Final Newsletter of the ATEsT project

No. 3 –April 2012

Analysing Transition Planning and Systemic Energy Planning Tools for the implementation of the Energy Technology Information System is one of the SET-Plan instruments analysing the evolution of the European energy infrastructure networks and systems planning for the transition towards a low carbon society. The goal is to create a knowledge platform in which energy models, techniques and data are collected and shared. www.atest-project.eu

The ATEsT project has been finalised – this is the final project newsletter informing about its final outcomes.

Work Packages Organization

Achieved

WP1: List of answers the models have to provide
WP2: Inventory of Models according to SET-Plan needs
WP3: Evaluation of modelling Tools
WP4: Tools Data Analysis
WP5: Tools Validation
WP6: Suggestions for Future Tools

Ongoing

WP7: Dissemination of Information

ATEsT Third Workshop, Brussels 26th March 2012

Final ATEsT Workshop

Overview of project outcomes, particularly regarding the formulation of the ATeST roadmap for models and methodologies development

Presentations and Minutes at:
http://www.atest-project.eu/Events.htm

WP1 defines the specifications of the models and tools to best address and support the SET-Plan decision making and implementation. Full report at:
http://www.atest-project.eu/pdf/D.1.1_Specification_Report.pdf

WP2 maps existing models and tools that cover transition planning and systemic energy topics through consultation of modelling team and by literature reviews. Full report at: http://www.atest-project.eu/pdf/D_2_1_Models_Characterisation_Report.pdf

WP3 proposes a methodology to find and evaluate suitable combinations of tools in order to support energy policy questions related to SET-Plan. Full report at:
http://www.cres.gr/atest/pdf/ATEST_Model_Rankings.pdf

WP4 identifies existing data and creates an inventory of data sources for different model types, assesses the weak points of the data currently in use, and additional data requirements. Full report at:
http://www.atest-project.eu/pdf/D_4_1-Report_Exiting_Data-Data_Requirements.pdf

WP5 validates the selected tools from WP3 using the data identified by WP4. Final report at: http://www.atest-project.eu/Publications.htm

WP6 formulates the ATEsT roadmaps for advanced models and methodologies to support decision making related to SetPlan implementation. Final report at: http://www.atest-project.eu/Publications.htm

Work Package 4. ANALYSIS OF DATA REQUIREMENTS FOR THE PROPOSED MODELS

Objectives:
1. Identification of existing required data and creating an inventory of data sources for different model types; 2. Assessing the existing data and the weak points of the data currently in use, and 3. Identifying data gaps and additional data requirements.

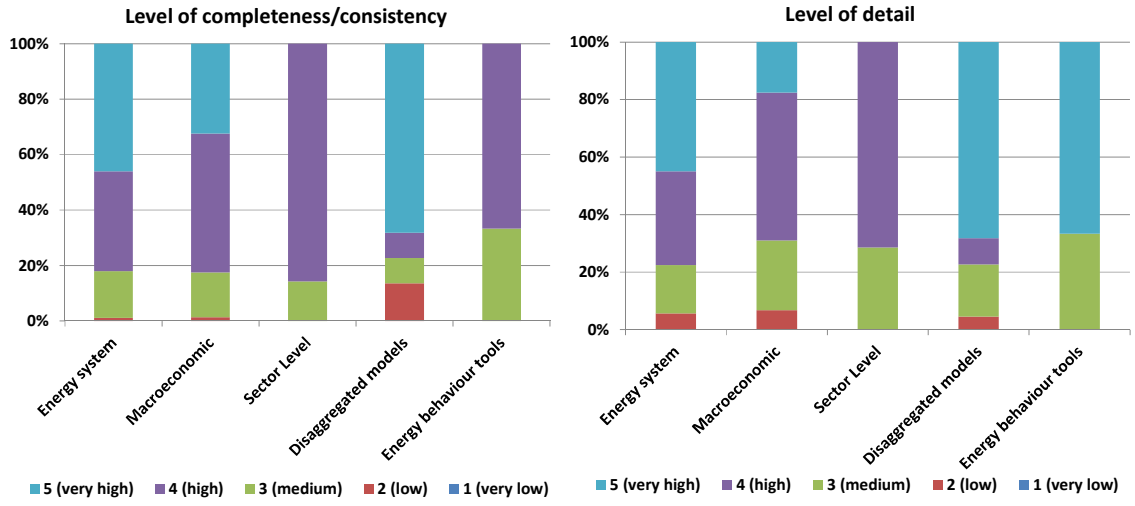
Approach: for each of the model families from WP2, was created a data collection list. A collection of data sources and respective information was compiled per model family. This was complemented with an assessment of the existing data and of additional data needs which was performed by internal and external model experts via an open call. Each modelling team addressed 40 questions to characterize models as a function of their ability to evaluate SET-Plan needs.

