# The consequences of climate change for EU agriculture

## Follow up to the COP21-UN Paris Climate Change Conference

Kaley Hart & Ben Allen
**Institute for European Environmental Policy (IEEP)**

# Structure of the Presentation

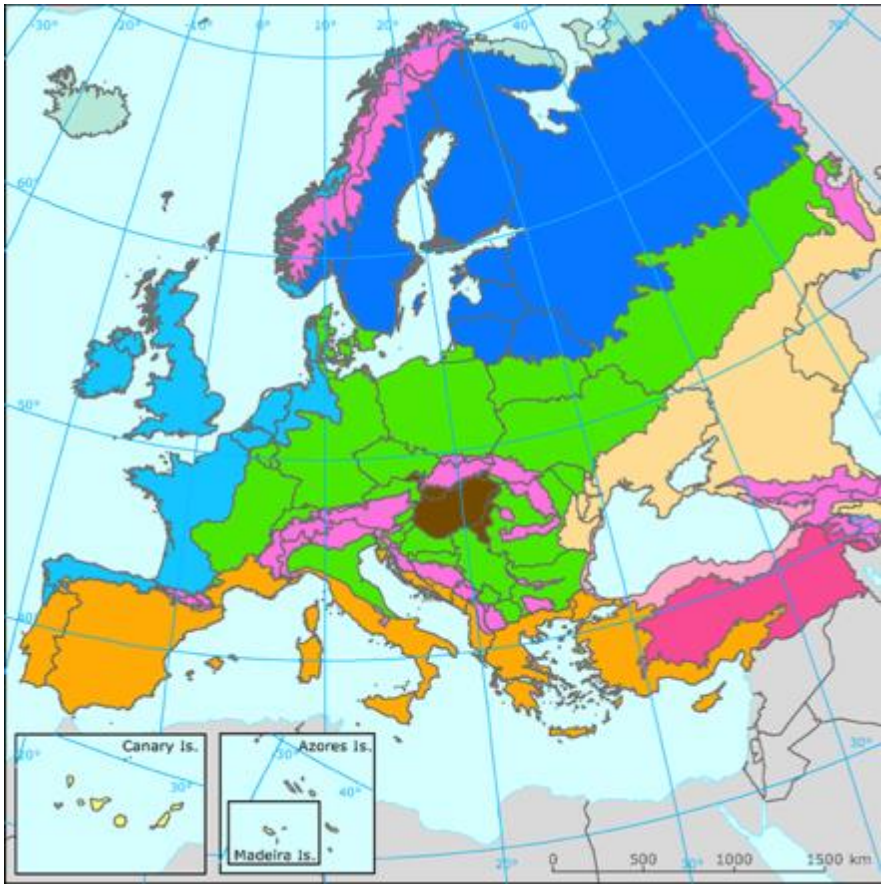
1. Interactions between agriculture and climate
2. EU climate action and agriculture
3. The climate role of the CAP
4. Perspectives on the future

# 1. Interactions between agriculture & climate

# Agriculture affected by the climate

## Pressures on farming systems

- Temperature variations
- Water availability
- Water quality
- Pests and disease
- Fire risk
- Storm damage

