

# Emissions and Climate Change What can Europe do?

**Cutting transport CO<sub>2</sub> emissions:  
Putting effectiveness & value for money centre stage**

*Stephen Perkins*

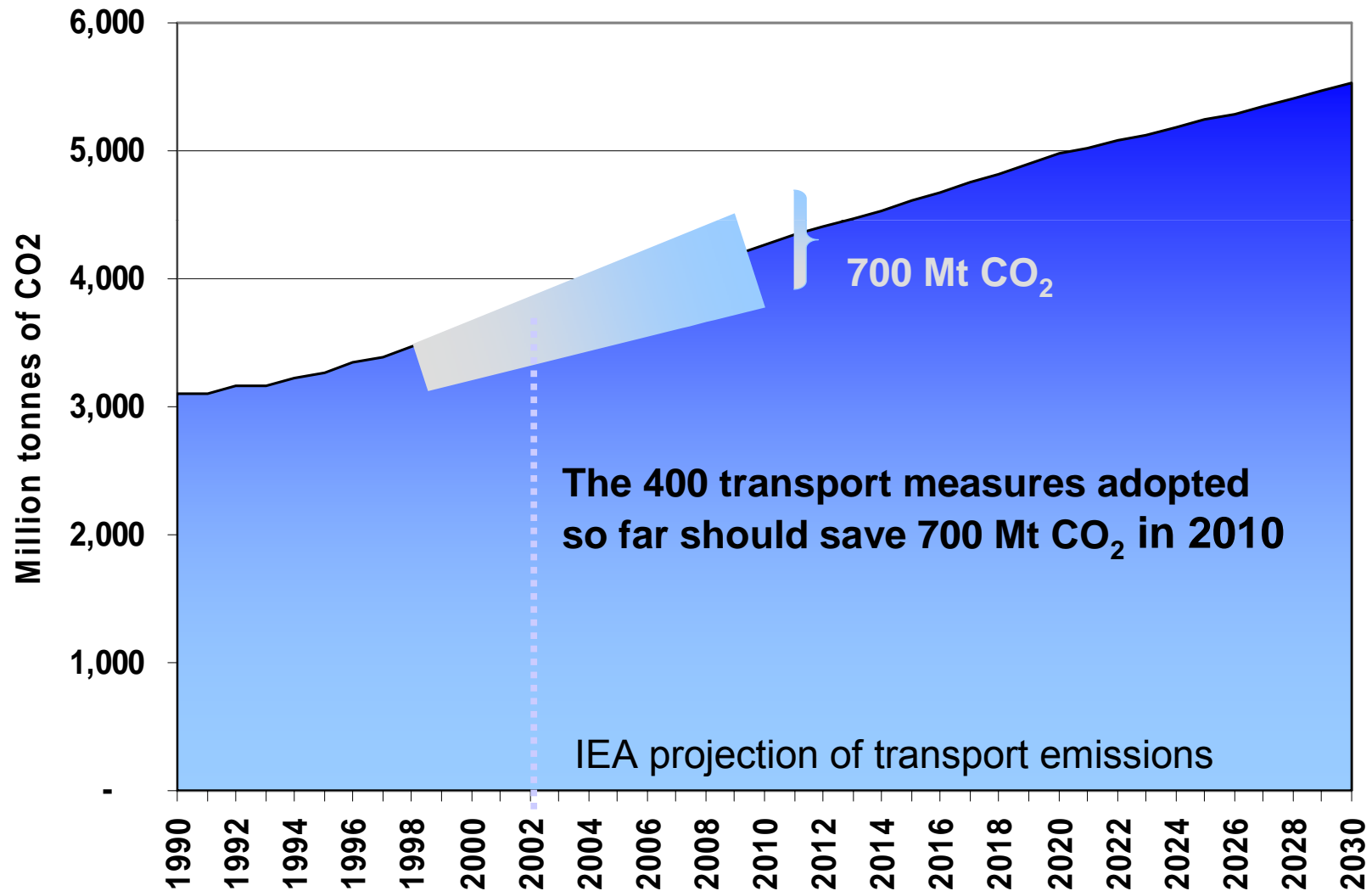




# Does cost-effectiveness matter?

- 2<sup>nd</sup> best argument – transport should mitigate more because limited de-localisation effects
- High cost measures have attracted political support
  - Hydrogen
  - Biofuels
  - Modal shift
  - Hybrids
- Despite low effectiveness
- Effective measures weak political support

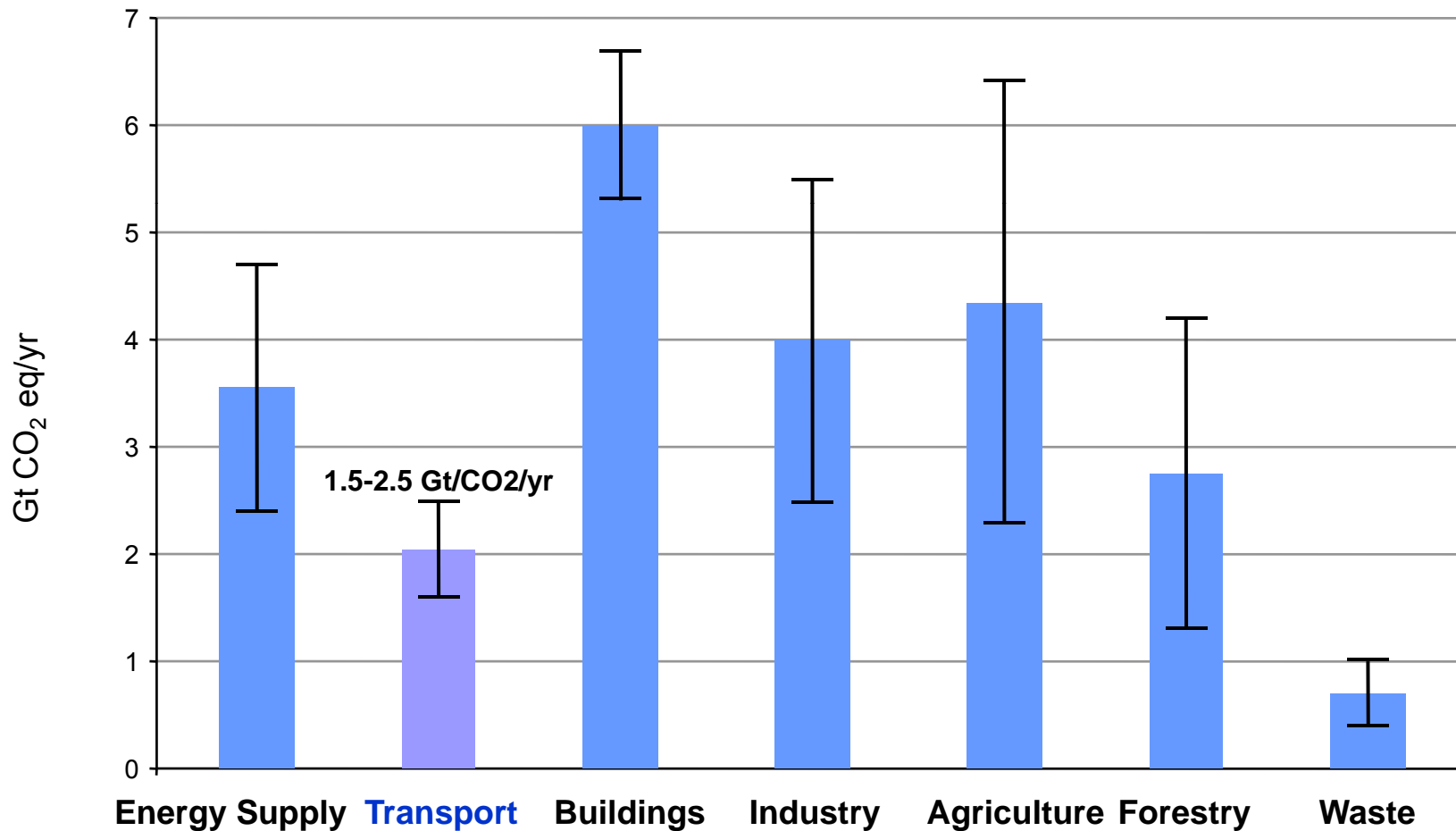
## ITF Transport Sector Emissions: Potential Impact of Current Policies



