D11.16: Final Report on Scientific Publications and Exchange

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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 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. 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.
The project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 691843 (SET-Nav).

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1 Executive Summary

SET-Nav supports strategic decision making in Europe’s energy sector, enhancing innovation towards a clean, secure and efficient energy system. Stakeholder dialogue and dissemination is one of the three pillars of SET-Nav. A lively stakeholder dialogue takes place through a series of events on critical SET-Plan themes. The active involvement of stakeholders in a two-way feedback process provides a reality check on our modelling assumptions and approaches, and ensures 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.

More particularly, the communication of SET-Nav results among the scientific community have taken several forms and used a variety of tools.

Some of the major SET-Nav target groups to whom our partners focused on conveying SET-Nav message are scientists, researchers and academia in general. Targeted dissemination activities are implemented in order to attract successfully these particular groups. In this context, participation and presentation in external conferences and events, scientific publications and policy papers, as well as newsletters’ design and release ensure successful outreach and promotion of the project, tailor-made to the needs of the scientific community.

The purpose of this deliverable is to report several dissemination means that constitute part of the SET-Nav dissemination strategy and have the scientific community as a main target group.
2 Introduction

One goal of the SET-Nav 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. Outcomes may support strategic decision making in Europe’s energy sector, enhancing innovation towards a clean, secure and efficient energy system. To this end, there is a dire need for scientific exchange among stakeholders relevant to the field (academia, scientists, researchers, etc.) and SET-Nav partners in order for the latter to gather important insights and ideas on the work on progress and draft next steps. In parallel, most of the project’s outcomes may be of great importance for the scientific community constituting valuable findings for further research.

Towards this scope, the main principles identified in the SET-Nav communication and dissemination strategy can be exploited and ensure that the appropriate measures are used for the efficient and effective information transfer and share to the appropriate audiences, while fruitful and intense dialogue among the scientific target groups and SET-Nav partners may also lead to this direction. These principles lay on the foundations of clarity, transparency and honesty, as well as information availability and openness.

There are several SET-Nav outputs that are of scientific interest and may prove to be useful for the scientific community. It is, therefore, the intention of SET-Nav consortium and of the project’s dissemination and communication activities to focus on the particular target group through scientific publications, articles in peer reviewed journals, announcements in conferences, presentations, newsletters and press release, etc. The main SET-Nav outputs are used in each stage of the project as incentives for academic research activities.

More particularly, SET-Nav partners participated to more than 26 international conferences, workshops, and webinars networking with relevant stakeholders and distributing information printed material. SET-Nav activities, objectives and results were promoted through 18 presentations and participation in 2 discussion sessions in conferences and workshops. Finally, 8 SET-Nav Newsletters and 15 SET-Nav Press Releases were distributed to more than 3,000 stakeholders and experts from which a percentage belongs to the scientific society in order to inform them about publications, events and SET-Nav news.

An overview of the main above mentioned SET-Nav activities are depicted in Table 1.
### Table 1: SET-Nav scientific exchange overview

<table>
<thead>
<tr>
<th>Dissemination Technique</th>
<th>Overview</th>
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| **Participation in external conferences** | 11 conferences  
12 workshops  
4 webinars  
A total of 18 presentations and 2 consultation reports in International Conferences, Workshops and Webinars  
- 7 presentations and 2 consultation reports in Workshops  
- 1 presentation in Webinar  
- 10 presentations in Scientific Conferences  
Distribution of 440 SET-Nav leaflets in external events |
| **Scientific Exchange – Synergies** | 27 Synergies with EU projects  
5 Joint Events co-organised with other H2020 initiatives |
| **Policy Briefs**                  | 5                                                                 |
| **Discussion Papers**              | 3                                                                 |
| **Issue Papers**                   | 16                                                                |
| **Publications**                   | SET-Nav Special Issue in the Utilities Policy journal - 9 manuscripts to be published online  
3 SET-Nav papers in open access Springer Book  
2 papers in Energy Strategy Reviews Special Issue  
15 Conference Papers  
5 publications in scientific journals |
| **Newsletters & Press Releases**   | 8 SET-Nav Newsletters  
15 SET-Nav Press Releases  
19 Partners Newsletters  
24 SET-Nav announcements in Energy- L and Climate- L mailing lists |

### 3 Participation in External Conferences

The effective communication and dissemination of the SET-Nav activities is an essential parameter for the achievement of the project’s goals and challenges. As such, partners were encouraged to participate in international events and conferences, in order to engage into networking and create bonds, to present the project and disseminate informational material and, in general, to make SET-Nav an ornate node in
paths and policies concerning Europe’s energy sector. SET-Nav partners are encouraged and assisted in the presentation of the project and its preliminary and final results, both during and after the end of the project. This includes the participation in events organized by the European Commission and to other international conferences and workshops in relevant fields so as to keep updated the scientific community, universities, research centres, the European Commission, and other interested groups and seek opportunities to interact with the technology industry. Participation in such events and results to be presented are previously agreed within the consortium. All partners participate actively in the process of identification of relevant events where the project action could be presented.

The particular section records the events where SET-Nav partners participated and presented the project. For each one of them, there is a brief description of the actions that have been done and the results each intervention has achieved.

Set-Nav participation in workshops

1. **Towards2030-dialogue & TRANSrisk Regional Workshop, 25 October 2016, Athens, Greece**: SET-Nav partners from NTUA and TU Wien participated in the event by distributing SET-Nav promotional material to an audience (43 participants) consisted of European and national policy makers, TSOs, DSOs, utilities, RES associations, business and industry, academia and civil society organisations, communicators and other public and private relevant actors.

2. **Towards2030-dialogue European Parliament event, 7 December 2016, Brussels, Belgium**: SET-Nav partners from TU Wien, NTUA, REKK, CEPS, Fraunhofer ISI participated in the Towards2030-dialogue European Parliament event “The new Energy Union Package: Ambitious Enough?”. The event attracted 45 national and European policy makers (public administration and Parliamentarians) responsible for the formulation of renewable energy policies, (RES) energy industry market players, (RES) sectoral associations, researchers, scientific bodies, energy analysts. SET-Nav dissemination material was distributed in the event, while fruitful discussions took place among the participants.

3. **Webconference of the SET-Plan Steering Group, 1 March 2017**: SET-Nav coordinator Gustav Resch represented SET-Nav at the working meeting of the SET-Plan Steering Group on “Energy Systems and Grids”. The meeting was organized by the Austrian Ministry BMVIT (Ministry on Transport, Innovation and Technology). Gustav Resch hold the SET-Nav institutional presentation to inform the group on the objectives and potential contributions of the SET-Nav project.

4. **REFLEX expert workshop, 8 November 2017, Karlsruhe, Germany**: SET-Nav participated at the expert workshop “Technological Learning in the Energy Sector - Implementation of experience curves in energy system models for future cost estimations and environmental impact assessment” organized by REFLEX H2020 project. The workshop took place on the 8th of November 2017 in Karlsruhe, Germany. The workshop presented state-of-the-art experience curves and addressed methodological issues of implementing experience curves in energy systems models. Furthermore, the workshop analysed the application of experience curves for prospective environmental impact assessment. The flyer of the workshop with more details on the program of the event can be found at event’s page.

5. **SET-Nav at 100 years anniversary of the School of Electrical & Computer Engineering, 27 November 2017, Athens, Greece**: SET-Nav partner Decision Support Systems Laboratory of the National Technical University of Athens (NTUA), participates at the School of Electrical and Computer Engineering of the NTUA 100 years anniversary event, which takes place on the 27th of November, at the Onassis Cultural

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Centre, in Athens, Greece. The event communicated and promoted the academic & research activities and the achievements of the School, as well as to highlight its important social contribution. SET-Nav project was presented among other EU projects to the invited audience, while information material was distributed.

6. SET-Nav at MEDEAS 1st Board of Stakeholders meeting, 12 December 2017: SET-Nav Partners participated in the 1st Board of Stakeholders meeting, organised by the MEDEAS project (http://medeas.eu/) in the form of a webinar “Presentation and Discussion on the MEDEAS model: structure, features, hypotheses”. It took place on the 12th December 2017. MEDEAS “Modelling the Energy Development under Environmental and Socioeconomic constraints” aims to create a new computational model that will define the future of the energy system in Europe, taking into account physical, as well as social constraints. MEDEAS will develop an advanced modelling tool to create, modify and test new and existing policies which could support the transition to a more sustainable European Energy system, based on renewable energy sources. Additional information is available on http://www.medea.eu/model/meleas-model.

