



CCS – Early Opportunities Global Assessments

Oslo, 21-22 June 2007

Summing Up

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G8 - Gleneagles Communiqué July 2005



“We will act with resolve and urgency to meet our shared multiple objectives of reducing greenhouse gas emissions, improving the global environment, enhancing energy security and cutting air pollution in conjunction with our vigorous efforts to reduce poverty“



General Itinerary

- **Finish 2008 (Japan G8-summmmit)**
- **Interim reporting to G8 summits**
 - ◆ **2006 Russia**
 - ◆ **2007 Germany**



IEA's Gleaneagle Programme

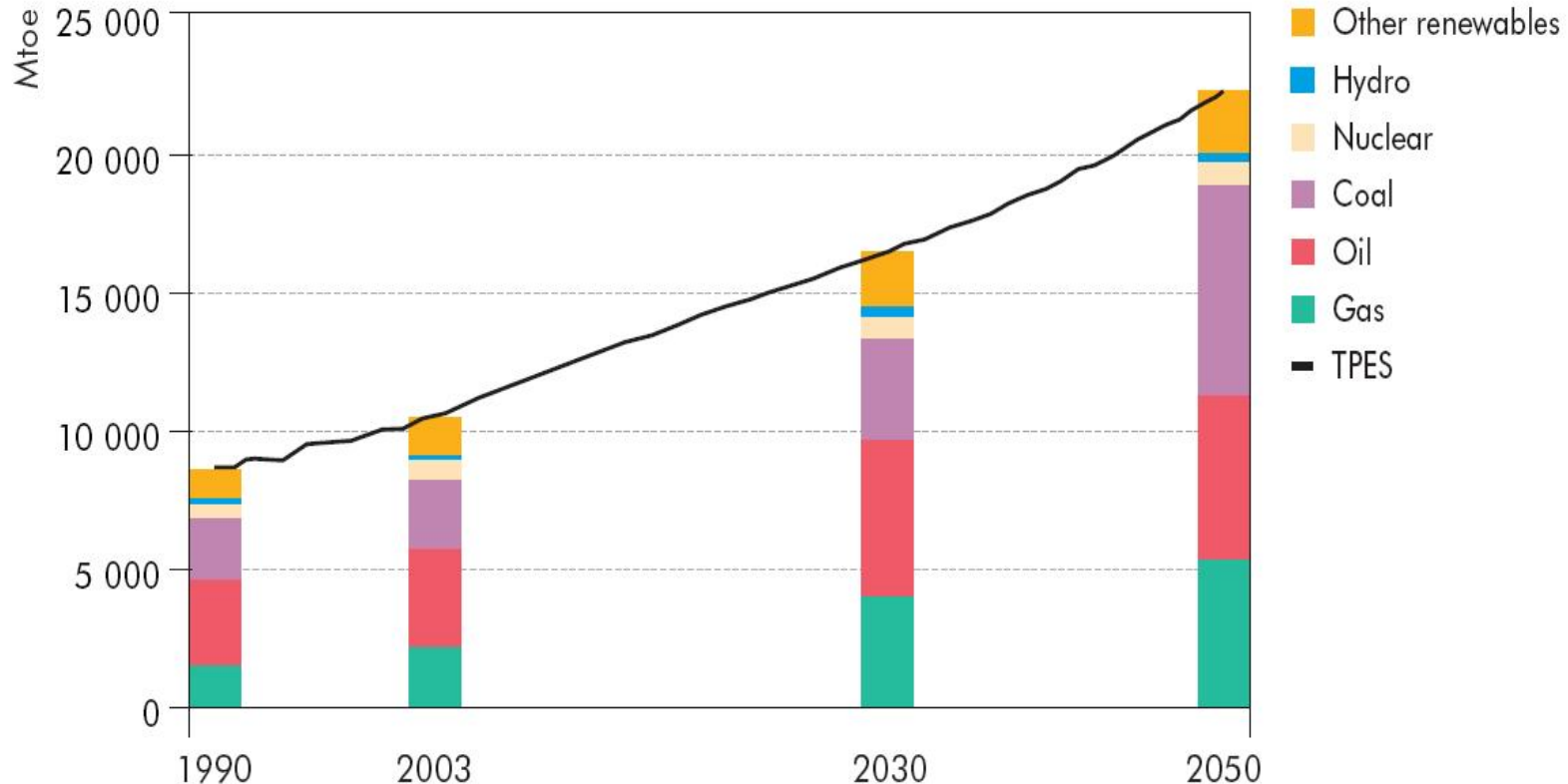
- Alternative energy scenarios and strategies
- promoting energy efficiencies in buildings, appliances, transport and industry
- Cleaner fossil fuels
- CO₂ capture and storage
- Renewable energy
- Enhanced international co-operation



