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ISI

FRAUNHOFER INSTITUTE FOR SYSTEMS AND INNOVATION RESEARCH ISI



ANNUAL REPORT
2020

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LEARNING FROM CRISES – THROUGH SYSTEMIC RESEARCH

The corona crisis dominated 2020 at Fraunhofer ISI as well. Like many others, we had to move most of the institute's activities online very quickly and work from home. Even if we have the benefit of considerable experience with mobile working at Fraunhofer ISI and, compared to many other activities, it is relatively easy to conduct our studies from our desks at home, the new situation still made considerable demands of us. Many employees were confronted with the double burden of working and family life, the missing interaction with their colleagues, and other hurdles of the new work situation. Events suddenly had to take place online; this was also the case for meetings, client appointments or the application of scientific methods and formats like expert workshops. This is why we would like to take this opportunity to thank all our employees as well as our clients and research partners, for us still having performed such excellent research together, in spite of the adversities.

In addition to the stress and struggles brought on by the circumstances of the corona crisis, such situations can also act as a catalyst, accelerating change and innovations, and can offer opportunities as well as their many disadvantages. If we look at the pandemic from the perspective of sustainability, we must ask ourselves whether the lack of ecological sustainability and the loss of biodiversity and wildlife habitats led to its outbreak, whether the lack of economic sustainability due to a globally interconnected economy contributed to its rapid spread, and whether low social sustainability, such as efficiency constraints in healthcare systems, made a decisive contribution to the severity of the crisis. According to a [scientific paper](#) produced in our Competence Center Sustainability, this also provides an opportunity to heighten awareness of the links between

the crisis and sustainability issues, and to accelerate the transformation towards sustainability as a result. This requires appropriate sustainability strategies, such as those developed in the framework of the [Science Platform Sustainability 2030](#), where Marion A. Weisenberger-Eibl is active in the Steering Committee. The platform's work shows that there are still conflicting goals between growth and sustainability, and that prosperity should be decoupled from resource consumption more strongly. In the future, sustainability strategies should take much greater account of aspects such as education, health care, gender equality, the rule of law, and climate and species protection. At the same time, it is important to ensure the adaptability of established social and economic systems so they are able to meet future challenges.

What can we actually do in concrete terms to make the relevant systems more robust and adaptable, in other words, more resilient in the future? What can we learn from the current crisis, how can we be better prepared for new crises in the future, and what contribution can systemic research make here? At Fraunhofer ISI, we devoted a great deal of time [to these questions](#) in 2020, in order to better understand how to mitigate the negative impacts of disruptive events on complex socio-technical systems, and what successful long-term adaptation strategies could look like. The concept of resilience, the ability to adapt continuously to changing environments in order to survive, is useful here in order to render economic and social systems more resilient and sustainable in the wake of a crisis than they were before. One of the basic assumptions here is that one can never foresee all the possible shock scenarios in complex interrelated systems. Instead, the core issue is to preserve

key capabilities and critical resources. The corona crisis, but also geopolitical uncertainties or global trade conflicts, for example, have highlighted how important technological independence is for Germany and Europe. In this context, Fraunhofer ISI presented an analytical approach to determine the criticality of technologies, and to develop strategies that ensure a certain degree of technology sovereignty. The topic of resilience also plays an important role in the joint project KResCo, which began at the end of 2020, and in which Fraunhofer ISI researches crisis management and resilience in the COVID-19 pandemic with its partner institutes in the Fraunhofer Group for Innovation Research. KResCo analyzes the impacts of the pandemic as well as the reactions and adaptation strategies in different European and non-European countries. Based on the research results, recommendations for action are compiled for politics, civil protection, the economy, society, and science, in order to strengthen their systemic resilience in the long term.

That fact that the corona crisis is accelerating the development of the corresponding resilience strategies could prove to be an important catalyst for major economic and societal transformation processes, such as digitalization and artificial intelligence, but also with regard to the robustness of infrastructures. Fraunhofer ISI has intensified its research in precisely these fields in 2020 and established the new cross-cutting topics "Artificial Intelligence" and "Transformation and Innovation Systems for Urban Areas". "AI" is considered from an innovation and application perspective. The research here focuses especially on AI's use-specific, economic and social implications - from AI-induced changes to the health system through AI contributions to the energy transition and up to the question of what will come after AI. The focus of the new cross-cutting topic "Transformation and Innovation Systems for Urban Areas" is on the complex, interdisciplinary challenges of urban areas and on developing solutions to them from the viewpoint of the city – ranging from climate protection and climate adaptation through the transformation of the energy and transport sectors up to housing and digitalization. Bundling the expertise available in all seven Competence Centers of Fraunhofer ISI makes it possible to

apply the institute's entire range of methodologies and skills quickly and comprehensively in new projects.

In addition to these new research fields, however, the transformation processes associated with resilience also played an important role in a number of different topics that have always been at the center of our research. In order to drive forward the decarbonization of the energy system, in 2020, we took a closer look at the opportunities and challenges of importing green hydrogen, which is considered an important component of the energy and climate transition. In addition, we explored how fuel cell and catenary technologies can contribute to climate-neutral freight transport, which currently causes more than one third of Germany's greenhouse gas emissions in the transport sector. The radical change and upheaval in the mobility sector was also a topic in the joint online series of lectures and debates "Focus: Future. Our life in 2050" hosted by the Chair for Innovation and Technology Management (iITM), which is led by Marion A. Weissenber-Eibl at KIT, and Fraunhofer ISI. In July 2020, this event revolved around the role of needs in future mobility decisions and the impacts these will have on mobility and the adaptability of the automotive industry.

In order to learn from crises and be better prepared for them in the future, analyses of crisis-based impacts are essential. These were also a big part of our research in 2020. A special survey of 237 industrial enterprises conducted in the framework of the German Manufacturing Survey revealed, for instance, that many companies were not prepared for this kind of crisis and had to contend with supply difficulties and slumps in production. Nevertheless, the survey also revealed the potentials and opportunities of the crisis, such as a possible, crisis-related digitization push, as many companies introduced new digital solutions during the lockdown in order to be better equipped for the future. Next to such short-term analyses, the longer-term impacts of the corona crisis are much more difficult to predict, but research can still make an important contribution here as well. Foresight experts from our institute provided methodological support for a process that developed six scenarios of the



possible state of the German economy in 2040, i.e. 20 years after corona. Bertelsmann Stiftung, which commissioned the project, invited 28 young decision-makers from politics, business and society as well as several economic experts to contribute their perspectives and help to develop recommendations for action. One of the scenarios regards the corona crisis as a decisive catalyst for transformations triggered in 2020 in industry, medicine or healthcare that

will benefit society in 2040. It is up to us whether it turns out like this, or whether more pessimistic scenarios will be proven right.

With this message of recognizing and using the opportunities and potentials of crises in spite of all the challenges involved, we hope you enjoy reading about our research activities in the past and - without doubt very peculiar - year 2020.

Prof. Jakob Edler
Executive director

Prof. Marion A. Weissenberger-Eibl
Director

1 Plug-in Hybrid Study

Together with the International Council on Clean Transportation (ICCT), the Competence Center Energy Technology and Energy Systems examined the fuel consumption and CO₂ emissions of plug-in hybrid vehicles in the [study](#) “Real-world usage of plug-in hybrid electric vehicles”. Their evaluation of comprehensive data sets from more than 100,000 plug-in hybrid vehicles in Europe, North America and China clearly showed that the vehicles’ real-world fuel consumption and CO₂ emissions are more than twice as high as those given in official test procedures. From the results, the study’s authors also derived concrete recommendations for policymakers on how to promote plug-in hybrid vehicles in the future.

2 Hydrogen Policy Brief

Green hydrogen and its synthesis products are considered essential components of the German and European energy and climate transition, with imports playing a key role. In this context, the Competence Centers Energy Technology and Energy Systems and Energy Policy and Energy Markets analyzed and assessed green hydrogen imports and the associated opportunities, tasks and challenges in a [policy brief](#). The focus was on the often still unclear factors on which imports depend. The policy brief is intended to contribute to understanding and not underestimating the complexity of importing hydrogen in the future.

5 Trace Substances

Following intensive preliminary studies of possible measures to reduce trace substances in aquatic eco-systems, the Competence Center Sustainability and Infrastructure Systems conducted a comprehensive [stakeholder dialog](#) on the German government’s trace substance strategy, planned by the Federal Ministry for the Environment, and provided specialist support for its contents. Together with the stakeholders, a balanced mix of source-, use-based and end-of-pipe measures was compiled, which is characterized by effectiveness and high efficiency. The result was presented to policymakers as a recommendation for implementation, and the catalog of measures forms the basis for the national trace substance strategy.

6 MFS Strategy

Studies conducted in the Competence Center Sustainability and Infrastructure Systems and as part of the scientific support provided to the Federal Ministry of Transport (BMVI) to develop the German government’s [Mobility and Fuels Strategy](#) (MFS) generate the knowledge needed to manage the transformation of the transport sector. The results of the studies, which form the basis for developing strategies to achieve the German government’s climate and energy targets in the transport sector, are also integrated into the work of the National Platform Future of Mobility (WG Climate) and form a scientific basis for Climate Cabinet negotiations.

9 Tracking Research Results

With this [study](#), the Competence Center Innovation and Knowledge Economy provides the EU Commission with relevant knowledge regarding the impacts of EU-funded research. It does so by using a methodology specially designed to track research results, by collecting and analyzing data, and by training EU Commission staff. The study covers approx. 8000 projects in ten thematic areas of the 7th Framework Program. The data were collected using 14 indicators such as output, result and impact indicators and contain information about publications, intellectual property rights, products based on them, start-ups and companies at the level of individuals and organizations.

10 Implementation of the HTS

This [project](#) supports the implementation of Germany’s High-Tech Strategy (HTS) 2025, which gears German research and innovation policy more towards addressing the Grand Challenges. It does so through scientific, evidence-based policy consultation within the framework of implementing the new mission-oriented policy of the HTS 2025, which is extremely complex due to its comprehensiveness, and through learning processes in the governance of these missions. The project is also developing an innovative concept to measure the impact of mission-oriented policy.

3 Forum Privatheit

The Forum Privatheit (Forum Privacy), which is a research consortium funded by the German Federal Ministry of Education and Research and coordinated by the Competence Center Emerging Technologies, works on issues related to privacy protection. The research results are not only used as input for scientific discourse, but also for society. For instance, problematic aspects of smart technologies were researched from the perspective of privacy protection, and design potentials were identified. In 2020, Forum Privacy also accompanied the data protection debate in connection with the Corona-Warn-App with its own blog.

4 Graphene Flagship

The Competence Center Emerging Technologies compiles the technology and innovation roadmap (TIR) within the European Commission's Graphene Flagship, one of the biggest funding initiatives in the history of the European Union. The TIR process represents a central strategic element of the flagship and plays a key role when planning each funding phase. Fraunhofer ISI is therefore making a significant contribution to determining the flagship's innovation strategy. As a result, it has gained high visibility in the scientific community and the industrial environment, and is now closely networked there.

7 BMWi's Long-Term Scenarios

The project "Long-term scenarios for the transformation of the energy system in Germany" conducted for the German Federal Ministry for Economic Affairs and Energy (BMWi) is used as the scientific basis for a long-term model of the climate and energy policy transformation process in Germany. The project, along with direct follow-up projects realized in the Competence Center Energy Policy and Energy Markets, sets important impulses for the development of the energy transition, especially the goals and policies for decarbonizing the German energy system.

8 Innovation Fund

This project of the Competence Center Energy Policy and Energy Markets prepared the ground for a low-emission innovation fund for energy-intensive industries, renewable energy sources, and subterranean CO₂ storage (CCS) in the context of the European emissions trading system. Together with industry partners, the project on behalf of the EU Commission laid the analytical foundations for an innovation fund, which is intended to initiate the transformation process in the period 2020–2030 with regard to lower CO₂ emissions, especially in carbon-intensive industries such as steel, cement and basic chemicals.

11 HTS Participation

The Competence Center Foresight used its methodological expertise to support the seven regional dialogs on the further development of the High-Tech Strategy 2025. Actors from science, industry and society jointly developed solutions for social challenges and the German government's missions. Fraunhofer ISI's approach to future-oriented participation is based on the conviction that it is better to develop innovations in cooperation with society.

12 Food Processing in a Box

What will we eat in 2035? What will the food industry of the future look like? What role will sustainability play? These and other questions are part of the "Food processing in a box (FOX)" project, funded by the EU Commission, in which the Competence Center Foresight identified the most important future food and nutrition trends. The results enabled the development of three scenarios for the European food sector in 2035, which map the innovation potentials along the entire value chain - from production through packaging and logistics to sales and consumption.



“OVERCOMING THE CRISIS IS ALSO A MENTAL PROBLEM”

Interview with Dr. Manfred Wittenstein, Chair of the Supervisory Board of Wittenstein SE and former President of the German Engineering Federation (VDMA) as well as Chair of the Board of Trustees at Fraunhofer ISI.

Dr. Wittenstein, it is hardly possible to talk about last year without mentioning the impacts of the crisis. How would you assess the changes brought about by the pandemic for Wittenstein SE and your industry?

Wittenstein: Our industry is one of the core elements of the German and European economy. At the moment, it is trapped in a double-dip recession. The virus came on top of an economic downturn that had already started before the pandemic hit. The entire industry is now facing the considerable challenge of maintaining its good position and prospects. Inspiring solutions, a high degree of employee loyalty, and the great sense of responsibility that the vast majority of company owners have in this sector, which is characterized by small and medium-sized enterprises, are helping us to get through this difficult phase together. What will certainly linger on is the realization that resilience and intelligent, comprehensive risk management have become much more important and will continue to be very important.

What do you expect from policymakers right now? How should they react to this challenging situation?

Wittenstein: Like businesses, policymakers should also have an approach based on values and not react in a primarily actionist-

interventionist way. Even though the current support and aid measures make sense, you often get the impression there is no longer term viable strategy or a sense of responsibility that extends beyond the present. Just looking at the debts we are accumulating is frightening. How will we deal with them? Further increases in taxes and duties? Further cutbacks in the already meagre state investments in education and infrastructure? Ramp up inflation to depreciate the debts? All poisonous for prosperity and employment! A heavy burden on the young and future generations!

“FRAUNHOFER ISI CAN REVEAL OVERARCHING TRENDS AND DESIGNATE OPTIONS FOR ACTION.”

What concrete contributions can Fraunhofer ISI make here?

Wittenstein: At the moment, the state is failing to see the urgency of the relevant issues. Forward thinking is missing. I think that Fraunhofer ISI can provide very good support here by drawing attention to the urgency and needs, as well as to the deficits. Accompanying research, in particular, is becoming more important in the current situation. Fraunhofer ISI can identify potential structural breaks and development trends and indicate what the associated opportunities and risks may be. It can reveal emerging trends and designate options for action. Thinking ahead is more than necessary. Not in the sense of presumption, but in the sense of intelligent conjecture. I very much hope that Fraunhofer ISI will grasp the nettle and reveal what our innovation system needs, triggering important debates in the process. Research can have great leverage in this position.

What lessons can we learn from the last few months?

Wittenstein: Crises reveal deficits. And today we can see the failings of recent years all the more clearly, for instance in infrastructure in the context of digitalization. The still superficial digitalization push that is visible at present must be given long-term backing. A bit of working from home will not make a change here. Especially as there are ambivalent assessments of the topic of working from home. I even see the danger here that the pendulum will swing too far. Digitalization can bring huge benefits. But we are still human beings – with everything that entails!

What will Germany's innovation system need, especially with a view to digitization?

Wittenstein: Above all, we need high quality, stable infrastructure – Germany is not the US. A few hotspots are not enough for us; we need broad, nationwide coverage! If we do not fulfill this long-standing requirement, we will pay dearly for it, because then we risk the long slow decline of our country as a place to live and do business. It may be that the effects of political decisions are not visible at first, but they will become all the more obvious later on, and are only reversible to a very limited extent, for example due to business investments gradually moving elsewhere.

How do you view the needs and possibilities of artificial intelligence in this context?

Wittenstein: Artificial intelligence holds huge potential, especially for a high-tech location like Germany - the associated possible increases in efficiency and effectiveness are not only economic, but also environmental (resources, sustainability) and social (working and living). But the be-all and end-all in the context of artificial intelligence is the collection, exchange and intelligent analysis of reliable, precise data. Especially in machine and plant engineering, we generate vast amounts of data. The important thing here is to connect more and more machines and companies in smart net-

works. And here, in particular, it becomes clear that AI is not just a tool, but first and foremost a mind-set!

“THE PANDEMIC HAS HEIGHTENED THE AWARENESS OF RISK AND UNCERTAINTY AND THE TOPIC OF UNCERTAINTY, IN PARTICULAR, HAS BECOME MORE RELEVANT.”