During the meeting, the stakeholders were introduced to the MEDEAS project, the MEDEAS World model structure and the main hypotheses and assumptions of the model. The possible policy targets and the simulated scenarios and results of the model were presented to stakeholders. The main focus of the meeting was to exchange with stakeholders and receive their feedback, input and suggestions regarding the MEDEAS world model in particular relatively to the model’s limitations and further developments.

7. Pathways to European decarbonisation: The INNOPATHS scenarios workshop, 6-8 February 2018, in Florence: SET-Nav partner, Charlie Wilson, participated in the "Pathways to European decarbonisation: the INNOPATHS scenarios workshop", 6-8 February 2018, in Florence, organised by the H2020-funded INNOPATHS project. He gave a talk on the 2x2 scenario typology being developed by the SET-Nav consortium for exploring decentralisation vs. entrenchment, and cooperation vs. fragmentation in the EU energy innovation landscape. This typology will help shape the integrative modelling activity planned for SET-Nav. The presentation is available in the event’s page.

8. "Innovation Indicators to Track Progress of Mission Innovation" Workshop, 10 January 2018, European Commission, Brussels: SET-Nav partners, Charlie Wilson & Yeong Jae Kim, were invited to a policy workshop in Brussels on "Mission Innovation" - the pledge by 20 countries (including the UK) to double clean energy R&D in support of the Paris Agreement. Charlie presented new work on indicators for tracking progress in the global clean energy innovation system. SET-Nav partners, Charlie Wilson & Yeong Jae Kim, also disseminated a short consultation report answering to the Mission Innovation indicator briefing paper. (Presentation on "Indicators for Tracking Mission Innovation and Methods for Assessing Mission Innovation Progress")

9. Workshop on Slovenian Gas Market in the Region, 4 April 2018, Ljubljana: The Slovenian gas market is increasingly involved in regional natural gas environment, therefore legislative innovations were presented, the situation on the market was summarised and projects that will contribute to a more efficient market and more reliable supply of natural gas were showed.

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5 http://set-nav.eu/content/set-nav-medea-1st-board-stakeholders-meeting-12-december-2017
6 http://set-nav.eu/content/pathways-european-decarbonisation-innopaths-scenarios-workshop-6-8-february-2018-florence
8 http://set-nav.eu/sites/default/files/common_files/events/Mission%20Innovation%20Presentation_UEA.PDF
9 http://set-nav.eu/content/workshop-slovenian-gas-market-region-4-april-2018ljubljana
Peter Kotek (REKK) attended the sixth workshop of Plinovodi d.o.o. (company managing the natural gas transmission network) and presented SET-Nav case study results.

10. **Third Mission Innovation (MI-3) Ministerial, 23 May 2018, Malmö, Sweden**: The international community discussed bold steps to enhance public and private investment and collaboration on clean energy research and innovation. The Ministerial was co-hosted by the European Commission, together with Denmark, Finland, Norway, Sweden and the Nordic Council of Ministers.

Yeong Jae Kim (Tyndall, UEA) participated in the Mission Innovation Workshop through a consultation report “Enhancing national and international data on government and private sector RD&D spending for better clean energy innovation policy”.

11. **SET-Plan Workshop “European Strategic Energy Technology Plan”, 12 July, 2018**: SET-Nav partner Decision Support Systems Laboratory of the National Technical University of Athens (NTUA), participated actively in the SET-Plan Workshop “European Strategic Energy Technology Plan”, which took place on 12 July 2018, in Athens, Greece, in order to promote the SET-Nav current work and expected results as a linkage with the SET-Plan. The workshop was organised by the Institute of Zero Energy Buildings (INZEB) and invited all organisations with an interest in the SET-Plan to get informed and discuss about it. The SET-Plan was presented particularly on the topics of cooperation within Europe in clean energy, SET-Plan governance, SET-Plan actions under the Energy Union, and Horizon 2020 contribution to the SET-Plan. On behalf of SET-Nav, Ass. Prof. Haris Doukas chaired the meeting and Dr. Chara Karakosta presented the SET-Nav H2020 project, its scope and work in progress, emphasizing on the support for the further development of the SET-Plan that is provisioned to be offered by the SET-Nav. In addition, the event was covered by the TV programme “ECO NEWS” of the Greek channel “SKAI”, where NTUA partners were interviewed and spoke about the importance of SET-Plan.

12. **VDI Expert Forum on Emissions Trading (VDI-Expertenforum), 13 November 2018**: SET-Nav partner Fraunhofer ISI participated in the VDI Expert Forum on Emissions Trading (VDI-Expertenforum), which took place on 13 November 2018, in Dusseldorf, Germany. The EU Commission tries to determine by the reform of emissions trading during the 4th trading period, the original idea of this market-based instrument to meet. At the same time, however, competitiveness, especially in the energy-intensive industry that is heavily affected, should also be maintained. How this should be implemented in concrete terms or how the situation will affect German companies in particular was further explained in detail by the speakers from BMU and DEHSt. Furthermore, an overview was given on the further efforts in Germany to protect the climate (climate protection plan, coal withdrawal) and what impact this can have on the industries concerned. SET-Nav partner Tobias Fleiter from Fraunhofer ISI made a presentation on “Innovative process technologies and their contribution to the decarbonisation of the energy-intensive industry in Europe”.

**SET-Nav participation in conferences**

1. **3rd International Scientific Conference on Economics and Management -EMAN 2019, 28 March 2019, Ljubljana, Slovenia**: EMAN conference’s scope was to establish and expand international contacts and co-operation across regions and countries. The main purpose of the conference was to provide

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10 http://set-nav.eu/content/third-mission-innovation-mi-3-ministerial-23-may-2018-malm%C3%B6-sweden
13 https://www.eman-conference.org/
scientists an encouraging and stimulating environment in which they may present results of their research to the scientific community and general public. Dr. Charikleia Karakosta, SET-Nav Dissemination leader (NTUA) participated and presented the paper “Impact Analysis of Multiple Future Paths Towards a Clean Energy Sector: A Stakeholder Participatory Approach”.

2. **9th International Conference on “Energy and Climate Change”, 12-14 October 2016, Athens, Greece**\(^\text{14}\): NTUA participated in the conference and disseminated various informational material while being engaged in ideas and knowledge transfer with various related stakeholders. Thirty participants from the scientific community and academia joined the event.

3. **Towards2030-dialogue Final Conference, 22 November 2016, Brussels, Belgium**\(^\text{15}\): SET-Nav partners from TU Wien, NTUA, REKK, CEPS, Fraunhofer ISI participated in Towards 2030-dialogue project final conference by distributing SET-Nav leaflets and networking with stakeholders of the energy sector. 150 participants attended the event, namely members of the Towards2030-dialogue consortium, stakeholders involved with RES policies, other policy representatives and relevant stakeholders from industry, business, financing institutions, TSOs, regulators, energy agencies and associations, NGOs and the academic community.

4. **6th International Symposium & 28th National Conference on Operational Research, 8-9 June 2017, Thessaloniki, Greece**\(^\text{16}\): The event entitled "OR in the digital era - ICT challenges" was co-organized by the Department of Applied Informatics of the University of Macedonia and the Hellenic Operational Research Society (HELORS). NTUA participated promoting SET-Nav through distribution of information material.

5. **15th IAEE European Conference 2017, “Heading towards sustainable energy systems: evolution or revolution?”, 3-6 September 2017, Vienna, Austria**\(^\text{17}\): The conference focused on new developments of energy conversion technologies, energy policies and their effects on a country level as well as on a global level, the efficient use of different types of primary energy resources and possible solutions to stop global warming. It was discussed which new technologies are required and which role they may play in a future supply system consisting of decentralised and central supply units (power plants, refineries, pipelines). Set-Nav partners submitted four abstracts in the conference and made four respective presentations. In particular, Pedro Crespo del Granado, Ruud Egging and Christian Skar from NTNU made a presentation on the initial outputs of case studies 6.3 and 7.4 named “Integrating electricity and natural gas planning: Linking models and assessment of reciprocal effects”. Yeong Jae Kim and Charlie Wilson from UEA presented the first stage of the energy innovation systems analysis with a presentation entitled “Evaluating the EU’s energy innovation system”. Michael Hartner, Sebastian Forthuber, Lukas Kranzl and Anna-Lena Klingler from TU Wien and Fraunhofer ISI presented their work on heating and cooling demand load profiles until the year 2050, while Sebastian Forthuber, Michael Hartner, Lukas Kranzl and Andreas Müller focused on the “Scenarios for heating and cooling demand in the European residential sector until 2030”.