## Policy Implications

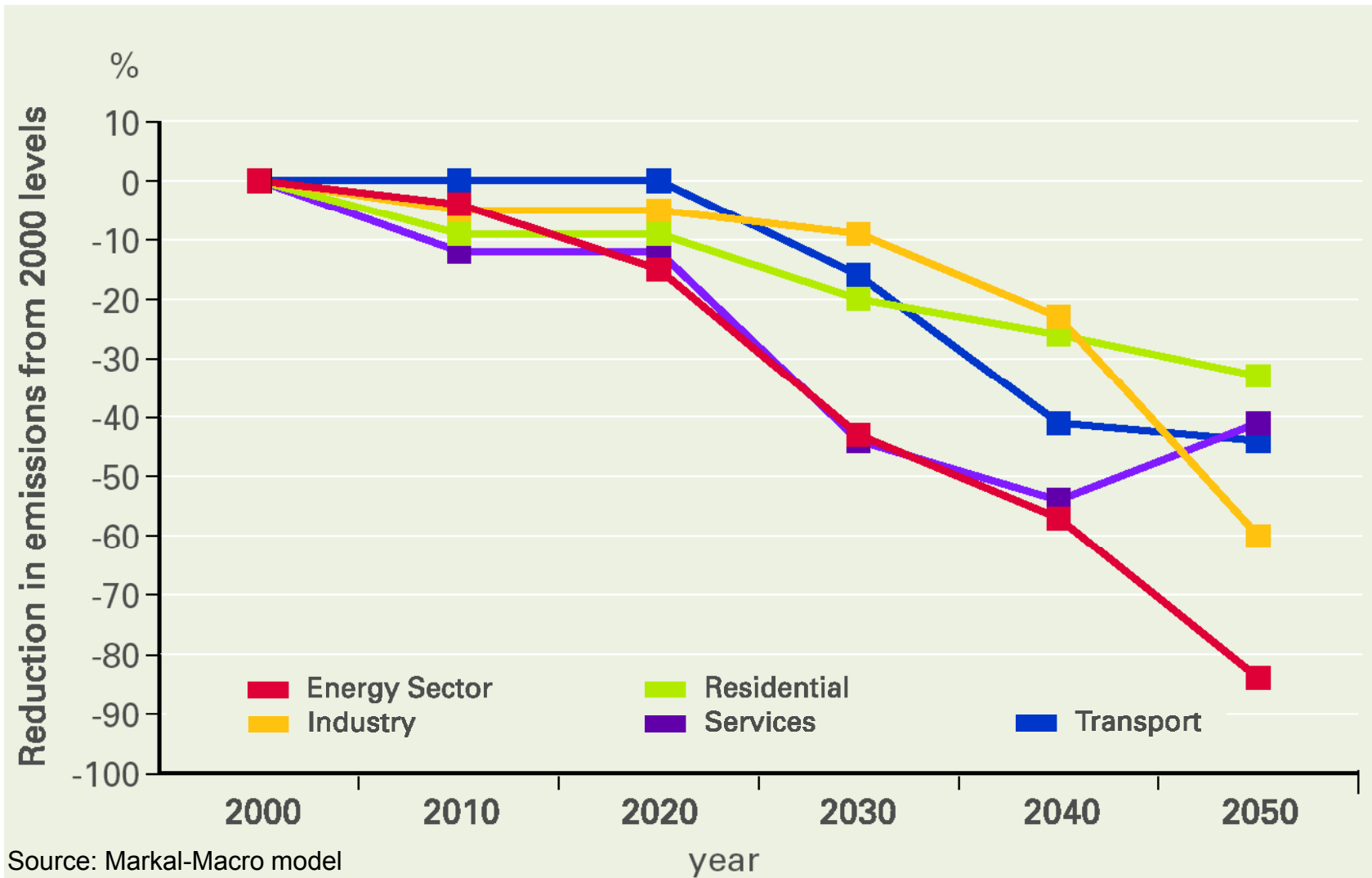
- More action needed if growth in transport emissions is to be cut.
- How much?
  - Power & heat sector will make biggest cuts
  - Some relatively low cost measures available in all sectors
  - Within transport some expensive measures implemented while cheap measures ignored