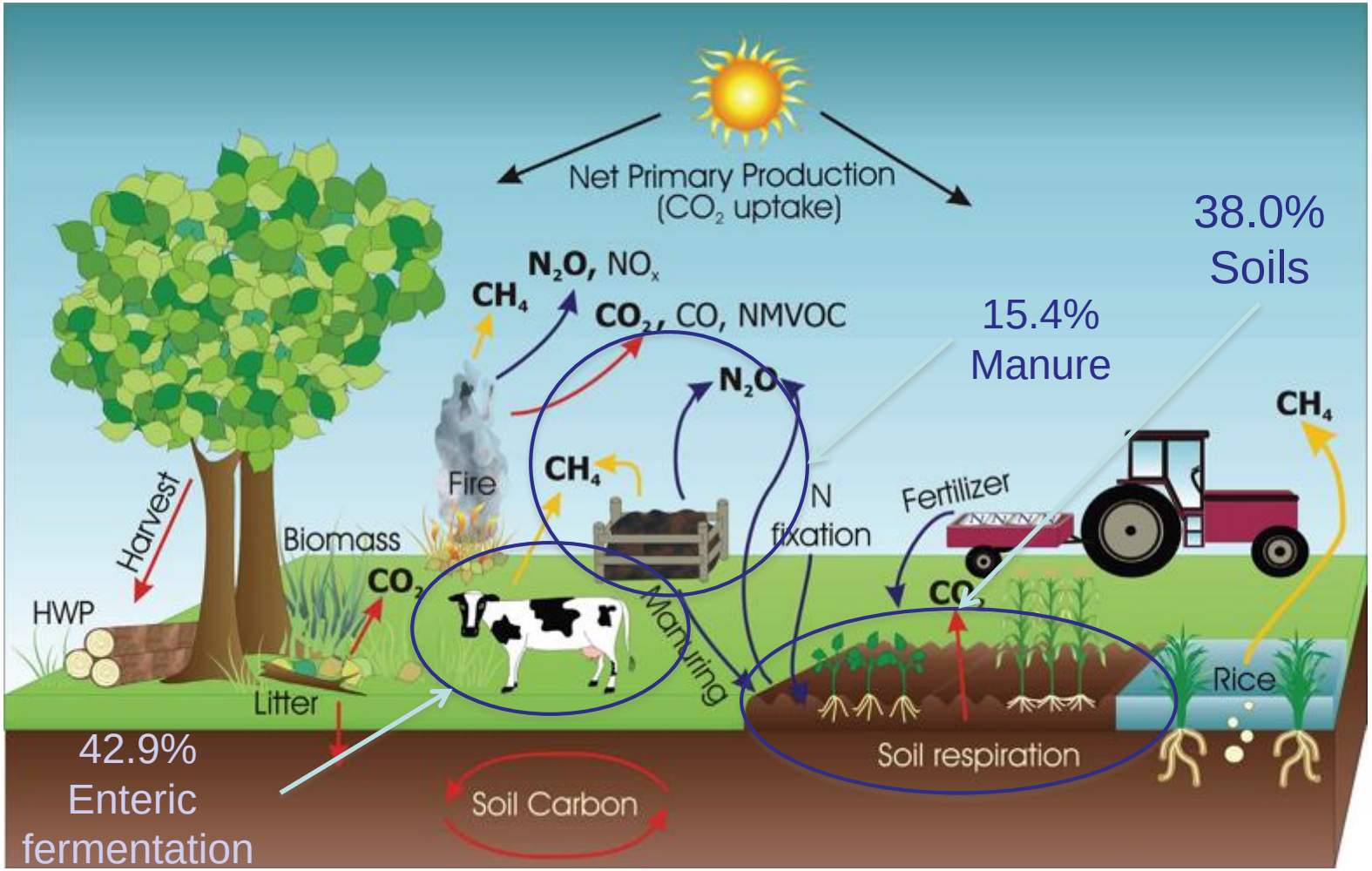



# Agriculture's impact on the climate

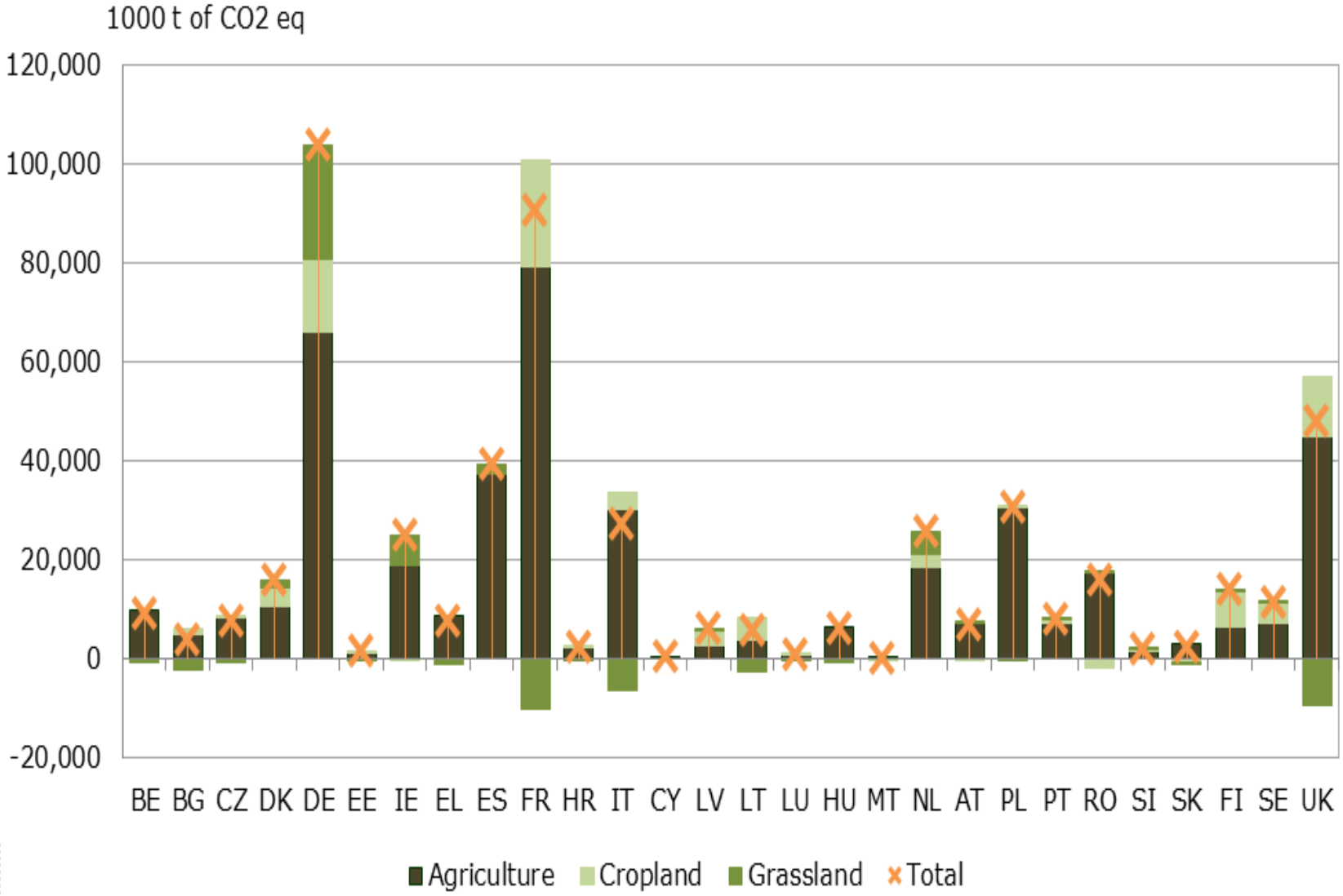
## Affects climate change:

- Emissions of GHGs – directly and indirectly
- Removal of GHGs from the atmosphere – carbon sequestration
- Contributions to reductions in other sectors (e.g. renewable energy)

