

12th EU Hitachi Science and Technology Forum
'Smart Energy Usage for a Sustainable Society'

Mapping the path to zero carbon emissions

Professor Jacqueline McGlade
Executive Director
European Environment Agency

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'Achieving the 80 % reduction means
nothing less than a transition to a new
energy system both in the way energy
is used and in the way it is produced.'

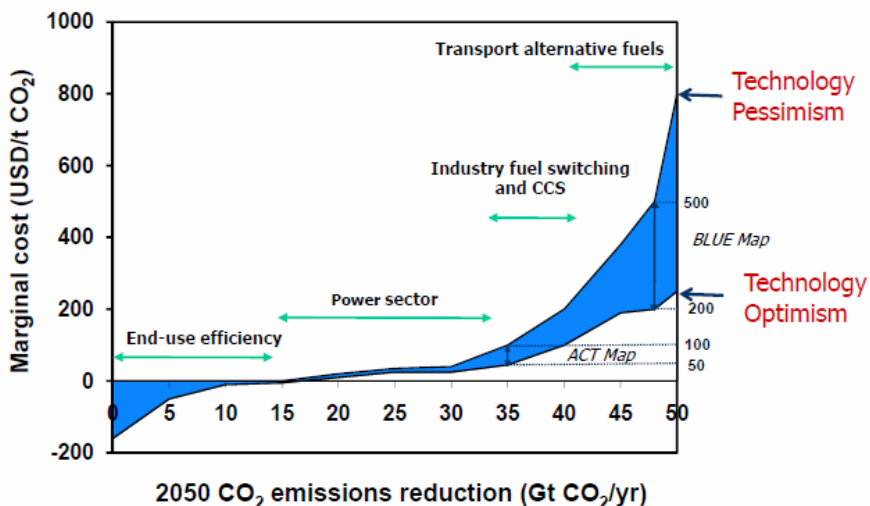
European Climate Foundation
Roadmap 2050

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Cost of emissions reductions

IEA, Energy and Technology Perspectives 2008

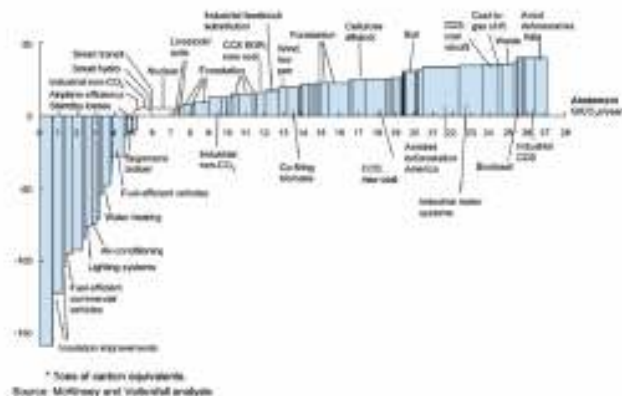


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Cost of emissions reductions

McKinsey Global Institute, 2008

THE COST CURVE PROVIDES A "MAP" OF ABATEMENT OPPORTUNITIES
Cost of abatement, 2030, \$/tCO₂e*



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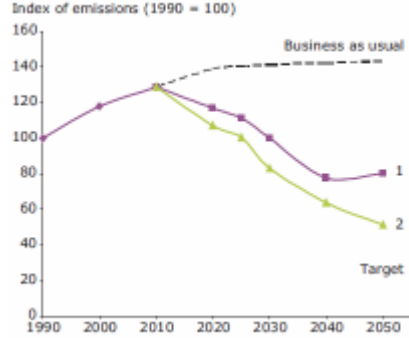
Towards a resource-efficient transport system
 TREN 2009 indicators tracking transport and environment in the European Union



'...if ambitious targets are to be achieved, policymakers will need to employ all measures rather than just picking the best ones.'

