



# Agenda item #3: JRC Study on modelling environmental and climate ambition in the agricultural sector - *Exploring the potential effects of selected Farm to Fork and Biodiversity strategies targets in the framework of the 2030 Climate targets and the post 2020 Common Agricultural Policy*

**Jesus Barreiro-Hurle, M. Bogonos, M. Himics, J. Hristov, I. Pérez-Domínguez, A. Sahoo, G. Salputra, F. Weiss, E. Baldoni & C. Elleby**

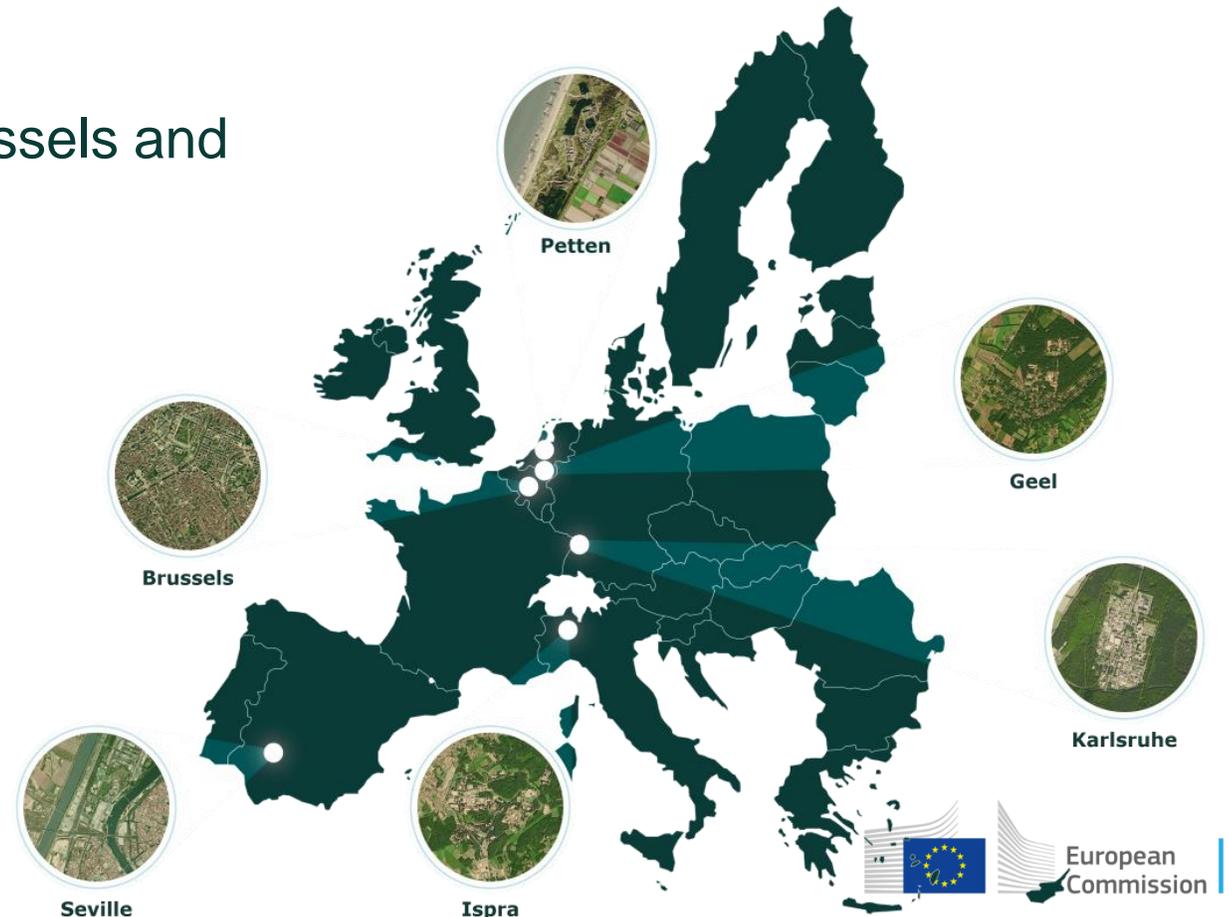


# Joint Research Centre (JRC)

*"As the science and knowledge service of the Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle"*

**3000 staff** Almost 75% are scientists and researchers. Headquarters in Brussels and research facilities located in **5 Member States**:

- Belgium (Geel)
- Germany (Karlsruhe)
- Italy (Ispra)
- The Netherlands (Petten)
- **Spain (Seville)**