# Agricultural GHG emissions ($CO_2$/non-$CO_2$)

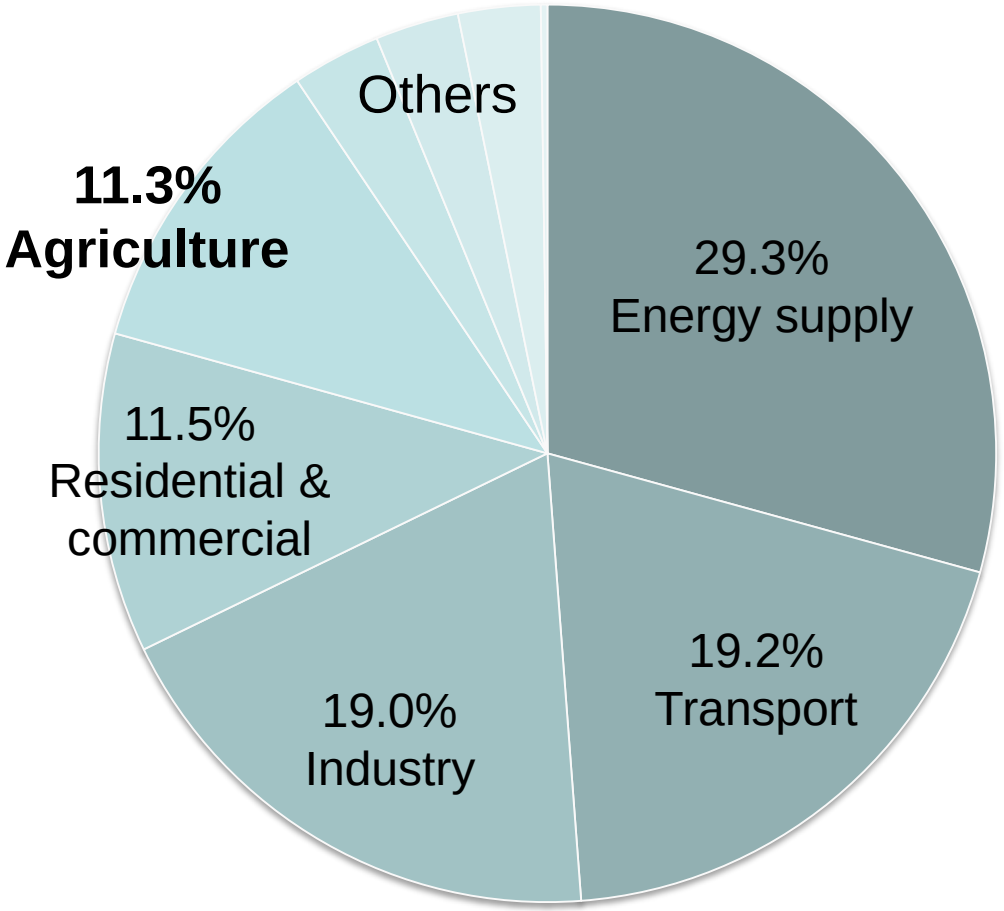


# GHG emissions from agriculture including agricultural soils (cropland and grassland), by Member State,



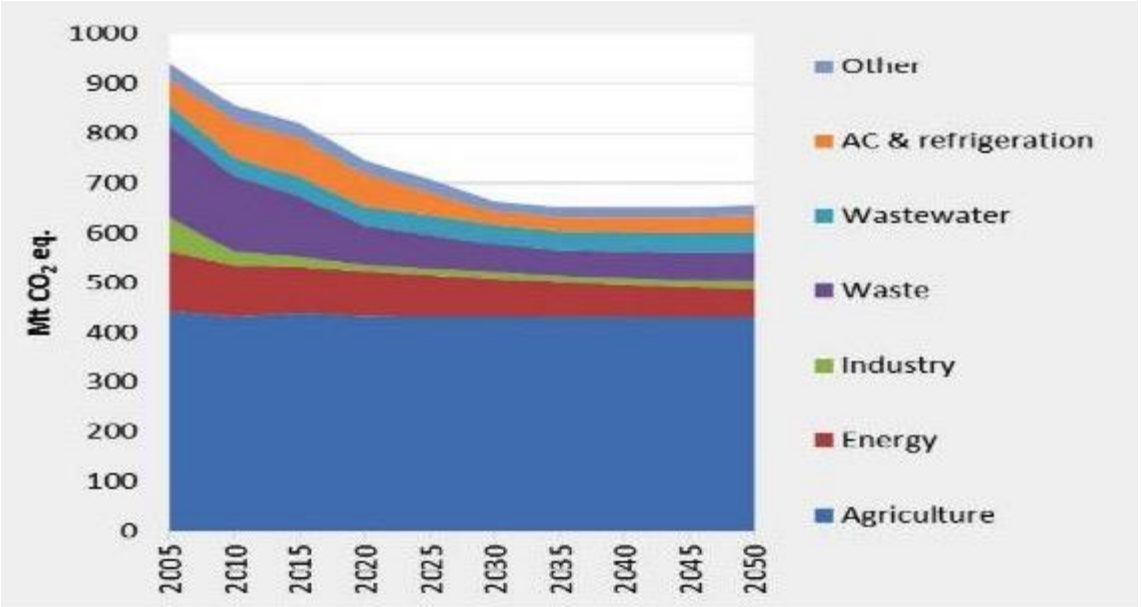
# Agriculture's contribution to GHG emissions ($CO_2$ & non $CO_2$)

- Significant variation by country
- Agriculture's contribution will become more significant over time
- FR, DE, UK make up ~44% of all agricultural emissions



# Agriculture's contribution to GHG emissions ($CO_2$ & non $CO_2$)

- Agriculture's contribution will become more significant over time
- FR, DE, UK make up ~44% of all agricultural emissions



# 2. EU Climate action & agriculture

# EU Climate Action & Agriculture (2020)

**Global framework:** The Kyoto Protocol

**EU framework:** 2020 climate & energy framework

## EU Actions

*Accounting and Reporting:*

- Effort Sharing Decision (ESD)
- Land Use, Land Use Change & Forestry (LULUCF)
- Emissions Trading System (ETS)

*Emission reduction, removals & adaptation:*

- Common Agricultural Policy (CAP)
- Renewable Energy Directive (RED)
- Water Framework Directive (WFD)
- National Emissions Ceiling Directive (NECD)
- etc.