European Environment Agency 

Effect of a combination of 'improve', 'avoid' and 'shift' measures




Index of emissions (1990 = 100)

Year	Business as usual	Line 1	Line 2	Target
1990	100	100	100	100
2000	115	115	115	115
2010	125	125	125	125
2020	135	115	105	105
2030	140	100	85	85
2040	140	80	65	65
2050	140	80	50	50

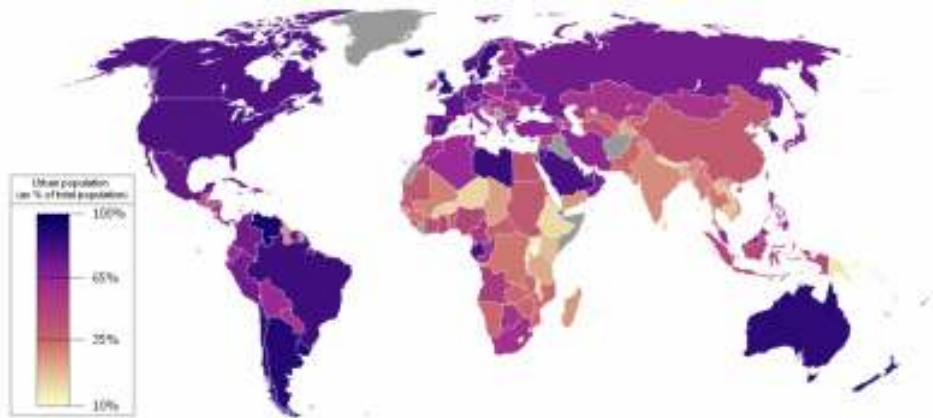
Each curve shows the additional effect of adding further instruments.

- 'Improve' package: improved engine and vehicle design, electric cars, low-carbon fuels and technologies encouraging behavioural change. These measures lead to a 44 % reduction in transport CO₂ emissions.
- 'Avoid and shift' package: road pricing, car clubs, increasing population density in cities, travel planning. These measures lead to a 20 % reduction in transport CO₂ emissions.

European Environment Agency 

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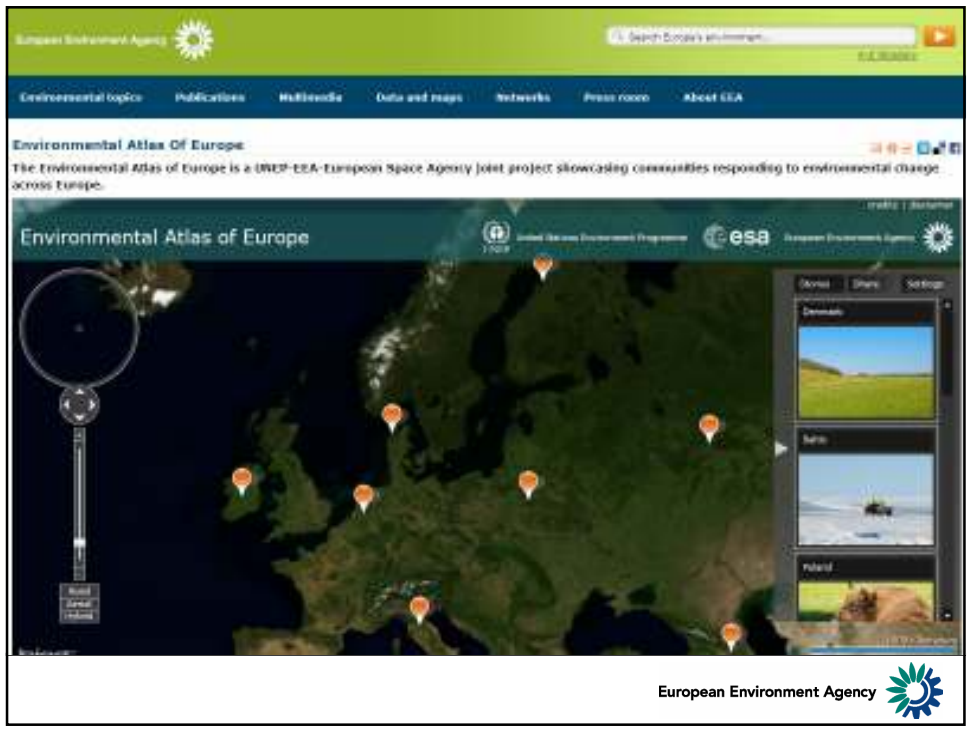
Urban population as % of total population



