ANNUAL REPORT 2021

MISTRA ELECTRIFICATION
Programme Year One

MISTRA
ELECTRIFICATION

CONTENT

FUNDED BY
MISTRA
The Swedish Foundation for Strategic Environmental Research

This is the first annual report from Mistra Electrification,
a reseach programme funded by
The Swedish Foundation for Strategic Environmental Research.

MISTRA
ELECTRIFICATION

The vision of the Mistra Electrification programme is to accelerate the transition to a sustainable and efficient energy system, through the creation of actionable knowledge for a feasible and fair transition.

PROGRAMME PARTNERS

Svenska Kraftnät · stockholm exergi · fortum · Nordion Energi · Göteborg Energi · Vattenfall · Hitachi Energy · Energiforsk · [e]gain · Utilifeed · Chalmers · IVL Svenska Miljöinstitutet · Lunds Universitet · University of Exeter · SLU

Karin Reuterskiöld,
Chair of the Mistra
Electrification
Programme Board

CHAIR OF THE BOARD

Collaboration and social acceptance are key factors for successful electrification

I strongly believe that electrification of our Society is a prerequisite for combatting the challenges posed by climate change. The adaptation and mitigation of climate change is a major feature of all plans for a future with a more sustainable society. We have engaged in the innovative and exciting Mistra Electrification Programme with the overall goal of adding substantial knowledge and relevant advice for all decision-making processes concerning electrification.

Mistra Electrification will cover, among other areas, energy systems designed for both business and general societal needs, the role of policies, and governmental support for a successful transition to a more sustainable society. It will also deal with a very important issue – the social acceptability and economic consequences of the energy transition with the focus on electrification, thereby broadening the perspective on electrification beyond the techno-economic point-of-view.

By combining expertise from the business and academic spheres with those of other relevant stakeholders, the Mistra Electrification Programme will reflect the most-important perspectives and, thus, help to accelerate the transition of energy systems in a fair and effective way. The five work packages of Mistra Electrification will develop knowledge that will form the basis for decisions in Society regarding regulations, laws, and other supportive measures.

Although we started this work just a few months ago, under challenging pandemic circumstances, I expect that there will be plenty of opportunities to discuss goals, achievements, and milestones in the years to come. Of one thing I am sure: the importance of electrification as a major transitional tool will only increase, as will the importance of collaborations between academia, the business community and Society. I am truly looking forward to interesting discussions within the programme and the programme board

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Karin Reuterskiöld,
Chair of the Board
Mistra Electrification Programme

INTRODUCTION

Accelerate the transition to a sustainable and efficient energy system through knowledge

This is the first annual report for Mistra Electrification. This research programme was formulated in response to Mistra's research call "Energy Transitions" and was selected to receive 50 million SEK of funding from Mistra. The project start was set as June 1st, 2021, so this report covers the first 7 months of the programme.

Seven academic partners are involved in the programme's five work packages, and nine non-academic partners are committed to the consortium. This in itself constitutes a strong and influential network, exploiting the synergies among the consortium partners. All the academic partners are well-established, with extensive networks in academia and among relevant stakeholders. In addition, Energiforsk has a comprehensive network of energy companies and industries, academic groups and governmental agencies, as well as access to several related research programmes – all of which will contribute to efficient dissemination of the programme results.

Strong collaboration between the partners is a key factor for the success of the programme. A novelty of the programme is that we will work methodically in an iterative way between the work packages and with the stakeholders. In this programme, we are looking beyond the mere technical solutions to understand how the transition to a fossil-free society can be accelerated. The socio-political and economic issues will serve as important aspects when defining the feasibility of the transition. We focus on electrification and sector coupling as prime enablers of the transition across sectors, rather than addressing the power, heating, transport and industry sectors separately.

Filip Johnsson,
Programme Director,
Mistra Electrification

Helena Sellerholm,
Vice Programme Director,
Mistra Electrification

In this first annual report, each work package is presented together with its objectives, its unique expertise, and achievements during the first 7 months of the programme.

