

*New approaches to secure Europe's energy supplies
First SECURE stakeholders meeting*

LONG-TERM ENERGY SECURITY RISKS FOR EUROPE: A SECTOR-SPECIFIC APPROACH

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OUTLINE

- General context of the paper
- Structure of the paper
- Introduction:
 - a sector-specific approach
 - the concept of security of supply
 - supply risk analysis
- Part 1- Specific supply risks for the major energy sources:
 - oil
 - natural gas
 - coal
 - nuclear
 - renewable energy sources
- Classification of security of supply risks in the EU

GENERAL CONTEXT OF THE PAPER

- This study is based on a background document initially conceived for the SECURE project: “Background paper on long-term security strategy for Europe”
- Work Package 3 (task 3.1)
- The paper is still a work in progress
- The next focus will be on the policy options to face EU energy supply risks: global/EU/Member States’ level
- It will eventually turn into a CEPS book by the end of 2009

STRUCTURE OF THE PAPER

INTRODUCTION

1. The concept of security of supply
2. Supply Risk Analysis
3. EU Energy Trends
4. General policy context and current developments

SPECIFIC SUPPLY RISKS FOR THE MAJOR ENERGY SOURCES

1. Oil
2. Natural Gas
3. Coal
4. Nuclear
5. New Renewables

CROSS-CUTTING ISSUES

1. Energy efficiency
2. Electricity
3. Europe's external energy policy
4. Environment and climate change

CONCLUDING REMARKS

A SECTOR-SPECIFIC APPROACH

- *Objective:* to move away from generalisations on security of energy supply
- There are fuel-specific diversities in the EU:
 - different risks for each energy source
 - needs for sector-specific qualifications
 - as a consequence, solutions must be sector-specific
- *Outcome:* to build a map from which policy-makers can identify sector-specific policy-options

Origins of this approach:
IEA, *Natural Gas Security Study* (1995)
Stern, *Security of European Natural Gas Supplies*
(2002)

Other CEPS works based on this approach:
INDES working papers (2004)
TFR on “Energy Policy for Europe” (2008)

THE CONCEPT OF SECURITY OF SUPPLY

- Elusive and controversial definition but two common features:
 - a) reasonable prices
 - b) uninterrupted availability
- Economic view vs political view
 - Economic view: energy matters are subject to market rules only
 - Political view: energy policy depends on foreign policy, hard power and national security
- Energy policy vs climate change policy

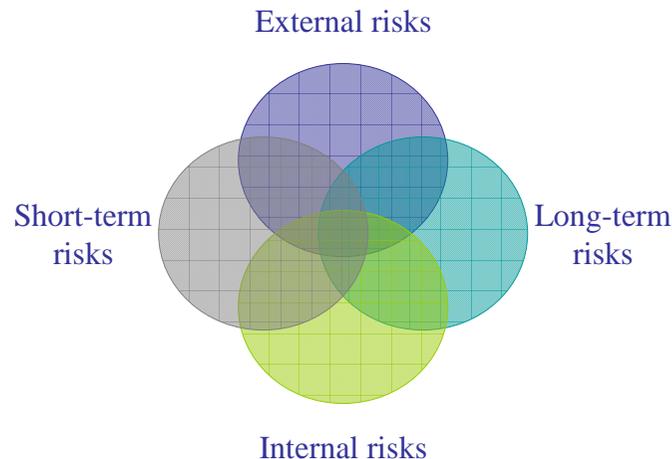


Complementarity and integration of the two dimensions

ENERGY SUPPLY RISK ANALYSIS

RISKS

- Geological
- Geopolitical
- Economic
- Technical
- Environmental



FUELS/

CROSS-CUTTING ISSUES

- Oil
 - Natural gas
 - Coal
 - Nuclear
 - Renewable sources
 - Electricity
 - Energy efficiency
 - Climate change
 - External energy policy
- Cross-cutting issues*

OIL

- Rising demand in the transport sector, declining oil production and increasing oil import dependence
- Transport risks:
 - by pipelines: aging infrastructures; political risks
 - by tankers: chokepoints vulnerability to piracy, accidents
- Competition for global resources:
 - increasing demand in developing countries
 - oil peak
- Oil price volatility:
 - high prices: negative impacts on the overall economy
 - low prices: negative impacts on energy investments and on the development of a low-carbon economy

