

# 2010 INTERNATIONAL WORKSHOP ON ENVIRONMENT AND ENERGY

“Global Collaboration in Sustainable  
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## The Assessment of the Security of Supply in the Evaluation of Energy Policies

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# SUMMARY

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- Background and motivation of research
- Objectives
- Methods
- Discussion and Conclusions



# BACKGROUND AND MOTIVATION OF RESEARCH

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## *Objectives*

To define a structured review process for assessing the security of energy supply and accounting its external costs.

The priority ideas of the research was:

- To review some approaches towards the assessment of long-term energy security;
- To make proposals for the evaluation of security related externalities and their consideration in decision making.

# METHODS

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## ❖ Concept:

- The “four ‘R’s of energy security” (review, reduce, replace and restrict);
- The theoretical Optimum on the Basis of the Costs and Benefits of Security.

## ❖ Approaches for the assessment of long-term energy security and the evaluation of related externalities:

- Diversity-based indices
- The Supply/Demand Index
- The Crisis Capability Index.

# The Concept of Energy Security

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**Understanding the problem:  
Review**

**Shifting to secure sources:  
Replace**

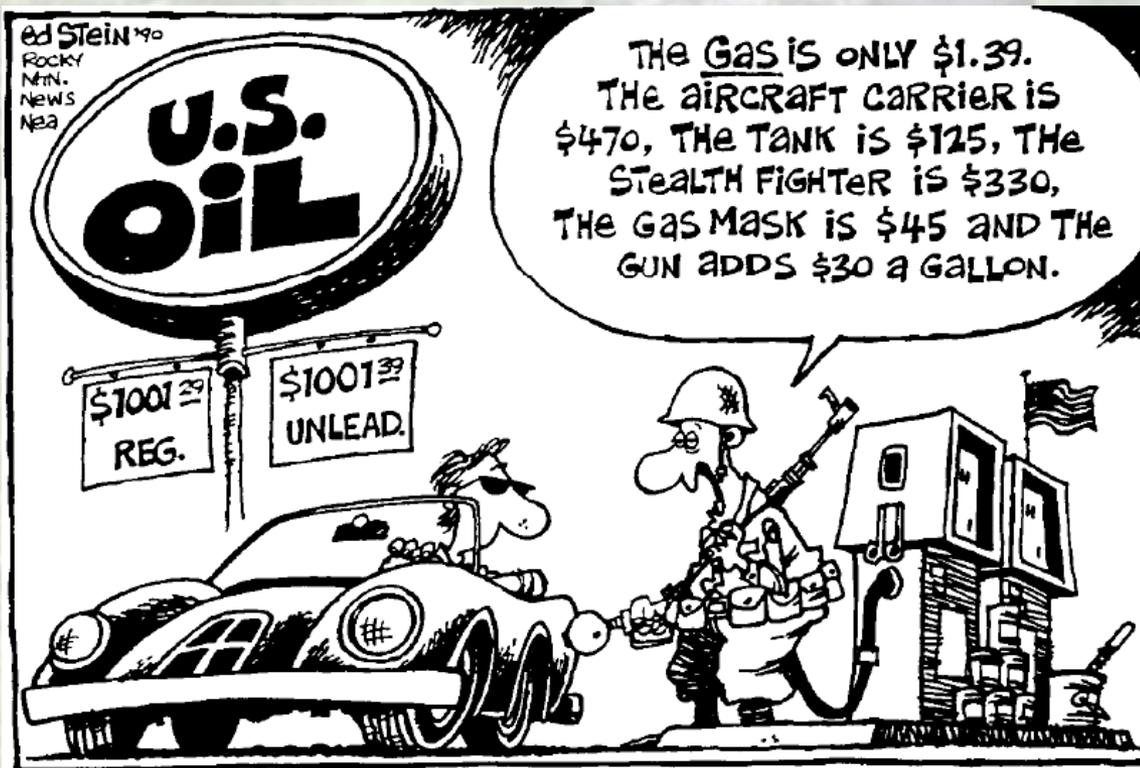
**The four 'R's of energy security**

**Using less energy: Reduce**

**Limiting new demand to  
secure sources: Restrict**

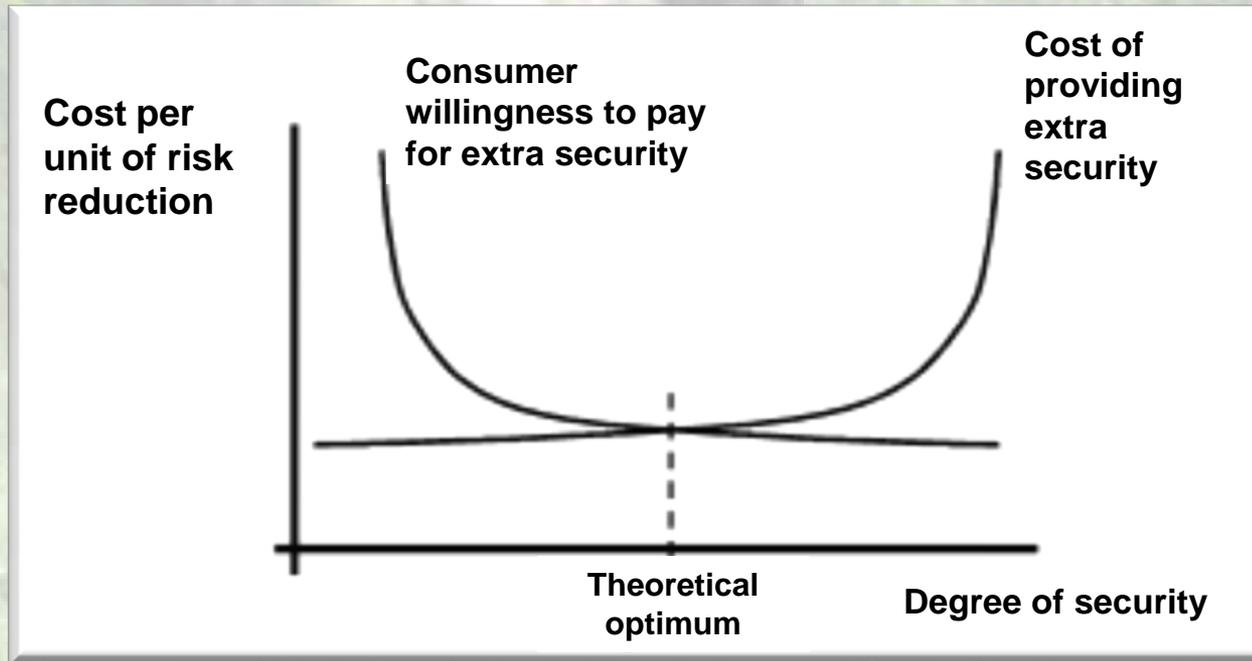
# The Concept of Externalities

An externality refers to the spill-over effects (costs or benefits) of one person's activities to another person's welfare.



