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5th ICA Rectors and Deans Forum 2015

Educating the young professionals to feed the planet and provide for sustainable bioeconomy

Session 2:
Addressing the challenge of sustainable natural resource management

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The context

- Growing world population - 10 billion between 2050 and 2011
- Demand for meat and dairy products, processed foods increasing with economic growth
- 60% increase in food production in 2050 may be needed – but many assumptions and uncertainties
- Pressing but different problem of ending world hunger by reducing poverty, and addressing lack of access to food

Europe's role

- In order to address hunger and to facilitate development, food production needs to rise mainly in poorer countries, especially Africa, Asia
- So no immediate need to increase overall EU production beyond market opportunities
- However this may change in future with greater pressures on global food system
- Europe needs to play a positive role in gearing up for a new world, both internally and in external relations
- We need to use a window of, say, 20 years to embed a robust, sustainable supply chain in Europe
- This is a significant challenge – not business as usual

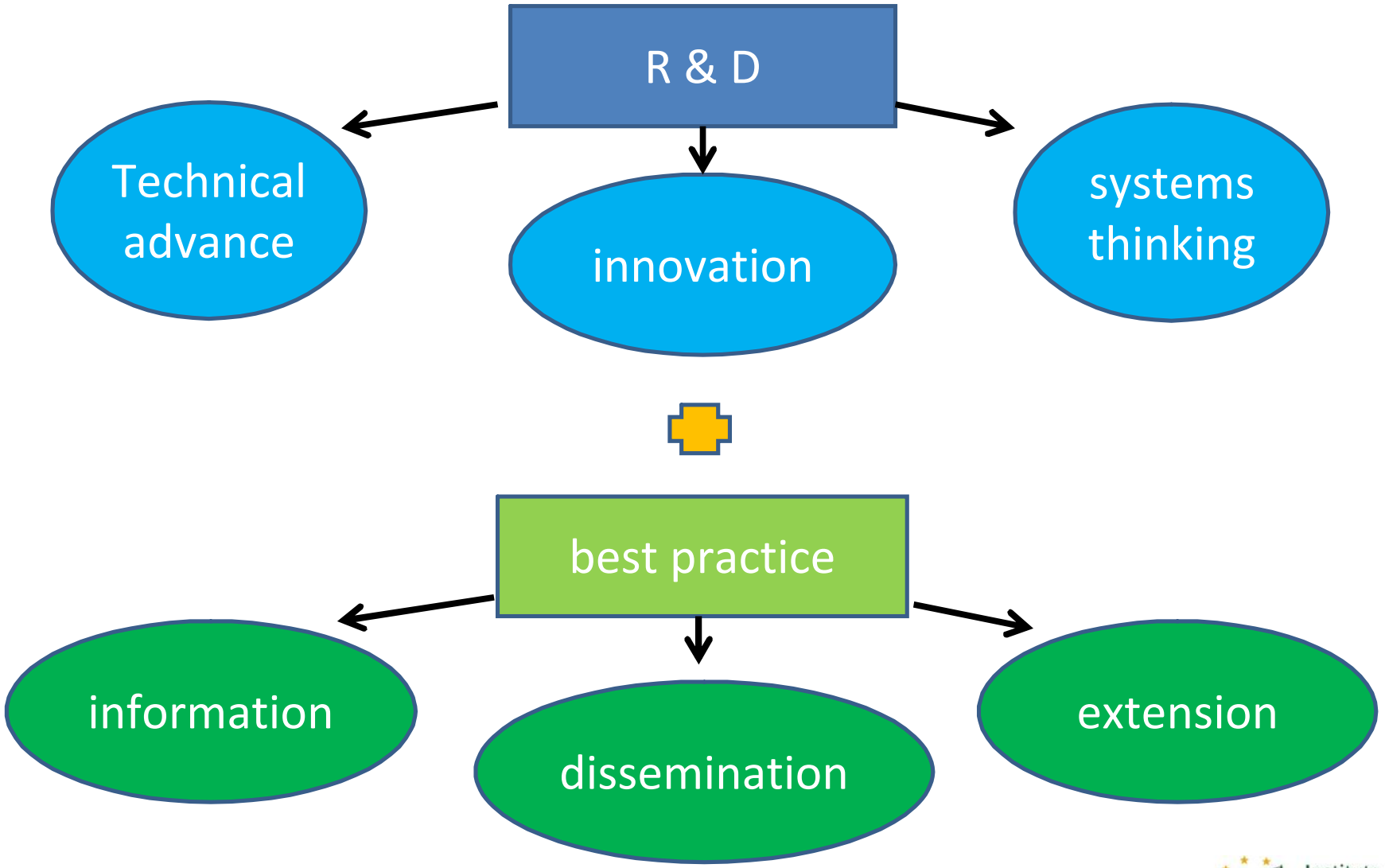
Six Priorities

1. Actively conserve the EU's own productive **resources for food production**, including land, soil, water, skills, infrastructure, research capacity, information and advice systems etc.
2. Strengthen the focus on **resource efficiency** in EU agriculture, including systematic effort to reduce the level of purchased inputs per unit of output
3. Fostering **innovation** and the spread of **best practice**; take the opportunities to reduce gaps between the top yielding and least efficient farms

Six Priorities

4. **Reduce Europe's overall demands** on the world food system, both of agricultural inputs and of food itself; the challenges of reduced waste and dietary change
5. **Align EU bioenergy** policies **with sustainability goals**; aiming to reduce pressure on limited land supplies, fully utilise wastes and residues; tailor incentives to appropriate scales and forms of production
6. Increase EU support for sustainable **agricultural production** in **the developing world**, directly through aid and indirectly through trade, policies on climate and energy etc.

Applying research and information to farming systems



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Develop sustainable farming systems

- Precision agriculture
- Conservation agriculture (3-4% now)
- Mixed / integrated crop-livestock farming (13% now)
- High Nature Value farming (c.25% now)
- Organic farming (5% now)
- Agroforestry

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EU funding streams for increasing sustainability

- Horizon 2020
- European Innovation Partnership for Agricultural Productivity and Sustainability
- “Greening” measures in revised Pillar 1 of the CAP
- Measures within CAP funded Rural Development Programmes

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Plant breeding and genetic resources

- Current crop yields high but further potential from crop breeding
- Maintain yields under more variable weather conditions without increasing use of water and fertilizers
- Maintain pest and disease resistance, greater drought and salinity tolerance, increased efficiency of nitrogen use, enhanced nutritional qualities in certain crops
- Conserve crop genetic diversity and crop wild relatives
- GM and other technologies for introducing novel traits into crop varieties have potential but impacts, acceptability and regulatory issues are critical
- Should legislation focus on the novel traits rather than the breeding technology?