# IPCC Sectoral GHG Abatement Potential for the World (Gt CO<sub>2</sub> eq/yr at less than \$100/tCO<sub>2</sub>)



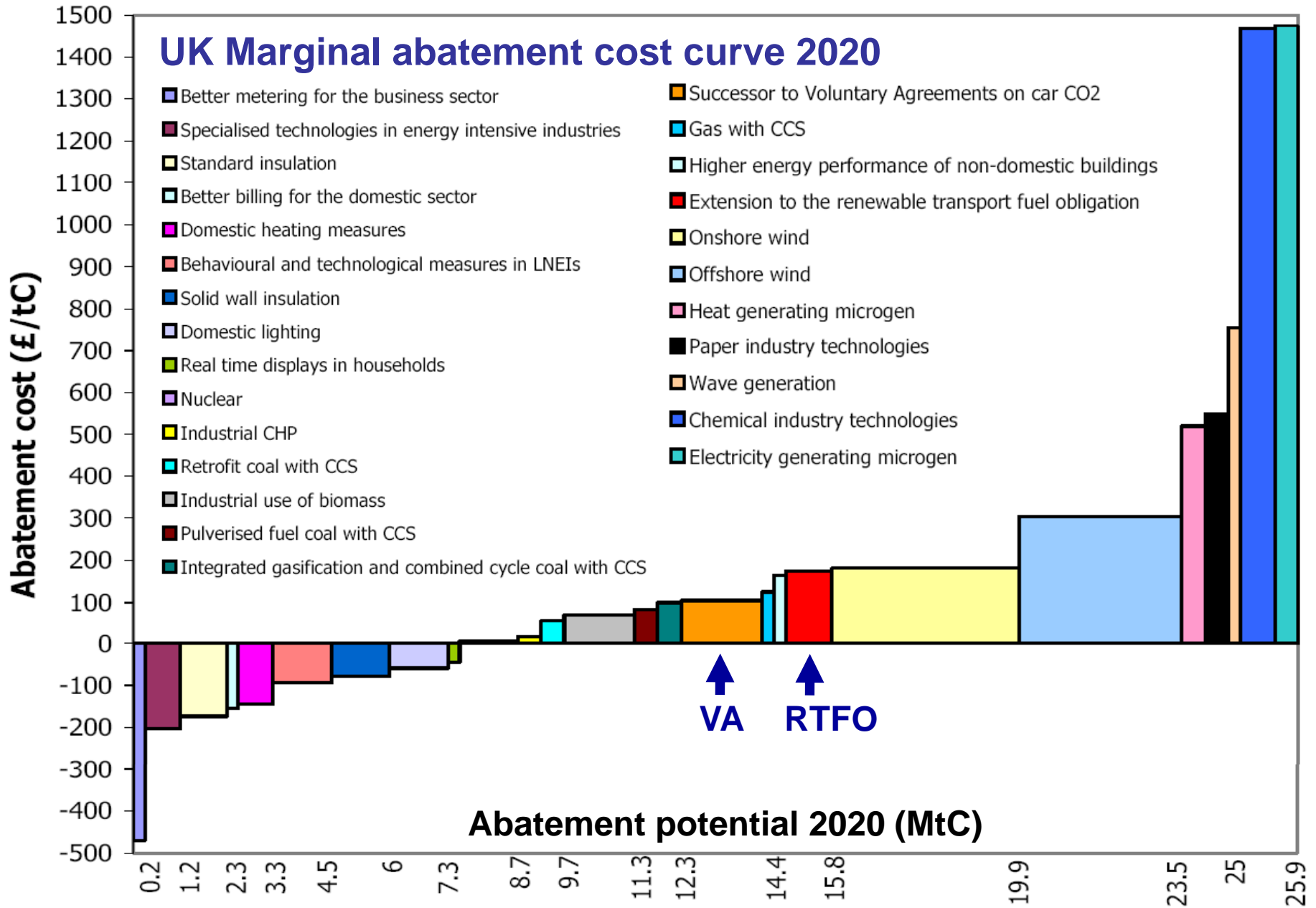
# UK Modeled CO<sub>2</sub> Emission Reductions by Sector

