The Energy and Climate Change Challenge: The IEA and the Gleneagles Mandate

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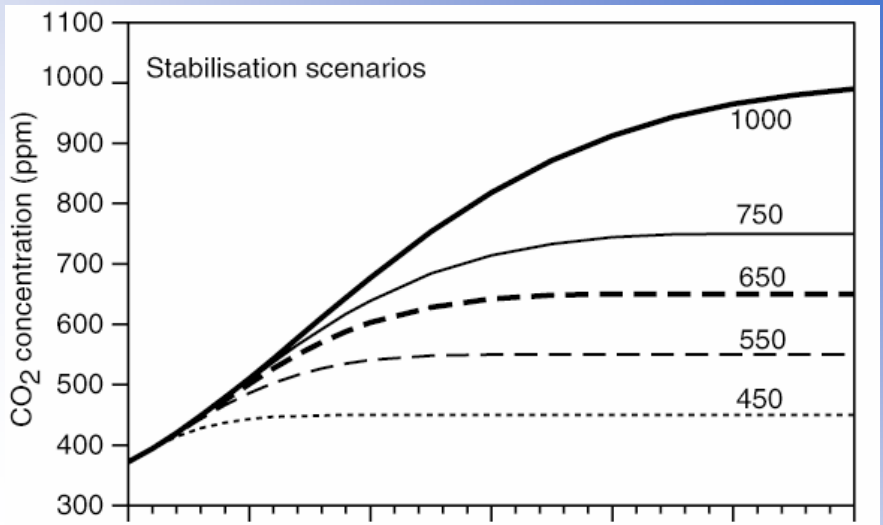
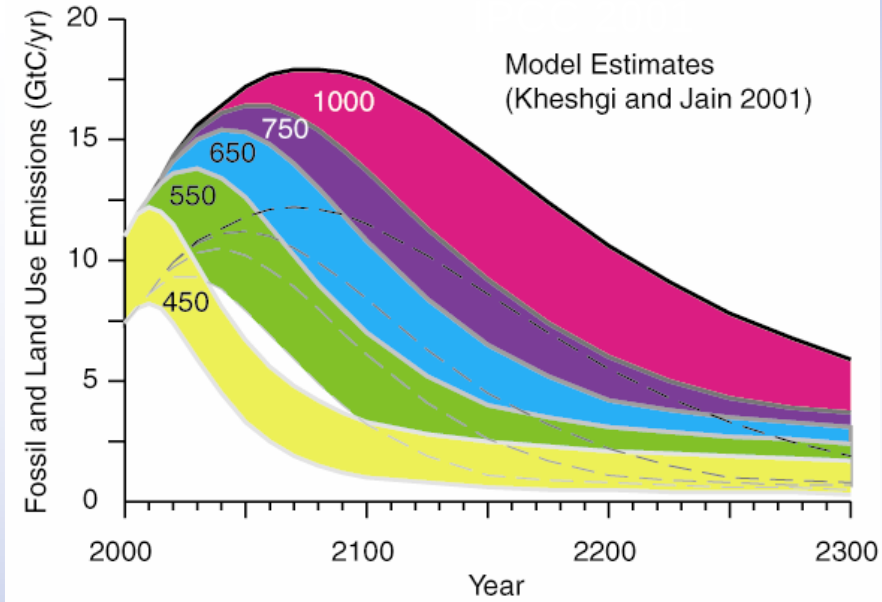
LONG-TERM MITIGATION OBJECTIVE

CO_2 emissions must approach zero for all stabilization levels, even for 1000ppm which is nearly 3 times current concentrations.