Main Findings:

1. Examples of weak points by model family:
- **Energy system:** data available on aggregated level or average numbers, different balancing methods (CHP); comparability of values about specific energy consumption.
- **Macro-economic:** Costs for data (GTAP database); Time lag until data are published (Input-Output tables); Inconsistencies between tech. classifications within macroeconomic databases.
- **Sector level:** Not updated data in the database.
- **Disaggregated:** Very detailed data of existing power plants not easily accessible; Stochastic RES generation profiles not updated often enough.
- **Energy behaviour:** Quality of data varies by context (and the commitment of the users of the tools) and may not be comparable.

2. Main additional requirements by model family:
- **Energy system:** Trade flows of semi-finished goods and specific energy consumption; Recycling potentials; Steam use & production; Building data; Behaviour in end-use; Useful energy; Load curve.
- **Macro economic:** European Social Accounting Matrix (SAM) allowing to extract national SAMs; Substitution elasticities; Detailed Physical Input-Output-Tables (PIOT); Demand patterns & motivation of consumers.
- **Disaggregated:** Existing Power Plants; Thermal vs. elect. performance of a thermal plant; Load forecasting; Operating framework of hydro-pumping; Geographically varied, household-specific electricity demand load curves; Information on demand-price relationships and acceptability
- **Energy behaviour:** Generation of new information for each new model process; Establish a "case library"; Qualitative/quantitative; objective data/subjective viewpoints of various stakeholders; Carbon footprint data.

Main Conclusions of WP4
- Each Policy Question should be answered with different types of models and/or tools and each model type has different ways of generating the required information and needs specific type of data.
- To improve the existing model platform, additional data is required and the availability of high quality data is a key issue for the future development of these models;
- Important data attributes for model improvements & enlargements are: availability of more detailed data, e.g. higher time & spatial resolutions; data consistency & comparability; depth of information & context-specific understanding when changes in behaviour are strived for.



Overall split of the analysed sources by level of completeness/consistency and detail

Work Package 5. VALIDATION OF THE TOOLS USING THE EXISTING DATA

Objective: Validate the selected tools from WP3 using the data identified by WP4

Approach: 1. Choose a number of models that appeared in different combinations in the analysis of WP3, i.e. models that appeared in the top combinations and were available to the project partners. 2. Formulate a linking scheme approach for these models. Note: Focus on model couplings that were not done in the past by examining the soft linking possibilities between them (CGE or MGM models not included).