# EU Climate Action & Agriculture (2030)

**Global framework:** The Paris Agreement

**EU framework:** 2030 climate & energy framework

## EU Actions

*Accounting and Reporting:*

- Effort Sharing Regulation (ESR)
- Land Use, Land Use Change & Forestry (LULUCF)
- Emissions Trading System (ETS)

*Emission reduction, removals & adaptation:*

- Common Agricultural Policy (CAP)
- Renewable Energy Directive II (RED II)
- Water Framework Directive (WFD)
- National Emissions Ceiling Directive (NECD)
- etc.

# The Paris Agreement & EU framework

## Mitigation:

- Targets for emission reductions
- 40% by 2030 (Global and EU ambition)
- 80% by 2050 (EU Low carbon transition)

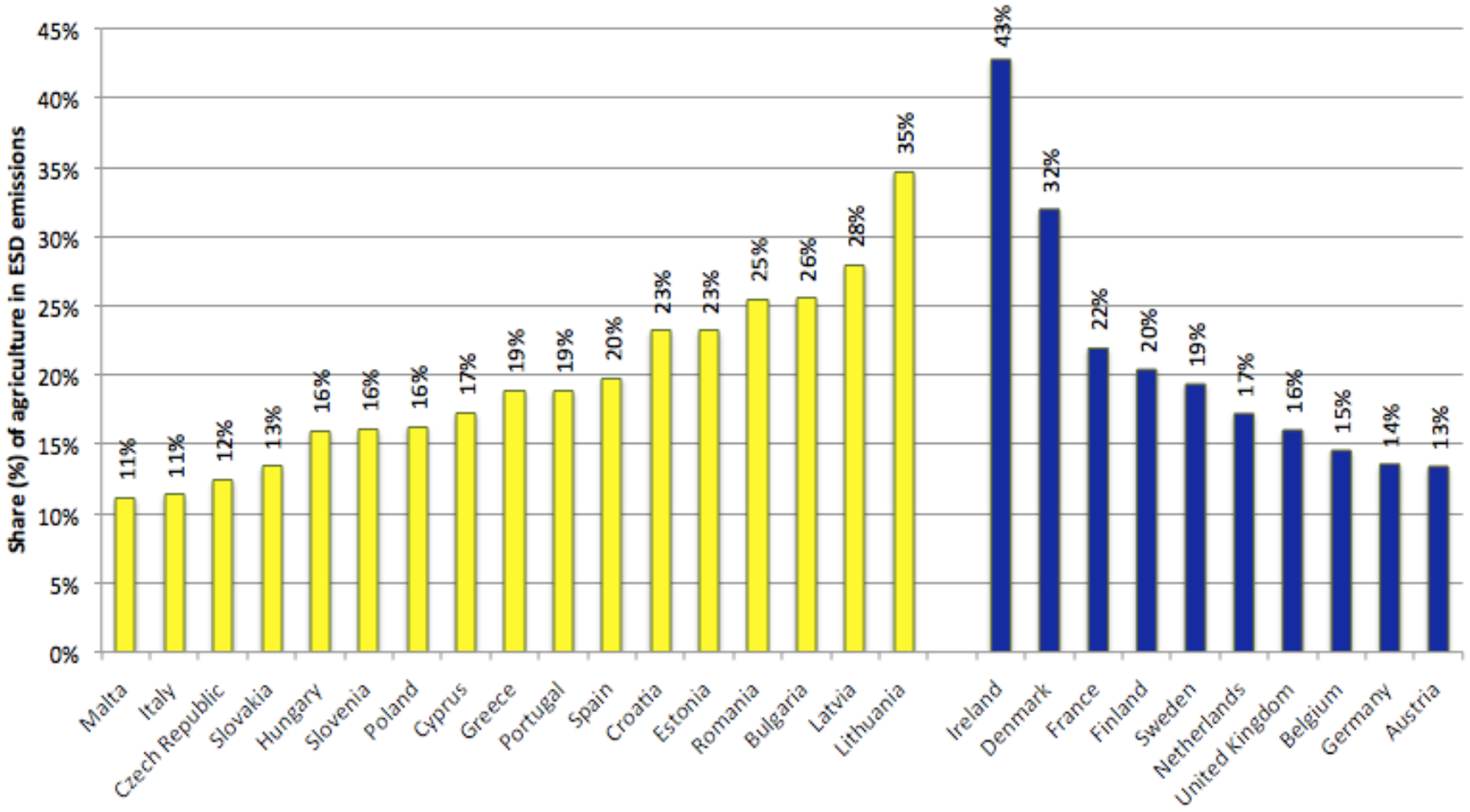
## Adaptation:

- Submit and update adaptation communications
  - implementation and support needs;
  - Priorities;
  - plans and actions.