6. **7th International Symposium and 29th National Conference on Operational Research, 14-16 June 2018, Chania, Greece**\(^\text{18}\): SET-Nav partner Decision Support Systems Laboratory of the National Technical University of Athens (NTUA), participated in the 7th International Symposium & 29th National Conference on Operational Research, which took place on 14-16 of June 2018, in Chania, Greece. The

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\(^\text{17}\) [https://www.aaeel/iae2017/](https://www.aaeel/iae2017/)

\(^\text{18}\) [http://www.set-nav.eu/content/7th-international-symposium-29th-national-conference-operational-research-14-16-june-chania](http://www.set-nav.eu/content/7th-international-symposium-29th-national-conference-operational-research-14-16-june-chania)
purpose of the Conference was to disseminate recent scientific advances in the field of Operational Research and Management Science in Greece and to promote international co-operation among researchers and practitioners. The specific aim of this year’s Conference was to highlight the role and importance of OR, new technologies and innovation in agriculture, tourism, energy and environment.

On behalf of SET-Nav the scientific paper “Assessing Decarbonisation Pathways towards 2050: A Multicriteria Approach” was presented, while SET-Nav information material was distributed.

7. **58th ERSA Congress “Places for People: Innovative, Inclusive and Liveable Regions”, 28-31 August 2018**: SET-Nav partner Ulf Johansen (SINTEF) participated in the ERSA congress “Places for People: Innovative, Inclusive and Liveable Regions”, which took place on 28-31 August 2018, in Cork, Ireland. ERSA puts people back at the heart of regional and urban development to examine how spatial and regional analysis can work to improve people’s lives. The Congress hosted a large variety of themes in spatial, regional, and urban economics, economic geography, and regional policy topics like local governance and institutions. Ulf Johansen made a presentation with the title “Regional aspects of a climate and energy tax reform in Norway– exploring double dividends”.

8. **Climate Change Conference, 9 November 2018, Athens, Greece**: SET-Nav partner Chara Karakosta (NTUA) participated in the Climate Change Conference which took place on 9 November 2018, in Athens, Greece. NTUA delivered SET-Nav message through networking and discussion with relevant stakeholders. The conference acted as an information and dialogue platform on the impact of climate change policies on businesses in all sectors.

9. **CenSES Energy and climate conference: Clean Energy for All, 22 November 2018**: SET-Nav partner NTNU participated in the CenSES 2018 “Energy and climate conference: Clean Energy for All”, which took place on 22 November 2018, in Oslo, Norway. At the conference Ruud Egging (NTNU) presented preliminary insights from the SET-Nav pathways, and disseminated modelling results through the presentation “Insights from large-scale multi-model analyses of the EU Energy transition”.


11. **6th Student Conference of HELORS, 28 February - 2 March 2019, Xanthi, Greece**: Dr. Chara Karakosta and Ms. Katerina Papapostolou (NTUA) participated in the 6th Student Conference of HELORS, 28 February - 2 March 2019, Xanthi, Greece with the paper: A. Papapostolou, C. Karakosta, H. Doukas, J. Psarras (2019). “Assessment of Alternative Scenarios for the Decarbonisation of the Energy System”, Book of Abstracts of the 6th Student Conference of HELORS, 28 February - 2 March 2019, Xanthi, Greece (in Greek). The conference was organized by the Hellenic Operation Research Society (HELORS) and the Department of Production and Management Engineering of the Democritus University of Thrace, under the auspices of the Stavros Halioris Social Center. The conference was organized to develop channels of communication and collaboration between researchers and research teams that come from a wide range of scientific areas and businesses. SET-Nav results on the pathways analysis were presented, while informational material was distributed as well.

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SET-Nav participation in webinars

1. **Webinar “European energy and climate policy and the role of innovation”, 11 December, 2017**\(^{23}\): SET-Nav joined to join Aurélie Faure-Schuyer, Research Fellow Energy and Climate at CEPS (EU GCC Clean Energy Technology Network Expert) and Bo Normark, Thematic Leader Smartgrids and Storage, InnoEnergy at the “European energy and climate policy and the role of innovation” webinar, organised by the Network on Monday, 11 December 2017 at 11:00 CET (14:00 UAE time zone).

   The webinar was organised by the EU GCC Clean Energy Technology Network and was focused on technology innovation. Specifically, since the COP21 agreement in Dec 2015, the role of innovation is complementing the role of climate finance and carbon markets in unlocking capital investments towards a low carbon economy. While investments in RES technologies gather pace, the needs for new investments in infrastructures remain high. So, that, decarbonisation goals (like mitigation, adaptation, and climate finance) need to be balanced against the pace of innovation in sub-industries and markets.

   As the EU climate change policy foresees 80-95% reduction in GhG towards 2050, the Clean Energy Package provides an interesting case example of a legislation aimed at mainstreaming innovation in new products, new services (e.g. local energy communities, demand response, aggregation of balancing services). Ultimately, it may broaden innovation towards a non-technological dimension."

2. **Webinar “Flexibility: Enabling renewable energy uptake in the EU electricity market”, 20 December 2017**\(^{24}\): SET-Nav joined Arndt Hassel, Associate Researcher, CEPS and EU GCC Clean Energy Technology Network Expert and Christian Egenhofer, Associate Senior Research Fellow & Director of Energy Climate House, CEPS and EU GCC Clean Energy Technology Network Expert as well as Alain Taccoen, Head of Stakeholders Relations - EU Strategy, EDF and Daniel Fraile, Senior Analyst Grids and Market, WindEurope at the EU GCC Clean Energy Technology Network “Flexibility: Enabling renewable energy uptake in the EU electricity market” webinar on Wednesday, 20 December 2017 at 10:00 CET (13:00 UAE time zone).

   The webinar focused on the share of intermittent wind and solar power in the EU which is increasing. Reaching a low-carbon electricity sector will depend on efficient integration of these energy sources by creating more flexibility, including through generation and demand response as well as the grid.

3. **Webinar: EU policies for decarbonising the transport sector, 1 February 2018**\(^{25}\): SET-Nav joined Arndt Hassel, Associate Researcher, CEPS and EU GCC Clean Energy Technology Network Expert and Christian Egenhofer, Associate Senior Research Fellow & Director of Energy Climate House, CEPS and EU GCC Clean Energy Technology Network Expert, as well as Petr Dolejsi, Mobility & Sustainable Transport Director, European Automobile Manufacturers’ Association – ACEA and Lisa Wolf, Policy Advisor, EURELECTRIC, at the EU GCC Clean Energy Technology Network “EU policies for decarbonising the transport sector” webinar, taking place on Thursday, 01 February 2018 at 11:00 CET (14:00 UAE time zone). Decarbonising the transport sector is one of the major challenges in fighting climate change. In the EU, political decisions and investment decision to reach this objective are taken across all levels of government, including supranational (EU) level, member state level and

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\(^{23}\) [http://set-nav.eu/content/webinar%e2%80%92e2%80%93europe-energy-and-climate-policy-role-innovation%e2%80%92e2%80%9311-december-2017](http://set-nav.eu/content/webinar%e2%80%92e2%80%93europe-energy-and-climate-policy-role-innovation%e2%80%92e2%80%9311-december-2017)

\(^{24}\) [http://set-nav.eu/content/webinar%e2%80%92e2%80%93flexibility-enabling-renewable-energy-uptake-eu-electricity-market%e2%80%92e2%80%9320-december](http://set-nav.eu/content/webinar%e2%80%92e2%80%93flexibility-enabling-renewable-energy-uptake-eu-electricity-market%e2%80%92e2%80%9320-december)

regions/communes. This webinar gave an overview of the EU’s role and existing policies at the EU level.

