



ESRI Forum

Current State and Prospects of GHG reduction targets

The EU's energy and climate strategy

Christian Egenhofer

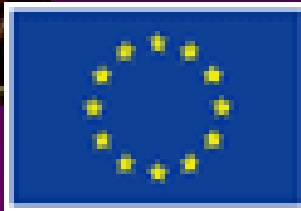
Senior Research Fellow

Centre for European Policy Studies (CEPS), Brussels



Roppongi Hills Mori Tower

Roppongi Academyhills, Tokyo 16 March 2007

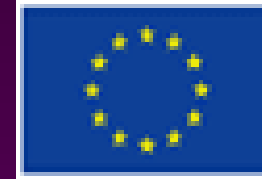


On 8/9 March 2007 EU Heads of Governments and States adopted a new *integrated* climate and energy policy

Legally binding targets

... by 2020

- - 20% greenhouse gas emissions (unilateral); if other countries join: - 30%
- + 20% renewables in overall energy mix
- + 20% better energy efficiency
- + 10% biofuels in overall energy mix
- All new fossil fuel power plants to be ready for carbon capture and storage (CCS)



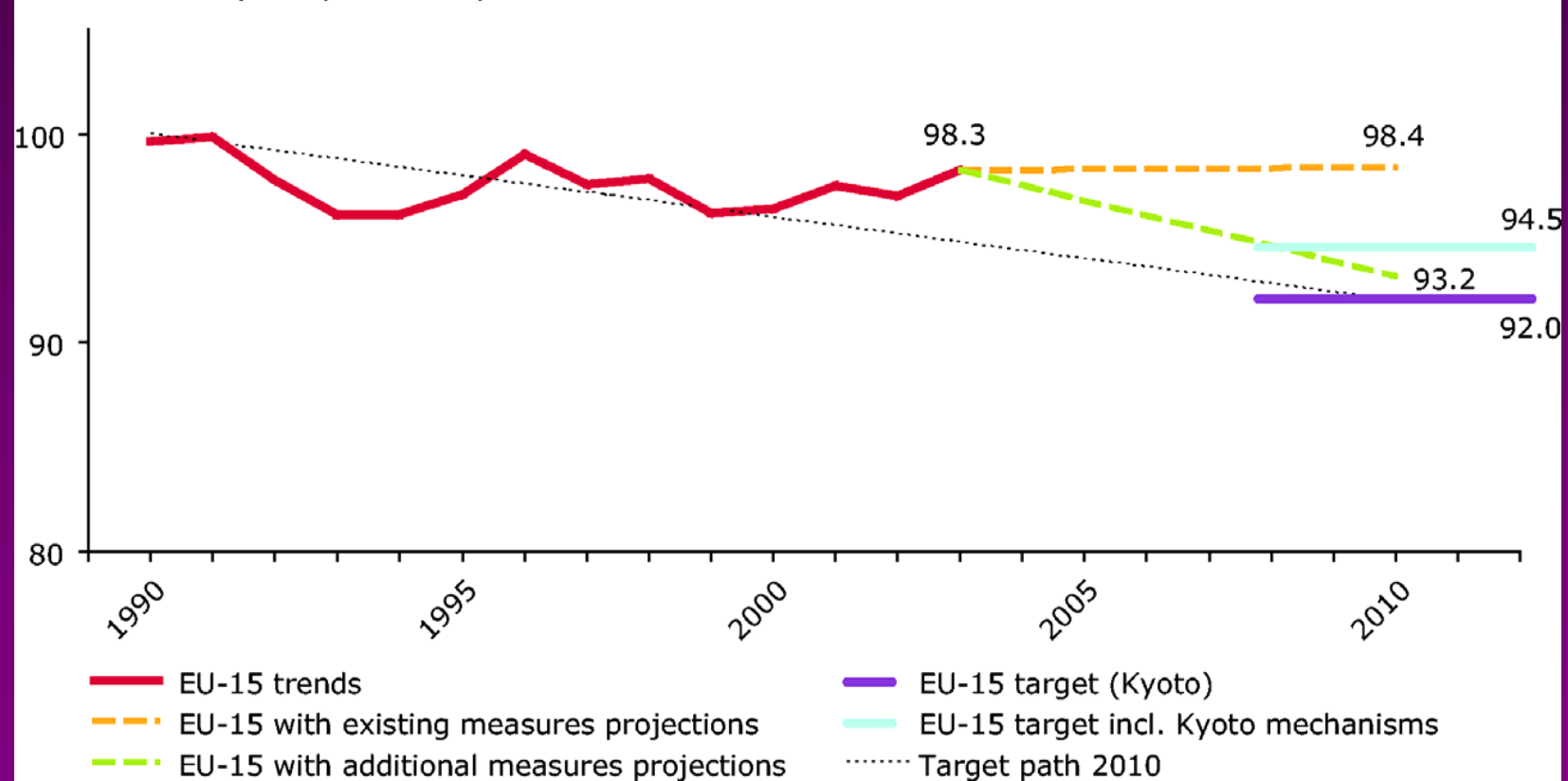
Objectives:

- **“Increase security of supply**
- **Ensuring the competitiveness of European industry and the availability of affordable energy;**
- **Promoting environmental sustainability and combatting climate change”**

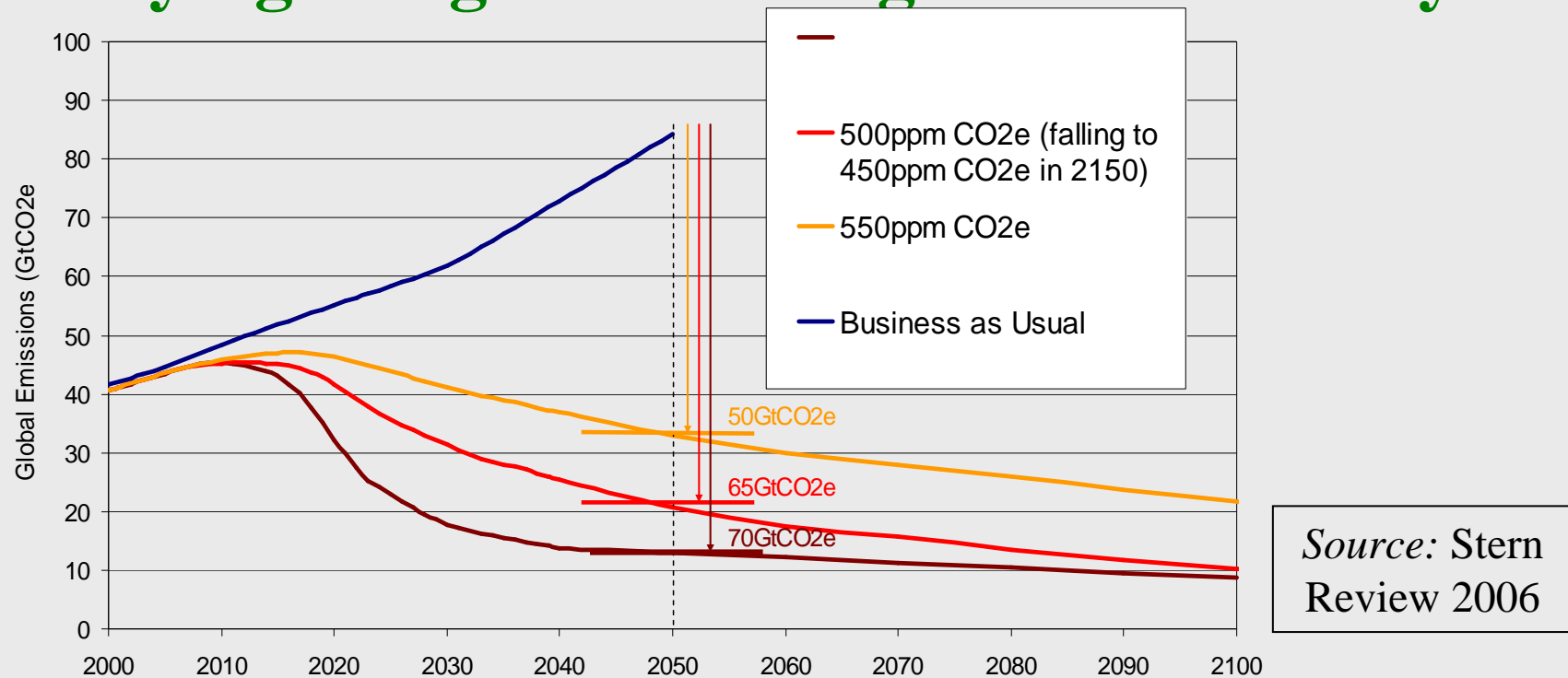
“... EU is committed to transforming Europe into a highly energy-efficient and low greenhouse-gas-emitting economy ...”