Is there anything positive you can take from the crisis?

Wittenstein: It is possible that the pandemic has heightened general awareness of risk and uncertainty. In particular, the topic of uncertainty has become more important in my opinion. While a “risk situation” is characterized by the fact that valid probabilities of occurrence can be attached to more or less well known possible events, there is no such framework of possible events with associated probabilities for “uncertainty”. This is what makes dealing with uncertainty so difficult and takes the vast majority of planning methods to their limits. Understanding this and facing the future courageously with an open mind in business, politics, science and society - if we manage that, we will have learnt something as a community.

Herr Wittenstein, thank you for your comments!

Interview conducted by Anne-Catherine Jung

WHAT ELSE WENT ON AT THE INSTITUTE IN 2020

EXAMPLES OF OUR VARIOUS ACTIVITIES

RISIS WEEK

at Fraunhofer ISI

The “RISIS week” took place at Fraunhofer ISI in January 2020. RISIS is an EU-funded project of 18 partners, which is constructing a broad data infrastructure in the field of STI studies and making this accessible to researchers. The RISIS week is the annual meeting of activists from all databases and partner organizations.

APPOINTMENTS

to important committees

In 2020, Barbara Schlomann was appointed to the Council of Experts on Climate Change and Katrin Ostertag to the Fraunhofer Scientific Advisory Board for Sustainability. Jakob Edler was re-elected as EU-SPRI President and appointed to the Austrian Council for Research and Technology Development. Marion A. Weissenberger-Eibl was elected Chairperson of the University Council at the Karlsruhe University of Applied Sciences.

ORGANIZATION

at Fraunhofer ISI

Rainer Walz is now the deputy director of the institute. Katrin Ostertag is head of the Competence Center Sustainability and Infrastructure Systems together with Rainer Walz. Patrick Plötz completed his habilitation at KIT, and now coordinates the business unit Energy Economy in the Competence Center Energy Technology and Energy Systems.

IKU

Innovation prize for climate and the environment

In March 2020, the German Federal Ministry for the Environment (BMU) and the Federation of German Industries (BDI) awarded the prizewinners for developing a smart water meter, heat management in offices and the environmentally-friendly production of plastic packaging, among others. Fraunhofer ISI provided the scientific evaluation of the submitted proposals, which formed the basis for the jury’s decision.

PRESENTATIONS

at conferences

In 2020, Fraunhofer ISI again participated in many conferences, for instance the eceee conference (8 presentations), EU-SPRI (two webinars on “Shaping systems transition”) and the NEST conference. There were also 8 presentations at the IST 2020 in Vienna, at which it was announced that the next IST 2021 will be organized by Fraunhofer ISI and will take place in Karlsruhe.

FONA

Workshop

The final workshop of the FONA evaluation conducted by Fraunhofer ISI and Prognos AG took place in Berlin in February 2020. More than 50 representatives from the German Federal Ministry of Education and Research (BMBF), universities, research institutions and businesses were given insights into the results of the evaluation and the development perspectives of the FONA framework program.

WORKSHOP

of the Joint Innovation Hub

The innovation workshop in September 2020 took place under the heading “shaping change”. Together with medium-sized enterprises, it was discussed how companies can continue along already successful paths and blaze new trails at the same time. Short introductions were given to the topics of strategic ambidexterity and boundary spanning and the workshop finished with identifying fields of activity and how to implement them.

TOP 100 WOMEN

in the German economy

The institute director, Marion A. Weissenberger-Eibl, was once again named as one of the 100 most influential women in German business in 2020 by the Boston Consulting Group (BCG) and the German business news magazine “manager magazin”.

POSITION PAPER

Technology sovereignty

The position paper presents a differentiated analytical approach to determining the criticality of technologies and the degree of technology sovereignty, both nationally and internationally. The team of authors around Jakob Edler presented and discussed the paper intensively at several high-profile events, such as the Knowledge Talk at the EU Commission's DG Research and Innovation, and the TIP Talk of the OECD.

NEW TOPICS

AI and Urban Areas

Fraunhofer ISI launched two new cross-cutting topics in 2020 »Artificial Intelligence« and »Transformation and Innovation Systems for Urban Areas«. Bundling the expertise available in all seven Competence Centers of Fraunhofer ISI makes it possible to apply the institute's whole range of methodologies and expertise quickly and comprehensively in new projects.

POLICY BRIEFS

on diverse topics

Fraunhofer ISI introduced a new publication format in 2020 and produced several policy briefs on topics researched at the institute. In January, for example, there was a policy brief on »Batteries for electric cars: Fact check and need for action«, and another on »Opportunities and challenges when importing green hydrogen and synthesis products« in December.

FOCUS: FUTURE

"E-Healthy"

The Chair for Innovation and Technology Management (iTm) at KIT, led by Marion A. Weissenberger-Eibl, hosts the series of lectures and debates on "Focus: Future. Our life in 2050" with Fraunhofer ISI and Carl Zeiss Meditec AG. In November 2020, the event focused on new approaches in the health sector and the opportunities and challenges posed by digitalization.

SEMINAR SERIES

in digital format

As part of Fraunhofer ISI's series of digital seminars, Stefan Pauliuk (Uni Freiburg) was a virtual guest at Fraunhofer ISI in May with a presentation on "Resource efficiency and climate change mitigation – A Prospective Industrial Ecology Assessment". In October, Bernhard Truffer (Uni Utrecht) spoke about "Mapping and measuring socio-technical transition dynamics by means of discourse network analysis".

COOPERATION

Fraunhofer ISI and IEG

In May, Fraunhofer ISI and Fraunhofer IEG established a new joint research group "Analysis of coupled energy infrastructures". The research conducted here focuses on the techno-economic analysis and modeling of sector-coupled, regional energy infrastructures, and the design of relevant regulation.

ANNUAL MEETING

of Forum Privatheit

The Annual Conference of the German research consortium Forum Privatheit (Forum Privacy), which is coordinated by Fraunhofer ISI, took place online in November 2020 under the heading "Self-determination and privacy – design options for a European path". The focus here was on regulatory, social, technical, and economic perspectives for a self-determined life and privacy in the digital transformation of society.

MISSIONS

Symposium

In December 2020, the HighTech Forum organized the Mission Symposium on the High-Tech Strategy 2025 together with Fraunhofer ISI. Participants discussed the practical implementation and further development of the mission-based approach in German research and innovation policy. Fraunhofer ISI is conducting its own project on missions and how to measure their success.

OUR COMPETENCE CENTERS

Through our comprehensive and inter-disciplinary perspective, we provide a wide range of services for our clients, which are bundled in seven Competence Centers with 28 Business Units:

Energy Policy and Energy Markets

The Competence Center Energy Policy and Energy Markets examines how the political and institutional framework of sustainable energy systems can be designed, further developed and evaluated.

Energy Technology and Energy Systems

The Competence Center Energy Technology and Energy Systems analyzes innovative energy technologies and their contribution to a sustainable energy system from a strategic perspective.

Foresight

The Competence Center Foresight develops, implements and conducts foresight processes within business, politics and society.

Innovation and Knowledge Economy

The Competence Center Innovation and Knowledge Economy analyzes the prerequisites for innovations and their effects from the company level up to national innovation systems.

Sustainability and Infrastructure Systems

The Competence Center Sustainability and Infrastructure Systems analyzes the prerequisites and possibilities to reduce emissions, and improve resource efficiency and sustainability.

Emerging Technologies

The Competence Center Emerging Technologies deals with the identification, evaluation and design of new technological developments and socio-technical transformations.

Policy and Society

Research and innovation are increasingly called upon to contribute to overcoming societal challenges. The Competence Center Policy and Society examines the resulting requirements.



RESEARCH FOR TOMORROW'S ENERGY SYSTEM

The Competence Center Energy Policy and Energy Markets designs and evaluates energy and climate policy measures and instruments for a faster development of a sustainable energy system as well as strategies for research and development. Integrating renewable energy sources into electricity markets and infrastructures, but also into heat markets, will remain a major challenge up to the middle of this century.

In 2020, research in the Competence Center revolved around the questions: How can we successfully and cost-efficiently manage the energy transition in Germany? How effective is the support for renewable energies? And how can we design sustainable energy concepts for urban areas in newly industrializing countries? In addition, the team advised national and international clients from governmental and non-governmental organizations as well as companies on introducing sustainable technological, economic and institutional innovations. Renewable energies and climate technologies help to strengthen the competitive position of export-oriented capital goods industries. Great market opportunities will open up for these industries in the coming decades both at home and abroad.

Once again in 2020, the Competence Center analyzed the effects of an increased use of renewable technologies on employment, income, economic structure and environment and helped decision-makers to design effective and practical policy instruments. For example, the Competence Center assessed renewable energy tenders on behalf of the German government. The research contained in the report had a direct influence on legislation and provided essential input for further shaping the energy transition in Germany.

At European level, the Competence Center supported the design of the Innovation Fund's launch call. The Innovation Fund is one of the world's largest funding programs, providing around ten billion euros to promote innovative, low-carbon technologies and processes in energy-intensive industries in the period 2020 to 2030. The aim is to bring industrial solutions for decarbonizing the EU

to market and thus support the transition to climate neutrality. On behalf of the European Commission, the Competence Center identified and classified more than 200 possible project proposals spanning all sectors. These include topics like carbon capture and storage/utilization, storage technologies and innovative approaches to energy production.

Urban areas are very relevant for the decarbonization of the global economy, especially in developing countries and emerging economies. Worldwide, they are responsible for 40 percent of the direct and 70 percent of the indirect CO₂ emissions. In the "Morgenstadt – Cities of the Future" project in 2020, the Competence Center developed sustainable energy concepts and scenarios based on the three case study examples in Mexico, Peru and India. The findings help to significantly reduce emissions in these areas and launch sustainable climate protection plans.

For DG Energy in 2020, the project team provided technical support with assessing the progress made in implementing Article 7 of the Energy Efficiency Directive, and preparing the policy implementation 2021–2030. Implementing and assessing the article is of the greatest importance to achieve the EU's energy and climate goals. This study provides a detailed analysis and deepens the understanding of one of the most important challenges in Europe.

The analyses of the five business units *Renewable Energies*, *Energy Policy*, *Climate Policy*, *Electricity Markets and Infrastructures*, and *Global Sustainable Energy Transitions* are based on a wide range of methods. These include policy analyses, scenario development, and – in cooperation with the Competence Centers Energy Technology and Energy Systems and Sustainability and Infrastructure Systems – detailed modeling of the transformation of the energy system.

[Other projects of the Competence Center](#)

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BUSINESS UNITS

▶ Renewable energies

▶ Energy policy

▶ Climate policy

▶ Electricity Markets and
Infrastructures

▶ Global Sustainable Energy
Transitions

STRATEGIES FOR A SUSTAINABLE ENERGY SYSTEM

Energy efficiency and renewable energy sources are key strategies for using energy in an environmentally-friendly and resource-saving way. The efficient use of energy also strengthens the competitive position of industry. Producing technologies that use and integrate renewable energy sources, highly efficient energy technologies, and energy services opens up large market opportunities at home and abroad. The research conducted in this field in the Competence Center Energy Technology and Energy Systems contributes to developing new technologies for a sustainable energy system.

In 2020, the business unit *Energy Efficiency* began a project that evaluates decarbonization measures in the steel and the cement industry, and develops the foundations of a roadmap. Another project team developed a program for companies in the food and beverage sector: Training courses tailored to the needs and potentials of the respective company link the transfer of knowledge on energy efficiency with models to change behavior and organizations, in order to establish an energy culture and energy awareness.

Among other projects in 2020, researchers in the business unit *Energy Economy* demonstrated that a network of 140 fueling stations would be sufficient to cover the hydrogen demand of fuel cell trucks in 2050. Together with the International Council on Clean Transportation, scientists also discovered that the real-world fuel consumption and emissions of plug-in hybrid vehicles are between two and four times higher than in the official test cycles. Finally, three ongoing field trials of catenary trucks were accompanied, in order to maximize the knowledge gained with regard to economic efficiency, environmental impact, and acceptance.

Researchers in the business unit *Demand Analyses and Projections* published an open source toolbox enabling cities, regions and countries in Europe to determine and model their demand for heating and cooling, and use this as a basis to develop strategies. In another project, they developed a holistic modeling approach to quantify the potentials for energy efficiency in buildings, transport and industry across Europe and make this knowledge usable. Among other things, they were able to show that previously unutilized waste heat from energy-intensive industry could supply more than half a million households via district heating systems.

In the business unit *Demand Response and Smart Grids*, the research team combined energy system models to examine a bundle of measures that can be used to maintain or even increase the security of supply in a transformed electricity system with extreme shares of renewables and strong sector coupling. Another topic in the business unit is the continued increase in decentralized battery storages and the measures that may be needed.

The business unit *Actors and Acceptance in the Transformation of the Energy System* also conducts research on the decision-making processes for energy efficiency measures and renewable energies in buildings, the acceptance of electric mobility in the local environment of charging infrastructure development, and the acceptance of a CO₂-oriented reform of energy levies, taxes and surcharges.

[Other projects of the Competence Center](#)

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BUSINESS UNITS

▶ Energy Efficiency

▶ Energy Economy

▶ Demand Analyses and Projections

▶ Demand Response and Smart Grids

▶ Actors and Acceptance in the Transformation of the Energy System



MAKING INFORMED DECISIONS – STRATEGIC FORESIGHT

The Competence Center Foresight develops and conducts strategic foresight processes with the aim of strengthening the futures literacy of our clients and society as a whole. We use a broad range of foresight methods to help clients analyze opportunities and challenges, and orient themselves to address uncertain futures, e.g. the consequences of the COVID-19 pandemic.

Future strategies are developed using horizon scanning, trend analyses, creative dialog formats, scenario processes, and roadmapping methods. Stakeholders and citizens can be included in designing future strategies with participatory methods of scenario development.

The business unit *Futures and Society* discovers and analyzes signals of change in society, the economy, politics, technology, and the environment. These signals and emerging trends are identified in their early development stages, and evaluated with the help of horizon scanning methods. Additionally, this unit specializes in highlighting the interactions between technologies and social change, helping to uncover and understand unexpected consequences for systems and behaviors.

What are the impacts of China's industrial policy on Germany? What opportunities and challenges result from using quantum technology? How do we want to live and do business in 2040? The business unit *Futures Dialogs* specializes in developing future visions to answer questions like these using a wide variety of both traditional and custom-designed dialog and workshop formats and methods. The goal of these activities is to integrate different

stakeholder perspectives into future-oriented discourse, and open up new lines of inquiry and creativity by initiating reflexive, solution-seeking conversations. For example, the "WIRtschaften 2040" project included voices from across German society to consider what our economy and society could look like in 20 years, taking into account the effects of the COVID-19 pandemic.

The business unit *Foresight for Strategy Development* supports organizations from business, politics, and society in developing robust visions that define future success and building roadmaps to achieve them. This process includes the use of trend radars to identify future disruptions, and the development of alternative scenarios to account for broader environmental change. Working with clients, we help them identify important options, define where and what actions are required, and foster sustainable, organizational foresight processes. As part of the "AHOY2050" project commissioned by MAN Energy Solutions SE, for instance, scenarios were developed for the maritime sector's pathway to a greener future. This study used the special expertise of Fraunhofer ISI in combining scenarios of transformation with quantitative modeling using the MATISSE model.

With its specific methodological expertise, target group-oriented result formats and interdisciplinarity, the team from the Competence Center Foresight helps stakeholders from business, politics and society to explore and utilize alternative futures in an informed way.

[Other projects of the Competence Center](#)

A high-angle, wide shot of a dramatic landscape. In the foreground, a person wearing a bright yellow raincoat stands on the edge of a dark, moss-covered rock formation, looking out over a deep canyon. A river flows through the center of the canyon, winding its way towards the horizon. The canyon walls are steep and covered in patches of green moss. The background shows a vast, flat landscape under a heavy, overcast sky with dark, grey clouds. The overall mood is somber and contemplative.

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BUSINESS UNITS

▶ Futures and Society

▶ Futures Dialogs

▶ Foresight for Strategy
Development

ANALYSES OF THE BIGGER PICTURE

What opportunities does the dynamic growth of the Asia-Pacific region in the fields of science, research and innovation hold for Germany and Europe? Which cutting-edge technologies should European industry keep an eye on in order to remain competitive, and what data exist here? Which methods can be used to measure the degree of interdisciplinarity in research organizations? The research conducted in the Competence Center Innovation and Knowledge Economy on the relationships between the economy, politics and society focuses on the bigger picture.

This Competence Center uses concepts of innovation economics to address current issues concerning the economic and social effects of innovation processes. It identifies the underlying influencing factors at the level of individual businesses or at a macroeconomic level. Other studies include the contributions of science systems to economic, technological, and social progress.

