

# The Support of the JRC to the EU Climate Change Policy

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<http://www.jrc.ec.europa.eu>

<http://ipts.jrc.ec.europa.eu>

# The Climate Change Problem

- The very first global environmental externality that mankind faces
- Change in temperature, precipitation, other climate variables (mean, variability, weather extremes)
- Very long time scale involved, intergenerational problem; uncertainty; policy costs today, benefits in long-term
- Emissions do alter the global climate system independently of the place of emissions; conflict of interests among sovereign countries: EU role.
- It is mainly an energy problem; energy-related emissions account for approximately 80%
- Global problem: participation challenge

# Fundamental Policy Questions

## Mitigation policies

1. How much to reduce (mitigate) emissions?
2. Who mitigates, and when (timing), and who pays?

## Adaptation policies

1. Identification of vulnerabilities
2. Cost/efficiency analysis of adaptive measures.

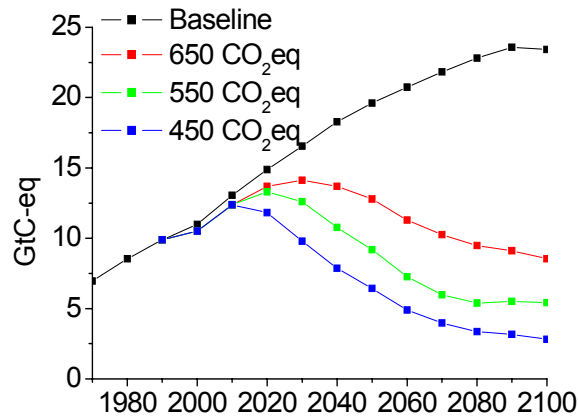
Reliable estimates of the benefits and costs of climate policies necessitate:

- Modelling GHG emissions pathways
- Developing alternative scenarios
- Providing economic estimates of mitigation costs
- Quantifying the damages avoided

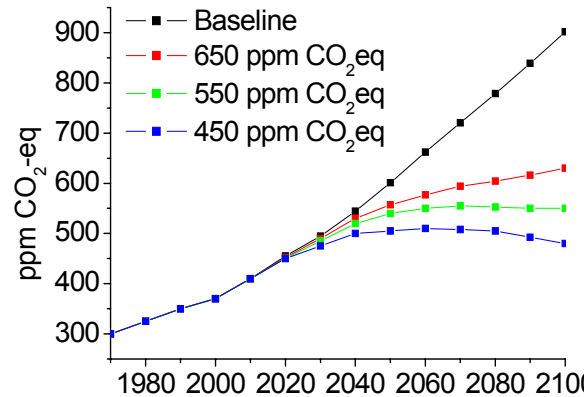
The JRC supports the EC in these activities

# Emission pathways and temperature rise

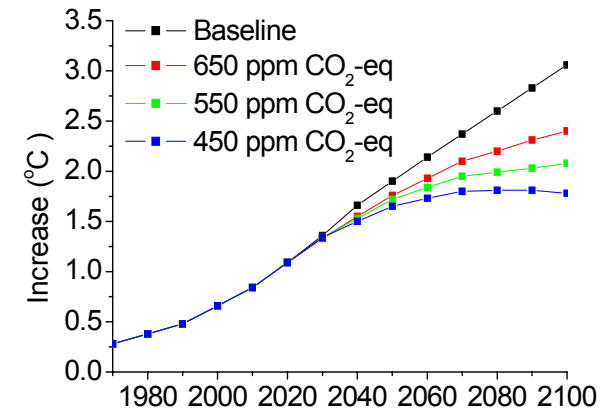
Emissions



Concentration



Temperature



Source: Van Vuuren et al. Multigas Stabilization Pathways

Probability of reaching the 2 C objective:

- With stabilization around 450 ppm: between 0.25 and 0.75
- With stabilization around 400 ppm: between 0.6 and 0.95

