



**Oslo Centre for Research on Environmentally friendly Energy**

# Annual Report 2018



## **Executive Summary**

CREE - Oslo Centre for Research on Environmentally friendly Energy - was established in 2011 as a Social Sciences based energy research centre funded by the Research Council of Norway (FME Samfunn) with an annual grant of NOK 8 million over an eight-years period (2011-19).

### *Research and impact*

To a large extent, energy and climate policy is focused on how to develop and utilize new technology and more environmentally friendly energy sources. In CREE, the impact of energy and climate policy, as well as the transition towards the low-emission society, is analysed through theoretical and empirical analyses, econometric studies, numerical modelling and laboratory experiments. Economic analyses in combination with knowledge in other fields are highly relevant for policy makers, regulators and stakeholders in the energy market.

### *Cooperation and partners*

The main focus is on economic research as the research partnership is formed by the Frisch Centre, the Department of Economics (ØI) at the University of Oslo (UoO), the Research department at Statistics Norway (SSB), and the Tilburg Sustainability Center, in the Netherlands. Cooperation with the Centre for Development and Environment (UoO), Faculty of Law (UoO), and Institute for Energy Technology (IFE) broadens the research perspective. The user perspective is ensured by several partners from industry and government; Energy Norway, Gassnova, the Norwegian Environment Agency, the Norwegian Ministry for Petroleum and Energy, the Norwegian Ministry of Climate and Environment, the Norwegian Water Resources and Energy Directorate, Statkraft Energy AS, and Statnett SF.

### *Research goal*

The main aim of the centre is to collect and develop knowledge on the effects of regulatory conditions in the energy market and how these affect technological improvements such as innovation in and diffusion of technology for renewable energy, energy efficiency and carbon capture and storage. The centre provides a basis for better regulatory strategies and for policy instruments designed to reach energy and climate goals established nationally and internationally. CREE also strives to develop methodological frameworks appropriate for achieving these goals.

### *Organization of the research*

Until 2016, the CREE research activities were organized in work packages. Due to clear requirements from the Norwegian Research Council to strengthen user involvement, multi-disciplinary activities, and thematic unity, the research activities are now successfully organized within four thematically specified Flagships. Each Flagship have specific activities and tasks related to making research more multi- and cross-disciplinary, more responsive to user needs, and with a strong international component.

### *Activities and outreach*

2018 has been the seventh year of CREE activities. We published 18 papers in international peer reviewed journals and held 58 conference and seminar presentations. CREE user activities included the annual user seminar, the annual dialogue seminar, CREE newsletter, CREE Hot Line (bilateral meetings with user partners) and seminar presentations for users. These meeting places are important for networking and the outreach of our research to user partners.



## **1 CREE – General description**

There is clear evidence that the global climate is changing, and that this change is mainly due to human activities. As has been stressed by the latest IPCC assessment report published in 2014, climate change can have a substantial impact on the economy, ecosystems and human welfare, and may have catastrophic impacts for parts of the world. Thus, there is a need to reduce greenhouse gas emissions as well as to adapt to inevitable changes. In 2015, the international community was successful in reaching a treaty (the Paris agreement) where nearly all countries in the world agreed to reduce their greenhouse gas emissions. A lot of details have still to be worked out, but technology improvements are widely held to be essential if we are to achieve the required emission cuts.

However, there are several challenges: the research and development effort, as well as diffusion and utilization of new, environmentally friendly energy sources, require appropriate incentives. Another important challenge is the future design and improvements of climate and energy treaties, such as the Paris agreement, that will help achieving a better social outcome. In this respect, effective policy instruments and fair outcomes are important. The aim of CREE, Oslo Centre for Research on Environmentally friendly Energy, is to provide a solid

base for policy making on these topics. CREE will also contribute to the collection and establishment of knowledge on how different regulations affect both the energy market and technological development. The centre studies policy instruments designed to reach the goals established in national and international energy and climate policy, while also examining how international treaties could be designed to achieve broader participation and deeper abatement.

The research of the centre is primarily grounded in economics, as reflected by the main research partners: Department of Economics at the University of Oslo, the Research Department at Statistics Norway, the Frisch Centre and the Tilburg Sustainability Centre. In addition, during the last years the centre has drawn on other perspectives through cooperation with researchers from other disciplines within the social sciences, law and technology.

