

## BASIC TRAINING COURSE ON VEDA-TIMES

21 - 23 NOVEMBER 2023, WEB TRAINING, 08.00AM - 12.00PM CET

Note: VEDA2.0 and GAMS have to be installed prior to the training course on your laptop, following the instruction that will be provided two weeks in advance

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### TUESDAY 5 SEPTEMBER

#### First session 08.00am-09.45am

- Presentation of the program and round table
- Introduction to the TIMES model generator

Break 09.45am-10.00am

#### Second session 10.00am-12.00pm

- Overview of VEDA2.0
  - Browsing a simple Demo
  - Base year templates and SysSetting for data input

### WEDNESDAY 7 SEPTEMBER

#### First session 08.00am-09.45am

- How to use VEDA2.0 to
  - Run a demo model
  - Analyse model results
- Exercises with the demo model

Break 09.45am-10.00am

#### Second session 10.00am-12.00pm

- VEDA scenario templates
  - Regular scenarios (insert and update transformation tables)
  - SubRes template
  - Exercises: building alternative scenarios
- How to represent the electricity generation sector in a Demo model

### THURSDAY 8 SEPTEMBER

#### First session 08.00am-09.45am

- User constraints in TIMES
- Example of user constraints in VEDA2.0-TIMES
  - Absolute constraint
  - Share constraint

Break 09.45am-10.00am

#### Second session 10.00am-12.00pm

- Exercise with the demo model

## REFERENCES

### TIMES Documentation and Demo Models

- Part I: [TIMES concepts and theory](#)

Part I provides a general description of the TIMES paradigm, with emphasis on the model's general structure and its economic significance. Part I also includes a simplified mathematical formulation of TIMES, a chapter comparing it to the MARKAL model, pointing to similarities and differences, and chapters describing new model options.

- Part II: [Comprehensive Reference Manual](#)

Part II constitutes a comprehensive reference manual intended for the technically minded modeler or programmer looking for an in-depth understanding of the complete model details, in particular the relationship between the input data and the model mathematics, or contemplating making changes to the model's equations. Part II includes a full description of the sets, attributes, variables, and equations of the TIMES model.

- Part III: [The Operation of the TIMES code \(organization of the TIMES modelling environment\)](#)

Part III describes the organization of the TIMES modeling environment and the GAMS control statements required to run the TIMES model. GAMS is a modeling language that translates a TIMES database into the Linear Programming matrix, and then submits this LP to an optimizer and generates the result files. Part III describes how the routines comprising the TIMES source code guide the model through compilation, execution, solve, and reporting; the files produced by the run process and their use; and the various switches that control the execution of the TIMES code according to the model instance, formulation options, and run options selected by the user. It also includes a section on identifying and resolving errors that may occur during the run process.

- Part IV: [VEDA 2.0](#)

Part IV provides a step-by-step introduction to building a TIMES model in the VEDA2.0 user interface for model management and results analysis. It first offers an orientation to the basic features of VEDA2.0, including software layout, data files and tables, and model management features, both for handling the input and examining the results. It then describes in detail twelve Demo models (available below) that progressively introduce VEDA-TIMES principles and modeling techniques