# Background



2019



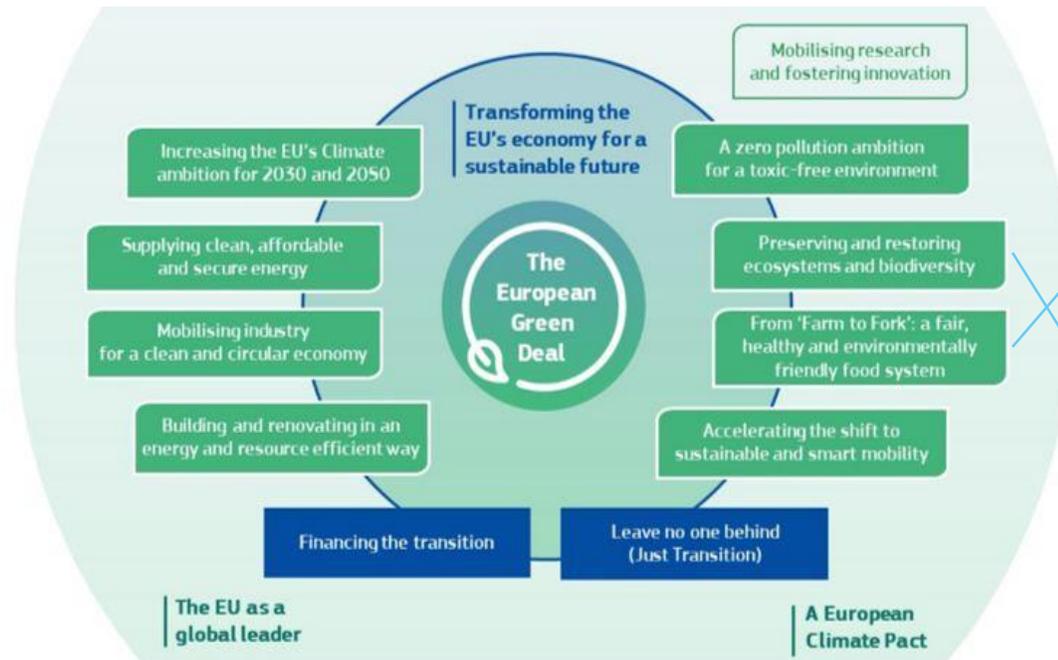
# Background



2018!