The centre has the following vision, which is stated in our Strategic Plan:

- We want to be a leading international research centre within energy, environmental, resource and climate economics
- We will generate knowledge that can contribute to a cost-effective and sustainable exploitation of Norwegian and international energy resources by industry and governments, as well as an effective and fair climate and energy policy, both nationally and internationally
- We will contribute to recruitment and training at the master, doctoral and post-doctoral levels in energy and environmental economics at the University of Oslo. Recruiting women to research will have a particular focus.

This report summarizes the activities and the achievements of the centre in 2018.

## **2 Centre organization**

Figure 1 shows the organization of the centre in 2018. The partners of CREE are divided into research partners and user partners. The research partners are:

Ragnar Frisch Centre for Economic Research (Frisch Centre), Oslo (host institution)  
Research department, Statistics Norway, Oslo

Department of economics, University of Oslo  
Tilburg Sustainability Center, Netherlands.

CREE has eight user partners:

Energy Norway

Gassnova SF

Norwegian Environment Agency

Norwegian Ministry of Climate and Environment

Norwegian Ministry for Petroleum and Energy

Norwegian Water Resources and Energy Directorate

Statkraft Energy AS

Statnett SF.

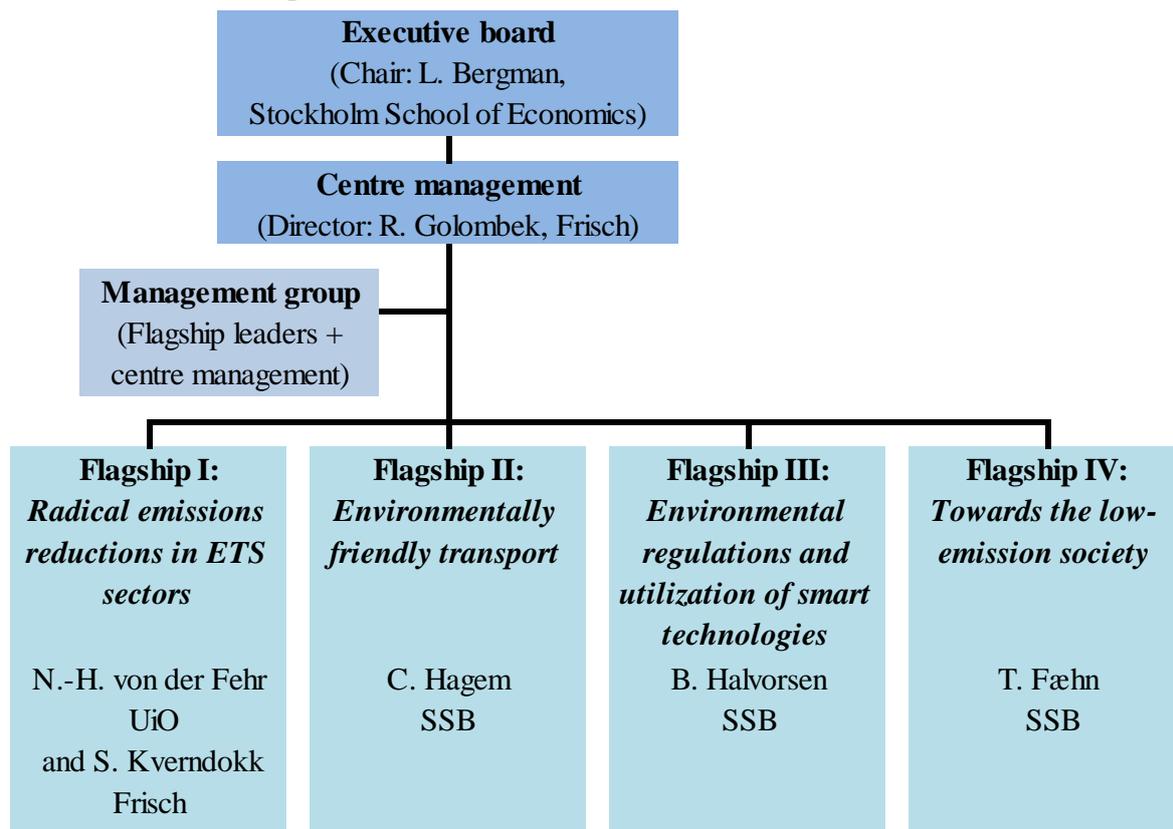
The user partners of the centre contribute with funding, but also to the research with detailed knowledge about markets, technologies and policy.

