Analysing Transition Planning and Systemic Energy Planning Tools for the implementation of the Energy Technology Information System

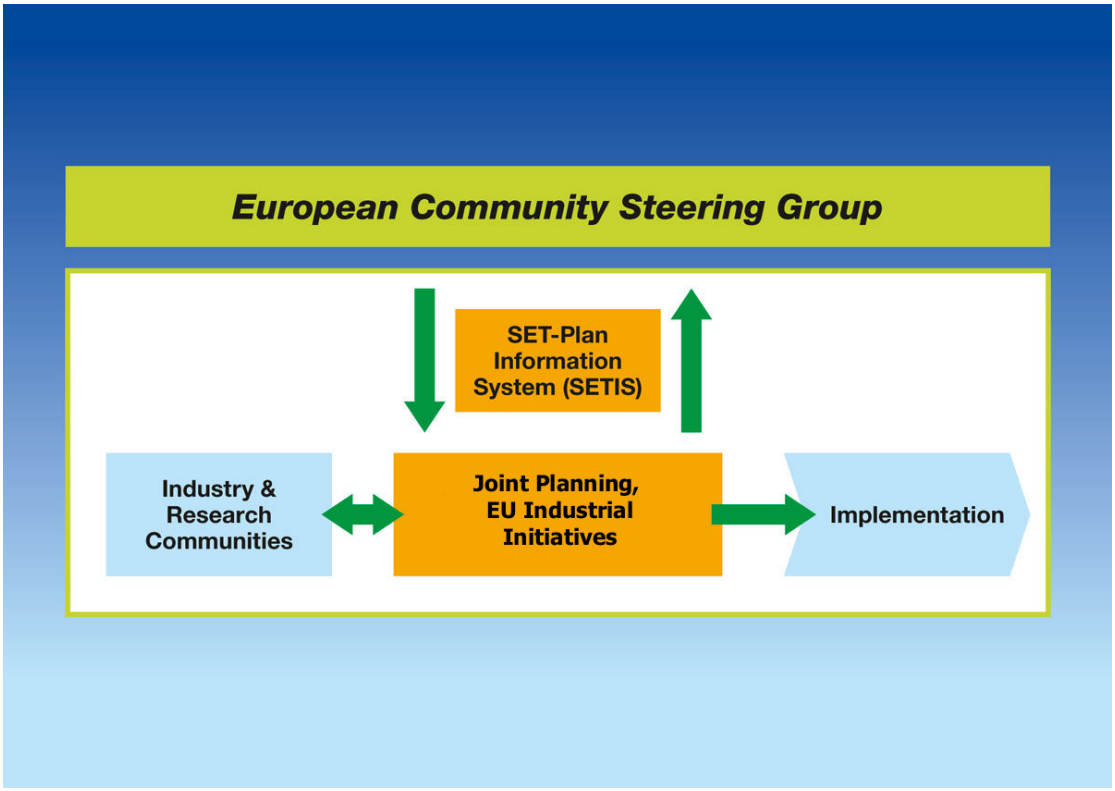
ATEsT stakeholder workshop background information

Brussels, 29 January 2010

The SET-Plan

The European Strategic Energy Technology Plan (SET-Plan) is the technology pillar of the EU's energy and climate policy. It is a blueprint for Europe to develop a world-class portfolio of affordable, clean, efficient and low emission energy technologies through coordinated research. It has been proposed by the Commission on 22 November 2007, and endorsed by the Council of the European Union and the European Parliament as the appropriate way forward. It lays out the EU's strategy to accelerate the development of these technologies and to bring them more quickly to the market.

The SET-Plan describes concrete actions to build a coherent energy research landscape in Europe. The idea is to better organize research efforts across Europe, selecting technologies with the greatest potential and planning together how money should be invested.



Alongside the European Industrial Initiatives (EII) and the European Energy Research Alliance (EERA), the 3rd implementation pillar relates with activities addressing future *European energy infrastructure networks and systems transition planning.*

Trans-European energy networks and systems of the future COM(2007) 723

"…To achieve a sustainable, interconnected European energy system will require massive energy infrastructure change as well as organisation innovation. It will happen over decades, transforming the energy industry and infrastructures, and represent one of the most important investments of the 21st century. Very diverse sectors will be affected, not only energy, environment and transport, but also information and communication technologies, agriculture, competition, trade and others. This will require a multidisciplinary approach to issues that are increasingly interconnected.

To plan and develop future infrastructures and policies, it is essential to have a good understanding of the full implications and logistics of new energy technology options.

The Commission proposes to initiate in 2008 an action on European energy infrastructure networks and systems transition planning*. It will contribute to optimise and harmonise the development of low carbon integrated energy systems across the EU and its neighbouring countries. It will help the development of tools and models for European level foresight in areas such as smart, bi-directional electricity grids, CO2 transport and storage and hydrogen distribution…."*

ATEsT

The European Commission has now initiated action on the 3rd implementation pillar with the launch of an FP7 Support Action named ATEsT (Analysing Transition Planning and Systemic Energy Planning Tools for the implementation of the Energy Technology Information System).

The aim of the ATeST project is to address the methodologies and modelling toolbox required to support the decision making of the SET-Plan in the priority area of transition planning of the deployment of low carbon technologies and their supporting infrastructures, through a joint effort between European research institutes (CRES, ECN, ENEA, IER, VTT, PSI, CIEMAT, EIHP) and the JRC, the implementing body of the Information System of the SET-Plan (SETIS).