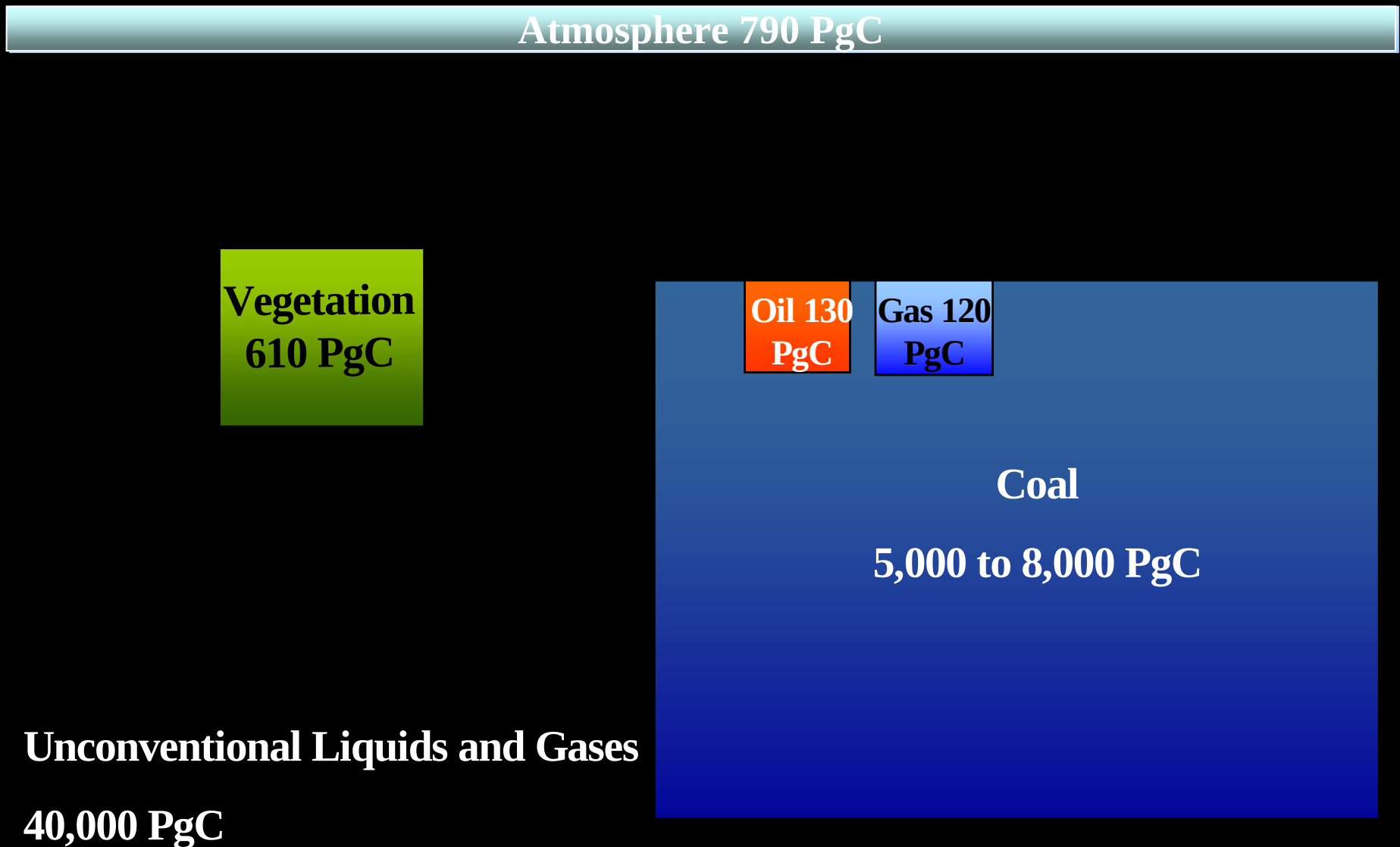




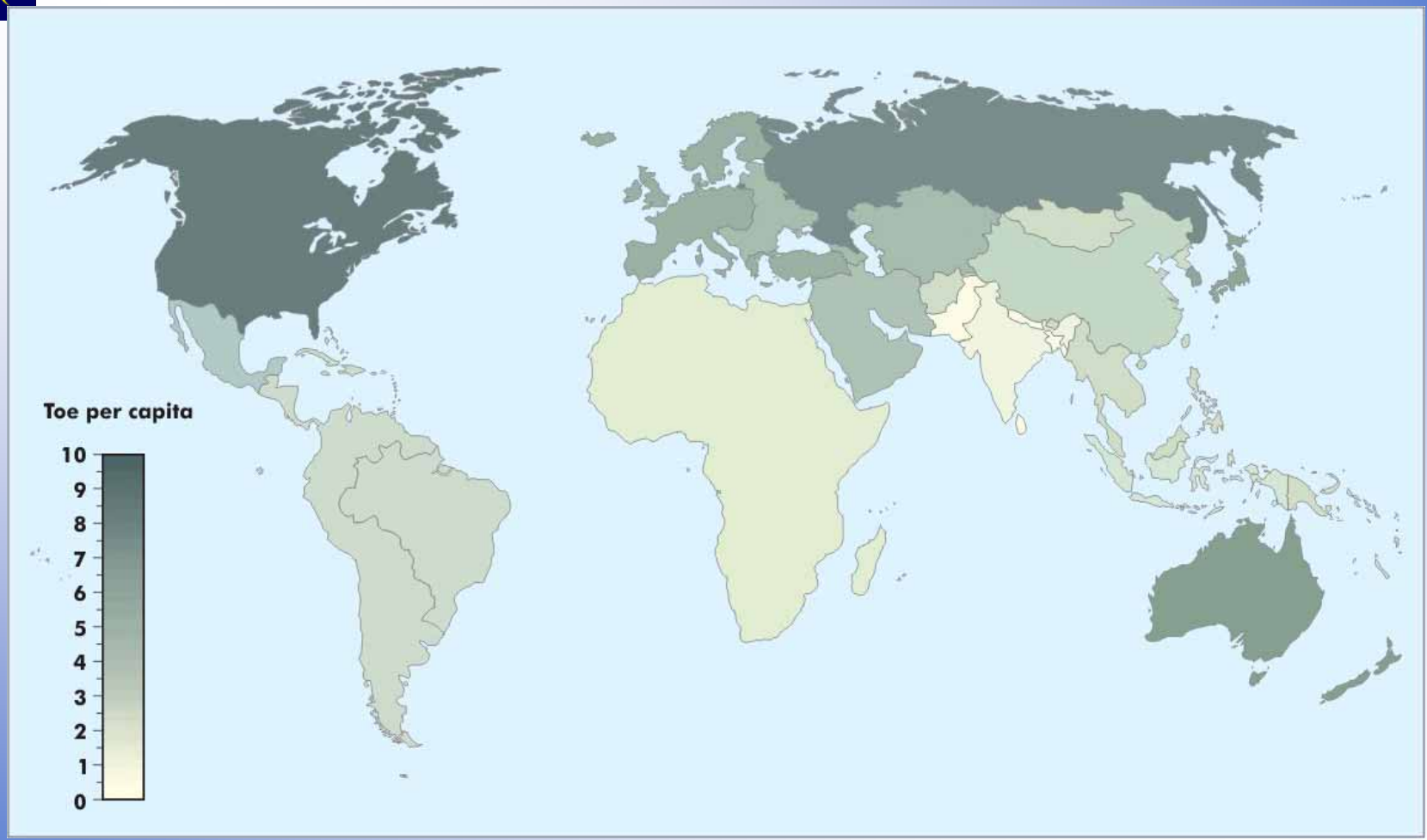
Source: Adapted from
Haroon S. Kheshgi

Realities that need influence policy choices.

FOSSIL FUEL RESOURCES



Per Capita Primary Energy Use, 2030

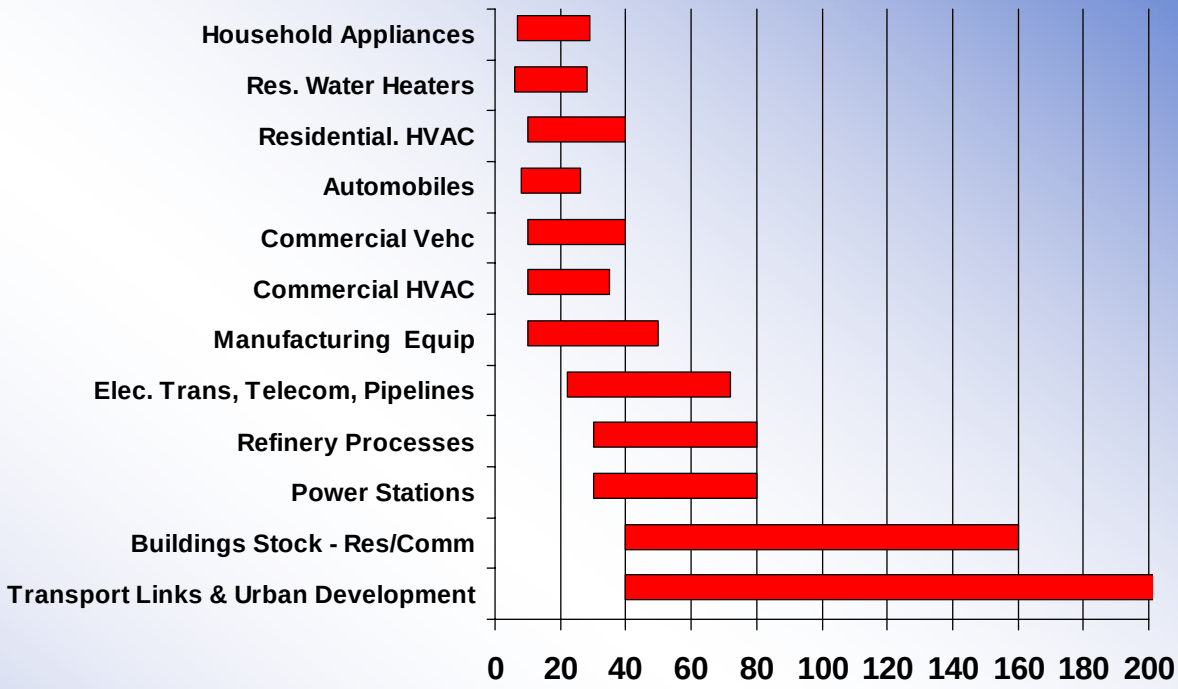


Per capita energy use remains much lower in developing countries

Mitigation Policy & Technology

Capital Stock Turnover Rates

- Capital stock turnover—*You don't kill the "cash cow." Thus, the margin for learning is the new capital stock market.*
- Increasing marginal cost of rapid deployment.