Most user partners, as well as research partners, are members of the executive board. Lars Bergman, Stockholm School of Economics, is the chairman of the board. At the end of 2018, the board members were Sverre A. C. Kittelsen (Frisch Centre), Brita Bye (Statistics Norway), Karine Nyborg (University of Oslo), Erik Nygaard (The Norwegian Environment Agency), Kjell Berger (Statkraft), Rolf Korneliussen (Statnett), Knut Kroepelien (Energy Norway), Ellen Skaansar (Norwegian Water Resources and Energy Directorate) and Ståle Aakenes (Gassnova). The Norwegian Ministry of Climate and Environment and The Norwegian Ministry of Petroleum and Energy do not want to be on the board. The board had two meetings in 2018, see [http://www.cree.uio.no/about/board/board\\_meetings/](http://www.cree.uio.no/about/board/board_meetings/).

The administration of CREE is located at the Frisch Centre. Dr. Rolf Golombek is the Director, and Jørg Gjestvang is the Project Coordinator. The administration has regular meetings with the management group, that is, the work package leaders, to discuss matters of importance for the centre.

The Centre research activities are organized within four thematically specified Flagships to strengthen the thematic unity and focus of the CREE centre.

**Figure 1: The organization of the centre in 2018**



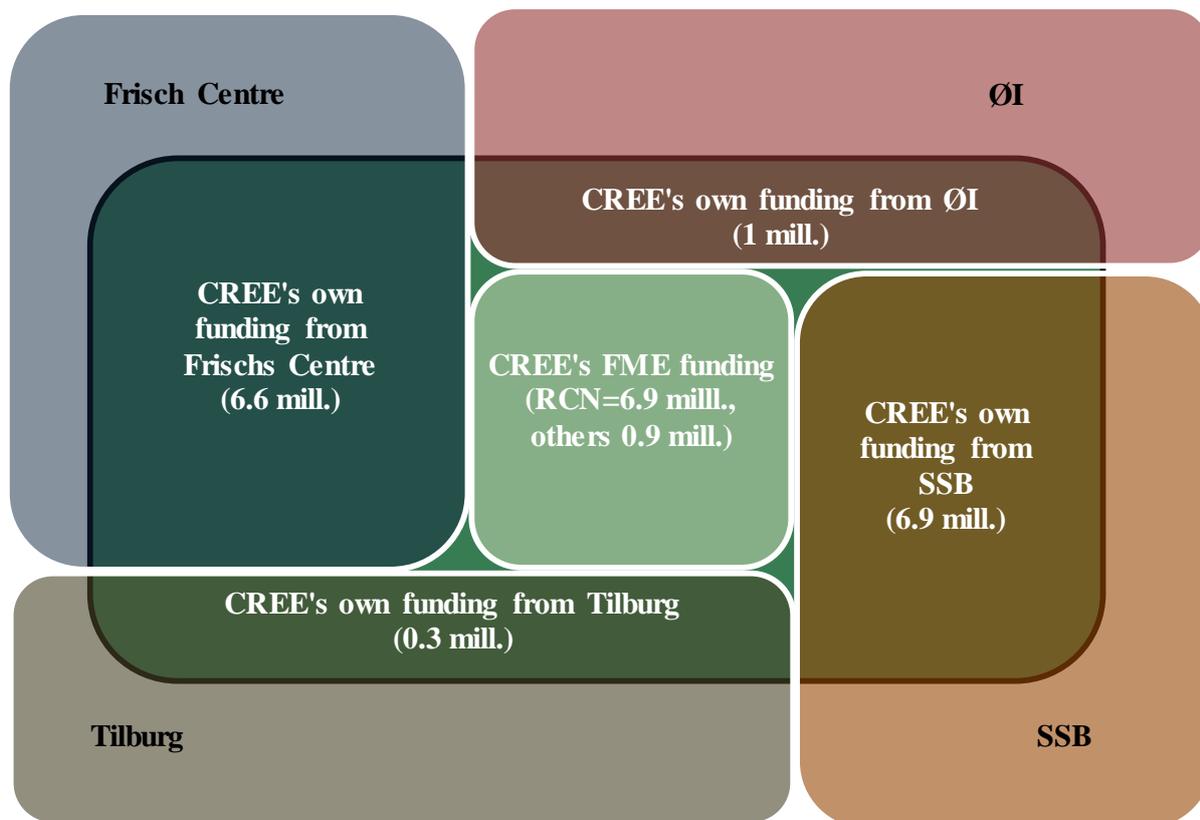
### 3 Funding in 2018

The funding of CREE in 2018 comes from various sources. The centre has normally an annual contribution from the Research Council of Norway (RCN) of NOK 8 million, user partner funding of NOK 350,000, and funding from the University of Oslo (UoO) of NOK 500,000. In addition, the centre has secured its own funding through other programs under RCN. The figure below gives an overview of the total funding in 2018. Note that in the figure, the funding from RCN is NOK 6.9 million, which is less than the annual NOK 8 million grant. The difference (NOK 1.1 million) was transferred to 2019, reflecting that CREE researchers are involved in so many (ordinary) research projects, see Section 2, that sufficient man months to carry out CREE research of NOK 8.0 million have not been available. Researchers affiliated to CREE have also been working on two large applications to the RCN; PLATON and TREAT. For more detailed information, see Appendix A2, which also shows the distribution of costs by CREE research partners and other units affiliated to the centre. Note that costs cover activities directly funded by RCN as well as activities financed by own funding, for example, funding through other RCN programs.

Figure 2:

## CREE funding in 2018

Total CREE centre funding incl. own funding. (22.5 mill.)



Own funding = professional work that is beneficial to the CREE centre, but is not part of CREE's direct funding from The Research Council of Norway. Own funding should be at least 25% of the total budget of CREE.

