

EFDA-TIMES: Status and Perspectives

C. Eherer, christian.eherer@efda.org

Semi-annual ETSAP Workshop
30 November 2006, IER Stuttgart, Germany

Overview

- Motivation of EFDA-TIMES
- Involved research groups
- Challenges faced during 2005/2006
- Achievements during 2005/2006
- Roadmap and perspectives
- Recently launched activities
- Outlook

Motivation of EFDA-TIMES

- Fusion power practically not considered in existing long-term energy scenarios (e.g. IASA-WEC, IPCC SRES)
- Earlier energy scenario studies within EFDA:
 - Only considered Western Europe (ECN)
 - Basic single-region global model (TUG-IPP)
- Thus, need for a tool within EFDA and the Associations to develop long-term multi-regional energy scenarios with fusion power
 - State-of-the-art and internationally accepted methodology
 - Enabling to contribute to the energy debate with such scenarios
- → Start of the EFDA-TIMES project in 2004
 - First version of the EFDA-TIMES Modelling Framework was developed for EFDA by an external consortium of experts and delivered in autumn 2004

Involved research groups

- CIEMAT, Spain
- ENEA, Italy
- iSpace, Austrian Research Studios, Austria
- Max Planck Institute for Plasma Physics (IPP), Germany
- Politecnico di Torino (POLITO), Italy
- Risoe National Laboratory, Denmark
- UKAEA Culham, UK
 - ECN, AEAT as subcontractors
- University of Technology Graz (TUG), Austria
- VTT-TEKES, Finland

Challenges faced 2005/2006

- Familiarisation with the EFDA-TIMES modelling framework and the VEDA software
- The initial version of EFDA-TIMES gives room for numerous improvements and adaptations
- Incomplete documentation and motivation of the model database and the underlying assumptions (data sources, regional multipliers, user constraints, etc.); makes in-depth review necessary
- The VEDA templates are based on MARKAL, while many EFDA-TIMES users only worked with TIMES
- Lacking documentation of new and improved VEDA features makes it difficult to use them
- Sometimes hard-to-follow MARKAL to TIMES conversion path (done internally in VEDA)
- Important TIMES features not supported in VEDA and the templates
- Technical problems with VEDA Front End and running the model

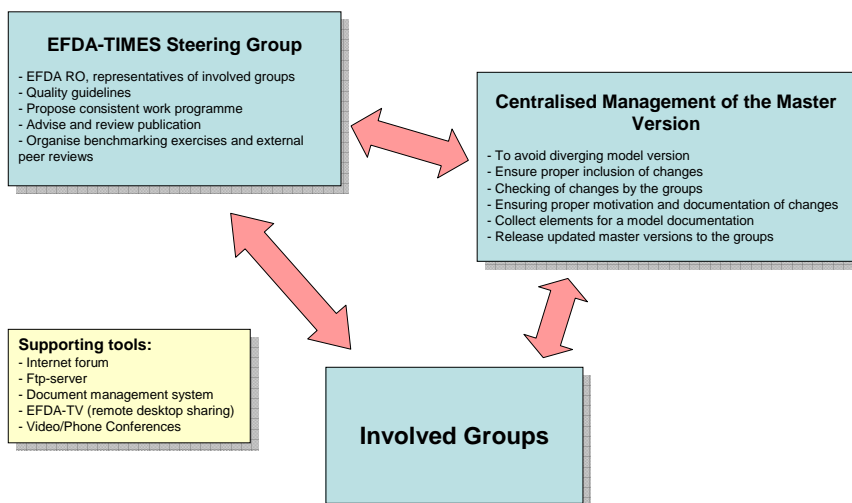
Achievements 2005/2006

- First review of EFDA-TIMES and extensive list of suggestions for improvement by VTT-TEKES and AEAT
- Alternative economic growth assumptions and revised driver elasticities for EFDA-TIMES (ENEA)
- Data collection and improvements
 - Electricity sector (CIEMAT)
 - Non-GHG pollutants (CIEMAT)
 - External costs (CIEMAT)
- Methodology for assessing external versus mitigation costs of fusion in long-term energy scenarios (CIEMAT)
- Implementation of a basic nuclear fuel cycle for Uranium (fission) and Lithium (fusion) (UKAEA)
- Review and suggestions for improvements of the residential sector (IPP)
- Impacts of Endogenous Technological Learning (ETL) and development of other learning approaches, e.g. ATL, Knowledge-Based-Learning (TUG)

Roadmap and perspectives

- To speed up the development process of EFDA-TIMES a two stage roadmap has been adopted:
 - **Stage I (July 2006 – 2007):** Do what is needed to produce publishable results. Publish the key assumptions and defensible preliminary results in a definitive paper.
 - **Stage II (2007 – 2008):** Further studies using the model, by fusion associations. Do what is needed to release a version to non-fusion users, which is attractive enough for them to want to use it.
- Stage I focuses on the following activities:
 - Consolidation of the model
 - Review of the technology database and model structure
 - Review of major assumptions and their impact and get them “right”
 - Stay close to well known IPCC scenarios (as far as possible)
 - Implementation of quality guidelines
 - Centralised management and documentation of the master version of the model

Roadmap and perspectives (2)



Recently launched activities

- In depth review of all model elements and the database
 - Upstream sector (ENEA, RISOE)
 - Resource base (CIEMAT, iSpace)
 - Electricity sector and technical scenarios on fusion power (UKAEA)
 - Residential sector (CIEMAT)
 - Transport sector and hydrogen subsystem (IPP)
 - Industry sector (VTT-TEKES)
 - Trades (POLITO)
- Management of the model master version (TUG)

Outlook

- Alternative set of driver projections?
- Formulation of a robust baseline scenario and a corresponding storyline
- Putting together a comprehensive documentation of the model
- Adjustments to the regional split (e.g. treatment of new EU member countries)
- Base year calibration to latest energy balances

Thank you!