The Emissions Challenge

GHG emissions (base year = 100)



Delaying mitigation is dangerous and costly

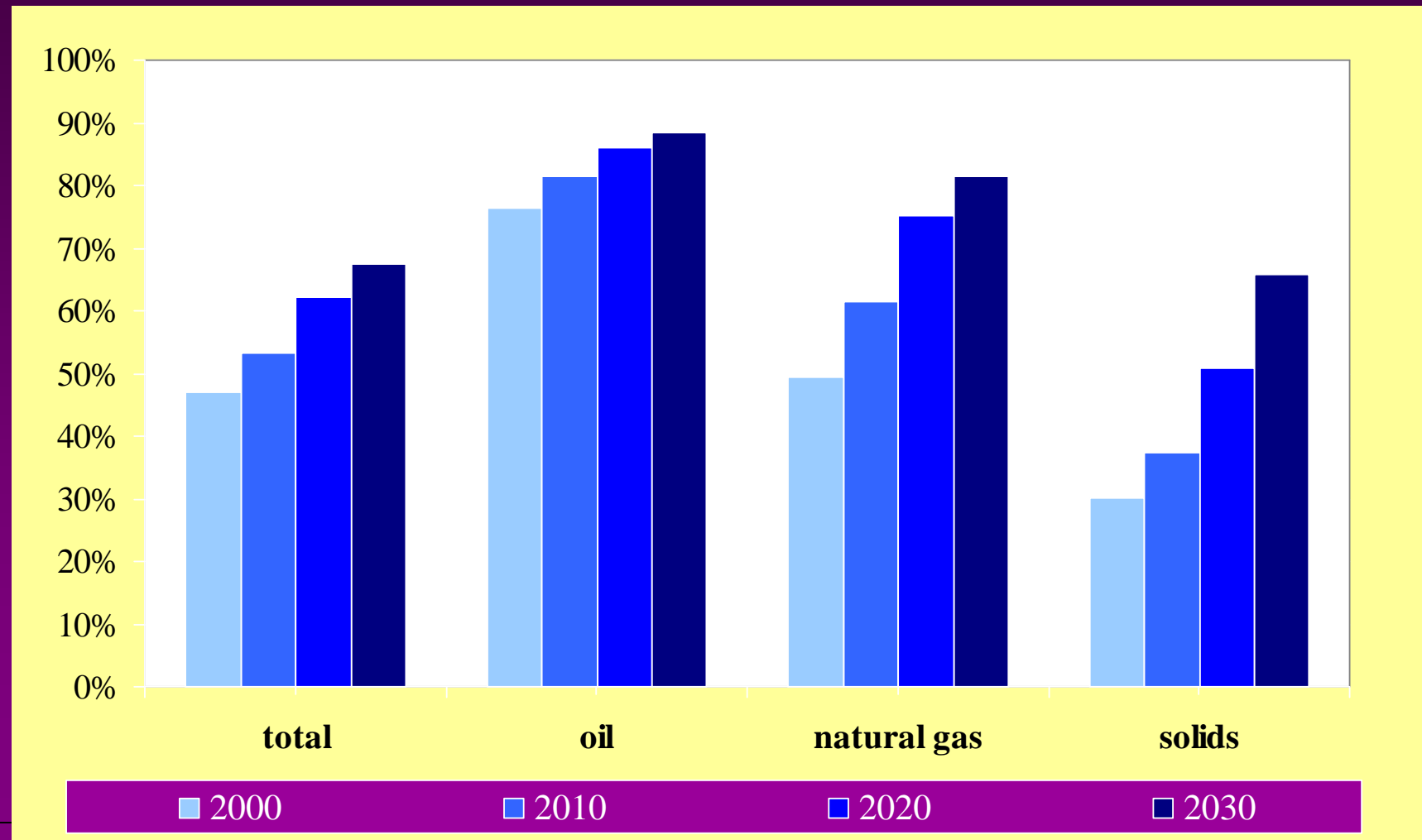


Stabilising below **450ppm CO₂e** without overshooting, would require emissions to **peak by 2010** with **6-10% p.a.** decline thereafter.

If emissions **peak in 2020**, we can stabilise below **550ppm CO₂e** if we achieve annual declines of **1 – 2.5%** afterwards

