Roadmap for moving to a competitive low carbon economy in 2050

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DG Climate Action

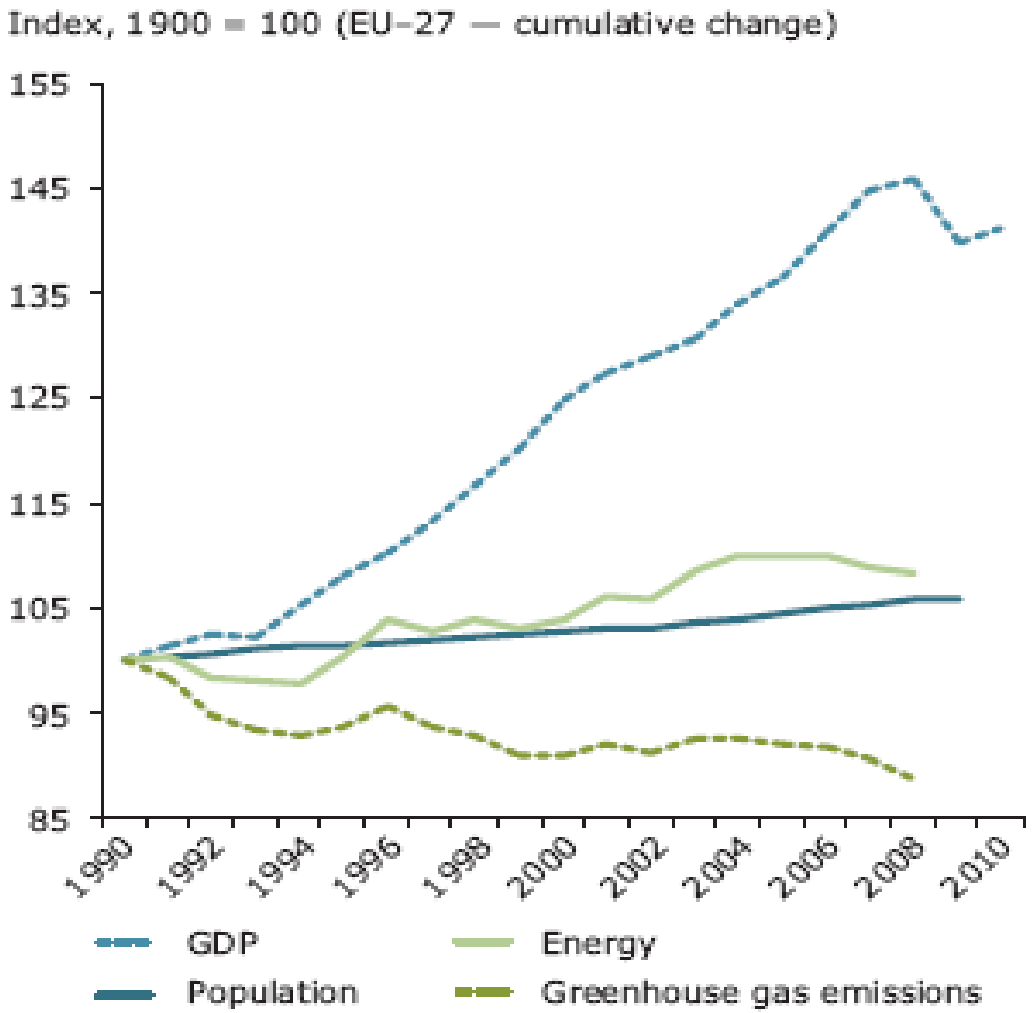
European Commission

Limiting climate change – a global challenge

- Keeping average global temperature increase below 2°C confirmed as global objective (Copenhagen, Cancun)
- Concrete emission pledges made by countries responsible for > 80% of global GHG emissions
- Need to prepare long-term low-emission development strategies
- …but current pledges are not sufficient to stay below 2°C

Climate Action until 2020

GHG emissions: Where is the EU now?



- EU emissions reduced by 16% between 1990 - 2009
- EU GDP grew 40%
- EU manufacturing grew by 34%
- EU on track towards the - 20% emission reduction target by 2020
- However, current policies would only lead to ca. - 40% GHG emissions by 2050

Climate Action at the heart of Europe's 2020 strategy

★Europe 2020 Strategy includes:

- Headline target to achieve climate and energy goals: 20% cut in GHG emissions by 2020
- Flagship initiative to increase resource efficiency in the EU

"*Smart, sustainable and inclusive growth*"

★Benefits for energy security

- EU increasingly dependent on imported fossil fuels
- Risks from high price of oil and gas

★Benefits for innovation, jobs & growth

- EU traditionally strong in manufacturing industries, ensure continued leadership while other regions are also investing in green growth

★Climate change impacts threaten future growth

- More frequent and severe extreme weather - floods, storms, heatwaves, droughts – impacts many sectors (agriculture, tourism, transport, health..)