It has been quite challenging to initiate such a large programme during the pandemic. Although the plan is to limit travel and make use of digital tools, we had hoped to have an in-person kick-off meeting in which all parties would get to know each other better. In addition, the above-mentioned collaboration between the partners has been restricted by the pandemic. Nevertheless, we have high hopes of being able to accelerate our co-operative activities over the coming 6 months, since we have used this time to prepare for research activities that will be partly executed through interactions with stakeholders, both within and outside of the consortium. Overall, we think we have managed to make the best of the situation, conducting interesting and engaging discussions in a digital kick-off meeting, and the research is up and running and the collaboration has been initiated. We look forward to meeting all of the consortium partners in person during 2022, so as to strengthen the relationships and share our experiences.

We are proud to represent the joint leadership of this important research programme and will work with dedication to meet the expectations of all the stakeholders. The need for a fast forward transition is urgent.

Filip Johnsson and Helena Sellerholm,
Programme Director and Vice Programme Director, Mistra Electrification

This is Mistra Electrification

The research programme involves a consortium of nine industry partners and five research partners. The consortium, which is funded by Mistra and the partners, is under the combined leadership of Chalmers University of Technology and Energi-forsk and reports to the Programme Board.

Programme Board

- **Karin Reuterskiöld** (Chair), Sustainable Business Strategist at Danske Bank
- **Lise Nordin**, Climate Coordinator at Västra Götalandsregionen
- **Åsa Pettersson**, CEO at Energiföretagen Sverige - Swedenergy
- **Andreas Regnell**, SVP Strategic Development at Vattenfall
- **Stefan Savonen**, SVP Energy & Climate at LKAB

Research Partners

- Chalmers University of Technology, three divisions/departments:
  - Energy Technology
  - Physical Resource Theory
  - Division of Electric Power Engineering
- IVL Swedish Environmental Research Institute
- University of Exeter
- Lund University
- Swedish University of Agricultural Sciences (SLU)

Industry Partners

- Svenska kraftnät (Swedish TSO)
- Stockholm Exergi
- Fortum
- Nordion Energi
- Göteborg Energi
- Vattenfall
- Hitachi Energy
- Egain
- Utilifeed

Programme Period

June 2021 – May 2025

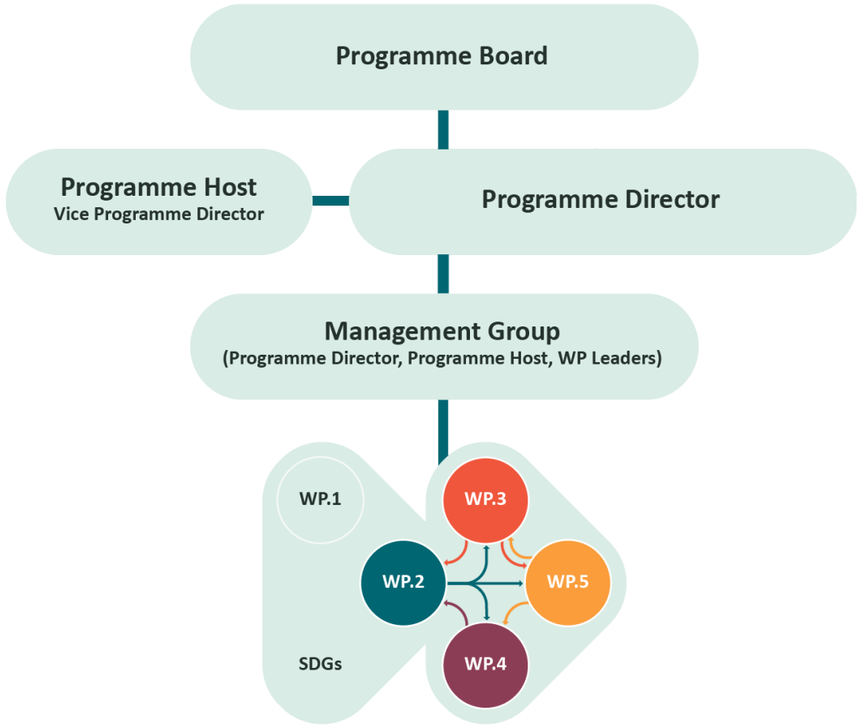
Budget and Funding

- In total, 67 MSEK, comprising:
- 50 MSEK from Mistra; and
- 17 MSEK as in-kind contribution from the research and industry partners

