Advanced training

Topic:

1) **Implementing near optimal solutions and multi objective optimization in TIMES**
2) **Application of new grid features to TIMES**

When: 26. And 27. November (in person). Back-to back ETSAP winter WS

Where: Close to VTT, Helsinki

Please sign up for the training to Pernille.Seljom@ife.no. The training is free for ETSAP members. There is a limitation on number of participants, and we will follow a first come first serve principle.

Prerequisites: Participants are expected to have prior experience with TIMES/Veda. This involves completion of basic training and the ability to independently implement new modeling features.

Aim: The aim of the training session is ETSAP modelers can implement advanced features in their respective models after finishing training. This will be done through presentations, hands-on demonstrations and class discussions.

Background: This training session is a part of an ongoing ETSAP project that serves as a polit for integrating advanced training in the long-term activities of ETSAP. The aim is to increase the use of advanced TIMES modelling features, promote broader applications of the TIMES framework and to improved collaboration and knowledge-sharing between experienced VEDA and TIMES users with the wider ETSAP community.

Topic: The first part of the training will cover advanced approaches for expanding the scope of TIMES analyses beyond conventional energy perspectives. Participants will learn how to integrate non-energy aspects such as nature, environment, area use, social acceptance, available capital, energy security and so on.

One way to approach this is to use Modeling to generate alternatives (MGA) to quantify the near optimal solution space. A stepwise method for exploring near-optimal solutions will be introduced, enabling the identification of alternative energy technology mixes and the assessment of flexibility in non-energy parameters. Another fundamental approach is to use multi-objective optimization (MOO) to quantify trade-offs between different objectives, such as minimizing costs versus minimizing use of critical materials.

The second part of the training will cover the updated grid extension module to TIMES that enables a more advanced modelling of trade in TIMES models.

Trainers: The trainers of the training are solid TIMEs modelers that have experience in applying these features.

The first training session will be prepared and be held by Dr Juan David Correa-Laguna from VITO, Belgium. He will focus on a modelling approach to explore the near optimal solution space and demonstrate the feature in a simple hands-on exercise in TIMES. The method can be applied to determine alternative energy technology combinations and to assess the flexibility of non-energy parameters, all while maintaining near-optimal cost.

The second and third training sessions will be prepared and be held by Dr. Matteo Nicoli from University of Turin, Italy. He will focus on MOO and their potential combinations and demonstrate the features in a simple hands-on exercise in TIMES.

The fourth training session will be prepared and held by Mr. Antti Lehtila, from VTT, Finland. He will present and demonstrate a novel and recent extension to the TIMES codes that facilitates for a more advanced grid modelling.

Day 1.

Session 1: 09:00- 12:00 - Stepwise method for exploring the near optimal solution space

Session 2: 13:00 – 16:00 - Application of multi-objective optimization in TIMES

Day 2.

Session 3: 09:00 – 12:00 - Application of multi-objective optimization in TIMES continuation

Session 4: 13:00 – 15:00 - New grid features in TIMES

Webinars: Each of the presenters will follow up after the training with a one-hour webinar for the ETSAP community that will be uploaded on the ETSAP Youtube channel.