Cumulative reduction

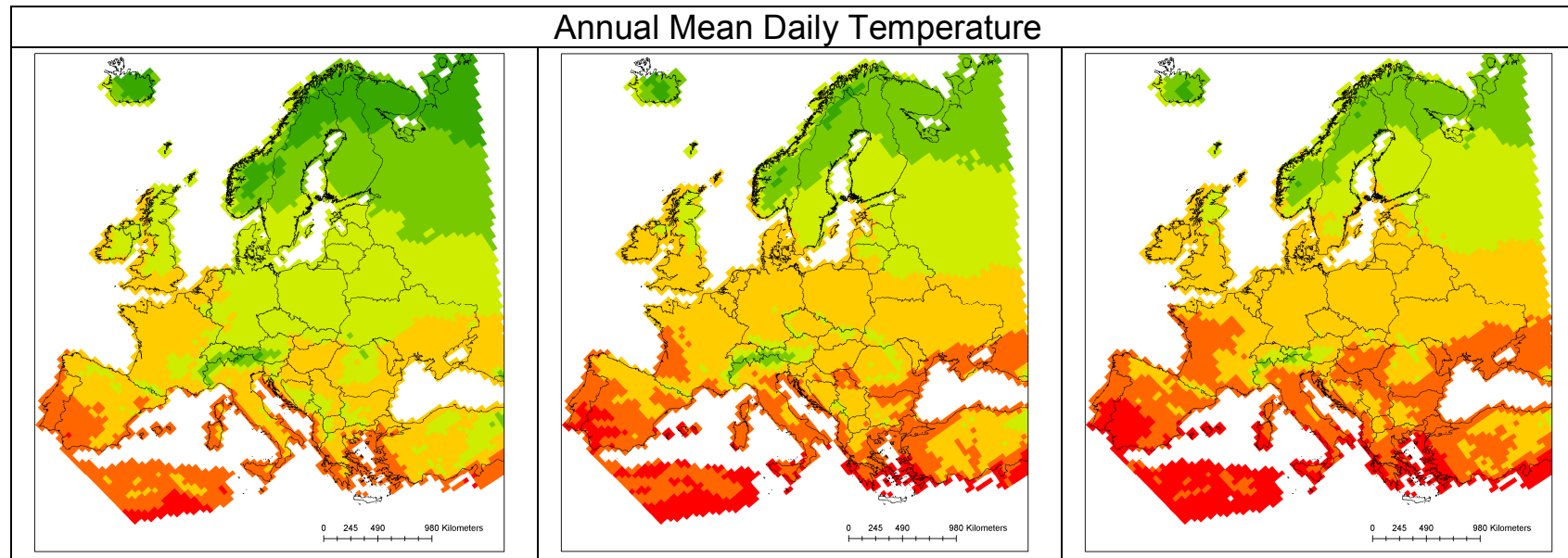
- 650 GtC (30%)
- 850 GtC (45%)
- 1200 GtC (60%)