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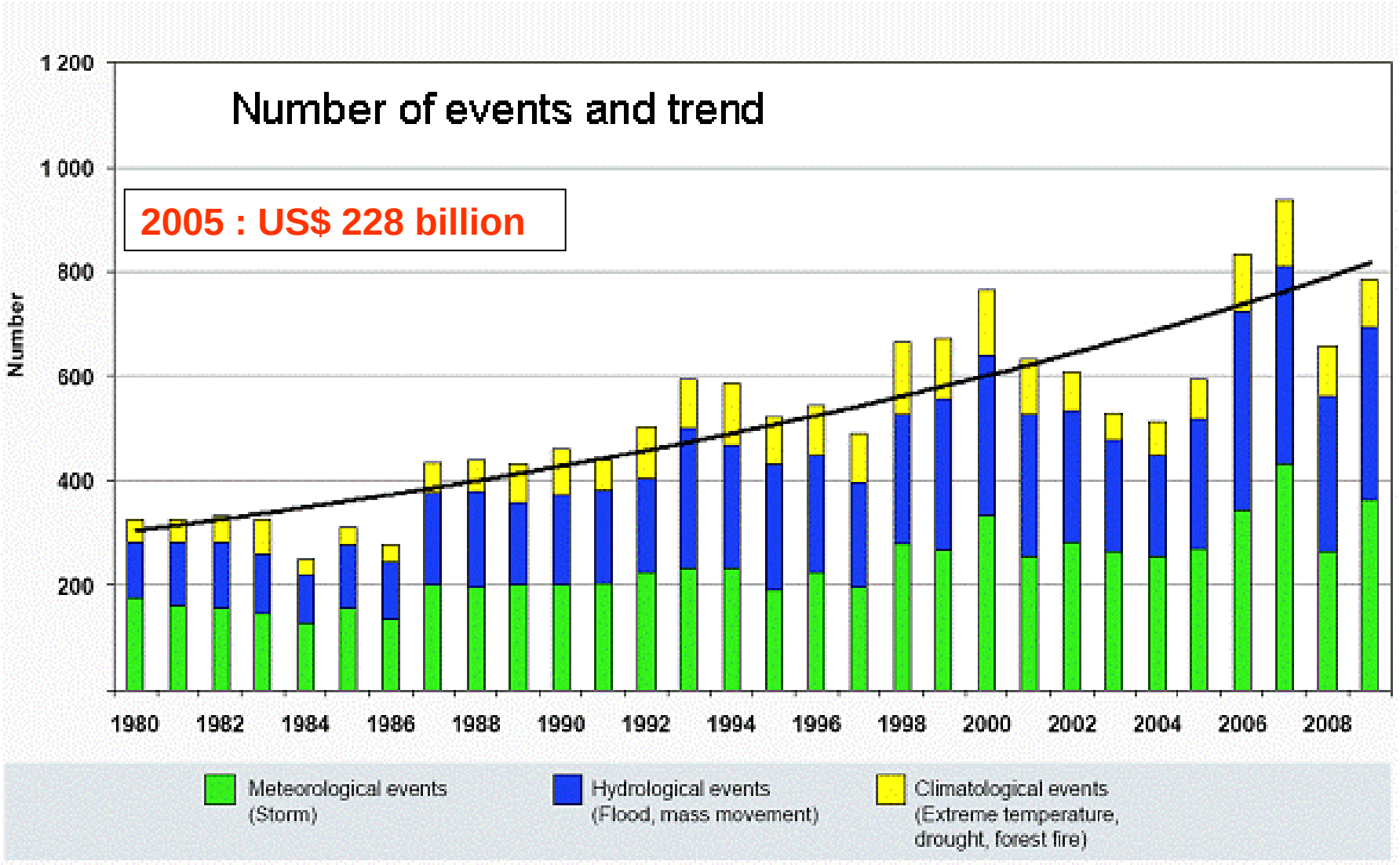
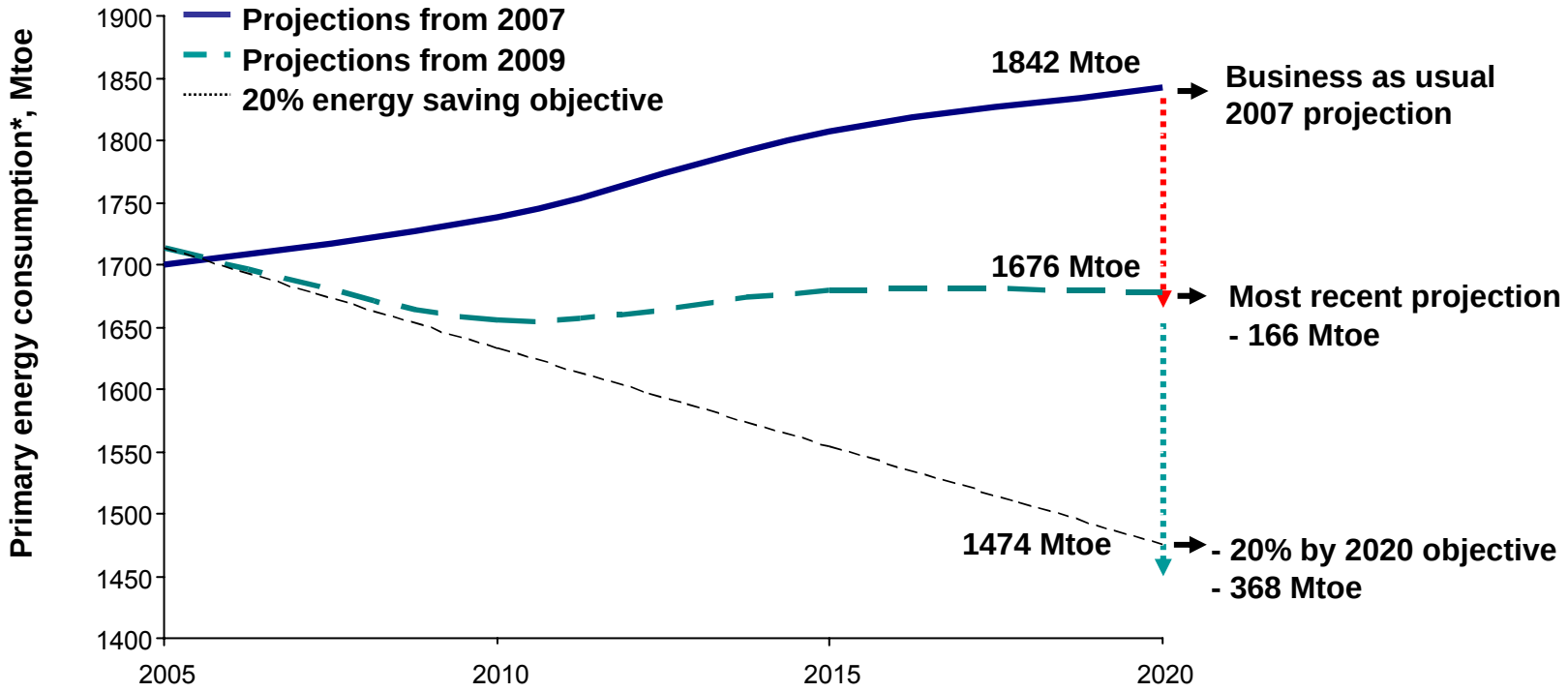
Climate change threatening future economic growth



What the EU is doing already: 2020 targets

- **Reduce GHG emissions by 20% (compared to 1990)**
  - EU Emissions Trading System reducing overall emissions from industrial installations (and aviation from 2012)
  - National emission targets cover other sectors: e.g. buildings, services, agriculture, transport (except aviation): -16 % in 2020 compared to 2005 level
- **Increase share of renewables in EU's energy mix to 20%**
  - National targets agreed: 14 % in 2020
- **Improve energy efficiency by 20% compared to business as usual projections**

Where the EU is not on track
Energy efficiency:



* Gross inland consumption minus non-energy uses

Additional efforts are needed to achieve the 20% energy efficiency improvement. Current policies will achieve only 10% savings

Climate Action — NEW! Energy Efficiency Plan

- **EU Heads of State on 4 Feb 2011 committed to**

  "Take determined action to tap the considerable potential for higher energy savings of buildings, transport and products and processes."