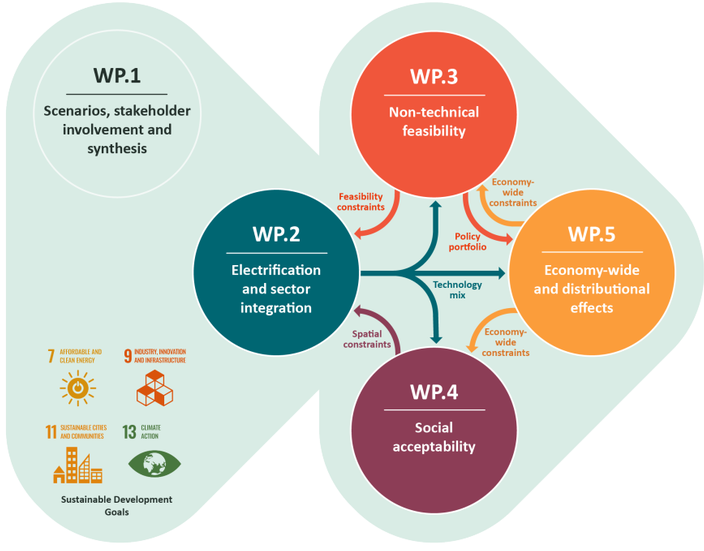
Work Packages

- **WP1** – Scenarios, stakeholder involvement and synthesis
- **WP2** – Electrification and sector integration
- **WP3** – Non-technical feasibility
- **WP4** – Social acceptability of energy infrastructure
- **WP5** – Economy-wide and distributional effects

Organisation of Mistra Electrification



Work packages and cooperation



WORK PACKAGE 1

Scenarios, stakeholder involvement and synthesis

Objective and focus of the work package

WP1 provides a structured process for the interactions with stakeholders throughout the programme, so as to formulate relevant scenarios and cases and synthesise the results. An important novelty of the work is that it combines a relevant network of stakeholders with a participatory integrated assessment methodology.

The challenge linked to implementing deep electrification and decarbonisation pathways (as identified in WP2) in the real world is to identify plausible scenarios for the introduction of such pathways, taking into consideration their non-technical feasibility (WP3), social acceptability (WP4), and economy-wide and distributional effects (WP5). Thus, collaboration and iteration are the keys to success. The work packages are dependent upon each other, and the research requires inputs from the stakeholders. WP1 manages the integrated participatory approach to address tensions and trade-offs through dialogue with relevant stakeholders, and it develops scenarios and synthesises the results into transition pathways.

WP1 will facilitate several workshops with different constellations to iterate the needs of the stakeholders and the outcomes of the research to achieve the overall objective of accelerating the transition to a sustainable and efficient energy system. The synthesis work will be an integrated component throughout the programme. Communication is also a vital part of the synthesis. The website allows access to parties not directly involved in the programme and facilitates the internal dialogue of the consortium, both of which activities are essential for successful collaborations.

Our expertise

With its unique network of industry and research actors, Energiforsk acts as programme host and leader of WP1. WP leader Helena Sellerholm holds a degree in chemical engineering and is an experienced project leader, managing large research programmes that are mainly related to heat and power production. Åsa Elmqvist, who is a project manager at Energiforsk and PhD student, focuses her doctoral studies on complex decision-making and will contribute with structuring and coordinating the stakeholder involvement methodology. Communications manager Jeanette Granström at Energiforsk manages all external and internal communications regarding the programme and, when needed, will coordinate with the communication units at the academic partner institutions. Several of the researchers involved in the other work packages contribute directly to the work within WP1, notably Assoc. Prof. Mikael Odenberger and Prof. Filip Johnsson, both at Chalmers University of Technology.

Activities and achievements in 2021

For the first 7 months of the programme, the main activities within WP1 have been to form the consortium and establish means of communication.

- Launch of programme web site mistraelectrification
- Setting up of internal communications channels.
- Arranging the kick-off meeting for all participating researchers and business partners.
- Organising a webinar on permitting processes for wind power in Sweden.

WORK PACKAGE 2

Electrification and sector integration

Objective and focus of the work package

The aim of this work package is to analyse pathways for the Swedish and Northern European electricity systems that address the anticipated electrification of the transport and industry sectors and that account for flexibility provision through sector coupling (including hydrogen production), as the basis for iteration with the other work packages. Thus, an important novelty of the work is the structured communication and iteration of the modelling results, using a set of indicators for quantifying the modelling results and then iterating the modelling based on inputs from WPs 3–5, as well as inputs from the participatory integrated assessment with the stakeholders. During the iteration, pathways with undesirable features are removed from the set of feasible solutions and the techno-economic optimisation is re-evaluated. The new solution includes information on the costs associated with making the pathway politically feasible and socially acceptable and on the economy-wide impacts of this new solution.