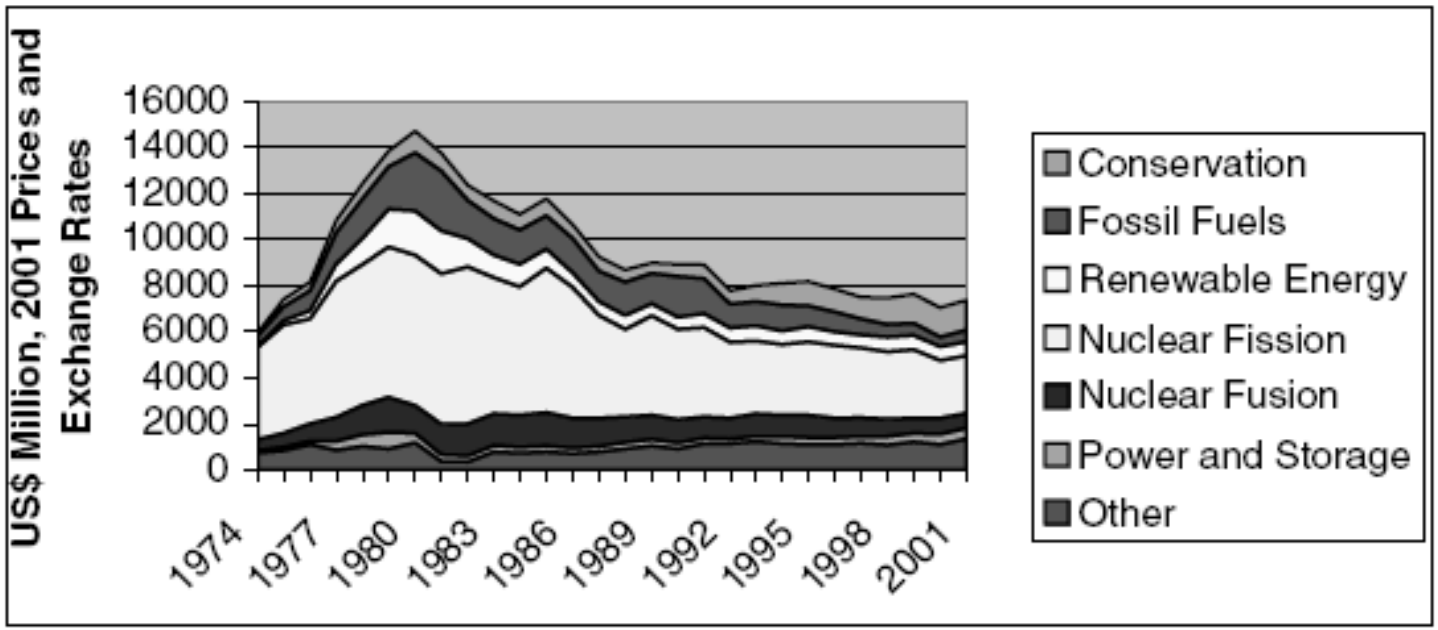


Early market signals and technology R&D can work together to assist the market transition – Policies and R&D are inseparable!

Source: Adapted from PNL/U of Maryland

Gov't Energy R&D Budgets

IEA Government R&D Budgets: 1974-2001



Source: Data reported to the IEA by IEA Member countries

Private energy R&D 0.1 to 0.6% of electricity sales in OECD countries vs 3.1% industry on average (source: Battelle)

The Technology Challenge

Stabilising Greenhouse Gas Concentrations in the Atmosphere

No single technology or policy can do it all

Different

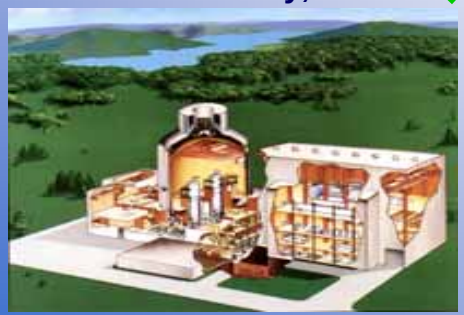
- regions
- markets
- scale-up requirements
- infrastructures
- resources
- preferences
- technology timing