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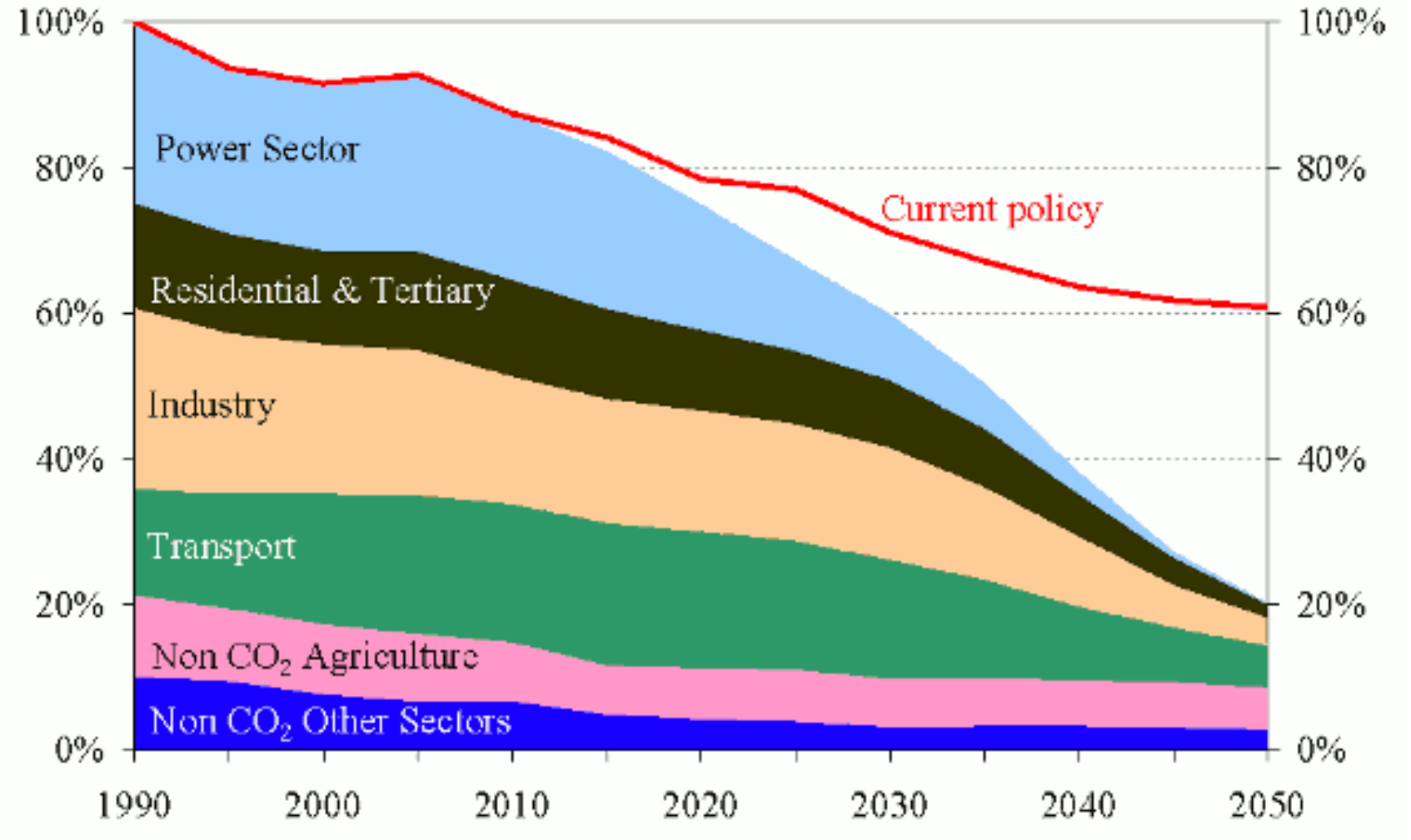
EU GHG emissions towards an 80% reduction