### FUNDINGS 2018 (In millions)

The Research Council of Norway	6.9
Others	0.9
<i>Public funding (UoO)</i>	0.5
<i>Privat funding (User partners)</i>	0.4
Own funding	14.7
<i>Frisch</i>	6.6
<i>SSB</i>	6.9
<i>ØI</i>	1.0
<i>Tilburg</i>	0.3
<b>Sum total funding</b>	<b>22.5</b>

## 4 Research organization - Flagships

Until 2016, the CREE research activities were organized in five work packages. However, effective from January 2017, and as part of the process to strengthen user involvement, multi-disciplinary activities, and thematic unity, the research activities are organized within four thematically specified Flagships. Each Flagship have specific activities and tasks related to making research more multi- and cross-disciplinary, more responsive to user needs, and with a strong international component.

### *Flagship I: Radical emissions reductions in ETS sectors*

The ETS sectors (the sectors covered by the EU Emissions Trading system) are mainly heavy energy-using installations such as power stations, oil and gas platforms, industrial plants, and also aviation within the EU. These cover about 45% of EU's greenhouse gas emissions. Non-EU members like Iceland, Lichtenstein and Norway are also part of the trading system.

ETS puts a limit on total emissions in these sectors, but individual participants can trade permits between themselves. In addition, these sectors also face other regulations, both from the EU and their domestic governments (e.g., carbon taxes), that provide further incentives to reduce emissions.

In this flagship, we consider emissions reductions in the ETS sectors. We concentrate our research on the power market, but we will also study other sectors. We aim to study and understand the driving forces behind the regulations and the choice of regulatory instruments in these sectors. Further, how they impact the Norwegian energy system and energy production, including investments in technologies and transmissions. We also study how regulations can be designed to ensure first-best or second-best investment decisions. Finally, we study environmental costs of investments in the energy system.

**Flagship leaders:** Professor Nils-Henrik von der Fehr, University of Oslo, and Dr. Snorre Kverndokk, Frisch Centre.

## Flagship themes

**I.1 Intermittency, Flexibility and Security of Supply**

**I.2 Transmission and Integration**

**I.3 Distributed Electricity and Storage**

**I.4 Regulatory Instruments and Impacts**

**I.5 CCS**

## Multi-disciplinary activities

- Close collaboration with engineers from Institute for Energy Technology (IFE) on I.1 and I.4, as well as the new projects *Security of supply* and *Windland* (see below).
- Close collaboration with lawyers from Faculty of Law (UoO) on I.1 as well on *Security of supply* and *Windland* (see below).
- Close collaboration with natural scientists from Norwegian Institute for Nature Research (NINA) on the project *Windland* (see below).