G8 with Outreach-Representatives 2007 Heiligendamm



World Total Primary Energy Supply by Fuel in the ETP Baseline Scenario 2003-2050



Primary energy use more than doubles between 2003 and 2050, with a very high reliance on coal

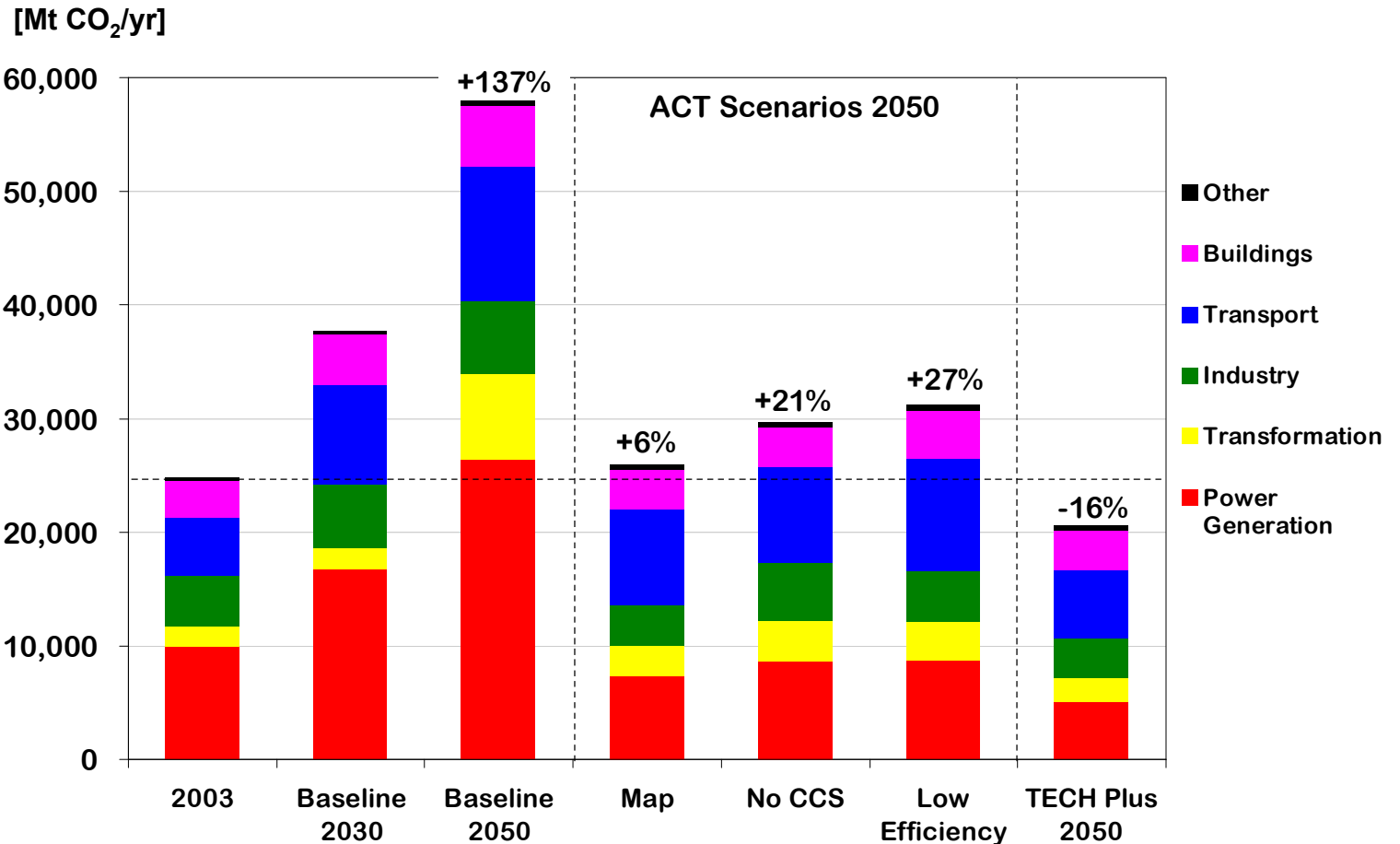
ENERGY
TECHNOLOGY
PERSPECTIVES

2006

Scenarios & Strategies
to 2050

Global CO₂ emissions 2003-2050

Baseline, ACT and TECH plus scenarios



CO₂ emissions can be returned to current levels through a portfolio of technologies and CO₂ emissions price of \$25/tonne CO₂ from 2030 onwards