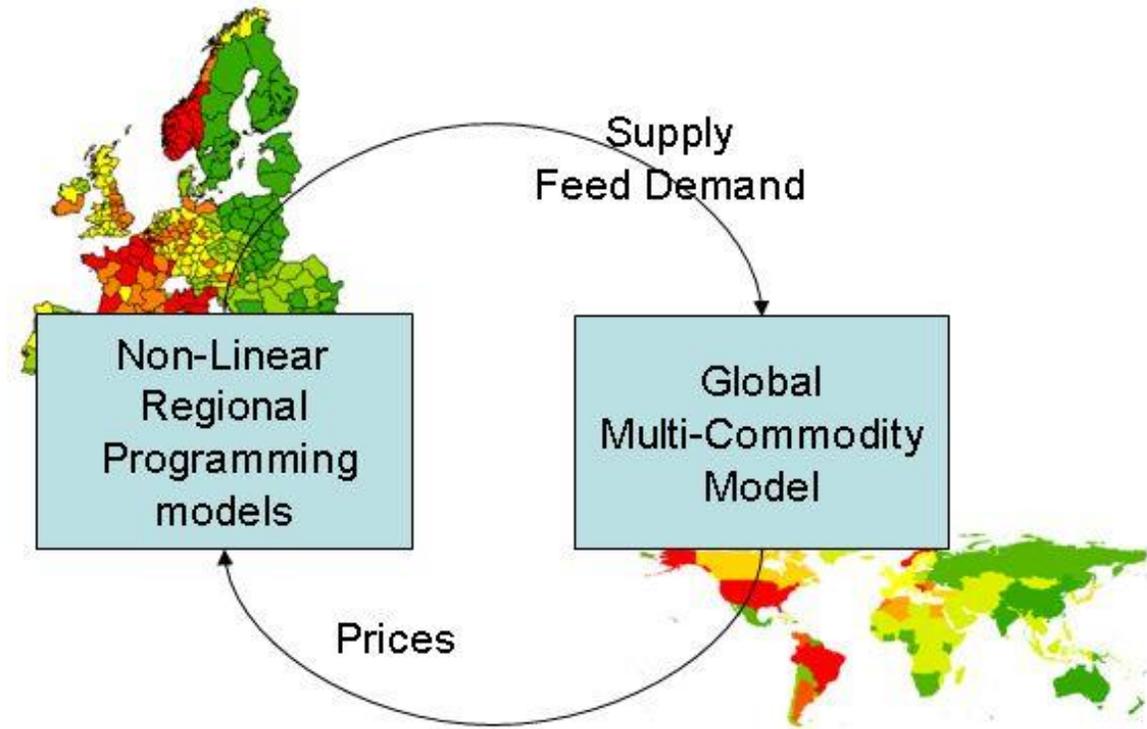


2020



# Approach

the CAPRI model

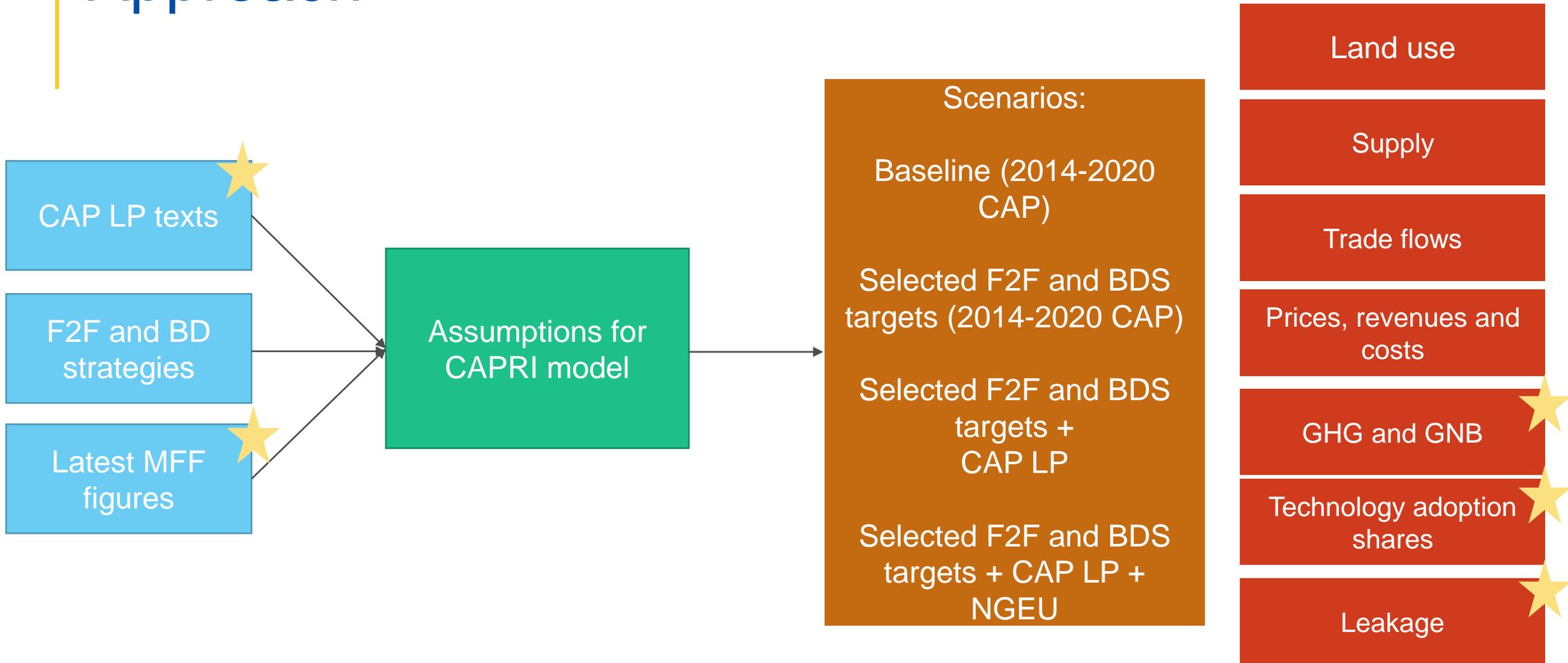


Nitrogen and carbon cycle

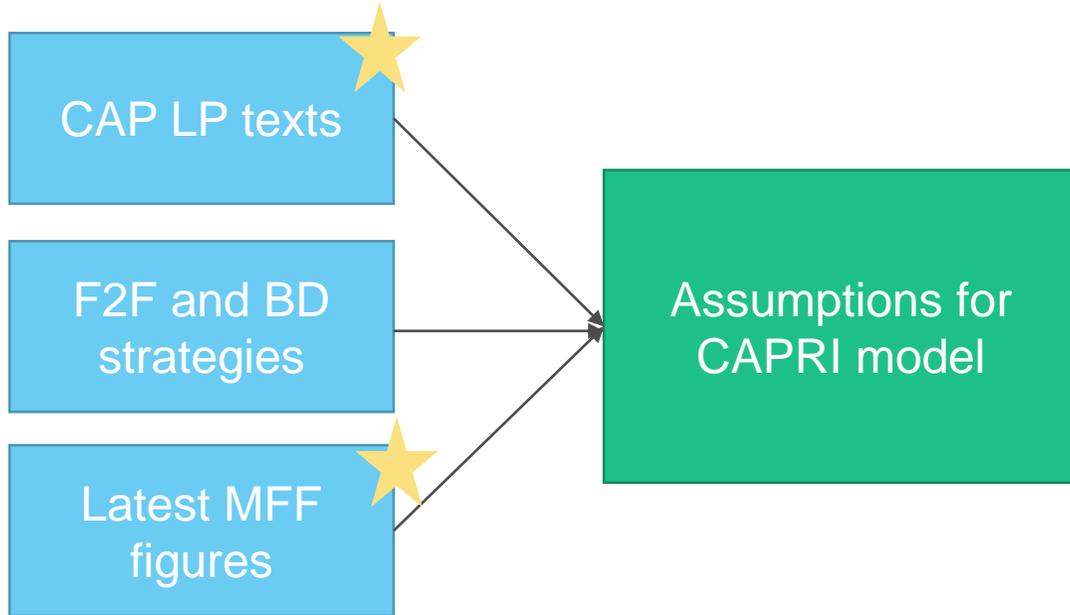
Detailed representation of *some* technologies