Vehicles: Efficiency, Bio-fuels, Hydrogen Fuel Cells

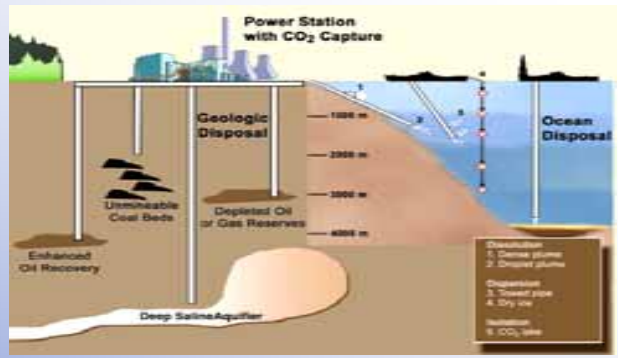
Renewable Energy Technologies

Zero Net Emission Bldgs., Industrial Efficiency, CHP

Bio-Fuels and Power



Nuclear Power Generation IV

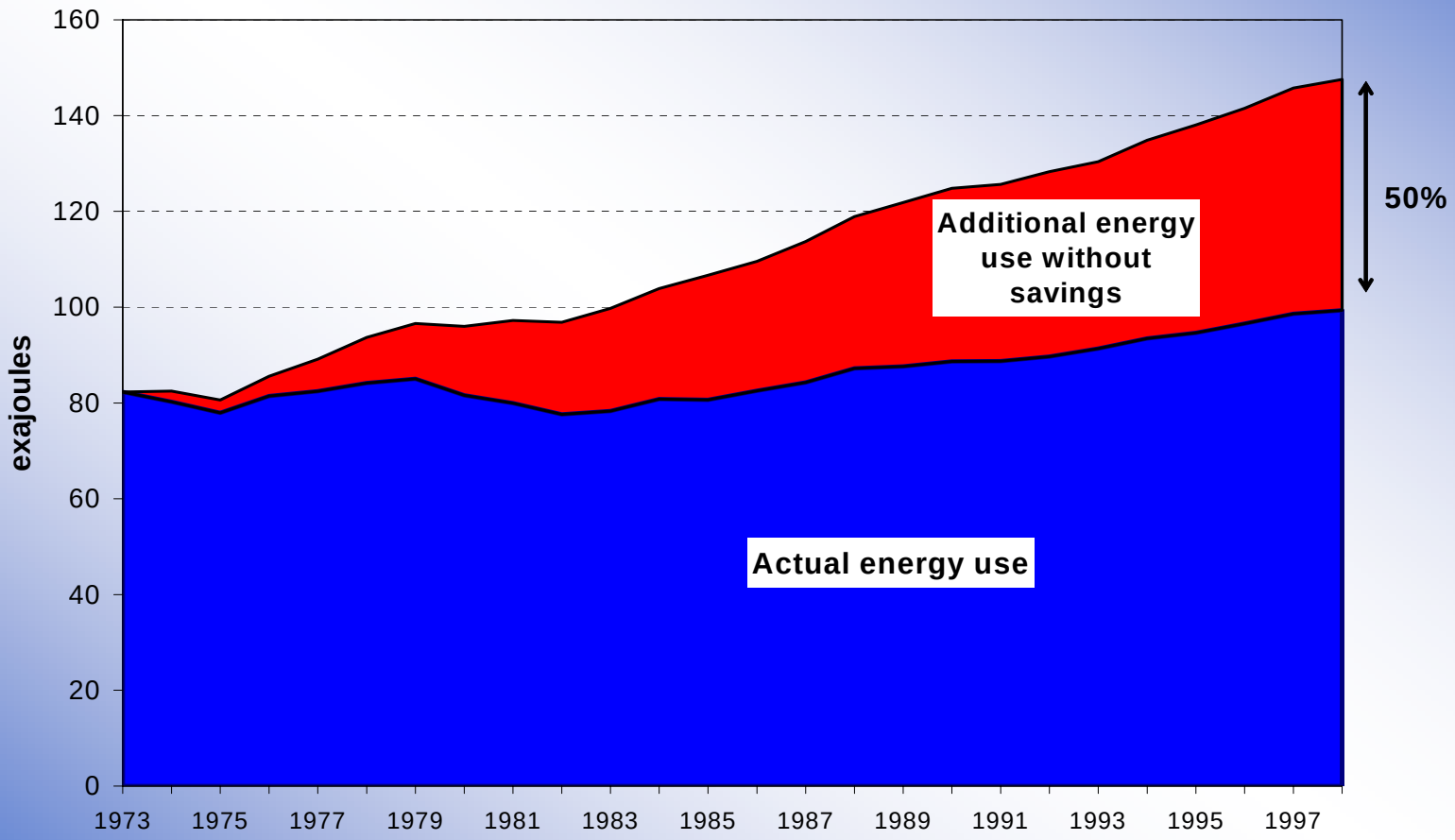


Carbon (CO_2) Sequestration

Advanced Power Grids

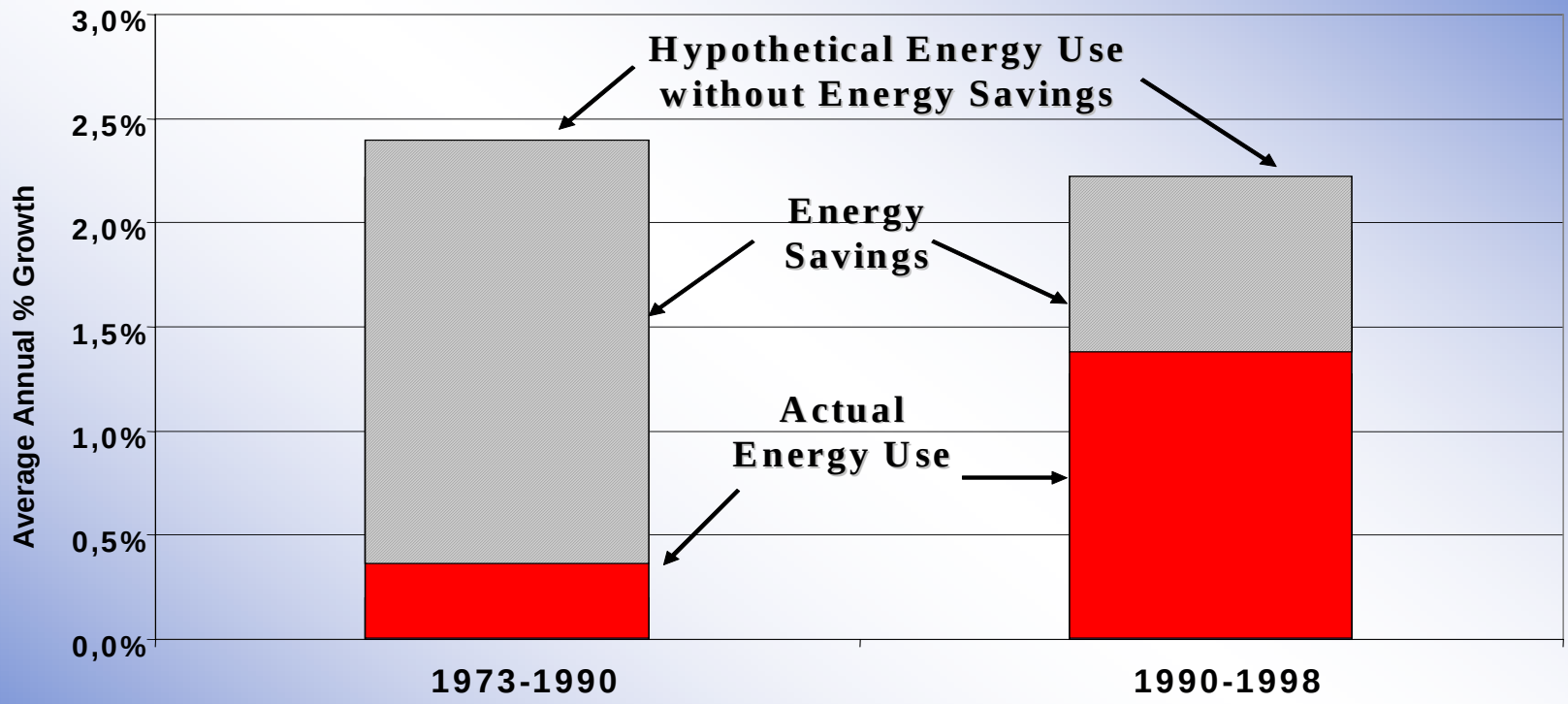
What has energy efficiency ever done for us?

Energy Demand and Savings
IEA -11



Without energy savings achieved since 1973 energy demand in 1998 would have been 50% higher

