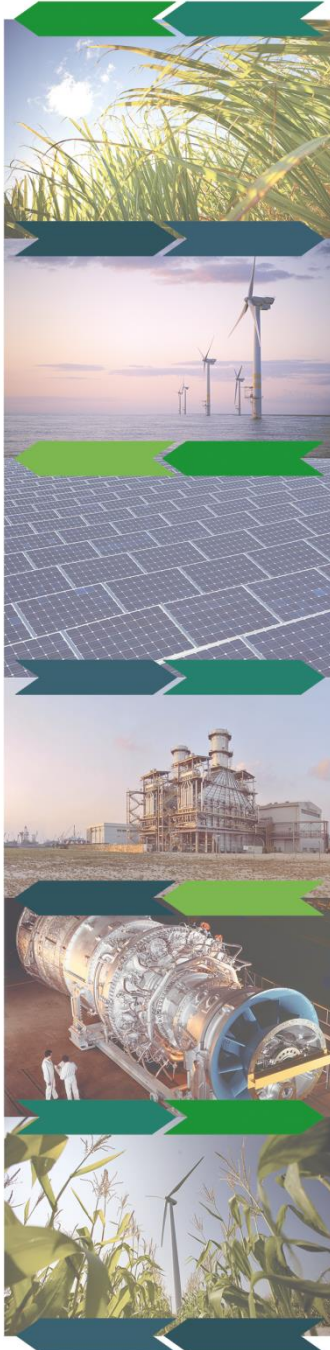# NAVIGATING THE ROADMAP FOR CLEAN, SECURE AND EFFICIENT ENERGY INNOVATION

Issue Paper and Proceedings on
Aggregating load profiles

… from the power sector models towards use in large-scale energy-system and integrated assessment models

Author(s): Dawud Ansari (DIW Berlin)

SET-Nav
Strategic Energy Roadmap

NAVIGATING THE ROADMAP FOR CLEAN, SECURE AND EFFICIENT ENERGY INNOVATION

AGENDA

SET-Nav Modelling Workshop in Vienna, Austria

Aggregating load profiles from power sector models towards use in large-scale energy-system and integrated assessment models

Thursday, 7, September, 2017

Campus Freihaus - D Vortragsraum Bibliothek, DD

Wiedner Hauptstr. 8, 1040 Vienna, Austria

8:45 - 9:00	*REGISTRATION*
9:00 – 9:30	Welcome by Marijke Welisch, TU Wien
	Overview of the SET-Nav modelling workshop series by Dawud Ansari, DIW
	Overview of load aggregation in the SET-Nav project, Michael Hartner, TU Wien
9:30 - 10:15	**Introduction: Review on aggregated electricity demand modelling (hourly) for use in long term power system analysis**, Karen Byskov Lindberg, NVE
10:15 – 11:00	**A novel method for incorporating power exchange limitations into energy system models and the impact of spatial aggregation**, Karl-Kiên Cao, DLR
11:00 - 11:30	*COFFEE BREAK*
11:30 - 12:15	**A parsimonious model for the complex German electricity system – what lessons to be learnt**, Philip Beran, University Duisburg Essen
12:15 - 13:00	**A simple approach to time series reduction - application in the model dynELMOD**, Clemens Gerbaulet, DIW
13:00 - 14:00	*LUNCH BREAK*
14:00 - 14:45	**Methodology for long term hourly electric load modelling taking into account building refurbishment, electric heating and climatic stochastics**, Karen Byskov Lindberg, NVE
14:45 - 15:30	**People's activities and residential electricity demand: A time use approach**, Jacopo Torriti, University of Reading
15:30- 15:45	*COFFEE BREAK*
15:45 - 16:30	**synPRO tool and other activities**, Bernhard Wille-Haussmann, Fraunhofer ISE
16:30 -17:00	Discussion time
17:00	**END OF WORKSHOP**

For registration please contact: Marijke Welisch, welisch @eeg.tuwien.ac.at

SET-Nav at a glance

SET-Nav will support *strategic decision making* in Europe's energy sector, enhancing innovation towards a *clean*, *secure* and *efficient energy system*. Our research will enable the EC, national governments and regulators to facilitate the development of optimal technology portfolios by market actors. We will comprehensively address critical uncertainties and derive appropriate policy and market responses. Our findings will support the further development of the SET-Plan and its implementation by continuous stakeholder involvement.

