

Transforming the energy system: investment risks and policy challenges?



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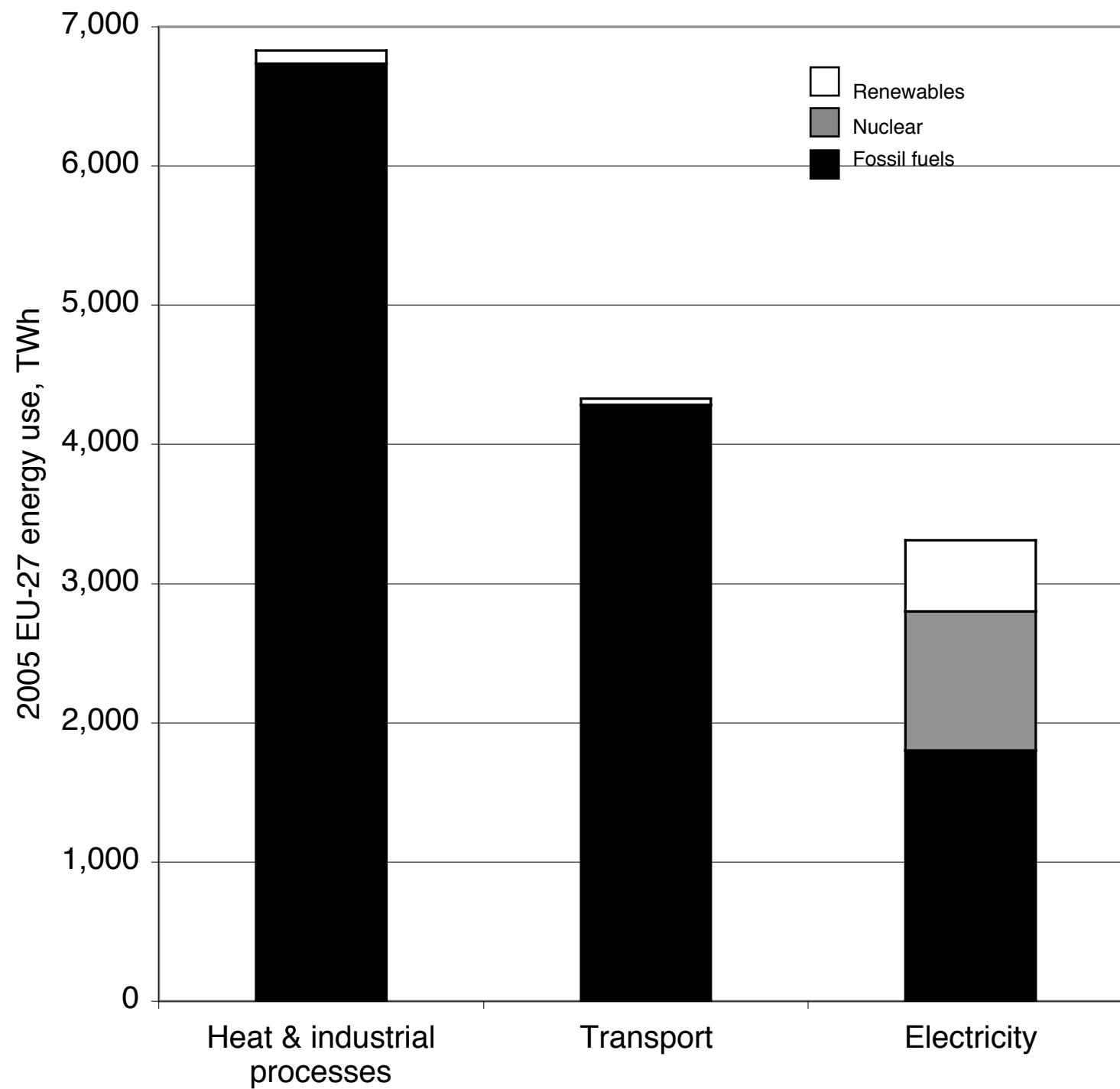
ALICE Project Symposium