A 10 year delay almost doubles the annual rate of decline required

The Energy Supply Challenge: EU Import Dependency



Main suppliers

Oil

- **Russia (31%)**
- **Middle East: 22%**

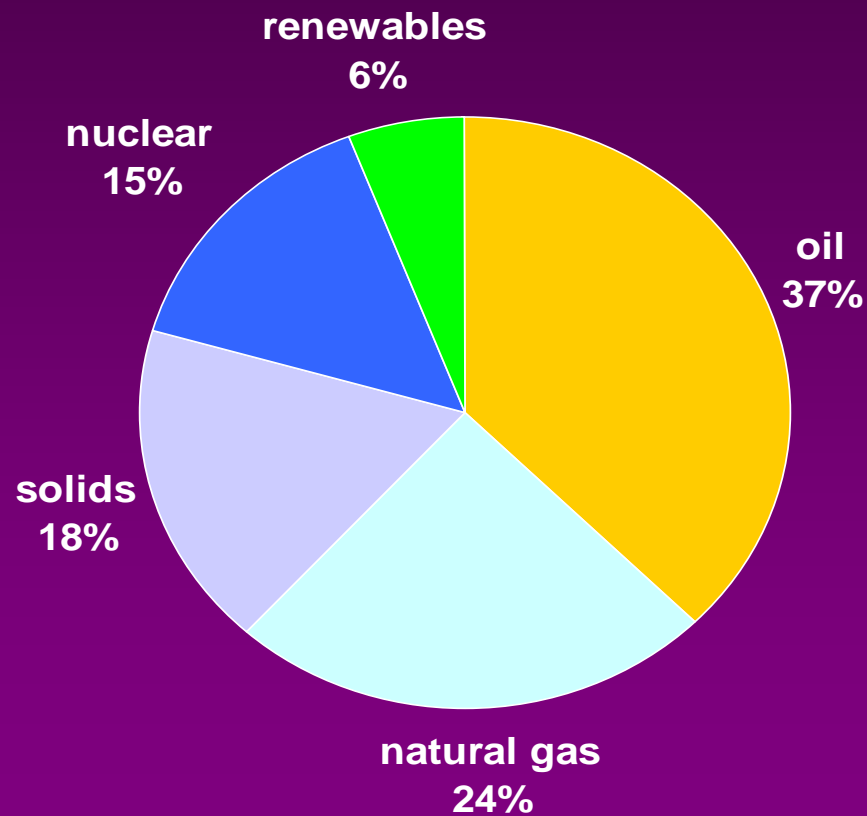
Gas

- **Russia: 33%**
- **Algeria: 21%**

Coal

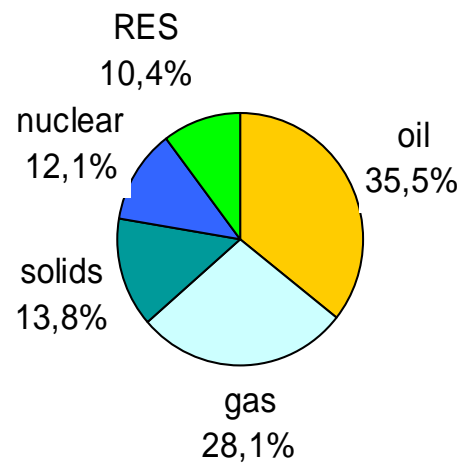
- **South Africa: 26%**
- **Russia: 16%**