Scenario Showing Least Cost Route to 60% Reduction by 2050



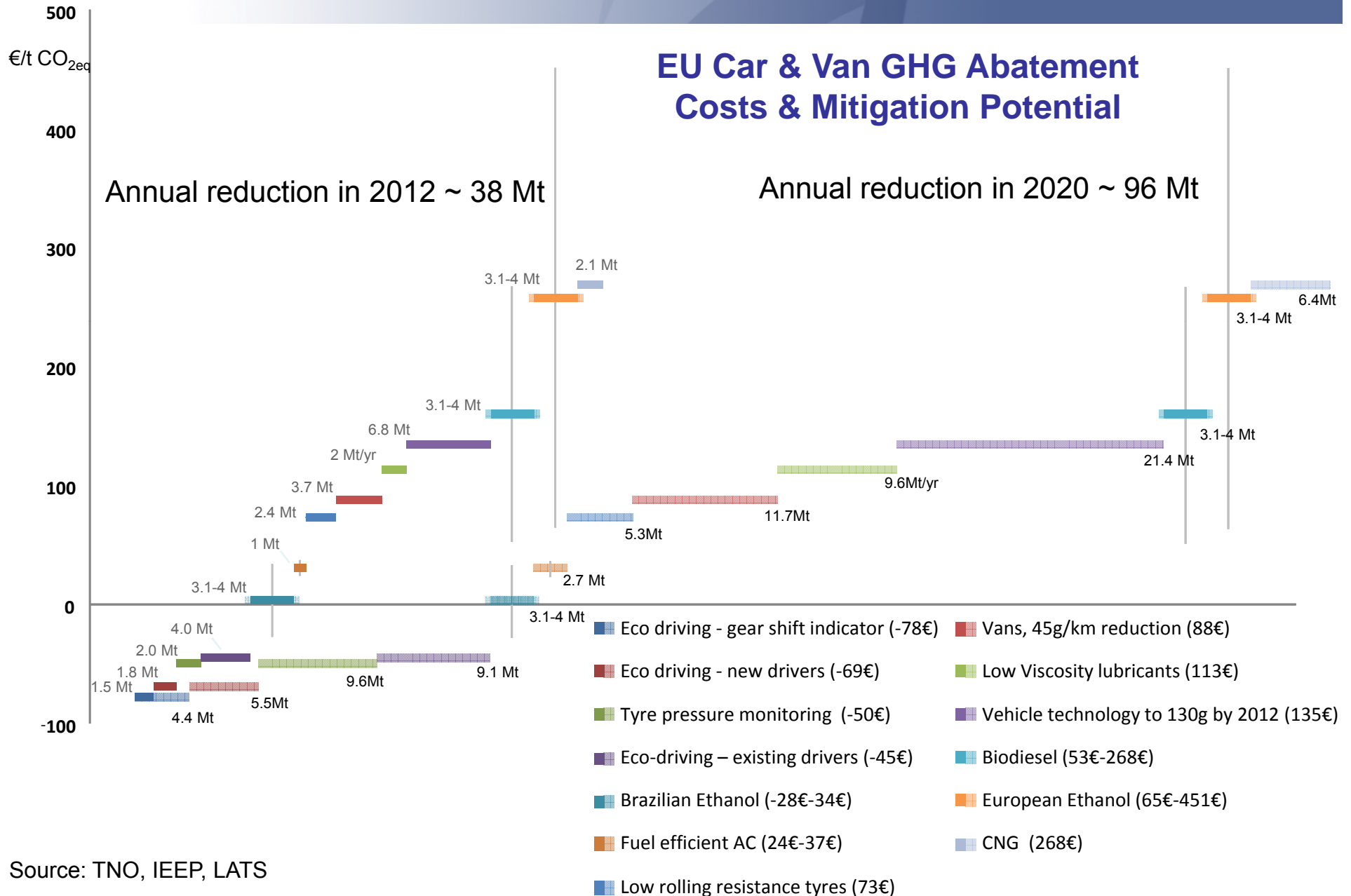


# UK Marginal abatement cost curve 2020





# EU Car & Van GHG Abatement Costs & Mitigation Potential

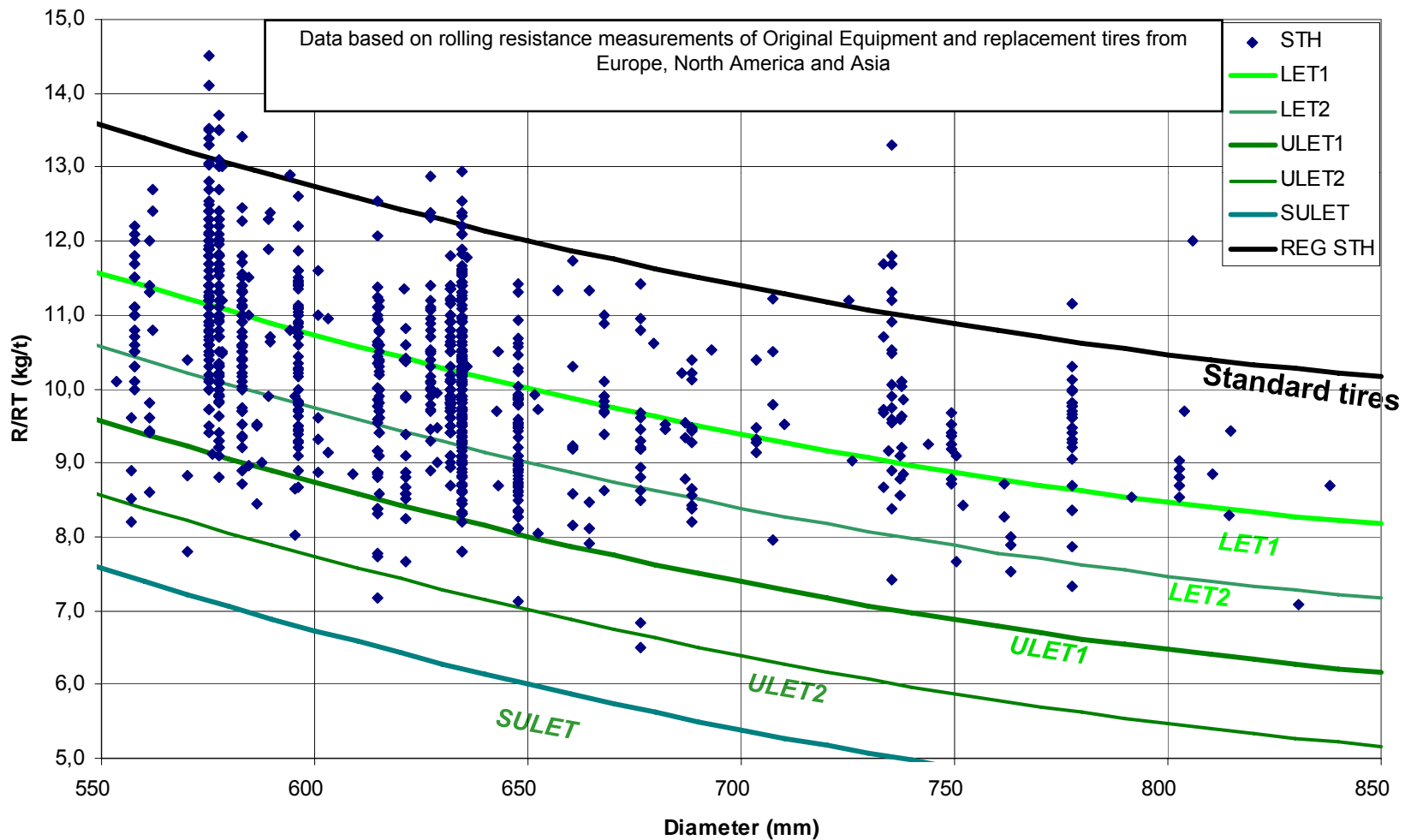


Source: TNO, IEEP, LATS

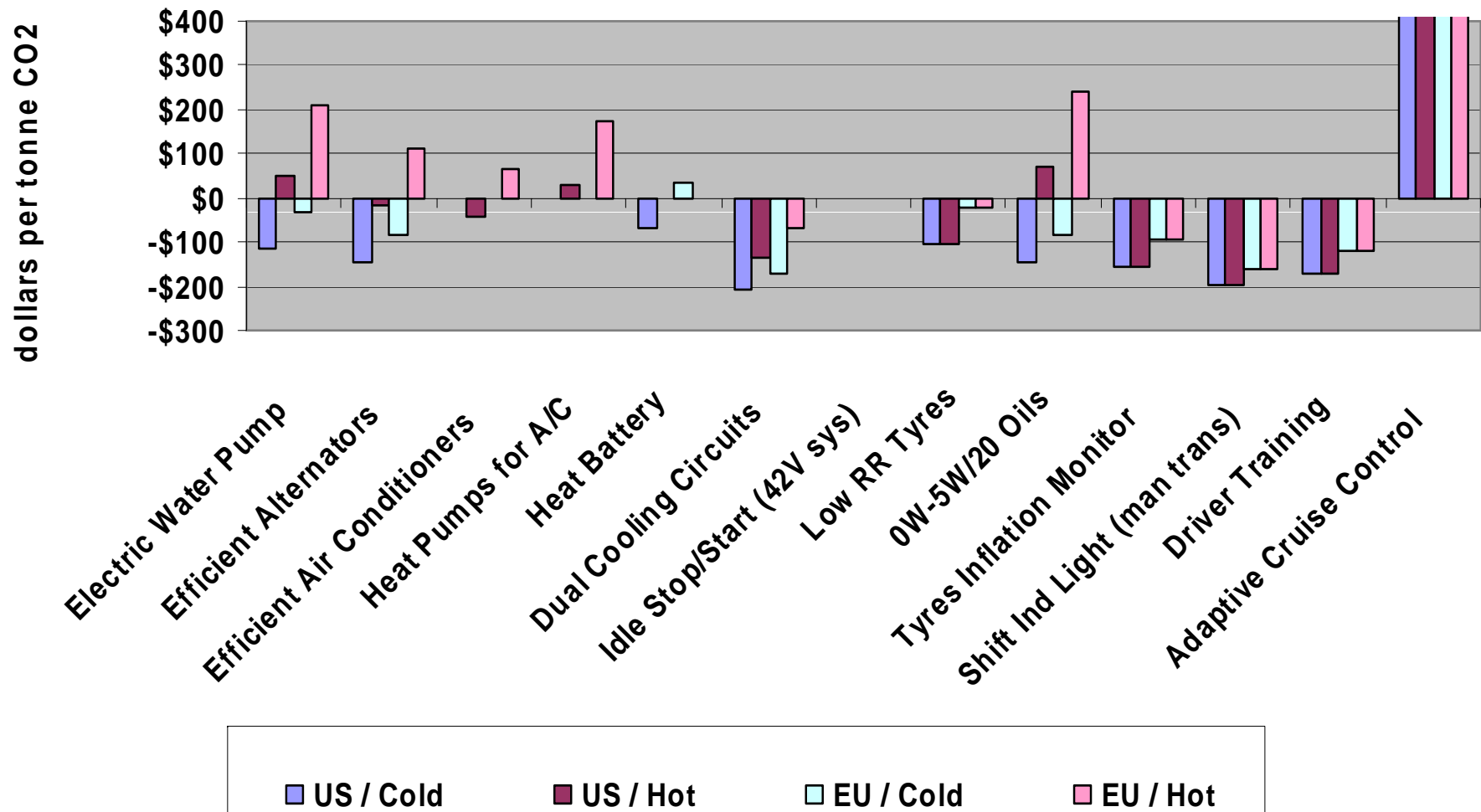


# Possible regulatory standard & energy efficiency “bins” for tyres

P metric STH



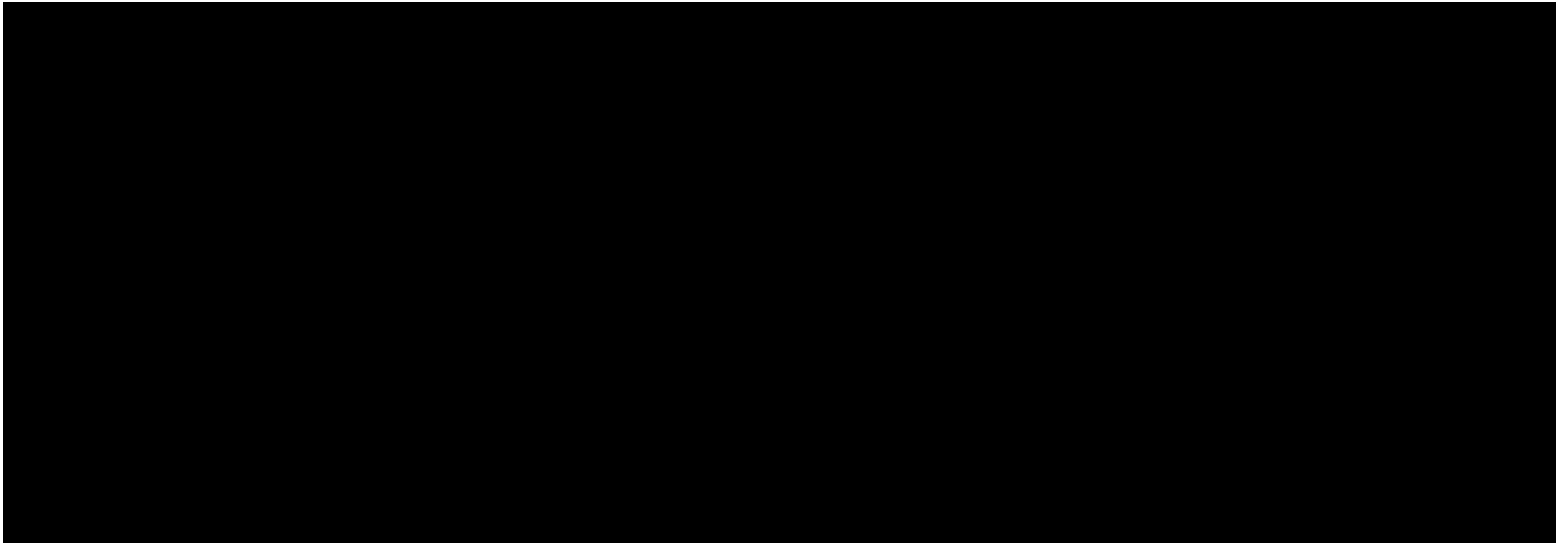
# Low Cost Vehicle Component Improvements





- Tyres, cruise control, air con effective under all conditions