Hotel Steigenberger, Potsdam

11 March 2010

The electricity challenge

Electricity is where the action is

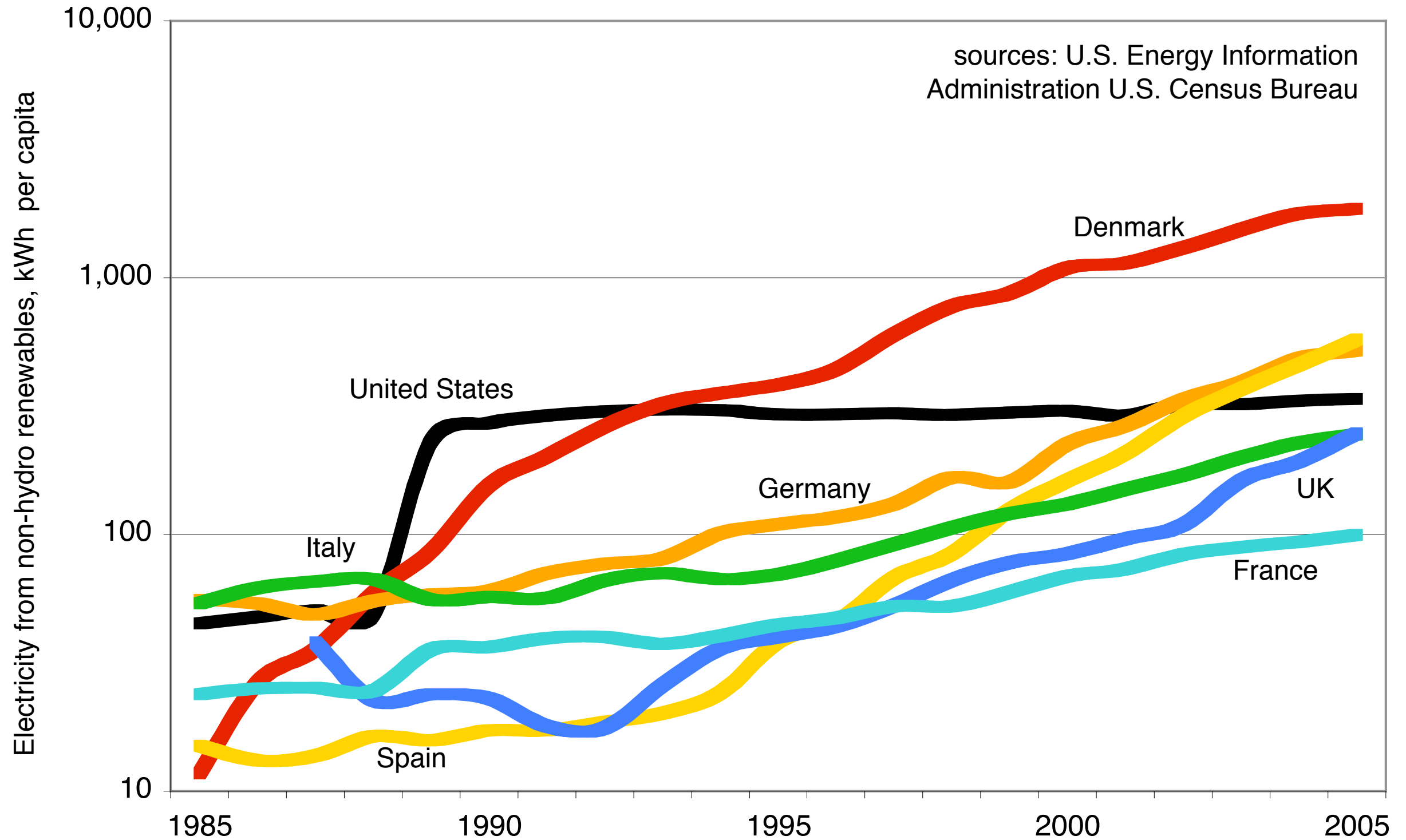


source: International Energy Agency

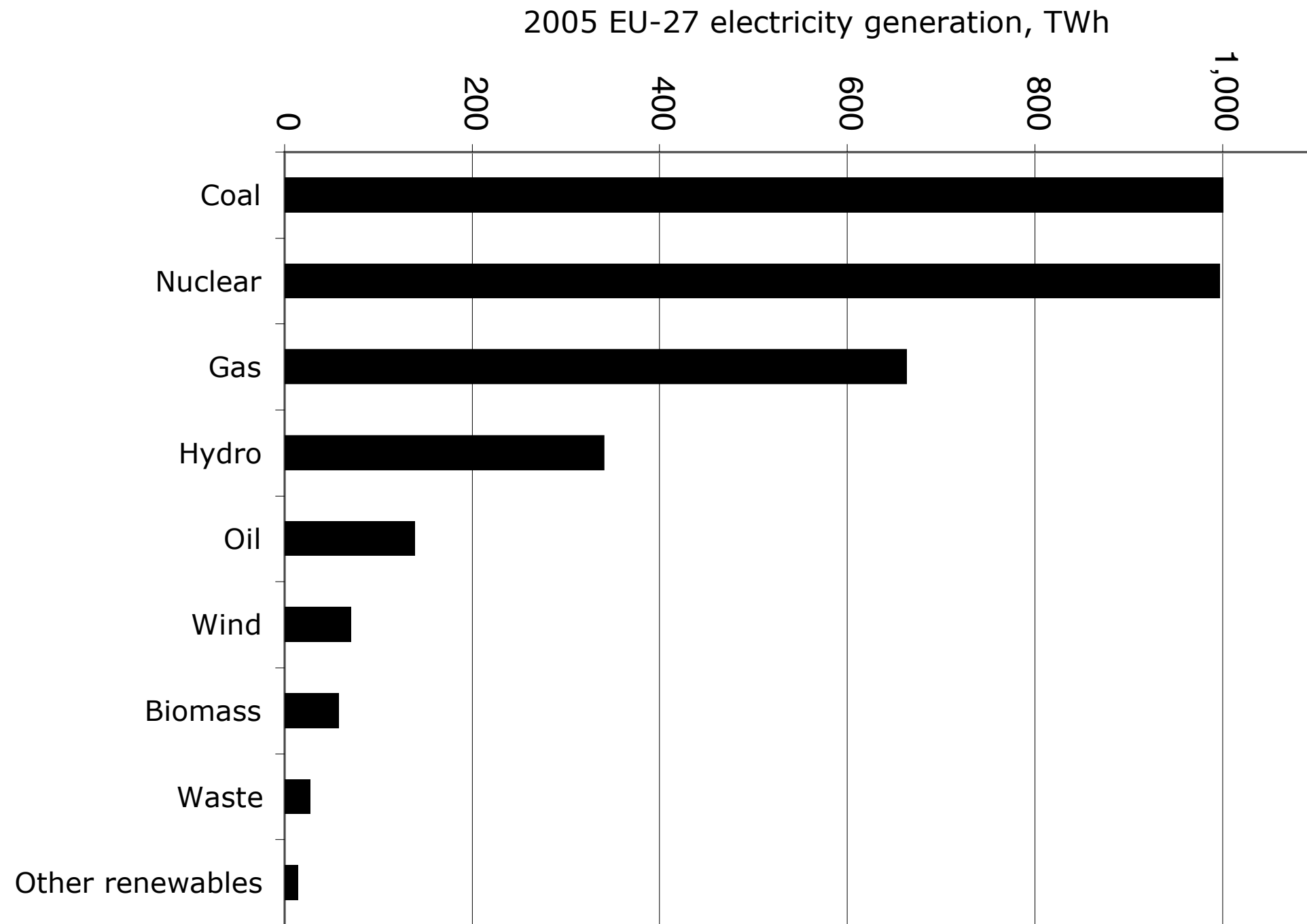
Electricity is where the action is



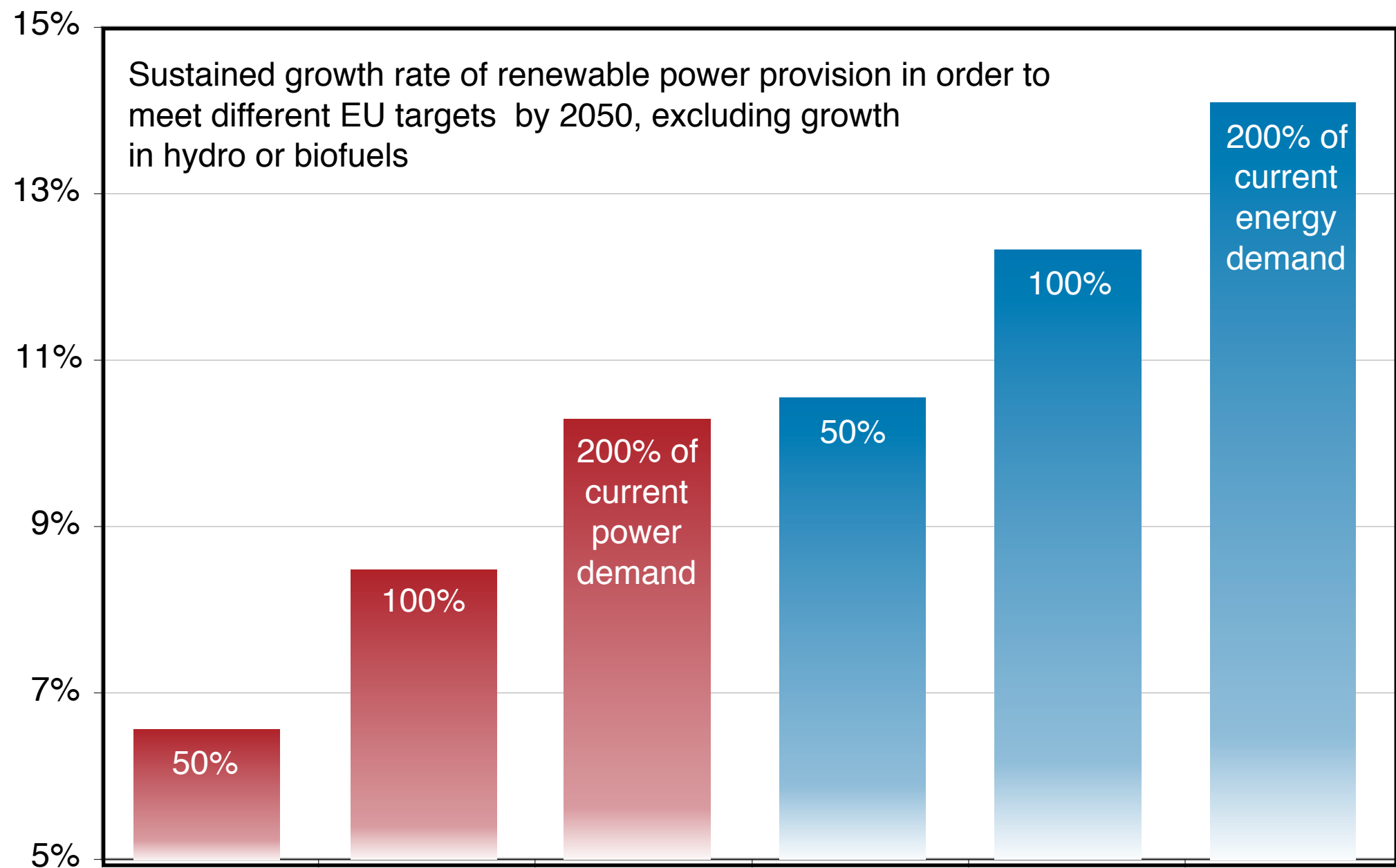