How to change current energy mix

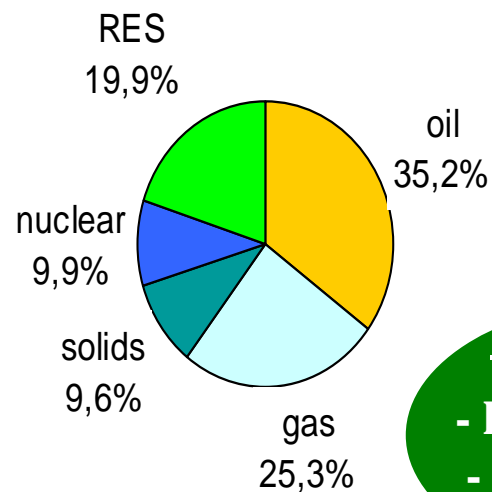


Energy mix 2020 ?

baseline scenario
consumption 1890 Mtoe



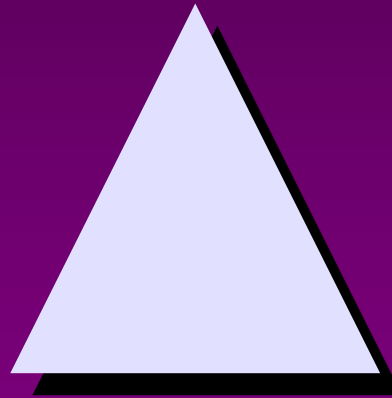
policy scenario
consumption 1633 Mtoe



- less emissions
- less consumption
- less dependency

How ?

Low carbon energy (supply)



Efficiency

Technology

Green activism or economic realism?



