

EML activities in the IEA ETSAP community

Time frame: Late 2019 to spring 2021

EML: Energy Modelling Lab ApS - energymodellinglab.com

IEA (International Energy Agency) Technology Collaboration Programme ETSAP (Energy Technology Systems Analysis Program) - iea-etsap.org

EML is an active member of the ETSAP community. EML has and continues to contribute to the ETSAP community in 2020 and 2021. We continue the Danish collaboration and participation at the IEA-ETSAP, Annex X to XIV under the new Annex XV. Our partners and consultants are actively developing TIMES models in several **projects**, regularly attend ETSAP's **biannual workshops and webinars**, took VEDA-TIMES **trainings**, were and will continue **teaching** energy systems analysis courses at post-graduate level by deploying the TIMES framework, develop auxiliary **tools** to improve pre- and post processing tasks and successfully **migrated from VEDA1 to VEDA2** during ongoing projects.

Projects

Title	Model	Period	Partners	Description	Website
NCES2020 Nordic Clean Energy Scenarios 2020	ON-TIMES	2020 - 2021	Energiforsk , NMBU , EA , VTT , IVL	The work builds on the NETP projects by complementing the cost-effective pathways with deeper analysis of uncertainty and alternative socio-technical framework conditions. This includes policy, technology shifts, economic outlook, developments in other countries and other societal changes that have an impact on the Nordic region - DK, FI ,IS ,NO and SE.	nces2020.tokni.com - under construction!
UEOR2021 Energy Outlook Report for Ukraine	TIMES-UA	2019 - 2021	UEDC, MoE , DEA , EA	This project develops an independent study of the Ukrainian energy system, which analyses development scenarios for input to national energy strategy documents and provides policy recommendations to achieve national energy and climate goals. Furthermore, the modelling results of this project can also be used to contribute to the National Energy and Climate Change Plan for the period 2021-2030 (NECP).	timesukraine.tokni.com
VEOR2021 Vietnam Energy Outlook Report 2021	TIMES-Vietnam	2021 - 2021	EREA , DEA	The objective of the project is that Vietnam's energy system becomes more sustainable through implementation of cost-optimized policy and planning by assisting MOIT and EREA to commission, develop, and analyse comprehensive long-term energy scenarios.	
LTES-AZ Long-term Energy Strategy for Azerbaijan	TIMES-AZ (to be dev.)	2021 - 2022	MoE , EQUINOCCIO , Ramboll , NIRAS	This technical assistance tackles the needs of Azerbaijan of reviewing and updating the Long-Term Energy Strategy (LTES) in the light of the recent situation in AZ. Another important focus in this technical assistance is to build up capacity in Azerbaijan to continue the work with LTES and in general to work with energy system analysis as a method for planning future investments and points of focus.	

Meetings

Biannual workshops

The biannual workshops focus on the practice of modelling and use of ETSAP tools e.g. MARKAL/TIMES modelling frameworks, participation in training activities and collaboration in projects related to the improvement of ETSAP tools. In general, the contribution to these workshops shall be based on current and future projects, particular within EU, Nordic and Danish research programs – by involving PhD students from Danish universities.

Our director and partners participated in several IEA-ETSAP semi-annual meetings over last years:

- 2019-12-09/13: [76th Semi-annual ETSAP meeting, Newcastle \(AU\)](#)
 - [Kenneth](#) co-organized the meeting, together with [Luke Reedman](#) from [CSIRO](#)
 - [Kenneth](#) chaired session 5 on research projects and gave a presentation about [The SHIFT Nordic TIMES model](#) project
- 2020-07-02/03: [Summer 2020 - 77th Semi-annual ETSAP meeting, online](#)
 - [Mikkel](#) gave a presentation during session 3 on the topic [The cost of green transition is nothing compared to our health and environmental costs](#)
- 2020-12-16/17: [Winter 2020 - 78th Semi-annual ETSAP meeting, online](#) (see also here: [78th SEMI ANNUAL IEW ETSAP MEETING](#))
- 2021-06-17/18: Next workshop, register [here](#)

For all past and coming workshops please see [here](#).

Webinars

Members of EML attended several ETSAP webinars:

- 2020-11-26: How to build a TIMES model from scratch
- 2020-12-10: Modelling clean energy transitions: approaches and tools for the World Energy Outlook and the Energy Technology Perspectives
- 2021-01-21: Developing and using TIMES models with git, GitHub and VEDA
- 2021-02-23: ETSAP webinar: High temporal and spatial resolution modelling in TIMES models
- 2021-03-30: Stochastic Modelling of VRES in TIMES and Modelling high VRES with hourly TS resolution, unit commitment, dispatch and capacity expansion in TIMES

Training

[Ida](#) participated in the 3 days ETSAP VEDA-Times web training.

- 2020-12-09 to 2020-12-11: Basic Training Course on VEDA-TIMES, Web Training by [Maurizio Gargiulo](#) from [E4SMA](#)

For future trainings please see [here](#).

Teaching

EML is teaching energy system modelling on the basis of the TIMES modelling framework. In the current term Mikkel and Kenneth are offering the course *TIMES-DK modelling* to graduate students at [SDU](#). The duration is approx. 20 weeks from February to June 2021.

Background

The students are given insights into the TIMES modelling framework and will deploy the Danish model TIMES-DK to assess the Danish energy systems within the scope of their individual assignments.

Objectives

The course aims to provide the students with knowledge and abilities to work in the TIMES-framework, which includes but is not limited to the following topics:

- Sector coupling of the full energy system
- Time aspect in the making of energy system assessment
- Resources barriers such as bioenergy, wind, solar and fossil potentials
- Carbon budgets and national GHG targets

Method

Weekly lectures combined with practical assignments and project work in groups. Results of case works are an integrated part of the teaching and will be presented and evaluated during the course.

Auxilliary tools

At EML we develop several auxiliary tools. Currently, we work on two tools, one to include biomass potentials for energy use in our analysis and the other to seamlessly aggregate and transmit data from a VEDA batch export excel file to our websites hosted by [Tokni](#):

- A biomass model - for more information contact [Ida](#)
- Veda to TOKNI - for more information contact [Till](#)

VEDA migration

Within the Nordic Clean Energy Scenarios ([NCES2020](#)) project EML migrated the development of the open source Nordic TIMES model (ON-TIMES) from [VEDA1 to VEDA2](#). It includes all of the 5 nordic countries, i.e. Denmark, Finland, Iceland, Norway, Sweden and serves the purpose of informing decision-makers and support the common Nordic commitment to carbon neutrality through strong, collaborative Nordic research and analysis.