4. **Webinar Scenarios for deep decarbonisation of the EU industry, 26 November 2018**\(^{26}\): SET-Nav partner Fraunhofer ISI participated in the Scenarios for deep decarbonisation of the EU industry webinar, which took place on 26 November 2018. In the EU and its Member States, the aim is to reduce emissions of greenhouse gases up to a minimum and to use energy more efficiently. Decarbonisation of industry plays a key role in reaching this goal. This webinar presented findings from two projects on strategies to reach ambitious low-emission levels in European industry. We looked at technological solutions, but also on strategies such as reduction of demand and increased rates of recycling. The webinar was organised by Fraunhofer Institute for Systems and Innovation Research ISI (Fraunhofer-ISI) in cooperation with Association negaWatt (France). Tobias Fleiter (Fraunhofer ISI) disseminated SET-Nav work holding a presentation on “Innovative process technologies and their contribution to decarbonise the EU industry sector”.

\(^{26}\) [http://www.set-nav.eu/content/webinar-scenarios-deep-decarbonisation-eu-industry-26-november-2018](http://www.set-nav.eu/content/webinar-scenarios-deep-decarbonisation-eu-industry-26-november-2018)
4 Policy and Scientific Outreach

4.1 SET-Nav Publications

In order to disseminate research findings with the long-term impact of SET-Nav in mind, the project also targets the development of high quality scientific publications. Thus, within the framework of the SET-Nav dissemination and communication activities, a series of publications, targeting at policy makers and the scientific community in general have been and will be implemented after the SET-Nav finalization. The publications include both SET-Nav articles and publications relevant to the project that are submitted and accepted in international conferences, journals, books and working paper series. The main objective of these publications is to mobilise acquired processed and accumulated SET-Nav knowledge towards the transition of the European energy system. These activities ensure that the project and its results are made known to the specific interested parties and scientific target groups.

SET-Nav Special Issue

SET-Nav’s approach is to provide a set of articles for open access publication under the title “The challenges of spatial and temporal aggregation: Modelling issues, applications, and policy implications”. The topic relates to 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 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.

The Special Issue is being published in the Utilities Policy journal. Utilities Policy is a leading peer-reviewed resource for academic researchers, government officials, industry professionals, sector analysts, and consultants in the global utilities policy community. The journal bridges theory and practice by disseminating original applied research that is rigorous, contemporary, and policy relevant. Utilities Policy is deliberately international, interdisciplinary, and intersectoral. The articles address utility trends and issues in both developed and developing economies. Authors and reviewers come from various disciplines, including economics, political science, sociology, law, finance, accounting, management, and engineering. Areas of focus include the utility and network industries providing essential electricity, natural gas, water and wastewater, solid waste, communications, broadband, postal, and public transportation services.

In order to attract papers of the highest quality for SET-Nav special issue a respective Call for Papers was circulated and widely communicated on SET-Nav website as well as on the IAEE conference webpage (https://www.aaee.at/iaee2017/postconference_workshop). The Call for Papers is available in D.11.15: Scientific Publications and Exchange – 1st version and online on SET-Nav website22. In addition, an email address (submissions@set-nav.eu) to receive the papers’ submissions had been set-up.

Up until now the following 2 articles are online under Volume 57 of Utilities Policy Journal:


Moreover, the following papers have been submitted to the special issue and are currently in the final stages of review. The review process is carried out by DIW and NTUA (Franziska Holz, Chara Karakostka, Anne Neumann).

3. P. Beran, C. Pape, C. Weber “Modelling German electricity wholesale spot prices with a parsimonious fundamental model—Validation & application”
4. H. Koduvere, S. Buchholz, H. Ravn, “Constructing aggregated time series data for energy system model analyses”
5. J. Torrini, “Temporal aggregation: Time use methodologies applied to residential electricity demand”
7. Lindberg, Bakker, Sartori “Modelling electric and heat load profiles of non-residential buildings for use in long-term aggregate load forecasts”

Special Issue of Energy Strategy Reviews

The following papers have been submitted to the Special Issue of Energy Strategy Reviews (Elsevier): “Energy transition and decarbonisation pathways for the EU”.


This open access Special Issue is a peer-reviewed collection of results from the first meeting of the Energy Modelling Platform for Europe (EMP-E), held on May 17th and 18th at the premises of European Commission’s DG Research. It brings together contributions by the EC-funded projects and European energy modelling groups participating in the event.

The Special Issue constitutes a peer-reviewed digest of models, approaches and policy insights for the assessment of energy transition and decarbonisation pathways in the European Union, vis-à-vis the Energy Union and the Strategic Energy Technology (SET) Plan. It provides academics and decision makers with a deep review of cutting-edge EU-focused energy modelling research. The Special Issue is structured in two sub-sections: a) modelling tools and methodologies; b) case studies and policy insights.
SET-Nav publications in open access Springer Book

SET-Nav participated in the publication of an open access book in Springer organized within the context of the H2020 project TRANSrisk - Transitions Pathways and Risk Analysis for Climate Change Mitigation and Adaptation Strategies28. Ass. Prof. Haris Doukas (SET-Nav Dissemination Leader) is one of the guest editors of the book. The book is relevant to the methodologies used in TRANSrisk and is published as an Open Access Book in Springer, with the title "Understanding risks and uncertainties in energy and climate policy: Multidisciplinary methods and tools towards a low carbon society". The book presents innovative methodologies and tools that help devise energy and climate policies that incorporate the key ingredients of robustness. In particular, it reflects multi-stakeholder engagement, since collective intelligence helps overcome quantitative models’ limitations, flexibility to evolve over time as new insights are gained, and identification of ways to trigger policy adjustment. SET-Nav partners have published their studies based on SET-Nav work:


SET-Nav Conference papers

SET-Nav participated in the 15th IAEE European Conference which took place in Vienna, Austria, on 3rd to 6th of September 2017. The main topic of the conference was: “Heading towards sustainable energy systems: evolution or revolution?”. SET-Nav partners submitted the following abstracts.


The cluster of SET-Nav, MEDEAS, REEEM, REFLEX Horizon 2020 projects working on “Modelling and analysing the energy system, its transformation and impacts”, organised the second conference of the Energy Modelling Platform for Europe (EMP-E) 2018, hosted by the European Commission DG Research & Innovation in Brussels on September 25th and 26th. The following publications were developed by SET-Nav partners:


SET-Nav partners participated in several national and international conferences promoting through publications the SET-Nav work:


**SET-Nav publications in scientific journals**

Several SET-Nav studies were also published in scientific journals:


²⁹ [https://www.tugraz.at/events/eninnov2018/home/](https://www.tugraz.at/events/eninnov2018/home/)


4.2 SET-Nav Policy Briefs

Partners are urged to present the policy recommendations emerged from their work, as well as project’s policy conclusions in a series of policy briefs dedicated to policy makers. SET-Nav policy briefs comprise all knowledge developed within the framework of SET-Nav, incorporating and further disseminating lessons learned to targeted stakeholders and experts, European & international audiences involved with the global energy sector. The publication of policy briefs prepares favourable grounds for knowledge transfer, and reinforce as widely as possible SET-Nav findings and recommendations, especially to policymakers and industry stakeholders at the Member State, EU and international levels.

The policy briefs are published on the “Policy Briefs” webpage at SET-Nav website, as well as on the web pages of SET-Nav consortium partners. They are also advertised in all other relevant outreach activities (newsletters, press releases, announcements, etc.). Printed copies are distributed at SET-Nav stakeholder workshops and serve as a basis of discussion. Within the framework of SET-Nav Final Conference a summarising Policy Brief with the overall key results of the whole project was prepared and printed. The policy briefs are written and published in a dedicated SET-Nav template.

The first SET-Nav policy briefing “Innovation Systems and the SET Plan” was published in September 2016. This policy briefing uses a systemic perspective on energy innovation to inform the EU’s Strategic Energy Technology (SET) Plan. It makes five high level recommendations each of which is supported by a series of specific research insights. These insights are set out in a longer policy report which provides extensive examples, arguments, and links to relevant research literature.