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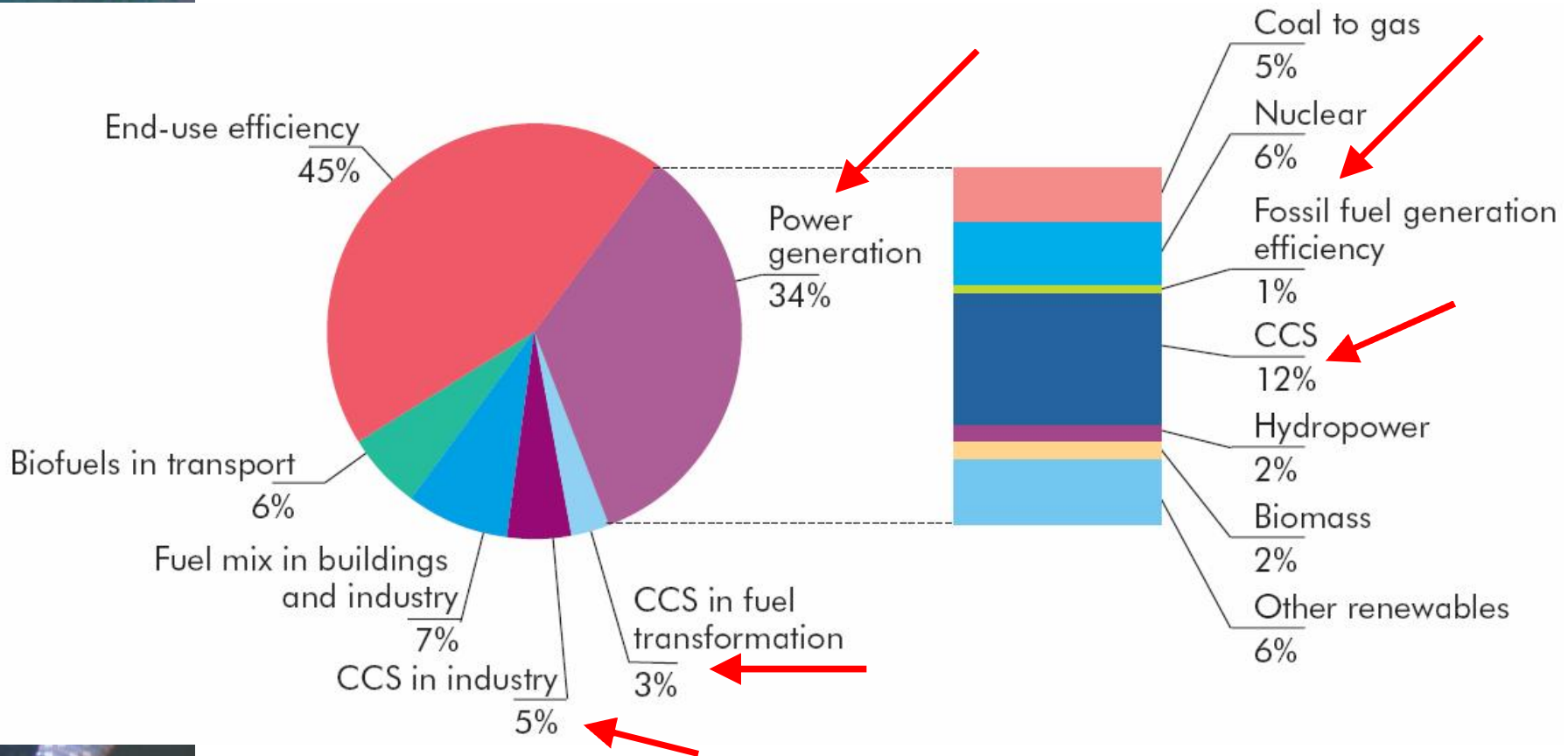
Scenarios & Strategies
to 2050



Accelerated Technology Scenarios (ACT)

- **Contributions to reduction of CO₂ emissions in 2050 compared to baseline scenario**
 - **31-53% Energy efficiency**
 - **20-28% CO₂ capture and storage (CCS)**
 - **11-16% Fuel switch**
 - **5-16% Renewable energies (electricity)**
 - **2-10% Nuclear power**
 - **~6% Bio fuels**
 - **1 – 3% Other technologies**

