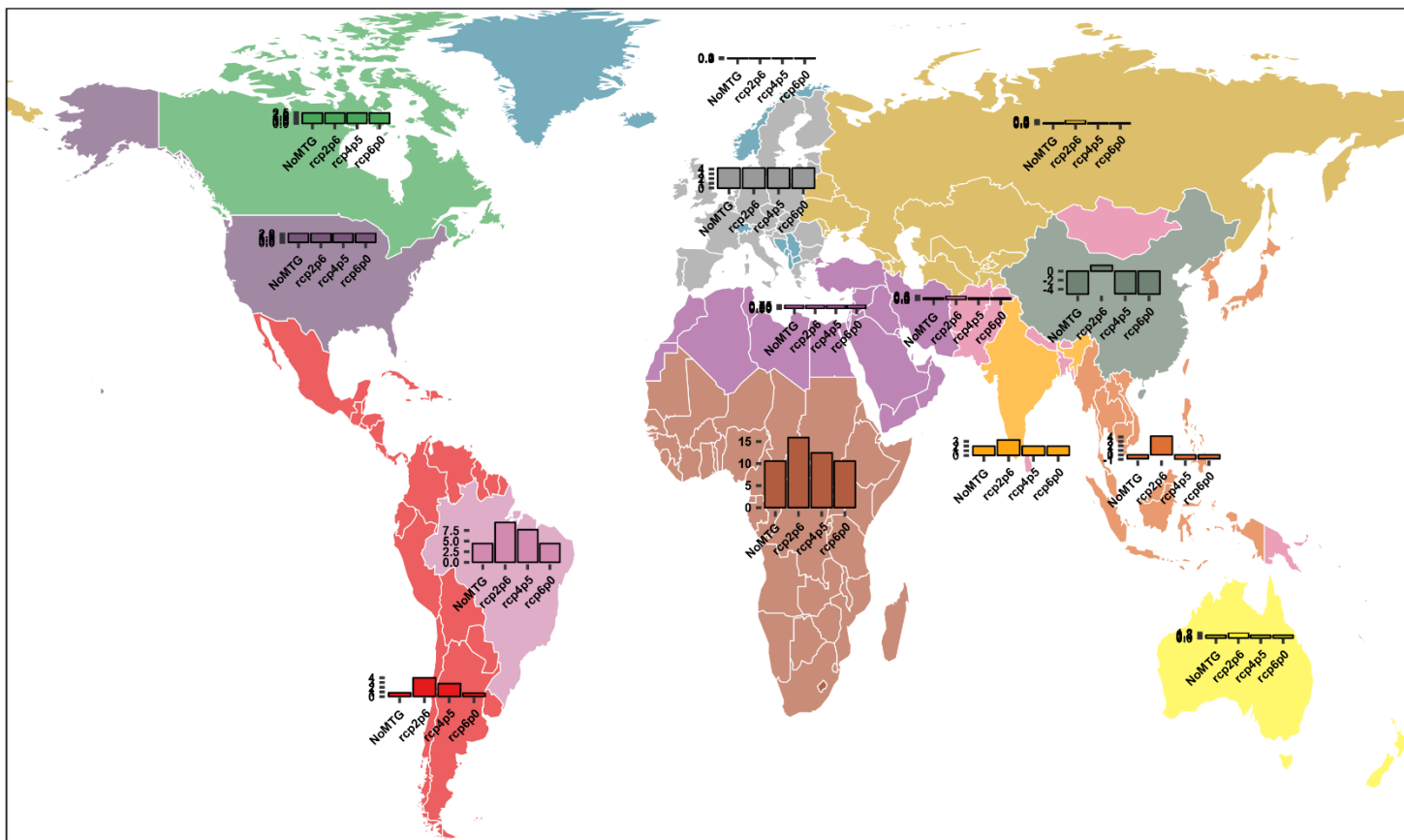
Climate change impacts: World

Crop yield change due to climate change by 2050 [%]