(2011) EU roadmap for moving to a competitive low carbon economy in 2050

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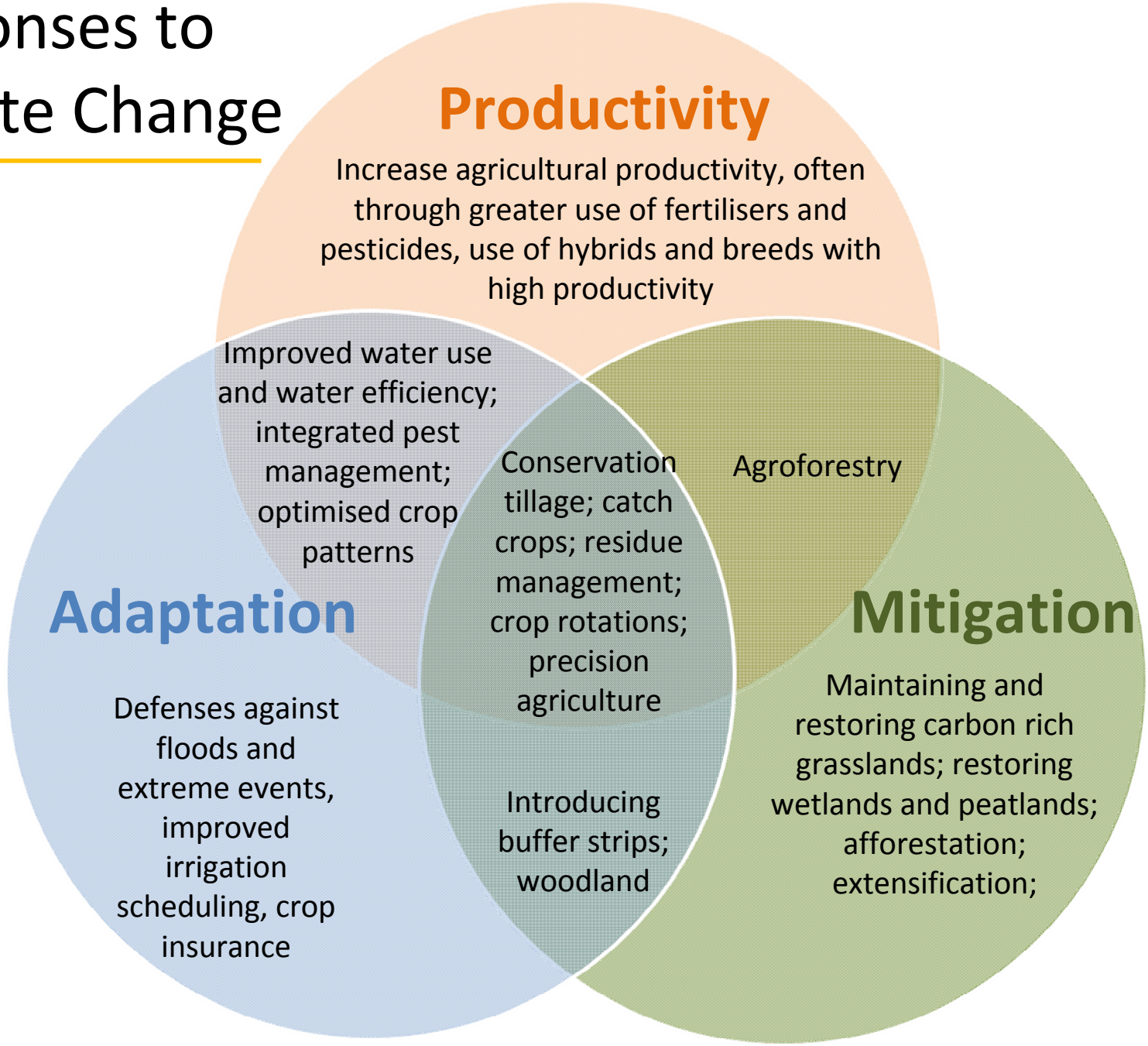
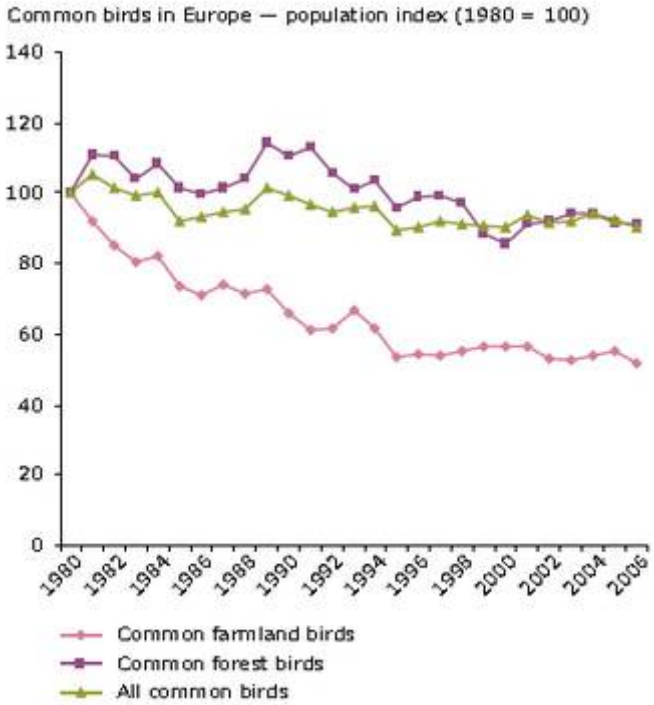
Climate issues

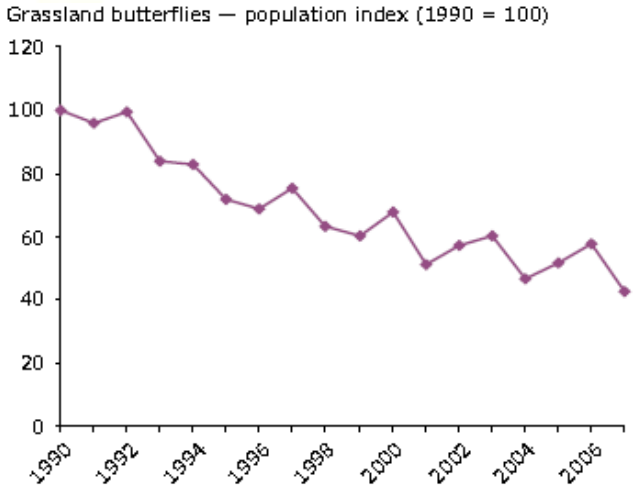
- Mixed impacts of climate change on EU agricultural production; greater risks in southern parts – water, soils, pests, fire etc.
- In France, Greece, Italy, Portugal & Spain 80% of total water use is for agriculture (European average 20%)
- Agriculture's share of EU GHG emissions 10% and falling but will be larger by 2050
- Non CO2 emissions need to fall by 42-49% (from 1990) to 2050
- Large range of options to reduce emissions, especially in livestock farming; some will need financial support
- Focus on carbon sequestration, forestry and LULUCF needs to increase; new EU climate policy framework to 2030

