- EUSUSTEL -

Brussels

September 19th & 20th, 2005

WP 8.1
Scope, Boundary Conditions & Hypotheses

William D'haeseleer

Leander Cosijns

University of Leuven Energy Institute

WP 8.1: Description (1)

- Must clearly define the overall scope (objectives), the generic boundary conditions (undisputable) and the generic grand hypotheses (debatable)

- Specific assumptions to be made (mentioned and justified) in different sub WPs.

WP 8.1: Scope or Objectives (1)

Strategic objective:

- Provide the Commission and the member states with coherent guidelines and recommendations to optimise the future nature of electricity provision and the electricity generation mix in Europe so as to guarantee an *affordable, clean and reliable* , i.e., *'sustainable'*, electricity supply system.

- Therefore, the aim is to establish a common European *methodology* to evaluate the 'sustainability' (in terms of cost, environmental impact and security of supply) of future electricity provision systems.

WP 8.1: Scope or Objectives (2)

Measurable and verifiable objectives (Project steps):

- Review analysis of the electricity provision in the EU-25 countries.
- Make projections for reasonable evolution of demand for energy services and determine the relationship with electricity demand. Propose justified DSM measures.
- Analysis of electricity generation technologies (also e.g. storage) and their integration into the overall generation system. For each technology, a realistic range of technical, environmental and economic characterising parameters are to be identified and future evolutions are to be estimated.

WP 8.1: Scope or Objectives (3)

Measurable and verifiable objectives (Project steps):

- Analysis of the current regulatory framework and its technical and economic consequences concerning the liberalisation of the electricity market (and the influence of the directives on renewable energy, CHP and emission trading). Reflect on an 'ideal' fully consistent framework for a fully integrated European electricity (and gas) market, to establish appropriate boundary conditions for the overall EU generation system.
- Determine the total social cost for electricity generation, both statically and taking into account system interaction. Perform scenarios to determine the 'most optimal solution' for electricity provision in the EU.

WP 8.1: Scope or Objectives (4)

Measurable and verifiable objectives (Project steps):

- Assure that the results of this project are appropriately screened with respect to the degree of realism, compatibility with liberalised markets and the 'desire' for security of supply. The results should be validated against international studies.
- Create a platform for interaction with the public by means of a web site. Organise a Seminar for result dissemination.
- Establish clearly the overall scope, boundary conditions and hypotheses of the project. Guarantee that a consensus is reached on the framework for 'sustainability'. Assure well-managed project coordination.

WP 8.1: Boundary Conditions

Defined as such of fixed constraints

- Time horizon: focus on 2030; reflect upon 2050
- Physical constraints: wind conditions, insolation, available area…(potentials)
- No physical shortage of fuels (but at what price?)
- Postulate common electricity & gas market based on current directives (take perfect transposition)
- Accept current environmental & safety standards of EU (NOx, SOx, PM10, …but not on GHG) throughout
- Post-Kyoto too uncertain → via hypotheses
- Other existing legislation & regulation as basis (other variations later as different hypotheses) EU & MS

WP 8.1: Hypotheses

Basic assumptions ('debatable')

- Some basic hypotheses throughout study → act as boundary conditions
- Hypotheses in the proper sense can be varied in different scenarios
- First set of hypotheses defines "reference" scenario
- Different hypotheses allow sensitivity analysis
- Examples:
  - Harmonise legislation in MS (e.g. green certificates)
  - Introduce varying schemes for DSM (e.g., white certificates)
  - Post-Kyoto: -16% in 2030 (linear extrapolation) up to -32%
  - Fuel prices: IEA 2004 or current prices? Fluctuations?
  - Change nuclear policies: phase out or not
  - Increasing value of emission certificates?

WP 8.1: Working Agreements

Standardisation within the study

- Currency: EUR2000 as reference
- For simplicity take $ = €
- Other exchange rates based on PPP
- Assume inflation 2% ??
- Discount rates 5% and 10% ??
- Use SI units (or other within brackets)
- …other…