Universität Stuttgart
IER Institut für Energiewirtschaft
und Rationelle Energieanwendung

ETSAP TIAM Documentation and Validation

Markus Blesl

Participating Partners: University College London (UCL); VTT Technical Research Centre of Finland Ltd.; Institute for energy technology (IFE); The Centre for Applied Mathematics (CMA); Imperial College London (ICL); Paul Scherrer Institute (PSI); Columbia University CGEP

Motivation and target

- The ETSAP TIAM model was developed since years in different ETSAP projects.
- To make the latest development of ETSAP TIAM model from end of 2021 available for new ETSAP members or distribute it as an open source model for this it is necessary to make it as transparent as possible.
- In this project, the many years of modeling experience will be transferred to a possible OS Wiki regarding the ETSAP TIAM model.

The aim is to improve the documentation as well as the advancement of the ETSAP TIAM model through collective knowledge.
The project thus has the goals of presenting a platform for future jointly developing and simultaneously ensure the comparability and reproducibility.

Deliverables, Partners, Timeline

Deliverables:

- Build up a Wiki for ETSAP TIAM and document the different parts of the model;
- Improvements in the TIAM model data;
- Demonstration of the results

Participating editing Partners:
IER + Columbia University CGEP; open for other partners

Participating Review Partners:
University College London (UCL); VTT Technical Research Centre of Finland Ltd.; Institute for energy technology (IFE); The Centre for Applied Mathematics (CMA); Imperial College London (ICL); Paul Scherrer Institute (PSI); open for other partners

Timeline:
December 2022 till September 2023 (Present the Wiki, GitHub-structure and the model (results) at the next EXCo)

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Modelling of the industry sector & material efficiency

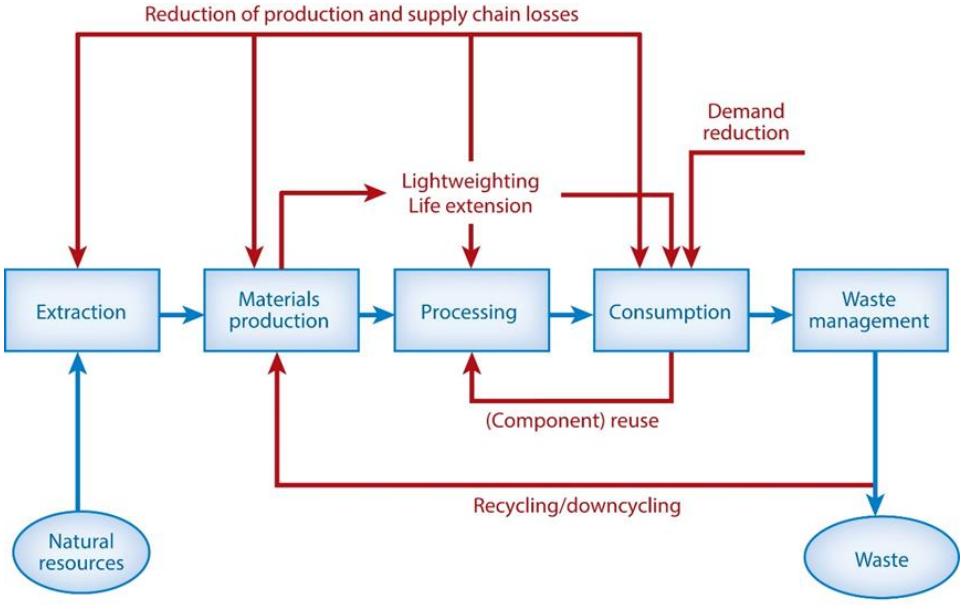
Participating Partners:

Markus Blesl (IER), Tiina Koljonen (VTT), Anna Krook-Riekkola (LTU), Pernille Merethe Sire Seljom (IFE); Tom Kober (PSI); James Glynn (Columbia University)

Markus Blesl

Motivation and target

- With material demands rising significantly in the past decade the decoupling of economic growth and environmental degradation is “one of the greatest global challenges” according to the United Nations (Sustainable Development Goals 12).
- The industry sector plays a crucial role in overcoming this challenge. Either material demands must be met by new, sustainable and efficient technologies or material demands must be reduced by material efficiency approaches.



The aims of the project is to combine the work of different TIMES working groups in the context of industry modelling. Each partner focuses on specific industry sub-sectors and analyzes the current and future technologies in this field and how they should be modelled. The objective is to **describe the potential and impact of material efficiency measures and how they should be modelled**

Deliverables and work share

The project aims to improve the modelling of current and future industry technologies for the ETSAP community and to identify the impact of various material efficiency measures. The main focus lies on the following aspects:

- Determination of relevant parameters for industry technologies and possible substitution paths
- Exemplary RES and modelling
- Limits of substitution and material efficiency measures
- The findings of this project will be documented. By **publications and the updating of industry E-TechDs** and **SubRES files**, results will be available for the scientific community.

	Industry sub-sector
IER	Cement, Chemical industry
VTT	Copper, Cobalt, Lithium
LTU	Iron & steel, Pulp & paper, Saw industry

Review:
IFE; PSI; Columbia University

Cost and Relevance

Cost:

Personal Costs			
Tasks	**Involved Partners**	**Costs per Partner**	**Total Costs**
Industry Modelling	3	6000	18000
Material Efficiency	3	6000	18000
		Total	**36000**

Other Expenses	**Estimated Costs**
3 Workshops (incl. Cost expeditions for travel)	10000
Total	**10000**

Total 46 k€

Relevance to the Annex:

The proposed project relates directly to the objective Research and Development, in particular to the ETSAP aims of

- "net zero GHG emissions systems",
- "Improved modelling of the consumption side of energy systems integrating human behavior into energy systems modelling"
- „Interaction of energy systems with materials use, with a particular focus on critical minerals".

As a database for industry technologies will be developed / updated, this project is expected to improve the modelling tool of all participating parties