# EU Accounting and reporting

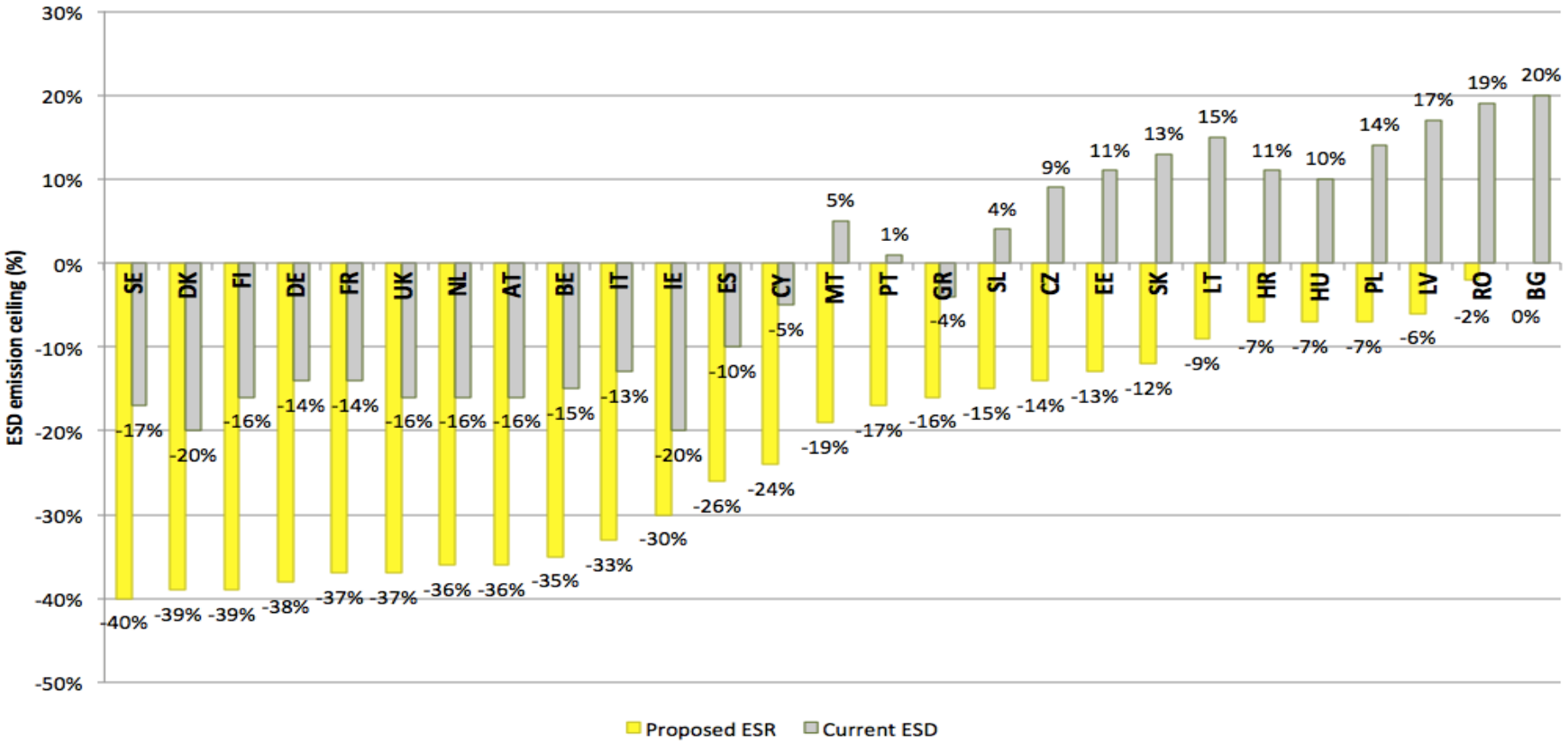
| Mechanism | 2020 | 2030 |
|---|---|---|
| **ESD:**<br>▪Non-$CO_2$ emissions from agriculture<br>▪Explicitly excludes emissions from land use, land use change and forestry (LULUCF | Cross sector target | Cross sector targets increased |
| **LULUCF:**<br>▪$CO_2$ emissions from cropland and grazing land management. | Excluded from CC&E framework<br>But LULUCF Decision requires some action | Included within CC&E<br>No-debit rule |
| **EU-ETS:**<br>▪$N_2O$ emissions from fertiliser manufacturing<br>▪Large bioenergy facilities<br>▪Zero carbon rating of biomass | | |