# PRUDENCE Climate Change Scenarios

1961-1990

2071-2100

2071-2100



Annual mean temp, C



GHG conc. X 2 over  
preindustrial times

$\Delta T = 2.2 \text{ }^\circ\text{C}$

GHG conc. X 3 over  
preindustrial times

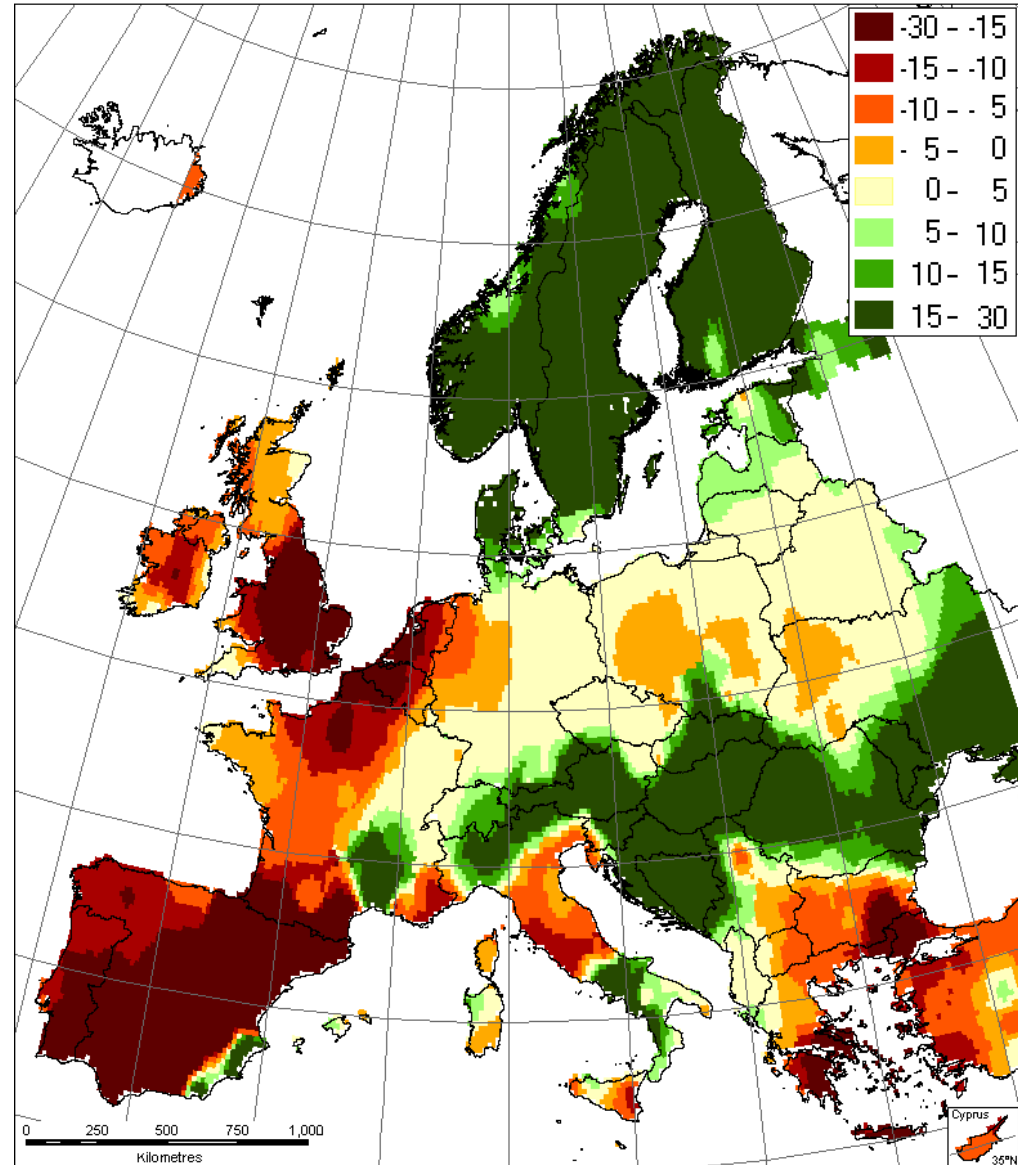
$\Delta T = 3 \text{ }^\circ\text{C}$

PESETA: A project aiming at providing quantitative estimates of climate change economic impact according to several damaging patterns:

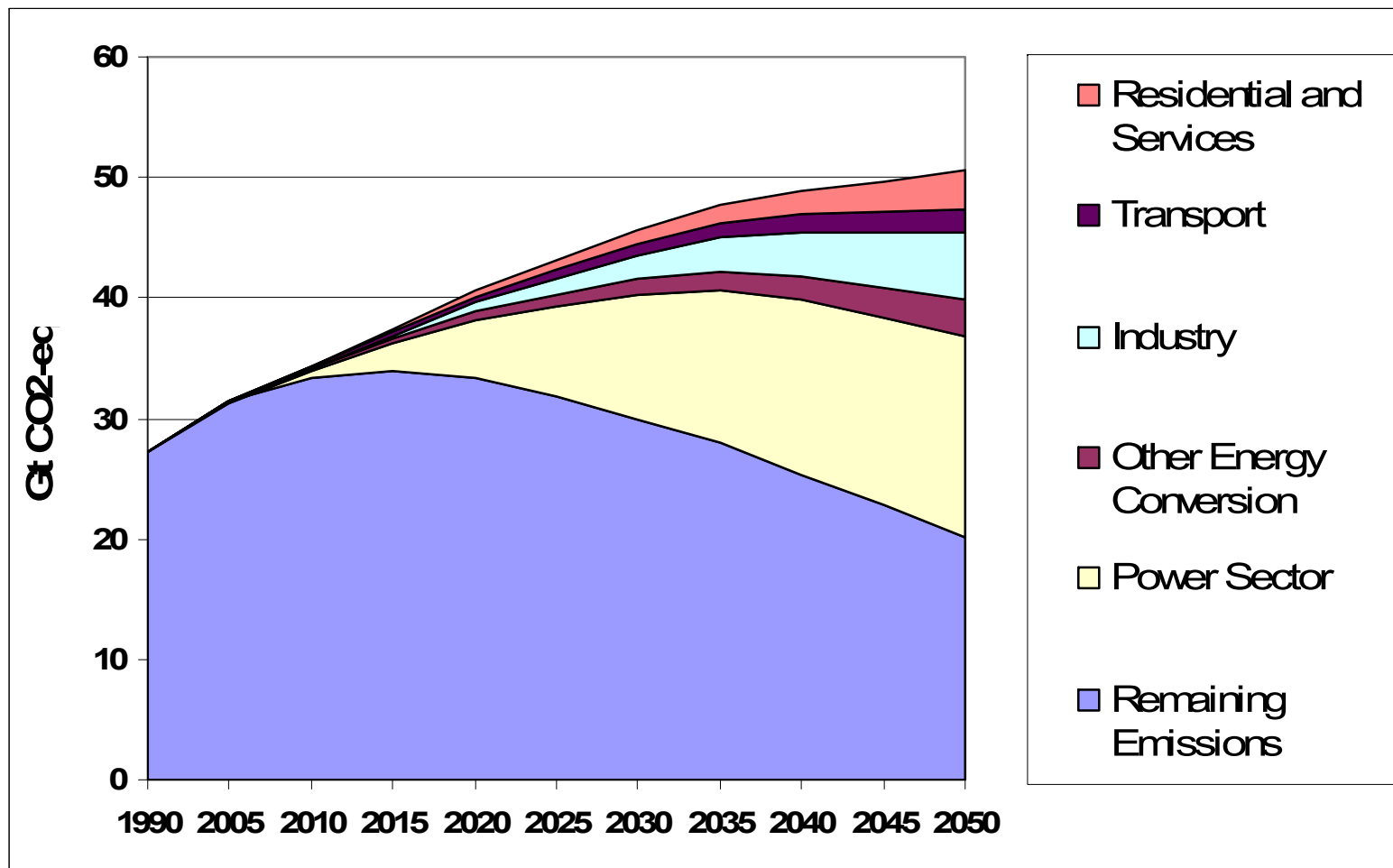
Agriculture  
Coastal protection  
River basin floods  
Energy demand  
Tourism industry  
Human health

Effects in agriculture  
A2 scenario  
2071-2100

Crop yield changes under the HadCM3/HIRHAM A2 scenario [%]

