

# TECHNOLOGY IMPACT ASSESSMENTS



## Technology-neutral policies and the climate challenge

Staffan Jacobsson

Environmental Systems Analysis

Chalmers University of Technology

# Introduction

- Technology neutrality as a recurring mantra
  - Climate debate
  - Industrialisation policy to drive large-scale and rapid structural change
    - Korea (30 years)
- EU (and the rest of the world) need to manage a yet larger structural change in the next 30 years
- Will argue for the need to implement technology-specific policies

# A mighty challenge

## – the case of electricity supply in the EU

- EU's electricity supply
  - 1997            2846 TWh
  - 2008            3374 TWh
  - 2040            5100 TWh
- Assume constant nuclear power (937 TWh) and phase-out of all fossil fuels (1832 TWh 2008)
- Capacity needs to be built to supply 3600 TWh – a mighty challenge

# New industrial structures required

- No single technology can help us meet this challenge
  - Wind turbines (on and off shore), solar cells, CSP, wave power, biomass based CHP, gasified biomass, CCS ....
- We need industries which
  - Develop all the technologies (and gradually improve them)
  - Build a capacity to deploy them in such large volumes that the market is saturated in 29 years
- 29 years is not a long time
  - Capital goods industries have emerged with the help of technology specific policies (Denmark, Germany)
    - Onshore wind is most mature but off shore faces many challenges...

# Parallell versus sequential development of new industries

- Parallell development that builds new industries (e.g. wave power devices) and strengthens existing industries (e.g. off shore wind) so that they can soon supply capital goods in large volumes
- Technology neutral policies lead to *sequential* development, where today's cost efficient technologies are deployed
  - Technology neutral policies will not stimulate the industrialisation of a broad range of technologies *in time*
  - Solar power and off shore wind power would cease to be invested in...

# Technology specific policies – multi dimensional intervention

- Instruments to form markets for electricity generated by a broad range of technologies (e.g feed-in laws in Germany and Britain)
- Many other types of interventions required
  - Off shore wind power
    - Funding gap
    - Lack of engineers
    - Need to use MSP to handle conflicting interests
    - Coordination of investments in grids, off shore and onshore
    - Other infrastructural bottlenecks (vessels, ports)
    - etc

# Technology specific policies – state, industry and academia

- Great challenge to form a policy organisation with the required competence to conduct technology-specific policies (in addition to general ones)
- Need for individual companies to act politically to legitimate technology specific policies
- Method is needed that helps policy makers to decide
  - which technologies to foster
  - how to do it (instruments of intervention)