Regional diversity on farm systems

# Approach



# Approach



# 4 targets of the F2F and BDS Strategies

- Most direct relationship with the agricultural sector
- Most adequate for targeting CAP support

Reduction of overall use of pesticides and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 2030

Reduction of 50% of the costs of plant protection products  
Increase of other costs to reflect alternative management options  
10% decrease of yield

Reduce nutrient losses by at least 50% while ensuring that there is no deterioration of soil fertility. This will reduce the use of fertilizers by at least 20% by 2030

Progressive reduction of nitrogen surplus depending on 2030 levels  
Technologies to enhance the nitrogen efficiency use available for farmers (i.e. precision farming, nitrification inhibitors) ★

reach the objective of at least 25% of the EU's agricultural land under organic farming by 2030 and a significant increase in organic aquaculture.

Increase of organic farming taking into account project baseline level for 2030 (i.e. 12% - shock +13%)  
No mineral fertilizer or plant protection products + reduce yield based on actual differences from FADN ★

At least 10% of agricultural area is under high-diversity landscape features.

Increase of fallow land taking into account project baseline level for 2018 (i.e. 4.7% - shock + 5.3%)  
No inputs no outputs ★

# What is missing from the F2F and BDS Strategies

- Action plans to facilitate the transition
  - Integrated nutrient management plan
  - Action plan on organic farming
  - Changes in taxation of food products
  - Food labelling initiative
- Other targets
  - Reduction of food waste
  - Planting of 3 billion trees
  - Broad-band in rural areas
  - Sales of antimicrobials

# CAP LP - Scenario assumptions

- Budget- latest figures of the 2018 proposals for the Multi-Annual Financial Framework (MFF)
  - *25% of the Basic Direct Payments Budget is allocated to Eco-Schemes (ECS)*
  - *30% of the Rural Development funds are allocated to Agro-environmental and Climate Measures (AECM) excluding payments for Areas with Natural Constraints (ANC)*
  - *Voluntary Coupled Support*
    - *Extensive beef, sheep and dairy*
    - *Includes the additional 2% of Pillar I for protein crops.*
  - *Additional 9 billion euros in constant prices proposed by the Commission in June 2020 as reinforcement of long-term budget not included*
- New green architecture
  - Mandatory measures (conditionality) and voluntary measures (incentives via ECS - 25% of direct payments and AECM - 30% of rural development funds).

# Scenario assumptions (cont.)

- **CAP LP + NGEU**

- Additional scenario incorporating NextGenerationEU budget – 15 billion euros supposed to support to digitalization and investments in the agricultural sector in line with the Green Deal Priorities
- Assumption: 30% reduction in cost for technologies for which investments are needed (*precision farming, anaerobic digestion, breeding measures and ammonia measures for housing and storage*)