The Asia-Pacific Research Area (APRA) is home to around half the world's population and developing very dynamically. These dynamics, especially the science and innovation policies of these countries, require close monitoring. The Competence Center provides such detailed monitoring in the APRA project and in high-resolution analyses of this region. This monitoring aids the German Federal Ministry of Education and Research and various science and intermediary organizations to identify competition and cooperation opportunities at an early stage, and to be able to adapt their own political actions to changes in the Asia-Pacific region.

In 2020, the Competence Center provided comprehensive, reliable and regularly updated data on cutting-edge technologies and technology trends from around the world in the "Advanced Technologies for Industry" project. These data from fields such as big data, augmented virtual reality, biotechnology, the Internet of Things, and

robotics serve the European Union as a basis for its plan to launch a competitive, future-oriented industry policy. The study analyzes the development and use of digital and key (enabling) technologies in all EU industries.

On behalf of the German Federal Ministry for Economic Affairs, the Competence Center also examined the impacts of the digital transformation of the economy on federal export credit guarantees in 2020. Within this project, the Competence Center was tasked with exploring the changes in exports due to digitalization and dematerialization in industry, and to derive recommendations for action. This was done based on findings from the "German Manufacturing Survey 2018", which was also conducted by the Competence Center.

In 2020, the Competence Center also developed methods to quantify the interdisciplinarity of science institutions in the "INTERDIS" project. A multidimensional approach is applied, ranging from quantitative indicators, modern text analysis methods up to case studies. The result is a procedure able to derive interdisciplinarity at the level of individual organizations. The validated procedure can be applied to organizations beyond the ones studied in the project - in a national or international context.

Researchers in the Competence Center use both quantitative and qualitative approaches and methods of empirical economic and social research to work on their projects. Their repertoire includes primary surveys and analyses of secondary data, but also the evaluation of large, structured data sets such as publication, patent, trademark and company data. More recently, this has expanded to include the analysis of unstructured data with the help of text mining, machine learning and other semantic methods.

[Other projects of the Competence Center](#)

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BUSINESS UNITS

- ▶ **Industrial Change and
New Business Models**
- ▶ **Innovation Trends and Science
Studies**
- ▶ **Competitiveness and Innovation
Measurement**



MAKING WATER SYSTEMS, TRANSPORT, POLICY DESIGN AND THE RAW MATERIALS MARKET MORE SUSTAINABLE

For sustainable development, whole systems must be re-designed in the direction of environmental compatibility. This requires considering the entire canon of sustainability goals, ensuring compatibility with economic and social requirements, and developing strategies based on acceptance and equity all at the same time. The Competence Center Sustainability and Infrastructure Systems analyzes the conditions for such a transformation in water and mobility, the raw materials market, and the circular economy.

Digitalization is influencing and driving transformation in all these areas. Its role and effects are considered as well as the role of urban areas when studying infrastructure-related innovation and transformation processes. The researchers consider ecological, economic, political and social aspects in their work. They show how to reconcile different sustainability goals and provide policymakers, administration, associations, foundations, and businesses with impulses for sustainable development.

Among other studies in 2020, scientists in the business unit *Sustainability Innovation and Policy* explored the interactions between the process of digitalization and the transition to a green economy, as well as how to utilize digitalization ecologically. Another project dealt with identifying synergies between the policy domains of resource conservation and health. The business unit also accompanied the “r+impuls” funding program of the German Federal Ministry of Education and Research BMBF as well as the German Innovation Prize for Climate and the Environment IKU organized by the German Federal Ministry for the Environment.

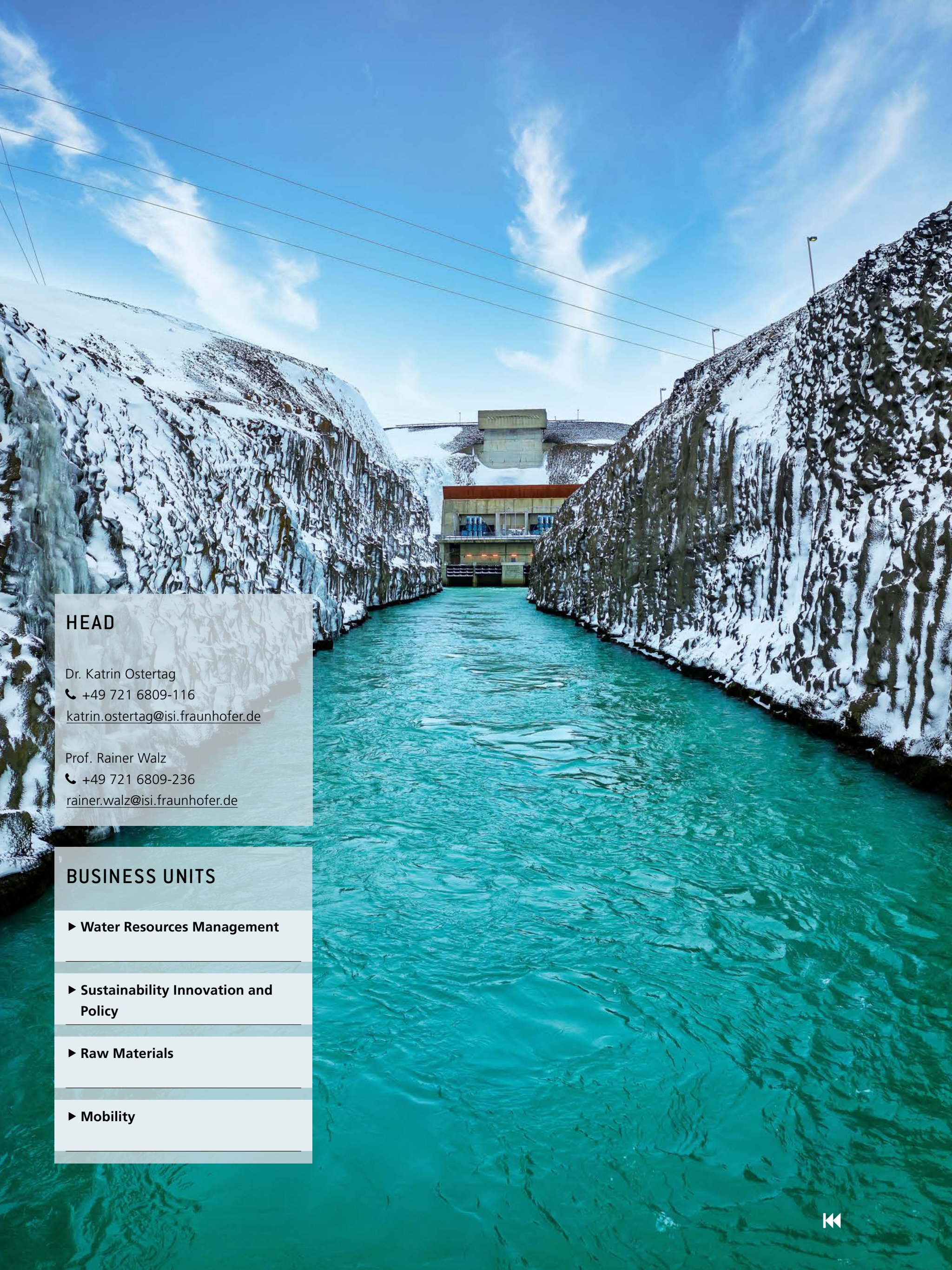
Research contracts in the business unit *Raw Materials* included an urban mining project on the potentials, trade-offs and supporting

factors for recovering raw materials from the anthroposphere. The business unit also worked in the field of copper stocks and flows on behalf of the International Copper Association, and developed a new, global, dynamic model for zinc flows and stocks for the International Zinc Association. In contracts for industry and in national and EU projects, researchers examined and assessed the influence of future technologies and megatrends such as electric mobility and the energy transition on the demand for raw materials and the security of raw material supply.

In 2020, researchers in the business unit *Water Resources Management* provided scientific support and helped to shape the process of developing the German government’s trace substance strategy. To help implement the energy transition, they developed an innovative concept to harness the previously unused heat potential of wastewater by distributing heat via the sewer system. In another project, the team researched how bundling infrastructures can be used to design environmentally-friendlier solutions that can be transferred to the whole of Germany.

Researchers in the business unit *Mobility* have supported the German government’s Mobility and Fuels Strategy for many years, which is the pivotal instrument for transforming the transport sector and achieving climate targets. Scientific reports such as those by Fraunhofer ISI close knowledge gaps and help to develop, prioritize and implement the measures needed to achieve energy and climate policy goals. In addition, the business unit’s team calculated what effects sustainable mobility will have on jobs in 2035: The scientists expect that overall losses and gains in employment will roughly balance.

[Other projects of the Competence Center](#)



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BUSINESS UNITS

▶ **Water Resources Management**

▶ **Sustainability Innovation and Policy**

▶ **Raw Materials**

▶ **Mobility**



SHAPING AND USING INNOVATIVE TECHNOLOGIES

The Competence Center Emerging Technologies identifies, evaluates, and shapes new technological developments and socio-technical transformations. Research topics include the bioeconomy, digital transformation, new materials and production processes as well as innovations in the health system. We develop recommendations for technology design and use, identify design options, advise decision-makers, support agenda setting in innovation policy, and contribute our expertise to scientific discourses.

In 2020, for example, the business unit *Bioeconomy and Life Sciences* investigated innovations in the bioeconomy based on three meat analogs developed to provide the growing global population with a sustainable supply of high-quality protein: plant proteins, insect proteins, and cultured meat. The project's aim was to analyze the interactions of these three analogs, and to compare their functionality and problem-solving potential.

In another project, the researchers identified and characterized the 50 most important bio-based innovations to help support decision-makers in the European Union as well as innovation stakeholders in industry. Their recommendations for action included how to strengthen the life sciences and biosciences in Europe in the future.

One current focus of the business unit *Information and Communication Technologies* is the coordination of the German research consortium "Forum Privatheit" (Privacy Forum). The research team developed 15 recommendations for action for trustworthy AI, for example, which not only preserve human self-determination despite artificial intelligence, but can actually promote it. In addition, they published a White Paper to support companies and public author-

ities when conducting data protection impact assessments. The White Paper provides an introduction to the GDPR requirements and the associated objectives. Data protection officers and those responsible in companies and public authorities are guided through five stages of how to conduct a data protection impact assessment in practice. Another project assessed the opportunities and risks of voice, speech and facial recognition systems.

In 2020, the business unit *Industrial Technologies* conducted a survey among European experts along the entire battery value chain to identify the specific knowledge and skills that will be needed in the future. The team also continued their research accompanying the "Research Factory Microelectronics Germany", and the "Technology and Innovation Roadmap of the European Commission's Graphene Flagship".

In 2020, researchers in the business unit *Innovations in the Health System* completed the project "Using Patient Science to Explore Rare Diseases". In cooperation with cystic fibrosis patients, their relatives and involving the cystic fibrosis community, they identified the main everyday problems of living with the disease. This also helped to further develop and disseminate the citizen science approach.

Researchers in the business unit also continued to support the "Healthy for a lifetime" funding initiative of the German Federal Ministry of Education and Research. The accompanying research project "GeLang BeLLa" brings the individual projects of the funding program together to exploit synergies and also supports them with information on important cross-cutting topics.

[Other projects of the Competence Center](#)



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BUSINESS UNITS

▶ Bioeconomy and Life Sciences

▶ Innovations in the Health System

▶ Information and Communication Technologies

▶ Industrial Technologies



PROFOUND EXPERTISE ACROSS ALL SYSTEM LEVELS

Researchers in the Competence Center Policy and Society offer clients from politics, politics-related organizations, and academia at supranational, national, regional and local levels advice and support with designing research and innovation policy strategies and transformation strategies as well as with evaluating and developing funding measures, funding programs, and governance instruments. They apply the latest theoretical approaches, analysis tools, indicators, benchmarking and evaluation concepts to do so.

The Competence Center's four business units *Policy for Innovation and Transformation*, *Societal Change and Innovation*, *Regional Innovation Dynamics and Knowledge Exchange*, and *Innovation and Regulation* explore how to design policies for complex transformation processes that are geared towards sustainability goals. There is a special focus on the role of research and innovation policy in addressing societal challenges. The Competence Center's particular competencies include in-depth knowledge of all system levels (macro, meso and micro) to address complex political issues and consultation needs as well as expertise spanning the entire research and innovation policy process.

In 2020, the Competence Center evaluated three pilot innovation competitions launched by the German Federal Ministry of Education and Research (BMBF). The three competitions "Energy-efficient AI system", "WELTSPEICHER" (a globally applicable domestic device for storing renewable power) and "Lab grown organ replacement" initiated by the BMBF as part of establishing the Agentur für Sprunginnovationen (Agency for Breakthrough Innovations) were analyzed and evaluated in terms of their funding approach, participants and the breakthrough character of the innovations. This was supplemented by an analysis of the market and application proximity of

the projects in each competition. The evaluation's aim is to use the knowledge gained for follow-up initiatives for breakthrough innovations in the future.

The Competence Center also worked on a detailed, fact-based database of Saxony's startup scene for the German state of Saxony. Data and figures on Saxony as a startup location, including the specific location conditions for startups, are identified, analyzed and processed in order to derive recommendations for how to strengthen and further develop the support for startups, and Saxony as a startup location.

In 2020, the Competence Center researched the suitability of standardization as an instrument for knowledge and technology transfer in the project "Norms and standards as a channel for knowledge and technology transfer". The aim was to develop recommendations for actions to better exploit the associated potentials. These include the finding that entering strategic cooperation, creating clearly defined responsibilities, implementing the corresponding incentives and measuring their performance can make a major contribution to the operationalization of a standardization strategy.

Overall, the Competence Center draws on a wide range of qualitative and quantitative social and economic science methods of analysis that are continuously further developed at Fraunhofer ISI. These include surveys, analyses of documents and comparison groups, social network and discourse analyses, the creation of typologies, and patent and publication analyses. In addition, it uses various methods for the consultative involvement of experts and stakeholders.

[Other projects of the Competence Center](#)

An aerial photograph of a modern glass skyscraper at dusk. The building is illuminated from within, and its glass facade reflects the sky. The surrounding city is covered in snow, and other buildings are visible in the background. The sky is a mix of blue and purple, indicating twilight. The overall scene is a high-angle view of a city street intersection with a roundabout, showing cars and a bus. The building is the central focus, with its reflection on the snow in the foreground.

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BUSINESS UNITS

- ▶ Policy for Innovation and Transformation
- ▶ Societal Change and Innovation
- ▶ Regional Innovation Dynamics and Knowledge Exchange
- ▶ Innovation and Regulation

HOW DO INNOVATIONS COME INTO THE WORLD?

Researchers in the Joint Innovation Hub (JIH) try out new scientific approaches and methods, and combine them to open up new fields and questions. Their interdisciplinary and transdisciplinary approach focuses on the question “How do innovations come into the world?” They look at innovation processes systemically from the perspective of organizations and stakeholders, and analyze how innovation processes can be initiated and implemented through the collaboration and interaction of actors from science, business, politics and civil society. They actively accompany these processes against the backdrop of continuous social change.

Researchers in the Joint Innovation Hub link social science and business management concepts and theories with ethnographic methods and creativity techniques. In order to derive innovative questions, they go to different places, seek out spatial, temporal and discursive references, and network with all the involved and affected actors. For example, they conduct in-depth interviews with stakeholders as part of extended situational analyses, but they also integrate actors who tend to have been overlooked so far. In addition, they employ qualitative and quantitative methods and work continuously on developing these.

The big questions of the JIH include: How can we identify effective emergent dynamics within constant social change? How can we develop existing ideas, technologies and ways of acting and at the same time be open to disruption and paradigm shifts? How can a changed understanding of complexity enable new paths in organizations?

The JIH supports organizations and companies in encountering change with strategic ambidexterity. Ambidexterity - the ability to use both hands equally well - describes the ability of companies to make use of their existing skills and processes (exploitation), and blaze new trails at the same time. For these new paths, it is important to discover and develop previously unknown or unused skills, process flows, methods and technologies (exploration). Organizations will only be able to survive in complex and dynamic environments if they strike the right balance between these two. So-called boundary spanners are important here to support this objective of ambidexterity. This not only concerns identifying them, but also defining their relevant capabilities and activating them.

Another essential part of ensuring the future viability of organizations and public institutions is to integrate the different social interest groups (stakeholders) in the best possible way.

Questions that occupy the JIH here are: How can the identification of relevant stakeholders and other latent actors be further refined? How can the subsequent analysis of goals for participation processes be further developed?

Researchers in the Joint Innovation Hub host different kinds of events to communicate the new formats and obtain feedback to develop them: In the experimental sessions, they link their observations, encounters and reflections with questions and challenges that are or could become relevant for society. They involve and invite people from science, business and society, who make a valuable contribution to the discourse about alternative futures. In addition, the JIH organizes series of discussions and workshops with the goal of developing regional and supra-regional sustainable innovation ecosystems.