Renewable power growth



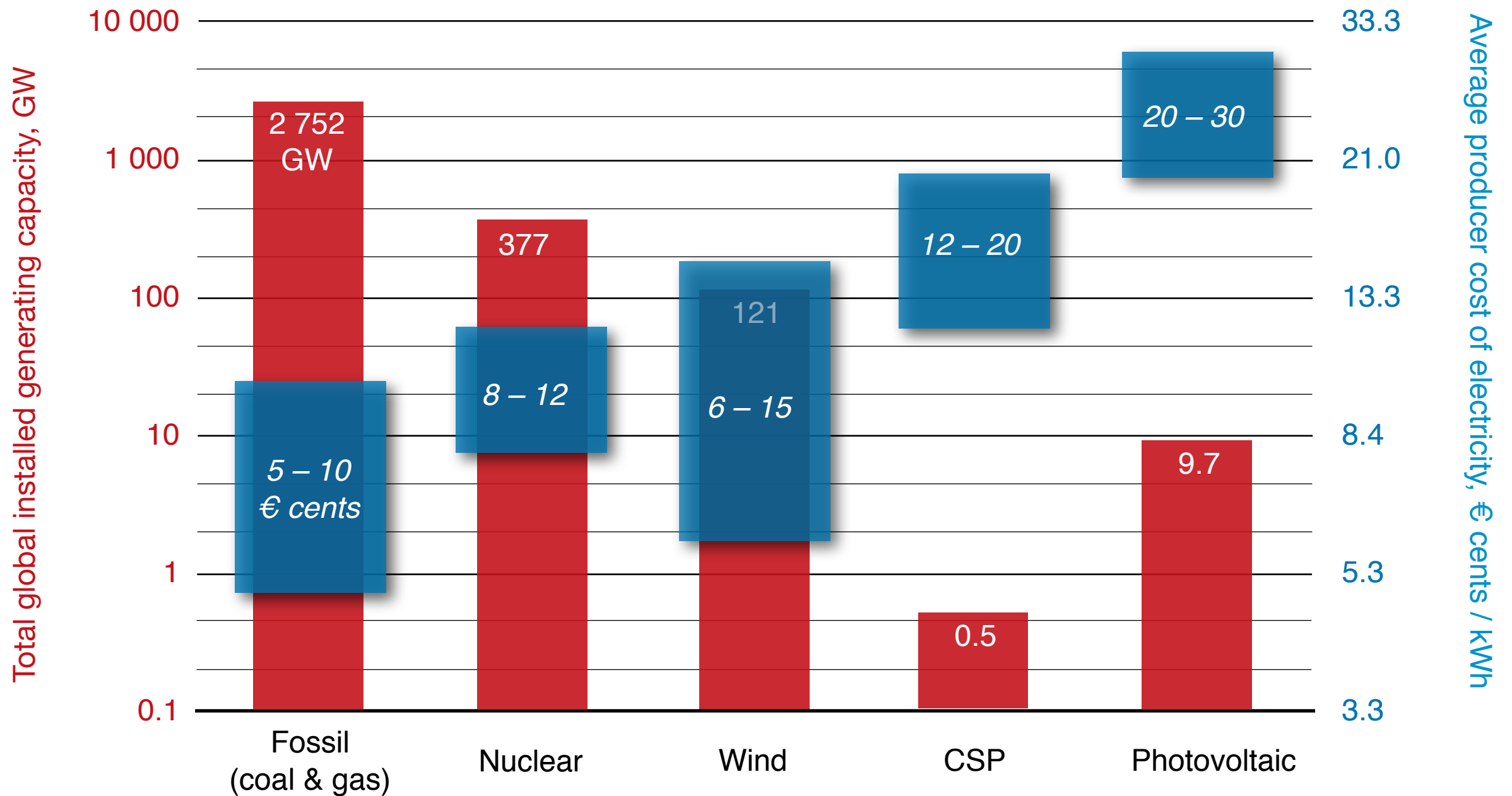
Power system structure



First-order challenge: growth and restructuring

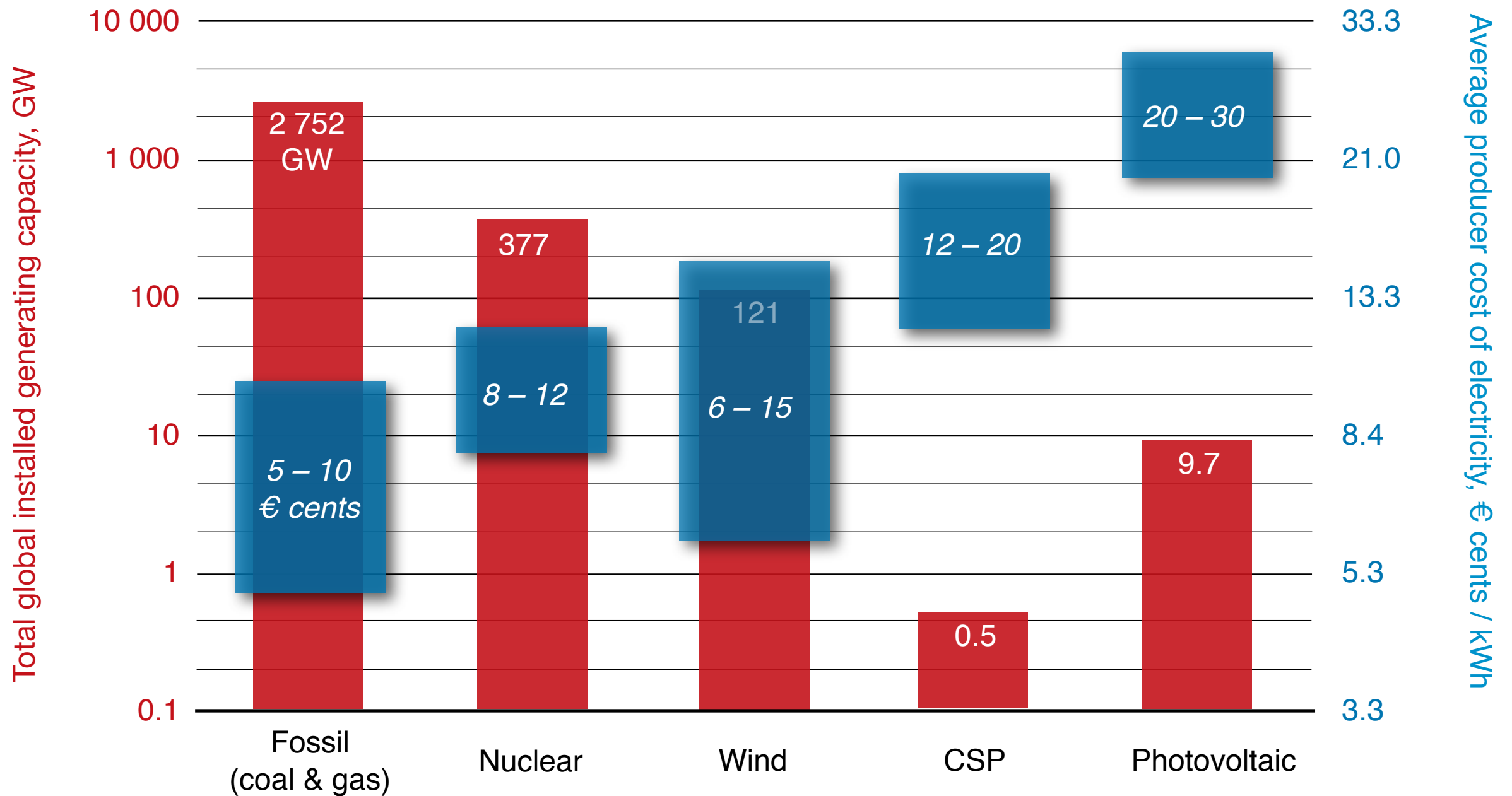


Second-order challenge: learning

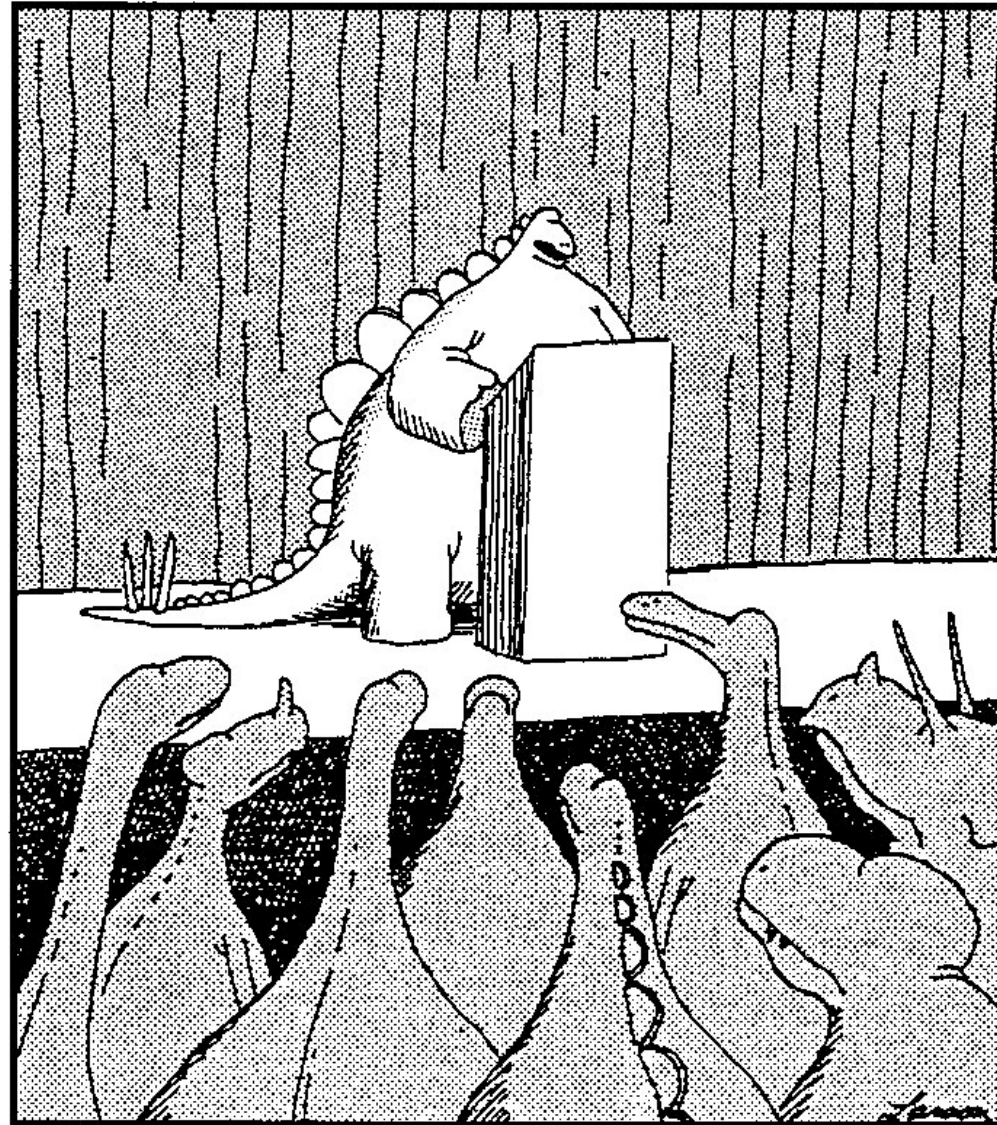


How do investors think?