  - combined these could save up 5-10% of fuel.
- Most technologies are most effective under cold conditions with dense traffic
  - water pump, energy efficient alternator, heat battery and 5W-20 oil most cost-effective
  - combined these could save up to 10% of fuel.
  - especially important for Northern climates
- Diesels: lower potential for improvement

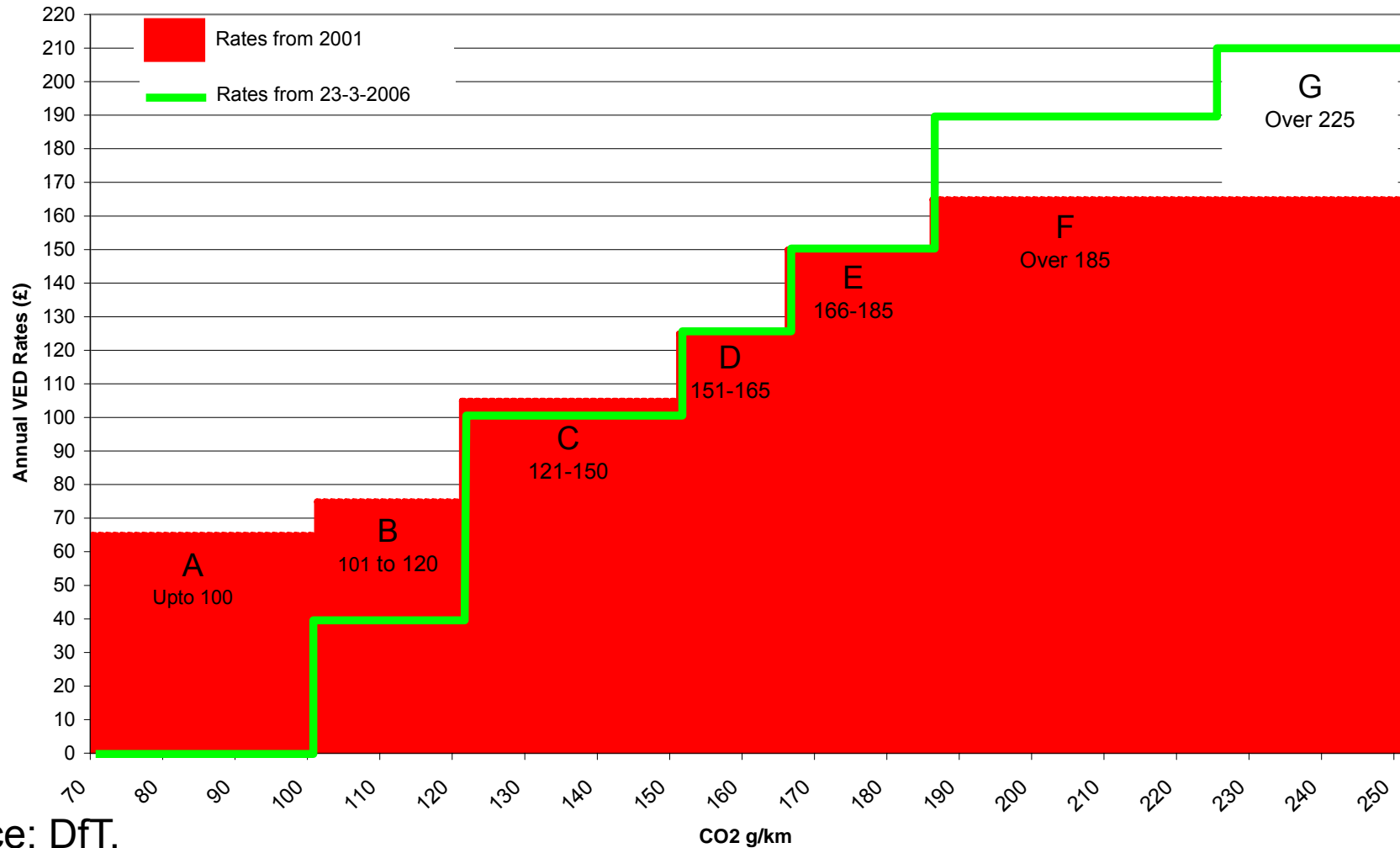
# Core Vehicle Technology



Source: King 2007 based on IEA, IEEP, CARB, Ricardo.