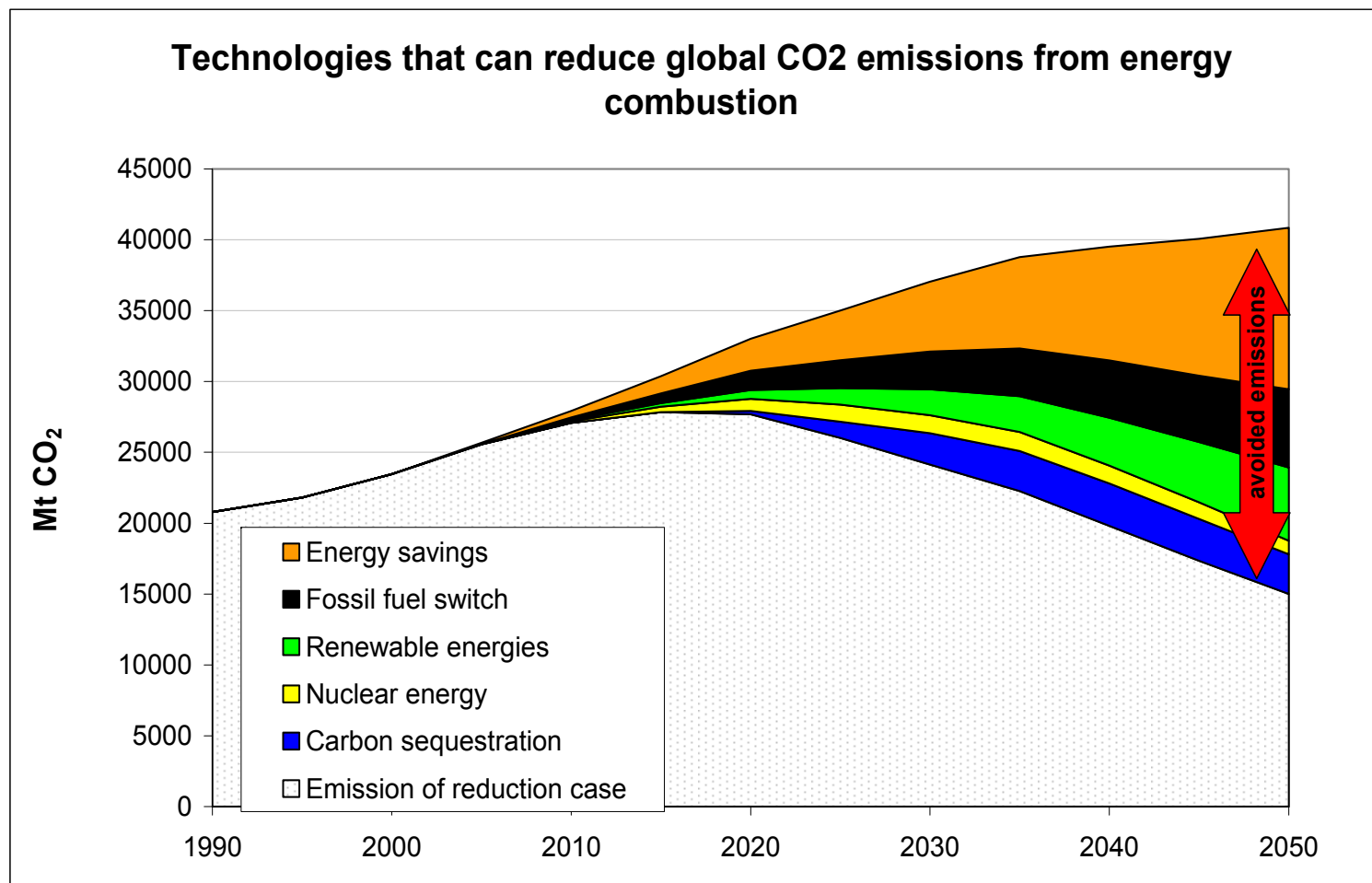


# Sectoral contribution to global emission reductions



Source: JRC IPTS/POLES model (DG ENV website)

