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# Energy Technology Perspectives 2008 and 2010

**Dolf Gielen**  
**9 February 2009**

# Energy Technology Perspectives 2008

- **In support of the G8 Plan of Action**
  - **Launch June 6<sup>th</sup>, Japan (G8 energy ministers meeting)**
- **This is a study about the role of technology**
- **It will result in key technology roadmaps that specify development needs**
- **It can be a basis for an international technology cooperation framework**
- **It is *not* meant for country target setting in a post-Kyoto framework**
- **It is *not* a study about climate policy instruments**
- **Energy CO<sub>2</sub> and energy methane emissions**

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# Energy Technology Perspectives Publication 2008

- **Scenario analysis 2005-2050**
  - **Baseline WEO2007 Reference Scenario**
  - **Global stabilization by 2050 (ACT)**
  - **Global 50% reduction by 2050 (BLUE) –  
*consistent with WEO2007 450 ppm case***
- **How to get there**
  - **Short and medium term technology policy needs**
  - **Special attention for technology roadmaps**
- **Technology chapters:**
  - **Power sector**
  - **End-use sectors**

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# Response to ETP2008 at the G8 meeting

- **G8 + 3 leaders and energy ministers meeting, June-July 2008, Japan**
  - **Agreed on a new international initiative on technology roadmaps and transition pathways supported by the IEA**
  - **Encouraged the IEA to extend its network to developing countries and to establish a basis for appropriate transfer of technologies**
  - **Called for increased investment in clean energy technology R&D – committed USD 10 bln**
  - **Endorsed the specific IEA/CSLF recommendations on CCS (20 demonstration plants), and asked us to assess implementation to 2010**
  - **Asked to continue work on indicators**

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# Feedback from Industry

- **Continued interest to enhance indicators**
- **Interest in the roadmaps process**
  - **Started to work on cement roadmap together with CSI**
- **Agreement that industry mitigation is challenging**
- **Agreement that new technology must play a key role for deep emissions cuts**

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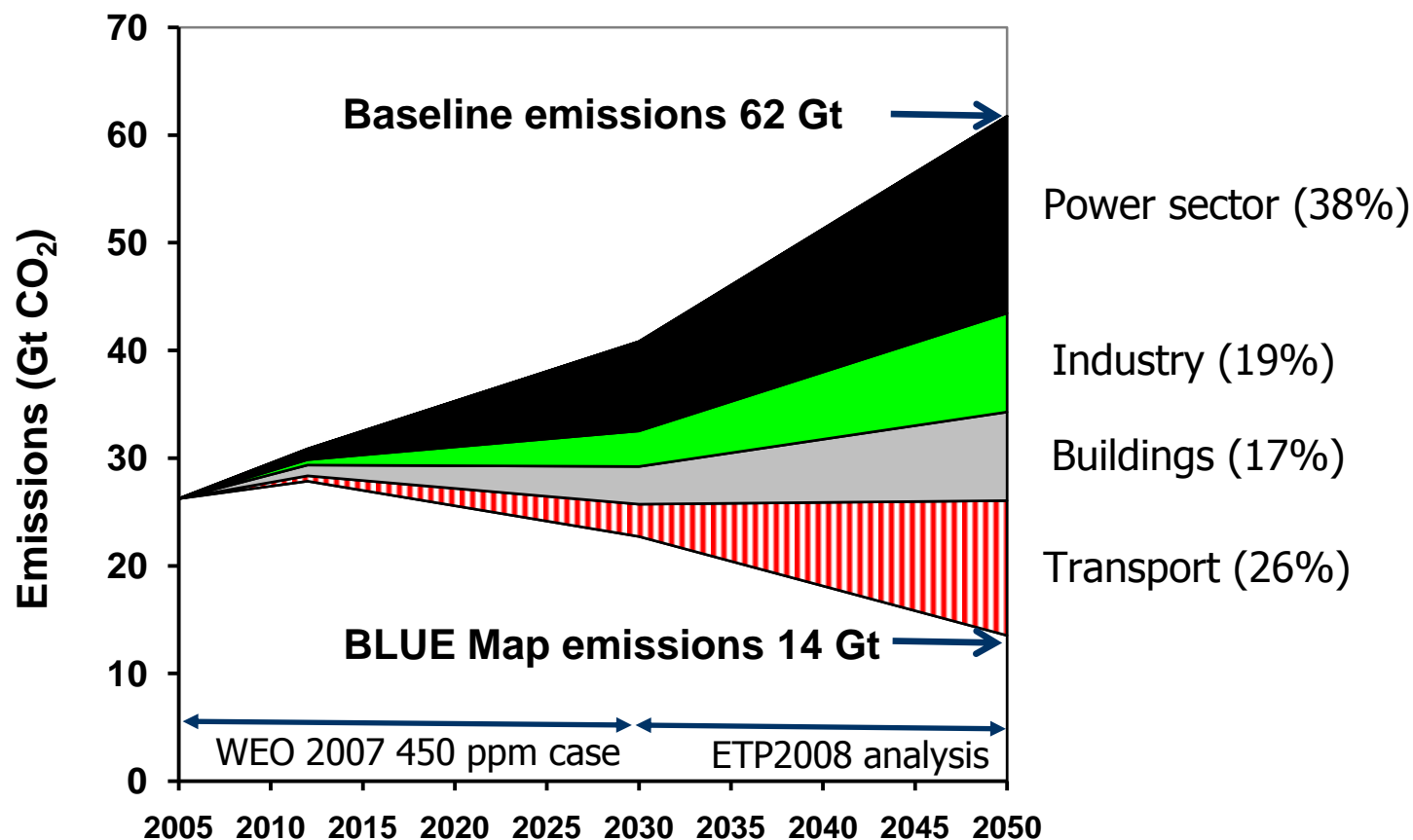
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# Sector Contributions – ETP2008