- **European Commission adopts new Energy Efficiency Plan with additional measures in order to reach 20% target by 2020**
  - Public sector to give the good example: binding targets for refurbishing public buildings + highest energy-efficiency criteria for public procurement
  - Industry: energy efficiency requirements for industrial equipment, energy audits, energy management systems
  - Improve efficiency of power and heat generation
  - Roll out smart power grids and smart meters

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A competitive low carbon roadmap until 2050

The Context: European Council Conclusions

- Science requires that global emissions are cut by -50% by 2050 compared to 1990
- EU objective of reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990, in the context of necessary reductions by developed countries
- Need for a **low carbon 2050 strategy** providing the framework for the longer term action
- Need to **fix intermediary stages** towards reaching the 2050 objective
- Need to **keep developments under review** on a regular basis

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2050 Roadmap

The first extensive global and EU analysis on how the long term target can be reached:

- ✓identifies cost-effective pathway, with intermediate milestones
- ✓identifies key technologies guiding R&D
- ✓identifies investments needs and benefits
- ✓identifies opportunities and trade-offs
- ✓guides EU, national and regional policies
- ✓gives direction to private sector and private households for long term investments

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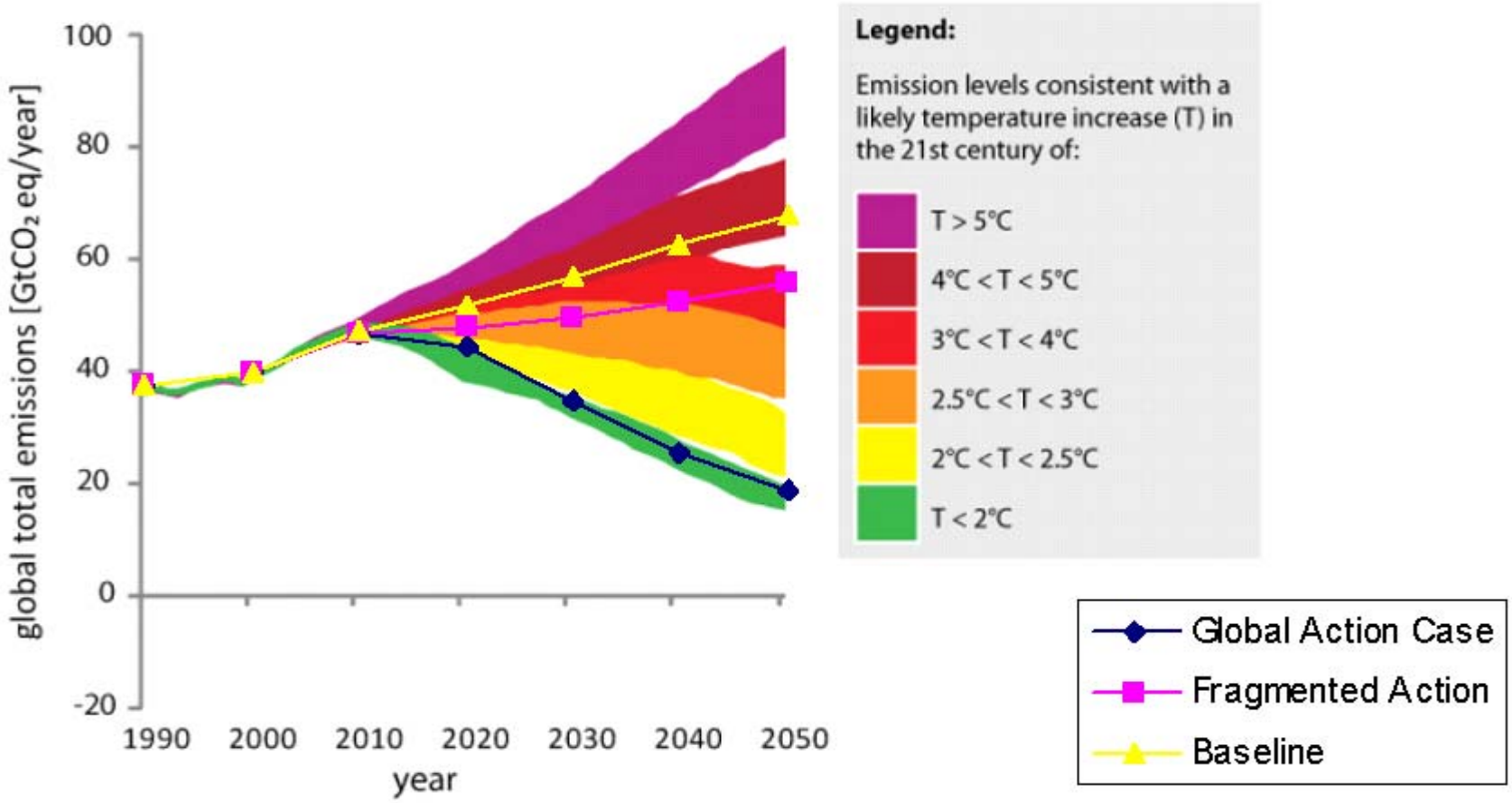
Global analysis

The impact of climate action on the global temperature increase by 2100

Global emissions pathway in the next 40 years will determine likely warming by the end of the century



Global climate action reduces emissions in all parts of the world

<u>EU objective:</u> 80 to 95% reductions largely through domestic measures:

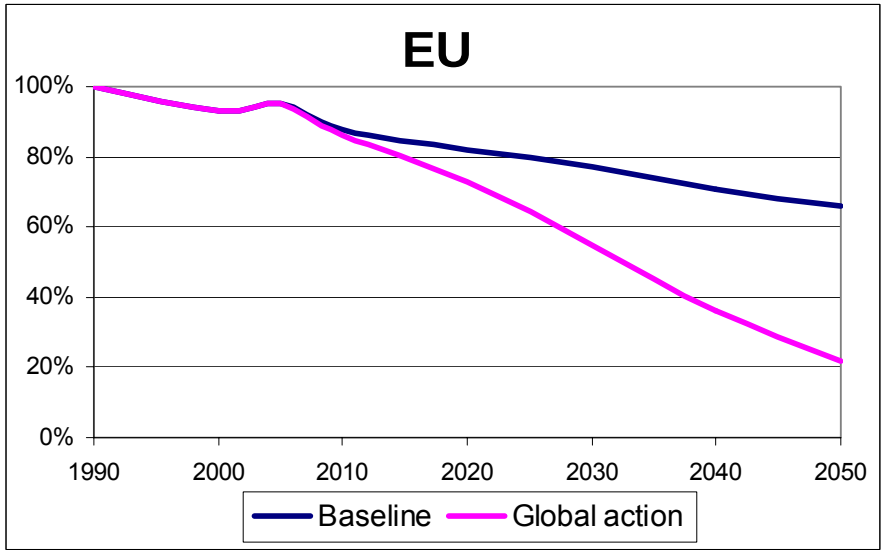
- around -80% internal reductions in 2050 compared to 1990

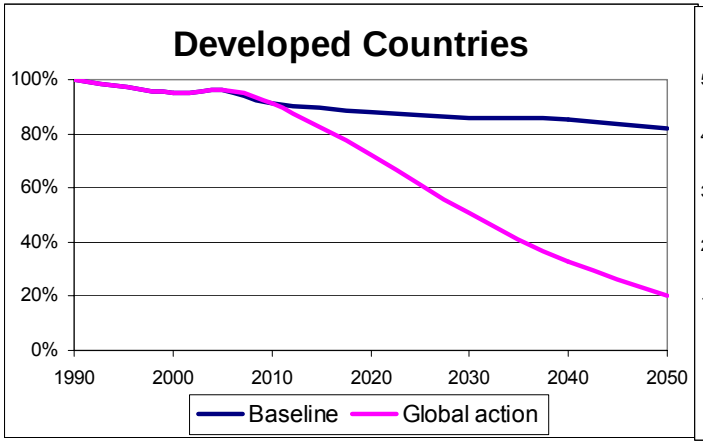
<u>Developed Countries</u>:

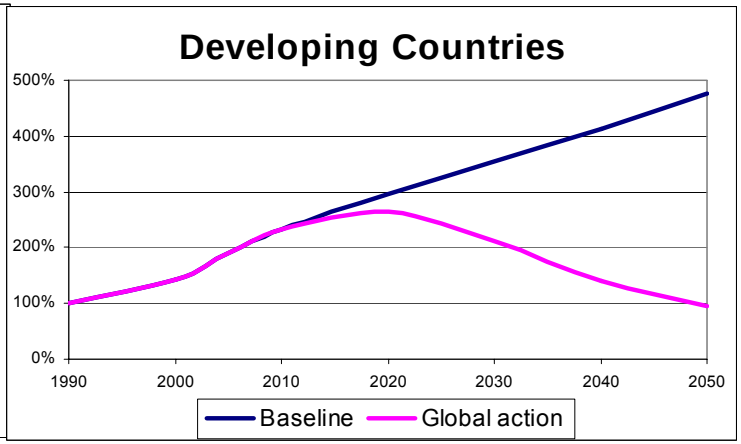
- similar effort

<u>Developing Countries</u>:

- -5% compared to 1990
- Equivalent to -80% compared to business as usual
- no cheap offsets by 2050