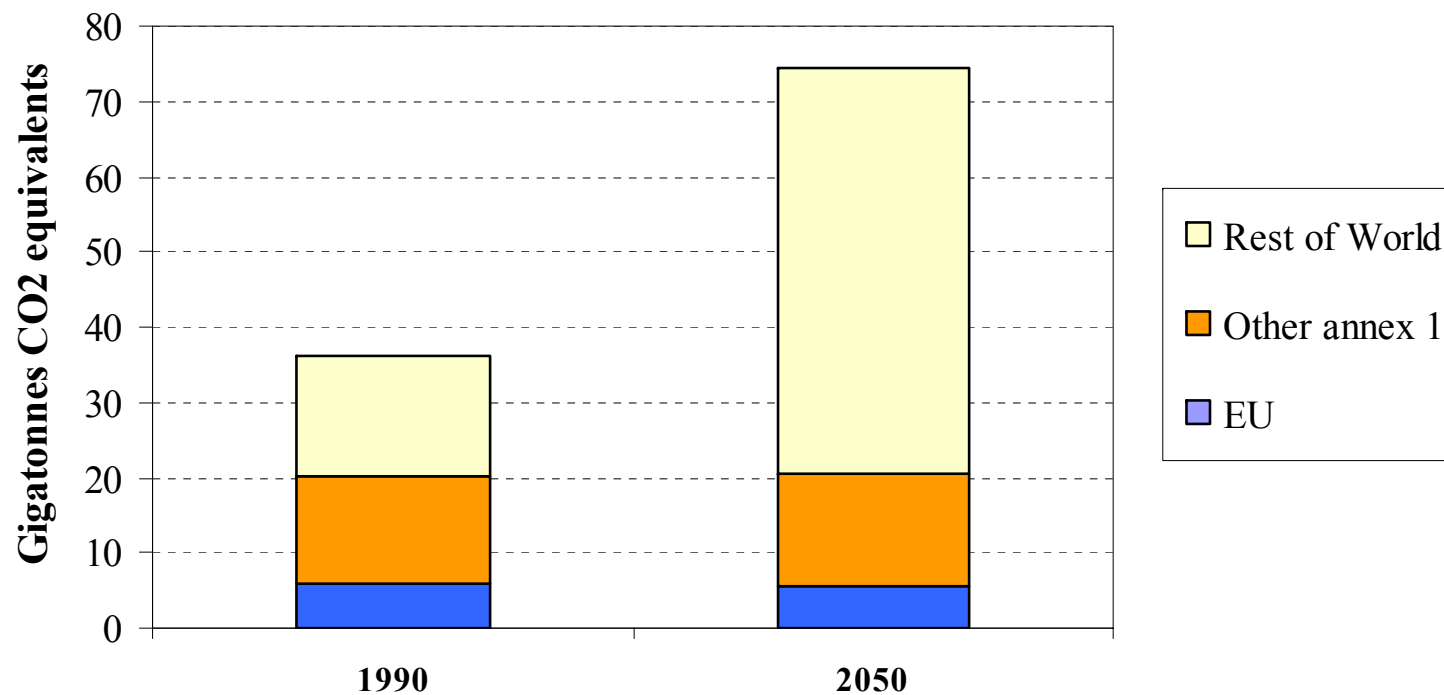
# Technologies that can reduce emissions from energy



Source: JRC IPTS/POLES mode (DG ENV website)

# EU alone cannot solve the climate change problem

**Figure 1: Projected development of greenhouse gas emissions in different regions of the world**



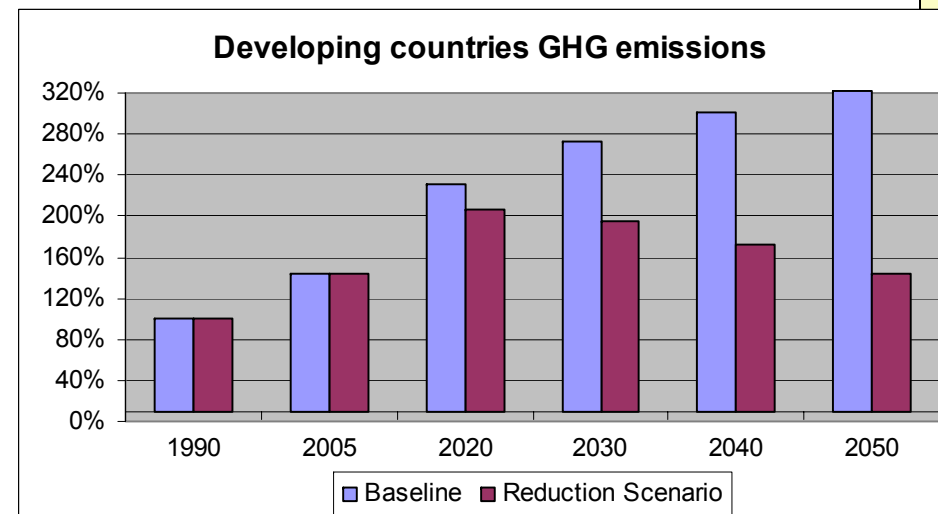
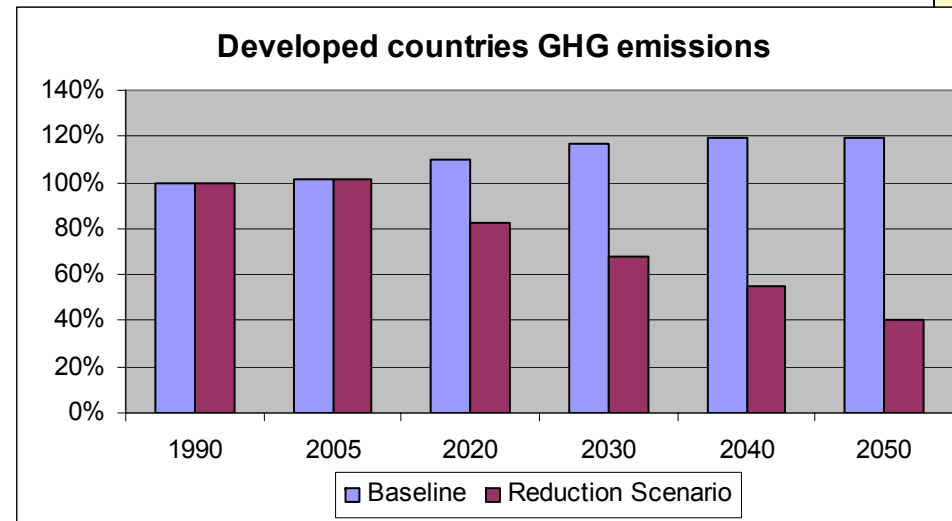
Source: Greenhouse gas reduction pathways in the UNFCCC process up to 2025, CNRS/LEPII-EPE, RIVM/MNP, ICCS-NTUA, CES-KUL (2003).