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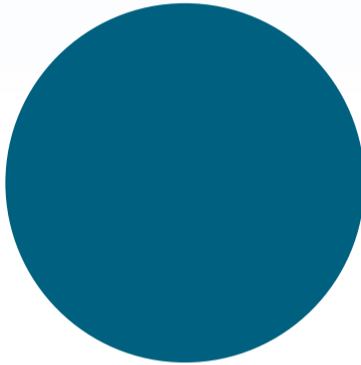
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FACTS AND FIGURES

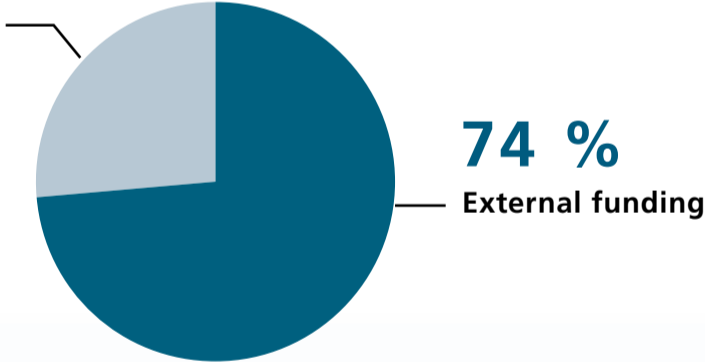
OPERATING BUDGET 2020 in million euros

Total
27.4



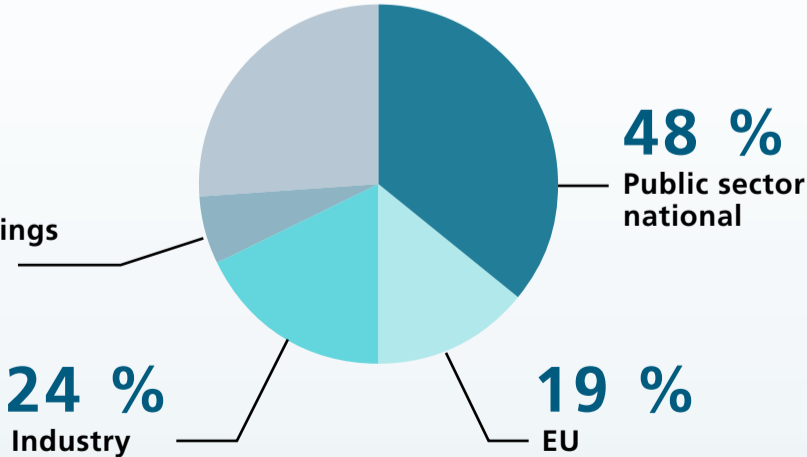
Basic funding
7.2

26 %
Basic funding

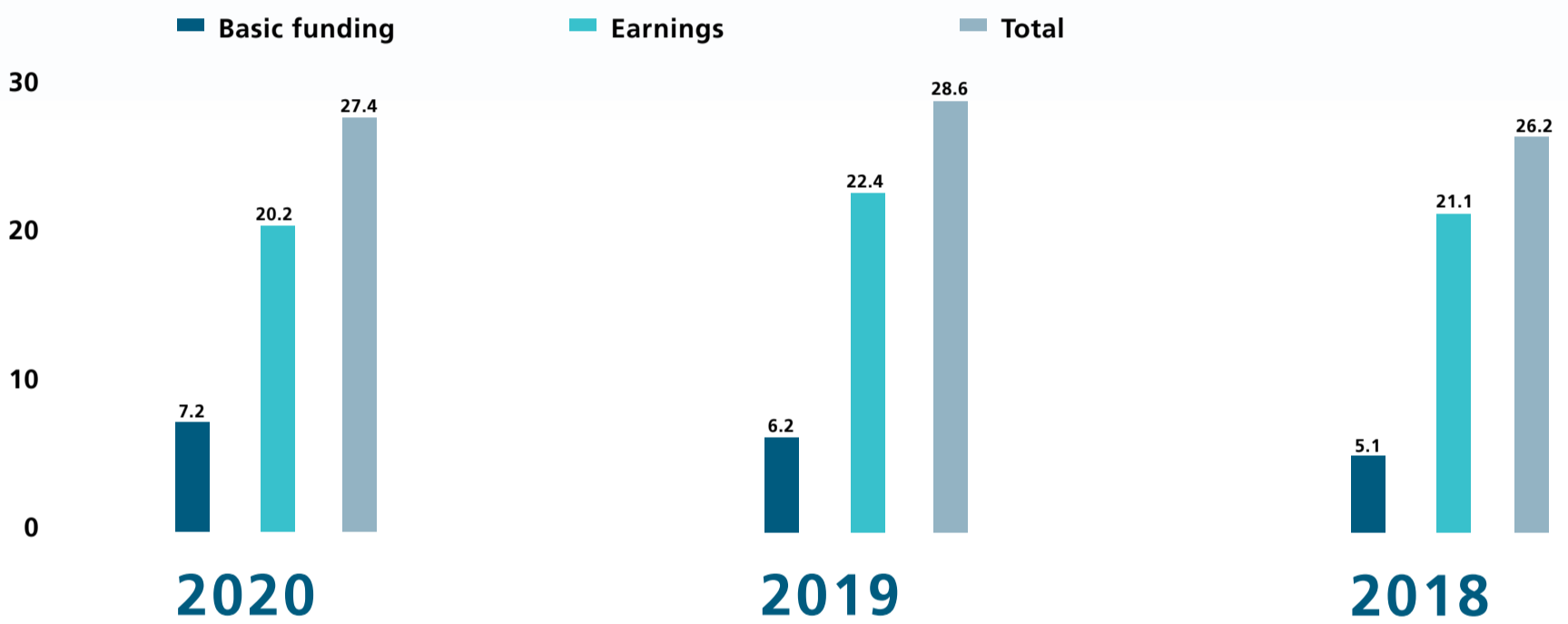


Earnings
20.2

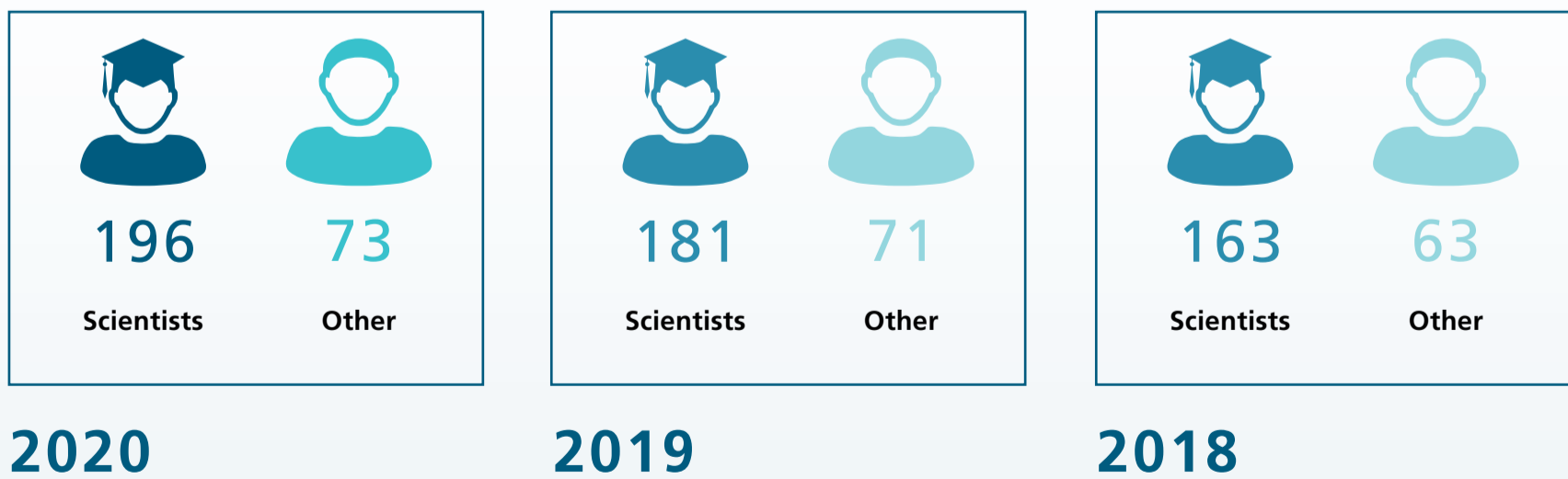
9 %
Other earnings
and R&E



DEVELOPMENT OF TURNOVER in million euros



NUMBER OF STAFF



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A NEW MEMBER ON THE BOARD OF TRUSTEES AT FRAUNHOFER ISI

Interview with Lisi Maier, Chair of the German Federation of Catholic Youth Associations (BDKJ).

As Chair of the German Federation of Catholic Youth Associations (BDKJ), you are sometimes referred to as the “face of Catholic youth associations”. What issues do you support?

Maier: I have been representing the interests of the BDKJ and its member associations in political Berlin for 8 years now. It is important to me to stand up for the creation of framework conditions for involving young people that function and are sustainably good, and that contribute to young people being able to participate in the political decisions that affect them nationwide and that span different departments.

“YOUNG PEOPLE AND THEIR PERSPECTIVES AND SUGGESTIONS ARE NOT HEARD OR INCLUDED ENOUGH IN THE CURRENT CRISIS POLICIES.”

What political areas do you think of first?

Maier: Well, this concerns economic and climate policy decisions but also social and educational policy issues - as the current corona pandemic has made abundantly clear. Young people’s perspectives and suggestions are not being heard or incorporated enough into the current crisis policy.

You are an advocate for the policy field of girls and women as well as the participation of young people. What do you do here?

Maier: That’s right. I am now also active on the board of the German Women’s Council. Even before my time at the BDKJ, when I was a student assistant to the university’s representative for women at the LMU Munich, for instance, I was already aware of how important a strong women’s and gender equality policy is as a driving force for the sustainable development of our society. I see this clearly again and again in the context of my international activities: sustainability is not possible without gender equality.

How important do you think youth participation is in terms of democratic policy-forming and decision-making?

Maier: Young people are the present and the future. It is therefore vital to include them in political decision-making processes. In our youth associations, we see that young people want to be part of the decisions! Initiatives like Fridays for Future have now clearly demonstrated to society that young people have their own concrete ideas of what the present and future should look like and that they want to help shape politics.

How can the interests of the younger generation be better incorporated into politics in order to shape a sustainable future?

Maier: Basically, it is important that young people are granted real rights. They have to be able to put forward their own interests and



attitudes and not only seemed to be allowed to participate when this is convenient. This is why I think that lowering the voting age is still the best, most effective, and fairest form of participation for young people.

What changes do you see in how the younger generation can bring their interests to bear on the transformation of society and the economy?

Maier: Issues relating to the energy transition and the transformation of mobility have played a major role for young people for many years now. Youth associations have long been calling for an expansion of local public transport services, or restrictions on short-distance flights. Issues to do with sustainable consumption also play a big role in youth associations - in relation to their own individual purchasing decisions and the relevant accompanying educational measures on the one hand, and in relation to clear political demands for an effective supply chain law that pays equal attention to human rights and the environment, on the other.

What is your most urgent political request in the election year 2021?

Maier: Young people have to be taken seriously, and their perspectives must be incorporated both in the run-up to and after the election. In particular, they must be considered in the coalition negotiations. In my opinion, the last few months in the context of the corona pandemic have made it very obvious that young people have not been heard in many places.

What do you mean exactly?

Maier: The interests and needs, especially of disadvantaged young people, have not been included in societal discourse or political decisions. To change this, we urgently need to look at compensating the disadvantages for this generation in the next legislative period. In particular, I think we must focus on formal and informal education as well as enabling young people a smooth and secure entry

to the labor market. All of this is necessary to provide young people with prospects for personal development and future opportunities.

“IFRAUNHOFER ISI CAN ACCOMPANY AND SUPPORT SOCIETY AND THE STATE IN THE SOCIAL AND ECOLOGICAL TRANSFORMATION.”

What expectations do you have as a future board member at Fraunhofer ISI? What can an institute like Fraunhofer ISI contribute to ensuring that we all make sustainable decisions in the long term, as a society, a state and an economy?

Maier: I believe that Fraunhofer ISI can make an important contribution through its expertise and perspective to accompanying and supporting society and the state during social-ecological transformation. From my point of view, it would also be necessary to include the perspectives of democratic civil society and non-formal education actors in this.

Frau Maier, thank you for your comments!

This interview was conducted by Anne-Catherine Jung.

ADVICE FROM SCIENCE, INDUSTRY, POLITICS AND ADMINISTRATION

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- ▶ **Prof. Thomas Hirth**
Vice-President for Innovation and International Affairs,
Karlsruhe Institute of Technology KIT
- ▶ **Prof. Patrizia Nanz**
Vice-President of the Federal Office for the Safety of
Nuclear Waste Management BASE, Berlin
- ▶ **Prof. Barbara Praetorius**
University of Applied Sciences, Berlin
Trustee from January 2021
- ▶ **Prof. Sylvia Schwaag Serger**
Professor of Research Policy at the School of Economics and
Management in the Department of Business Administration,
Lund University

MEMBERS FROM POLITICS AND ADMINISTRATION

- ▶ **Dr. Anna Christmann**
German Bundestag, Bündnis 90/Die Grünen, Berlin
Trustee from January 2021
- ▶ **MinDir Matthias Graf von Kielmansegg**
Head of "Policy Issues and Strategic Coordination" in the
Federal Ministry of Education and Research, Berlin
- ▶ **MinR'in Dr. Caroline Liepert**
Head of Unit 33 (Research and Innovation Policy, Research
in Biosciences, Natural Sciences and Medicine), State Minis-
try of Baden-Wuerttemberg for Science, Research and Arts,
Stuttgart
- ▶ **Hilmar von Lojewski**
Councillor and Head of the Department Urban Development,
Building, Housing and Transport of the Association of Ger-
man Cities, Berlin
Trustee from July 2020
- ▶ **Lisi Maier**
Chair of the German Federation of Catholic Youth Associa-
tions, Düsseldorf
Trustee from January 2021
- ▶ **Ltd. MinRat Dr. Peter Mendler**
Head of Unit 31 and Deputy Head of Department 3, State
Ministry of Baden-Wuerttemberg for Economic Affairs,
Labour and Housing Construction, Stuttgart

GROUPS AND ALLIANCES | ACADEMIC TEACHING

GROUPS AND ALLIANCES

Fraunhofer ISI a member of the Fraunhofer groups:

- Innovation Research
- Materials and Components – MATERIALS (Guest)

Fraunhofer ISI a member of the Fraunhofer Alliances:

- Batteries
 - Big Data and Artificial Intelligence
 - Energy
 - Nanotechnology
 - Water Systems (SysWasser)
 - Traffic and Transportation
-

ACADEMIC TEACHING

Hendrik Berghäuser

LECTURE
European Economic Integration
Hochschule Kehl

Daniela Beyer

SEMINAR
Innovationsprozesse Live
Karlsruher Institut für Technologie

Daniela Beyer

SEMINAR
Die Aushandlung von Open Innovation
Karlsruher Institut für Technologie

Knut Blind

LECTURE
Innovation Economics
Technische Universität Berlin

LECTURE

Intellectual Property Management – IP Management
Technische Universität Berlin

COLLOQUIUM

Doktoranden-Colloquium Innovationsforschung
Technische Universität Berlin

Harald Bradke

LECTURE
Energiewirtschaftliche Aspekte der Energietechnik I
Universität Kassel

Barbara Breitschopf

LECTURE
Socio-economic and ecologic aspects of infrastructure planning
Karlsruher Institut für Technologie

Heike Brugger

SEMINAR
Advanced Methods Course on Network Analysis
Zeppelin Universität

Uta Burghard

SEMINAR
Qualitative Methoden im Risiko- und Nachhaltigkeitsmanagement
Hochschule Darmstadt

Kerstin Cuhls

SEMINAR
Methoden der Zukunftsforschung
Freie Universität Berlin

SEMINAR

Forschungswerkstatt, Teil Implementation
Freie Universität Berlin

SEMINARS

Strategische Vorausschau. Vertiefung und Anwendung explorativer Methoden (Modul B)
Bundesakademie für Sicherheitspolitik

LECTURE

Ringvorlesung
Freie Universität Berlin

SEMINARS

Foresight
Universität Straßburg, Frankreich

Elisabeth Dütschke

SEMINAR
(Wie) gelingt sozial gerechter Wandel? Energiewende und Klimapolitik in Deutschland
Karlsruher Institut für Technologie

Jakob Edler

LECTURE
Strategic Innovation Procurement. 2 day lecture at the International Masters Course on Public Procurement Management of Rome
Tor Vergata University, Roma, Italy