The second SET-Nav policy brief entitled “Energy and Climate towards 2050—four scenarios” was published in March 2017 and it is available on the website. This policy brief aims to facilitate political decision-making by studying four energy and climate scenarios towards 2050. These four narratives bound the range of plausible alternative futures by defining certain trajectories, downside risks, new trends, and ‘unknown unknowns’ that could significantly affect decarbonisation policy in the years to come. The analysis aims to make explicit and bring to the forefront of thinking the diversity of opportunities and challenges that lie ahead of globally concerted attempts to decarbonise the global economy. The first SET-Nav policy brief has been promoted in the third issue of SET-Nav Newsletter, in April 2017.

The third SET-Nav policy brief on SET-Nav Case Studies30 has been prepared in May 2018. Using SET-Nav’s strengthened modelling capabilities in an integrated modelling hierarchy, multiple dimensions of impact of future pathways: sustainability, reliability and supply security, global competitiveness and efficiency

are analysed. This analysis combines bottom-up "case studies" linked to the full range of SET-Plan themes with holistic "transformation pathways". The particular policy brief is a good overview of several SET-Nav case studies highlighting the work that has been done so far in this direction, as well as policy recommendations derived, in a clear and concise report.

The fourth SET-Nav policy brief: *Decarbonising the EU's Energy System. Policy implications and priorities from modelling in the SET-Nav project* was developed for the Final Conference in Brussels in March 2019. In this policy brief, the authors focused on specific energy transition questions addressed by the SET Nav pathways. Through a large-scale modelling effort, key insights based on the SET-Nav main modelling perspectives were described: demand side, energy supply and infrastructure, and the macroeconomic effects.

The fifth SET-Nav policy brief: *Final Report on SET-Nav Policy Briefs* was developed to summarise the project’s outcomes. This policy brief includes the main policy recommendations arisen from SET-Nav’s implementation. More particularly, the brief highlights the ways that research on innovation systems can inform the SET Plan, investigates the energy and climate status development towards 2050 through the introduction of four scenarios, briefly presents the SET-Nav case studies and underlines the policy implications and priorities from modelling in the SET-Nav project.

The SET-Nav policy briefs are available online on the website[^31].

### 4.3 SET-Nav Issue Papers and Discussion Papers

#### SET-Nav Issue Papers

The SET-Nav Issue Paper on “*Hybrid Modelling: Linking and Integrating Top-Down and Bottom-Up Models*” was prepared for the Modelling Workshop “Top-Down Bottom-Up Hybrid Modelling” on November 2016 at NTNU Trondheim, Norway. The paper introduces the starting points of model linking and describes the approaches of soft-linking, hard-linking and integrated models. The Issue Paper is available online[^32].

The SET-Nav Issue Paper on “*Risk and Uncertainty Modelling in Energy Systems*” was prepared for the SET-Nav Modelling Workshop “Modelling of Risk & Uncertainty in Energy Systems” on March 2017 at ETH Zurich, Switzerland. The paper focuses on the risk assessment of energy systems and on the various approaches for modelling these risks. The electrical power energy systems, gas networks and power systems with high penetration of RES are extensively discussed. The issue paper is available online[^33].

The SET-Nav Issue Paper on “*Centralized vs. Decentralized development of the electricity sector*” was published in March 2017. The paper defines two different scenarios for the increase of renewable energy in Europe, namely the centralised scenario and the decentralised one. Then, it estimates the investments in the power transmission grid which will be required due to the large amount of renewable generation

[^31]: [http://www.set-nav.eu/content/pages/policy-briefs](http://www.set-nav.eu/content/pages/policy-briefs)
expected in the coming decades, explored in the two different scenarios. The issue paper is available online34.

The SET-Nav Issue Paper on “Aggregating load profiles… from the power sector models towards use in large-scale energy system and integrated assessment models” was prepared for the the Modelling Workshop “Aggregating load profiles from the power sector models towards use in large-scale energy-system and integrated assessment models”, on September 7, 2017 Vienna, Austria. The paper explores the time series scale alternation and particularly, the reduction of time series which is a considerable challenge. Specifically, the paper gives a small overview of the recent literature about time series reduction, and consequently presents a practical example for time series reduction with the use of dynELMOD model. The issue paper is available online35.

The SET-Nav Issue Paper on “Projects of Common Interest and gas producers pricing strategy”, was prepared for the third SET-Nav stakeholder event “Europe’s gas infrastructure needs towards 2050: which projects of common interest should be prioritised?” held on September 28, 2017 at CEPS, in Brussels, Belgium. The paper intends to shed light on whether the existing gas infrastructure is capable to serve the decarbonisation goals of the EU and if not, what pieces of infrastructure could fill the gap. More particularly, in the paper three different gas models analyse a set of natural gas infrastructure projects and the results are compared. The input data set and the key assumptions are harmonised for the coordinated gas market modelling exercise. The issue paper is available online36.

The SET-Nav Issue Paper on “Macroeconomic Consequences of sustainable energy sector innovation” was published in January 2018. The paper uses three different macro-economic models in order to evaluate the economic and environmental impacts of two case studies, namely “scenarios of the global fossil fuel markets” and “Energy demand and supply in buildings and the role for RES market integration”. The issue paper is available online37.

The SET-Nav Issue Paper on “Low-carbon transition of EU industry by 2050 - Extending the scope of mitigation options” was published in February 2018. The paper presents possible mitigation pathways for the EU28 that achieve an ambitious reduction in GHG emissions of more than 85% by 2050 compared to 1990 in the industrial sector. The issue paper is available online38.

The SET-Nav Issue Paper on “Heating and cooling demand and supply in buildings and the role for RES market integration” was published in February 2018. The paper discusses the main outputs from a modelling case study within the SET-Nav project dedicated to the analysis of energy demand and supply in buildings and

the role for renewable energy market integration in the electricity system. The issue paper is available online.\(^{39}\)

The SET-Nav Issue Paper on “Scenarios of the global fossil fuel markets” was published in February 2018. The paper investigates four independent and novel scenarios for the global energy markets towards 2050 in order to identify bounds to the range of plausible alternative futures. This is done by defining certain trajectories, downside risks, new trends, and ‘unknown unknowns’ that could significantly affect the success of decarbonisation policies in the years to come. The issue paper is available online.\(^{40}\)

The SET-Nav Issue Paper on “The Role for Carbon Capture, Transport and Storage in the Future Energy Mix – Which Role for Infrastructure?” was published in February 2018. The paper uses an innovative and unique quantitative framework to analyse the perspectives of Carbon Capture Transport and Storage (CCTS) in Europe until 2050, with particular focus on the infrastructure needs and system costs related to the use of CCTS. The issue paper is available online.\(^{41}\)

The SET-Nav Issue Paper on “Unlocking unused flexibility and synergy in electric power and gas supply systems” was published in February 2018. The paper presents an analysis into the role of different supply-side flexibility options in the EU electricity generation mix towards 2050. For this purpose, three defined cases (or scenarios) analyse the usage of the transmission grid to share flexibility, the deployment of electricity storage options and other technologies, and the role of gas power plants to achieve high levels of RES deployment. The objective is to compare trade-offs between various supply side flexibility and outline key synergies among them. The issue paper is available online.\(^{42}\)

The SET-Nav Issue Paper on “Perspectives for nuclear power” was published in March 2018. The paper conducts a technology assessment of nuclear power plants (NPP) with a focus on cost estimates, parameters affecting the economic competitiveness of NPP’s as well as prospective developments, by the means of a comprehensive literature review. The issue paper is available online.\(^{43}\)

The SET-Nav Issue Paper on “Ways to a cleaner and smarter transport sector” was published in May 2018. In the paper ambitious policy scenarios were analysed to achieve a CO\(_2\) emission reduction in the transport sector of 60% to 65% by 2050 compared to 1990. The issue paper is available online.\(^{44}\)

Alongside the modelling workshop “Two-stage decision making and modelling for energy markets”, organised on 11 October 2018, in Berlin, Germany the Issue Paper “Multilevel equilibrium problems with


applications in energy – A quick introduction” was published in October 2018. The paper is authored by Dawud Ansari (DIW Berlin) and introduces readers with basic knowledge of undergraduate calculus to the classes of mixed complementary problems (MCPs), mathematical problems under equilibrium constrains (MPECs), and equilibrium problems under equilibrium constrains (EPECs).

Moreover, in order to inform stakeholders on the SET-Nav modelling case study dedicated to analyse the optimal diffusion rate of renewable electricity generation within the European Union in the years up to 2050, the Issue Paper “Diffusion rate of Renewable Electricity - An assessment of the optimal RES share under varying determinants” was produced in February 2019.