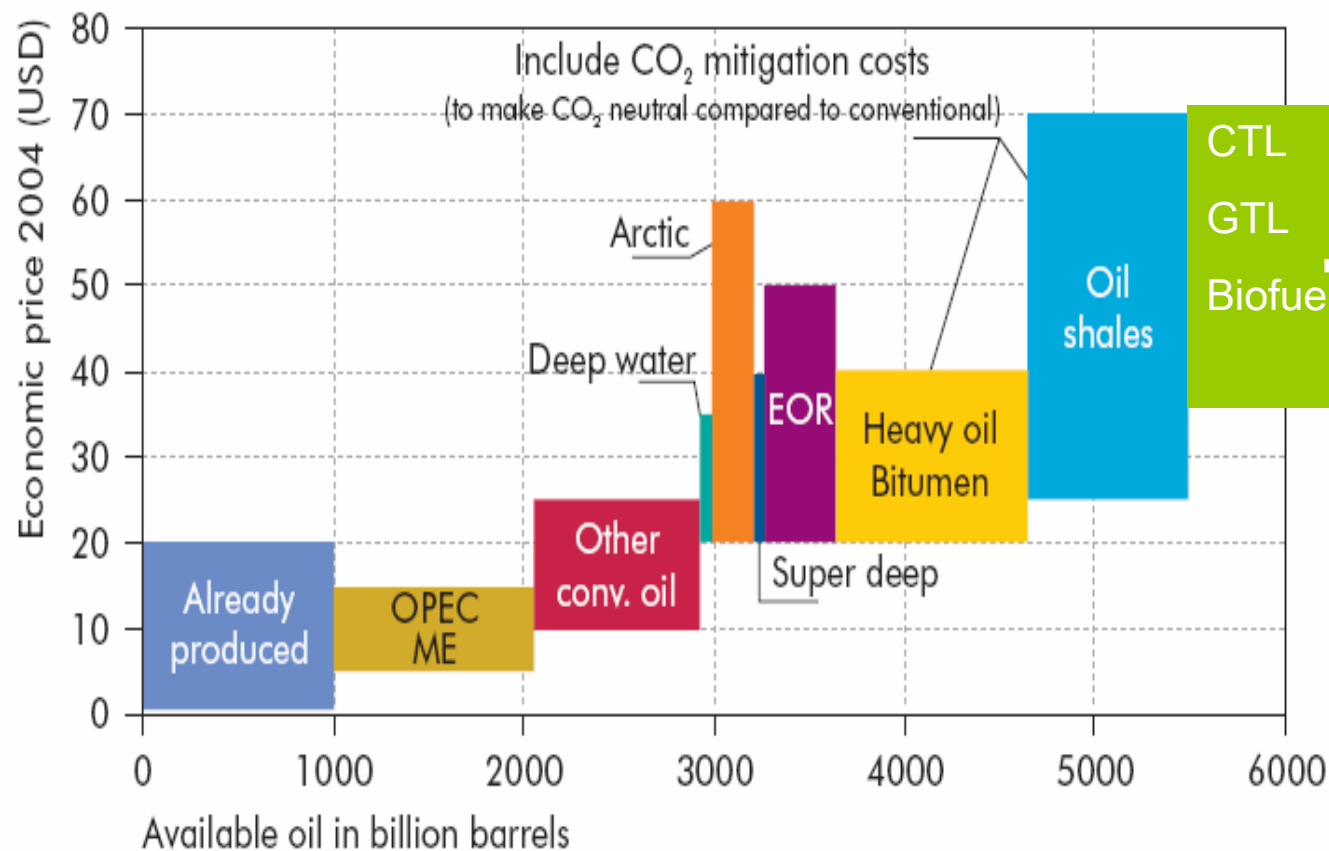
Business cautiously welcomes initiative

Why ?

- **Strong political commitment**
- **EU Leadership on climate change**
- **Making the EU popular with citizens**
- **Acting now is cheaper than acting later**
- **Ambitious but doable**

But real economic and political benefits

The energy dimension: OPEC and conventional oil may peak: Most recoverable resources should become economical at oil prices significantly below current level



Source: IEA 2005, *Resources to Reserves – Oil & Gas Technologies for the Energy Markets of the Future*

**Really good news is that
new conventional and non-conventional
are outside OPEC**

Potential of Non-Renewable Energy Sources

Energy Resource	Potential → up to 10 trillion (10 ⁹) bbl oil equivalent)
Total worldwide petrol and natural gas production since start of fossil fuel production	~ 1 500
Conventional oil	1 792
Conventional gas	2 148
Heavy oil, bitumen	2 323
Deep sea, arctic, enhanced oil recovery etc.	> 2 500
Non conventional gas	> 8 000
Coal	23 820
Uranium	520 to 1 750

Potential of Non-Renewable Energy Sources

Energy Resource	Potential → up to 10 trillion (10 ⁹) bbl oil equivalent)
Total worldwide petrol and natural gas production since start of fossil fuel production	
Conventional oil	
Conventional	
Heavy oil, bit	
Deep sea, arctic etc.	
Non conventional	
Coal	
Uranium	

International Energy Agency:
5-10 trillion barrels of oil equivalent exist
= 3 to 8 times total production since beginning of fossil fuel age