IEA-11 Energy Use
Impact of Energy Savings

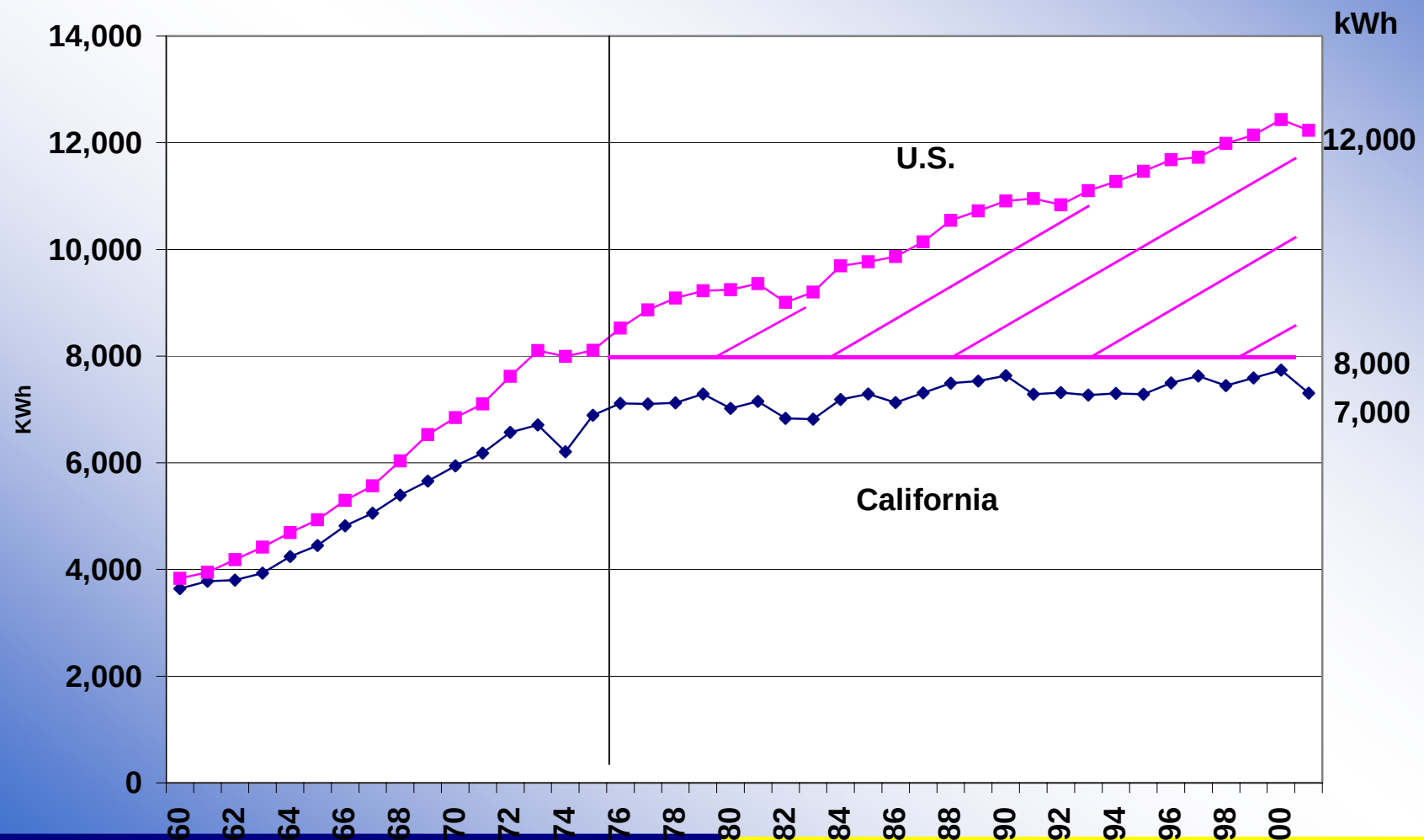


Rates of energy savings have slowed significantly after 1990, leading to rapid demand growth

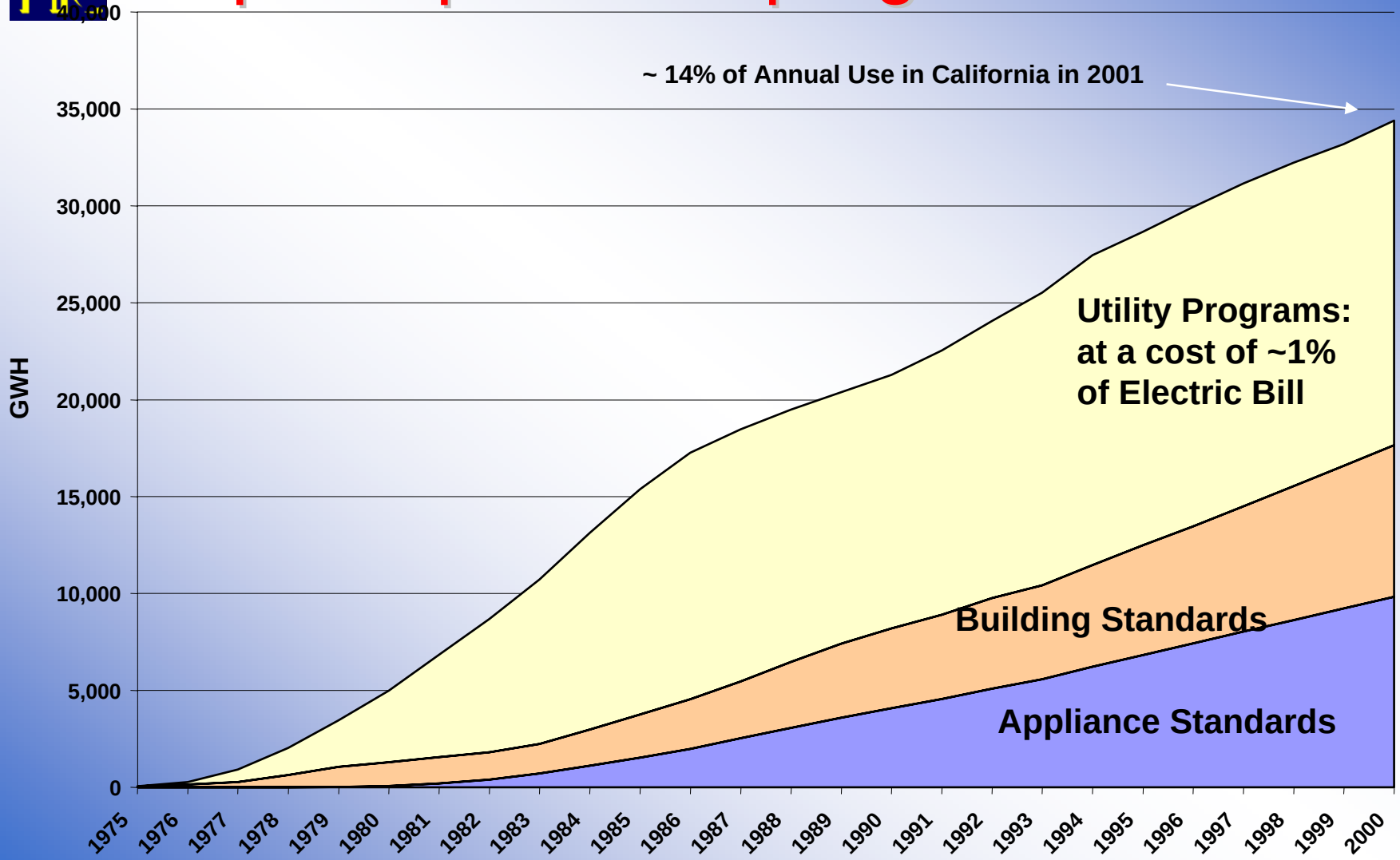
What have we been doing for energy efficiency?

Do Policies Really Work?