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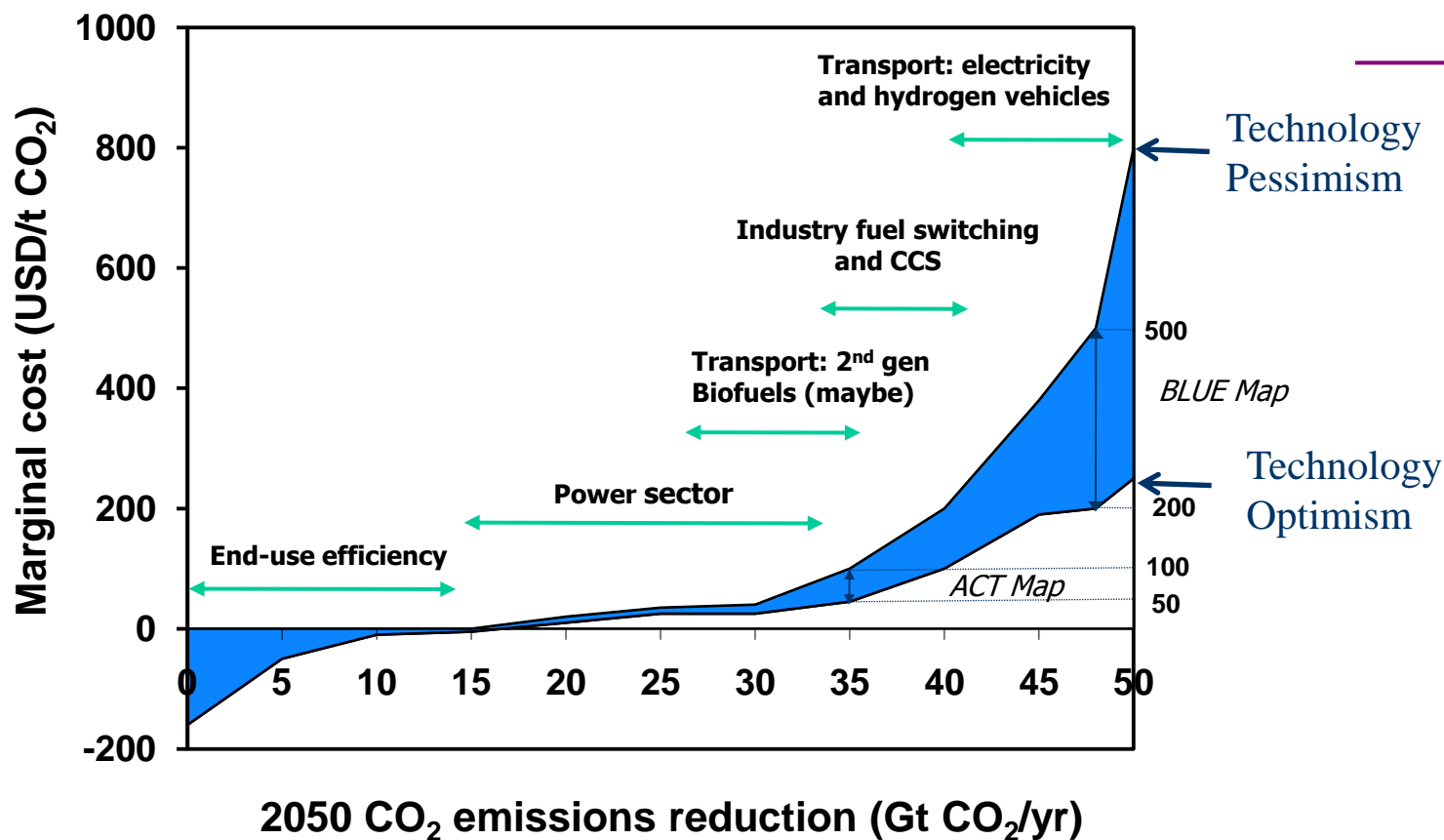
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# A New Energy Revolution ?