Model linking proposal

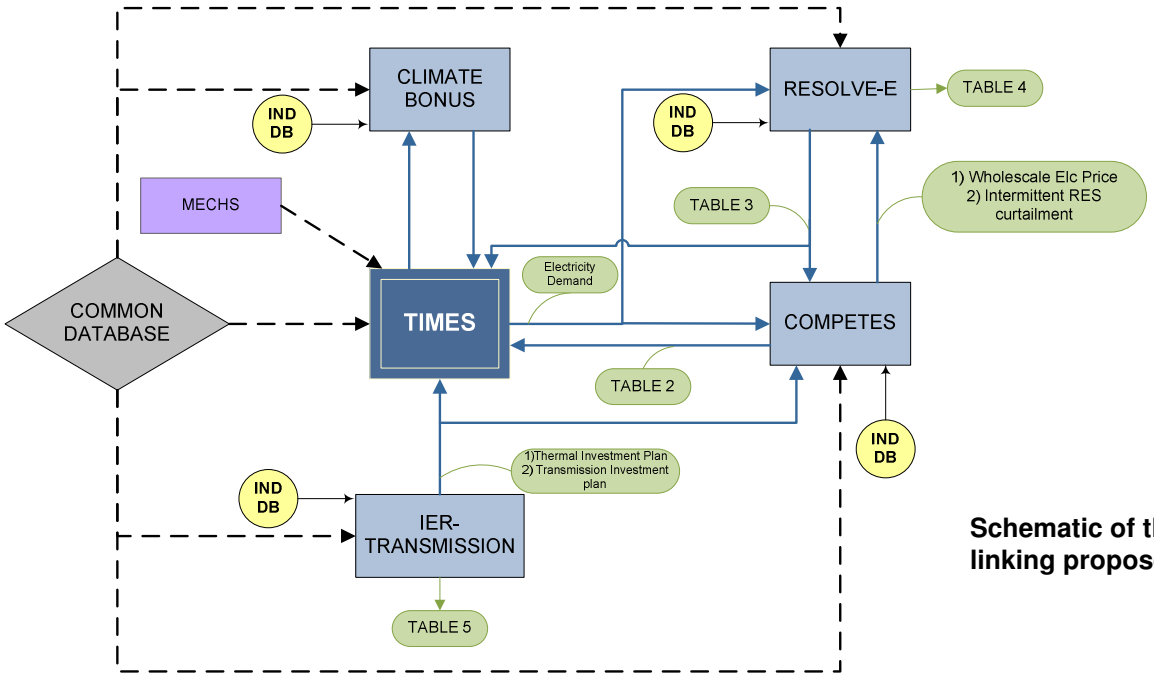
Step 1 - A systemic model covering the whole of the energy system like TIMES is run with input from: Climate-BONUS, MECHanisms. The electricity demand from TIMES is used as an input to IER-Transmission which optimizes both thermal generation and transmission capacity expansion, simultaneously. The output is forced in TIMES.

Step 2 - Output of the systemic model used as an input to the iteration between RESolve-E and COMPETES that focus on the electricity and renewables. The thermal system and transmission is optimised in IER-Transmission.

Step 3 - COMPETES and RESolve-E are soft linked. Both models use as input outputs from other models, as for RESolve-E the wholesale electricity price from TIMES, or RES capacity development and RES electricity production from RESolve-E in COMPETES. The total electricity demand as well as investments in thermal generation and transmission comes from TIMES and is shaped by the output of IER-Transmission. The final results come from RESolve-E, where the RES production is corrected according to the curtailment levels from COMPETES.

Step 4 - Output of COMPETES+RESolve-E used as input to the TIMES model: RES Capacity development; RES Electricity production; RES electricity curtailment; Power trade flows; Congestion price (Marginal price of the transmission capacity).

Step 5 - Achieve convergence establishing a convergence formula between models: the iteration between the model runs will result to a shift of the optimal points in each model. Need to define “confidence intervals” for some key exchange variables. Note: Convergence and optimality of the final solution is an open issue and should be further analysed.



Schematic of the model linking proposed.

Work Package 6. SUGGESTIONS FOR FUTURE TOOLS DEVELOPMENT

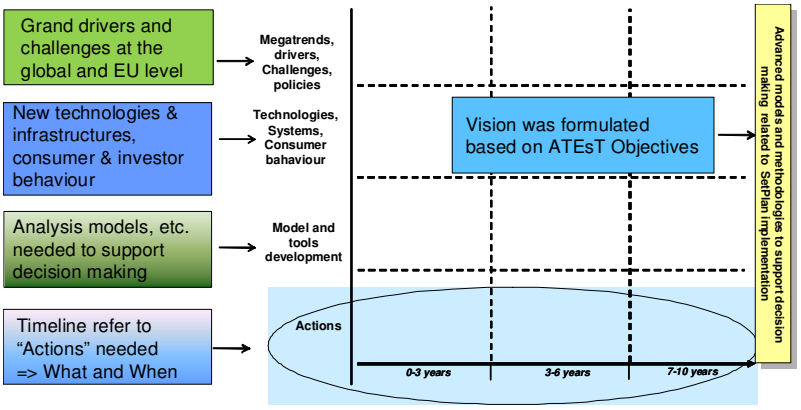
Objective: Create a framework/roadmap for tools necessary to plan and develop future energy systems and policies.