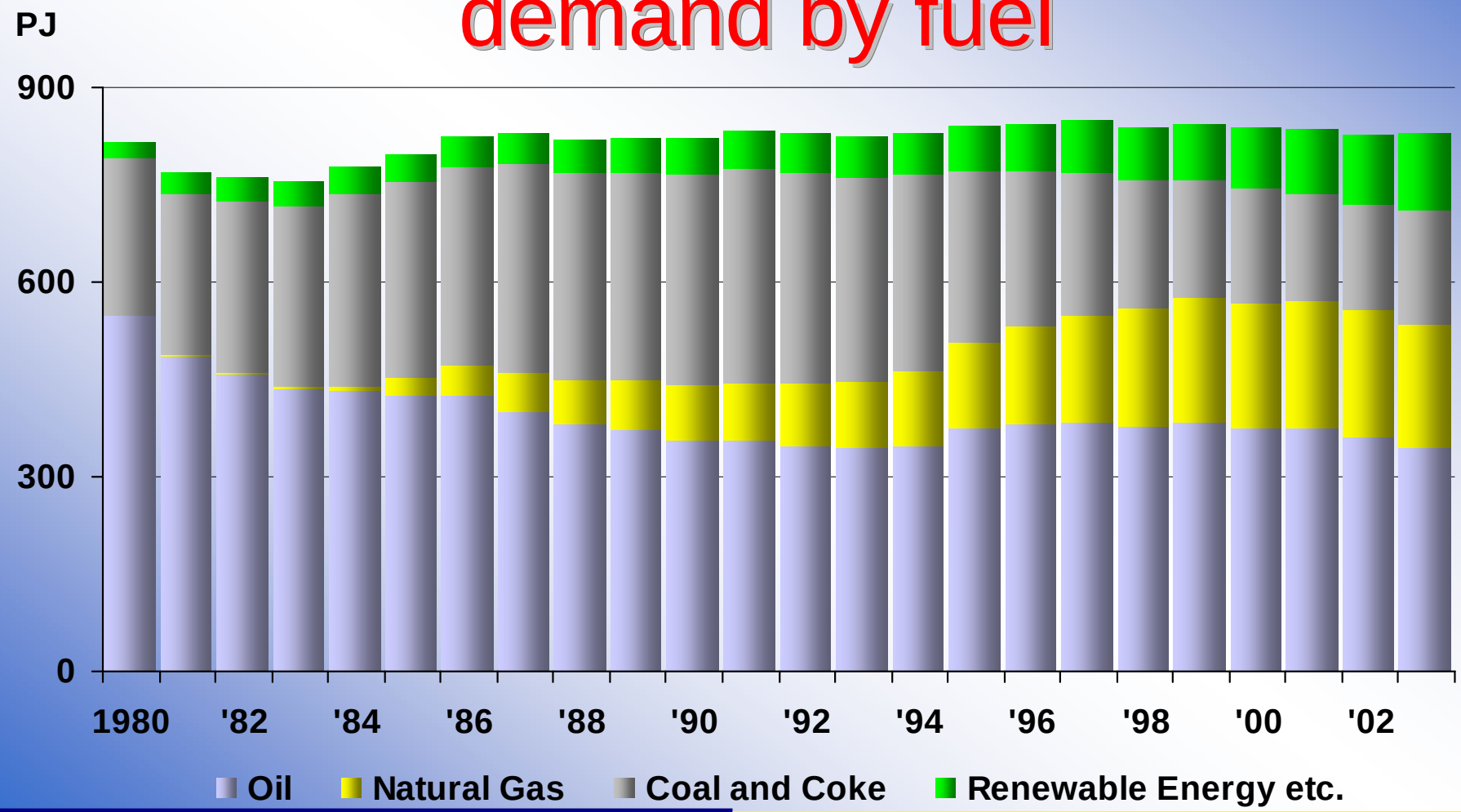
Impacts: US vs. CA electricity use



Impacts pre-2001 programmes in CA

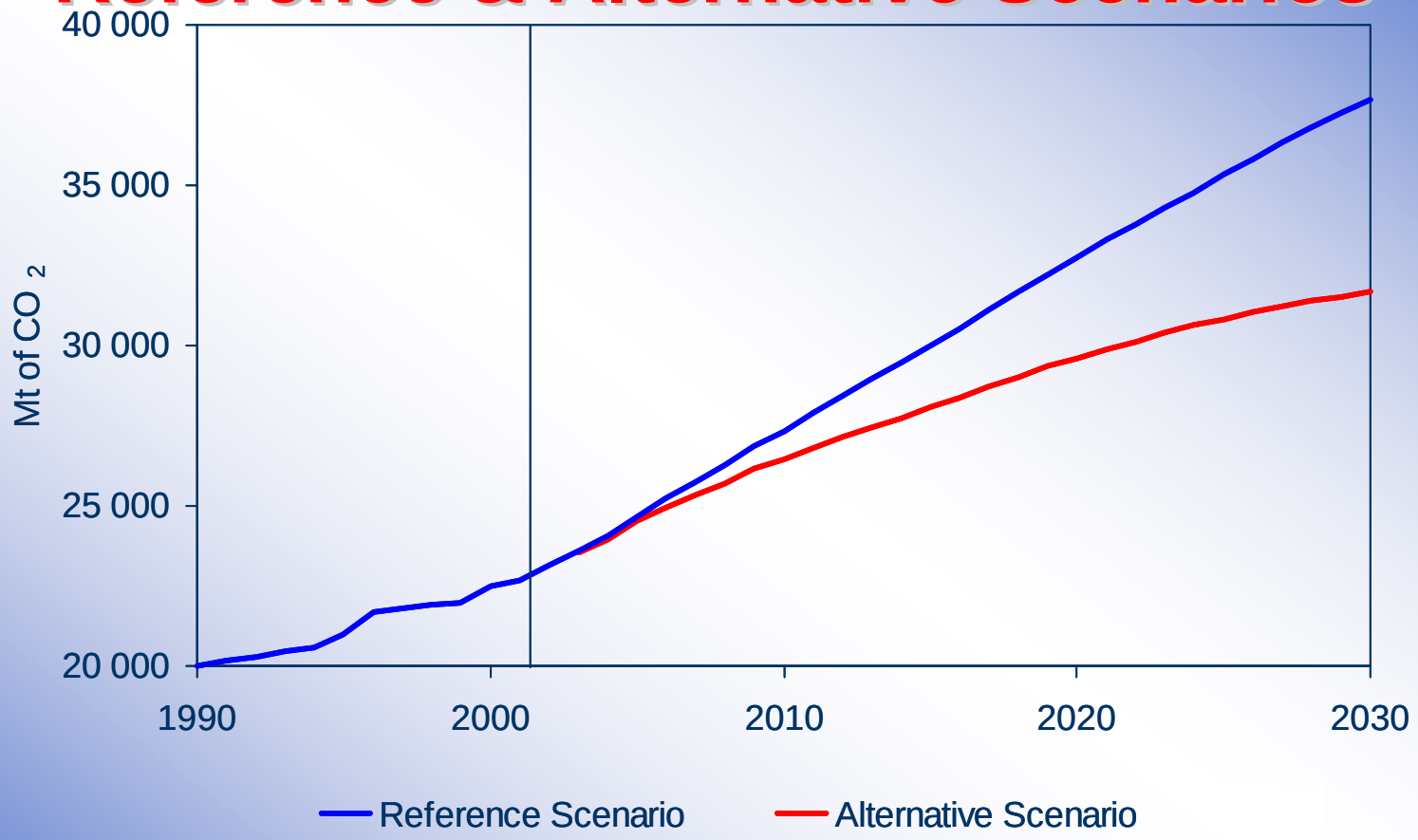


Denmark: gross energy demand by fuel



What more could energy efficiency do for us?

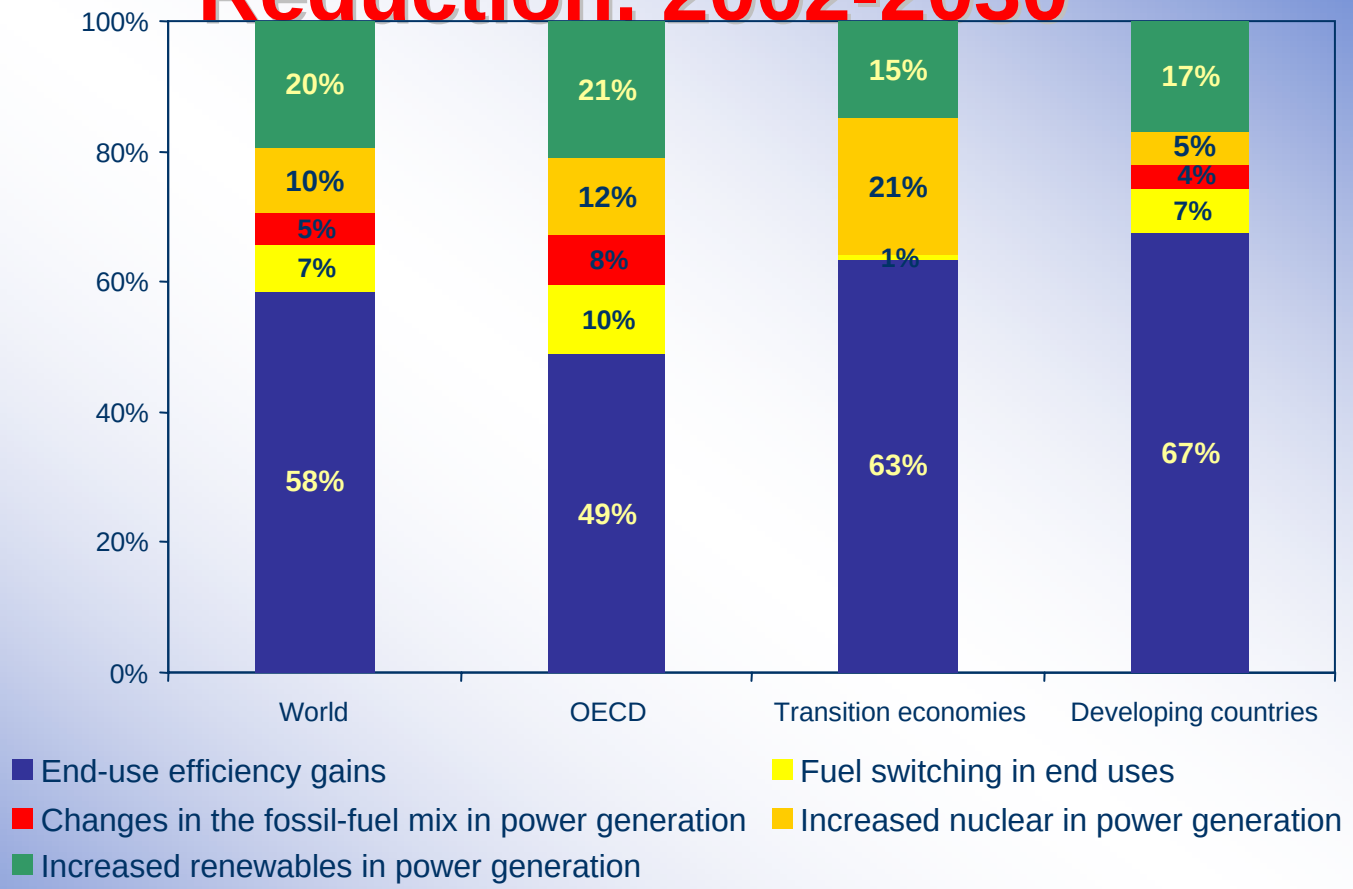
Global CO2 Emissions in the Reference & Alternative Scenarios