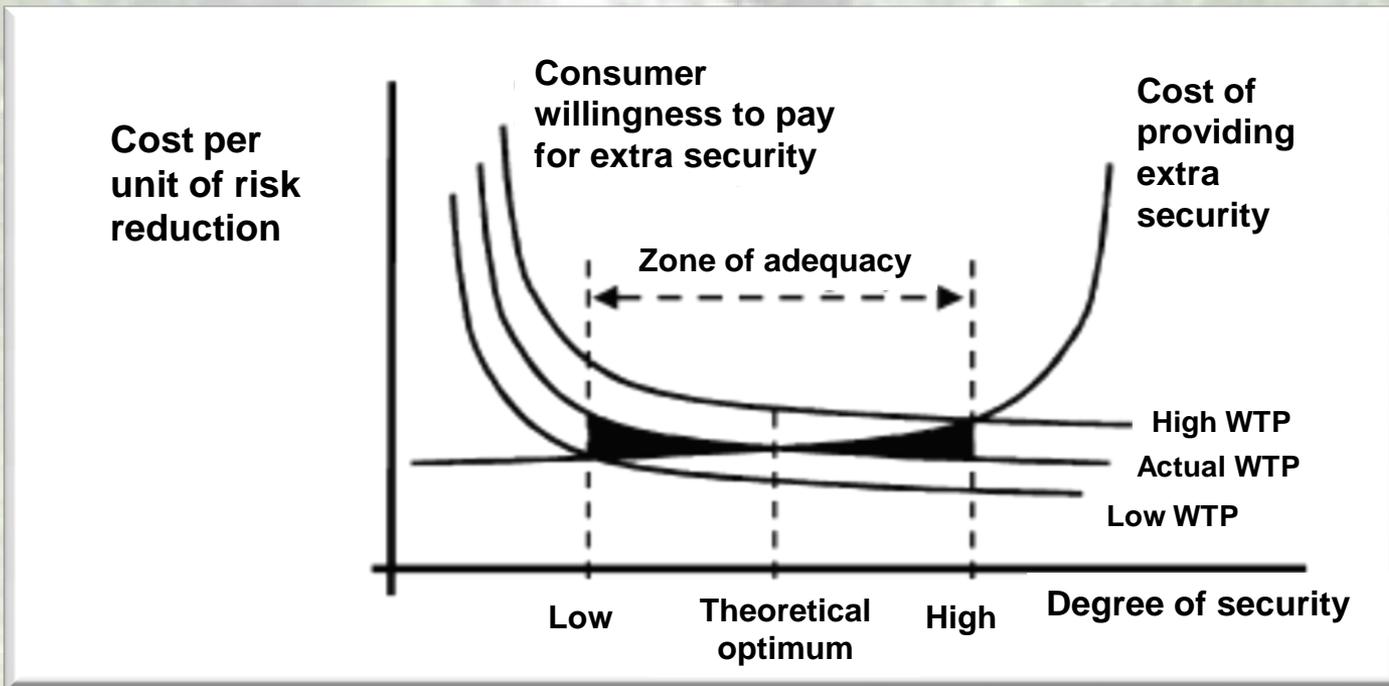
Source: Hubbard, H. M. (1991), *The real cost of energy*, Scientific American.

# Theoretical Optimum on the Basis of the Costs and Benefits of Security



Source: Enese Lieb-Dończy, Achim-Rüdiger Böhner, and Gordon MacKerron, 2003.