Responses to Climate Change



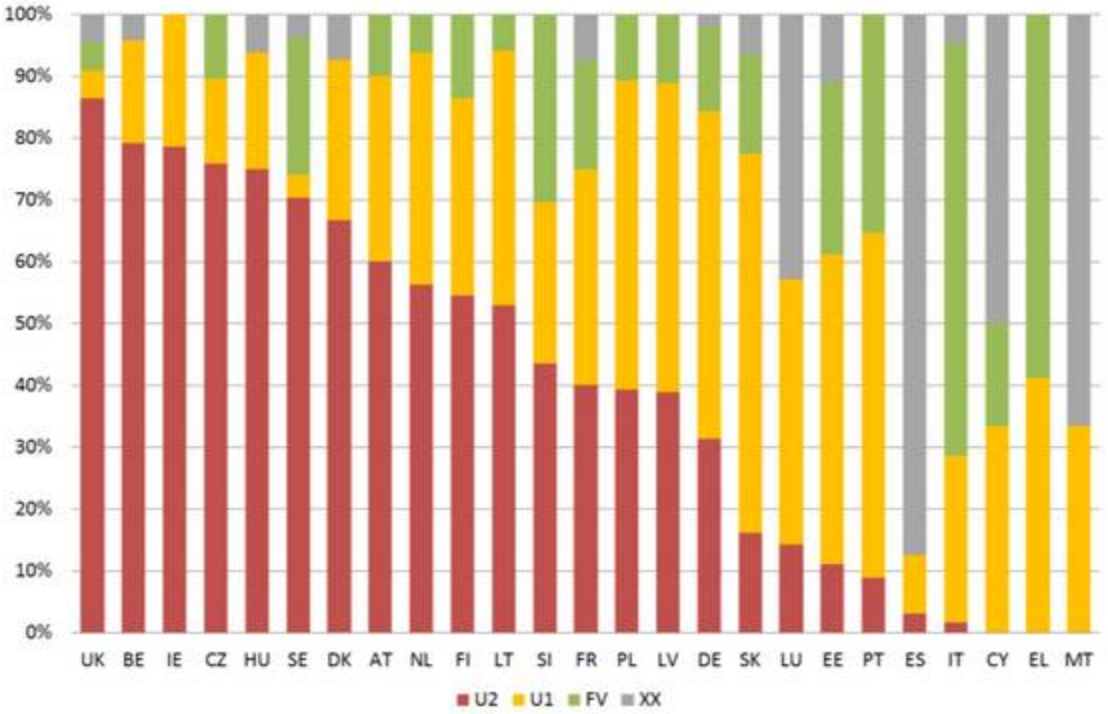
Biodiversity Trends





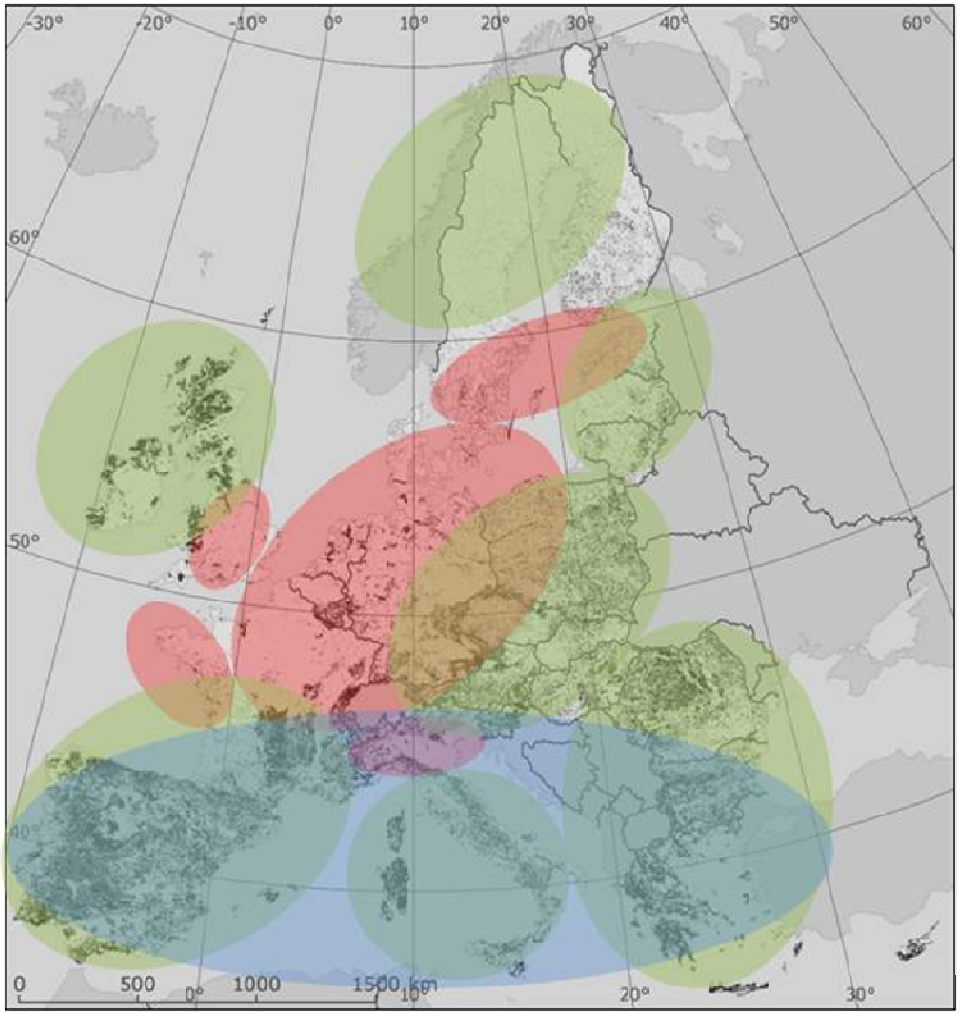
'to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss'.

Conservation status of habitats associated with agriculture across Member States (%)



favourable FV; unfavourable-inadequate U1; unfavourable-bad U2; unknown XX

Environmental challenges



Marginal agricultural areas

Challenges: maintain on-field biodiversity, stimulate favourable practices, increase profitability without intensifying

Prime agriculture areas

Challenges: reduce pressures on air, soil and natural habitats, nature reserve approach to remaining high nature value agri patches