NATURAL GAS

- Rising demand, declining production and increasing import dependence
- External risks:
 - under-investment in gas producing countries
 - exporters' reliability risks
 - transit risks
- Internal risks:
 - short term: investment to cope with low-probability events
 - long-term: ability of the market to provide timing signals for investment in transmission and distribution

COAL

- Both demand and production of coal has decreased in the EU and import dependence is expected to rise
- Long-term: coal imports are regionally diversified; from stable countries; abundant; safe transport
- Short-term: a) supply disruptions due to technical accidents, extreme weather conditions, underinvestment; b) changing global demand structures
- Environmental risks associated to extraction and combustion of coal and high climate change risks

NUCLEAR ENERGY

ADVANTAGES

- Increasing competitiveness
- Indigenous fuel
- Small uranium consumption
- Low-carbon intensity

RISKS

- High investment risks
- High safety risks
- Waste disposal problem
- Public opinion's opposition
- Uranium availability

RENEWABLE ENERGY SOURCES

ADVANTAGES

- Reduced import dependence from fossil fuels
- Structural advantages
 - storability
 - abundant availability
 - transportability
- Reduced energy price risks and energy price volatility
- Low CO₂ content

RISKS

- Structural drawbacks:
 - intermittency
 - seasonality variation
 - needs for back-up capacity
- Infant industry: high costs
- Possible RES import dependence

CLASSIFICATION OF SECURITY OF SUPPLY RISKS: GEOLOGICAL & GEOPOLITICAL RISKS

Type of risk	Events	Price rise		Probability in 20 years	Duration	Fuel affected					
		Intl.	Domestic			Oil	Gas	Coal	Nuclear	RES	Elec.
<i>Geological risks</i>											
Resource depletion/shortage	Lack of investment; extraction difficulties; unsustainable global demand; political constraints	Yes	Yes	Low	Decades, permanent	x	x	x	(x)	–	–
<i>Geopolitical risks</i>											
Voluntary output reduction	Quotas on production (by OPEC cartel; by a possible gas cartel); supply cut-off	Yes	Yes	Low-medium	Months, days	x	x	–	(x)	(x)	–
Involuntary output reduction	Civil unrest; political turmoil; war; terrorism	Yes	Yes	Low-medium	Variable	x	x	–	–	–	–
Transport and transit risk	Transport: sea-lane bottlenecks; lack of investment; piracy Transit: political instability of transit countries; tense relations with exporting countries	Yes	Yes /No	Low-medium-high	Variable	x	x	–	–	–	x

CLASSIFICATION OF SECURITY OF SUPPLY RISKS: ECONOMIC RISKS

Type of risk	Events	Price rise		Probability in 20 years	Duration	Fuel affected					
		Intl.	Domestic			Oil	Gas	Coal	Nuclear	RES	Elec.
<i>Economic risks</i>											
Under-investment	Transition towards liberalisation; lack of investment incentives; capital shortage; public opinion opposition	No	Yes	High	Years	x	x	x	x	x	x
Market disruption	Regulatory failure/shortcoming	Yes	Yes	Medium	Variable	x	x	–	–	x	x
Price fluctuation	Supply-demand imbalance; lack of spare capacity; speculation	Yes	Yes	High	Months, years	x	x	–	–	x	x

CLASSIFICATION OF SECURITY OF SUPPLY RISKS: ENVIRONMENTAL & TECHNICAL RISKS

Type of risk	Events	Price rise		Probability in 20 years	Duration	Fuel affected					
		Intl.	Domestic			Oil	Gas	Coal	Nuclear	RES	Elec.
<i>Environmental risks</i>											
Accidents	Major oil spill (land or sea)	No	Yes	Medium	Variable	x	-	-	-	-	-
	Nuclear accident	No	Yes	Low	Variable	-	-	-	x	-	x
Climate change	Increasing greenhouse gas emissions	Yes	Yes	High	Permanent	x	(x)	x	-	-	x
From production	Coal extraction and combustion	No	Yes	Medium	Variable	-	-	x	-	-	x
	Radioactive waste form nuclear	No	No	Medium	Permanent	-	-	-	x	-	-
	Unsustainable biomass production	No	No	High	Decades	-	-	-	-	x	-
<i>Technical risks</i>											
System failure	Extreme weather conditions; under-investment; technical neglect; major pipeline burst	Yes/no	Yes	Medium	Days, weeks	x	x	x	x	x	x
Intermittency risks	Absence/low inputs (e.g sun, wind)	No	No	Medium	Hours, days	-	-	-	-	x	x

THANK YOU FOR YOUR ATTENTION



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