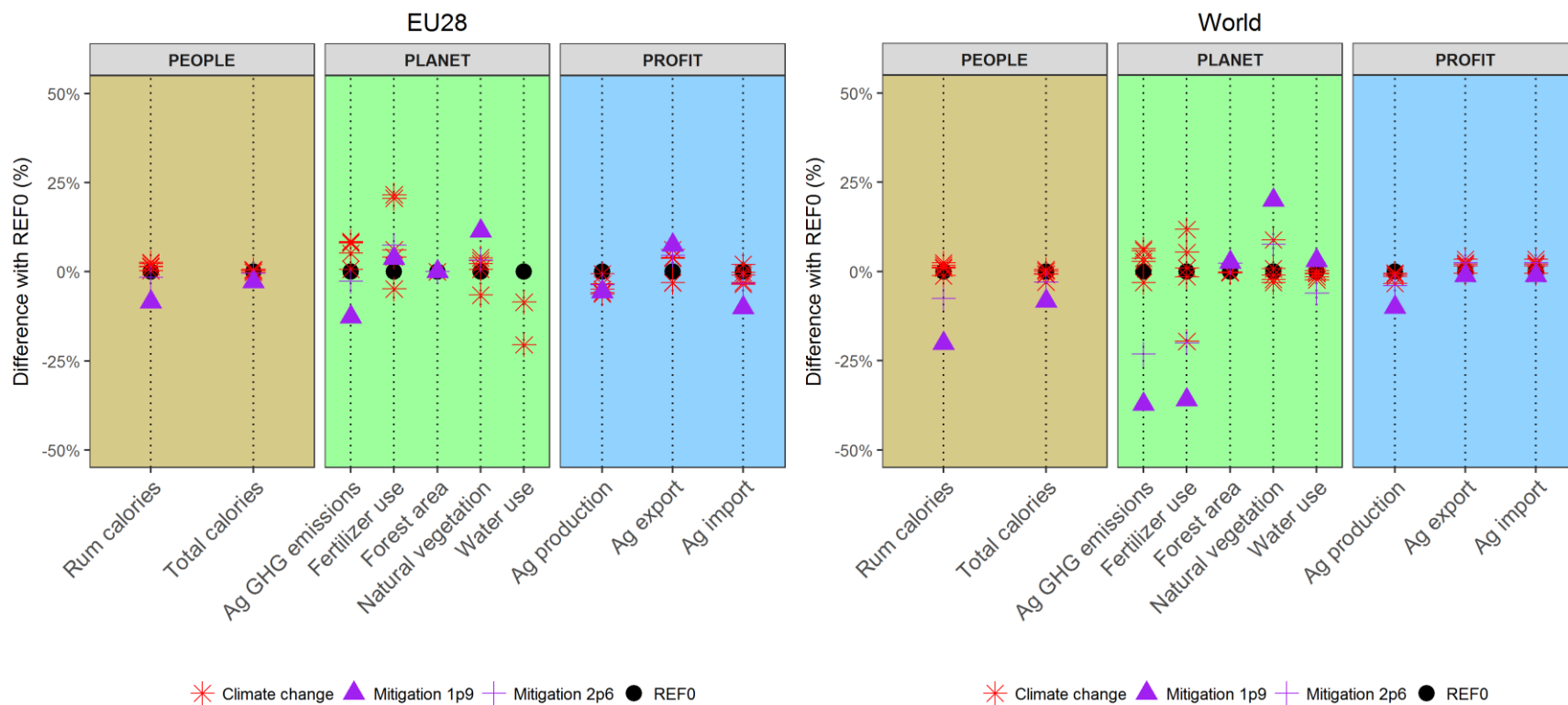
CC mitigation: Bioenergy

Biomass supply for energy production in RCP2p6 by 2050 [EJ]



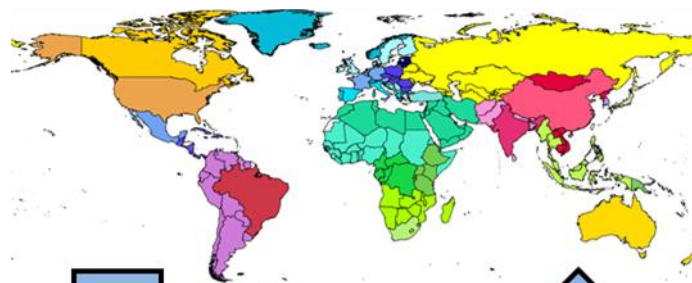
Source: MESSAGE-GLOBIOM (Fricko et al. 2017)

Climate change



Adaptation strategies for sustainable ecosystem services and food security under adverse environmental conditions

GLOBIOM



GLOBIOM-EU



GLOBIOM-CZ





Thank you!

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