# Approach

CAP LP texts

F2F and BD strategies

Latest MFF figures

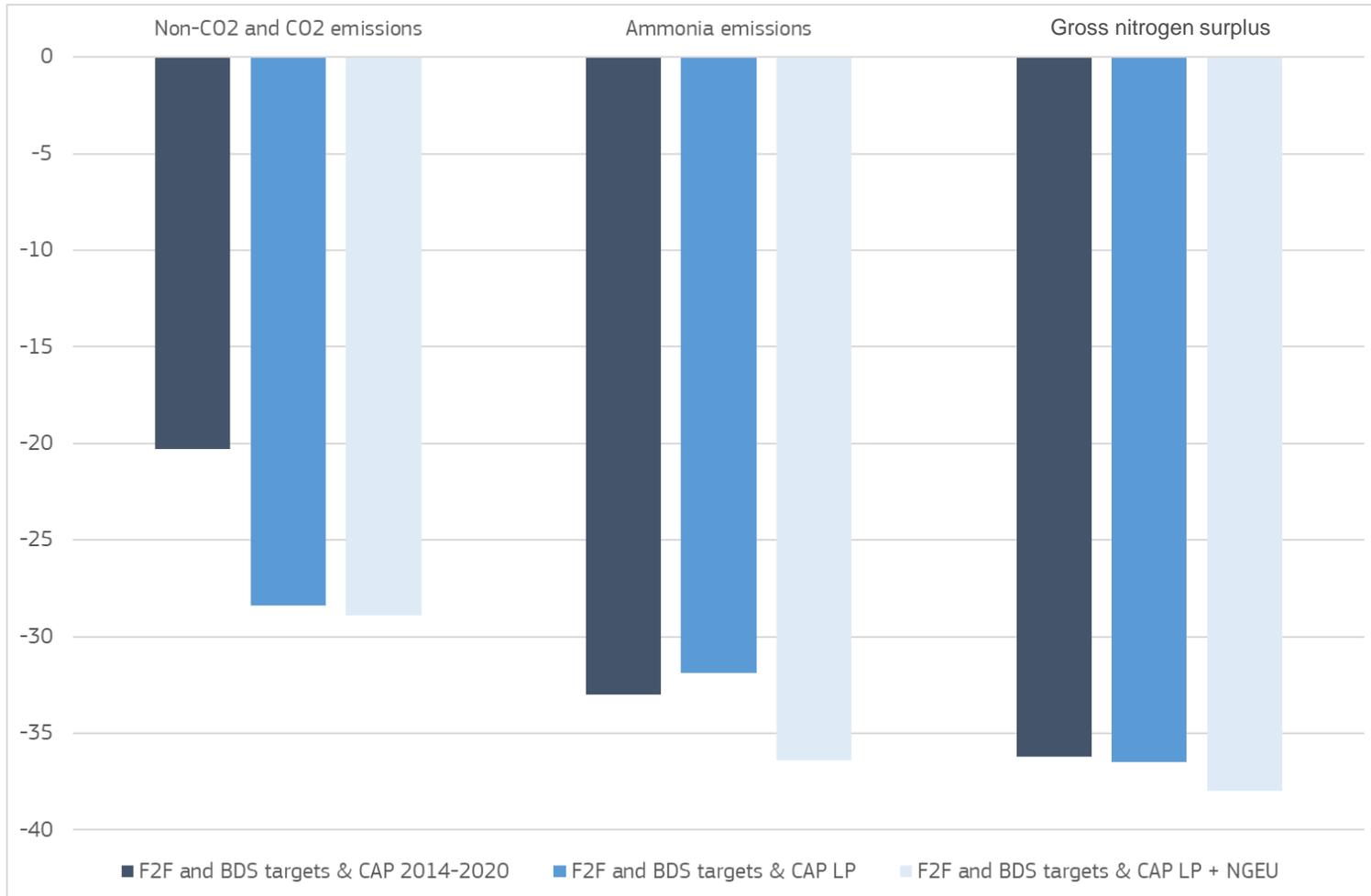
Assumptions for CAPRI model

Scenarios:

- Baseline (2014-2020 CAP)
- Selected F2F and BDS targets (2014-2020 CAP)
- Selected F2F and BDS targets + CAP LP
- Selected F2F and BDS targets + CAP LP + NGEU