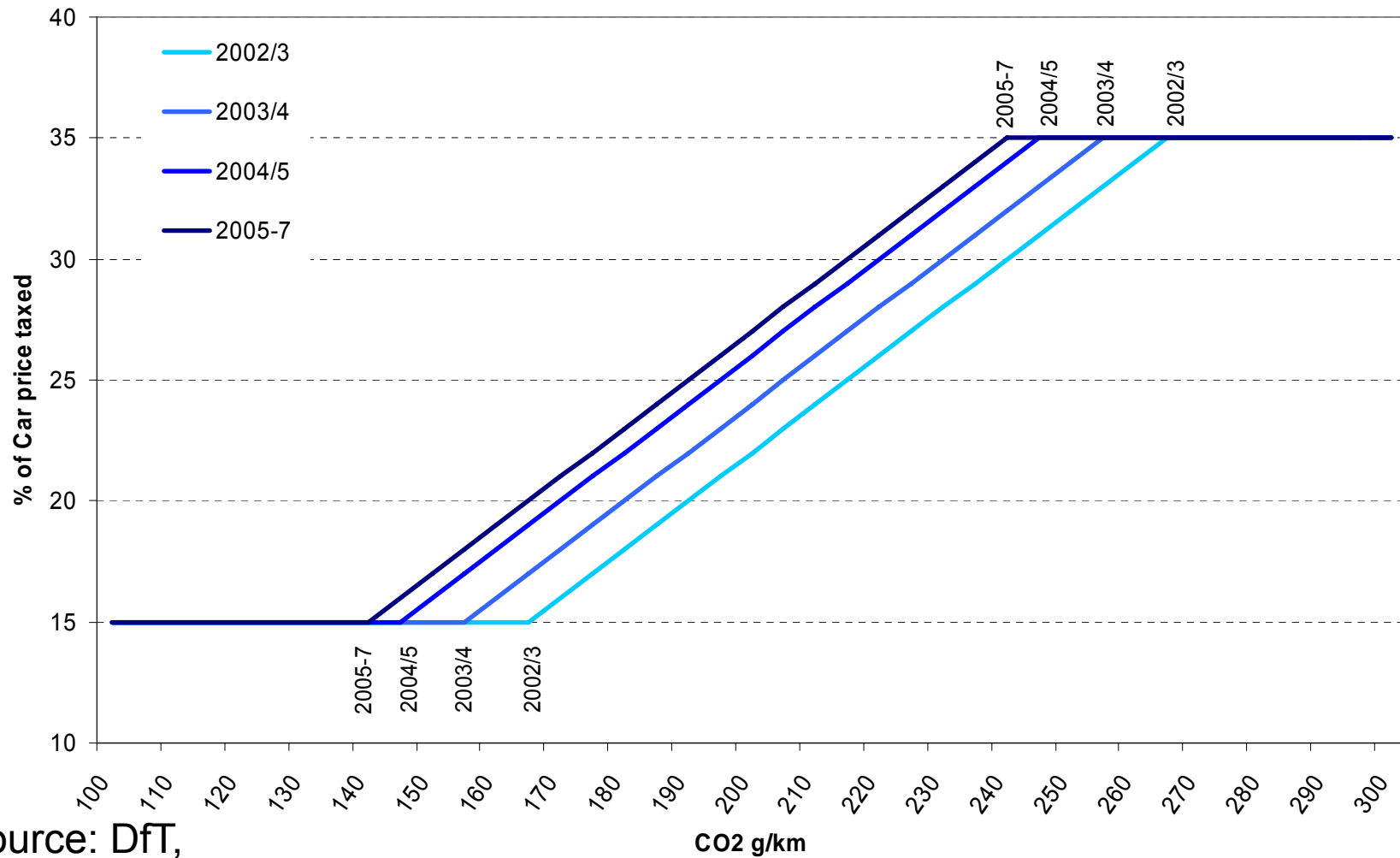
## Differentiation of annual circulation tax for private cars in the UK



