



# **Towards carbon neutrality in 2050: the role of the bioeconomy**

**Valeria FORLIN (C.3)  
DG CLIMA**

# Agriculture contribution to climate policies

## PROMOTE the bioeconomy

Bio-feedstocks  
for industry and  
power sectors

Advanced  
biofuels

Substituting  
building  
materials

## REDUCE GHG emissions

Precision  
farming

Breeding

Nitrification  
inhibitors

Anaerobic  
digestors

Energy  
efficiency

## ENHANCE carbon removals

Afforestation

Limit  
deforestation

Improve  
standing stocks  
/ increment  
rates

Sustainable  
soil  
management

Wetland  
management

## ADAPT to climate change

Water retention

Choice of  
resilient crops

Enhance soil  
quality

Agro-forestry

Emission Trading  
(substitution effect)

Effort Sharing

LULUCF

EU Adaptation  
Strategy

EU Governance Regulation

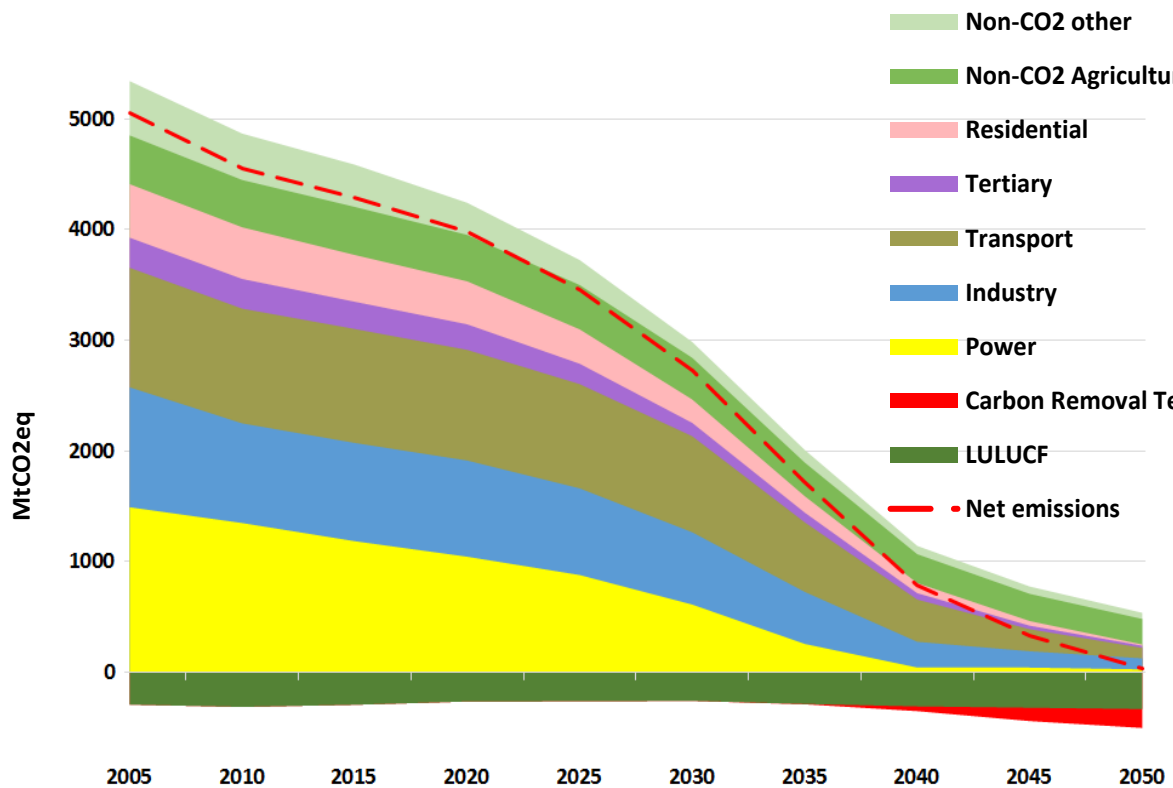
EU Climate framework



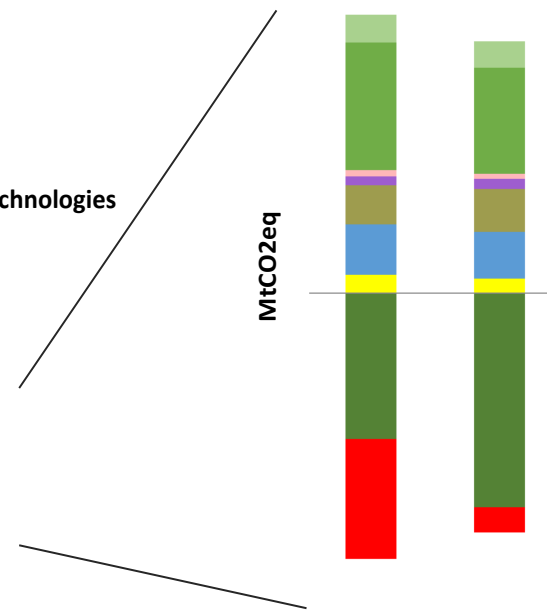
European  
Commission

# Communication "A Clean Planet for All"

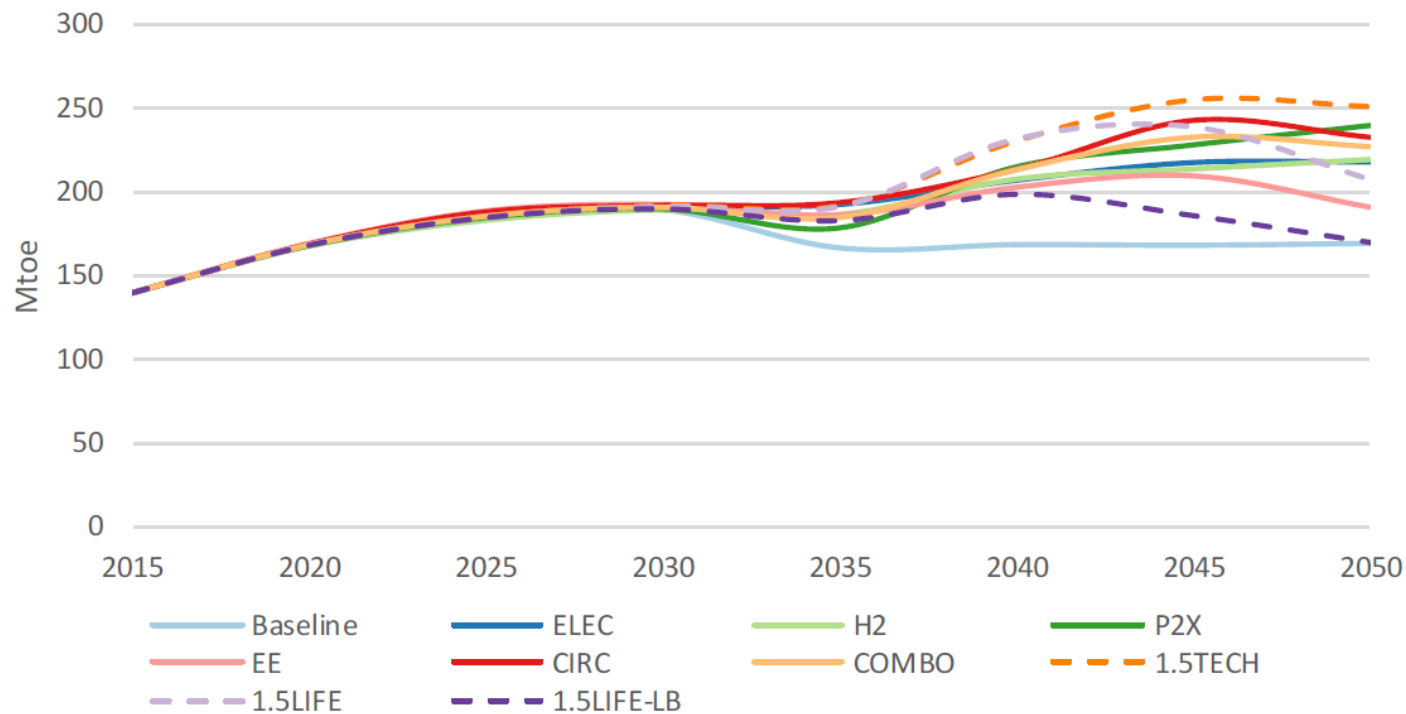
<https://europa.eu/!uJ83HG>



Different zero GHG pathways lead to different levels of remaining emissions and absorption of GHG emissions



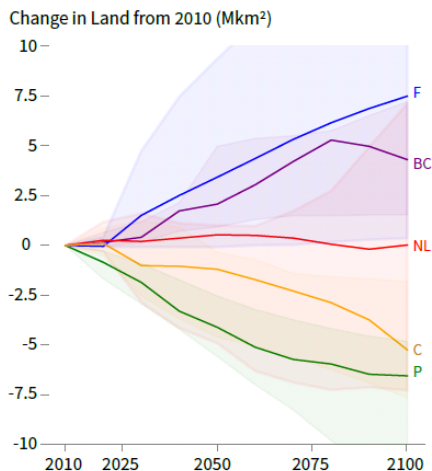
# Projections on consumption of biomass and waste for energy