# EU alone cannot solve the climate change problem

## The way ahead for 2020 and beyond (1990=100%)

- The 2°C objective: Global GHG emissions need to peak around 2020
- EU & Developed countries: 30% GHG emission reduction target by 2020, compared to 1990 levels
- Developing countries: Reduced growth asap, absolute reductions after 2020
- Deforestation: halt within two decades and then reverse

Source: JRC IPTS/POLES mode



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**SLIDES**

1. Duplicate the slide
2. Do not change the text
3. Try not to place text in a box.
4. Replace the month (Month YYYY") with your country (Country RC") with your country
5. Set it in Eurofont. Otherwise, keep the original typeface.
6. Keep the original line.
7. Keep the original line.
8. Keep the original line whenever possible.
9. Replace the number with the number.
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# Key Objectives: Climate Change and Energy Package

- January 10th 2007: EC initiatives announced.
- Endorsed at the European Council 8-9 March 2007
- Meeting the 2°C objective (Top down):
  - EU: In the international negotiations set forward the GHG reduction target of 30 % by 2020 for developed countries (compared to 1990 levels).
  - EU: A firm independent commitment to achieve at least 20% GHG emission reductions by 2020 (compared to 1990)
- Tools (Bottom up):
  - “An Energy Policy for Europe”
  - GHG policies including Emissions Trading
  - Development of a global carbon/GHG market

## Sound Economic Analysis Needed

- “Winning the Battle” & Stern Review: benefits of limiting Climate Change outweigh costs of action
- Costs of inaction: 5-20% of global GDP (Stern Review)
- Costs of action for the EU 2020:
  - -30% target with global participation: -0.19% annualised GDP
  - -20% independent target: -0.02% to -0.09% annualised GDP
- Costs of action globally:
  - -0.14% annualised GDP by 2020
  - -0.19% annualised GDP by 2030
- Does not include Co-benefits:
  - Increased energy security
  - Improved competitiveness through innovation
  - Health benefits from reduced air pollution
  - Limits on climate change

## Conclusions

- The JRC constitutes a valuable repository of expertise to support the definition and implementation of the EU climate change policies.
- The JRC guarantees scientific and technical neutrality and a EU-oriented approach.
- The fields of competence range from the scientific expertise on geo and biosciences to techno-economic analysis of alternative policy options
- The JRC pursues an strategy of further specialisation in several climate-related issues in connection with the scientific, mitigation, adaptation and innovation challenges.

All documents in the climate and energy package:

[http://europa.eu.int/comm/environment/climat/home\\_en.htm](http://europa.eu.int/comm/environment/climat/home_en.htm)

[http://ec.europa.eu/environment/climat/future\\_action.htm](http://ec.europa.eu/environment/climat/future_action.htm)

[http://ec.europa.eu/energy/energy\\_policy/index\\_en.htm](http://ec.europa.eu/energy/energy_policy/index_en.htm)

<http://energy.jrc.ec.europa.eu>

<http://ccu.jrc.it>

<http://peseta.jrc.ec.europa.eu>