# EU Accounting and reporting




**Share (%) of agriculture (non CO2) in ESD emissions in 2015**

# EU Accounting and reporting

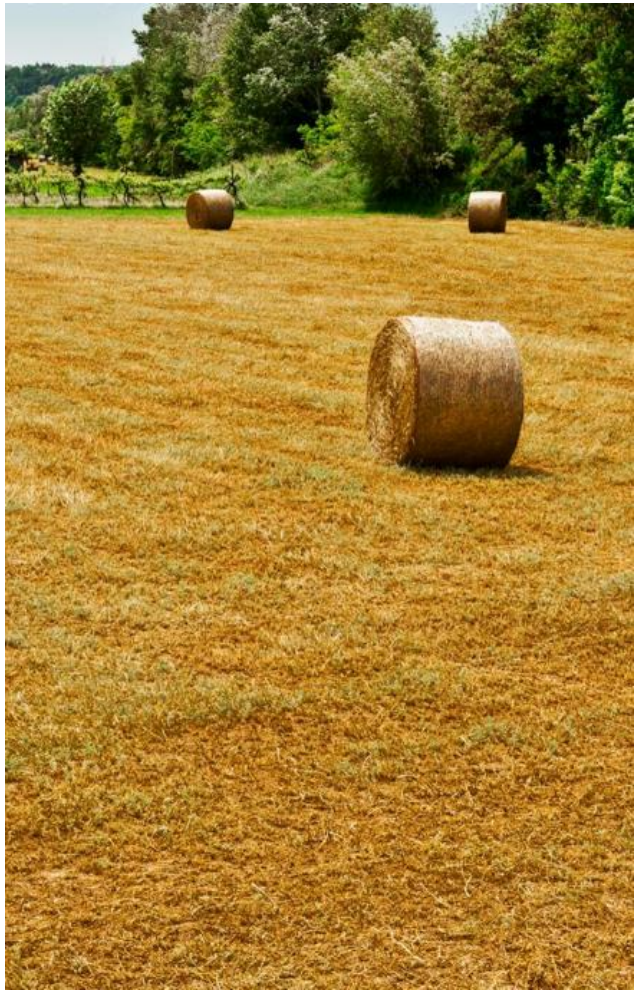



**GHG reduction targets for 2020 set out in the ESD and for 2030 in the proposed ESR**

# Mitigation actions in agriculture

## Mitigation actions

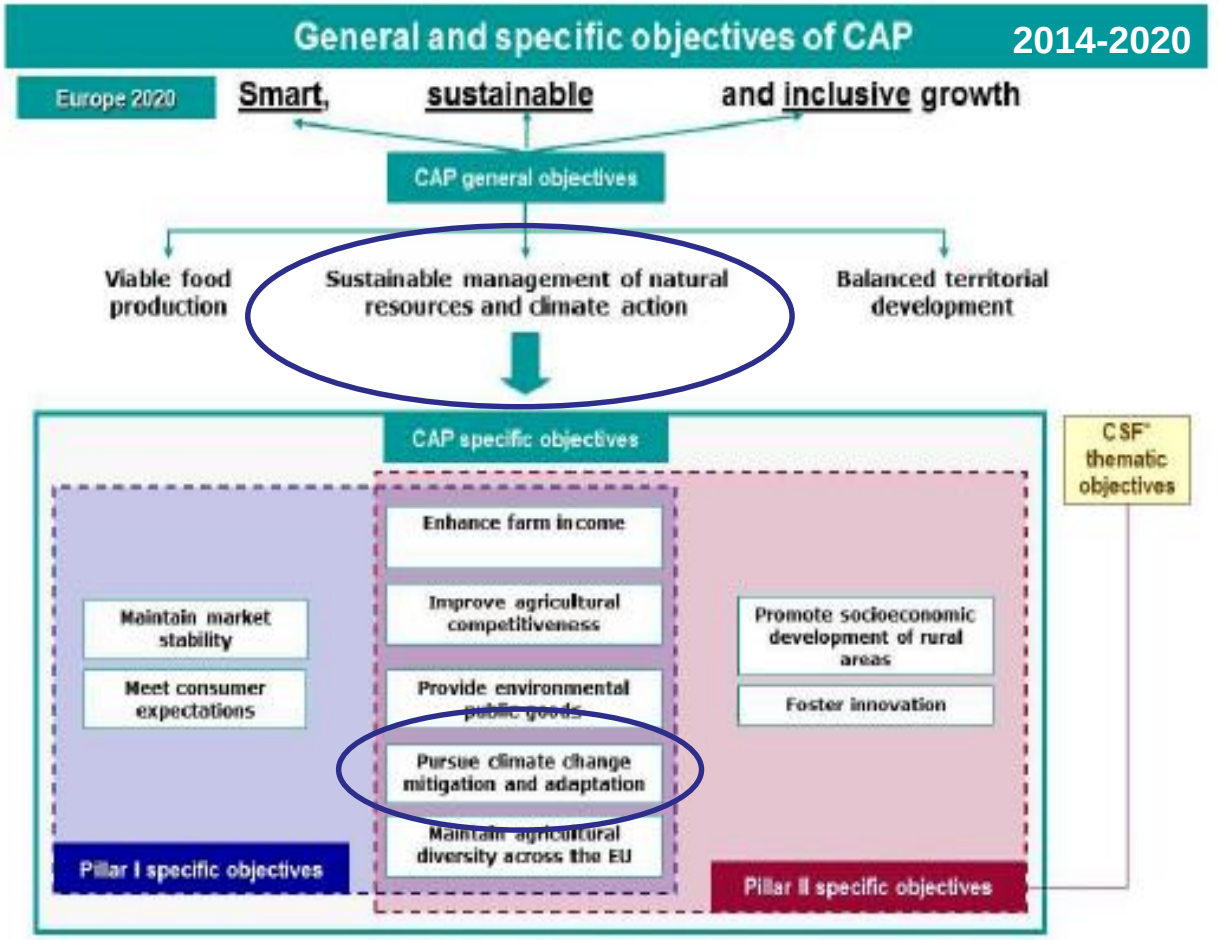
- Reduced tillage
- Zero tillage
- Leaving crop residues on the soil surface
- Ceasing to burn crop residues and vegetation
- Use cover/catch crops
- Livestock disease management
- Use of sexed semen for breeding dairy replacements
- Breeding lower methane emissions in ruminants
- Feed additives for ruminant diets
- Optimised feeding strategies for livestock
- Soil and nutrient management plans
- Use of nitrification inhibitors
- Improved nitrogen efficiency
- Biological N fixation in rotations and in grass mixes
- Carbon auditing tools
- Improved on-farm energy efficiency
- Conversion of arable land to grassland to sequester carbon in the soil
- New agroforestry
- Wetland/Peatland conservation/restoration
- Woodland planting



# 3. The climate role of the Common Agricultural Policy

# Climate and the CAP

- CAP has considerable potential to advance climate action on agricultural (and forest) land
- Climate objectives have become more prominent in the CAP over time