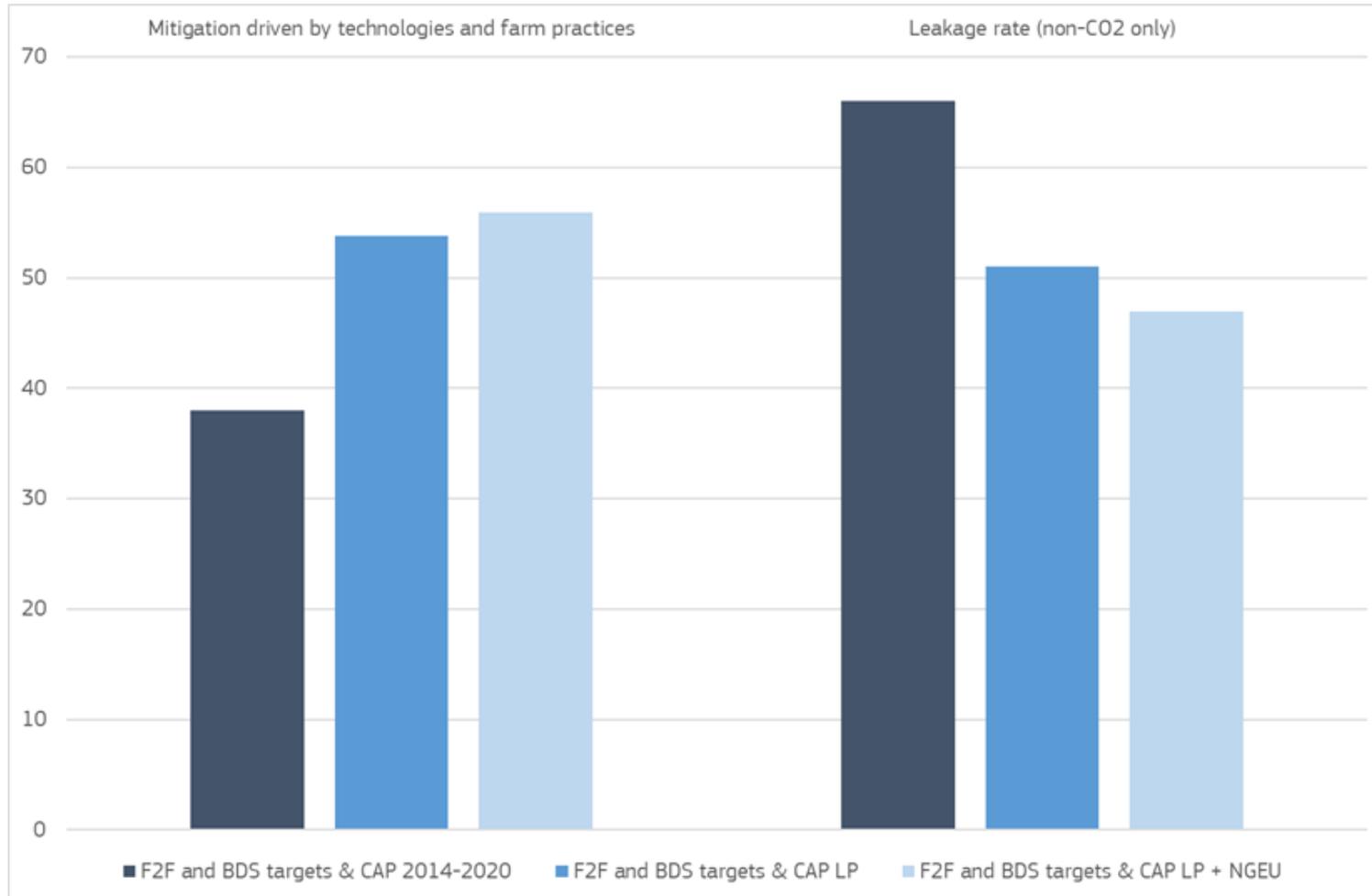
- Land use
- Supply
- Trade flows
- Prices, revenues and costs
- GHG and GNB
- Technology adoption shares
- Leakage

# Provision of environmental benefits



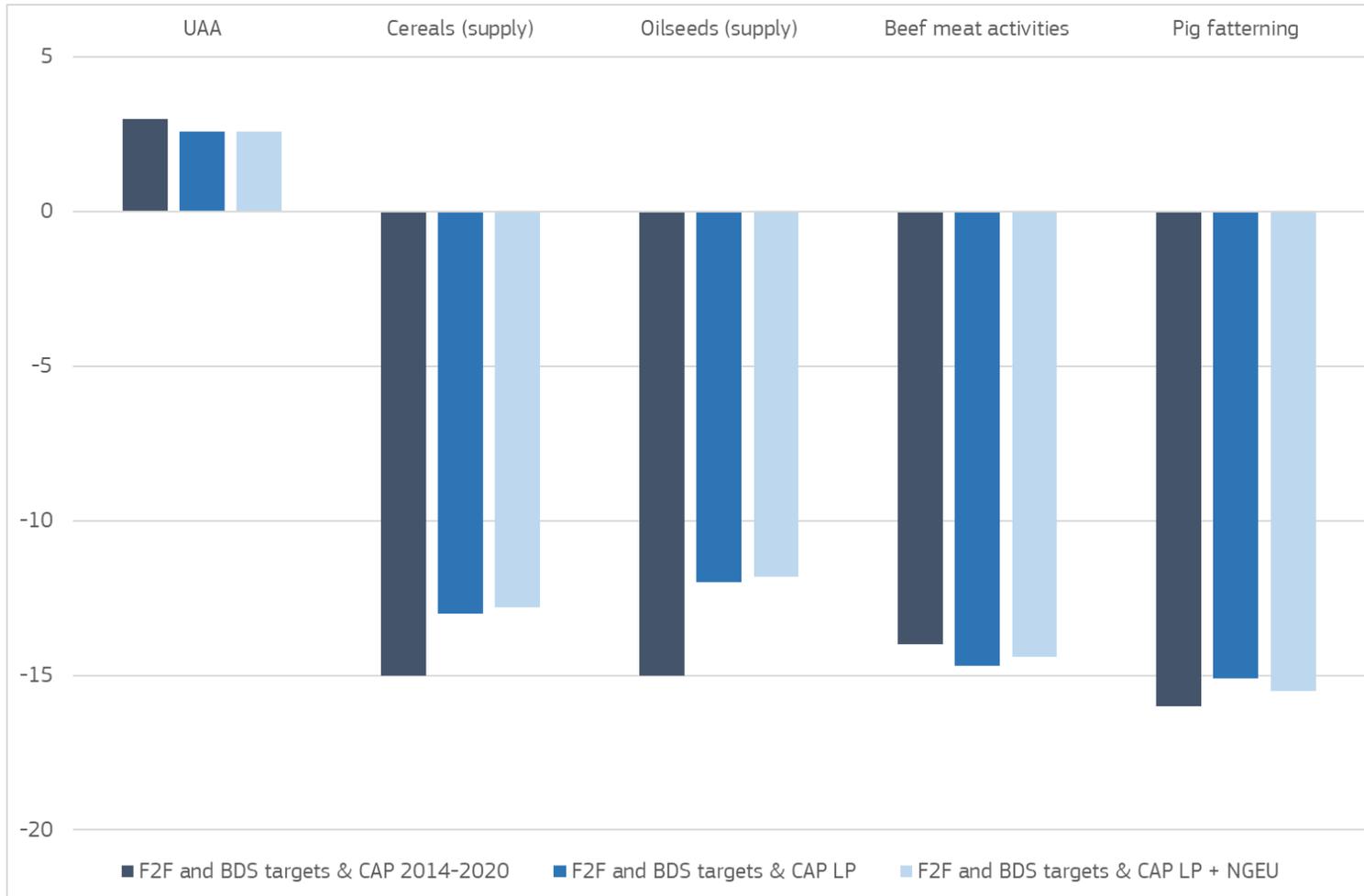
- F2F and BDS targets improve environmental performance of the agricultural sector
- The implementation of the CAP LP further increases the improvement
- Again the most challenging aspect is the nitrogen balance of the agricultural sector