**To bring emissions back to current levels by 2050 options with a cost up to USD 50/t are needed. Reducing emissions by 50% would require options with a cost up to USD 200/t, possibly even up to USD 500/t CO<sub>2</sub>**

# Industrial Emissions Reduction in 2050 - ETP2008

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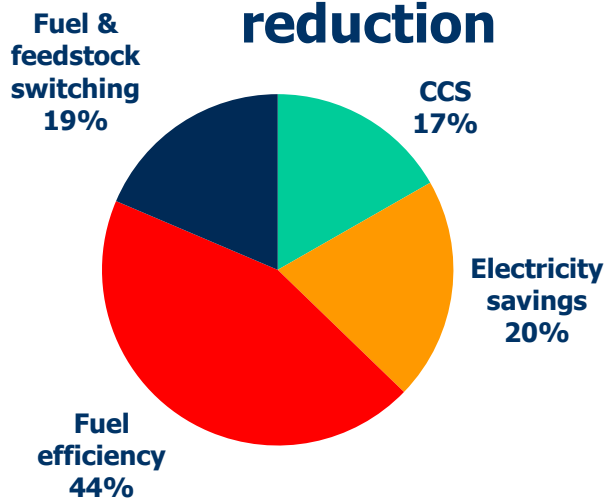
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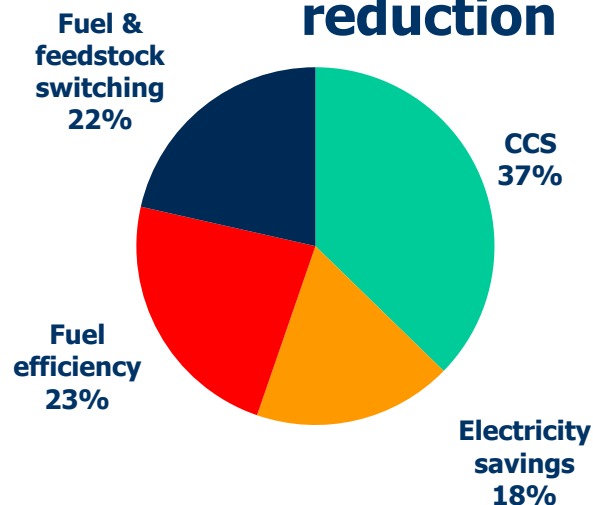
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## ACT Map 4.3 GtCO<sub>2</sub> reduction



## BLUE Map 9.8 GtCO<sub>2</sub> reduction



# Key Messages

- **We are facing an urgent challenge in the energy sector and we need a global solution**
- **Emissions stabilization – mainly energy efficiency and power sector measures (ACT scenarios)**
- **Halving emissions by 2050 implies also deep cuts for transport and industry (BLUE scenarios)**
- **Marginal cost ACT USD 50/t; BLUE USD 200/t (optimistic technology estimates)**
  - **The cost uncertainty increases with ambition level**
- **USD 45 trillion additional investment cost for BLUE (1% of GDP)**
- **Important supply security benefits**
- **We need a steep change in government policies, with closer international collaboration**
- **The roadmaps can provide a focus for this**

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# Some Observations for Industry

- **-50% for the world means -21% for industry**
- **Marginal cost for the whole economy much higher than average cost for industry**
- **CCS may become very important for industry**
- **It's not only about implementing energy efficiency – new technology is key**

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# Draft Structure of ETP2010: Four components

- Updated scenarios with more regional detail
- Roadmaps and energy transitions
- Sectoral detail (supply and demand side)
- Cross-cutting issues

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# Regional detail

## ■ India

- So far 2 workshops in Delhi
- Expert working group being established
- 1<sup>st</sup> DRAFT power sector analysis nearing completion

## ■ China

- Building on well established cooperation framework and models
- Cooperation agreement with ERI/NEA
- Visiting scientist starting half March

## ■ Europe

- Building on IER 30-country Europe model

## ■ United States

- Building on BNL multi-regional US model

# Roadmaps: Key Technology Options for emissions halving by 2050

87% of emissions reduction needed for emissions halving

## ■ Supply side

- **CCS power generation**
- Coal – IGCC
- Coal – USCSC
- Nuclear III + IV
- **Solar – PV**
- Solar – CSP
- **Wind**
- Biomass – IGCC & co-combustion
- **Electricity networks**
- 2<sup>nd</sup> generation biofuels

## ■ Demand side

- Energy efficiency in buildings
- Energy efficient motor systems
- Efficient ICEs
- Heat pumps
- **Plug-ins and electric vehicles**
- Fuel cell vehicles
- Industrial CCS
- Solar heating
- **Cement**

***Work on elaboration of roadmaps has started***

# Sectoral Analysis – Work in Progress

- **Industry (2009) (lead Cecilia Tam)**
  - Indicators and sector specific scenarios
  - Materials needs for an energy transition
  - Industry review meeting 9-10 February
- **Transport (2009) (lead Lew Fulton)**
  - Elaborate MoMo/ETP2008 scenarios
  - Special attention for non-LDV modes
  - Draft ready
- **Electricity networks (2009) (lead Shin-Ichi Inage)**
  - Draft report ready March 2009
  - Workshop with relevant IAs 3 & 4 February
  - Meetings with industry
  - Roadmap workshop June 2009
- **Buildings (2009) (lead Michael Taylor)**
  - Improve data situation
  - Elaborate new stock/renovation issues
  - Work has started

# Thank You !

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