*CSF: Common Strategic Framework including the EFRD, ESF, CF, EAFRD and EMFF

# Climate Action in practice via the CAP

## Main CAP measures with climate potential:

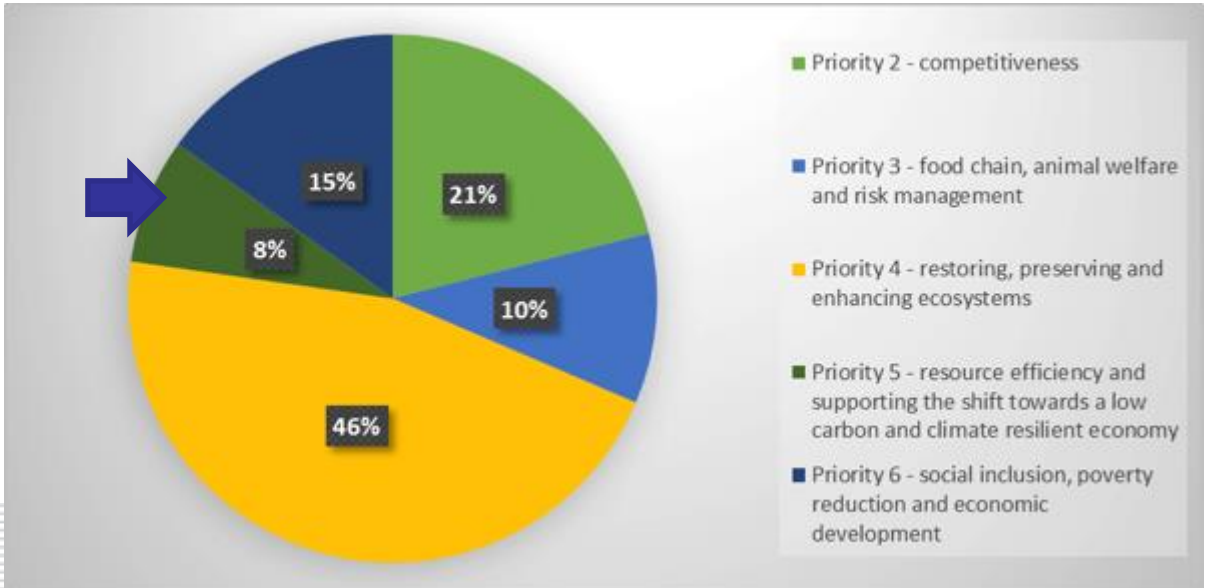
- Cross-compliance GAEC standards
- Farm Advisory System
- Pillar 1 green direct payments
- Pillar 2 rural development measures (land management, investments, advice and capacity building)

## Achieving climate benefits in practice depends on:

- the choices made by Member States in programming the CAP for 2014-20; and
- the choices made by farmers within the options available to them.

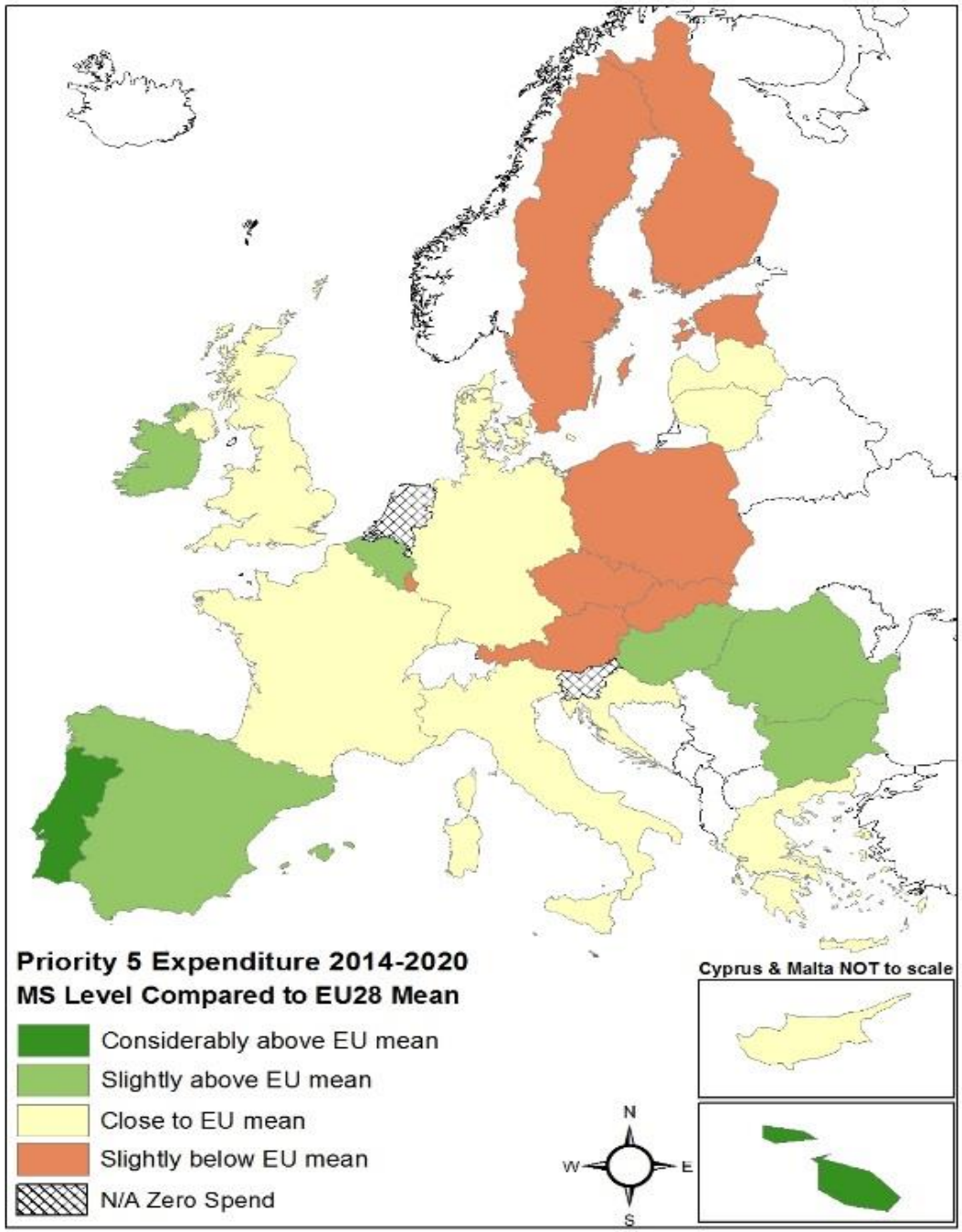
# Variable implementation

- Minimalist approach in many MSs
- Climate not a compulsory element of the Farm Advisory System
- RDP budgetary allocations for climate are lower than for other objectives
- Targets for climate indicators non existent in some RDPs or very low ambition.