Source: DfT,

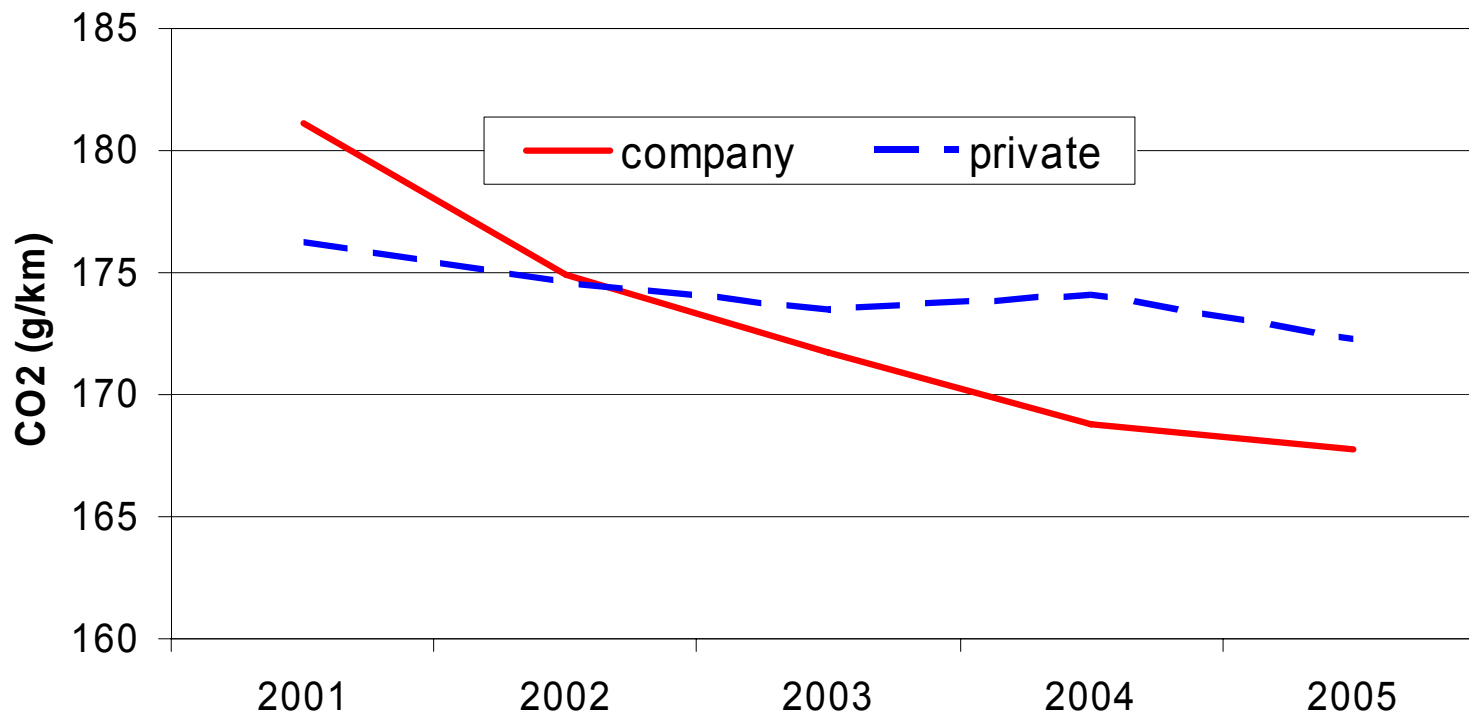


# Company car tax differentiation in the UK



Source: DfT,

# Impact of UK tax differentiation



Source: DVLC

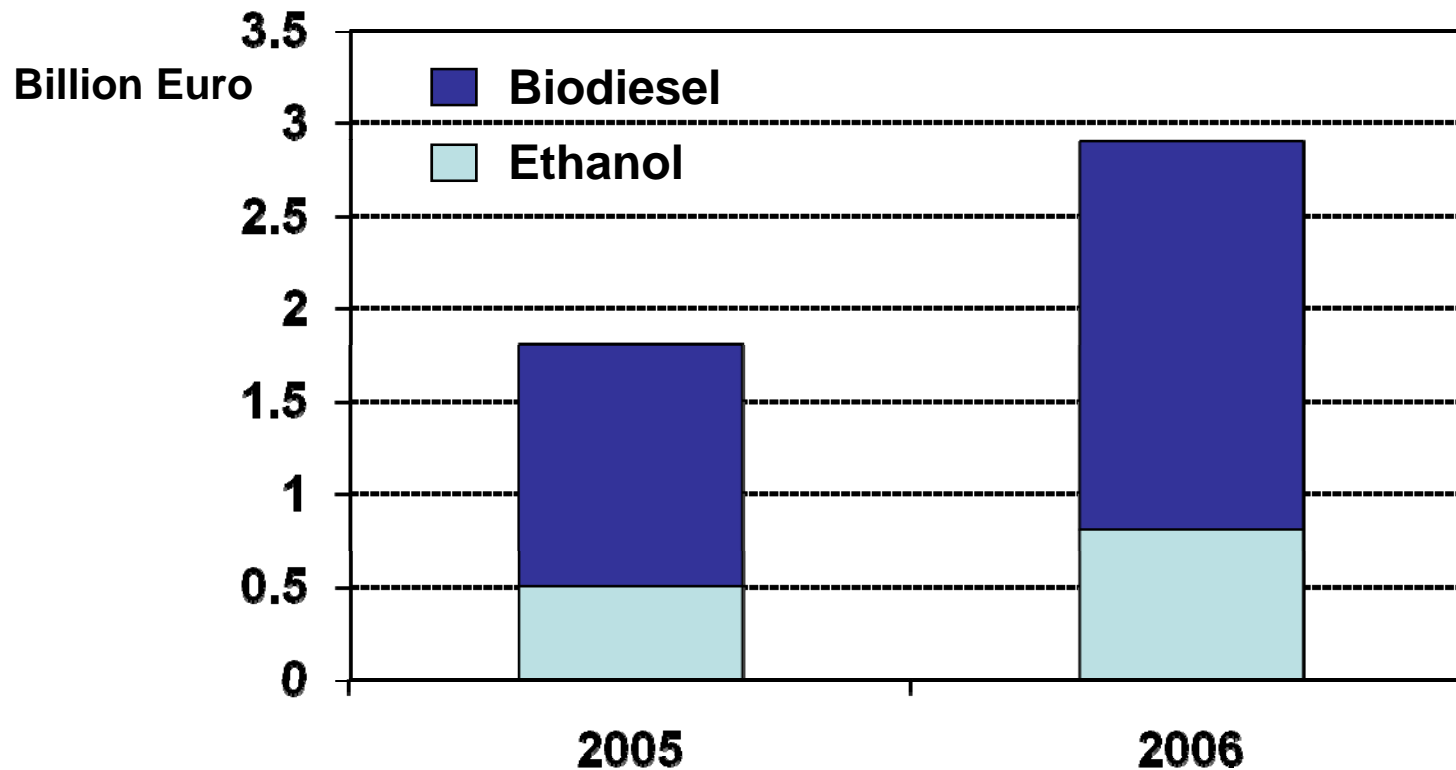
## High cost GHG mitigation: Biofuel subsidies

Average performance	Euros/tCO <sub>2eq</sub>	USD
US corn-ethanol	390	520
EU sugar-beet ethanol	450—620	610—840
EU rapeseed biodiesel	750—990	1 000—1 340

Sources: Koplow 2007; Kutas *et al.*, 2007.