## International collaboration

Professor Fridrik Baldursson, Reykjavik University. Professor Claude Crampes, University of Toulouse. Dr. ing. Markus Blesl, University of Stuttgart. Professor Claudie Boiteau, Director of the Master programme Law and Market Regulation, Université Paris-Dauphine.

## Large research projects

CREE has two research projects with funding by the Research Council of Norway that address topics under this flagship:

*Security of Supply*, funded by ENERGIX and lead by the Frisch Centre. Scientific partners: Frisch Centre, Statistics Norway, University of Oslo (Department of economics, Faculty of law) and Institute of Energy Technology (IFE). This project started in 2016, and relates to flagship themes I.1 and I.3.

*Windland: Spatial assessment of environment-economy trade-offs to reduce wind power conflicts*, funded by ENERGIX and led by SSB. Scientific partners: Institute for Energy Technology (IFE); Norwegian University of Life Sciences, NMBU; Norwegian Institute for Nature Research (NINA), Vista Analyse; Faculty of Law, University of Oslo (UoO). This project relates to I.4.

## User involvement

- NVE and Statnett have been involved in Flagship I through meetings, consultations and seminars.

## ***Flagship II: Environmentally friendly transport***

Norway has committed to a 40% reduction of greenhouse gas emissions from the non-ETS sectors by 2030. Transport makes up a major share of Norwegian emissions in the non-ETS. Although there will be flexibility available for the non-ETS sector across the EU members, the Norwegian Parliament has announced that they aim for radical domestic emission cuts in transport.

Norwegian transport can be divided into sea, air, rail and road. Road can further be divided into private, light duty and heavy duty vehicles. The sustainability of transport can be improved by i) reducing the total amount of traveling, ii) modal shift, e.g. from road to rail, and iii) by introducing new technologies (e.g., electric vehicles). For policy it is important to obtain the right balance between the measures; taking into account that there may be market imperfections when introducing new technologies.

**Flagship leader:** Dr. Cathrine Hagem, Statistics Norway

### **Flagship themes**

**II.1 Electrification of private road transport**

**II.2 Integrating transport with electricity markets**

**II.3 Over-coming barriers to more sustainable commercial transport**

**II.4 Biofuels in road and air transport**

### **Multi-disciplinary content**

For II.1 and II.2, we have close cooperation with TØI, and the research encompasses disciplines like political science and engineering.

### **International collaboration**

We have cooperated with Professor Stef Proost at Leuven University on II.1 and II.2.

### **Large research projects**

***Electrification of transport:*** Challenges, mechanisms and solutions - ELECTRANS (KPN funded by the Norwegian Research Council) under the ENERGIX program and led by Statistics Norway. Scientific partners: Frisch Centre and Institute of Transport Economics. The overall objective of ELECTRANS is to provide new knowledge about the challenges and opportunities in electrifying the private car fleet in Norway. The point of departure is that by 2030, at least 50% of the private car fleet will be electric. The project is a part of the research in both II.1 and II.2.

*Driving towards the low-emission society:* Funded by the Norwegian Research Council under the ENERGIX program and led by the Frisch Centre. Scientific partner: Institute of Transport Economics. The primary aim of the project is to obtain accurate and reliable knowledge on the effects of existing and potential future policies to support the transition to zero- and low-emission automobiles in Norway. The project is a part of II.1.

### User involvement

Statkraft, Ringerikskraft, Meschkraft and Veidirektoratet are involved in II.1 through ELECTRANS.

### *Flagship III: Environmental regulations and utilization of smart technologies*

Achieving ambitious environmental and climate goals requires broad adoption of environmentally friendly and energy efficient technologies in homes and businesses. This flagship aims to increase our understanding of how policies can motivate and incentivize research, development and diffusion of both low-emissions technologies and technologies aiming at lowering energy consumption. What impact will economic factors, habits and norms have on development and utilization of new technologies? How do firms and consumers use and respond to new technologies? To what extent does adoption of the new technologies actually reduce energy demand? A variety of analytical and empirical approaches that draw on economic theory and other social sciences will be applied.