Main irrigated areas

Challenge: reduce water stress

Background (dark grey patches): HNV farmland distribution

Source: EEA

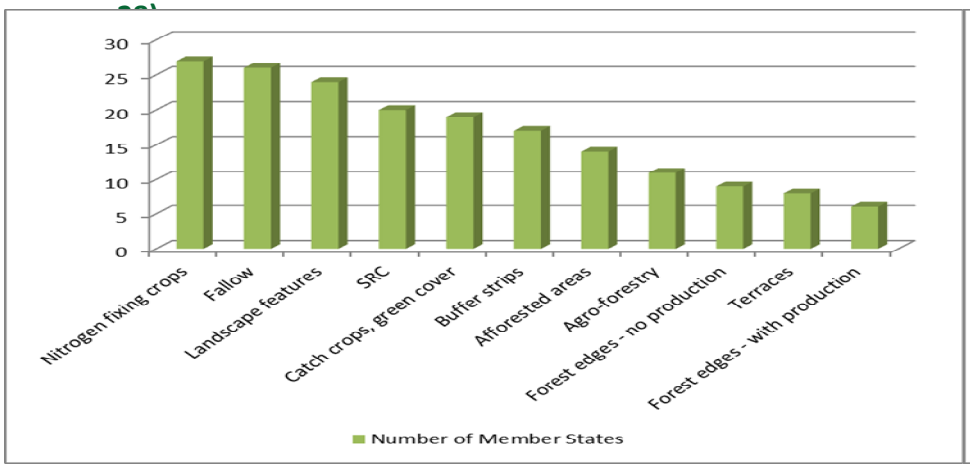
Some key policy responses

- Expanded and more focussed incentive schemes for climate resilient and biodiversity-friendly farmland management
- Measures to constrain unsustainable farming practices e.g. through implementation of the Nitrates and Habitats Directives; targets to reduce pesticide use and apply IPM more widely; cross-compliance
- Targeted innovation, research, dissemination effort including work on the factors causing loss of honeybees & wild pollinators
- Reducing external impacts of EU policies eg fisheries