These contributions of the SET-Nav project rest on three pillars:

The wide range of objectives and analytical challenges set out by the call for proposals can only be met by developing a broad and technically-advanced *modelling portfolio*. Advancing this portfolio and enabling knowledge exchange via a modelling forum is our first pillar.
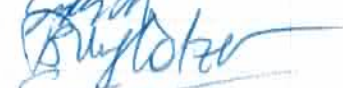
The EU's energy, innovation and climate challenges define the direction of a future EU energy system, but the specific *technology pathways* are policy sensitive and need careful comparative evaluation. This is our second pillar. Using our strengthened *modelling capabilities* in an integrated modelling hierarchy, we will analyse multiple dimensions of impact of future pathways: *sustainability*, *reliability* and *supply security*, *global competitiveness* and *efficiency*. This analysis will combine bottom-up 'case studies' linked to the full range of SET-Plan themes with holistic 'transformation pathways'.

Stakeholder dialogue and *dissemination* is the third pillar of SET-Nav. We have prepared for a lively stakeholder dialogue through a series of events on critical SET-Plan themes. The *active involvement* of stakeholders in a two-way feedback process will provide a reality check on our modelling assumptions and approaches, and ensure high policy relevance. Our aim is to ensure policy and market actors alike can navigate effectively through the diverse options available on energy innovation and system transformation.

SET-Nav partners

No	Participant Name	Country Code
1	Technische Universität Wien, Energy Economics Group *(TU Wien)*	AT
2	Fraunhofer-Institut für System- und Innovationsforschung *(Fraunhofer ISI)*	DE
3	Deutsches Institut für Wirtschaftsforschung *(DIW Berlin)*	DE
4	Norges teknisk-naturvitenskapelige universitet i Trondheim *(NTNU)*	NO
5	Stiftelsen SINTEF *(SINTEF)*	NO
6	Société Européenne d'ECOnomie *(Seureco)*	FR
7	Universidad Pontificia Comillas *(Comillas)*	ES
8	National Technical University of Athens *(NTUA)*	GR
9	Regional Center for Energy Policy Research *(REKK)*	HU
10	Centre for European Policy Studies *(CEPS)*	BE
11	University of East Anglia *(UEA)*	UK
12	Eidgenössische Technische Hochschule Zürich *(ETH)*	CH
13	Axpo Services AG *(Axpo)*	CH
14	General Electric *(GE)*	CH
15	International Institute for Applied Systems Analysis *(IIASA)*	AT
16	M-Five GmbH Mobility, Futures, Innovation, Economics *(M-Five)*	DE

Name	Institution	
Manuel Villavicencio	Paris-Dauphine Univ.	
Anselm Eicke	Sciences Po	
Eike Blume-Werry	Axpo	
Florian Dierickx	Université Clermont Auvergne	
Haris Doukas	NTUA	
Katerina Foruli	NTUA	
Johannes Hiry	TU Dortmund	
Ivo Kafemann	DIW	
Hasan Basri Tosun	DIW	
Dipl.-Ing. Dr. Gerald Kalt	oesterreichische Energieagentur	
Jasper Geipel	TU Wien	
Michael Hartner	TU Wien	
Thomas Faber	Axpo	
Dawud Ansari	DIW	
Marijke Welisch	TU Wien	
Christian Skar	NTNU	
Pedro Crespo del Granado	NTNU	
Samuel Carrara	FEEM	
Gustav Resch	TU Wien	
Bettina Burghholzer	TU Wien	
Jonas Savelsberg	Universität Basel	
David Daniels	EIA	
Le Wen	University of Auckland	
Arno Behrens	CEPS	
Hector Marañón-Ledesma	NTNU	
Sebastian Forthuber	TU Wien	
Lukas Kranzl	TU Wien	
Karl-Kiên Cao	DLR	
Philip Beran	Uni Duisburg Essen	
Jacopo Torriti	Reading University	
Clemens Gerbaulet	DIW	
Karen Byskov Lindberg	NVE	

| Bernhard Wille-Haussmann | Fraunhofer ISE | |

Call for papers

(Special Issue in *Utilities Policy*)

on the topic

"The challenges of temporal and spatial aggregation: Modelling and policy implications"

Abstract Deadline: 15th Oct, 2017

Call for papers

"The challenges of temporal and spatial aggregation: Modelling and policy implications"

Abstract Deadline: 15th of October, 2017

(Extended Abstract, 400 – 800 words)

Final Submission: 30th of November, 2017

The SET-Nav project (www.set-nav.eu), coordinated by the EEG at TU Wien, is announcing a

Call for papers

"The challenges of temporal and spatial aggregation: Modelling and policy implications"

to be published in a special issue in Utilities Policy.