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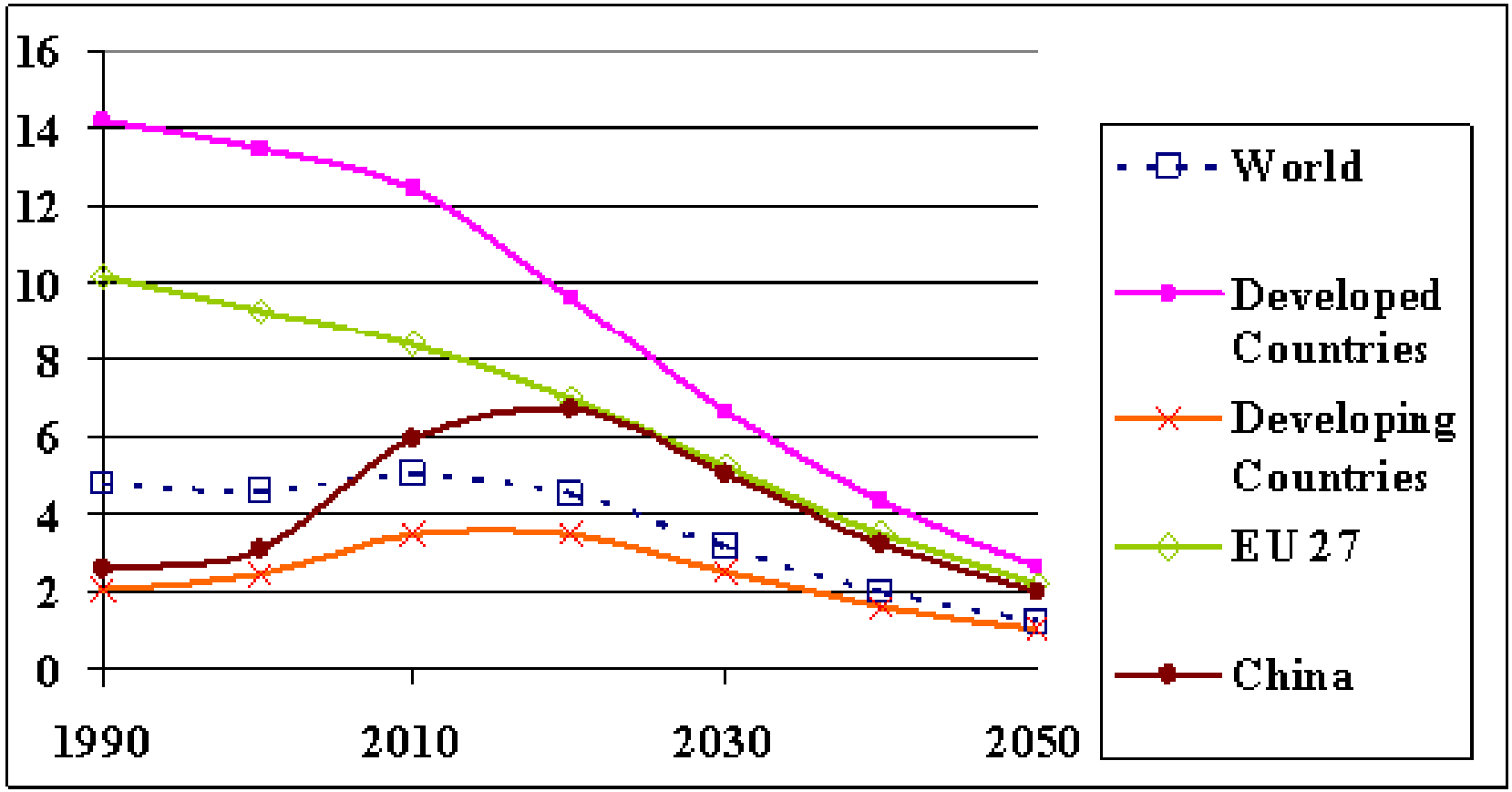
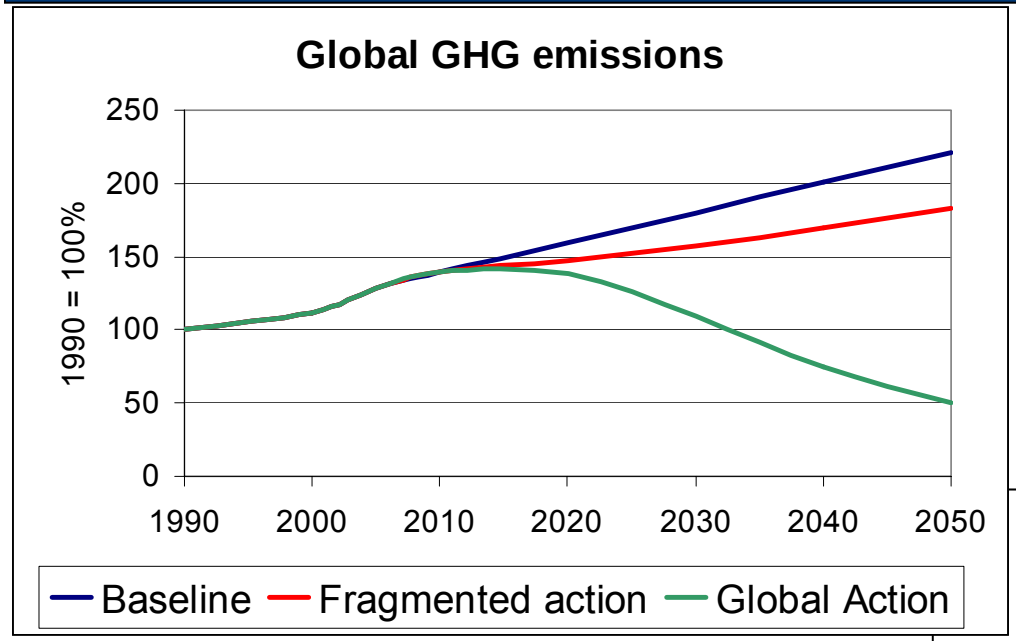
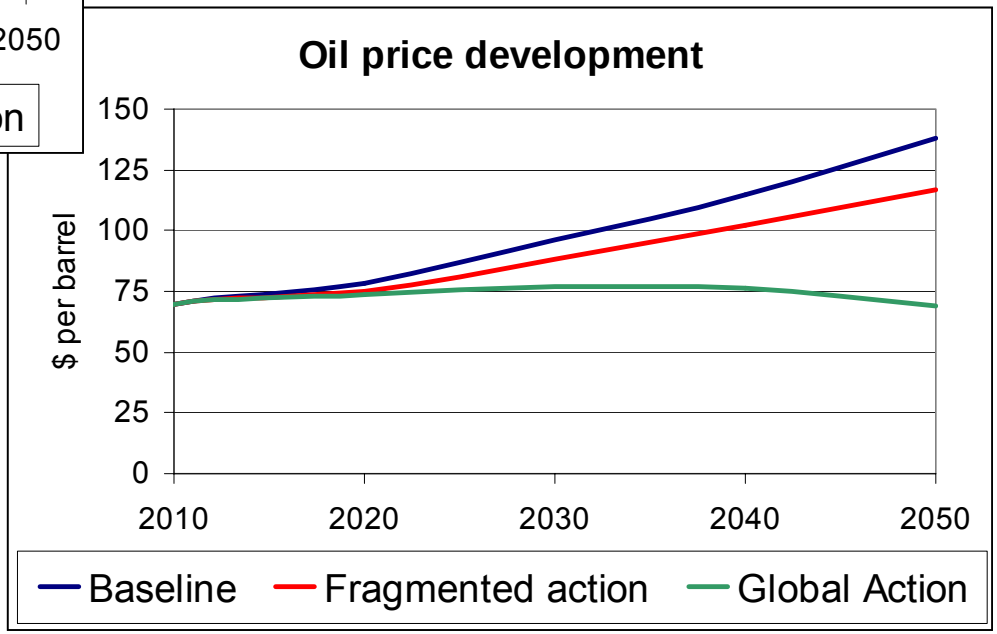
Global climate action leads to converging emissions per capita



Global climate action reduces fossil fuel prices





Forestry and agriculture need to be part of the solution

- **Land use challenges**
  - Feed 9 billion people in 2050 (1/3 more than today)
  - Stop deforestation and preserve bio-diversity
  - Increase production for bio-energy
  - Contribute to GHG reductions

- **Solutions**
  - Sustainable intensification of agricultural production
  - Resource efficient land use & consumption essential (food, feed, fiber, bio-energy)