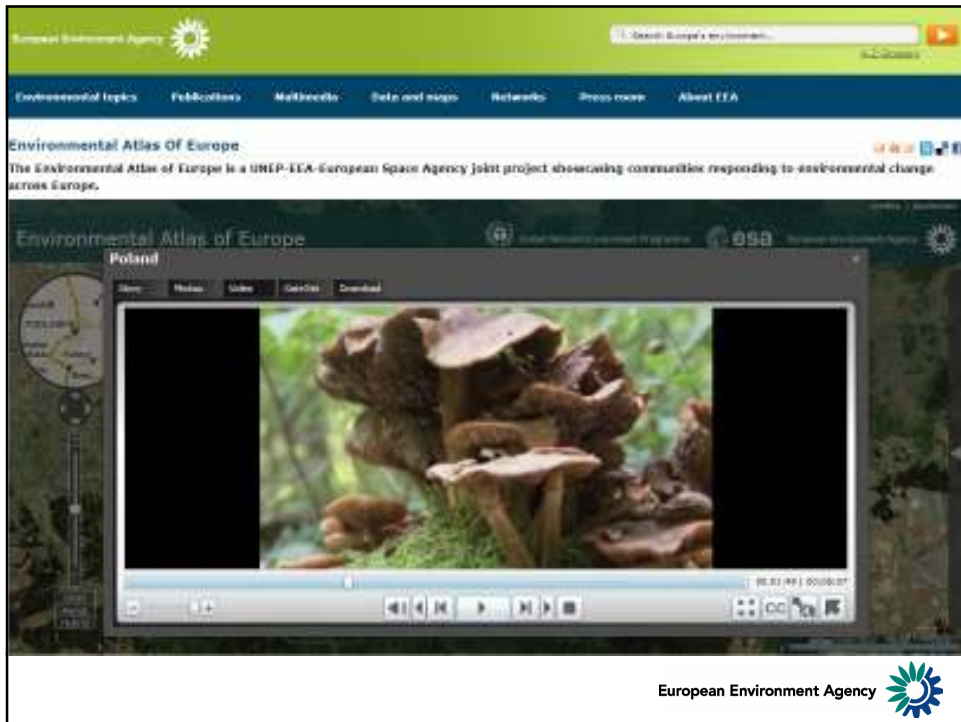
Source: UN Human Development Report

*Smart grids can cut demand by 15 %,
simply as a result of consumers learning
more about their usage.*





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Thank you for your attention!

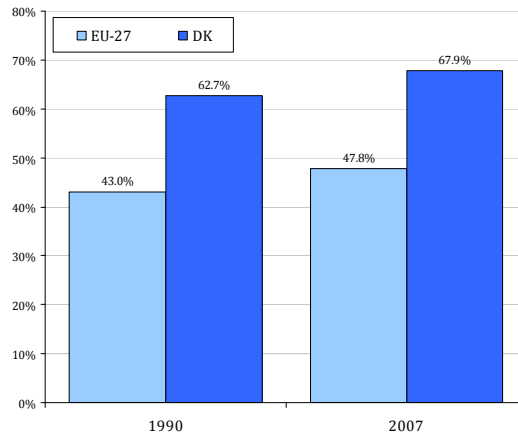
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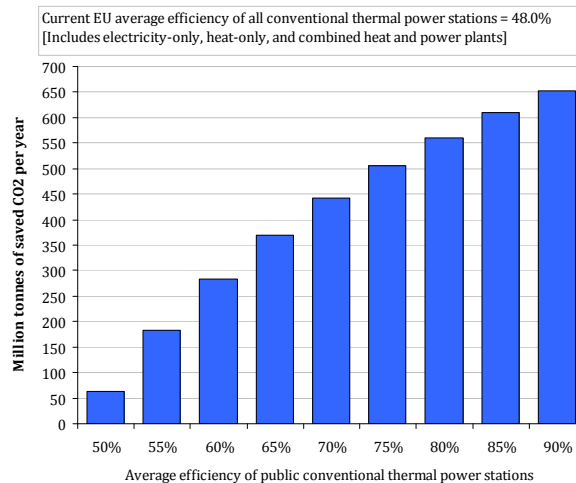
Additional slides