# From reduced production to improved efficiency – the case of GHG emissions



- The implementation of the CAP LP allows meeting the Climate targets via technology instead of via reduced production
- The integrity of the effort improves as leakage to the rest of the world falls
- Including technologies and practices focusing on nitrogen could replicate this trend

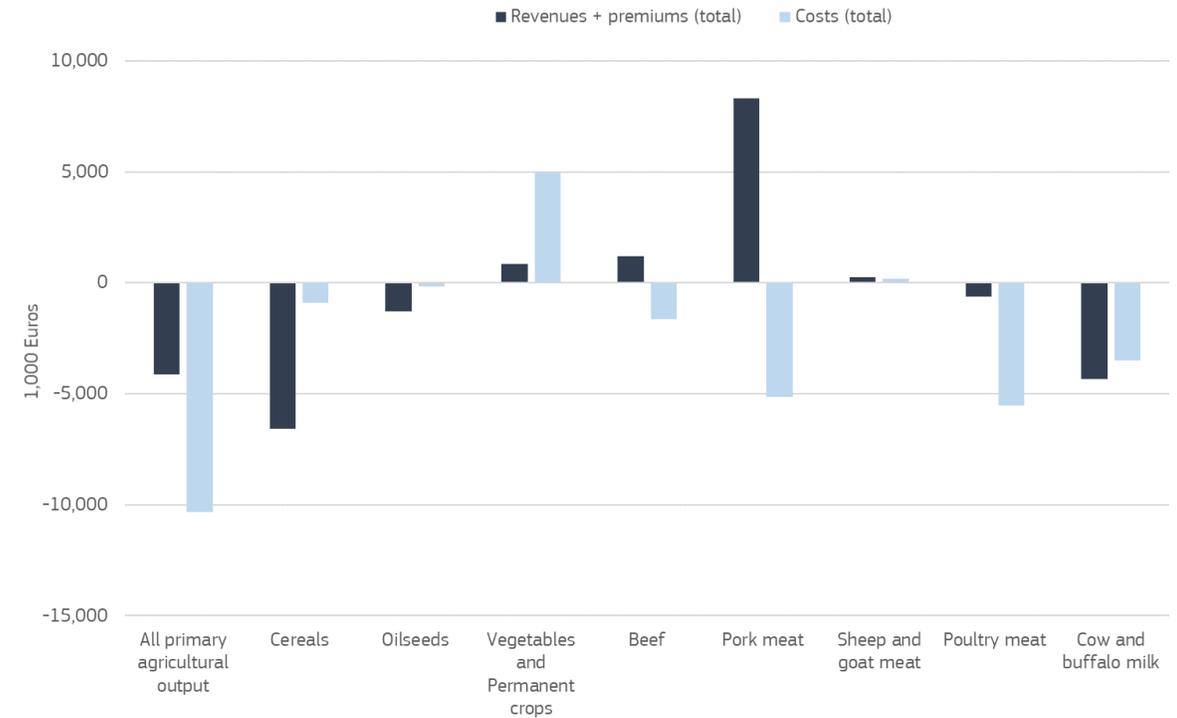
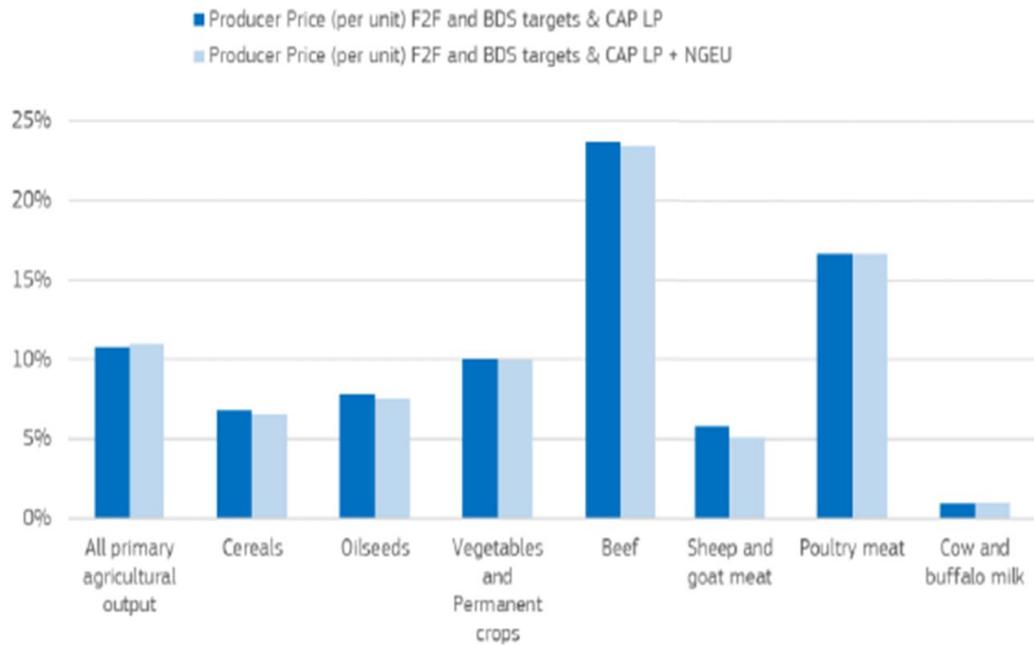
# Change in agricultural production