Objectives of WP2

- To provide pathways for the Swedish and the Northern European electricity system, including electrification of industry and transport, infrastructural requirements and sector integration for different assumptions made regarding external parameters (scenarios), including different target trajectories for carbon emissions towards zero emissions.
- To investigate the possibilities linked to distributed generation, including prosumer systems in urban areas, and the role of electric vehicles, including smart charging strategies.
- To develop novel approaches to integrating spatial constraints and political and institutional feasibility constraints into techno-economic modelling by means of a set of key indicators for quantifying the input and outputs from modelling with respect to the quantities required for the subsequent analyses in WPs 3–5.
- To assess sustainability impacts, synergies, and trade-offs.
- To assess the potential role of information technology as an enabler of sector integration, for example, the role of virtual power plants (e.g., aggregated heat pumps bidding on electricity markets).
- To develop solutions that guarantee stable operation of the power systems when operated with a high penetration level of non-dispatchable electricity generation (most notably, wind power), and compare these solutions from the technical and economic perspectives.

Our expertise

The core work of WP2 is performed by the Energy Systems Group at Energy Technology and by the Department of Electrical Engineering at Chalmers University of Technology. The energy systems research is led by the programme director Prof. Filip Johnsson, together with Dr. Lisa Göransson and Assoc. Prof. Mikael Odenberger. These researchers have an accumulated 20 years of experience with techno-economic modelling of energy system transitions. We have performed many projects in cooperation with different stakeholders, such as the North European Power Perspective project and its predecessor projects. The energy systems group consists of around 20 persons, including PhD students. The group has strong connections with the other research units at the Division of Energy Technology, which has a technical focus on applied thermodynamics with many industrial collaborations. This ensures that both the input and the results from the techno-economic analysis pass a "reality" check in terms of what is feasible from the technical and economic perspectives. The research conducted at the Department of Electrical Engineering is led by Prof. Massimo Bongiorno, who is also leading the recently started "Swedish Electricity Storage and Balancing" competence centre.

Activities and achievements in 2021

- Definition of first scenarios for technology assessment – we have constructed candidate scenarios but final decisions remain to be made. As the basis for scenario decision, we have performed a literature survey of non-technical barriers to electrification in the Nordic countries and held an internal workshop that examined these barriers (Energy Systems Group).
- Work is ongoing towards deciding which methodology will be applied for the stakeholder interviews on the subject of non-technical barriers.
- A report on wind power development in Sweden, including reasons for why projects have not been approved, is under development.
- The Department of Electrical Engineering has conducted a literature review of modular multilevel converters (MMCs), with the focus on topologies that can facilitate the integration of energy storage. In addition, researchers at the department have developed simulation models for one "state-of-the-art" MMC topology.

WORK PACKAGE 3

Non-technical feasibility

Objective and focus of the work package

WP3 assesses whether the rates of the transitions modelled in WP2 are feasible. Whereas the models used in WP2 identify optimal electricity pathways based on technical constraints such as resource availability and intermittency challenges, WP3 draws on empirical material to characterise non-technical feasibility constraints, such as the rate of innovation, investment levels, and institutional and social changes. WP3 aims to recommend policy solutions, mixes and sequences that can overcome these constraints and enhance the feasibility of the transition pathways.

WP3 adopts a novel approach that is based on an interdisciplinary understanding of the nature of the causal mechanisms driving and blocking energy transitions, which we represent as a co-evolution of the techno-economic, socio-technical and political systems. We apply a cutting-edge feasibility assessment framework to assess the feasibility of decarbonisation in the specific context of Sweden nested within Europe. This enables us to deliver recommendations that account for feasibility constraints that are outside the control of Swedish actors. In addition, we strive to advance scientific understanding of the interactions between feasibility constraints at different levels of governance. In order to identify policy interventions that are capable of accelerating decarbonisation and the transition to renewables modelled in WP2, WP3 will investigate relevant decision-making processes among key actors (e.g., investment decisions made by industrial actors) through choice experiments and how these are and can be affected by policy interventions, policy mixes and the sequencing of both existing and novel policies.

