



Institute for European  
Environmental Policy

# Energy efficiency and climate change

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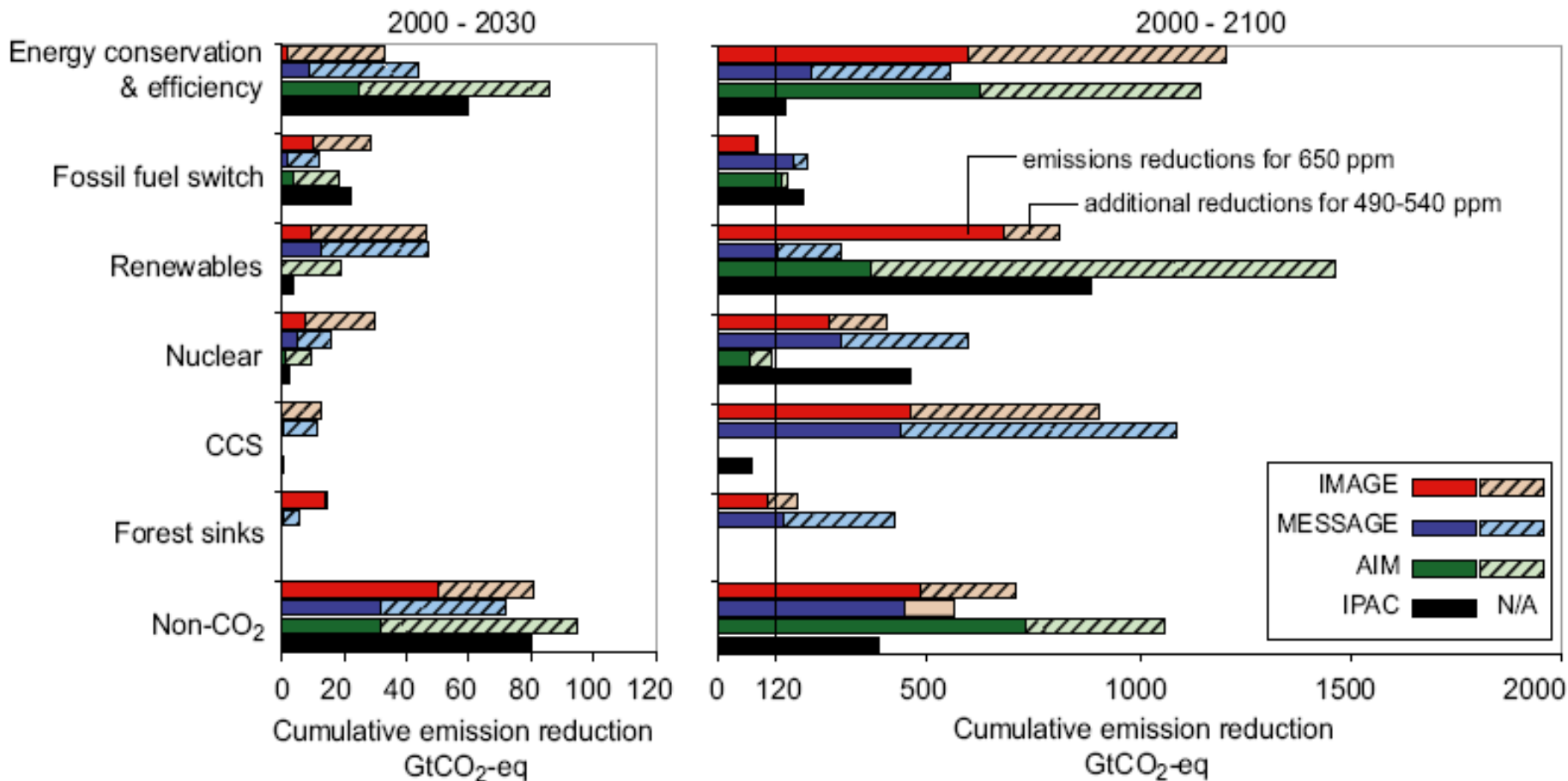
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# Why is energy efficiency a good idea?