The EU's energy, innovation, and climate challenges define the direction of the future energy system, but specific pathways are policy-dependent and need careful comparative evaluation. Accurate modelling plays a crucial role to understand, build, and optimize the future energy system. However, as a considerable challenge, modelling distinct aspects of the energy system requires different timescales, and, for example, a second-by-second energy balance is needed in the power sector, while decades are considered when analysing climate or environmental changes.

The topic **"The challenges of temporal and spatial aggregation: Modelling and policy implications"** deals with challenges that arise from the aggregation of information from detailed power sector models for the further use in large-scale energy system or integrated assessment models. The issue accounts for the increased complexity modern electricity grids face due to the integration of stochastic renewable generation and necessary demand side management.

The contributions to the special issue shell highlight this topic from various perspectives, including, for example, the identification of determinants of electricity demand and their appropriate modelling, and the representativeness of models with reduced complexity. Overall, abstracts should include modelling papers as well as applications in model expansion / integration that may serve to assess future policy pathways up to 2050.

About the SET-Nav Modelling Forum and the IAEE post-conference workshop

The call for papers is connected to the upcoming IAEE post-conference workshop on this topic as part of the SET-Nav Modelling Forum (http://www.set-nav.eu/content/pages/modelling-forum), coordinated by DIW Berlin (http://www.diw.de/en). In five workshops on different modelling challenges, state-of-the-art and innovative modelling approaches and their applications are presented and discussed to disseminate them to a larger audience in energy economics and facilitate knowledge exchange between modellers. One goal of the SET-Nav Modelling Forum is the development of more holistic models that are more capable to answer the

research questions of the future, by assessing the caveats of existing approaches and finding strategies to overcome the current limitations. We discuss best-practice examples and, whenever necessary, formulate and test alternative modelling approaches.

For submissions, please contact submissions@set-nav.eu

For any questions please contact contact@set-nav.eu

Project duration:	April 2016 – March 2019
Funding programme:	European Commission, Innovation and Networks Executive Agency (INEA), Horizon 2020 research and innovation programme, grant agreement no. 691843 (SET-Nav).
Web:	www.set-nav.eu
General contact:	contact@set-nav.eu

About the project

SET-Nav aims for supporting strategic decision making in Europe's energy sector, enhancing innovation towards a clean, secure and efficient energy system. Our research will enable the European Commission, national governments and regulators to facilitate the development of optimal technology portfolios by market actors. We will comprehensively address critical uncertainties facing technology developers and investors, and derive appropriate policy and market responses. Our findings will support the further development of the SET-Plan and its implementation by continuous stakeholder engagement.

These contributions of the SET-Nav project rest on three pillars: modelling, policy and pathway analysis,

and dissemination. The call for proposals sets out a wide range of objectives and analytical challenges that can only be met by developing a broad and technically-advanced modelling portfolio. Advancing this portfolio is our first pillar. The EU's energy, innovation and climate challenges define the di_rection of a future EU energy system, but the specific technology pathways are policy sensitive and need careful comparative evaluation. This is our second pillar. Ensuring our research is policy-relevant while meeting the needs of diverse actors with their particular perspectives requires continuous engagement with stakeholder community. This is our third pillar.

Who we are?

The project is coordinated by Technische Universität Wien (TU Wien) and being implemented by a multinational consortium of European organisations, with partners from Austria, Germany, Norway, Greece, France, Switzerland, the United Kingdom, France, Hungary, Spain and Belgium.

The project partners come from both the research and the industrial sectors. They represent the wide range of expertise necessary for the implementation of the project: policy research, energy technology, systems modelling, and simulation.