Second-order challenge: learning



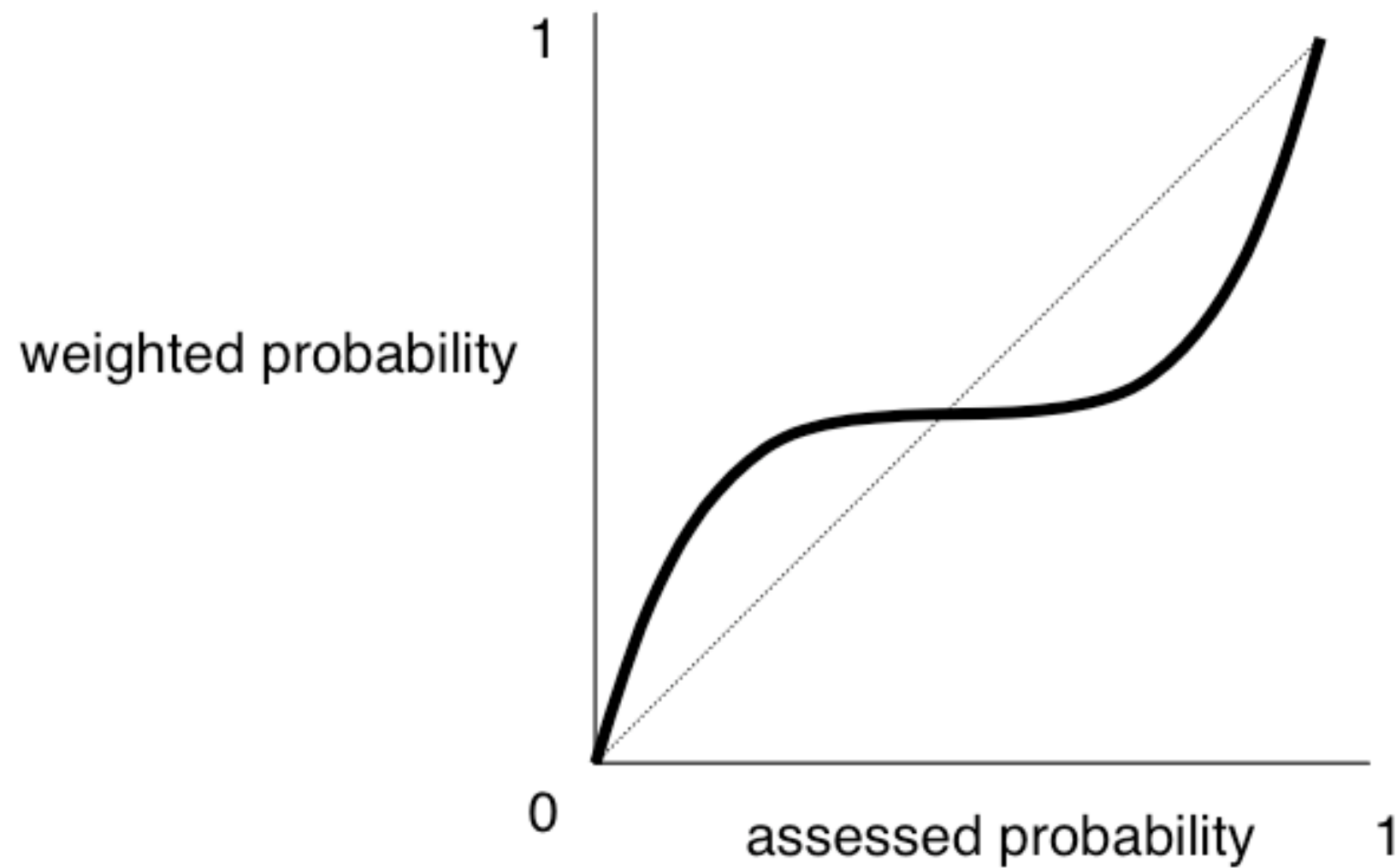
Quasi rational economics



"The picture's pretty bleak, gentlemen. ...
The world's climates are changing, the mammals
are taking over, and we all have a brain
about the size of a walnut."

