The background of the slide is a dark blue image showing the silhouette of a person climbing a mountain. The person is in the upper right, and the mountain peak is in the lower left. The overall tone is professional and focused on sustainability.

High-renewables European electricity supply

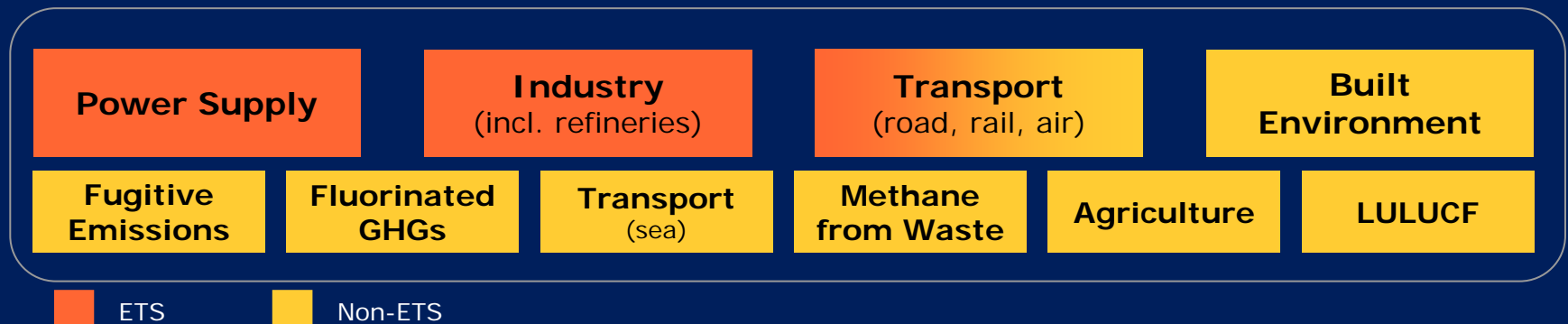
in the framework of

ambitious policies for energy efficiency and greenhouse gas reduction

Kees van der Leun
Brussels, 22 March 2010

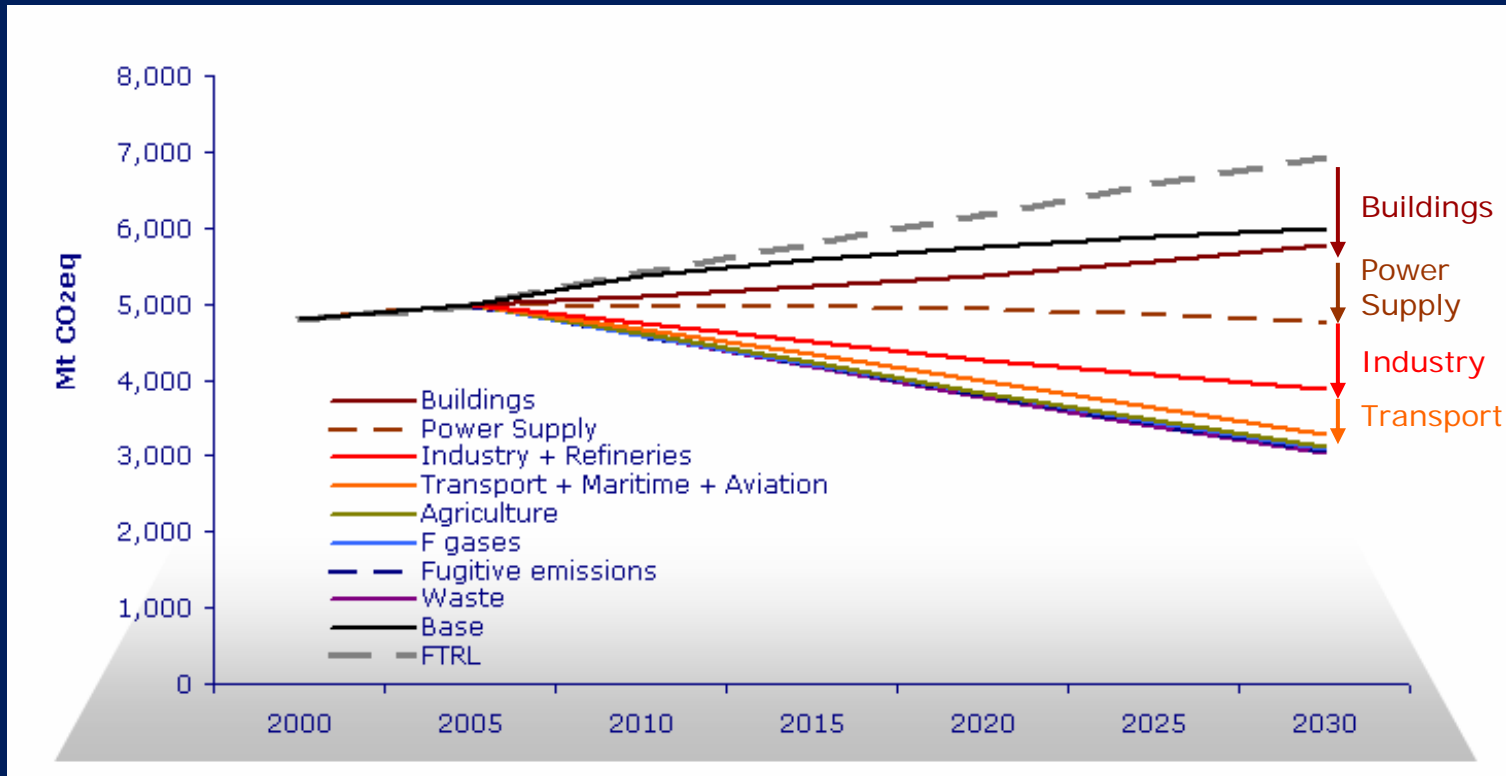
Sectoral Emission Reduction Potentials and Economic Costs for Climate Change