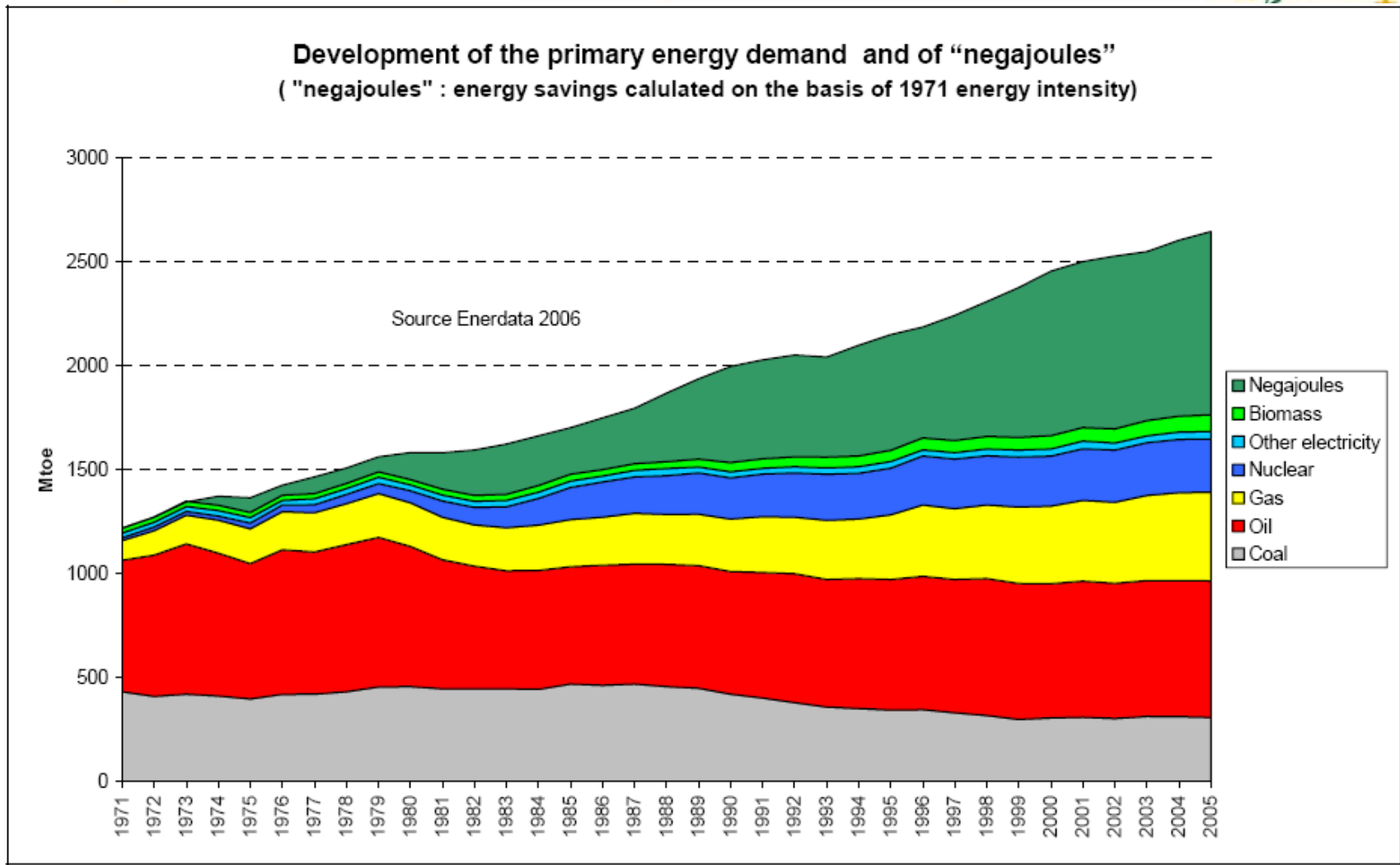
- Most GHG emissions occur as a result of the production and consumption of energy.
- Improving the efficiency with which we use energy is therefore key to climate change mitigation.
- In addition energy efficiency can:
  - reduce the need for investment in energy infrastructure
  - cut fuel costs
  - increase competitiveness
  - improve consumer welfare
  - reduce local air pollution
  - Improve energy security(IEA 2009)

# Importance of energy efficiency for climate change mitigation



Source: IPCC 4<sup>th</sup> Assessment report

# Significance of energy efficiency in meeting energy demand 1971-2005





“These “negawatts” (contributed by energy efficiency) have been every bit as valuable in economic terms as the “produced watts” of energy they replaced. With today’s energy prices, a negawatt of energy saving costs about half of what it costs to produce the same amount of energy. The cheapest, most competitive, cleanest form of energy for the European Union remains that of saved energy.”

European Commissioner for Energy, Andris Pielbalgs.

Source: ECEEE website

# Estimates of energy saving potential to 2020 (EU25) (I)



| Sector                          | Energy consumption (Mtoe) 2005 | Energy Consumption (Mtoe) 2020 (Business as usual) | Energy Saving Potential 2020 (Mtoe) | Full Energy Saving Potential 2020 (%) |
|---------------------------------|--------------------------------|--|-------------------------------------|---------------------------------------|
| Households (residential)        | 280                            | 338  | 91                                  | 27%                                   |
| Commercial buildings (Tertiary) | 157                            | 211  | 63                                  | 30%                                   |
| Transport                       | 332                            | 405  | 105                                 | 26%                                   |
| Manufacturing Industry          | 297                            | 382  | 95                                  | 25%                                   |