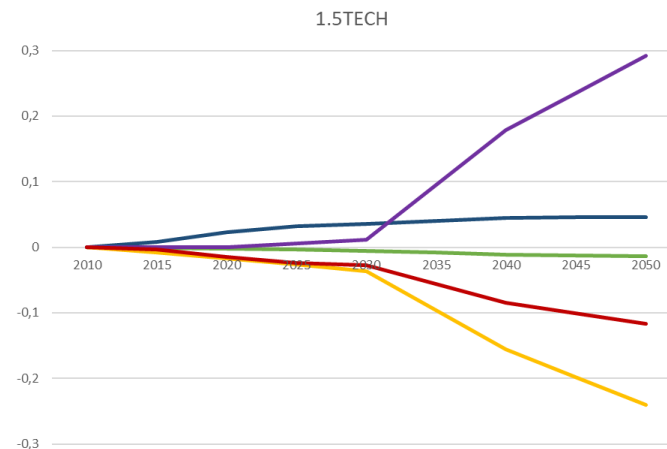
Source: PRIMES.

# Change in land use from 2010 (in million km<sup>2</sup>)

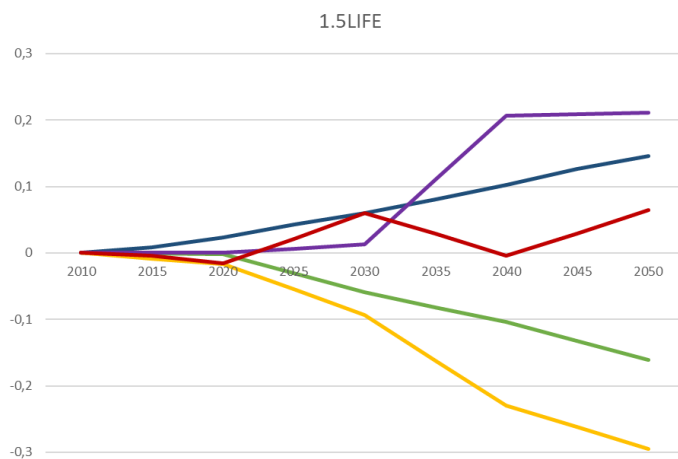
## GLOBAL: IPCC, SSP1 Sustainability focused



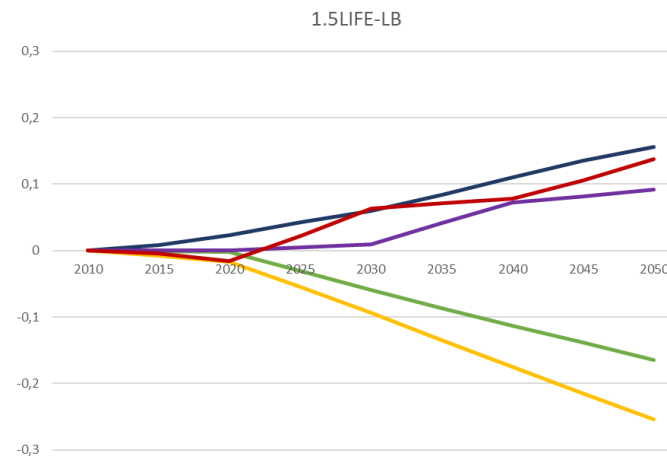
## EU: technology scenario



## EU: consumer choice scenario



## EU: consumer choice & additional sequestration incentives scenario



— Forest   
 — Pasture   
 — Cropland   
 — Energy crops   
 — Natural Vegetation

# Bioeconomy in climate planning

- **National Energy and Climate Plans** (Governance Regulation 2018/1999) should provide (*more*) info on:
  - Sectoral policies and measures to achieve emission reduction commitments (including in agriculture)
  - Biomass supply:
    - Projections on forest biomass supply (domestic and imported), its sources (e.g. types of feedstock) and potential impact on the LULUCF sink
    - Measures on biomass mobilisation, taking into account sustainability / other uses
- All national **Adaptation Strategies** recognise agriculture and forestry as highly vulnerable – risks that can affect the development of the bioeconomy!

CAP Strategic Plans are a crucial instrument to implement the vision laid out in the NECPs, and to address the risks identified in the Adaptation Plans.