**Flagship leader:** Dr. Bente Halvorsen, Statistics Norway

### Flagship themes

- III.1 Innovation and diffusion of green technologies**
- III.2 Technical building standards and energy use**
- III.3 Increased energy efficiency in existing buildings**
- III.4 Utilization of smart technologies**
- III.5 Energy security and option value**

### Multi-disciplinary activities

- Close collaboration with social anthropologists from Centre for Development and the Environment (SUM), which is a CREE sub-contractor, on topics III.2, III.3, III.4 and III.5.
- Collaboration with architects and engineers from SINTEF Building and Infrastructure (SINTEF Byggforsk) on topic III.4.

### International collaboration

Professors Reyer Gerlagh and Sjak Smulders, Tilburg University and Tilburg Sustainability Centre, on topic III.1.

### Large research projects

CREE has one research project with funding from the Norwegian Research Council that addresses topics under this flagship:

*Security of Supply*, funded by ENERGIX and lead by the Frisch Centre, is related to III.4. Scientific partners: Frisch Centre, Statistics Norway, University of Oslo (Department of economics, Faculty of law) and Institute of Energy Technology (IFE).

### User involvement

Ringerikskraft is involved in III.4.

### ***Flagship IV: Towards the low-emission society***

While the first three flagships focus on specific sectors and technologies, this flagship aims at taking a comprehensive view by focusing on larger entities; nations, regions and the world. Development and diffusion of environmentally friendly technologies are driven by the long-term goal of becoming a low-emission society. The public good-characteristics of the environment and the climate call for coordinated and over-arching policies across sectors and/or nations. There is a need to understand the political, legal, economic, behavioural and technological motivations and obstacles for alternative pathways.

Approaches in this flagship embrace theoretical and numerical models of technological, behavioral and political responses to challenges in the energy-environment-climate nexus. It is also pivotal to learn from experience by using empirical methods and experiments of behavioral responses.

**Flagship leader:** Senior Researcher Taran Fæhn, Statistics Norway

### Flagship themes

**IV.1: Greening the economy**

**IV.2: National and international climate policies and treaties**

**IV.3: Barriers and opportunities to transformation**

### Multi-disciplinary activities:

- Close collaboration with technology experts from IFE on IV.1
- Collaboration with expert of psychology and behavioral economics on IV.2

### International collaboration:

As seen from the table below, there is substantial international involvement in our projects. We will have particularly close and frequent cooperation with Professor Böhringer, University of Oldenburg (IV.1 and IV.3).

### Large research projects

CREE has two research projects with funding from the Norwegian Research Council that address topics under this flagship:

**Smart Paths:** Funded by KLIMAFORSK and led by Statistics Norway, is related to IV.2 and IV.3. Scientific partners: IFE, BI, University of Strathclyde and University of Oldenburg. This project has a policy/science forum of experts from policy-making, government and industry.

**Sustainable transformation to sustainability:** Funded by KLIMAFORSK and led by the Frisch Centre, is related to IV.2. Scientific partners: Statistics Norway, University of Oslo (Department of economics, Department of Political Science).

### User involvement

Norwegian Environment Agency, Ministry of Finance, Ministry of Climate and Environment, The science-policy forum in the Smart Paths project.

## **5 Professional activities and results in 2018**

The professional activities in 2018 have been concentrated on the research in the flagships, workshops, CREE seminars, and several user activities including the user conference and the dialogue seminar.

The CREE research workshop took place in Oslo (at Statistics Norway) on 15-16 November. 25 people attended the workshop, mainly researchers from the research partners and sub-contractors in CREE, but also from our international network. Presentations covered research from the work packages, and on subjects related to the work packages.

The program is available at:

[http://www.cree.uio.no/outreach/events/research\\_workshops/8th-research-workshop.html](http://www.cree.uio.no/outreach/events/research_workshops/8th-research-workshop.html)

There were 10 CREE seminars in 2018, including 4 seminars given by international visitors.

The seminars were given at Statistics Norway, Frisch Centre and University of Oslo.

For a list of all seminars, see: <http://www.cree.uio.no/outreach/events/seminar/2018/>

The annual user conference was held in April and was again co-organized with CICEP, another centre for social science research on environmentally friendly energy (FME-S). The conference was in Norwegian and the title was “Energy and Climate Policy Conflicts in Europe”. About 90 people attended the conference.