- “SERPEC-CC”
- Carried out from 2006 to 2009 by a consortium, led by Ecofys
- Studies for DG RTD and DG Env, covering the following sectors:

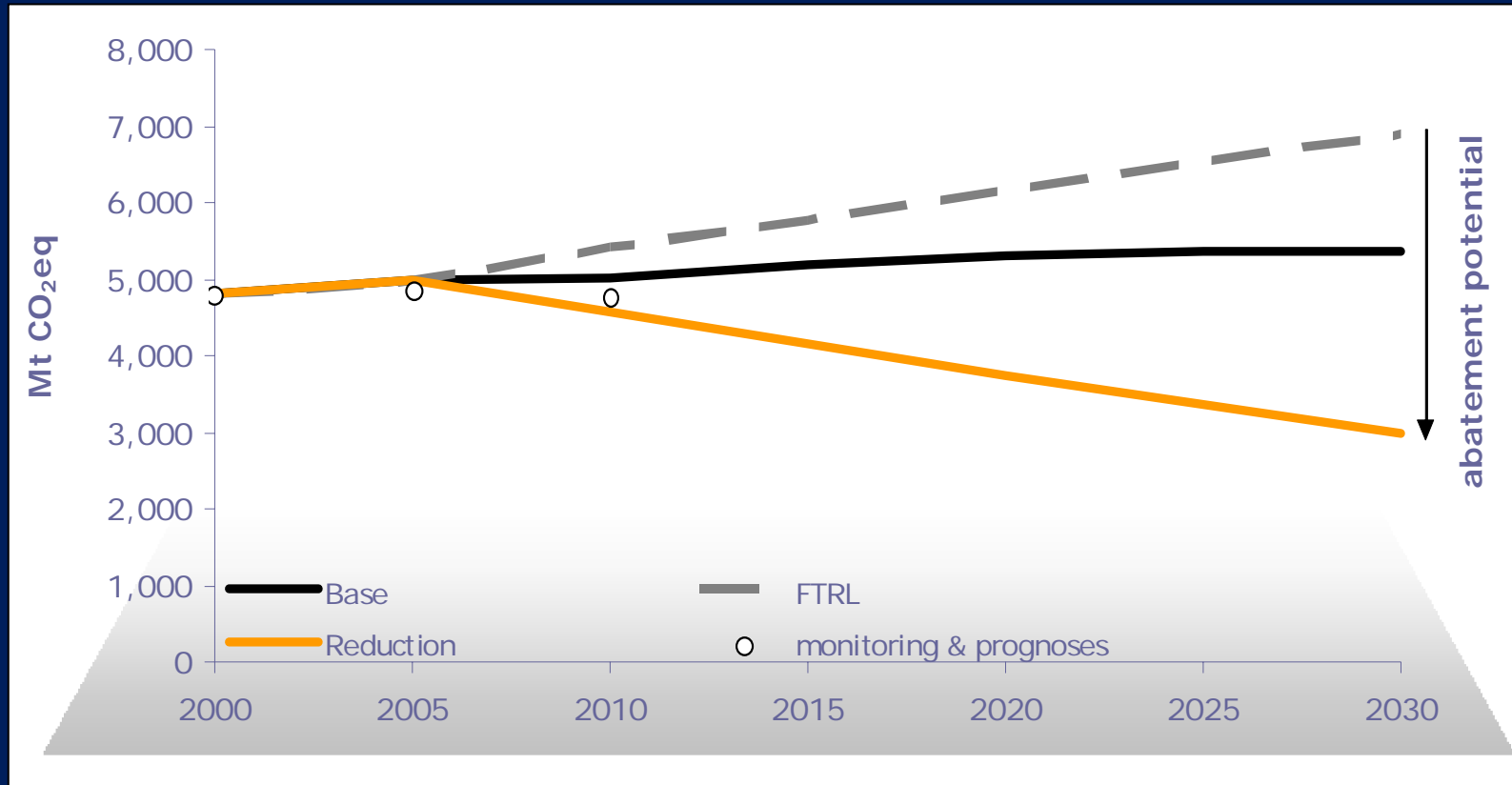


DG RTD = Directorate General for Research, Technology and Development