# Thank you!

[valeria.forlin@ec.europa.eu](mailto:valeria.forlin@ec.europa.eu)

## #EU2050

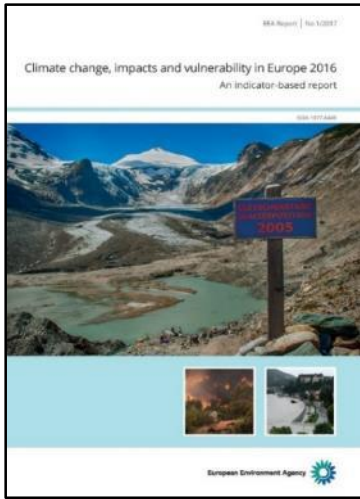
<https://ec.europa.eu/clima/news/commis-sion-calls-climate-neutral-Europe-2050.en>

Climate  
Action





# Impacts of climate change in Europe



**Arctic region**  
Temperature rise much larger than global average  
Decrease in Arctic sea ice coverage  
Decrease in permafrost areas  
Decrease in biodiversity  
Increasing risk of the exploitation of natural resources and for sea transportation  
Risks to the livelihoods of indigenous peoples

**Coastal zones and regional seas**  
Sea level rise  
Increase in sea surface temperatures  
Increase in ocean acidity  
Northward migration of marine species  
Risks and some opportunities for fisheries  
Changes in phytoplankton communities  
Increasing number of marine dead zones  
Increasing risk of water-borne diseases

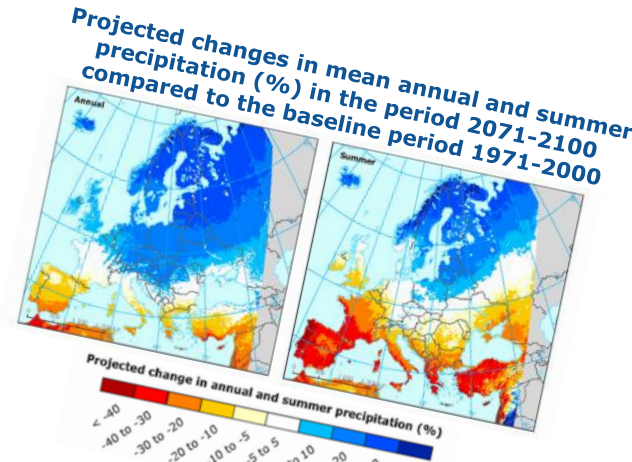
**Mediterranean region**  
Large increase in heat extremes  
Decrease in precipitation and river flow  
Increasing risk of droughts  
Increasing risk of forest fires  
Increasing competition between different water users  
Increasing water demand for agriculture  
Increase in crop yields  
Increase in risks for livestock production  
Decrease in mortality for southern disease vectors  
Increasing habitats for energy production  
Expansion of habitats for pest and disease  
Decreasing potential for cooling  
Increase in energy demand and potential increase in other seasons  
Increase in multiple climatic hazards  
Increase in multiple climate hazards  
Most economic sectors negatively affected  
High vulnerability to spillover effects of climate change from outside Europe

**Mountain regions**  
Temperature rise larger than European average  
Decrease in glacier extent and volume  
Upward shift of plant and animal species  
High risk of species extinctions  
Increasing risk of forest pests and landslides  
Changes in hydropower potential  
Decrease in ski tourism

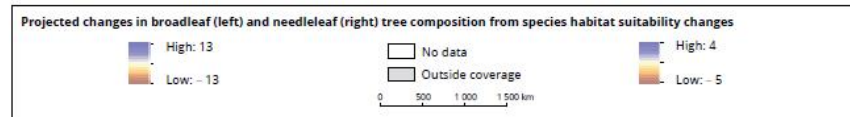
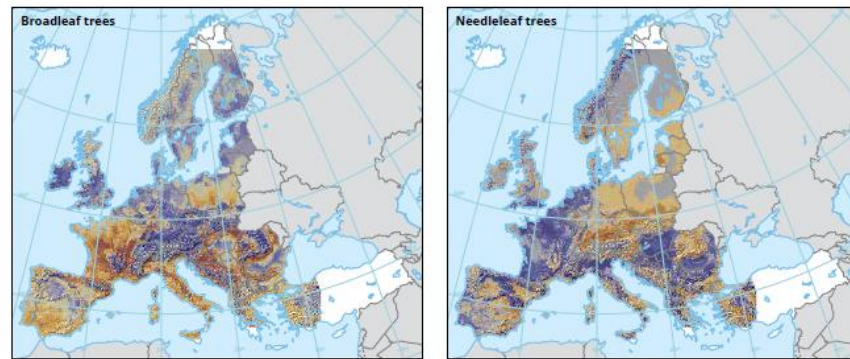
**Continental region**  
Increase in heat extremes  
Increase in summer precipitation  
Increasing risk of forest fires  
Increasing economic value of forests  
Increase in energy demand for cooling