For more information about the conference, see

[https://www.cree.uio.no/outreach/events/user-meetings/brukerseminar\\_cicep\\_cree\\_180419.html](https://www.cree.uio.no/outreach/events/user-meetings/brukerseminar_cicep_cree_180419.html)

CREE also organized a half-day dialogue seminar with the user partners, where the user partners chose the subjects for dialogue; see

[https://www.cree.uio.no/outreach/events/user-meetings/dialogseminar\\_181120.html](https://www.cree.uio.no/outreach/events/user-meetings/dialogseminar_181120.html)

Togheter with the research group on natural resources at the Faculty of Law, University of Oslo, CREE organized a joint user workshop. The focusing was on what are capacity mechanisms, how do they work, and who should have access to these mechanisms?

For more information about the workshop, see

[https://www.cree.uio.no/outreach/events/seminar/2018/seminar\\_juss\\_kapasitetsmekanismer\\_v2018.html](https://www.cree.uio.no/outreach/events/seminar/2018/seminar_juss_kapasitetsmekanismer_v2018.html)

In 2018, 18 papers were published in international peer reviewed journals, see Table 1 below and also Appendix A3. We have also published one book chapter and produced 14 CREE working papers. Further, we have published 5 popular science articles. The CREE scientists have held 58 conference and seminar presentations. They have also been mentioned at least 13 times in the media.

**Table 1: Publications 2011-2018**

	2011	2012	2013	2014	2015	2016	2017	2018
Journal articles:	8	16	21	28	19	23	23	18
Books and article in books:		2	7	6	2	6	1	1
Working Papers:	9	21	30	20	24	15	10	14
Popular scientific articles:	4	10	12	7	7	18	4	5
Other publications:		5	3	2	18	8		
Conference and seminar presentations:		100	100	74	108	76	65	58
CREE in the media:	9	41	31	23	26	20	11	13

For more information about the publications, see <http://www.cree.uio.no/publications/>

Table 2 shows planned deliverables in 2018, according the CREE work plan for 2017, relative to realized deliverables. As documented by the Table, most of the planned deliverables were met. Note that contact with users cover more than those activities documented in Table 2, for example, presentations at meetings and seminars with user partners and more informal (project) meetings, see Appendix A3.

**Table 2: Planned versus realized deliverables, 2018**

<b>Planned</b>	<b>Delivered</b>
One user seminar	<a href="#">-Energi- og klimapolitiske konflikter i Europa</a> <a href="#">-Kapasitetsmekanismer</a>
One dialogue seminar	<a href="#">-Verdsetting av miljøkonsekvenser og fornybar energiproduksjon</a>
Synthesis reports of two flagships	<a href="#">-Synthesis report of Flagship I</a> <a href="#">-Synthesis report of Flagship III</a>
Four newsletters	<a href="#">-CREE newsletter Nr 1 - 2018</a> <a href="#">-CREE newsletter Nr 2 - 2018</a> <a href="#">-CREE newsletter Nr 3 - 2018</a>
At least two CREE hot line meetings	<a href="#">-Norges vassdrags- og energidirektorat (NVE)</a>
One research workshop	<a href="#">-8th research workshop 2018</a>
Around 21 working papers, mainly published as CREE working papers	<a href="#">-14 CREE working papers 2018</a>
At least 8 published papers in journals or books in 2018	<a href="#">-19 Scientific Journals</a>



## 5.1 Snapshots of some research projects

### The social discount rate

The government's guidelines for choice of discount rate has changed over time. In the period 1999-2014, the guidelines recommended differentiation of the discount rate based on the project's systematic risk. After 2014, this was no longer recommended, partly because the risk adjustment proved to have low transparency and consistency across sectors. According to the updated guidelines from 2014, risk adjustment should follow a normal return requirement that suits a large group of public-sector projects.