Wolfgang Eichhammer

LECTURE
Policies for Energy & Material Transitions
Universität Utrecht, Netherlands

LECTURE

Energy in the Context of Sustainability
Universität Utrecht, Netherlands

Rainer Elsland

LECTURE
Rationelle Energieanwendung der Industrie
Universität Koblenz-Landau (Fernstudiengang)

LECTURE

Einführung in die Energiewirtschaft und das Energiemanagement
Wilhelm Büchner Hochschule, Darmstadt

LECTURE

Analyse der Energiebereitstellung und -umwandlung
Universität Koblenz-Landau

Carsten Gandenberger

LECTURE
Nachhaltiges Wirtschaften und Umweltmanagement
Hochschule Karlsruhe – Technik und Wirtschaft

LECTURE

Leadership & Sustainability
FOM Hochschule Essen

Joachim Globisch

SEMINAR
Computergestützte Managementmethoden
Hochschule Pforzheim

Matthias Gotsch

LECTURE
Einführung in die Betriebswirtschaftslehre
Hochschule Fresenius, Heidelberg

LECTURE

Controlling
Hochschule Fresenius, Heidelberg

LECTURE

Kostenmanagement
Hochschule Fresenius, Heidelberg

LECTURE

Nachhaltiges Management
Hochschule Fresenius, Heidelberg

LECTURE

Finanzierungsmanagement
Hochschule Fresenius, Heidelberg

Andrea Herbst

LECTURE
Mikroökonomie
Duale Hochschule Lörrach

Djerdj Horvat

LECTURE
Wissenschaftliches Arbeiten
Hochschule Karlsruhe – Technik und Wirtschaft

LECTURE

International Business Networks
Hochschule Karlsruhe – Technik und Wirtschaft

Lena Kappler

LECTURE
Internes Rechnungswesen
Technische Hochschule Bingen

Marian Klobasa

DISTANCE LEARNING MODULE
Energietransport und -verteilung sowie Energiespeicherung
Universität Koblenz-Landau

Henning Kroll

SEMINAR
Regionen im gesellschaftlich-technologischen Wandel
Regionalpolitik vor alten und neuen Herausforderungen
Leibniz Universität Hannover

Christian Lerch

LECTURE
Dienstleistungsökonomik
Hochschule Karlsruhe – Technik und Wirtschaft

LECTURE
Business Model Innovation
MCI Management Center Innsbruck,
Innsbruck, Austria

LECTURES
Industrie- und Serviceinnovation
Hochschule für Wirtschaft und Um-
welt
Nürtingen HWU

Cornelius Moll

LECTURE
Business Model Innovation
Hochschule Karlsruhe – Technik und
Wirtschaft

LECTURE
Business Model Innovation
MCI Management Center Innsbruck,
Innsbruck, Austria

Felix Neuner

LECTURE
Stochastik
DHBW Heidenheim

LECTURE
Gewöhnliche Differentialgleichungen
DHBW Heidenheim

Patrick Plötz

SEMINAR
*Ökonomische Aspekte der Verkehrs-
wende*
Karlsruher Institut für Technologie

LECTURE
*Quantitative Methods of Energy
Economics*
Karlsruher Institut für Technologie

Martin Pudlik

SEMINAR
Sustainable Energy Technology
RWTH Aachen

SEMINAR
Angewandte Methoden
Technische Hochschule Bingen

LECTURE
*Methoden der Regenerativen
Energiewirtschaft*
Technische Hochschule Bingen

LECTURE
Stromnetze
Technische Hochschule Bingen

LECTURE
Energiewirtschaft
Technische Hochschule Bingen

LECTURE
Rechnungswesen
Technische Hochschule Bingen

SEMINAR
Stromhandel
Technische Hochschule Bingen

SEMINAR
Betriebswirtschaft 2
Technische Hochschule Bingen

SEMINAR
Energiemanagement
Technische Hochschule Bingen

SEMINAR
*Energie- und Versorgungstechnik in
der Praxis*
Technische Hochschule Bingen

SEMINAR
*Unternehmensplanspiel (Stromhan-
del)*
Technische Hochschule Bingen

Thomas Reiß

LECTURE
Management neuer Technologien
Karlsruher Institut für Technologie

Clemens Rohde
LECTURE
Energieeffizienz
Technische Universität Darmstadt

LECTURE
*GPEK – Fachrolle Energie- und Res-
ourcenmanagement*
Technische Universität Darmstadt

LECTURE
*Renewable Energies, Energy scena-
rios and Climate protection*
Technische Universität Darmstadt

Andreas Röß

SEMINAR
*Einführung in Niklas Luhmanns
Systemtheorie*
Hochschule Fulda

Florian Roth

LECTURE
*Resilience: From Concept to
Application*
Bauhaus University Weimar und
Hong Kong Baptist University,
Hong Kong, China

LECTURE
*Resilience: From Concept to
Application*
Bauhaus University Weimar und
Hong Kong Baptist University,
Hong Kong, China

Joachim Schleich

LECTURE
Energy Marketing and Strategy
Grenoble Ecole de Management,
France

LECTURE
Managerial Economics (MBA)
Grenoble Ecole de Management,
France

LECTURE
Advanced Econometrics, PhDs
Grenoble Ecole de Management,
France

Ulrich Schmoch

LECTURE
Innovation and Transfer
Deutsche Universität für Verwal-
tungswissenschaften Speyer

Torben Schubert
LECTURE
Innovation Management
Lund University, Sweden

LECTURE
Globalization of Innovation
Lund University, Sweden

Felix Tettenborn
LECTURE
Global Challenges and Sustainability
SRH Hochschule Heidelberg

LECTURE
Micropollutants
SRH Hochschule Heidelberg

LECTURE
Resource oriented sanitation
SRH Hochschule Heidelberg

LECTURE
Water reuse and resource recovery
SRH Hochschule Heidelberg

Rainer Walz

LECTURE
Umwelt- und Ressourcenpolitik
Karlsruher Institut für Technologie

LECTURE
Umweltökonomik und Nachhaltigkeit
Karlsruher Institut für Technologie

LECTURE
*Socioeconomic aspects of develop-
ment planning*
Karlsruher Institut für Technologie

Marion Weissenberger-Eibl

SEMINAR
*Fallstudienseminar Innovations-
management*
Karlsruher Institut für Technologie

LECTURE
*Innovationsmanagement: Konzepte,
Strategien und Methoden*
Karlsruher Institut für Technologie

Martin Wietschel

LECTURE
Energiepolitik
Karlsruher Institut für Technologie

LECTURE
*PhD Program KIC: Energy models –
supply and demand side*
Grenoble Ecole de Management,
France

SEMINAR
Themenfelder Energie und Umwelt
Karlsruher Institut für Technologie

Andrea Zielinski

SEMINAR
Text Mining
Ruprecht-Karls-Universität
Heidelberg

HABILITATIONS | DISSERTATIONS | PRESENTATIONS

HABILITATION

Patrick Plötz

Electrification of Road Transport – Empirical Findings on Model-based Assessment of CO₂ Emissions, Market Potential, and Policies
Prof. M. Wietschel, Fraunhofer ISI
Prof. W. Fichtner, KIT
Karlsruher Institut für Technologie

DISSERTATIONS

Pia Niessen

Identifikation von Resilienzindikatoren in produzierenden klein- und mittelständischen Unternehmen
Prof. Dr.-Ing. Ralph Bruder
Technische Universität Darmstadt

Sabine Preuß

Interventions for Attitude Change: Measuring and Improving Negative Attitudes Toward Gay Men
Prof. Dr. Melanie C. Steffens
Universität Koblenz-Landau

Matthias Rehfeldt

Fuel switching as contribution to the decarbonisation of the industry sector – Integration in a bottom-up energy system model
Ernst Worrell, Universität Utrecht
Wolfgang Eichhammer, Fraunhofer ISI
Universität Utrecht, Niederlande

Fanny Seus

Zusammenarbeit von Entwicklungsstandorten in multinationalen Unternehmen
Univ.-Prof. Dr. Marion A. Weissenberger-Eibl
Karlsruher Institut für Technologie

Luisa Sievers

Regionale Verteilungswirkung der Energiewende – Eine modellbasierte Analyse möglicher Effekte auf Wertschöpfung und Beschäftigung
Prof. Axel Schaffer
Universität der Bundeswehr München

PRESENTATIONS

SELECTION

Ali Aydemir

Industrial excess heat and district heating: potentials and costs for the EU-28 on the basis of network analysis
► Online: eceee Summer Study 2020 – Industrial Efficiency

Susanne Bieker

Smart Cities
► Webinar: The Material Opportunity in Smart Cities, Shanghai, China

Susanne Bieker

Innovative waste heat utilization by heat distribution via sewer networks
► Online: Deutsch-Russisches Seminar: Umweltfreundlicher Städtebau unter den Bedingungen des Klimawandels, Moscow, Russia

Susanne Bieker

Bestände schützen: Erfordernisse der Klimaanpassung in der Stadt, im Quartier und am Gebäude
► BBA-Tagung: Instandhaltungsmanagement Berliner BBA-Akademie

Harald Bradke

Energiewende 2030 – Wie die Wissenschaftler den Klimawandel sehen
► VDI-Podcast Technik aufs Ohr unter <https://s.fhg.de/energiewende>

Harald Bradke

Energiewende 2.0 durch Sektorkopplung
► VDI-Policy Forum unter <https://s.fhg.de/VDI-Policy-Forum>

Harald Bradke

Klimaschutz – kann man das nicht besser machen?
► Online: VDI im Dialog

Tanja Bratan

Sustainable Resource Use in the German Health Sector
► Online: European Resources Forum

Uta Burghard

Infrastruktur für alternative Antriebe – Nutzerakzeptanz und Ladeverhalten in der Praxis
► Webinar im Rahmen der Profilregion Mobilitätssysteme Karlsruhe

Malte Busch

The role of boundary spanners in the innovation approach of SMEs in the context of a crisis: A stakeholder perspective
► Online: G-Forum 2020, 24. Virtuelle Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand, Karlsruher Institut für Technologie

Kerstin Cuhls

Delphi-Studie. Die Zukunft der afrikanisch-europäischen Beziehungen
► Online: Mittagsgespräch: Präsentation im Bundesministerium für internationale Zusammenarbeit und Entwicklung (BMZ), Berlin

Elisabeth Dütschke

Bürgerinnen und Bürger in der Energiewende: Akzeptanz und Beteiligung
► Online: Dialog Infrastruktur: Energiewende: Akzeptanz und Beteiligung, Austria

Jakob Edler

From enabling to delivering: Understanding the implications of mission oriented innovation policy
► International Series on “Historically aware research and innovation policy” The Making Universities Matter (MUM) platform and VINNOVA, Stockholm, Sweden

Jakob Edler

Technology Sovereignty. From Demand to Concept
► Online: Library Talk, DG Research and Innovation of the European Commission, Krakow, Poland

Jakob Edler

Resilience to systems shocks: the role of technology sovereignty
► Online: OECD STI Policy Seminar Series, Paris, France

Wolfgang Eichhammer

Status and development of energy storage for ancillary services in Germany
► Online: The 9th Energy Storage International Conference and Expo ESIE2020, Beijing, China

Wolfgang Eichhammer

Energy Efficiency Policies and Measures in the EU: The ODYSSEE-MURE Project
► Online: IAEA (International Atomic Energy Agency) – Regional Training Course on Assessing Demand-side Contributions to Energy and Climate Strategies, Vienna, Austria

Wolfgang Eichhammer

Carbon Contracts for Difference – auch für Energieeffizienz in der Industrie?
► Online: Vortrag bei der Arbeitsgruppe Energie der Deutschen Unternehmensinitiative Energieeffizienz DENEFF, Berlin

Tobias Fleiter

Deep decarbonisation of the German industry via electricity or gas? A scenario-based comparison of pathways
► Online: eceee Summer Study 2020 – Industrial Efficiency

Rainer Frietsch

Impact perspective and demand for new indicators – the example of “Data 4 Impact”
► Joint BMBF and EURITO Workshop on “New Innovation Indicators – From Research to Policy Application” Berlin

Andrea Herbst

Options for achieving a close-to climate-neutral EU industry and their implications
► Webinar: EU Sustainable Energy Week 2020

Nils Heyen

Patient Science as a new Citizen Science approach? When fragile groups such as chronically ill people become citizen scientists

► Online: ECSA (European Citizen Science Association) 2020 Conference, Trieste, Italy

Nils Heyen

Patient Science: a new approach of Citizen Science for health and well-being

► Online: Citizen Science SDG Conference, Berlin

Nils Heyen

Soziale Implikationen der digitalen Selbstvermessung

► Online: Tagung Digitalisierung und Gesundheit – Ethische Aspekte der mHealth Technologie, Bayreuth

Thomas Hillenbrand

Spurenstoffstrategie des Bundes – Sachstand

► Webinar: 14. Krankenhaus-Umwelttag NRW

Thomas Hillenbrand

Integrierte Wassermanagementsysteme im Kontext von Klimafolgenanpassung

► Webinar: Klimafolgenanpassung, Qualifizierungslehrgang Kommunales Nachhaltigkeitsmanagement NRW

Thomas Hillenbrand

Erarbeitung des Wasserwirtschaftlichen Fachplans des Landes Hessen

► Hessisches Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz, Gießen

Claudia Hohmann

Infrastructure transition of urban water management – A structured approach to translate between strategic planning and practical implementation

► Online Conference: EURAM 2020 Dublin, Ireland

Claudia Hohmann

Lost in translation within the Transition of urban infrastructure – A structured approach to translate between strategic planning and practical implementation

► Online: 11th International Sustainability Transition Conference (IST), Vienna, Austria

Bärbel Hüsing

Kommunikation und Partizipation für die gesellschaftliche Transformation zur Bioökonomie

► Online: Veranstaltungsreihe Kommunikation und Partizipation in der Bioökonomie

Murat Karaboga

Datenschutzrechtliche Gestaltungsmöglichkeiten jenseits der Fokussierung auf die Ermächtigung des Individuums

► Online: Forum Privatheit, Jahreskonferenz 2020

Simone Kimpeler

Impulsvortrag für Entwicklung des Grundsatzprogramms

► Neue Zeiten – Neue Antworten – Regionalkonferenz zum Grundsatzprogramm Bündnis 90/Die Grünen Baden-Württemberg, Rheinland-Pfalz, Mannheim

Simone Kimpeler

Strategische Vorausschau für einen strukturierten Umgang mit Zukunftsunsicherheit

► 22. Kongress für Familienunternehmen, Witten

Simone Kimpeler

Digitalisierung der Arbeitswelt – Chancen und Herausforderungen für (Frauen-) Arbeitsplätze

► Internationaler Frauentag, Stuttgart

Marian Klobasa

Künstliche Intelligenz (KI) in der integrierten Energiewende

► EnerKI – Expertenworkshop

Marian Klobasa

German Energy Storage Experiences: Best Practices in Policy, Business Models and Standards

► Online: Workshop German energy storage experiences and implications for China

Jonathan Köhler

Simulation Modelling for Urban Transitions to Sustainable Mobility

► Online: Workshop Leibniz-Institut für ökologische Raumentwicklung

Jonathan Köhler

Karlsruhe ohne Autos: Warum und wie?

► Online: Terrestrische Universität S4F (Scientist for Future) mit KIT ITAS

Konstantin Krauß

What drives the usage of shared transport services? An impact analysis of supply and utilization of mobility services in German cities

► Online: Conference STRC – 20th Swiss Transport Research, Switzerland

Konstantin Krauß

Sharing, Hailing, Selling – Grundlagen, Potenziale und Auswirkungen neuer Mobilitätsdienste

► Webinarreihe der Profilerregion Mobilitätssysteme Karlsruhe

Henning Kroll

Der Forschungsraum Asien-Pazifik. Chancen und Herausforderungen in der Kooperation mit China, Japan und Südkorea

► Online: ChinaForum Tübingen

Henning Kroll

Key Findings of the 2020 RIS3 Survey

► Online: Expertenvortrag bei der Europäischen Kommission

Henning Kroll

Advanced Technologies for Industry, EU's strengths, risks and opportunities in advanced technologies in times of covid

► Online: ATI Project Seminar Series

Sabine Langkau

Environmental and economic impacts of the technologies developed in the Biomimc project

► Online: Biomimc – Final seminar: Public presentation of the outcomes of the ERA-MIN project

Sabine Langkau

Scenario Development in LCA: A Practical Guideline

► Online: Mintea Autumn School on prospective LCA 2020

Sabine Langkau

Which methods are suitable to measure the impact of business innovation on the SDGs?