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EU analysis

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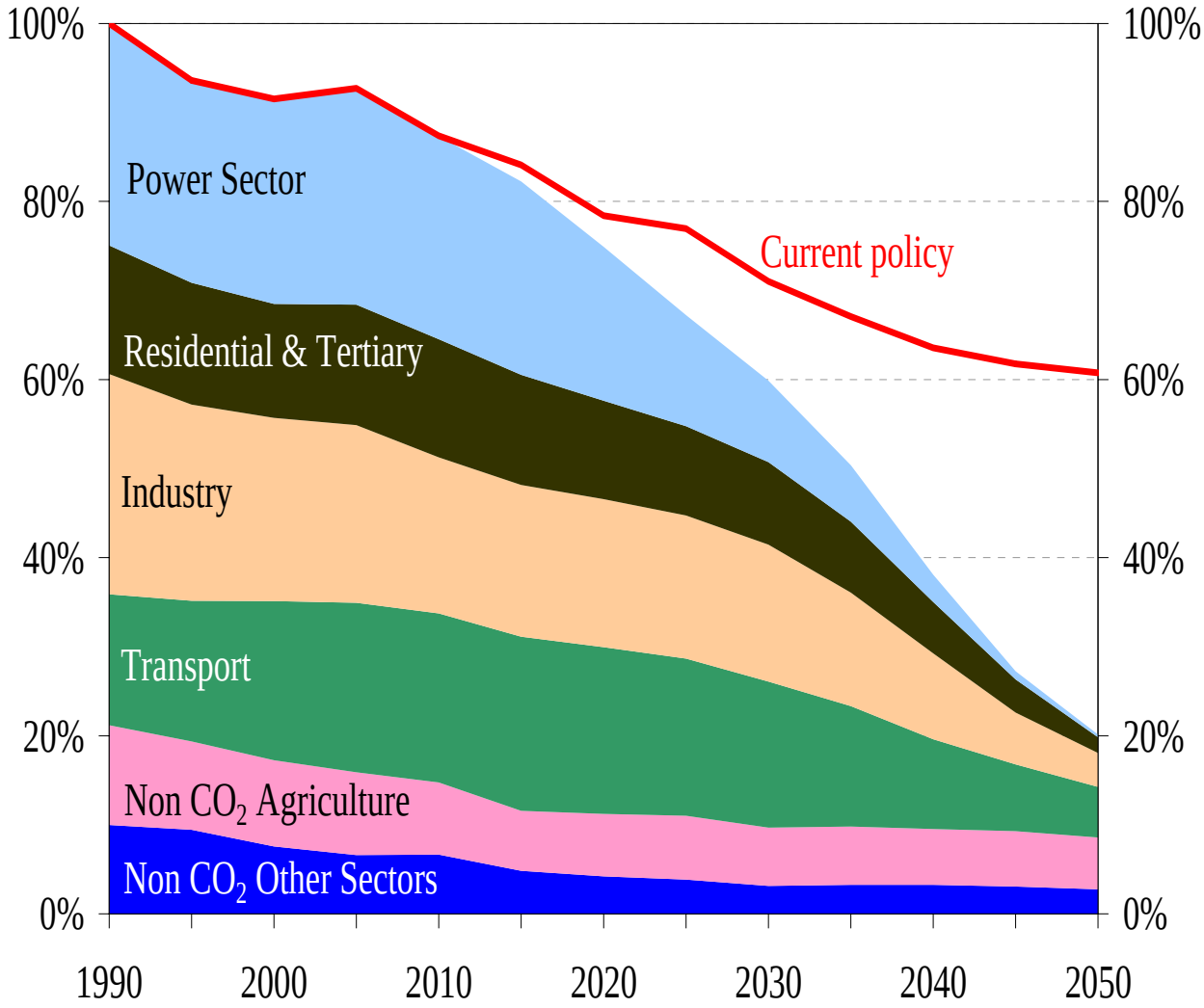
A cost-efficient pathway towards 2050

80% domestic reduction in 2050 is feasible

- with currently available technologies,
- with behavioural change only induced through prices
- If all economic sectors contribute to a varying degree & pace.

Efficient pathway:

-25% in 2020
-40% in 2030
-60% in 2040



Energy Efficiency will be key

- **Energy efficiency is the single most important contribution, especially until 2020**
  - Current policies only result in 10% energy efficiency improvement
  - roadmap confirms key role of efficiency up to 2020 and beyond
  - **efforts towards 20% efficiency target would deliver 25% GHG reduction**
  - ETS is one instrument to deliver additional efficiency

Roadmap 2050: Investing in the EU economy

- **Additional domestic investment: € 270 billion annually during 2010-2050, equivalent to 1.5% of GDP** (Total investment = 19% of GDP in 2009)**, of which**
  - built environment (buildings and appliances): € 75 bn
  - transport (vehicles and infrastructure): € 150 bn
  - power (electricity generation, grid): € 30 bn

Note:

- **Investment in the EU economy and EU jobs, not cost**
- **delaying action increases overall investment requirements**
- **R&D and early demonstration/deployment crucial**

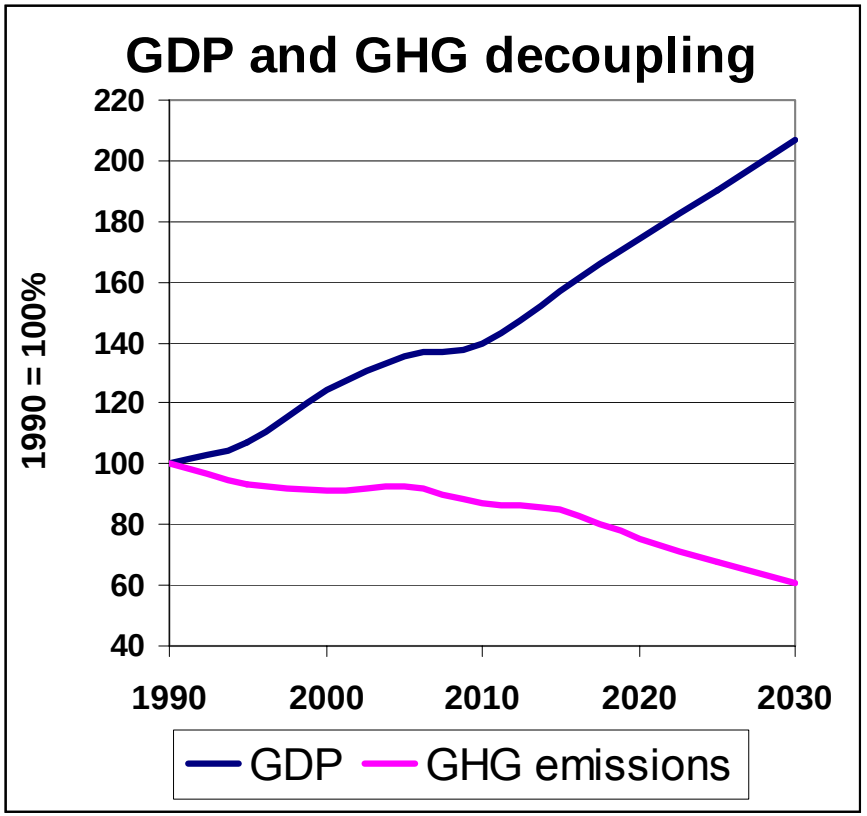
Roadmap 2050: Benefits for EU energy security and air quality