GAEC and Ecological Focus Areas (greening)

- Cross-compliance GAEC Standards:
  - GAEC 1 - buffer strips adjacent to water courses
  - GAEC 4 - minimum soil cover
  - GAEC 5 - land management to limit erosion),
  - GAEC 6 - protection of soil organic matter
  - GAEC 7 - retention of landscape features
- Greening measures – EFA

EFA elements chosen by Member States as eligible



Types of landscape features permitted within EFAs (EU-

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Food waste and diets

- Waste still a major issue; affects most of food chain, particularly the consumer/distribution end of the chain
- Estimated at 138 million tonnes p.a. in STOA study, and 146 kg per capita in Germany alone
- Multiple measures available to reduce wastes, including in the food industry – target setting by Member States, revising EU legislation on food safety and improving industry supply chain management
- Significant opportunity to change dietary practices by 2050; EU consumption of meat, dairy, eggs and fish around double world average

Strategies and Targets

- The Roadmap proposed that the disposal of edible food waste should be cut in half by 2020
- The Commission did not elaborate the reduction target; the expected Communication on Sustainable Food, originally planned for 2013/14, did not appear
- However, the 2014 Commission Communication “Towards a Circular Economy”, proposed a more modest target, along with several measures such as banning the landfilling of biodegradable waste by 2025
- Member States were to develop national food waste prevention strategies, aiming to ensure a reduction of food waste in key sectors of at least 30 percent by 2025
- This was to cover the manufacturing, retail / distribution and food service / hospitality sectors as well as households

Circular Economy in Suspense

- The new Commission under Mr Juncker has withdrawn its previous proposal for legislation on waste targets
- It proposes a new “more ambitious” proposal to promote the circular economy due in late 2015
- Material being drawn from several sources including a major public consultation this summer
- The debate at government level has moved away from binding targets on Member States; more emphasis on indicative targets and voluntary measures
- No decision yet on food waste, DG Sanco in lead

What do we mean by resource?

Primary biomass
Derived from dedicated production

Residual biomass
Resulting from biomass production + management but is not the primary output

Waste biomass
Results from previous consumption or discards. does not drive production or resource use


Dedicated energy crops


Dedicated forest biomass


Conventional food and feed


Algae and micro organisms


Landscape management


Industrial residues


Agricultural and forestry residues


Industrial waste


Municipal waste including UCO and food waste

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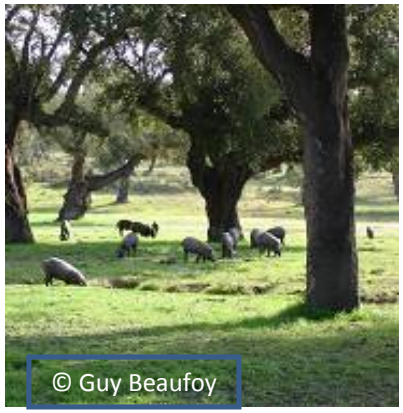
Wastes and residues for the bioeconomy

- Wastes and residues from the agriculture/forestry/food sector a significant resource not only for energy but for a range of materials, including biochemicals, bioplastics
- Potential in the EU estimated at the equivalent of around 4-14% of EU fuel energy consumption
- Range of technologies available, including thermochemical and biochemical
- BUT will need suitable policy drivers to utilise the potential, with new emphasis on these feedstocks, less bias towards energy uses, for biomass adherence to the waste hierarchy and adoption of the cascading principle
- More focus on the bioeconomy within the circular economy

Five Challenges (at least!)

- Maintaining and increasing yields sustainably, using more knowledge intensive approaches
- Better policies to achieve environmental goals on farmland, in both extensive and high yielding systems
- Reduce waste and address consumption issues
- Diminish EU's global footprint for food and
- New alignment of bioenergy policies



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Options for sustainable food and agriculture in the EU. Synthesis report of the STOA Project 'Technology Options for Feeding 10 Billion People'

Institute for European Environmental Policy, London/Brussels.