► Online: Workshop Bertelsmann-Stiftung und econsense

Christian Lerch

Volkswirtschaftliche Relevanz von B2B Plattformen und ihre verschiedenen Ausprägungen

► Online: SAP-Veranstaltung

Frank Marscheider-Weidemann

Innovative Materialien für eine nachhaltigere Wasserversorgung

► Abschlusskonferenz der BMBF-Fördermaßnahme MachWas, Frankfurt

Nicholas Martin

Digital Tools and Data Protection in Taiwan's Response to Covid-19

► Online: ISMS Forum, Spain

Cornelius Moll

Innovative City-Logistik – Konzepte, Potenziale, Wirtschaftlichkeit

► Industriearbeitskreis "Nachhaltige Mobilität in der Stadt" der Profilerregion Mobilitätssysteme Karlsruhe

Christoph Neef

Neue BatterieZelltechnologien – Potenziale vom Material bis zur Prozesstechnik

► Online: Workshop Technologieauschuss IHK Baden-Württemberg

Peter Neuhäusler

Generating a classification for trademark filings – A String Matching approach

► Online: The 10th Annual Global TechMining Conference (GTM2020)

Peter Neuhäusler

The RISIS trademark database

► RISIS WEEK 2020, Karlsruhe

Marius Neuwirth

Potenziale von Wasserstofftechnologien zur Dekarbonisierung der Chemieindustrie in Deutschland

► 16. Symposium Energieinnovation Konferenz, Austria

PRESENTATIONS | PROJECTS

Marius Neuwirth

Hydrogen Technologies for a CO₂-neutral Chemical Industry – A plant-specific bottom-up assessment of pathways to decarbonise the German chemical industry

- ▶ Online: eceee Summer Study 2020 – Industrial Efficiency

Jutta Niederste-Hollenberg

Klimaschutzpotenziale der Abwasserwirtschaft – Benchmark, Innovationen, Chancen, Hemmnisse

- ▶ Fachgespräch im Rahmen des Nationalen Wasserdialogs des BMU, Bonn

Jutta Niederste-Hollenberg

Urbane Wasserinfrastrukturen im Kontext aktueller Herausforderungen – Motivation und Ansätze für Transitionen

- ▶ fbr-Fachsymposium, Mannheim

Jutta Niederste-Hollenberg

Gute Gründe für eine Nationale Wasserstrategie

- ▶ Online: Jahresmeeting Verband für Nachhaltigkeits- und Umweltmanagement

Katrin Ostertag

Ressourcenschonung im Gesundheitssektor – Handlungsoptionen in ausgewählten Hot Spots

- ▶ Workshop: Ressourcenschonung im Gesundheitssektor, Fraunhofer-Forum, Berlin

Katrin Ostertag

Which methods are suitable to measure the impact of business innovation on the SDGs?

- ▶ Online: Workshop Bertelsmann-Stiftung und econsense

Patrick Plötz

Real-world usage of plug-in hybrid electric vehicles

- ▶ T&E Webinar: Closing the real world fuel consumption gap with Fuel Consumption Meters, Belgium

Patrick Plötz

Fördernde und hemmende Faktoren für eine erfolgreiche Markteinführung von Elektrofahrzeugen

- ▶ Trinationale Konferenz Elektromobilität, Basel, Switzerland

Patrick Plötz

Daily car mobility is mostly irregular

- ▶ Physical resource theory seminar, Sweden

Pia Manz

Future regional distribution of final energy demand and the impact of sector coupling options – A model-based scenario analysis

- ▶ Online: CINES Summer School on Energy Systems, Italy

Pia Manz

Future synergies of industrial excess heat potentials and buildings energy demand in Germany

- ▶ Online: 6th Smart Energy Systems Conference, Denmark

Ralf Lindner

Governing the diversity of mission-oriented Innovation Policies: A new typology

- ▶ Online: 11th International Sustainability Transition conference (IST) 2020, Vienna, Austria

Thomas Reiß

Das Gesundheitswesen aus Innovationssystemperspektive

- ▶ Hybridworkshop: Soziale Gesundheitswirtschaft, DGB, Berlin, virtual

Thomas Reiß

The International Graphene Landscape

- ▶ Online: Graphene for Research, Innovation, Collaboration (GARIC), Graphene Flagship

Thomas Reiß

Graphene Industrialisation

- ▶ Science Technology Forum, Graphene Flagship, Paris, France

Karoline Rogge

Transformative policy mixes for accelerating sustainability transitions in the energy sector

- ▶ Online: Keynote 11th International Sustainability Transition Conference (IST) 2020, Vienna, Austria

Karoline Rogge

Policy mixes for sustainability transitions

- ▶ Webinar: NEST series of sustainability transitions community

Karoline Rogge

Missionsorientierte Innovationspolitik: In welchen Themen ist Missionsorientierung relevant? Nachhaltigkeit und Energie

- ▶ Online: Evangelische Akademie Loccum

Andreas Röß

Verantwortliches Handeln in der angewandten Forschung – Erkenntnisse aus dem EU Projekt JERRI

- ▶ Online-Talk Campus Birlinghoven

Aline Scherrer

Infrastruktur für alternative Antriebe – Nutzerakzeptanz und Ladeverhalten in der Praxis

- ▶ Webinar: Profilerregion Mobilitätssysteme Karlsruhe

Aline Scherrer

Competition between alternative drives? Introducing socio-political factors to the study of multi-technology interaction

- ▶ Online: 11th International Sustainability Transition Conference (IST) 2020, Vienna, Austria

Joachim Schleich

Discriminatory subsidies for energy-efficient technologies and the role of social preferences

- ▶ Online: Climate Annual Conference, School of Regulation, Florence, Italy

Thomas Schmaltz

Graphene Technology and innovation Roadmap – Focus on Electronics

- ▶ Online: Workshop Electronics Online, co-organized by Graphene Flagship, Research Institutes of Sweden (RISE), SIO Grafen, Sweden

Torben Schubert

Sketching the CDM-Model in BIG-PROD

- ▶ Online: Meeting of the policy advisory board of BIGPROD

Torben Schubert

Technologiesouveränität – Von der Forderung zum Konzept

- ▶ Livechat: Friedrich-Ebert-Stiftung

Torben Schubert

Organizational Contexts of Human Capital – When Hiring MNC Employees Enables or Constrains Exporting in Domestic Firms

- ▶ Online: Research Seminar, Center for International Business Studies, Gothenburg University

Sarah Seus

Evaluation of the Framework Programmes for “Research for Sustainable Development” (FONA)

- ▶ Online: European Environmental Evaluators Network Forum (EEEN) 2020, Finland

Thomas Stahlecker

Business-Science linkages as an integral element of national and regional innovation systems

- ▶ 2nd Meeting National Focal Points of the Subregional Innovation Policy Outlook (IPO), Geneva, Switzerland

Thomas Stahlecker

Präventive Regionale Strukturpolitik am Beispiel der Energiewende – Innovation und Regulation als Treiber?

- ▶ Tagung der Evangelischen Akademie Loccum

Thomas Stahlecker

Innovation Potentials in the Logistics Sector and the Role of Policy: The case of Germany

- ▶ VIII Kazakh-German Logistics Forum, Almaty, Kazakhstan

Axel Thielmann

The Emerging Battery Markets beyond xEV – Development of Special EVs and Mobile Applications

- ▶ Advanced Automotive Batteries Conference (AABC), Wiesbaden

Axel Thielmann

New technology development in Germany and the EU – from technology-driven approaches towards mission-orientation

- ▶ Hybrid Conference: 2020 Korean – German Conference on Technology and Standards, Korea/Germany

Axel Thielmann

Education needs for the European Battery Value Chain

- ▶ Online: ETIP Onlineworkshop, Belgium

Daniel Thorpe

Inspiring societal change through Cross Innovation as a dynamic and practically orientated concept

► Online: 2nd European Cross Innovation Conference, Hamburg

Daniel Thorpe

The role of boundary spanners in the innovation approach of SMEs in the context of a crisis: A stakeholder perspective

► Online: G-Forum 2020, 24. Virtuelle Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand, Karlsruher Institut für Technologie

Daniel Thorpe

Soziale Innovation mit Zukunftsfähigkeit – für die Bewältigung der Krise und darüber hinaus

► Online: DBU Workshop Technische, soziale, regulatorische und Prozessinnovationen, Osnabrück

Ariane Voglhuber-Slavinsky

Methodological challenges for combining qualitative future scenarios and LCA in the food and agricultural sector

► Online: 12th International Conference on Life Cycle Assessment of Food. Towards sustainable AGRI – Food Systems, Berlin

Ariane Voglhuber-Slavinsky

Sustainability in the future farming sector: Environmental scenarios

► Online: 34th EFFoST International Conference 2020, Haifa, Israel

Fabian Voswinkel

Energy Efficiency at the Core of the Clean Energy Transition: Achievements and Opportunities in the EU

► Online: Vietnam Energy Summit 2020, Hanoi, Vietnam

Jakob Wachsmuth

Draft Methodology for Calculation of GHG emission avoidance by Energy Storage Projects

► Online: EASE Innovation Fund Technical Workshop on Greenhouse Gas Emissions Savings Methodology, Brussels, Belgium

Rainer Walz

Zentrale Handlungsempfehlungen aus der Evaluierung zur Weiterentwicklung von FONA

► BMBF-Abschlussworkshop FONA-Evaluierung, Berlin

Rainer Walz

Eckpunkte einer ökologischen Innovationspolitik für die Kreislaufwirtschaft

► Zirkuläre Wertschöpfung: Herausforderungen für die Industrie-, Technologie- und Innovationspolitik, Fachgespräch der FES

Rainer Walz

Increasing the impact of research for sustainability – lessons from the evaluation of the German FONA program

► Impact of Science 2020: Annual AESIS Conference, Krakow, Poland

Marion A. Weissenberger-Eibl

Auffahrt Richtung Zukunft: Wie gestalten wir die Zukunft der Mobilität?

► Online: Votih Tech Talk, Heidenheim

Marion A. Weissenberger-Eibl

Mit Wissen Zukunft gestalten

► Online: Change Digital – Handelsblatt Fachmedien

Marion A. Weissenberger-Eibl

Junge Menschen im Gespräch mit Wissenschaft, Politik und Gesellschaft

► Online: Forum WPN 2030 und Der Tagesspiegel, Berlin

Florian Wittmann

Governing diversity of mission-oriented innovation policies: A new typology

► Online: Eu-SPRI 2020

Sven Wydra

In welchen Themen ist Missionorientierung relevant? Bioökonomie und Landwirtschaft

► Online: Veranstaltung der Evangelischen Akademie Loccum

Daniela Zingler

Which methods are suitable to measure the impact of business innovation on the SDGs?

► Online: Workshop Bertelsmann-Stiftung und econsense

PROJECTS**CROSS-DEPARTMENTAL PROJECTS**

• SYSTRA: Konzept- und Methodenentwicklung zur Analyse von sozio-technischen Systemtransformationen
Jakob Edler, Katharina Schiller

• ISDEC: Innovation System Data Excellence Center
Jakob Edler, Rainer Frietsch, Marian Klobasa

INSTITUTE DIRECTORS

• RISIS 2: European Research Infrastructure for Science, technology and Innovation policy Studies 2
Jakob Edler

• Hightech-Forum 2025 – das zentrale Beratungsgremium der Bundesregierung für Forschung und Innovation
Jakob Edler

• World Economic Forum: Principles for earning trust in technology governance, Supporting a World Economic Forum Initiative
Jakob Edler

• Bertelsmann Stiftung: Innovationspolitische Studien zur Unterstützung der Vorbereitung des Reinhard Mohn Preises (RMP) 2020
Jakob Edler

• KResCo: Krisenmanagement und Resilienz – Corona
Daniela Beyer

ENERGY POLICY AND ENERGY MARKETS

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• AURES II: Auctions for Renewable Energy Support II
Vasilios Anatolitis

• EUKI_CACTUS: Consolidating Ambitious Climate Targets with End-Use Sufficiency
Mahsa Bagheri

• MUSTEC: Market uptake of Solar Thermal Electricity through Cooperation
Inga Boie

• RES-Platform: Development of a networking platform and support to local and regional authorities for renewable deployment
Inga Boie

• DG ENER PREBS II: Technical Assistance in Realisation of the European Commission 5th Progress Report on Renewable Energy
Barbara Breitschopf

• RES-Observer: Technical Assistance in Monitoring and Analysis of Renewable Energy Data for the Period 2016–2020
Barbara Breitschopf

• RE H&C Pathways: Renewable Heating and Cooling Pathways, Measures and Milestones for the Implementation of the Recast Renewable Energy Directive and Full Decarbonisation by 2050
Barbara Breitschopf

• Akzept: Wirkungen von Eigenversorgung und Mitgliedschaft in Bürgerenergiegesellschaften auf soziale Ungleichheit und deren Beitrag zur gesellschaftlichen Akzeptanz der Energiewende; Teilvorhaben Partizipation und Akzeptanz der Energiewende
Barbara Breitschopf

PROJECTS

- EnTEC: Support for the Creation of a Multi-Disciplinary Innovations Analysis for the Energy Transition – setting up a multi-disciplinary centre of expertise for the energy transition
Barbara Breitschopf

- IceCompetition: Report on electricity costs of energy-intensive industries in Iceland – a comparison with energy-intensive industries in selected countries
Barbara Breitschopf

- EEF-Assistance: Assistance with the Analysis to Support the Implementation of the Efficiency First Principle in Decision-Making
Heike Brugger

- Politikszenerarien IX: THG-Projektion: Weiterentwicklung der Methoden und Umsetzung der EU-Effort Sharing Decision im Projektionsbericht 2019
Heike Brugger

- NEWTRENDS: New trends in energy demand modeling
Heike Brugger

- MANIFOLD: Modellentwicklung und Modellkopplung zu Akteursverhalten in Innovations- und Diffusionsnetzwerken
Heike Brugger

- RokiG2050: Roadmap für einen klimaneutralen Gebäudebestand
Heike Brugger

- Electric Space Heating: Potentials and Levels for the Electrification of Space Heating in Buildings
Gerda Deac

- ParisArt6: Entwicklung von Optionen und Ausgestaltungsmöglichkeiten zum neuen internationalen Marktmechanismus gemäß Art. 6 des Pariser Abkommens
Vicki Duscha

- ETS 8: Strukturelle Weiterentwicklung des EU-ETS nach 2020
Vicki Duscha

- EU-ETS extension: Possible extension of the EU Emissions Trading System (ETS) to cover emissions from the use of fossil fuels in particular in road transport and the buildings sector
Vicki Duscha

- NDC-Update: Implications of the decrease of RES-E and battery cost projections for the revision of the NDCs of selected countries
Johannes Eckstein

- UBA-Innovation-Fund: Zusammenspiel und Überlappungen des neuen EU-Innovationsfonds mit anderen EU-weiten und nationalen Förderprogrammen für Innovationen in der im EU-ETS verpflichteten Industrie
Johannes Eckstein

- GIZ_Balkan_NECs: Support for the planning and preparation of the integrated National Energy and Climate Plan (NECP) / Capacity Development für Klimapolitik in den Ländern Südost-, Osteuropas, des Südkaukasus und Zentralasiens, Phase III
Johannes Eckstein

- ENEFIRST: Making Energy Efficiency First principle operational
Wolfgang Eichhammer

- GIZ_Turkey_EU_IPAII: Technical Assistance for Renewable Energy and Energy Efficiency Support for the Municipalities and Universities
Wolfgang Eichhammer

- ODYSSEE-MURE: Monitoring EU energy efficiency first principle and policy implementation
Wolfgang Eichhammer

- OPTRES100: Energiesystemoptimierung zur Unterstützung hoher Anteile Erneuerbarer Energien
Wolfgang Eichhammer

- ETS China II: Platform for Policy Dialogue and Cooperation between the EU and China on Emission Trading
Wolfgang Eichhammer

- AR6 review: IPCC 6th assessment report review
Wolfgang Eichhammer

- DG COMP Electricity Benchmarks: Technical support to the Commission in developing electricity consumption efficiency benchmarks in the context of the Guidelines on State aid for indirect emission costs during the 4th phase of the Emissions Trading System
Wolfgang Eichhammer

- RES Youth Energy Turkey: Technical Assistance for Renewable Youth Energy Operation
Wolfgang Eichhammer

- Perceptions_H&C: Overview of Heating and Cooling: Perceptions, Markets and Regulatory Frameworks for Decarbonisation
Wolfgang Eichhammer

- GIZ Energiespeicher: Komponente 2 China – Marktmechanismen, Geschäftsmodelle und Standards von Energiespeichern in Deutschland
Wolfgang Eichhammer

- GIZ H2Global Budget: Validation of H2Global budget requirements for BMWi
Wolfgang Eichhammer

- Worldbank PtX Central Asia: High-Level Assessment of Technical Feasibility and Economic Viability of Hydrogen Production, Use and Exports
Wolfgang Eichhammer

- Worldbank PtX Georgia: High-Level Assessment of Technical Feasibility and Economic Viability of Hydrogen Production, Use and Exports
Wolfgang Eichhammer