 DG Env = Directorate General for Environment
 LULUCF=Land Use, Land Use Change and Forestry

Comprehensive, bottom-up emissions reduction estimate by sector



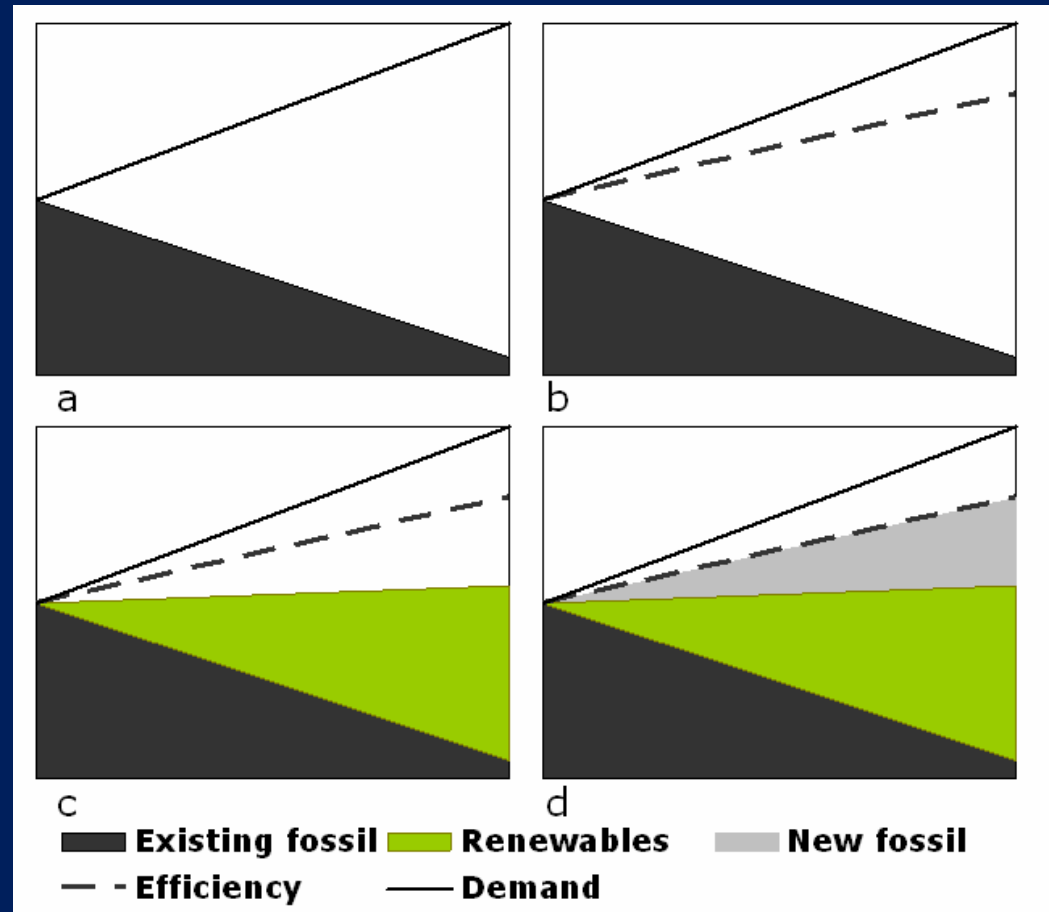
Reduction potential found:
2020: 30% below the 1990 level
2030: 45% below the 1990 level