Source: Gary Larson, *The Far Side*

Quasi rational economics



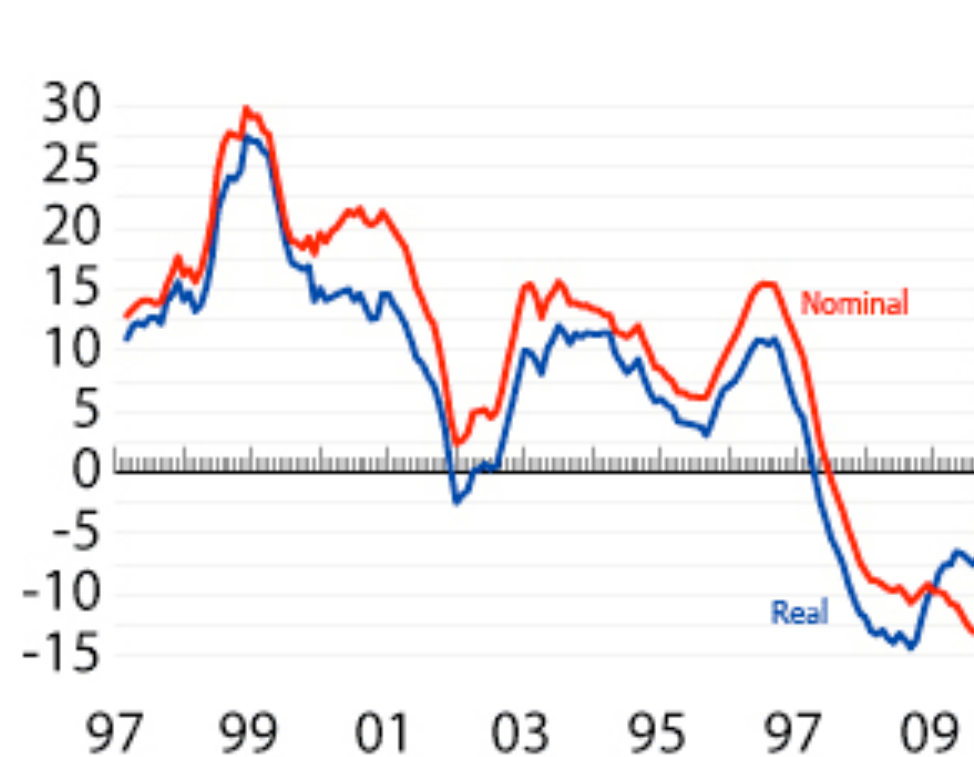
Quasi rational economics

Ireland



House price change

% change over a year earlier



Average price of new houses

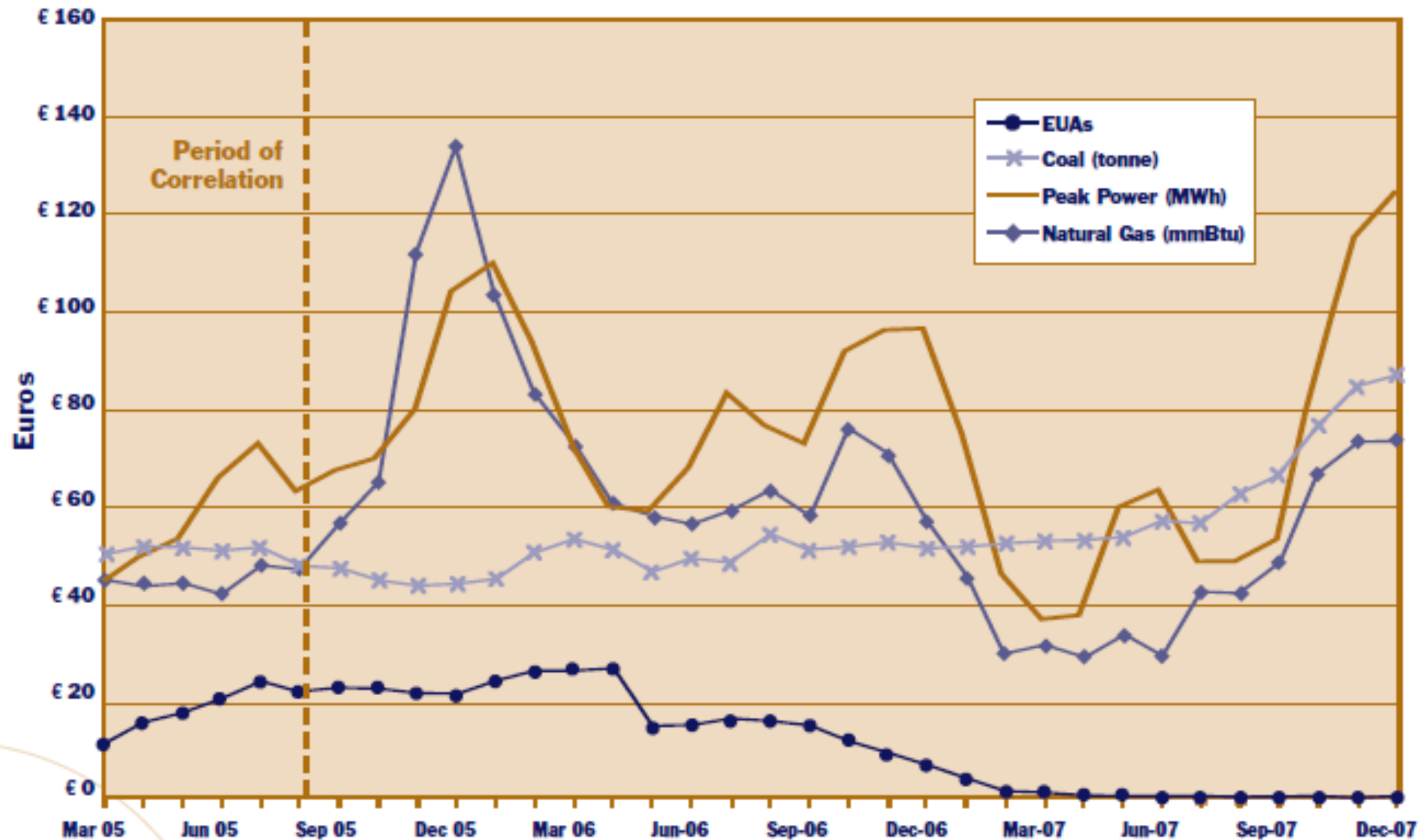


Volatility in carbon market



source: Ellerman and Joskow, 2008

Volatility in fuel prices



source: Ellerman and Joskow, 2008

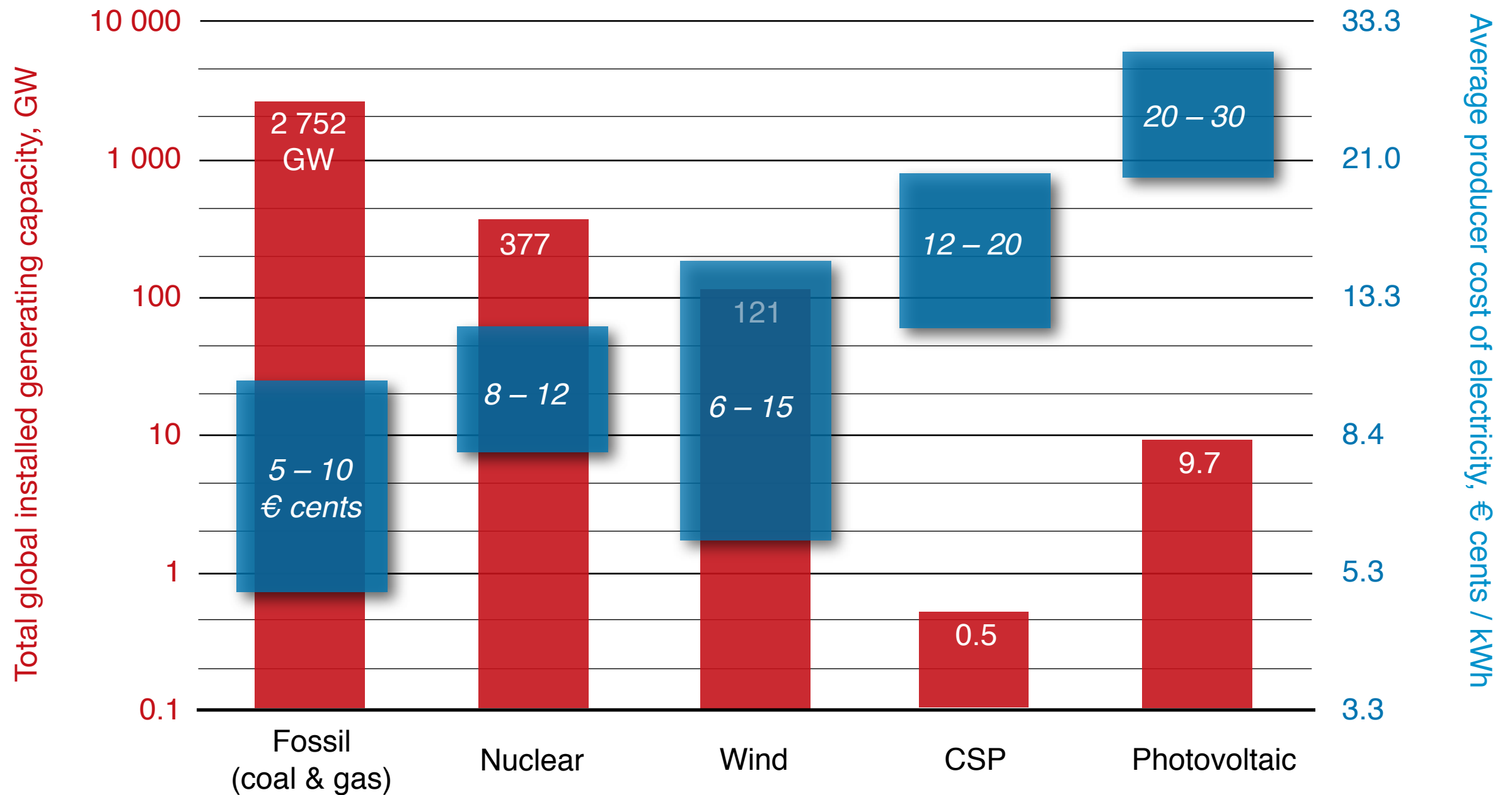
What policies do we need?

Avoiding thinking traps

“ To be a conventional academic economist
you almost have to swear an oath
that governments can’t outguess markets
in the allocation of capital.”

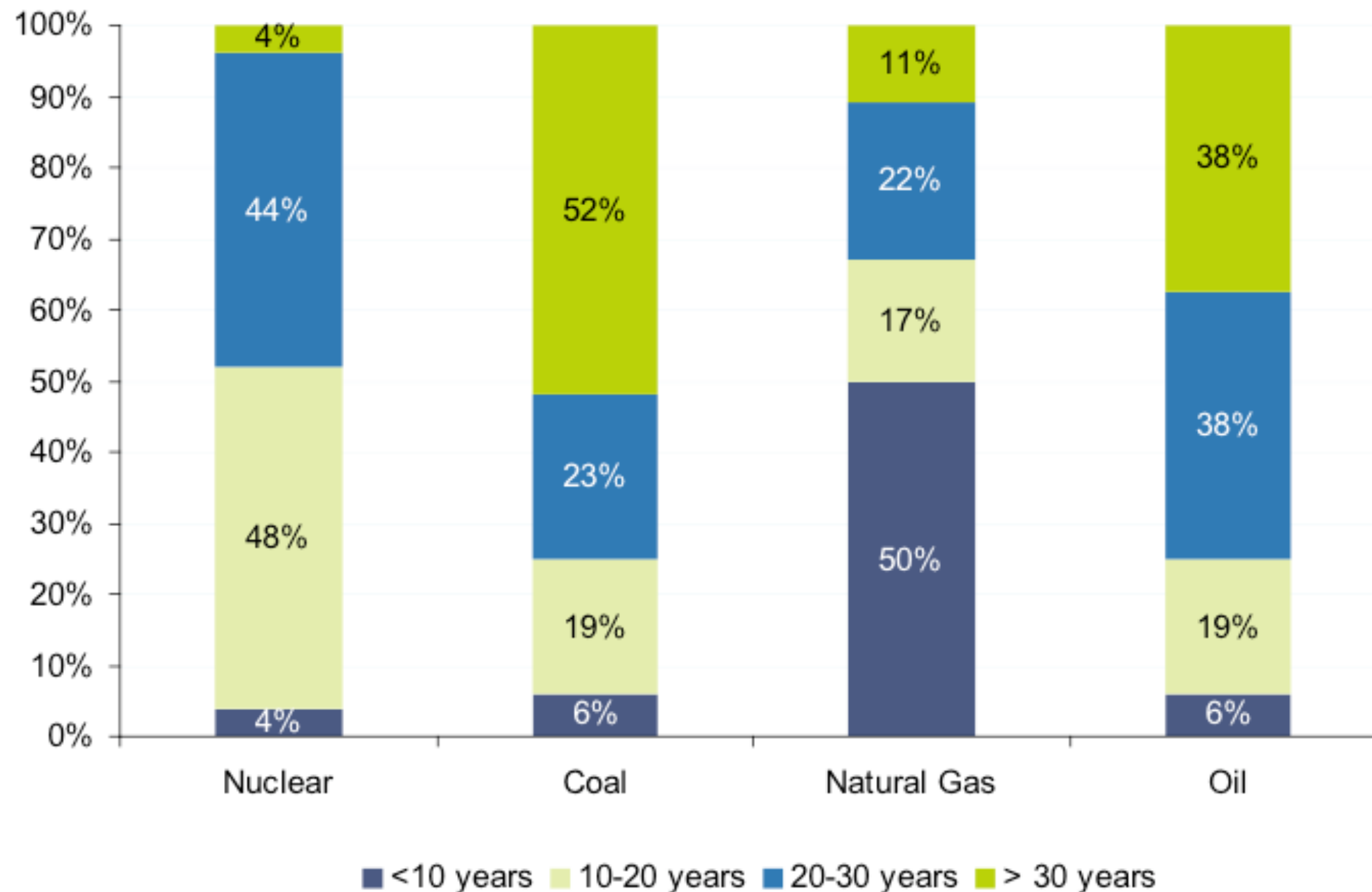
Robert Kuttner, *The New Yorker*, 2010
on why even Paul Krugman is wary of industrial policy