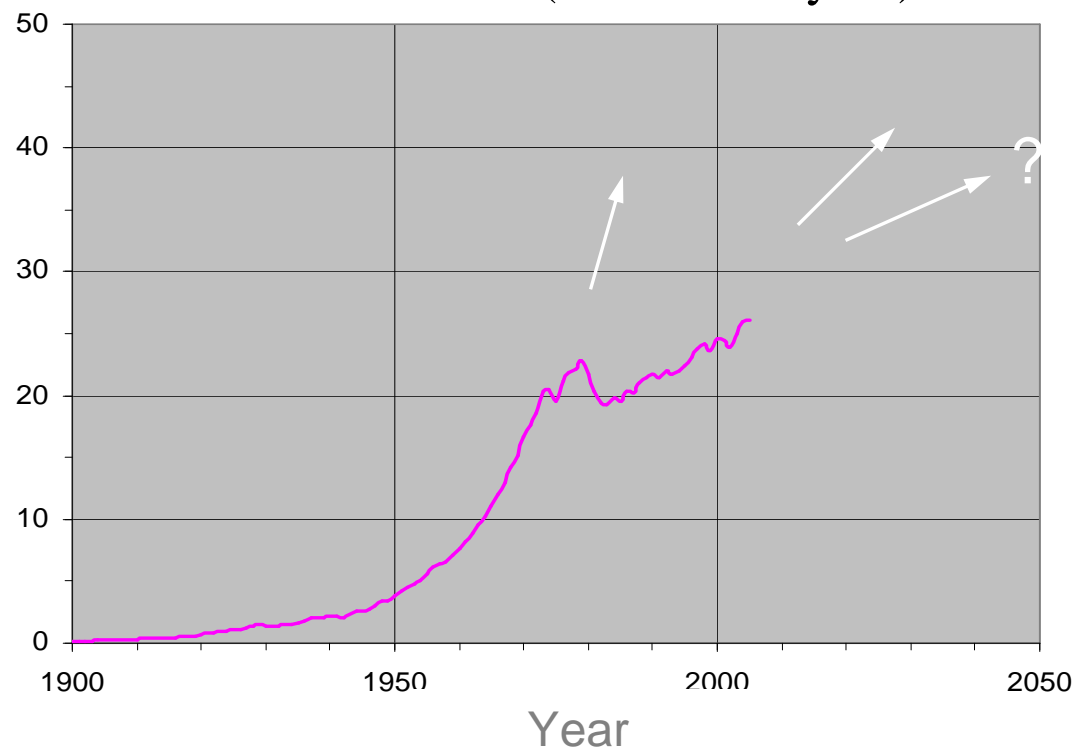
Whether these resources will come to the market will depend on market forces, i.e. supply/demand and technology

**(Global) climate change action plays major role:
global carbon price**

- 1. makes new reserves economic**
- 2. promotes the development of alternative sources
(e.g. clean coal/carbon capture and storage,
renewables)**
- 3. deployment of existing technologies such as
nuclear**

Global Crude Oil Production and the Oil Price Shock have reduced demand – with a time lag

Crude Oil Production (10^9 barrel / year)



Costs and benefits

Savings from energy efficiency

- Euro 50 billion p.a. by 2012
- Euro 100 billion p.a. by 2020; possibly higher depending on oil price

Possibly overall net benefit but not all benefits can be given a monetary value – confirmed by a CEPS study

Energy efficiency could achieve almost all of the 20% target for greenhouse gas emissions.

Source: European Commission

Costs and benefits

Renewables

- With CO₂ price of Euro 20 per tonne, no extra costs
- 20% share will cost Euro 18 billion p.a. at oil price of \$ 48 per barrel;
- At \$ 78 per barrel; costs are Euro 10,6 billion p.a.

Benefits for job creation and technology leadership.

Summary

- **EU faces an energy (import dependency) and climate change challenge**
- **Integrated energy and climate change package tries to address these**
- **Strong climate change policies if applied globally promotes the development of a wider variety of supply options (new conventional fossil resources, non-conventional resources, renewables, nuclear etc.**

Summary (2)

- **This reduces influence of supplier countries**
- **Costs are not excessive even if not all benefits can be calculated such as energy security, employment, technological leadership**
- **Reduction of energy consumption is crucial to keep energy bill constant (while prices increase)**
- **Strong political commitment and support from citizens have been most important**



**CENTRE FOR
EUROPEAN
POLICY
STUDIES**

Christian.egenhofer@ceps.eu

Place du Congrès 1

B-1000 Brussels

T: +32 2 229 3911

F: +32 2 219 4151

www.ceps.eu