The Issue paper on “The role of natural gas in an electrifying Europe” were issued in the view of the final Policy event in Brussels in March 2019. In this paper the authors outline issues and challenges concerning the role of natural gas in an electrifying Europe and share insights and implications obtained from analyses performed with a European and a global model for gas market and infrastructure analysis.

SET-Nav Discussion Papers

The SET-Nav discussion paper “A three-model linkage for energy – economics-environmental analysis: TIMES, REMES and EXIOBASE” was published in February 2017. The paper presents how an energy systems model for Norway, a regional economic model for Norway and an environmental and climate assessment tool can be linked to allow improved assessments of energy and climate policies. The discussion paper is available online45.

The SET-Nav discussion paper “Engineering Resilience in Critical Infrastructures” was published in April 2017. The paper shortly elaborates on the definition of resilience, the need for resilience in critical interdependent infrastructures, and on resilience quantification. The discussion paper is available online46.

The SET-Nav discussion paper “An introductory tutorial on convex formulations for equilibrium and bi-level problems” was published in January 2019. The paper illustrates how many partial equilibrium problems with oligopolistic supply can be cast as convex optimisation problems rather than mixed complementarity problems as is the current method of choice in the literature. The discussion paper is available online47.

4.4 SET-Nav Newsletters and Press Releases

Electronic SET-Nav newsletters and press releases are issued regularly in order to disseminate the project’s activities and up to date progress to all interested stakeholders. All newsletters and press

releases are available in the SET-Nav website⁴⁸, as well as respective posts are being communicated through the SET-Nav social media. Up to date eight (8) SET-Nav newsletters and fifteen (15) SET-Nav press releases have been send SET-Nav stakeholders.

It is envisaged that a final newsletter, summarising the outcomes of the SET-Nav policy event and the final conference, as well as the final reports and policy recommendations will be distributed after the end of the project.

Moreover, partners that publish own newsletters or magazines allocate a substantial part to inform their wider audience on the progress of the project. Up until now, nineteen (19) newsletters have been distributed by SET-Nav partners and are all available in Dissemination and Media page, under the Partners’ Newsletters category.

Apart from the SET-Nav newsletters, several news regarding SET-Nav activities and events are announced to an important number of stakeholders related to the fields of climate and energy policy through the ENERGY-L and the CLIMATE-L mailing lists. ENERGY-L and CLIMATE-L are community announcement lists for policy makers and practitioners involved in sustainable energy policy and climate change policy respectively. These peer-to-peer services are meant to advance understanding of issues related to sustainable energy and climate change by allowing subscribers to post announcements related to activities with strong focus in these sectors. Twenty-four (24) announcements on SET-Nav workshops and publications have been communicated up to March 2019.

⁴⁸ http://www.set-nav.eu/content/pages/dissemination-and-media
5 Scientific Exchange – Synergies with other initiatives

SET-Nav actively seeks links and interactions with other EC-funded projects in the respective areas, analysing the impacts of the technological development and innovation on the energy-system. SET-Nav established a dialogue and a continuous exchange, over the whole duration of the project, with the consortia in charge of these projects, in order to avoid duplication of work and exploit synergies.

Twenty-five (25) synergies with EU projects have been established and approached to discuss sharing of disseminated materials, for example project newsletters, and develop collaborative dissemination activities, such as joint workshops/event, thereby increasing the visibility of the project.

Modelling Forum

SET-Nav modelling forum is a core SET-Nav activity that facilitates knowledge exchange with other consortia. The SET-Nav team brings together modelling groups from varied backgrounds by organizing workshops related to specific challenges with respect to modelling. Five modelling workshops have been implemented in Trondheim, Zurich, Vienna and Berlin. The workshops were open to any interested energy modeller, European and internationally. They included presentations from members of the consortium, but renowned experts (experienced researchers) from the academic community were also invited to bring in their knowledge and experience from previous modeling exercises. These workshops were beneficial to the development of more holistic models that are better able to answer the research questions of the future, by assessing the caveats of existing approaches and developing strategies to overcome the limitations. Exchange of best-practice examples and formulation and test of alternative modelling approaches are taken place.

By bringing together researchers from the consortium with colleagues from across the academic community, these workshops serve as an open exchange platform for best practice in modelling, and thereby serve the goal of the Horizon 2020 programme of transparency and openness in applied modelling. In particular partners from other consortia have attended the workshops either as speakers, panellists or as participants.

SET-Nav Modelling Workshop “Top-down bottom-up hybrid modelling”, 24-25 November 2016, Trondheim, Norway

In the workshop the following six presentations were given by external experts:

- “Integrating Bottom-Up into Top-Down: A Mixed Complementarity Approach” by Christoph Böhringer, University of Oldenburg and Thomas F. Rutherford, University of Wisconsin (Madison);
- “Integrated Assessment of Energy Policies: A Decomposition of Top-Down and Bottom-Up” by Christoph Böhringer, University of Oldenburg and Thomas F. Rutherford, University of Wisconsin (Madison);
- “Activity Analysis: From NLP To MCP” by Christoph Böhringer, University of Oldenburg and Thomas F. Rutherford, University of Wisconsin (Madison);
- “Bottom-up/Top-down modeling Applied Aspects and Large Scale Applications” by Jan Abrell, ETH Zurich;

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• “Hybrid modelling, Some practical applications” by Ulrich Fahl from the Institute of Energy Economics and the Rational Use of Energy (IER), University of Stuttgart and member of the REEEM consortium;

At the end of the workshop the round table discussion “Future research directions in hybrid modelling” took place with the participation of Jan Abrell, Ulrich Fahl, Per Ivar Helgensen and Franziska Holz.

**SET-Nav Modelling Workshop “Modelling of Risk & Uncertainty in Energy Systems”, 29 March 2017, Zurich, Switzerland**

In the workshop the following six presentations were delivered by external academics:

• “Foundational issues of risk assessment” by Terje Aven, University of Stavanger, Norway;
• “Uncertainty representation and propagation” by Nicola Pedroni, Université Paris-Saclay/CentraleSupélec Chair «System Science and the Energy Challenge» (ECP);
• “Link between risk assessment and decision-making in energy systems” by Emanuele Borgonovo, Bocconi University;
• “Energy systems planning under uncertainty: models versus real energy systems” by Chris Dent, University of Edinburgh;
• “Stochastic bi-level electricity market modelling” by Martin Densing, Paul Sherrr Institut;
• “Decentralized generation systems under uncertainty” by Han Xuejiao, Power Systems Laboratory, ETH Zurich.

The workshop was concluded with the organisation of a panel session.

**SET-Nav Modelling Workshop “Aggregating load profiles from the power sector models towards use in large-scale energy-system and integrated assessment models” 7 September 2017, Vienna, Austria**

In the workshop the following seven topics were presented:

• “A novel method for incorporating power exchange limitations into energy system models and the impact of spatial aggregation” by Karl-Kiên Cao, Institute of Engineering Thermodynamics German Aerospace Center (DLR) Stuttgart;
• “A parsimonious model for the complex German electricity system – what lessons to be learnt” by Philip Beran, University Duisburg Essen;
• “Methodology for long term hourly electric load modelling taking into account building refurbishment, electric heating and climatic stochastics” by Karen Byskov Lindberg, NVE;

**SET-Nav Modelling Workshop “Two-stage decision making and modelling for energy markets”, 11 October 2018, Berlin, Germany**

In the workshop the following eight presentations were delivered:

• “An introduction to (multilevel) equilibrium modelling” by Sauleh Siddiqui, Johns Hopkins University;
• “Modelling coordination between renewables and grid: Policies to mitigate distribution grid constraints using residential PV-battery systems” by Paul Neetzowa, Humboldt-University Berlin;
• “Least-cost distribution network tariff design in theory and practice” by Tim Schittekatte, Florence School of Regulation and Paris-Sud University;
• “Inconsistent policies in an MPEC framework” by Olivier Massol, IFP School;
• “A new game theoretical approach for modelling export energy markets equilibria” by Ibrahim Abada, Engie, Center of Expertise in Economic Modelling and Studies;
• “Bargaining power in networks: a cooperative game theory approach” by Franz Hubert, Humboldt University Berlin.