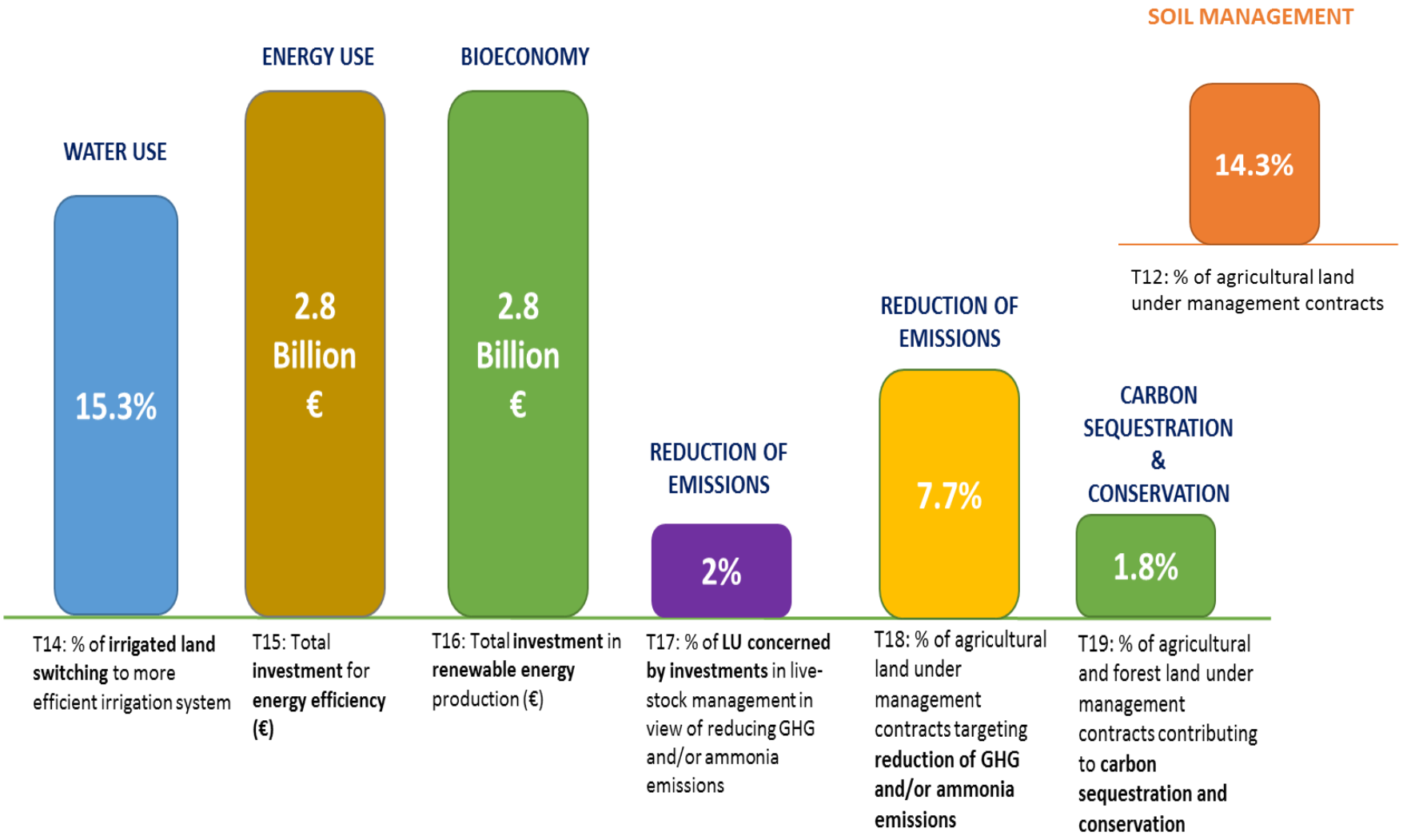



Overall Expenditure for RDPs by Strategic Priority: EU-28 2014-2020

# MS RDP expenditure on climate compared to EU average



# RDP targets relevant to climate



# 4. Future perspectives

# Perspectives for the agricultural sector and CAP

- To reach the target agreed under the Paris Agreement may require net zero emissions from all sectors at some point around or after 2050
- Greater consideration will need to be given to how the agriculture sector can play an enhanced role
- There is a need to reconcile food security with climate change concerns
- Despite this, there is still progress that could be made within the sector to enhance carbon sequestration, improve energy efficiency, and reduce GHG emissions relating to land management.
- Potential action to reduce EU demand for GHG-intensive agricultural production, through measures to address excess meat and dairy consumption in diets or measures to tackle food waste has not yet been adopted at EU level.

# Potential climate actions - agriculture

## Land use change

- E.g. afforestation, agro-forestry, arable conversion

## Crop Production

- E.g. Zero/reduced tillage, cover/catch crops, crop residues

## Livestock Production

- E.g. Disease management, breeding, feed additives etc

## Nutrient and Soil Management

- E.g. Nitrification inhibitors, improved N fixation etc

## Energy

- E.g. Carbon audits, energy efficiency, anaerobic digesters

# Considerations for the future

## Evidence:

- Database of evidence on mitigation potentials of different farming practices in different climatic zones and on different soil types

## Clear objectives, pathways and targets:

- Vision and pathways to achieve objectives required
- The lack of explicit GHG emission reduction or carbon sequestration targets for the agriculture sector means there is little incentive to focus attention in this area
- Must not forget the consumption dimension

## CAP and other relevant policies:

- Design of instruments and measures with climate objectives in mind
- Encourage improved use and implementation by Member States and greater uptake by farmers

# Thank you for your attention

Kaley Hart – khart@ieep.eu

Ben Allen – ballen@ieep.eu

Institute for European Environmental Policy

www.ieep.eu @IEEP_eu