- Reduction in production mainly driven by the nitrogen restriction
- The implementation of the CAP LP eases the pressure in agricultural production
- Farm level analysis shows that it is possible to further reduce the impact via efficiency gains

# Impact on prices and income

Targets + CAP only



# Conclusion

- Our analysis confirms the **positive impact of the Farm to Fork and Biodiversity strategies on our environment and climate**, showing that agriculture is indeed essential to achieving the Green Deal objectives.
- **The environmental benefits** of the F2F and BDS may come at a **cost for the EU agricultural sector** regarding production and income, but a strong EU policy can **mitigate these effects** by accelerating the transition towards sustainable food systems creating new opportunities for farmers.
- The green architecture of the **future CAP has the right tools to support such a transition through the enhanced conditionality, a ringfenced budget and the eco-schemes. The future CAP will be instrumental to implement the (production-related) targets of the Green Deal.**

Policy initiative	Coming from....		Covered in analysis?
			
Reduction in pesticides			
Reduction in nutrient loads			
Integrated nutrient management action plan			
Increased area under organic farming			
Organic farming action plan			
Increased area under high-diversity landscape features			
Facilitate the placement on the market of sustainable and innovative feed additives			
Stimulation of healthier and sustainable diets			
Revision of animal welfare legislation and option for animal welfare labelling			
Code of conduct for responsible business and marketing practice			
Reduction in food losses and waste			
Reduction in sales of antimicrobials			
Shift to sustainable fish and aquaculture			
Revision of competition rules for collective initiatives promoting Sustainability			
Contingency plan for ensuring food supply and food security to be put in place in times of crisis			
Revision of marketing standard			
Harmonized mandatory front-of-pack nutritional labelling			
Change in taxation of food products			
....and many more!			

# What next?

- Change of paradigm – from restriction to production inputs
- The baseline is a moving target – i.e. impacts of no action on biodiversity loss need to be incorporated
- Significant changes such as those implied by the level of targets put at risk the plausibility of many parameters
  - Models get out of their comfort zone
  - Examples of the impossible becoming reality exist (e.g. carbon free production processes for steel)
- Systemic changes affect also fundamentals of behavior all along the value chain (farmers, processors, retailers & consumers)

# Thank you

*J. Barreiro-Hurle, M. Himics, F. Weiss, I. Pérez-Domínguez, J. Hristov, M. Bogonos, A. Sahoo, G. Salputra, C. Elleby, E. Baldoni*



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JRC TECHNICAL REPORT

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