A 10 - 20 year problem

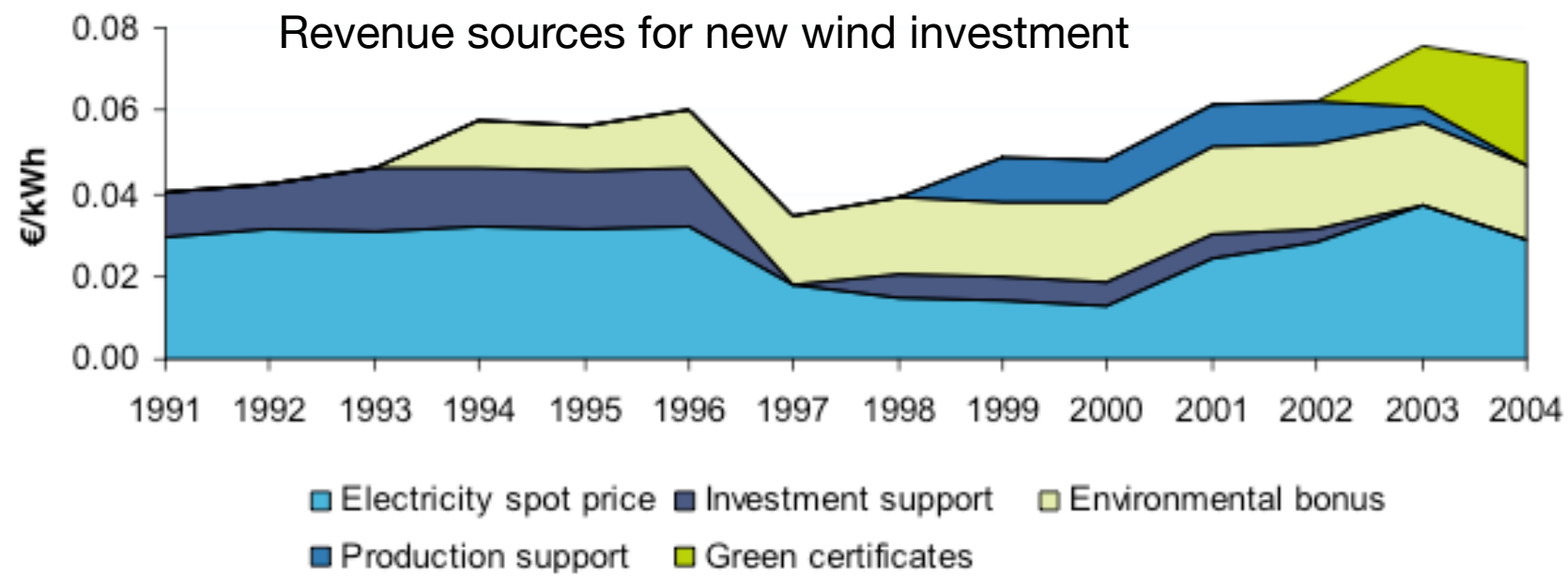


A 10 - 20 year problem

Age structure of power plants in EU29

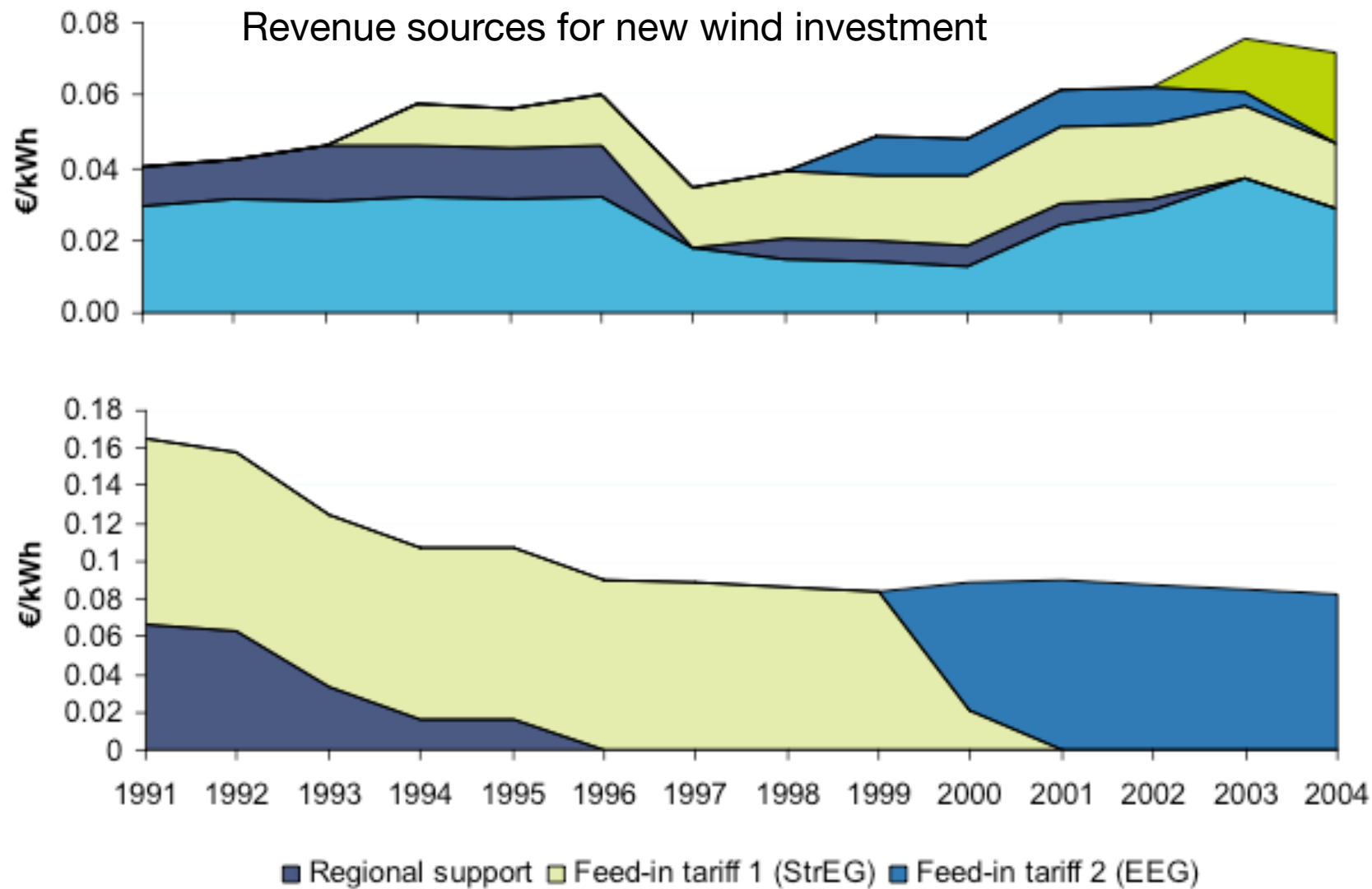


Policy structure matters



Sweden

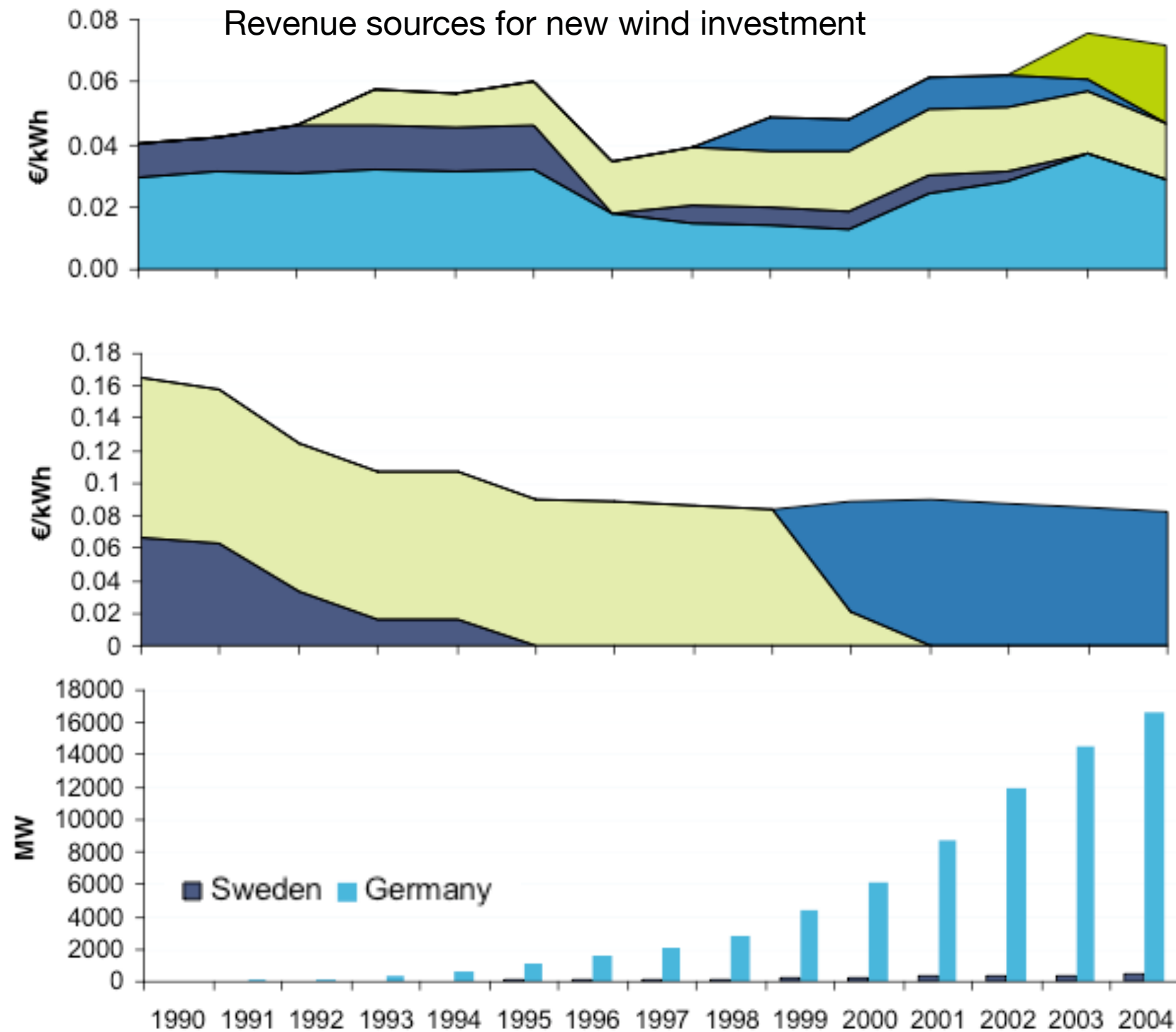
Policy structure matters



Sweden

Germany

Policy structure matters



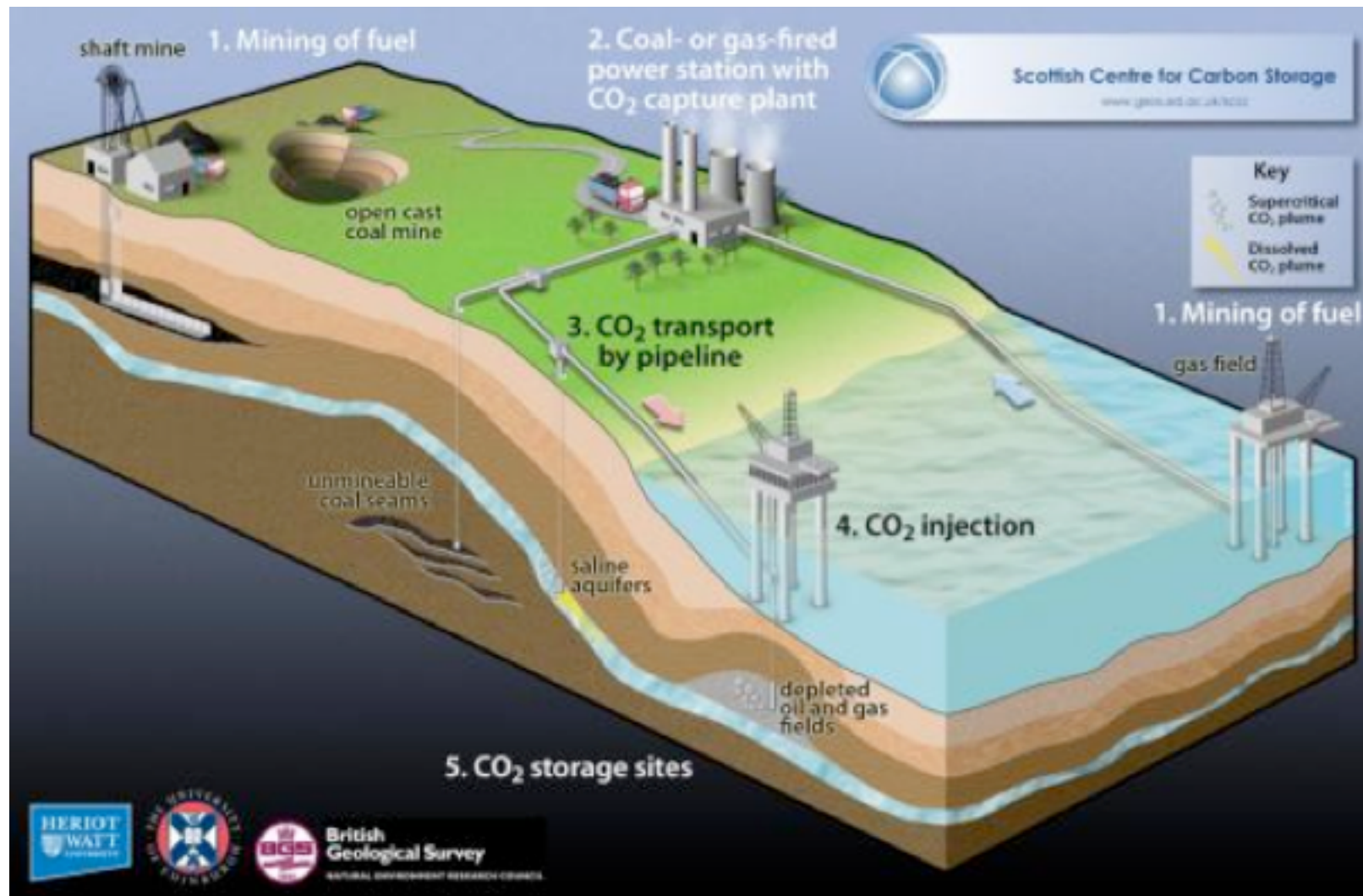
Sweden

Germany

Results

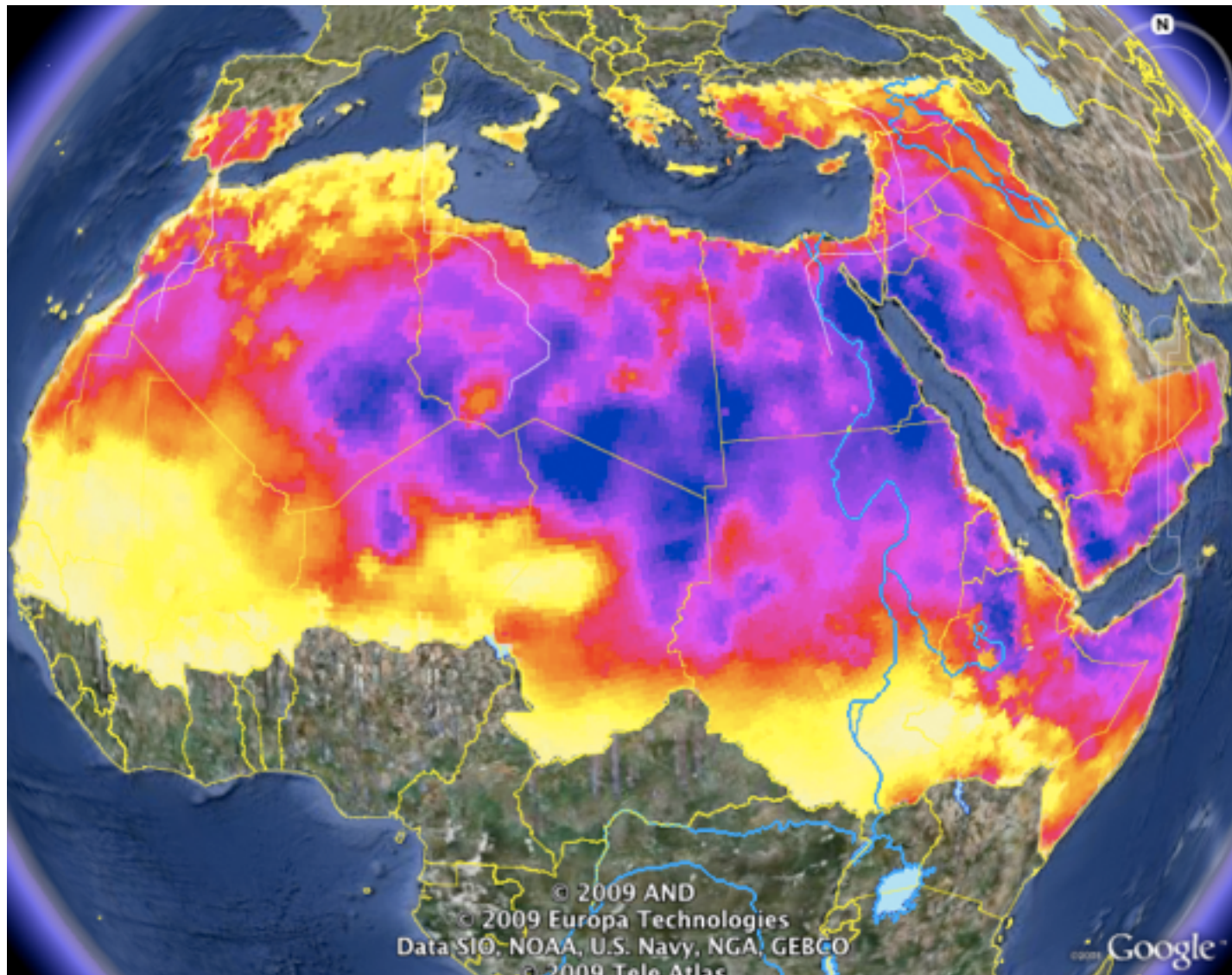
Charge to the three working groups

Group 1: Clean coal



- Built on proven technologies
- Current business model
- System stability
- but how soon can we start?
- and where does it get us?
- what are the risks?

Group 2: Large scale centralized renewable



- Almost infinitely scalable
- Competitive backstop technologies
- System stability at large scale
- can we work together?