At the end of the workshop the panel discussion “Which road for applied modelling – scientific excellence or policy communication?” took place with the participation of Franziska Holz (moderator), Rudolf Egging, Olivier Massol, Sauleh Siddiqui, and Marijke Welisch.

**Participation in activities organised jointly with other H2020 projects**

Apart from the modelling forum, SET-Nav co-organised several events with other H2020 initiatives in order to increase the exchange of knowledge and information, as well as to raise the robustness of the scientific results.

1. **H2020 Contractors’ Workshop on Energy System Modelling, 30 June 2016, Brussels, Belgium**[^3]: SET-Nav partners from TU Wien, IIASA, CEPS participated at the H2020 Contractors’ Workshop on Energy System Modelling. The workshop’s objective was the identification of possible synergies and/or overlaps among energy system modelling projects. Representatives from INEA, DG ENER, DG RTD and JRC, as well as participants in the H2020 projects REEEM, REFLEX and MEDEAS participated at the event. SET-Nav partners disseminated the project by a SET-Nav introductory presentation and a SET-Nav Modelling Strategy presentation and connected with the three other project consortia to make use of synergies and maintain an active exchange throughout the course of the projects.

2. **Energy Modelling Platform for Europe (EMP-E) start-up meeting, 17-18 May 2017, Brussels, Belgium**[^4]: SET-Nav participated at the first meeting of an Energy Modelling Platform for Europe (EMP-E) 2017 that took place on May 17th and 18th by the European Commission DG Research & Innovation in Brussels. SET-Nav partners from TU Wien and NTNU made two presentations on SET-Nav models. The first presentation named ”Insights in the LCE 21 projects Linking models - (SET-Nav)” by Gustav Resch focused on the issues and challenges that arise when linking different models, while the second named ”Linking models in SET-Nav” by Ruud Egging (NTNU) tried to address the challenges of linking models, providing input and relevant experience gained through the SET-Nav project. In the second day of the meeting, SET-Nav led one of the event’s six Focus Groups, named “Methodologies for linking models”. To further disseminate SET-Nav methodology, study approach and case studies, two roll-up posters on SET-Nav were designed for the event’s purposes. The first poster is a general poster on the SET-Nav content and briefly presents the project pillars, methodological framework, case studies, modelling workshops and stakeholder involvement & dissemination activities. The second poster is dedicated to the SET-Nav Case Studies, presenting the links between the SET-Plan challenges with the three SET-Nav pillars and the SET-Nav Case studies. Two of the eleven SET-Nav case studies are extensively analysed in the poster. The two SET-Nav posters are available in Appendix A.

3. **LCE 21 – Energy System Modelling Clustering Event, 28 November 2017, Brussels, Belgium**[^5]: The meeting fostered exchange between the different energy system modelling projects in the Horizon 2020 Program, namely REEEM, SET-Nav, MEDAS, REFLEX.

Several common issues were discussed:


Scenario: The discussion concluded that since it was impossible to take the same assumptions in different models, it would be worth trying to map the different dimensions. A cluster of scenarios can be foreseen: the clustering will serve to make common, shared conclusions and maybe policy recommendations.

Methodology: The discussion was about the possibility to exchange factsheets on the different models used.

Data: The main aspects discussed were related to the:
- Categorization of data: which level of aggregation, metadata.
- Exchange of data: which sets of data can be shared and which protocols are needed
- Having a session at EMP-E 2018

Dissemination and Exploitation: The organisation of a common event alongside the 2018 SET-Plan conference has been envisaged, as well as the possibility to organise a lunchtime conference at DG ENER combined with a common policy brief.

4. Decarbonisation project networking workshop, 7 February 2018, Brussels, Belgium

SET-Nav partner, NTUA, participated at the decarbonisation project networking workshop, co-organised by DG Research and Innovation (RTD) and the Executive Agency for SMEs (EASME), on 7th February 2018, at the European Commission (DG RTD) CDMA building, in Brussels, Belgium.

The workshop’s objective was to stimulate peer-to-peer and science-to-policy discussions on how to get the most out of EU-funded projects for the benefit of the society and policy-making. More particularly, interactions among participants were established, while major results in the pipe as well as areas and solutions that can make our joint commitment to climate research and innovation more beneficial were identified.


SET-Nav participated at the Second Meeting of an Energy Modelling Platform for Europe (EMP-E) 2018, hosted on September 25th and 26th by the European Commission DG Research and Innovation in Brussels. In the first day of the meeting, SET-Nav coordinator Gustav Resch (TU Wien) gave a brief presentation of all LCE21 projects, while Tobias Fleiter (Fraunhofer ISI) presented innovations for deep decarbonisation of industry (and their role in energy scenarios). During the second day of the meeting Jasper Geiper (TU Wien) presented the model integration platform developed within SET-Nav’s framework. To further disseminate SET-Nav methodology and case studies three posters on SET-Nav were designed for the event’s purposes. The posters are “SET-Nav project insights: Experiences on model integration and formulating energy transition pathways”, by Pedro Crespo del Granado (TU Wien); “Multicriteria assessment of alternative decarbonisation pathways towards the European energy transition” by Katerina Papapostolou (NTUA); and “From Empirical Analysis of the EU’s Energy Innovation System to Storylines of Future Change”, by Yeong Jae Kim (UEA). More information on the meeting can be found at the events dedicated webpage on SET-Nav website.

More information on European projects’ interventions at SET-Nav Modelling workshops can be found in the following table.