Approach: The ATEsT roadmap especially focuses on the needs for tools, models and methodologies development as well as concrete actions needed. The roadmap process entailed:

Step 1 - Collection of insights from project partners (internal workshops) + priorisation of actions in a video conference;

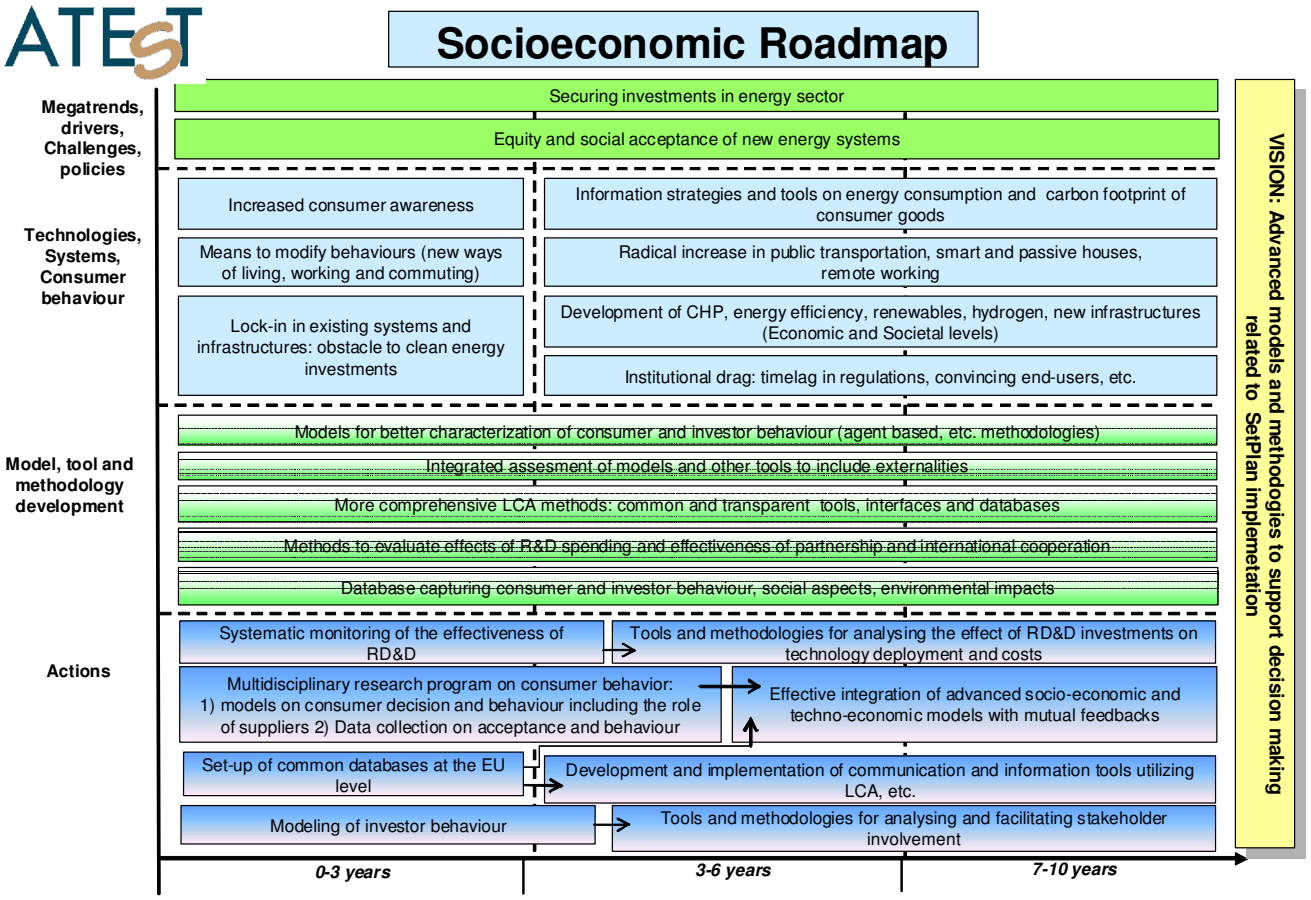
Step 2 - Construction of roadmaps by VTT based on the collected material;

Step 3 - Discussion in the ATEsT final workshop → editing of the roadmaps based on comments.