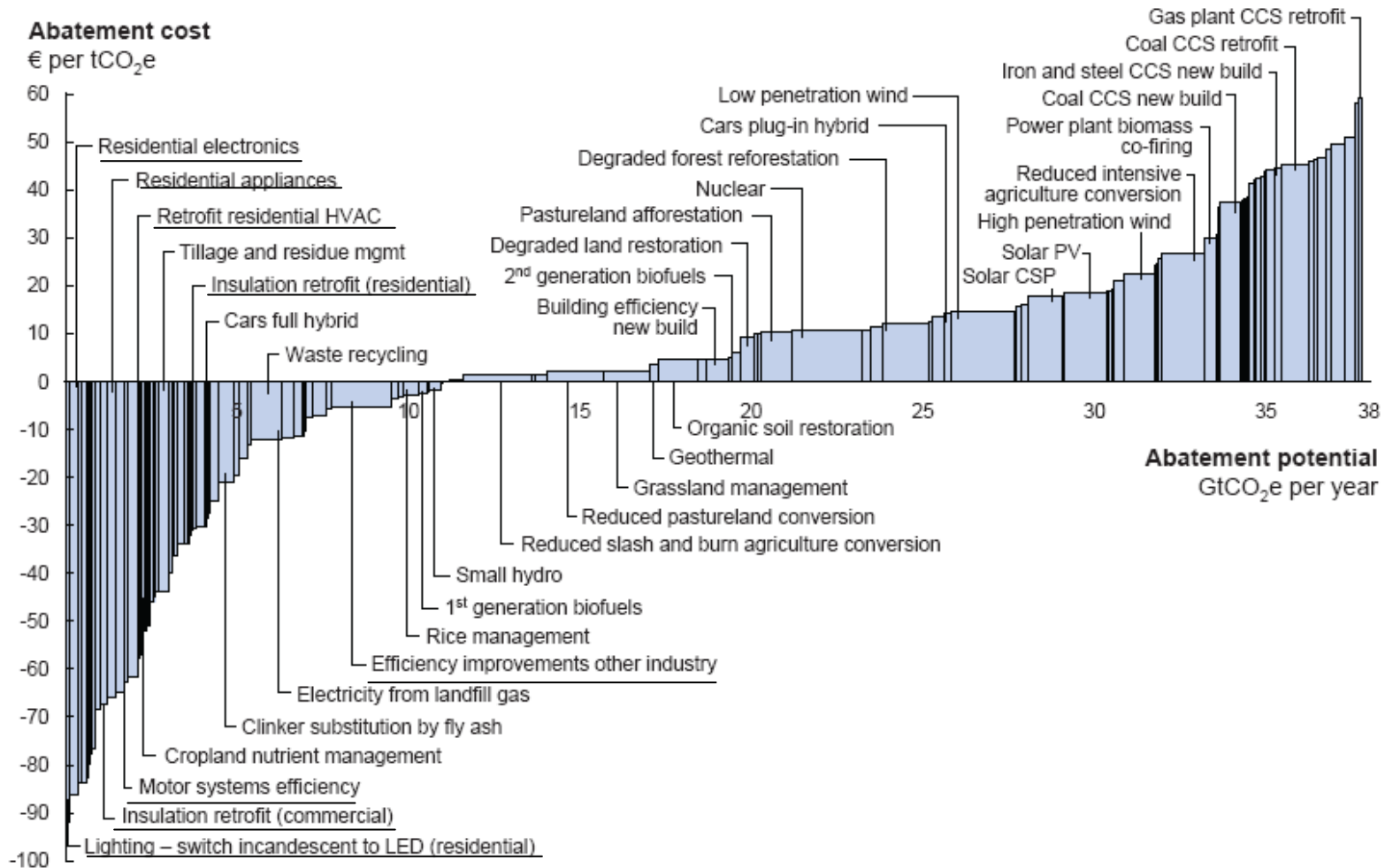
Source: European Commission, EU-25 Baseline Scenario and Wuppertal Institute 2005. Cited COM(2006)545 final.

# Estimates of energy saving potential to 2020 (EU25) (II)



- Significant cost-effective potential remains. Current target 20% by 2020. Not legally binding, but could become so.
- Largest cost-effective savings potential lies in the buildings sector.
  - 27% and 30% respectively
  - E.g. retrofitted wall and roof insulation in residential; improving the management of buildings in commercial – the latter not just a matter of technology. Appliances and other energy-using equipment in both.
- Manufacturing industry:
  - 25%
  - E.g. motors, fans and lighting
- Transport:
  - 26 %
  - Improved vehicle efficiency and a significant impact from shifting to other modes of traffic.

# GHG abatement cost curve



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below 60Euro per tCO<sub>2</sub>e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will pay.



# Some reasons why low hanging fruit can be difficult to pick



- Although many energy efficiency measures can be done at negative or little overall cost, they are unlikely to happen by themselves.
- Unlocking the potential often requires changing existing practices, and mobilising a diverse set of actors.
- Building sector example:
  - Even commercial buildings supposedly at the cutting edge of energy performance, often do not live up to expectations (numerous Probe studies).
  - This is because the challenge usually goes beyond technological systems, and includes human ones...
  - We should get more interested in energy consumption *in use*.
  - “First cost” can be a further barrier, e.g. both in the commercial and residential building sector.
  - “Split incentives” compounds this: one actor makes the investment, another reaps the benefits from the savings.
- Good policy design and implementation can help us take up this challenge.
- Will require good co-ordination across different levels of governance



**Thank you**

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