**Boreal region**  
Increase in heavy precipitation events  
Increase in snow, lake and river ice cover  
Increase in precipitation and river flows  
Increasing potential for forest growth and increasing risk of forest pests  
Increasing damage risk from winter storms  
Increase in crop yields  
Increase in hydropower potential  
Increase in summer tourism

**Other impacts:**  
Increase in precipitation events  
Increase in coastal flooding  
Increasing risk of damage from winter storms  
Increasing damage risk from winter storms  
Increase in energy demand for heating  
Decrease in multiple climatic hazards



Map 4.17 Projected change in climatic suitability for broadleaf and needleleaf trees

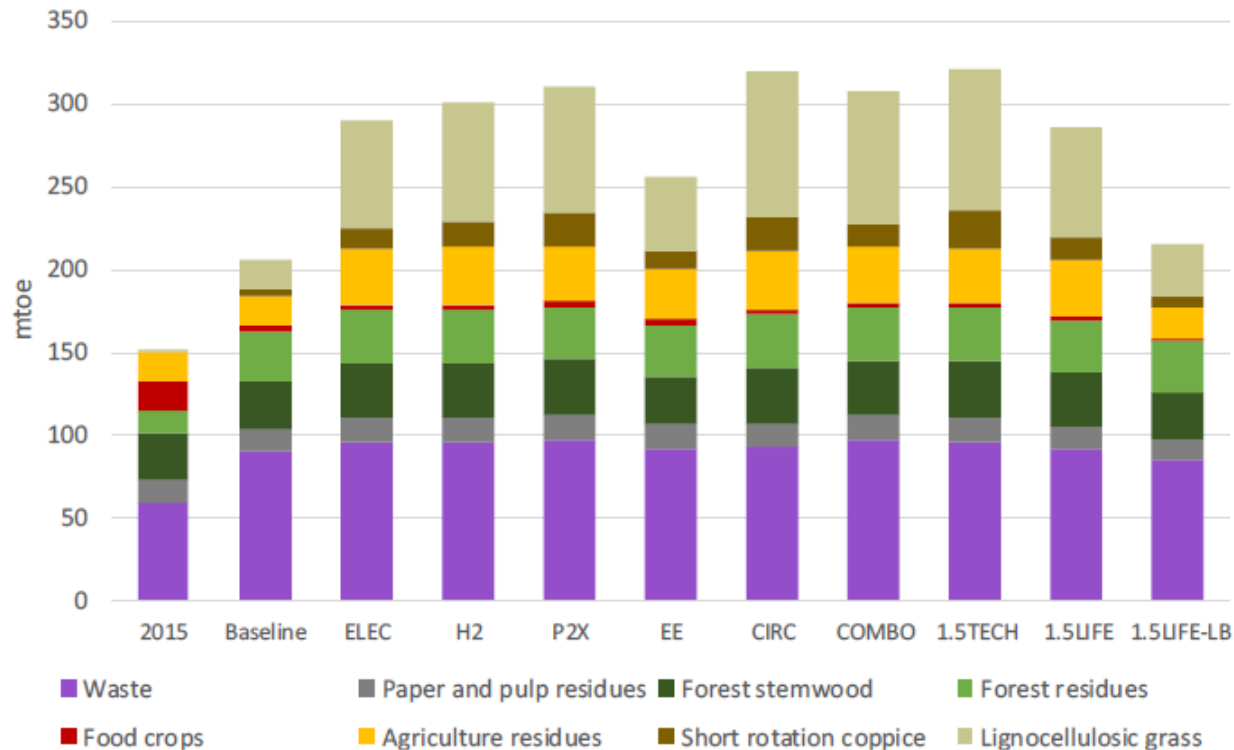


**Note:** The two maps indicate to what degree broadleaf (left) and needleleaf (right) tree species are expected to increase (blue) or decrease (brown) in numbers by 2100. The results represent ensemble species distribution modelling simulations, using climate projections from six RCMs under the A1B scenario.

**Source:** Adapted from Lindner et al., 2014.



## Break down of bioenergy feedstock in 2050



Source: PRIMES, GLOBIOM.

## Use of natural land by 2050