- **Fuel savings: € 175 to 320 billion on average annually during 2010-2050** (compared to € 270 billion investments)
- **Primary energy consumption about 30% below 2005 without negatively affecting energy services**
- **Making EU economy more energy secure:**
  - Halves imports of oil and gas compared to today
  - Saving € 400 billion of EU oil and gas import bill in 2050, equivalent to > 3% of today's GDP
  - Safeguard against macro-economic impacts of future energy price hikes
- **Air quality and health benefits: € 27 billion in 2030 and € 88 billion in 2050**

Roadmap 2050: Benefits for EU economic growth

★ Significant increase in domestic investment

- Shift from fuel costs to investment expenditure → money stays in the EU
- Innovation in key growth sectors crucial for future competitiveness
- GDP growth decoupled from GHG emissions also after 2020
- GDP more secure from energy price shocks



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Roadmap 2050: Benefits for EU jobs

★ Sources of new jobs

- Short term: e.g. in renovation of buildings, production of insulation materials, renewables industry
- Potential **net job creation** up to 1.5 million by 2020
- Use auctioning revenues from EU emissions trading system and tax revenues for reduction of labour costs and increase in investments and R&D
- Long term job prospects depend on favourable economic framework conditions, e.g. expenditure on research & technology development, innovation, entrepreneurship, new skills, investment

Roadmaps of international competitors

- **Several emerging economies (e.g. Korea, China, Brasil, India) develop low emission and green growth strategies**
- **Main drivers: innovation, leading in new growth sectors, energy security & resource efficiency, clean air**
- **For example: China's draft 12th 5-Year Plan (2011-2015):**
  - increase carbon and energy intensity targets
  - pilot emission trading systems
  - develop low carbon zones
  - invest 5 trillion yuan (€ 570 billion) in new energy
  - increase renewable energy by 65% by 2015
  - invest 100 billion yuan (€11.5 billion) in alternative vehicles

Policy challenges and future work (1)

- **Implement Strategic Energy Technology Plan (€ 50 billion from 2014-2020)**
- **Develop innovative financing instruments to use limited public finance to leverage private sector investments in the next EU budget, e.g. in cohesion policy**
- **Use Common Agricultural Policy to contribute to further emission reductions and increased absorption of natural sinks, taking into account the increased demand for agricultural and forestry products including for bio-energy**

Policy challenges and future work (2)

- **Ensure the achievement of 20% energy efficiency target by 2020, and in this context use the role of the emissions trading system**
- **Give clarity for long term investments, especially in ETS sectors**
  - Define 2020 - 2030 policy framework
  - upward review of 1.74% linear reduction to be considered to achieve -80% GHG emissions by 2050
  - measures to protect vulnerable industries against carbon leakage in the case of fragmented action

Next steps

- ★ Present Roadmap 2050 to the European Council, European Parliament and others
- ★ Discuss in the Informal Environment Council, Budapest, March 26, 2011 and conclude the debate with Member States in June 2011
- ★ Prepare sectoral roadmaps: Transport White Paper (end March), 2050 Energy Roadmap (autumn 2011), industry-specific initiatives
- ★ Member States to develop long-term national and regional low emission development strategies
- ★ Present Roadmap 2050 to international partners in order to reinvigorate international negotiations in the run-up to Durban

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For further information:

http://ec.europa.eu/clima/policies/brief/eu/index_en.htm

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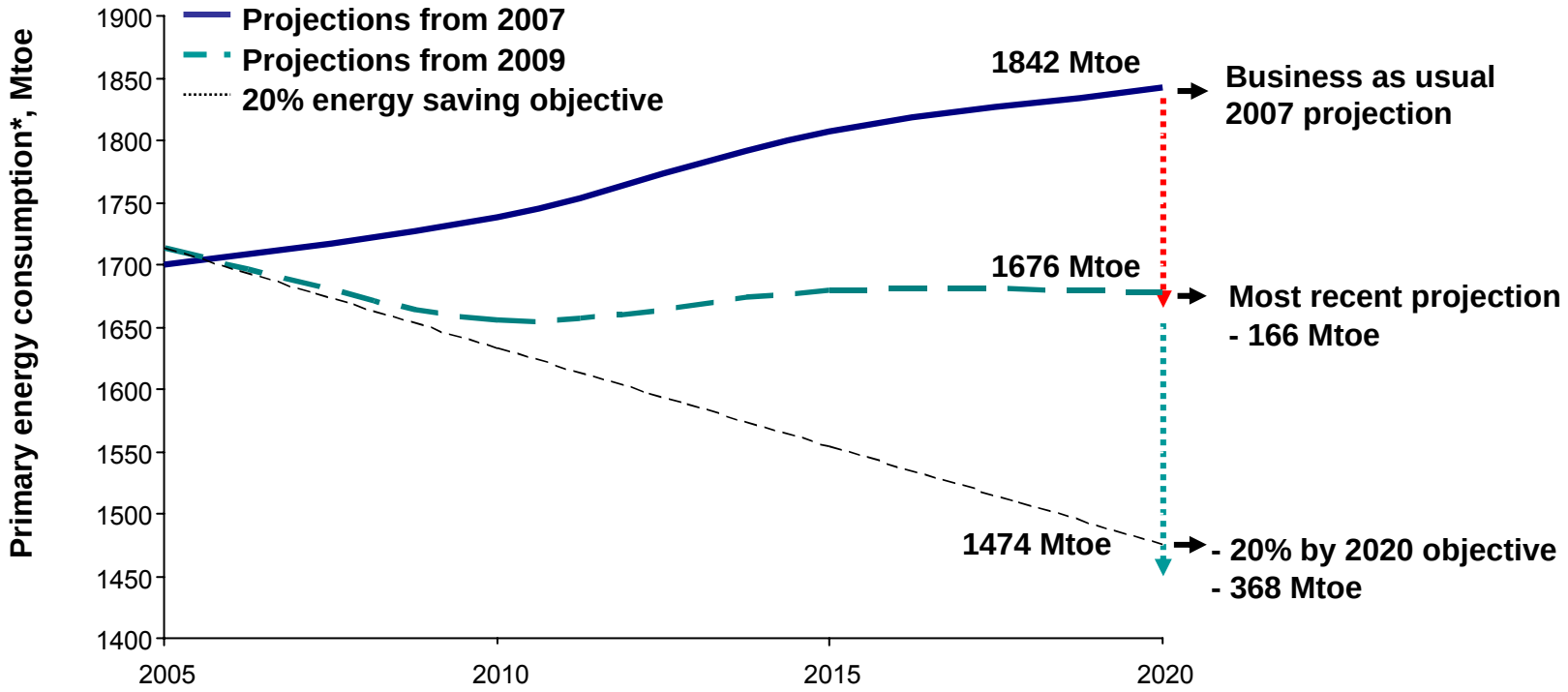
Energy efficiency
EU not on track