Objectives of WP3

- Construct feasibility spaces for rapid implementation of the most critical elements of the pathways, including:
  - Expansion of low-carbon power generation (onshore and offshore wind, distributed solar, the future of nuclear power);
  - Expansion of hydrogen technologies, including production, supply, and storage; and
  - The phase-out of fossil fuels (coal and natural gas) in Northern Europe (e.g., coal phase-out in Poland).
- Translate the insights from the first objective into benchmarks that can be used for interpreting the parameters of the pathways produced in WP2 (in particular, deployment rates), so as to identify, in collaboration with WP2, the feasibility constraints and trade-offs related to these key elements relevant for specific pathways and elaborating pathways that stay within these constraints.
- Identify and analyse policy mixes that can trigger the implementation of the transition pathways in the context of Swedish and EU energy and climate policies (e.g., the EU ETS) and strategies linked to the EU Green Deal.

Our expertise

The IIIEE (International Institute for Industrial Environmental Economics) at Lund University and the Division of Physical Resource Theory at Chalmers lead the work in WP3, drawing on their expertise in the feasibility of climate mitigation action and the rates of technological change. IVL is contributing to WP3 with their expertise in environmental policy design. WP co-leader Prof. Aleh Cherp (IIIEE and the Department of Environmental Sciences and Policy at the Central European University, Vienna, Austria) is experienced in collaborative projects conducted across different disciplines. His research focuses on energy security, energy transitions, and the feasibility of clean technologies such as solar and wind power to meet climate targets. Jessica Jewell, Assoc. Prof. in Energy Transitions at the Department of Space, Earth and Environment at Chalmers University and Professor at the Centre for Climate and Energy Transformation at the University of Bergen, Norway leads a number of international projects focused on the mechanisms and feasibility of climate action, including fossil fuel phase-out and nuclear power. Hodjat Arabi, who is an incoming PhD student at Lund University, has a background in economics and environmental science and policy and will work on distilling lessons from other European countries for application to Sweden's electricity transition.

Activities and achievements in 2021

- *Definition of the initial set of growth models.* This involved analyses of Gompertz and logistic models for wind and solar power worldwide and the results were published by Cherp et al. (publication in July 2021, with most of the dissemination, code for model fitting, etc. being carried out in Sept–Nov 2021). Additional models (exponential, log-linear, log-max) and validation of growth parameters have been conducted in preparation for submission for publication (scheduled for Summer of 2022).
- *Compilation of initial data for wind power deployment.* Data on Northern Europe and worldwide compiled from different sources and continually updated. A visualisation tool for these data is provided here.
- *Review of the EU Green Deal of relevance for Sweden's energy system.* This work has started. The European Commission's climate package "Fit for 55" (FF55), was published in July of 2021. We have reviewed the parts of FF55 that address the EU Emissions Trading System and a New ETS for the transport sector. This review has been presented to and discussed with the Ministry of Environment and the Swedish EPA to identify issues that are of the greatest importance for Sweden.

WORK PACKAGE 4

Social acceptability of energy infrastructure

Objective and focus of the work package

The aim of WP4 is to understand the social acceptability of the energy infrastructure solutions identified in WP2 as being necessary to achieve climate neutrality.

This work package adopts an interdisciplinary approach that combines engineering and social science to forge a socio-technical perspective on social acceptability. We will investigate how the public and actors such as officials and company representatives represent and accept different technological solutions towards climate neutrality, taking account of perceived benefits and costs, how and where these are distributed, and whether this is perceived as being fair. This will also include an examination of the different roles that citizens are willing to play in enabling sustainable energy transitions, for example as prosumers or investors. Furthermore, we will provide an innovative contextual approach that integrates spatial data on the locations of energy projects with information on how people relate to those locations or places. Our aim is to synthesise engineering-based energy technology assessments with social science analyses of place/technology 'fit' and reactance. In this way, we will work closely with stakeholders to ensure that policymaking is informed by rigorous scientific evidence rather than anecdote.

Objectives of WP4

- To estimate potential locations for future wind power plants and future levels of deployment density based on historical geospatial data (also to inform WP2).
- To identify the technological pathways and spatial locations for deployment that are expected by stakeholders and experts to be controversial with the public generally and local communities in particular.
- To investigate how the different technological solutions obtained in WP2 are represented and accepted by the public at the societal and local community levels, as well as by officials and company representatives.
- To understand the roles that citizens are willing to play in enabling sustainable energy transitions, for example as prosumers or investors, and how these roles might vary across social groups, personal characteristics and spatial areas.
- To advance understanding of the socio-spatial aspects of technological pathways, specifically the compatibility between particular landscapes and specific technological solutions (e.g., large-scale wind power), using mapping methodologies.