- and where does it take them?

Group 3: Municipal utilities



- Adapted to local / regional needs
- Recently quite dynamic
- Decision-makers care about REN
- Are they the agents of change?
- what is required for that?

Planning this symposium



Who is going to invest in the great energy transition

Planning this symposium



Who is going to invest in the great energy transition
and **what** are we waiting for?

Thematic focused discussion

Who

what

Diagram illustrating the process of CO₂ capture and storage (CCS) in a coal-fired power station.

Key:

- Supercritical CO₂ phase
- Dissolved CO₂ phase
- Gas field

1. Mining of fuel

2. Coal-fir gas-fired power station with CO₂ capture plant

3. CO₂ transport by pipeline

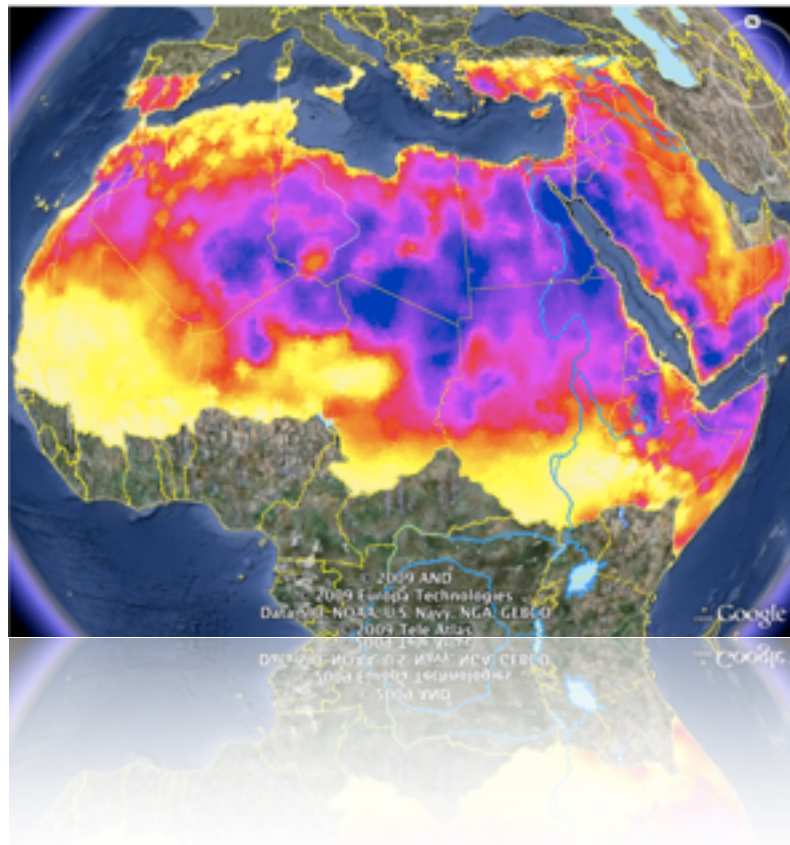
4. CO₂ injection