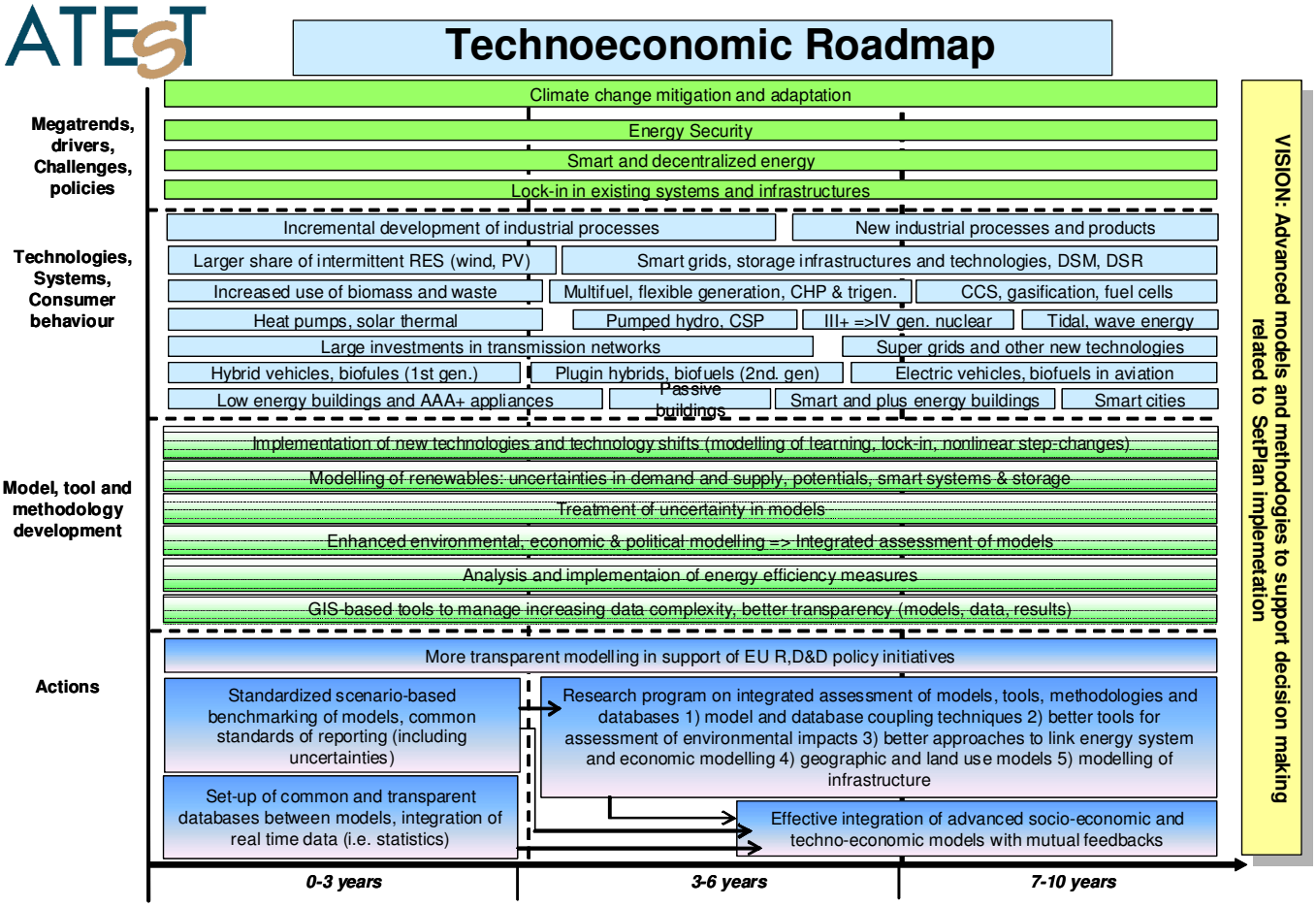
Schematic representation of the ATEsT roadmaps

A socio-economic and a techno-economic roadmaps were generated. Each driver and development in the roadmaps aggregate a series of more detailed components.