Power supply sector necessitates a scenario approach: all options compete for the same demand

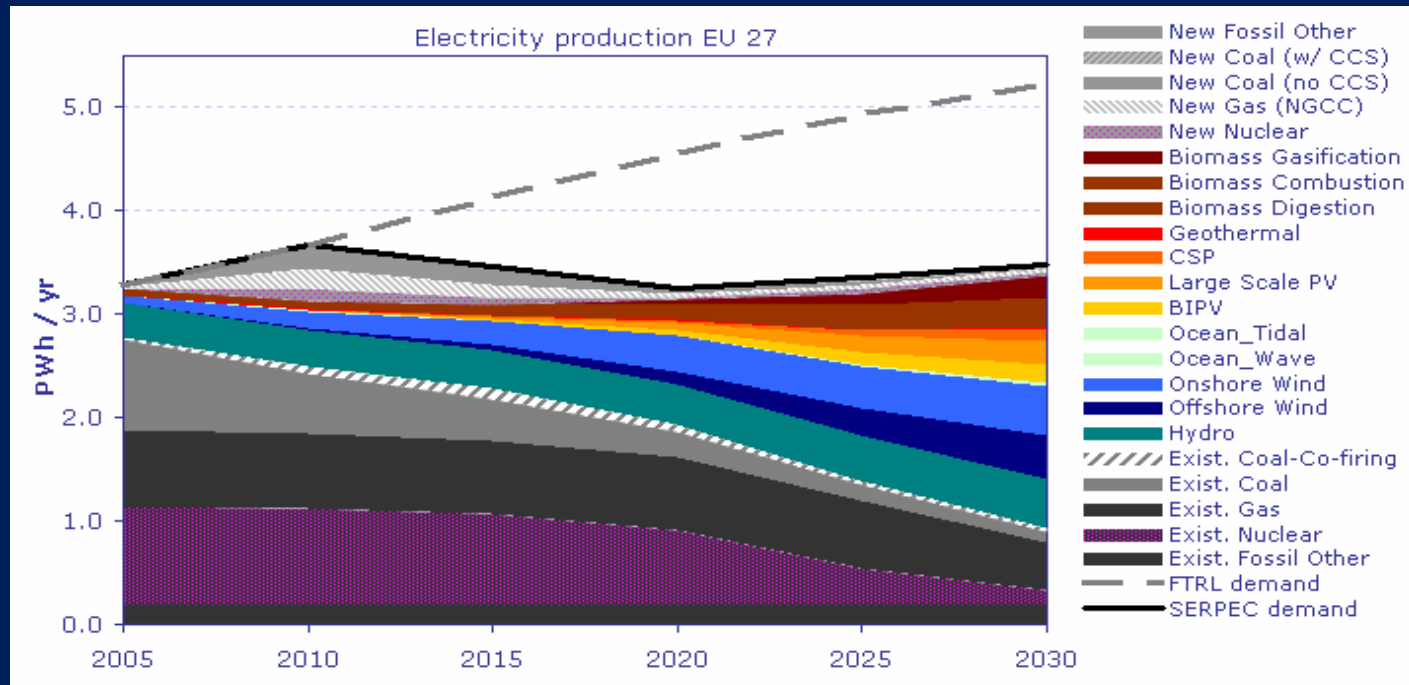
Step-wise approach to Power Supply scenario definition:

- a. Existing generation capacity (including some co-firing of biomass)
- b. Lower demand by efficiency savings
- c. Renewable power options
- d. Fill gap with NEW FOSSIL



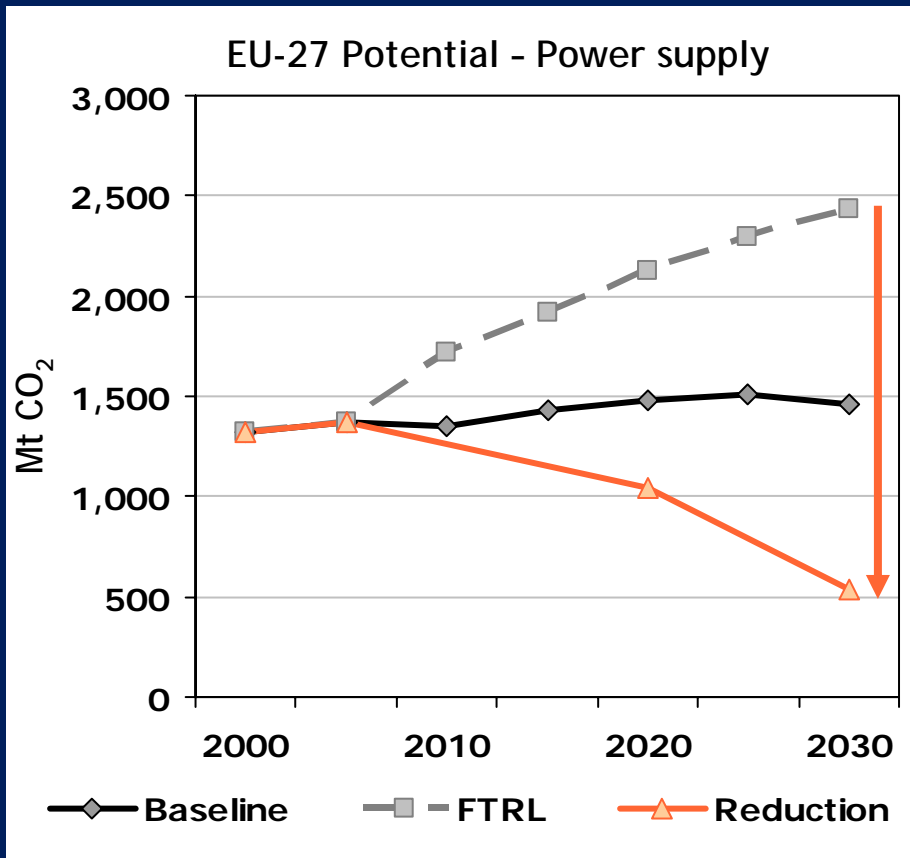
Ambitious efficiency measures and fast deployment of renewables can lead to 70% RES by 2030

- NB: Total biomass use was constrained to 50% of EU internally available, sustainable biomass potential* in 2020 and 65% in 2030



* Biomass potentials were based on the EEA study (2006): "How much bioenergy can Europe produce without harming the environment?" Report No. 7/2006

High carbon emissions savings result



- 2020 potential
 - 1,080 Mt CO₂ versus FTRL
 - of this: 660 Mt from electricity savings on the demand side
- 2030 potential
 - 1,900 Mt CO₂ versus FTRL
 - of this: 880 Mt from electricity savings on the demand side

- Approach
 - 2005 existing stock taken into account
 - Reference price:

Price (€/MWh)	2005	2030
Retail (for comparison with BIPV)	90	112
Wholesale (all others)	45	57

- Power mix emissions factor: 0.5 tCO₂/MWh

FTRL = Frozen Technology Reference Level
 Source: baseline from PRIMES; FTRL from Ecofys

Key learnings

High RES share and emissions reduction needs both:

- Full force electricity savings: double the present rate, e.g. top ambition Eco-design directive
- Maximum renewables implementation rate until 2030

Then little new fossil generation capacity needed

Acknowledgements

- The consortia which carried out the SERPEC-CC projects consisted of
 - ECOFYS [Consortium lead for both projects]
 - E³M lab at the National Technical University of Athens (NTUA)
 - IPTS group of the European Joint Research Centre (JRC)
 - CE Delft (CE)
 - AEA Technology (AEA)