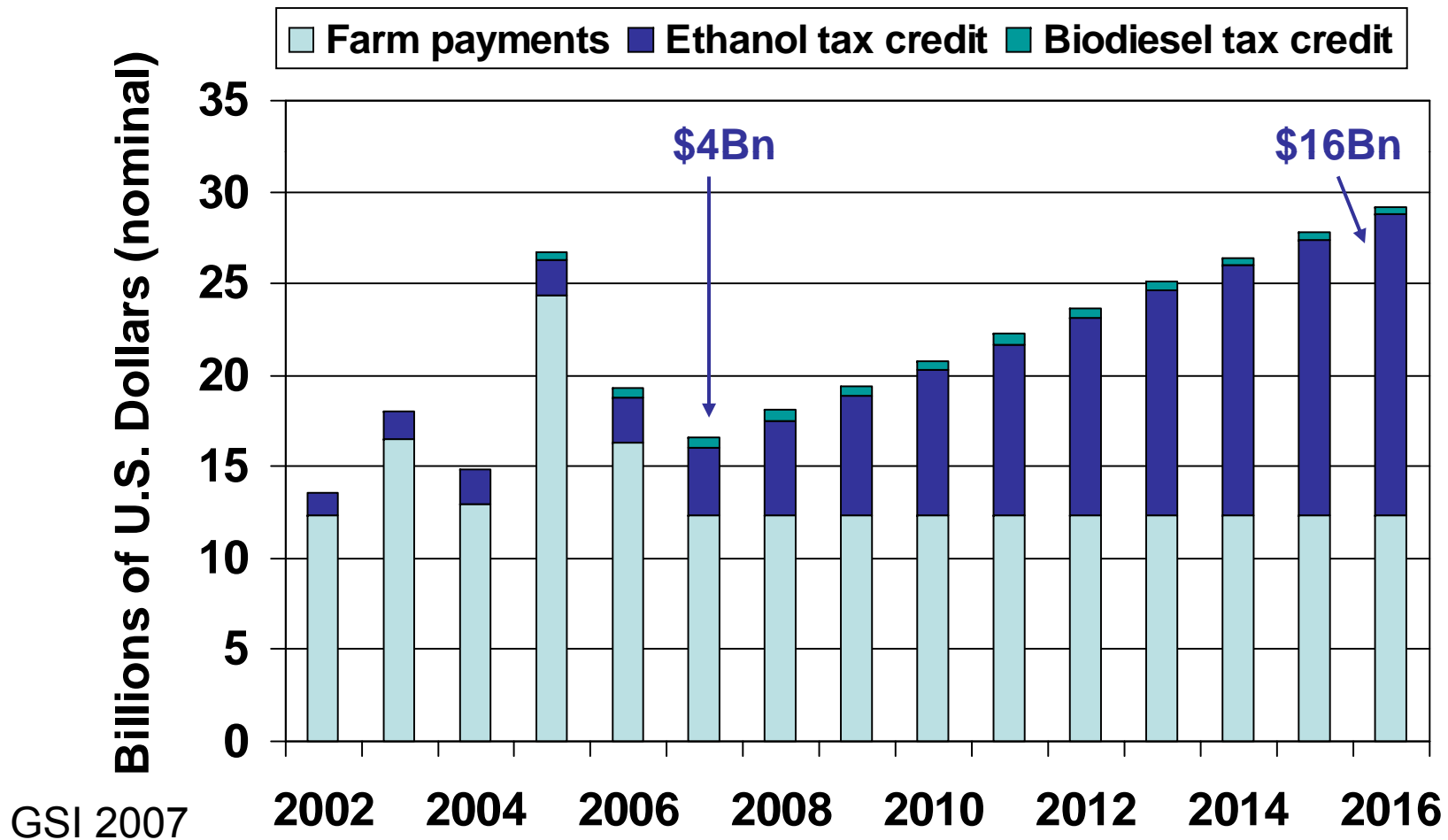


## Biofuels: EU tax subsidies increasing rapidly (Excise tax exemptions - revenue loss)



Sources: Koplow 2007; Kutas 2007; for GSI

# US biofuel tax subsidies to grow and grow



# Biofuels GHG emissions balance

- Wide range of uncertainty in the estimation of life-cycle GHG emission balances;
- Farming practice can shift the balance from positive to negative;
- Oxidation of soil carbon and emissions of  $N_2O$  from fertiliser application are big sources of GHG emissions.



## Designing support for biofuels

- Volumetric targets inappropriate
  - Likely to favour worst performing, lowest cost production
- Transport fuel carbon content targets better
- Certification for biofuels production
  - Should improve outcomes even if it is difficult
  - Not suited to indirect effects – forest destruction
  - Requires extensive stakeholder consultation
  - Crude system better than no certification

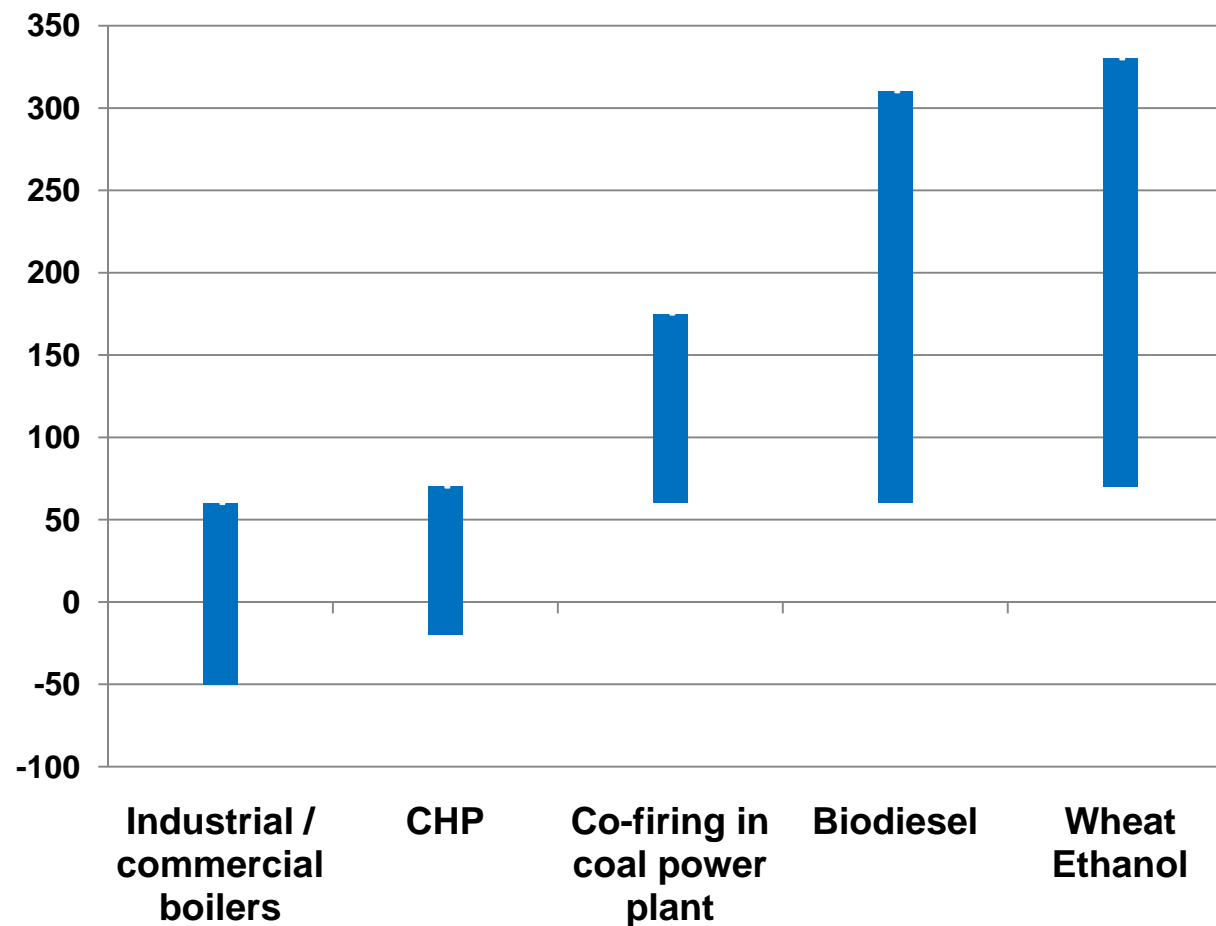
## ... designing support cont.

- UK, NL, Germany, Switzerland, California, EU developing certification to regulate market
- Range and poor performance of today's biofuels partly result of absence of regulation or incentives linking support to CO<sub>2</sub> balance
- Fuel carbon taxes, including for biofuels, would be more cost-effective than subsidies or targets



# Biomass better for heat and power

£ / tonne CO<sub>2</sub> abated



Source: Dti



## Policy package

- Integrated packages of measures needed
  - Vehicles, fuels, demand mgmt, modal shift
- But vehicle efficiency measures deliver most
- Off-cycle components and eco-driving are most cost-effective
  - Large, immediate savings – should be core measures
  - Switch attention to efficiency, away from fuels & modal shift co-benefits approach (currently 1/3 of all national policies reported)



## Priorities

- Differentiate vehicle taxes by CO<sub>2</sub>
  - More countries
    - In EU, no need to wait for Directive
  - stronger incentives
    - Linear incentives to avoid fragmenting car market
- New low cost efficiency measures
  - Off-test vehicle component standards / incentives
    - tyres, lights, air conditioners, lubricants.
  - On-road efficiency
    - driving style training / instruments



# References:

- [www.cemt.org](http://www.cemt.org)
  - Environment pages
  - Research Centre pages
- [www.internationaltransportforum.org](http://www.internationaltransportforum.org)