

TIMES improvements in REACCESS and REALISEGRID EU Projects

Evasio Lavagno
LAME, Politecnico di Torino, Italy

Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

In the **REACCESS Project**, started January 2008, the modelling tools are the **pan-EU27+** TIMES model originally developed in NEEDS and further implemented during the RES2020 Project and the **TIAM** TIMES model that considers 14 World regions.

The main modelling improvements needed for the REACCESS Project involve the **trade/import approach** among the European countries and the rest of the World.

Risk of Energy Availability: Common Corridors for Europe Supply Security

Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

While for the intra-EU energy exchanges the usual TIMES schemes and paradigms can be maintained (with some improvements), a **new approach** is needed for the **energy import from the rest of the World**, that presently and even more in the future is a very critical issue and where a strong competition with other consuming Countries takes place.

In addition to the usual technological, economic and environmental parameters, a new approach to the **spatial aspects** must be considered for this new “region”, where the international energy trade is performing.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

During the first activity year the main efforts have been devoted to the **identification** and **characterization** of these new entities - **the energy corridors** – collecting data on present and planned and/or expected situations of oil, gas, coal, biomass, nuclear fuels and new energy vectors as far as **resources**, primary and secondary **productions**, and **transportation** through “**captive**” and “**open sea**” routes, from any part of the World towards not only Europe but also the other World regions that are competing with Europe for these supplies.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

A parallel activity started for exploring and testing **modelling solutions**, having in mind also the complexity of the management of a **new World TIMES model** involving

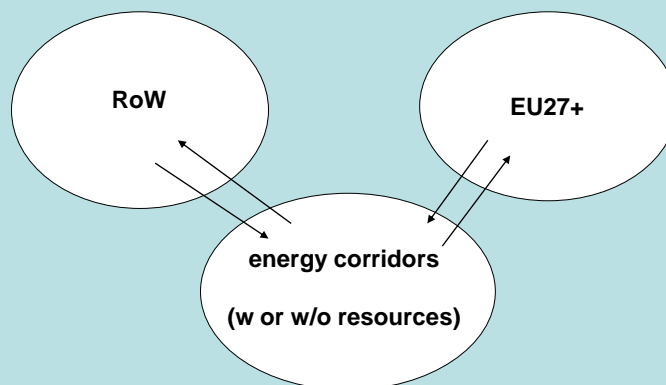
- the **30 European sub-regions**, represented by the adapted version of the existing pan-EU27+ TIMES model,
- the **15 World regions** represented by the adapted version of the existing TIAM Model, and
- The new “region”, representing the **international energy trade** and involving several hundredths of individual entities.

Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects



Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

Several solutions have been elaborated and are presently discussed on the modelling representation and the aggregation of the components of this new “region”, which require to give particular (and new, for the usual TIMES LP approach) consideration to the **spatial parameters**.

The very large amount of data upon **origin** and **destination**, type of **commodity**, **path** (sometimes “intruding” the EU space with very large common infrastructures), interactions with the **spatial environment** (producing externalities and risk effects), **transportation technologies** (pipes, cables, ships, trains, trucks, ..) that has been collected must be converted in suitable **modelling parameters**.

Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

Sometimes **captive** (pipelines) and **open sea** (shipping routes) segments are **connected** into a single particular corridors.

Very large gas and oil **common** and well identified **infrastructures** with multiple input (like the pipes coming from Russia and other central Asia Countries) are supplying several EU energy systems and must be considered as single infrastructures, mainly from the point of view of the risk/reliability evaluations.

Venice, June 16*,2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

Particular efforts have been devoted to the **spatial analysis** of the identified energy corridors, by using GIS tools and approaches that are very new for TIMES applications.

The work that has been done in this field is very relevant for supporting the full description of the corridors and for the analyses of risk analysts.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

The second relevant improvement required by the objectives of the REACCESS Project involve the **risk/reliability** of the **energy supply** and the solutions for taking into consideration this particular dimension of the energy problems.

Several proposals have been presented and are now discussed, in order to manage **endogenously** and/or **exogenously** this very important component of the supply security.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

In the **REALISEGRID Project**, started on September 2008, the main modelling tool is the pan-EU27+ TIMES model originally developed in NEEDS and further implemented during the RES2020 Project.

A first improvement is involving the **extension** of the area coverage to the **Balkan Countries**, Croatia, Bosnia Herzegovina, Serbia, FYR of Macedonia, Albania and Kosovo (from pan-EU27+ to EU27++ or EU36).

REseArch, methodoLogies and technologieS for the effective development of pan-European key GRID infrastructures to support the achievement of a reliable, competitive and sustainable electricity supply

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

A second improvement involves the description of **energy infrastructures**, principally the national electricity grids and their interconnections, but also the EU natural gas networks, their interconnections and the external supply systems.

The objectives of the project, and the work required to TIMES modellers, is to explore **the capability of the global EU energy infrastructural system to support the future energy (mainly electricity) needs** in different scenarios, in particular those with relevant role of **intermittent energy source** utilizations.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

In order to fulfill these requirements, a more detailed representation of the **electricity grids and interconnections** has been assumed and, presently, a full description of the **national gas networks** is under way.

Particular care is devoted to the complex system of energy connections existing in the **North Sea Energy System**.

Solutions for the management of the **intermittent source** contribution to the electricity supply will be explored through suitable TS approaches.

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy

TIMES improvements in REACCESS and REALISEGRID EU Projects

The details of the modelling solutions we are exploring for both Projects are very “technical” for a “open” discussion; moreover some issues have been described in previous presentations. For these reasons I suggest that particular topics could be discussed in parallel meetings.

Thanks for the attention

Venice, June 16th, 2009

ETSAP Workshop

Evasio Lavagno, LAME – POLITO, Italy