The "tools" that will be evaluated in the framework of ATEsT are methodologies for the analysis of energy policies and mathematical models that can be used in order to simulate the development of the energy system or analyse the transition planning in the energy system.

The objectives of the project are to:

1. Review models/tools used in European Countries, bearing in mind what is used outside Europe and what are the requirements of the SET-Plan.
2. Identify and recommend common tools and/or methods to be used in the MS and in SETIS, and gain consensus on these models.

3. Identify and recommend existing sets of data (on technologies, energy resources, statistics, etc.), and provide a roadmap for the development of the data on a European and regional level.
4. Identify the roadmap for the improvement and development of the tools and methods in order to cover the needs of the SET-Plan implementation.

More information can be found on the ATeST project website: http://www.atest-project.eu/.

This workshop

Determining which information is needed by policy makers to enable their decision making concerning the transition towards a low carbon energy system is one of the key objectives of the project. This information serves as specifications for the modeling toolbox used to analyse the energy system as well as the planning of the transition. Below, an initial list of specifications is drafted which reflects the current view of the ATEsT project team. The aim of the workshop is to retrieve feedback on this draft list of specifications and share recommendations and suggestions on which information is essential to come to good decisions in the framework of the SET-Plan. The intended result is a set of broadly consented decision parameters.

List of Specifications

Strategic planning

The overriding goal of this activity is (i) to identify technologies that are critical for the EU to meet its European Climate and Energy goals, (ii) to quantify their potential and related impact of their deployment on the EU policy goals (iii) to assess the impact of RD&D investment on technology developments and further on the related benefits to the EU policy goals.

Key issues to consider are:

Technology performance and development potential

- Technology costs ((upfront) investment, O&M etc.
- Technology environmental performance
- Technical performance

- Expected cost reduction
  - Potential for cost reduction
    - as a function of time
    - as a function of deployment
  - Ultimate cost level (the level at which raw material prices take over from learning and economies-of-scale effects)
  - Total investment required from public and private funds (for whole program) to make technology competitive with fossil and nuclear options
  - Potential for technical improvements

Technology deployment

- Maximum potential of a given technology and pathway at which time horizon
- Regional specificities
- Impact on the energy system structure

Policy indicators

- How much CO2 reduction per technology
  - Also accounting for the deployment of technologies
- How much % renewables
- How much efficiency gain
  - Overall
  - Per technology option (per kWh and for all installations constructed)
  - Consider National/ EU/ Biofuels targets
- Impact on EU security of supply
  - Decreased use of imported fuels and electricity

- Economics
  - Societal costs

    - System boundaries
        - Competitiveness considerations for regional industry. How do vulnerable industries react?
        - healthcare costs
        - etc.
    - Shifting technology options
        - It should be possible to calculate different scenarios where specific technology options may be prioritized
    - The effect of different forms of stimuli (feed-in tariffs, grants, quota obligations and targets, fiscal measures, etc.) on deployment and price/cost development
- External impacts of political decisions
    - Health and/or mortality
    - Other environmental impacts (water, particulates, soil, etc.) than ghg emissions
    - Employment
    - Etc.

Deployment and planning the transition

This activity aims at understanding the transition of the energy system and how it could be implemented. Its goal is to support the decision-making related to investments for instance, in commercial-scale demonstration projects providing guidance on how these project can be used as seeds for further deployment etc.

- *Spatial planning*
    - Where and when to deploy the technology to anticipate and have a better understanding in, for instance, the requirement in supply chain, logistics, trans-national electricity interconnections, taking into account environmental aspects, resource potential and other uses

- *Deployment pathways*
    - how demonstration projects can be used as seeds for deployment ramp-up
    - How grids and transport networks should evolve to accommodate the shift to a low carbon energy system - concept proposals
    - Logistics requirement and planning for deployment

- *Market designs and organisational changes*
    - What are the barriers, required changes

- *Acceptance of technology*
    - Behavior change
    - Public acceptance of technologies
    - People's perceptions on technologies
    - Having this sort of information in the database may already be enough, projections for the future are hard to make

- *Impact analysis of the transition*
    - System reliability, Security of supply

- Supply chain and logistics
- Economics
- Employment
- Sectoral changes etc.

Innovation & R&D

- R&D funding mechanisms
- Industrial chances
  - For example opportunities for Europe's energy industry to expand on global markets. This may be expressed in the global economic potential for a technology and the ability of the European energy industry to have an impact on global developments.
- Influence of strategic documents
- Learning potential
  - Rate of cost reduction
  - Ultimate cost level
- Long term perspective
  - Economic potentials
- What is Europe strong at?
- What are the Member States strong at?
- Which technologies do we need to reach our targets (also those after 2020)
  - Make sure not to just consider industrial strength, but also that you actually contribute to further emission reductions.
  - Is the technology economically or environmentally driven?
- Are the areas that need particular attention due to worldwide competition?

Reinforcing international cooperation

This activity aims at understanding in which fields international cooperation is beneficial to enhance the transition of the energy system. Its goal is to support decision making related to how cooperation between the EU and third countries enhance the development of energy technologies and their deployment.

- Potentials of Joint Implementation and Clean Development Mechanism
  - Can we make our targets elsewhere outside the EU
  - Which technologies do we need (and in what form)
- Benefits of international cooperation initiatives like IPHE, CSLF
  - The effect of turning partial spill-over to perfect spill-over (for example by exchanging knowledge on local learning aspects of energy technologies like installation, utilization, etc.
- Development of deployment and costs outside Europe (i.e. integrate IEA projections in SETIS)
  - for example for exploring possibilities of free riding