- GIZ_China_2060: Strategische Umweltdialoge China/Deutschland
Wolfgang Eichhammer

- EEA Prosumer: Energy Prosumption in Europe
Jan George

- EC_DH Regulation new RED: Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive
Anne Held

- BMWI_OffshoreEU: Wissenschaftliche Unterstützung bei der regionalen Zusammenarbeit beim Ausbau der Erneuerbaren Energien von Offshore-Windenergie in der Nordsee und der Europäischen Union, insbesondere der Ostsee
Anne Held

- IKI-MENA-LINK-PREP: Linking Ambitious Renewable Energy Development and Efficient Sector Coupling in the Mena Region – Preparation Phase
Anne Held

- Finanz-Sektorkopplung: Finanzierung der Energiewende: Auswirkungen auf die Sektorkopplung und Verteilungswirkungen
Anne Held

- BMWi Eval. Ausschreibungen: Evaluierung der Ausschreibungen nach dem Erneuerbare-Energien-Gesetz 2017, dem Windenergie-auf-See-Gesetz und zugehöriger Ausschreibungsverordnungen
Holger Höfling

- 50Hertz-MiFri_2020: EEG-Prognose 2021–2025
Holger Höfling

- UBA Stromlieferung: Möglichkeiten von Stromvertragskonstellationen bei CO₂-frei erzeugtem Strom (insbesondere aus Erneuerbaren Energien) im Hinblick auf enthaltene CO₂-Kosten
Holger Höfling

- IHK-EHS-Fragen: Bearbeitung von zwei Fragestellungen zum Thema Emissionshandel und CO₂-Produktlebenszyklusbetrachtung
Sascha Lehmann

- MGSCI: Leitung des City Labs Saltillo im Rahmen der Morgenstadt Global Smart Cities Initiative
Jose Ordonez

- BMWi Klimaschutz: Auswirkungen der Klimaschutzziele und diesbezüglicher Maßnahmen auf den Energiesektor und den Ausbau der erneuerbaren Energien

Benjamin Pfluger

- BMWi-Infrastrukturen: Szenariobasierte Analyse der Anforderungen an die Infrastrukturen im Rahmen der Energiewende und Auswirkungen auf deren Finanzierung und Planung

Benjamin Pfluger

- GIZ MongoliaPTX: Provide technical support to the elaboration of a technical study on Green Power-to-hydrogen potential in Mongolia

Martin Pudlik

- DG ENER – Assessment Tool Technical assistance to develop a tool for assessing energy efficiency policies and measures

Matthias Reuter

- DG_ENER_EY_Buildings: Better data for better buildings – Understanding the role of big data

Matthias Reuter

- Energy Efficiency Templates 4: Überprüfen und Aktualisieren des Energy Efficiency Templates der IEA für Deutschland

Matthias Reuter

- ETS-STRAT: Strategien von Unternehmen und Erfolgsfaktoren im EU-Emissionsrecht

Joachim Schleich

- NostaClimate: Die Relevanz nicht-staatlicher Akteure für individuelle Klimaschutzaktivitäten und Klimapolitik: Eine theoretische, experimentelle und empirische Analyse

Joachim Schleich

- BfEE Monitoring-Einsparungen: Harmonisiertes Monitoring von Energieeinsparungen deutscher Effizienzmaßnahmen sowie kontinuierliche Prüfung/Aktualisierung der prognostizierten Einsparziele der Maßnahmen für das Jahr 2030

Barbara Schlomann

- DENEFF_Green Recovery: Green Recovery

Barbara Schlomann

- BMU_Analysen-Energieeffizienz: Wissenschaftliche Analysen zu aktuellen klimapolitischen Fragen im Bereich der Energieeffizienz insbesondere in den Sektoren Industrie, GHD und Gebäude

Barbara Schlomann

- BMWi Energieeffizienzfonds: Evaluierung und Weiterentwicklung des Energieeffizienzfonds

Barbara Schlomann

- BMWi Folgeabschätzungen 2030: Energiewirtschaftliche Projektionen und Folgenabschätzungen 2030

Barbara Schlomann

- DG Ener Article 7 Assessment: Technical assistance on assessing progress in implementing Article 7 of the Energy Efficiency Directive (EED) and preparing the policy implementation in view of the new obligation period 2021–2030

Barbara Schlomann

- BMU_NKI-Evaluierung: Evaluation, Begleitung und Anpassung bestehender Förderprogramme sowie Weiterentwicklung der Nationalen Klimaschutzinitiative (NKI) 2019–2023

Barbara Schlomann

- UBA_Einsparverpflichtung: Mögliche Ausgestaltung eines Energieeinsparverpflichtungssystems für Deutschland

Barbara Schlomann

- BfEE_Roadmap Energieeffizienz: Roadmap Energieeffizienz 2050: Umsetzung und Begleitung eines dialogorientierten Beteiligungsformats zur Identifikation sektorübergreifender Pfade zur Halbierung des Primärenergieverbrauchs bis 2050 – Wissenschaftliche Begleitung

Barbara Schlomann

- UBA_Politikenszenarien X: THG-Projektionen: Politikenszenarien für den Klimaschutz X

Barbara Schlomann

- BMWi Innovationskraftwerke: Technische und wirtschaftliche Analyse zu innovativen EE-Kraftwerkskonzepten (Hybridkraftwerk)

Frank Sensfuß

- Leitstudie Strommarkt 2: Leitstudie Strom – Analysen für eine sichere, kosteneffiziente und umweltverträgliche Stromversorgung

Frank Sensfuß

- BMWi Langfristszenarien 3: Langfristszenarien für die Transformation des Energiesystems in Deutschland

Frank Sensfuß

- Paris Reinforce: Delivering on the Paris Agreement: A demand-driven, integrated assessment modeling approach

Jakob Wachsmuth

- EU-LTCS-Assess: Langfrist-Klimaschutzstrategie der EU: Implikationen für Sektoren und Handlungsfelder

Jakob Wachsmuth

- Effort-Sharing PA: Implikationen des Pariser Klimaschutzabkommens auf nationale Klimaschutzanstrengungen

Jakob Wachsmuth

- DG-CLIMA_Innovation-fund: Support to prepare the first call for proposals under the Innovation Fund – methodologies for calculation of relevant costs and effectiveness of GHG emissions avoidance

Jakob Wachsmuth

- DGEner_REfuels: Technical assistance to assess the potential of renewable liquid and gaseous transport fuels of non-biological origin (RFNBOs) as well as recycled carbon fuels (RCFs), to establish a methodology to determine the share of renewable energy from RFNBOs

Jakob Wachsmuth

- UBA-Trafo-Gas: Transformation der Gasinfrastruktur zum Klimaschutz

Jakob Wachsmuth

- UBA-NECPs: Implikationen der nationalen Energie- und Klimapläne (NECPs) auf Mittel- und Langfristzielsetzungen der EU

Jakob Wachsmuth

- DG-CLIMA_Innovation-Fund-II: Support for the management of the Innovation Fund calls for proposals

Jakob Wachsmuth

- EEG-Öffnung: Unterstützungsleistungen bei der Ausgestaltung zur Öffnung von Fördersystemen für Strom aus Erneuerbaren Energien für im Ausland erzeugten Strom

Jenny Winkler

- GIZ SET Roadmap: Advice on and support of bilateral energy partnerships with developing and emerging countries

Jenny Winkler

- RES Auction Online Platform: Assistance in facilitating regional cooperation on deploying and supporting renewable energy across EU Member States by increased transparency and coordination through an online platform and best practice exchange on support policies

Jenny Winkler

- EEA_RE_self-consumption: Renewable Energy Self-Consumption

Jenny Winkler

- NUDGE: Nudging consumers towards energy efficiency through behavioral science

Katharina Wohlfarth

- MICAT: Multiple Impacts Calculation Tool

Katharina Wohlfarth

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- BaWü-Abwärme: Erstellung einer Studie zur Abwärmenutzung in Unternehmen

Ali Aydemir

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- UBA_Dekarbonisierung Stahl-Zement: Dekarbonisierung der industriellen Produktion – Bewertung von Dekarbonisierungsmaßnahmen und Erarbeitung von Eckpunkten einer Roadmap für die Stahl- und Zementindustrie

Ali Aydemir

- ActlonHeat: From heating and cooling strategies to action

Ali Aydemir

- DG ENER Taxation Lot 1: The role of Energy Taxation and Prices for the Clean Energy Transition in the Context of Sector Integration and Carbon Border Mechanisms: Energy System Modelling and Future Scenarios

Anke Bekk

- G-PST: Global Power System Transformation (G-PST)

Anke Bekk

- CINES: Fraunhofer Cluster of Excellence Integrierte Energiesysteme

Harald Bradke

- PATH2LC: Public Authorities together with a holistic network approach on the way to low-carbon municipalities

Uta Burghard

- DG Grow-Ecodesign Batteries 2: Follow-up feasibility study on sustainable batteries

Antoine Durand

- EEFIG 3 Efficiency in Industry: Launch and facilitate the implementation of a new EEFIG Working Group on further improvements of energy efficiency in industry

Antoine Durand

- GIZ Algerian: German-Algerian Energy Partnership

Antoine Durand

- DG Ener – Ecodesign Kettles: Preparatory study for electric kettles

Antoine Durand

- DG ENER – Ecodesign Smartphone: Ecodesign preparatory study on mobile phones, smartphones and tablets

Antoine Durand

- DG GROW Ecodesign 2020: Framework Contract for studies and/or technical support in the area of Ecodesign

Antoine Durand

- DiffusionEE: Modellierung individueller Entscheidungsprozesse und des Einflusses von Intermediären bei der Diffusion von Energieeffizienzmaßnahmen und Erneuerbaren Energien im Gebäudebereich

Elisabeth Dütschke

- EE-Rebound: Rebound-Effekte und erneuerbare Energien – Auswirkungen einer umweltfreundlichen Energieerzeugung auf das Verbrauchsverhalten von Konsumenten und Prosumern

Elisabeth Dütschke

- KOSMA: Komponenten der Entstehung und Stabilität von Rebound-Effekten und Maßnahmen für deren Eindämmung

Elisabeth Dütschke

- License: Direct, Indirect, Psychological, and Macro-economic Rebound Effects – Psychological perspective on Rebound Effect and Policy Recommendations

Elisabeth Dütschke

- Strategy CCUS: Strategic planning of regions and territories in Europe for low-carbon energy and industry

Elisabeth Dütschke

- COreFAKTEN: Verbundvorhaben: Gesellschaftliche Akzeptanzfragen einer Reform der Energieabgaben, -steuern und -umlagen mit CO₂-Bepreisung; Teilvorhaben: Qualitative Exploration von gesellschaftlichen Akzeptanzfragen einer Reform der Energieabgaben, -steuern und -umlage

Elisabeth Dütschke

- Versorgungssicherheitsbericht: Definition und Monitoring der Versorgungssicherheit an den europäischen Strommärkten von 2017 bis 2019

Rainer Elstrand

- HotMaps: Heating and Cooling: Open Source Tool for Mapping and Planning of Energy Systems

Tobias Fleiter

- sEnergies: Energy Efficiency Quantification in Synergetic Renewable Energy Systems

Tobias Fleiter

- UBA CO₂ neutrale Prozesswärme: Umbau des industriellen Anlagenparks im Rahmen der Energiewende: Ermittlung des aktuellen sdT und des weiteren Handlungsbedarfs zum Einsatz strombasierter Prozesswärmeanlagen

Tobias Fleiter

- DG ENER – RES-H-EU: Renewable Space Heating under the Revised Renewable Energy Directive

Tobias Fleiter

- JRC Industry Data: Specific Energy Uses in EU Energy-intensive Industries: Characterisation and Improvement Potential

Tobias Fleiter

- DG ENER – METIS 3: Research on the EU Energy Sector Integration in the Context of the Clean Energy Transition

Tobias Fleiter

- OECD_Industry_Policies: Relative to the development of the project on sustainable transition of the Dutch industry

Tobias Fleiter

- BfEE CA H&C: Ausschreibung des Comprehensive Assessment Heating and Cooling

Markus Fritz

- Profilregion Mobilität II: Profilregion Mobilitätssysteme Karlsruhe – effizient – intelligent – integriert

Till Gnann

- MODEX-EnSAves: Modellexperimente – Entwicklungspfade für neue Stromanwendungen und deren Auswirkungen auf kritische Versorgungssituationen

Till Gnann

- BOLD: Begleitforschung Oberleitungs-Lkw-Forschung in Deutschland

Till Gnann

- Profilregion II_DissemAcademy

Till Gnann

- UBA ETS Produkte: Thema, Analyse und Darstellung der Produkte in den im EU-ETS erfassten Industriebranchen, ihrer wirtschaftlichen Bedeutung und ihrer Bedeutung für die CO₂-Emissionen

Andrea Herbst

- EEA Circular Economy Actions: Quantification Methodology for, and Analysis of, the Decarbonisation Benefits of Sectoral Circular Economy Actions

Andrea Herbst

- ARIADNE: Evidenzbasiertes Assessment für die Gestaltung der deutschen Energiewende – Teilvorhaben Fraunhofer-Systemanalyse mit Wärme, Industrie, Strom, Infrastruktur

Andrea Herbst

- Energy Data Scientist

Andrea Herbst

- DG ENER LREM2018 Baseline

Andrea Herbst

- INDUCE: Towards a sustainable agro-food INDUstry: Capacity building programmes in energy efficiency

Tim Hettesheimer

- Agora_Grüne Batterien: Grüne Batteriezellproduktion in Europa: Potenziale und Handlungsbedarf

Tim Hettesheimer

- ICCEE: Improving Cold Chain Energy Performance

Simon Hirzel

- DEESME: Developing national schemes for energy efficiency in SMEs

Simon Hirzel

- BeWiSe: Begleitforschungsprojekt Wasserstoff in der Stahlherzeugung, Teilvorhaben Untersuchung des Transformationsprozesses der Stahlindustrie im sozio-technischen Gesamtsystem

Simon Hirzel

- c/Sells: Techno-ökonomische Forschung zu Märkten, Netzen und Prosumern in einem zukünftigen Energiesystem

Marian Klobasa

- BMWi_Redispatch: Untersuchung zur Beschaffung von Redispatch

Marian Klobasa

- BMWi_Batteriespeicher: Batteriespeicher in Netzen

Marian Klobasa

- Lastmanagement-Monitoring_2018: Aufbereitung der Daten des Lastmanagement-Monitoring 2018

Marian Klobasa

- dena_Studie EnerKi II: Künstliche Intelligenz in der integrierten Energiewende II

Marian Klobasa

- TNO Collaboration: Common Collaboration Plan

Marian Klobasa

- VerSEAS: Versorgungssicherheit in einem transformierten Stromsystem mit extremen Anteilen Erneuerbarer Energien und starker Sektorkopplung

Matthias Kühnbach

- BMWi-PKW-Bewertung: Analyse der ökonomischen, technischen und ökologischen Effizienz ausgewählter Fahrzeugantriebe und Kraftstoffe

Cornelius Moll

- E2DRIVER: Training on energy audits as an Energy Efficiency DRIVER for the automotive sector

Lisa Neusel

- BMUB_Maßnahmen-Klimaschutzplan: Wissenschaftliche Unterstützung Klimapolitik und Maßnahmenprogramm 2018

Patrick Plötz

- UM_BW_IEKK: Wissenschaftliche Begleitung der Fortschreibung des Klimaschutzgesetzes Baden-Württemberg und des Integrierten Energie- und Klimaschutzkonzeptes Baden-Württemberg (IEKK)

Patrick Plötz

- ICCT-PHEV_UF: Elektrische Fahranteile von Plug-in-Hybrid-Elektrofahrzeugen

Patrick Plötz

- VDA_BEV-LKW: Kurzstudie Hochleistungsschnellladenetz für Elektro-Lkw

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- ENBW-Flottengrenzw_E-Fahrzeuge: Markthochlauf Elektrofahrzeuge bis 2030

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- PKW-EnVKV: Novellierung der Pkw-EnVKV – Fortsetzungsmaßnahme

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- Flottengrenzw_E-Fahrzeuge: Markthochlauf Elektrofahrzeuge bis 2030

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- LamA: Enabling single access of mobility chains in business context

Sabine Preuß

- BMUB-Aktionsprogramm-Klimaschutz: Umsetzung Aktionsprogramm Klimaschutz 2020 – Begleitung der Umsetzung der Maßnahmen des Aktionsprogramms

Clemens Rohde

- BMWi-Monitoring Netzwerk: Monitoring der Initiative Energieeffizienz-Netzwerke

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- M-Benefits: Valuing and Communicating Multiple Benefits of Energy-Efficiency Measures

Clemens Rohde

- BMWi_Anwendungsbilanzen: Erstellung der Energiebilanzen für die Jahre 2018 bis 2020