ATEsT Socioeconomic Roadmap for more advanced models and methodologies to support decision-making related to SET Plan implementation

Work Package 6. SUGGESTIONS FOR FUTURE TOOLS DEVELOPMENT (II)



ATEsT Technoeconomic Roadmap for more advanced models and methodologies to support decision-making related to SET Plan implementation

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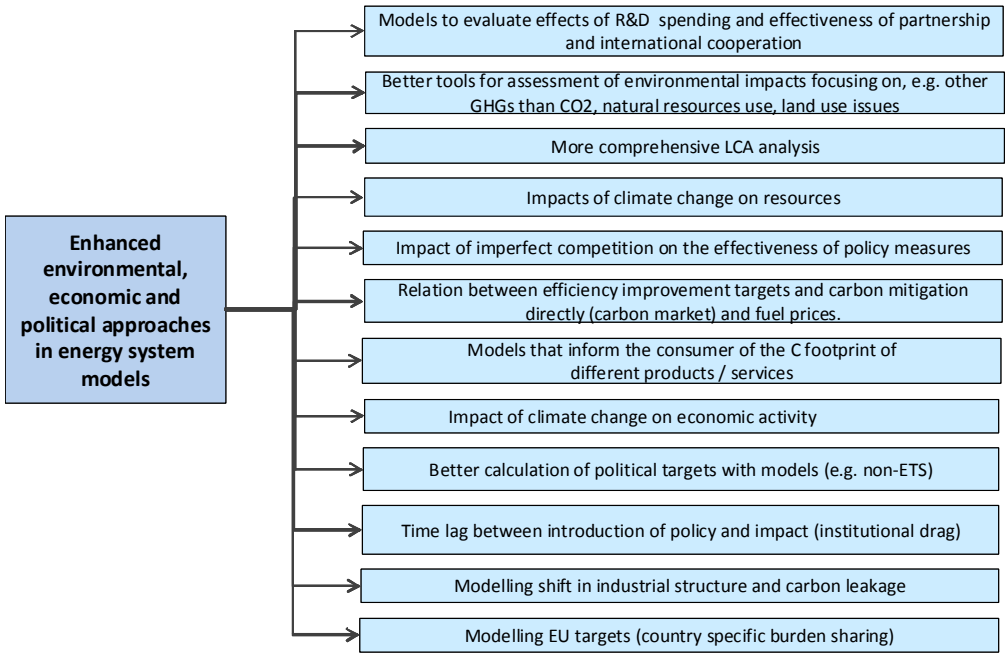

Disaggregation of some of the model and methodologies developments in the Technoeconomic Roadmap

ATEsT Website

www.atest-project.eu

ATEsT Partners

- CENTER FOR RENEWABLE ENERGY SOURCES (CRES)
- ENERGY RESEARCH CENTRE OFTHE NETHERLANDS (ECN)
- AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE (ENEA)
- UNIVERSITY OF STUTTGART (IER)
- TECHNICAL RESEARCH CENTER OF FINLAND (VTT)
- POLICY STUDIES INSTITUTE – UNIVERSITY OF WESTMINSTER (PSI)
- CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS (CIEMAT)
- ENERGY INSTITUTE HRVOJE POZAR (EIHP)
- EUROPEAN COMMISSION - JOINT RESEARCH CENTRE (INSTITUTE for ENERGY and TRANSPORT)

Contact:
George Giannakidis
Centre for Renewable Energy Sources and Saving
Tel. +30 2106603324 • Fax +30 2106603301
E-mail: ggian@cres.gr