Our expertise

The research within WP4 is co-led by the University of Exeter, UK and IVL Swedish Environmental Research Institute. WP co-leader Patrick Devine-Wright is Professor of Human Geography based in the Geography Department and Global Systems Institute at the University of Exeter. WP co-leader Magnus Hennlock is Senior Researcher at IVL Swedish Environmental Research Institute. Recently recruited is Adam Peacock, Postdoctoral Research Fellow at the University of Exeter. Fredrik Hedenus is Professor of Sustainability and Systems Analysis at Chalmers University of Technology and researches wind deployment heterogeneity and the integration of variable renewables. Yodefia Rahmad, who is a PhD student at Chalmers with a background in Aerospace Engineering, is currently working to understand what shapes the spatial heterogeneity of wind deployment in Sweden.

Activities and achievements in 2021

- Data on wind power deployment (both capacity and generation, onshore and offshore) in Sweden and relevant independent variables that can explain variations in deployment between municipalities.
- Desk research and planning for recruiting stakeholders, companies, authorities and municipalities for participation in the research activities of WP4.
- Recruitment of a postdoctoral research fellow (Dr. Adam Peacock, from 1st February 2022).
- Conducted literature reviews on academic and policy literature of relevance to WP4 research focus and proposed mapping methods.
- Developed a draft research plan (including budget forecasting and travel planning) for the University of Exeter, including the outlining of a more-detailed two-phase approach to the initial stakeholder interview stage.
- Compiled a list of 56 stakeholders from national and regional contexts and across different sectors as potential interview candidates. This list has since been refined to an initial 14 stakeholders to interview, which is to be confirmed with project colleagues.
- Developed interactive mapping tool using ArcGIS 'Story Map' and QGIS to: (i) utilise spatial data to inform the recruitment of key stakeholders; (ii) assess the current spatial distribution of energy technologies and infrastructures across Sweden; and (iii) use as a complementary tool for stakeholder interviews.
- Developed five iterations of stakeholder interview questions to help unpack the spatial dynamics of the energy transition across Sweden.

WORK PACKAGE 5

Economy-wide and distributional effects

Objective and focus of the work package

The aim of WP5 is to shed light on how the Swedish economy will be affected by different policy choices, using the Computable General Equilibrium (CGE) modelling approach and unique empirical data, a combination that makes this work both novel and unique. For example, we address the question: 'How is Swedish competitiveness affected by electrification, given that we have comparative advantages in producing electricity and using it in energy-intensive industries?'

Through the iterative work packages managed by WP1, WP5 will inform WPs 3 and 4 on the overall distributional effects of the different transition pathways. This work package aims at incorporating stakeholder information knowledge to refine the analysis and position it within a realistic framework. The work of WP5 is novel in that we will contribute new theoretical results on the links between competitiveness metrics and exact welfare measures in a general equilibrium setting. This will be of great importance, given that the views expressed in public and political debates on the effects that the energy transition will have on the economy vary widely.

Objectives of WP5

- To quantify the effects on competitiveness of the energy transition pathways obtained from WPs 2–4, i.e., under different technology mixes and policy assumptions in Sweden and internationally.
- To quantify the distributional effects of the energy transition pathways obtained from WPs 2–4, i.e., under different technology mixes and policy assumptions.
- To understand the role of electricity trade with neighbouring countries in the transition pathways, using inputs from WP1 and iteratively with WP2.

The results from the analysis will be iterated with WPs 2–4.

Our expertise

The research within WP5 is led by SLU, the Swedish University of Agricultural Sciences, and the Centre for Environmental and Resource Economics (CERE). CERE is a centre for interdisciplinary research in the areas of environmental and natural resource economics located in Umeå. WP5 leader Bengt Kriström is Professor of Resource Economics at the Department of Forest Economics at SLU and Senior Advisor at CERE. Chris Boehringer, Professor of Economic Policy at University of Oldenburg, also contributes to the research within WP5.

Activities and achievements in 2021

- Data collection, updating and re-parametrisation of our macroeconomic CERE model.
- Refinement/extensions of the CERE model logic to specific research themes, such as competitiveness and impacts of energy/climate policies.
- Updating an econometric sector model (forest sector) that provides additional perspectives (although this is beyond the scope of the project plan, it is regarded as potentially useful for the research programme).