Clemens Rohde

- DG Ener – EEFIG 3 Taxonomy: Launch and facilitate the implementation of a new EEFIG working group on input on energy efficiency to the emerging EU sustainable finance taxonomy and tagging energy efficiency loans

Clemens Rohde

- DG ENER – EEFIG 3 – DEEP 2.0: Host, maintain and improve the De-risking Energy Efficiency Platform (DEEP)

Clemens Rohde

- DG ENER-EEFIG 3 M-Benefits: Launch and facilitate the implementation of a new EEFIG Working Group on multiple benefits of energy efficiency

Clemens Rohde

- Ergänzungsevaluierung Förderprogramme: Ergänzende Untersuchung zur Evaluation des Programms zur Förderung der Abwärmevermeidung und -nutzung in gewerblichen Unternehmen sowie des Programms zur Förderung hocheffizienter Querschnittstechnologien

Clemens Rohde

- GIZ Ukraine EE IND 3: Energieeffizienzberatung in Unternehmen (IKLU)

Clemens Rohde

- DG Ener-EEFIG 3 DEEP (Phase 2): Development of new features and expanding the De-risking Energy Efficiency Platform (DEEP)

Clemens Rohde

- GIZ Indien: Unterstützung Bilateralenergiepartnerschaften in Entwicklungs- und Schwellenländern

Clemens Rohde

- MobileCityGame: Interdisziplinäres Mobilitätsplan- und -simulationstool am Beispiel der Stadt Karlsruhe

Aline Scherrer

- HANNA-e: Förderfibel Fraunhofer Innovationsprogramm

Daniel Speth

- UBA_Wirtschaftlichkeit: Wirtschaftlichkeit neu denken: Investitionsentscheidungen im Dienste des Umweltschutzes

Fabian Voswinkel

- BfEE-Evaluation Industrief.: Ausschreibung einer gemeinsamen Evaluation des Förderpakets Bundesförderung für Energieeffizienz in der Wirtschaft – Förderwettbewerb und Bundesförderung für Energieeffizienz in der Wirtschaft – Zuschuss und Kredit

Fabian Voswinkel

- Helmholtz Energieszenarien

Martin Wietschel

- eWayBW 1: Feldversuch zur Erprobung elektrischer Antriebe bei schweren Nutzfahrzeugen auf Bundesfernstraßen in Baden-Württemberg

Martin Wietschel

- TrafoKommune: Transformationsprozess für die kommunale Energiewende – sektorengekoppelte Infrastrukturen und Strategien zur Einbindung von lokalen Akteuren / Teilvorhaben Mobilitätszenarien und Kopplung der Strom- und Gasverteilnetze

Martin Wietschel

- DVGW_Roadmap Gas 2050: Entwicklung einer Roadmap zur Umsetzung des DVGW-Energieimpulses bis zum Jahr 2050

Martin Wietschel

- Gas2030+NSW: Abschluss Dialogprozess Gas 2030 und Überführung der Ergebnisse in die Nationale Strategie Wasserstoff (NSW)

Martin Wietschel

- LamA-Input: LamA-Input-ISI

Martin Wietschel

- BMWi H2: Systemdienliche Integration von grünem Wasserstoff

Martin Wietschel

- MethQuest-MethSys: MethQuest_MethSys – Erzeugung und Einsatz von Methan aus erneuerbaren Quellen in mobilen und stationären Anwendungen; Teilvorhaben: Energiewirtschaftliche Systemanalyse zur Erzeugung und Einsatz von Methan aus erneuerbaren Quellen

Martin Wietschel

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Kerstin Cuhls
- SCAR 5th Foresight: 5th Foresight for the Standing Committee of Agricultural Research
Kerstin Cuhls
- FOD Post-Covid19 Scenarios: Foresight on Demand: After the new normal: Scenarios for Europe in the post Covid-19 world
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- Zukünfte des Sprachenlernens: Delphi-Umfrage und Zukunftsworkshop zum Thema Zukünfte des Sprachenlernens, Goethe Institut
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- BioKompass: Bio-Kompass – Kommunikation und Partizipation für die gesellschaftliche Transformation zu Bioökonomie
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- FOD Consumer Behaviour: Foresight on Demand: Impact of Covid-19 on European consumer behaviour
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- WiZuKunftZuhause: Innovative analoge und digitale Partizipationsformate und -technologien
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- TRIGGER: Trends In Global Governance and Europe's Role
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- Made in China 2025: Modellbasierte Szenarioanalyse der Auswirkungen von Made in China 2025 auf die Wertschöpfungs- und Marktanteile des deutschen Maschinen- und Anlagenbaus
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- Szenarien SDGs: In die Zukunft geblickt: Mögliche Szenarien für die Sustainable Development Goals
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- FOD EcosysPerform: Foresight on Demand: Science and Technology and Innovation Foresight Study 2050
Philine Warnke

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- OSIRIS Oslo Institute for Research on the Impact of Science
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- Ausgründungsstudie: Studie zur Bewertung des Gründungsgeschehens in Deutschland mit einem besonderen Fokus auf öffentlichen Forschungseinrichtungen
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- Impact: Der Impact der Fraunhofer-Gesellschaft
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- APRA: APRA-Performance Monitoring mit Schwerpunkt China
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- Innovationsprofile_China: Regionale Innovationsprofile in China: Innovationsbedingungen und Innovationstypen
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- EFI_Schlüsseltechnologien: Schwerpunktstudie Schlüsseltechnologien

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- EFI_PAT_2019: Ergebnisse von öffentlicher und privater Forschung: Patente (Kernstudie 2020)

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- Dashboard: Innovationsindikator – Dashboard 2019

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SUSTAINABILITY AND INFRASTRUCTURE SYSTEMS

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- InnoA2-Phase2: Innovative Abwärmennutzung durch Wärmeverteilung über die Kanalisation

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- Wear2Share: ReziProK – Verbundvorhaben: Wear2Share – Innovative Kreislaufgeschäftsmodelle in der Textilwirtschaft – Koordination und wissenschaftliche Untersuchungen

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- Fraunhofer KlimaAktiv

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- MKS NRVP 2030 – Phase2: Nationaler Radverkehrsplan 2030

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- Digi und Öko: Digitalisierung ökologisch nachhaltig nutzbar machen

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- Digi & Klima: Digitalisierung und Klimawandel: Hebeltechnologien, Anwendungen und Gesamteffekt der Digitalisierung auf die CO₂-Emissionen

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- PULK: Umwelt- und Klimaschutz in der Logistik: Potenziale umweltorientierter Logistikkonzepte zur Reduzierung der Emissionen des Güterverkehrs

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- Agora Autonom: Energieverbrauch der Fahrzeugautomatisierung (EEV_AVF)

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PROJECTS

- MKS Umrüstung LINT: MKS Umrüstung der Abellio LINT 41 Diesel-Triebwagen für das DISA-Netz zum Zweck der CO₂-Emissionsreduzierung
Michael Krail
- MKS_Bahnkorridore: MKS-Potenzialanalyse der Korridore des Kernnetzes Schienengüterverkehr
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- MKS_Digitalisierung Schiene: MKS Beiträge zur Digitalisierung und Automatisierung der Sicherheitstechnik als Teil der Eisenbahninfrastruktur
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- MKS_Knoten: MKS Verlagerungspotentiale und Verbesserung der Umweltbilanz durch Ausbau kritischer Bahnknoten
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- MKS3 Ad Hoc: Wissenschaftliche Beratung und Begleitung des BMVI zur Weiterentwicklung der Mobilitäts- und Kraftstoffstrategie – Ad-hoc-Beratung
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- MKS3 Energieeffizienz Schiene: Weiterentwicklung der Richtlinie über die Förderung
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- MKS3 Klimaschutzmaßnahmen
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- MKS3 Koordination: Wissenschaftliche Beratung und Begleitung des BMVI zur Weiterentwicklung der Mobilitäts- und Kraftstoffstrategie – Gesamtkoordination
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- MKS3 NPM Begleitung
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- MKS-Strategie IV: Unterstützung des BMVI bei der Weiterentwicklung der Mobilitäts- und Kraftstoffstrategie
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- MKS3 Wirkungsmonitoring: Wissenschaftliche Beratung und Begleitung des BMVI zur Weiterentwicklung der Mobilitäts- und Kraftstoffstrategie – Wirkungsmonitoring von Klimaschutz- und Energieeffizienzmaßnahmen
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- NECP Lux: Wissenschaftliche Beratung bei der Erstellung des Integrierten Nationalen Energie- und Klimaplan für Luxemburg
Michael Krail
- TRIMODE: Services contract for the development of a Europe-wide transport model, technology watch data and scenarios
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- EITRM-MIN-TEA: Materials Innovative Technologies Assessment
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- ERA-MIN2-Biomimic: ERA-MIN 2 – Ressourceneffiziente Kreislaufwirtschaft
Sabine Langkau
- IKU 2019 + 2021: Innovationspreis für Klima und Umwelt für die Jahre 2018 bis 2022
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- Umweltinfo_Digital: ReFoPlan – Umweltinformationen: Systematik, Potenziale und Verwertung im Kontext der Digitalisierung
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- CU-Modell X: Development of a global copper flow model – Phase X
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- INTEGRIS: Gebündelte Infrastrukturplanungen und -zulassungen und integrierter Umbau von regionalen Versorgungssystemen – Herausforderungen für Umwelt- und Nachhaltigkeitsprüfungen
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- UBA THG KKA: Ermittlung der Relevanz von Treibhausgas-Emissionen aus abflusslosen Gruben (Abwassersammelgruben) sowie aeroben und anaeroben Kleinkläranlagen und Erarbeitung eines detaillierten Messkonzepts
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- HyAlt4Chem: Säurebasierte Hydrolyse von unbehandelten Altholzrecyclaten zur Bereitstellung von Biochemikalien
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- P-Rück-NRW: Umsetzung der Anforderungen der Klärschlamm-Verordnung zu Phosphorrückgewinnung in Nordrhein-Westfalen
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- r+TeTra: r+Impuls Technologietransferprojekt – Teilvorhaben 1: Projektleitung, Wirkungsanalyse und Öffentlichkeitsarbeit
Christian Sartorius

- EE-Rebound: Rebound-Effekte und erneuerbare Energien – Auswirkungen einer umweltfreundlichen Energieerzeugung auf das Verbrauchsverhalten von Konsumenten und Prosumern

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- SEEK: Wissenschaftliche Begleitung von zwei Pilotprojekten zur Erhöhung der Sammelquoten von Elektro- und Elektronikaltgeräten in Baden-Württemberg

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- HBS Besch.effekte_nh_Mobilität: Analyse der Beschäftigungseffekte nachhaltiger Mobilität in Deutschland bis 2035

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- Nachhaltige Mobilität: Schwerpunktstudie Nachhaltige Mobilität

Luisa Sievers

- Cu-RecPaper: Using appropriate recycling rates

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- Cu-Trade: Deeper examination of foreign copper trade data

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- EITRM-CRITICALC: Criticality Life long Learning Course

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- EITRM-IRTC: IRTC International Round Table on Materials Criticality

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- EITRM-IRTC-Business: IRTC-Business. International Round Table on Criticality in Business Practice

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- ICA-Urban-Mining

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- InteResE: Interdisziplinäre Bewertung des Ressourcenbedarfs für die Energiewende: Rohstoffbedarf für Bereitstellung, Speicherung und Übertragung von Strom und Wärme

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- Arzneistoffeintragserhebung 2: Umwelteinträge von Arzneimittelwirkstoffen – Bilanzierung der Emission sowie Konsequenzen für Risikobewertung und -management, Teil II: Befragungen und Bilanzierung von Emissionen

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- ReAs: Reduzierung der Gewässerbelastungen mit Rückständen von Arzneistoffen in ausgewählten Pilotprojekten: Detaillierung und Vorbereitung konkreter Umsetzungen

Felix Tettenborn

- Arzneistoffeintragserhebung 1: Umwelteinträge von Arzneimittelwirkstoffen – Bilanzierung der Emissionen sowie Konsequenzen für Risikobewertung und -management: Konzepterstellung der Befragungen

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Heike Aichinger

- The Economic and Social Impact of Software & Services on Competitiveness and Innovation

Bernd Beckert

- GeLang: Begleitforschung zur Förderinitiative "Gesund – ein Leben lang"

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- DESIREE: DECision Support In Routine and Emergency HEalth Care: Ethical and Social Implications

Tanja Bratan

- Sano: Centre for New Methods in Computational Diagnostics and Personalised Therapy

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- H2-D: Eine Wasserstoffwirtschaft für Deutschland

Henning Döscher

- H2-BW: Wasserstoff-Roadmap Baden-Württemberg

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- Privacy Forum II: Forum Privatheit und selbstbestimmtes Leben in der digitalen Welt

Michael Friedewald

- DSFA: Datenschutz-Folgenabschätzungen für die betriebliche und behördliche Praxis

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- SPARTA: Strategic programs for advanced research and technology in Europe

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- TRADINNOVATION: Innovationen in der Bioökonomie in traditionellen Sektoren am Beispiel von drei Innovationslinien zu Fleischanaloga

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- Bioökonomie-Ressource CO₂: Technologie- und Marktstudie: Übersicht über Technologien zur bioinspirierten CO₂-Fixierung und -nutzung sowie der Akteure in Baden-Württemberg

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- Deepfake-Regulierung: Tackling Deepfakes in the new AI Legislative Framework

Murat Karaboga

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- Digi&Green Economy: Wechselwirkungen zwischen dem Prozess der Digitalisierung und dem Übergang zu einer Green Economy

Nicholas Martin

- Strategische Positionierung eines Unternehmens

Christoph Neef

- FoFeBatt: Forschungsfertigung Batteriezelle Deutschland – Teilprojekt 1: Entwicklung und Inbetriebnahme der Produktionslinie

Christoph Neef

- Durchführung eines Workshops Marktentwicklung und Potenzialanalyse Anlagen für die Batteriezellfertigung

Christoph Neef

- BatSpiN: Batteriespeicher in Netzen

Christoph Neef

PROJECTS | VISITING RESEARCHERS

- FRAME: Fraunhofer microelectronics innovation enhancement – Innovationsunterstützende Begleitung der Forschungsfabrik Mikroelektronik Deutschland (FMD) – Gründungsprojekt des Fraunhofer-Verbunds Innovationsforschung
Thomas Reiß

- Mittelstand 4.0 – Kompetenzzentrum Stuttgart
Thomas Reiß und Bernd Beckert

- Graphene Core 2: Graphene Flagship Core
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- Graphene Core 3: Graphene Flagship Core
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- KoV: Kompetenzanalyse Fraunhofer-Verbünde
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Ulrich Schmoch

- KFW-Zukunftstechnologien: Identifizierung und Bewertung von Zukunftstechnologien für Deutschland
Ulrich Schmoch

- BEMA Phase II: Begleitmaßnahme Batterie 2020
Axel Thielmann

- Digital Transformation KET: Monitoring digital transformation and key enabling technologies
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- Strategische Beratung der Batterieindustrie und Systemintegratoren
Axel Thielmann

- VDMA-RM: Roadmap Batterieproduktionsmittel (Update 2020)
Axel Thielmann

- EITRM-Lifelong Learning School: EIT Raw Materials – Skills needs from Industry in the Battery Sector
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- New HoRRizon: Excellence in science and innovation for Europe by adopting the concept of Responsible Research and Innovation
Florian Wittmann

- BIO-BASED Innovation_LOT2: Study on support to R&I policy in the area of bio-based products and services life and biological sciences and technologies as engines for bio-based innovation
Sven Wydra

- BW-Biointelligenz: Roadmapping Biointelligenz für Baden-Württemberg
Sven Wydra

POLICY AND SOCIETY

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Knut Blind

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Knut Blind

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Knut Blind

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Knut Blind

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Knut Blind

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- SUPER_MoRRI: Scientific Understanding and Provision of an Enhanced and Robust Monitoring system for RRI
Susanne Bühner

- SONNET: Social innovation in energy transitions: Co-creating a rich understanding of the diversity, processes, contributions, success and future potentials of social innovation in the energy sector
Karoline Rogge

- StratFo_BW_2017: Strategische Ausrichtung der wissenschaftlichen und industriellen Forschung in Baden-Württemberg
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- WP3 Scoping
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- WP4 Pilots
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- WP7 Dissemination
Thomas Stahlecker

- BBSR_Innovationstransfer: Zukunft Bau – Der Weg von Innovationen in die Praxis – systematische Analyse des Innovationstransfers
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- Bayern_FTI-Strategie 2019: Unterstützung bei der Überarbeitung der Bayerischen Forschungs-, Technologie- und Innovationsstrategie – Strategieprozess 2019
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- Fh_H2-D: Hydrogen Economy Reloaded: Advanced Components for Long-lasting
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IMPRINT

Publisher

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Systems and Innovation
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Germany

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