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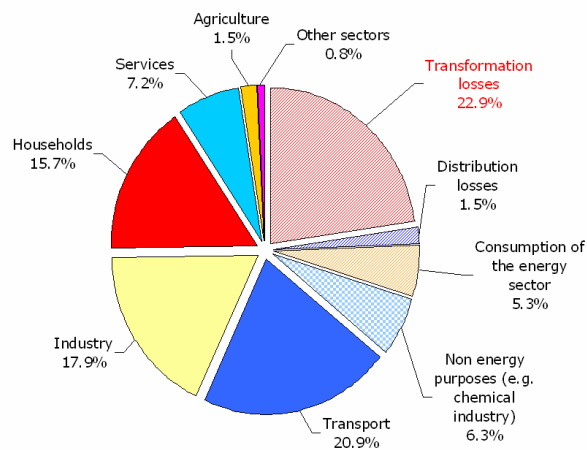
Average transformation efficiency from public conventional thermal power stations and district heating plants



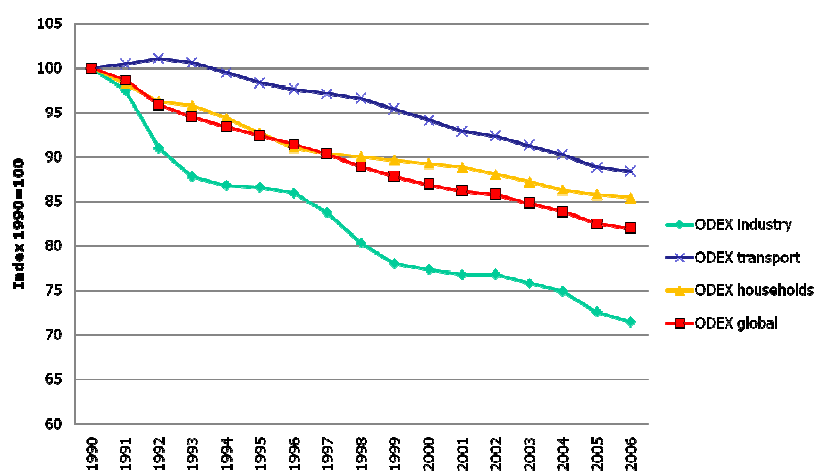
Projected EU-27 annual CO2 emission savings assuming improved transformation efficiencies

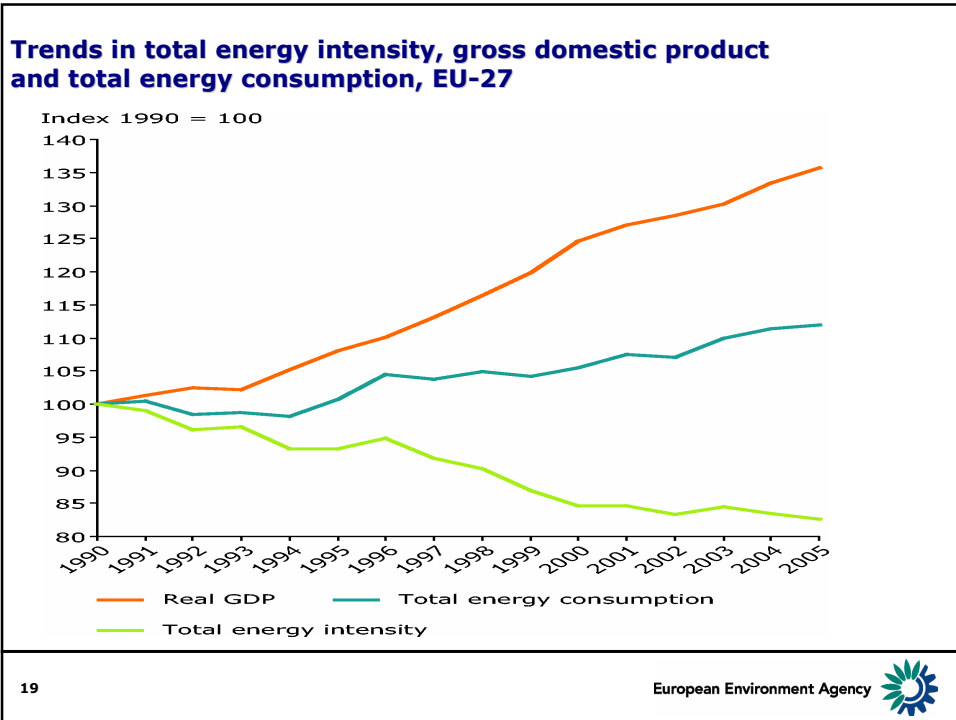


Final consumption by sector and energy losses (% of primary energy consumption)



ODEX energy efficiency index, EU-27





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Improved efficiency is offset by changing behaviour