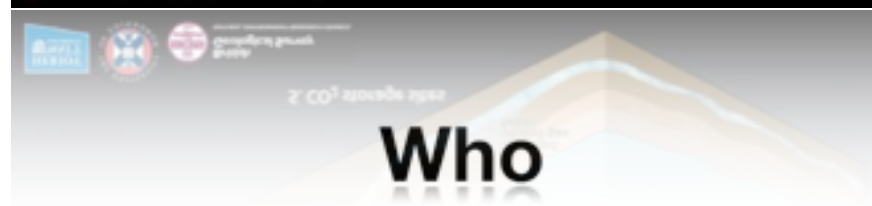
5. CO₂ storage sites

Labels in the diagram include: shaft mine, open cast coal mine, coal-fir gas-fired power station with CO₂ capture plant, CO₂ transport by pipeline, CO₂ injection, depleted oil and gas fields, saline aquifers, and CO₂ storage sites.

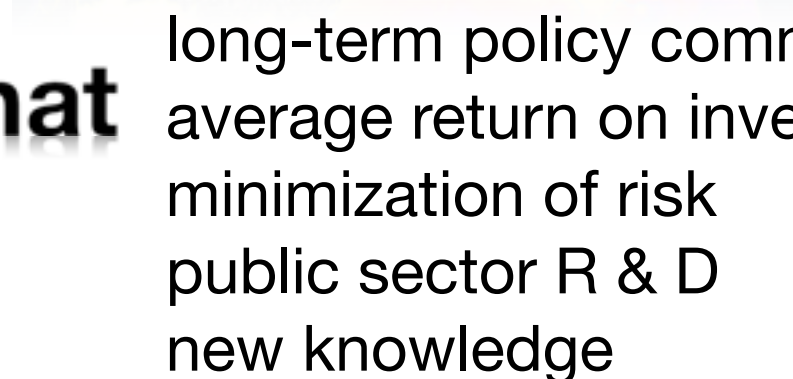
Logos: Heriot Watt University, British Geological Survey, Scottish Centre for Carbon Storage.

what





goals
capacity
concerns
experience
partners



- long-term policy commitment
- average return on investment
- minimization of risk
- public sector R & D
- new knowledge



Structure

Today, 16:00 – 18:00

- introductory presentations (1 hour)
- brainstorming discussion (1 hour)

Tomorrow, 9:00 – 10:30

- identifying key messages

Tomorrow, 11:00

- present key messages (5 – 10 minutes)