CO_2 emissions are 16 % less in the Alternative scenario in 2030, a reduction of about 6 Gt of CO_2

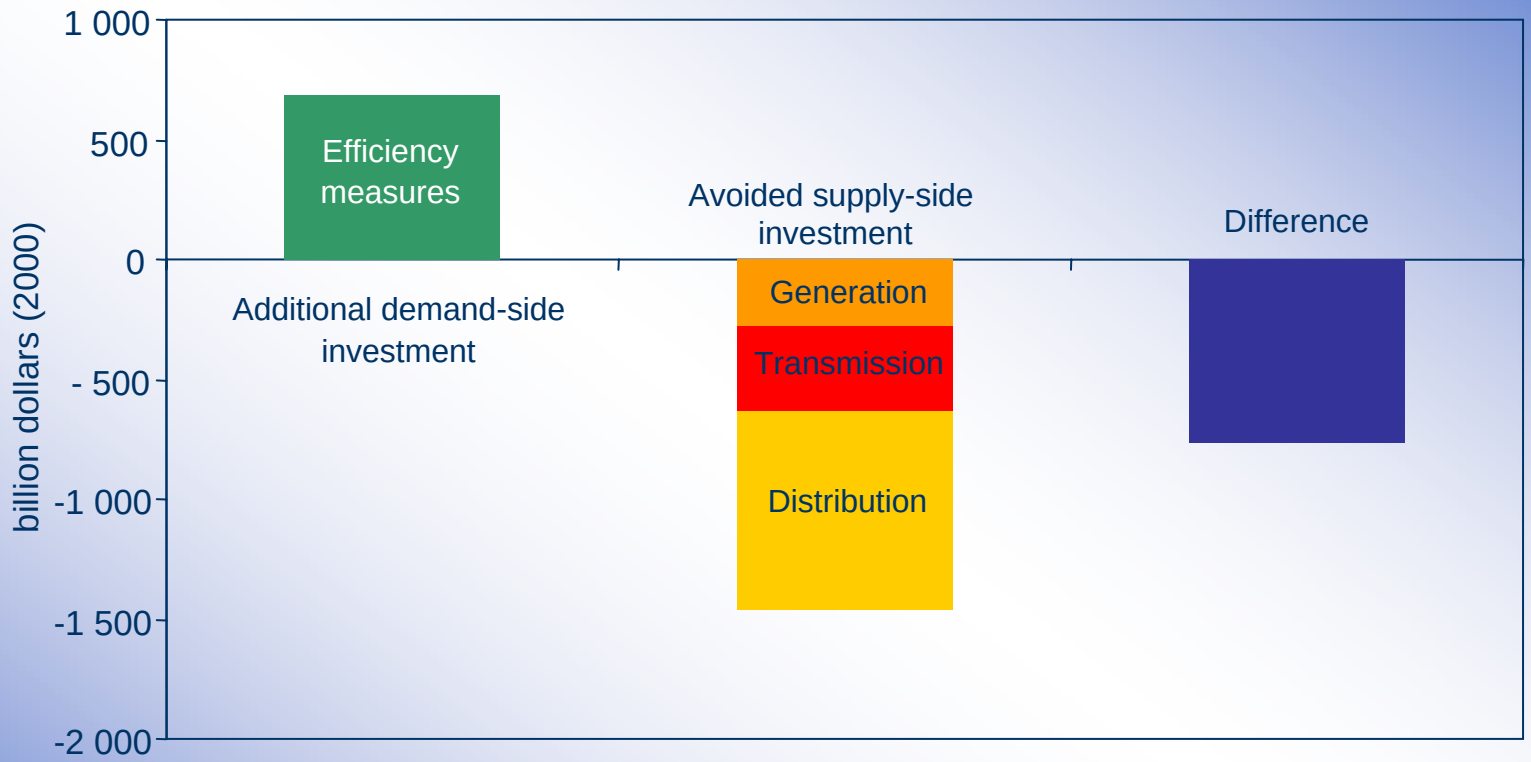
Source: WEO 2004

Contributory Factors in CO_2 Reduction, 2002-2030



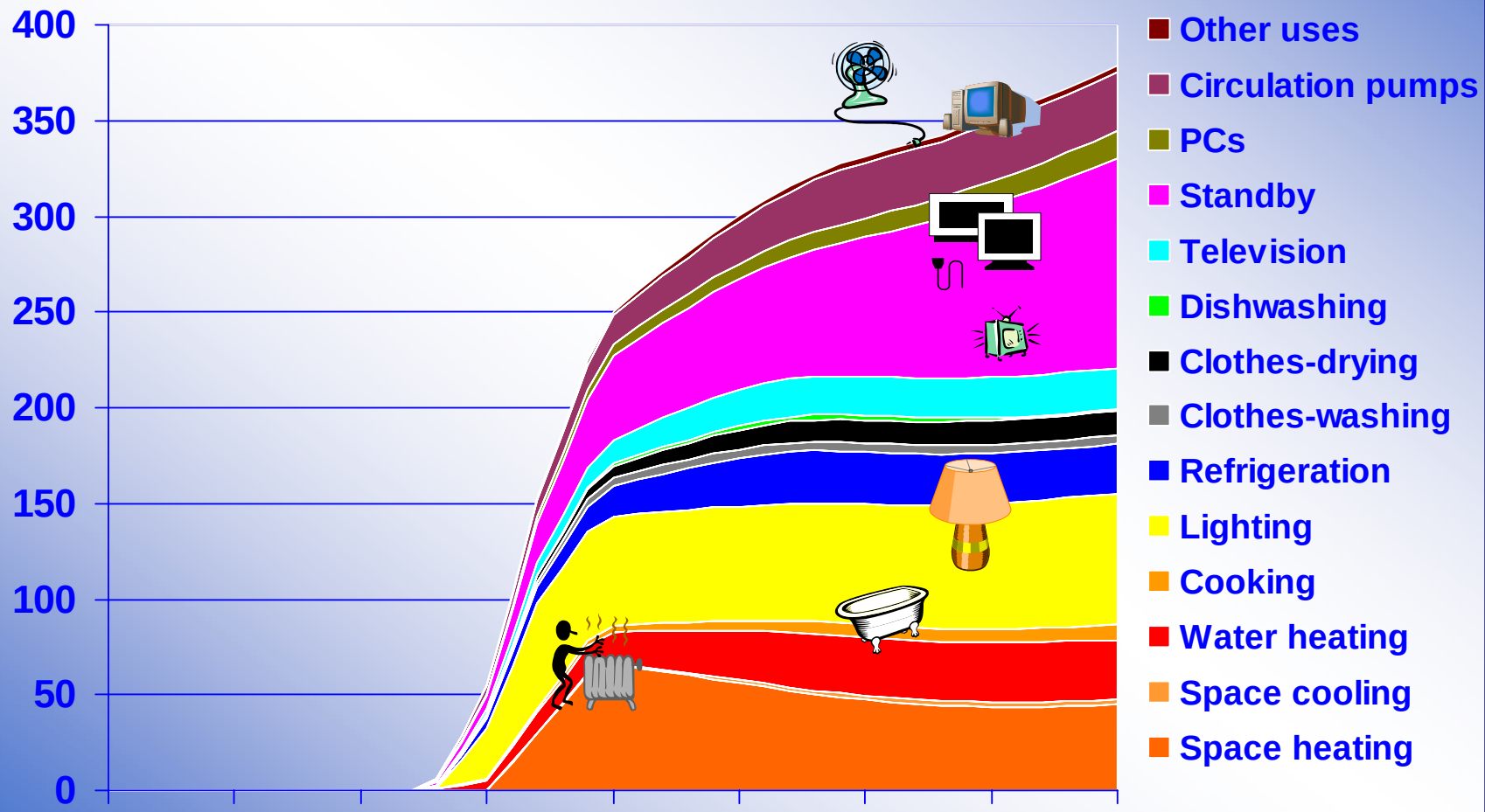
Improvements in end-use efficiency contribute for more than half of decrease in emissions, and renewables use for 20%

Difference in global electricity investment in the Alternative vs. Reference Scenario 2003-2030

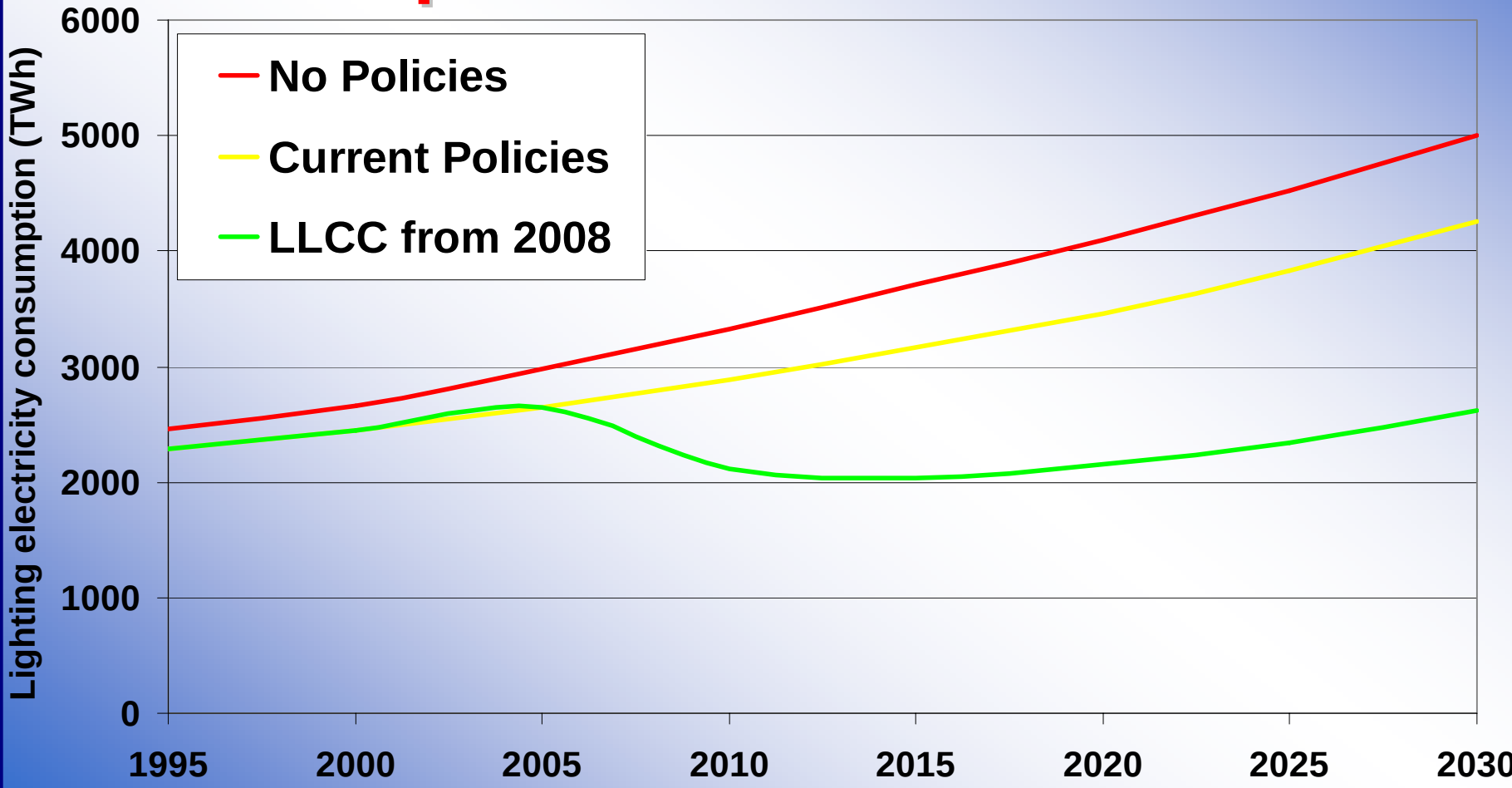


Additional investments on the demand side are more than offset by lower investment on the supply side

Projected additional potential savings by end-use for IEA-Europe



Key lighting findings: no-policies, current-policies and LLCC-scenarios



Policy Challenges for the Future

Considerable potentials for improved energy efficiency still exist, but…

- **a new boost is needed to accelerate energy savings.**
- **Public policy efforts are essential to:**
  - **Internalise the cost of environmental consequences in energy prices.**
  - **Adopt norms and standards.**
  - **Stimulate the development of more efficient technologies.**
- **Energy efficiency is not easy, nor glamorous – IT'S THE SMALL THINGS THAT MATTER!**

The G8 Gleneagles Plan of Action

- It builds the analytical foundation for targeting market failures and applying the appropriate response.
  - Where are we using energy in industry and how efficiently? – Assessment of energy performance experience.
  - What policies are in place? – a database on policies, codes and standards by major sector
  - How can we do better? – analysis and identification of best policy practice.
- Brings major energy users together in a dialogue.