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Roadmap Milestones

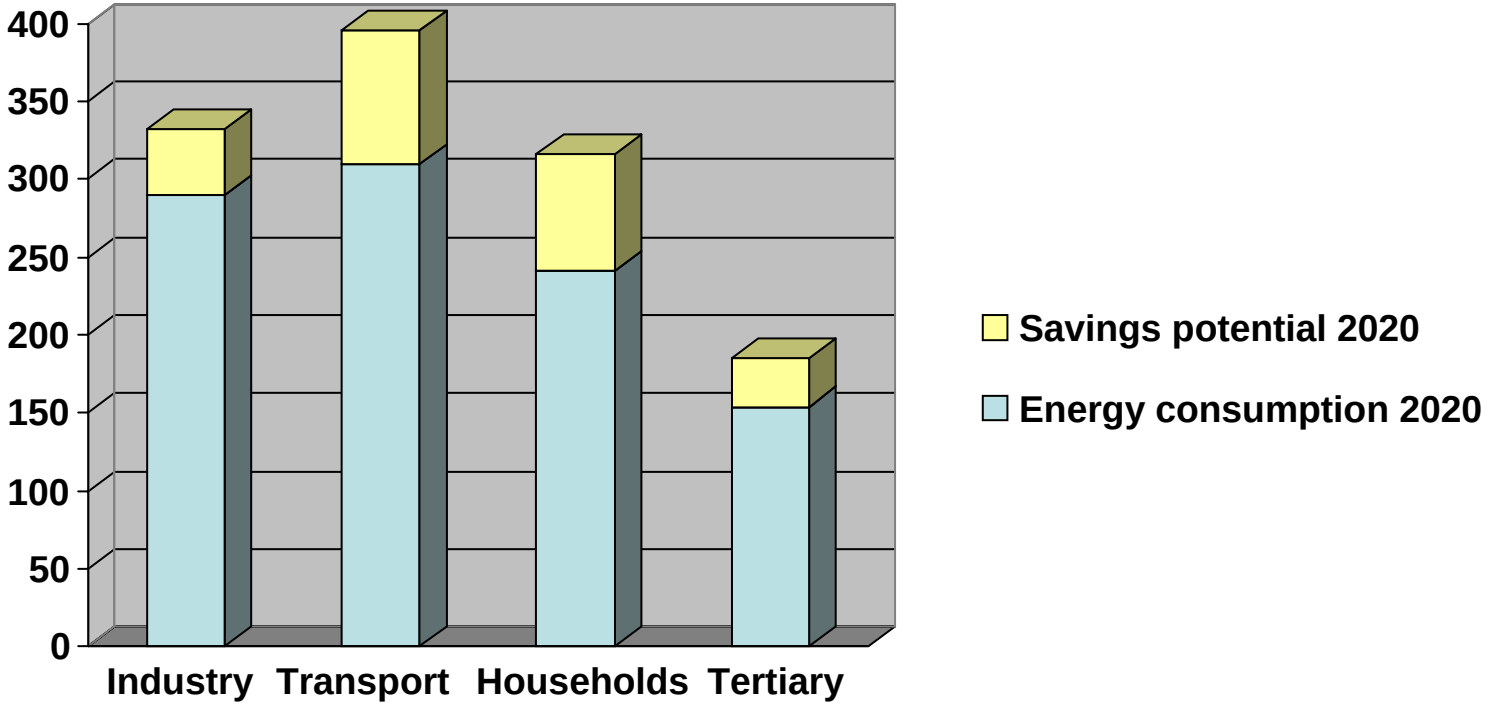
- **Not about targets, but identifying cost-efficient trajectory**
- **Gradual emission reductions:**
  - -1.0% per year 2010-2020 vs 1990
  - -1.5% per year 2020-2030 vs 1990
  - -2.0% per year 2030-2050 vs 1990
- **Sectoral milestones: all sectors contribute in different manner**

GHG reductions compared to 1990	2005	2030	2050
Power (CO_2)	-7%	-54 to -68%	-93 to -99%
Industry (CO_2)	-20%	-34 to -40%	-83 to -87%
Transport (incl. CO2 aviation, excl. maritime)	+30%	+20 to -9%	-54 to -67%
Residential and services (CO_2)	-12%	-37 to -53%	-88 to-91%
Agriculture (non-CO_2)	-20%	-36 to -37%	-42 to -49%
Other non-CO_2 emissions	-30%	-72 to -73%	-70 to -78%

Energy security: current risks (IEA)

- **Demand: rising fast in emerging economies**
- **Supply: conventional oil production to flatten out, North Sea production to decrease**
- **New supply to come largely from OPEC countries**
- **Short term:**
  - oil imports represent 2.1% of EU GDP
  - oil import bill increased US $70 billion from 2009-2010
- **Longer term trends and risks**
  - import dependency set to increase
  - further price increases
  - related macro-economic risks related to inflation, trade balance, competitiveness

Energy savings contribute to climate action



- ✓ 20% energy efficiency target helps to achieve a 25% reduction in GHG emissions by 2020
- ✓ Extra measures in Energy efficiency plan.
- ✓ EU ETS can contribute to higher energy savings