# Theoretical Optimum on the Basis of the Costs and Benefits of Security



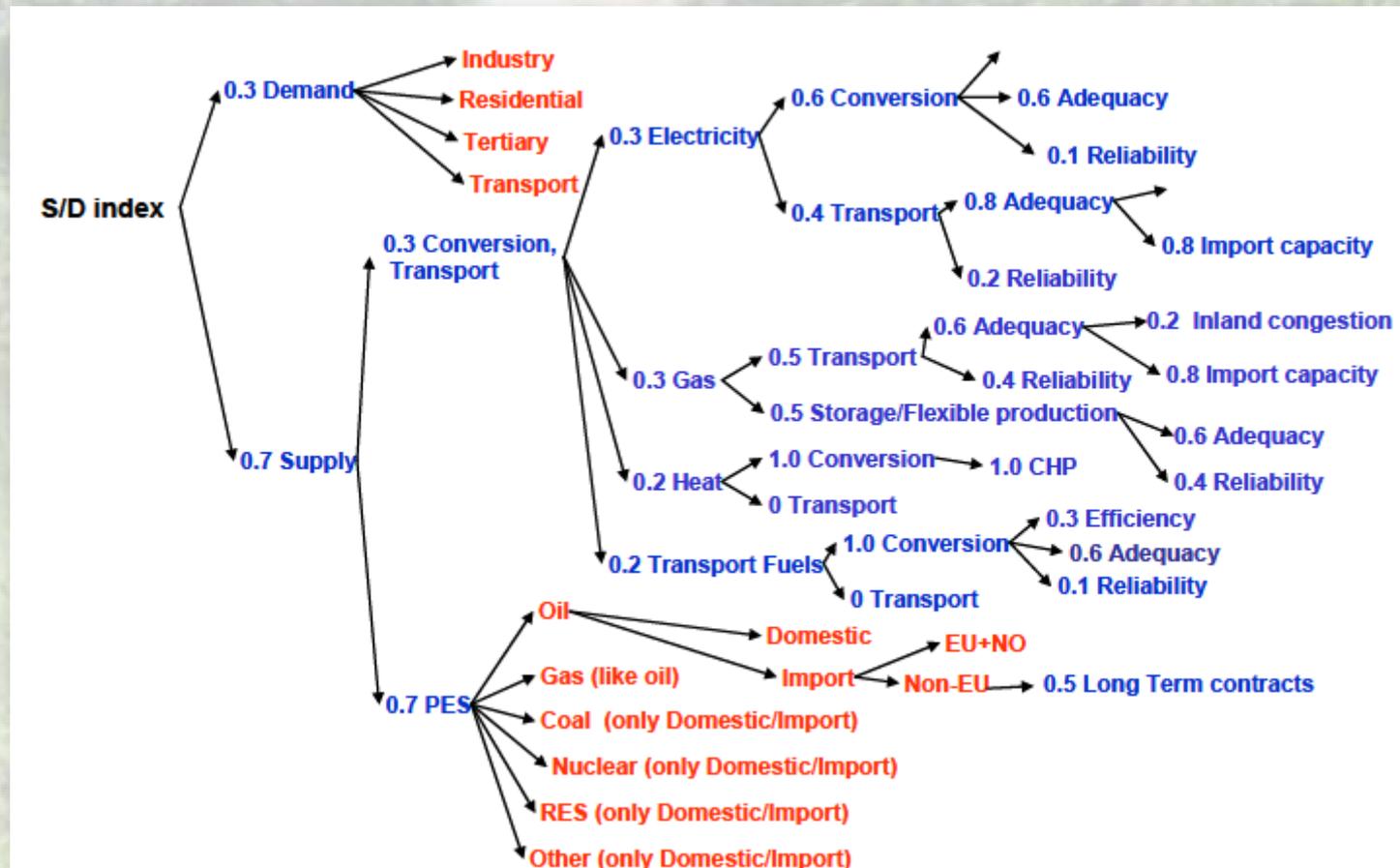
Source: Enese Lieb-Dończy, Achim-Rüdiger Böttner, and Gordon MacKerron, 2003.

# Review of some recent approaches to measure supply security

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- ❖ Multi-fossil-fuels energy security measurement
- ❖ Diversity-based indices
- ❖ Supply/Demand Index
- ❖ Simple indicators of Energy Security
- ❖ The Crisis Capability Index

# Review of some recent approaches to measure supply security - Supply/Demand Index



Source: EU Standards for Energy Security of Supply, ECN, 2007.  
Weights (defaults) and shares used in the Supply/Demand Index Model

# DISCUSSION AND CONCLUSIONS

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- ❖ Businesses and consumers will continue to have the primary responsibility for security (short term) of its own energy supplies.
- ❖ It is important to stress that compatibility and compliance with existing emergency rules and commitments under the IEA Treaty.
- ❖ The use of a common framework to assess the energy situation will also uncover the impact of national policy choices on the energy market.
- ❖ The use of standards for security of supply provides a tool to explicitly address trade-offs among security of supply, reduction of CO<sub>2</sub> and costs.
- ❖ The need for an integrated approach that enables capturing all key issues at stake.

# DISCUSSION AND CONCLUSIONS

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- ❖ Valuation of supply security externalities: social cost-benefit analysis of policy measures and public spending and taxation of fossil fuels.
- ❖ Measures enhancing long-term security of supply: better fuel economy, substitution towards renewable fuels, demand reduction and behavioral changes from high-environmental-social-externalities activities.
- ❖ It should be noted that as much as some countries are depending on imports, other countries depend on exports and presumably have an interest in the long term well-being of their customers.

Thanks ...



Our mission should be to mitigate social demands in poor and developing countries for increasing energy security **WORLDWIDE**.