DELIVERABLES 2021

Administrative

- Programme Plan Year 1 (June–December 2021)
- Programme website: www.mistraelectrification.com
- Consortium agreement
- Kick-off meeting with all partners on Sept. 20, 2021
- Communication Plan Years 1–2
- Programme Plan Year 2
- Inaugural Programme Board meeting
- First Programme Management Team meeting

Scientific publications

- Chateau, Z., Devine-Wright, P. and Wills, J. (2021). Integrating sociotechnical and spatial imaginaries in researching energy futures. Energy Research and Social Science, 80, 102207.
- Walker, C., Devine-Wright, P., Rohse, M., Gooding, L., Devine-Wright, H. and Gupta, R. (2021). What is 'local' about Smart Local Energy Systems? Emerging stakeholder geographies of decentralised energy in the United Kingdom. Energy Research and Social Science, 80, 102182.
- Cherp, A., Vinichenko, V., Tosun, J., Gordon, J. & Jewell, J. National growth dynamics of wind and solar power compared to the growth required for global climate targets. Nature Energy 6, 742–754 (2021). (Work carried out mostly before the programme started).
- Yang, Jinxi, Christian Azar, Kristian Lindgren, 2021. Financing the transition towards carbon neutrality – an agent-based approach to modelling investment decisions in the electricity system. Frontiers in Climate 3:738286.

Media and other appearances – a selection

There have been several media appearances by researchers in Mistra Electrification. Below is a list of selected media appearances from key researchers in the programme (other researchers from the programme have been co-authors of some of the opinion pieces, such as those published in *DN Debatt*). The links direct to web pages (mostly in Swedish, for obvious reasons).

"National growth dynamics of wind and solar power compared to the growth required for global climate targets" with Cherp, A., Vinichenko, V., Tosun, J., Gordon, J. & Jewell, J.

Participated in Swedish Television programme ("Agendas stora klimatdebatt"), SVT Play. Agenda – Klimatutmaningen - del 1 | SVT Play

Agenda - Klimatutmaningen - del 2 SVT Play

Resulting in several media contacts after broadcast of the Agenda TV programme:
Forskarnas dom – underkänner politikernas klimatplan | SVT Nyheter

Forskarnas sågningar: "Förslagen räcker inte" (expressen.se)

Partierna: Elfordon lösningen på utsläppen från transporterna | SVT Nyheter

"Hur realistiskt är det att fånga in koldioxid direkt från luften i Sverige?" Ny Teknik

Opinion piece: "Orealistiska kärnkraftsförslag tar fokus från viktigare frågor" with Aleh Cherp etc.

Opinion piece: "Enorma möjligheter att snabbt bygga ut förnybar el" – DN Debatt with Lars Zetterberg, other researchers and Anders Wijkman

Chalmersprojekt ska undersöka koldioxidsugens framtida roll | SVT Nyheter

Expertens vindkraft-känga mot Öckerö – när ryska naturgasen stryps, Filip Johnson

Opinion piece: Den energipolitiska debatten är en dialog mellan döva, Filip Johnson

Opinion piece: Domstolar ska inte formulera klimatpolitiken, Christian Azar

Podcast: Vetenskapligt med Häggström och Liv: Azar om att förse politiker med fakta

During the preparation period for the start-up of the programme, the programme contributed to advising the European Commission, with Filip Johnsson participating as a working group member in the work on the report titled: "A systemic approach to the energy transition in Europe", which was written as part of the Science Advice for Policy by European Academies (SAPEA). The report was presented by Filip Johnsson to the their Royal Highnesses the King of Sweden and King of Spain and several industrial leaders (in connection with the Spanish state visit in November) in a workshop at IVA on November 25, 2021.

Programme Management Team and WP Leaders

- Filip Johnsson, Programme Director and Leader of WP2
- Helena Sellerholm, Programme Vice Director and Leader of WP1
- Aleh Cherp, Co-Leader of WP3
- Jessica Jewell, Co-Leader of WP3
- Patrick Devine-Wright, Co-Leader of WP4
- Magnus Hennlock, Co-Leader of WP4
- Bengt Kriström, Leader of WP5
- Jeanette Granström, Communications Lead

Website

mistraelectrification.com

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