Table 2: SET-Nav synergies

<table>
<thead>
<tr>
<th>Synergies with EU projects</th>
<th>Funding Program</th>
<th>Type of collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETTER - Bringing Europe and Third countries closer together through renewable Energies</td>
<td>EC Intelligent Energy - Europe programme.</td>
<td>Exchange ideas among the SET-Nav and BETTER partners through email exchange, networking in several EC events, social media, etc. BETTER logo and link is provided in “SET-Nav” website.</td>
</tr>
<tr>
<td><a href="http://www.better-project.net/">http://www.better-project.net/</a></td>
<td></td>
<td></td>
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<tr>
<td>LIMITS - Low climate Impact scenarios and the Implications of required Tight emission control</td>
<td>European Community's Seventh Framework Programme FP7-Cooperation-ENV</td>
<td>Exchange ideas among the SET-Nav and LIMITS partners through email exchange, networking in several EC events, social media, etc. LIMITS logo and link is provided in “SET-Nav” website.</td>
</tr>
<tr>
<td>Strategies <a href="http://www.feem-project.net/limits/">http://www.feem-project.net/limits/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARISMA – Innovation for Climate Change Mitigation <a href="http://www.carisma-project.eu/">http://www.carisma-project.eu/</a></td>
<td>EC Horizon 2020 program</td>
<td>Exchange ideas among the SET-Nav and CARISMA partners through email exchange, networking in several EC events, social media, etc. SET-Nav link in CARISMA “Projects - Synergies” webpage and vice versa.</td>
</tr>
<tr>
<td>Green ECONET <a href="http://greeneconet.eu/">http://greeneconet.eu/</a></td>
<td>EC 7th Framework Programme for Research and Technological Development</td>
<td>Exchange ideas among the SET-Nav and Green ECONET partners through email exchange, networking in several EC events, social media, etc. Green ECONET logo and link is provided in “SET-Nav” website.</td>
</tr>
<tr>
<td>Synergies with EU projects</td>
<td>Funding Program</td>
<td>Type of collaboration</td>
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<tr>
<td>CECILIA2050 - Combining Policy Instruments to Achieve Europe’s 2050 Climate Targets</td>
<td>European Union’s 7th Framework Programme for Research (FP7)</td>
<td>Exchange ideas among the SET-Nav and CECILIA2050 partners through email exchange, networking in several EC events, social media, etc. SET-Nav logo and link in towards 2030-dialogue “Links” webpage.</td>
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<tr>
<td><a href="http://cecilia2050.eu/">http://cecilia2050.eu/</a></td>
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<tr>
<td>EU-GCC Clean Energy Network</td>
<td>European Union</td>
<td>Participation of SET-Nav partners in 3 webinars organised within the framework of EU-GCC Clean Energy Network in December 2017 and February 2018. Exchange ideas among the SET-Nav and EU-GCC Clean Energy Network partners through email exchange, networking in several EC events, social media, etc. SET-Nav information and link on EU-GCC Clean Energy Network e-observatory and vice versa.</td>
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<tr>
<td><a href="http://www.eugcc-cleanenergy.net/">http://www.eugcc-cleanenergy.net/</a></td>
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<tr>
<td>ENSPOL - Energy Saving Policies and Energy Efficiency Obligation Schemes</td>
<td>Intelligent Energy Europe Programme of the European Union</td>
<td>Exchange ideas among the SET-Nav and BETTER partners through email exchange, networking in several EC events, social media, etc. SET-Nav logo and link in ENSPOL “Useful links” webpage and vice versa.</td>
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<tr>
<td><a href="http://enspol.eu/">http://enspol.eu/</a></td>
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<tr>
<td>Dia-Core – Policy Dialogue on the assessment and convergence of RES policy in EU Member States</td>
<td>Intelligent Energy Europe Programme of the European Union</td>
<td>Exchange ideas among the SET-Nav and Dia-Core partners through email exchange,</td>
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<td>Type of collaboration</td>
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<td><a href="http://diacore.eu">http://diacore.eu</a></td>
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<td>networking in several EC events, social media, etc. Dia-Core logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td><strong>OPTIMUS – Optimizing energy use in cities through smart decision support systems</strong> <a href="http://optimus-smartcity.eu/">http://optimus-smartcity.eu/</a></td>
<td>European Union’s Seventh Programme for Research, Technological Development and Demonstration</td>
<td>Exchange ideas among the SET-Nav and OPTIMUS partners through email exchange, networking in several EC events, social media, etc. OPTIMUS logo and link is provided in “SET-Nav” website.</td>
</tr>
<tr>
<td><strong>APRAISE – Assessment of Policy Interrelationships and Impacts on Sustainability in Europe</strong> <a href="http://apraise.org/">http://apraise.org/</a></td>
<td>European Union’s Seventh Programme for Research, Technological Development and Demonstration</td>
<td>Exchange ideas among the SET-Nav and APRAISE partners through email exchange, networking in several EC events, social media, etc. APRAISE logo and link is provided in “SET-Nav” website.</td>
</tr>
<tr>
<td><strong>FLAGSHIP – Forward Looking Analysis of Grand Societal Challenges and Innovative Policies</strong> <a href="http://www.flagship-project.eu/">http://www.flagship-project.eu/</a></td>
<td>European Union’s Seventh Programme for Research, Technological Development and Demonstration</td>
<td>Exchange ideas among the SET-Nav and FLAGSHIP partners through email exchange, networking in several EC events, social media, etc. FLAGSHIP logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>RESPONSES - European RESPONSES to climate change</td>
<td>EC 7th Framework Programme of the European Commission</td>
<td>Exchange ideas among the SET-Nav and RESPONSES partners through email exchange, networking in several EC events, social media, etc. RESPONSES logo and link is provided in “REEEE” website and vice versa.</td>
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<tr>
<td>PATHWAYS - Transition Pathways To Sustainable Low-Carbon Societies</td>
<td>European Union’s 7th framework programme for research, technological development and demonstration</td>
<td>Exchange ideas among the SET-Nav and PATHWAYS partners through email exchange, networking in several EC events, social media, etc. PATHWAYS logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>TRANSrisk-Transitions Pathways and Risk Analysis for Climate Change Mitigation and Adaptation Strategies</td>
<td>European Union’s Horizon 2020 research and innovation programme</td>
<td>Exchange ideas among the SET-Nav and TRANSrisk partners through email exchange, networking in several EC events, social media, etc. SET-Nav participation In an open access Springer book published by TRANSrisk, TRANSrisk brochures distribution in SET-Nav Modelling Workshop,</td>
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<td>AMPERE - Assessment of Climate Change Mitigation Pathways and Evaluation of the Robustness of Mitigation Cost Estimates  <a href="http://ampere-project.eu/web/">http://ampere-project.eu/web/</a></td>
<td>EC seventh framework programm</td>
<td>Exchange ideas among the SET-Nav and AMPERE partners through email exchange, networking in several EC events, social media, etc. AMPERE logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>ENTRACTE - Assessment and further development of the European climate policy  <a href="http://entracte-project.eu/">http://entracte-project.eu/</a></td>
<td>European Union’s Seventh Framework Programme for research, technological development and demonstration</td>
<td>Exchange ideas among the SET-Nav and ENTRACTE partners through email exchange, networking in several EC events, social media, etc. ENTRACTE logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>POCACITO European post-carbon cities of tomorrow  <a href="http://pocacito.eu/">http://pocacito.eu/</a></td>
<td>European Union’s Seventh Framework Programme for Research, Technological Development.</td>
<td>Exchange ideas among the SET-Nav and POCACITO partners through email exchange, networking in several EC events, social media, etc. POCACITO logo and link is provided in “SET-Nav” website.</td>
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| Reflex- Analysis of the European Energy System under the aspects of flexibility and technological progress  
http://reflex-project.eu/ | European Union’s Horizon 2020 research and innovation programme | REFLEX and SET-Nav are part of the LCE21 project family (which consists of Reflex, SET-Nav, MEDEAS and REEEM projects). Co-organisation as LCE21 cluster of three workshops:  
  ii) LCE 21 – Energy System Modelling Clustering Event in Brussels, November 2017;  
| MEDEAS – Modelling the Renewable Energy Transition in Europe  
http://www.medias.eu/ | European Union’s Horizon 2020 research and innovation programme | MEDEAS and SET-Nav are part of the LCE21 project family (which consists of REFLEX, SET-Nav, MEDEAS and REEEM projects). Co-organisation as LCE21 cluster of three workshops:  
  ii) LCE 21 – Energy System Modelling Clustering Event in Brussels, November 2017;  
  iii) Energy Modelling Platform for |
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<tr>
<td>REDPeAk (Residential Electricity Demand: Peaks, Sequences of Activities and Markov chains)</td>
<td>EPSRC Fellowship</td>
<td>Exchange ideas among the SET-Nav and REDPeAk partners through email exchange, networking in several EC events, social media, etc. Presentation named “People’s activities and residential electricity demand: A time use approach” by Prof Jacopo Torriti, University of Reading at the SET-Nav modelling workshop in Vienna. REDPeAk logo and link is provided in “MEDEAS” website.</td>
</tr>
<tr>
<td>GREEN-WIN</td>
<td>European Union’s Horizon 2020 research and innovation programme</td>
<td>Exchange ideas among the SET-Nav and GREEN-WIN partners through email exchange, networking in several EC events, social media, etc. GREEN-WIN logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>INNOPATHS</td>
<td>European Union’s Horizon 2020 research and innovation programme</td>
<td>Exchange ideas among the SET-Nav and INNOPATHS partners through email exchange, networking in several EC events, social media, etc.</td>
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<td>Europe (EMP-E) 2018 in Brussels, September 2018.</td>
<td></td>
<td>SET-Nav participation at the H2020 Contractors’ Workshop on Energy System Modelling, June 2016, Belgium. Representatives from the H2020 projects MEDEAS, REEEM, REFLEX. SET-Nav participation at the 1st Board of Stakeholders meeting, organised by MEDEAS in December 2017. SET-Nav logo and link is provided in “MEDEAS” website and vice versa.</td>
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<td>SET-Nav participated at “Pathways to European decarbonisation: the INNOPATHS scenarios workshop” organised by INNOPATHS in February 2018. INNOPATHS logo and link is provided in “SET-Nav” website.</td>
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<tr>
<td>PROSPECT</td>
<td>European Union’s Horizon 2020 research and innovation programme</td>
<td>Exchange ideas among the SET-Nav and PROSPECT partners through email exchange, networking in several EC events, social media, etc. SET-Nav logo and link is provided in “PROSPECT” website and vice versa.</td>
</tr>
<tr>
<td>iBRoad</td>
<td>European Union’s Horizon 2020 research and innovation programme</td>
<td>Exchange ideas among the SET-Nav and iBRoad partners through email exchange, networking in several EC events, social media, etc. Participation of Alice Corovessi, INZEB – iBRoad in the discussion panel of the SET-Nav Regional workshop in Athens, Greece. iBRoad logo and link is provided in “SET-Nav” website.</td>
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