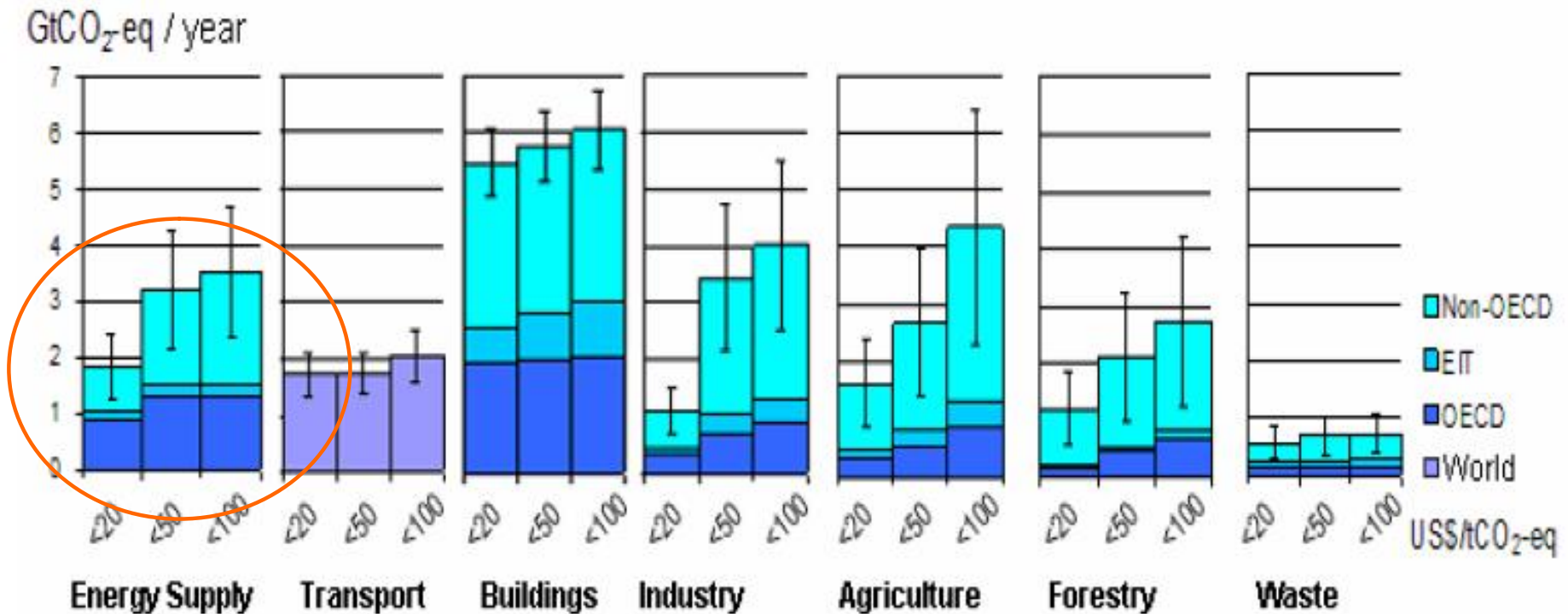
Role of CCS in Mitigating CO₂ Emissions (Map Scenario)



CCS in all scenarios 20 – 28% emissions reduction compared to Basis scenario



All sectors and regions have the potential to contribute



Note: estimates do not include non-technical options, such as lifestyle changes.



CCS Challenges (1)

- Developing thousands of Sleipner fields by 2050
- Making new plants capture ready
- Predictable economic incentives in the medium and longer term
- Relevant national and international legal and regulatory frameworks

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CCS Challenges (2)

- Favourable public perception
- Technology
 - ◆ Total cost of capture
 - ◆ Building the CO₂ Infrastructure
 - ◆ Proof for storage retention in different geological structures
 - ◆ Avoiding the technology's "Valley of Death"
- Not missing the window of opportunity for CO₂-EOR

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Workshops on Near-term Opportunities for CCS

Three events:

- **Issues Workshop**
(San Francisco) 22-23 August 2006
Summary Report available
Status of analysis/follow-up ...
- **Assessment Workshop**
(Norway) 21-22 June 2007
- **Recommendations Workshop**
(Canada)





Analysis Suggested in San Francisco (1)

- Catalogue national and international incentives and models for CCS and report on processes (done); address risk (?)
- Prepare status report post 2012 issues (?)
- Monitor World Bank activities for new funding mechanisms (?); review other existing financing models (?)





Analysis Suggested in San Francisco (2)

- Status report on legal/regulatory models (done, new IEA publication)
- Summary of CCS activities (to some degree in “Legal Aspects” and upcoming)
- Stakeholder analysis (?)
- Review of existing public outreach activity, media coverage (to some extent)
- Prepare accident scenario simulation (?)





Agenda Items for Future Workshops Suggested in San Francisco

- **Technical**
- **Commercial and financial**
- **Legal and regulatory**
- **Public awareness**
- **International mechanisms**



What We Have Learned (1)

- Progress in international work (London Convention)
- Many more national activities
- No full size plant yet that demonstrates all aspects of CCS
- Cost remain an issue
- Uncertainty remains an issue



What We Have Learned (2)

- **Communication and public perception remains an issue; transparency has shown good results**
- **Need for regulation: Not one size fits all, but international exchange about key issues**
- **Demonstration plants key to learn about technology and to develop full legal and regulatory framework**
- **Insurability**
- **Infrastructure: Role for governments and private sector?**



Towards the 3rd CCS Workshop in Calgary, Canada

- Summary draft report on Oslo-workshop in September
- Recommendations workshop in November
- Recommendations to G8 in 2008 (including recommendations on capture-capability)