The article points out weaknesses in the arguments for the revision in 2014, and we suggest how to make consistent and transparent project-specific risk adjustments. The inspiration for the article comes from the CREE dialogue seminar on the discount rate in November 2017. During the seminar, it appeared that practitioners in the energy and environmental field deviate from the governmental guidelines. In some cases, this is due to unclear guidance from the government on how to understand the guidelines. This leads to confusion among practitioners when the discount rate is chosen. In other cases, a practice that deviates from the guidelines seems reasonable. The observation that many cases showed substantial difference between the guidelines and practice, prompted to study more closely the background for today's guidelines.

Reference: Frikk Nesje and Diderik Lund, Risikojustering av kalkulasjonsrenta i samfunnsøkonomiske analyser, Samfunnsøkonomen nr. 4, 34-42, 2018.

[https://www.cree.uio.no/publications/pdf\\_popular\\_scientific\\_articles/samfok\\_2018\\_4\\_kalkulasjonsrenta\\_lund\\_nesje.pdf](https://www.cree.uio.no/publications/pdf_popular_scientific_articles/samfok_2018_4_kalkulasjonsrenta_lund_nesje.pdf)

## Social Norms and the Environment

Social norms affect environmental quality. But what exactly is a social norm? Environmental economists studying the topic draw on diverse scholarly traditions, and do not always have the same phenomenon in mind when using the concept. In particular, psychologists and game theorists tend to have related, but quite different phenomena in mind when using this term. Because environmental economists have been inspired by both of these scholarly traditions, their use of the term can sometimes be confusing.

The paper discusses the various meanings of the term “social norms” used in the environmental economics literature. It may for example refer to common, but not necessarily socially approved, behaviors; to internalize ethical rules; or, in game theoretic analyses, to one of several equilibria in a coordination game.

A simple formal framework for analysis of voluntary contributions to public goods is outlined. This framework is used to define and illustrate differences and similarities between altruism, moral norms, and social norms. Since these concepts reflect different ideas of what motivates individual behaviors, their policy implications also differ.

Importantly, if one uses the game theoretic notion of a social norm, such norms can be associated with tipping points: although social norms tend to be stable over time, sufficiently large changes in expectations about others’ behavior and social reactions can make social norms change – and if this happens, it can happen abruptly. It is argued that environmental policy can potentially help invoke such shifts, thus leading to abrupt and possibly dramatic aggregate behavioral change.

Reference: Karine Nyborg, Social Norms and the Environment, Annual Review of Resource Economics, Vol 10, 405-423, 2018.

<https://doi.org/10.1146/annurev-resource-100517-023232>

### Strategic technology policy as a supplement to renewable energy standards

In many regions, renewable energy targets are a primary decarbonization policy. Most of the same regions also subsidize the manufacturing and/or deployment of renewable energy technologies, some being sufficiently aggressive as to engender WTO disputes.

The aim of this paper is to examine potential rationales for green industrial policy, i.e., subsidies to renewable technologies, when there is a binding renewable market share mandate and there is international trade in the technology equipment. Subsidies may be provided downstream to energy suppliers and/or upstream to technology suppliers; each has tradeoffs.

A two-region model where a downstream energy-using product is produced competitively but not traded across regions is set up; this is the case for electricity. A renewable energy technology is available, provided by a limited set of upstream suppliers who exercise market power. There are multiple market failures, including negative externalities from emissions and imperfect competition.

In the model, subsidies (both downstream and upstream) can offset underprovision of the renewable alternative by the upstream suppliers, due to imperfect competition. However, they allow dirty generation to expand as the market share mandate becomes less costly to fulfill. Downstream subsidies raise all upstream profits and crowd out foreign emissions. Upstream subsidies increase domestic upstream market share but expand emissions globally.

The study finds that strategic subsidies chosen non-cooperatively can in fact be optimal from a global perspective, if both regions value emissions at the global cost of carbon. If, however, the regions sufficiently undervalue global emissions, restricting the use of upstream subsidies can enhance welfare.

Reference: Carolyn Fischer, Mads Greaker and Knut Einar Rosendahl, Strategic technology policy as a supplement to renewable energy standards, *Resources and Energy Economics*, Vol 51, 84-98, 2018.

<http://doi.org/10.1016/j.reseneeco.2017.05.006>

### **Should the Norwegian commercial transport sector be subsidized?**

Norway has ratified the Paris Agreement, according to which the country has committed to reducing greenhouse gas emissions by 40 percent by 2030, compared to emission levels in 1990. The Norwegian commercial transport sector is responsible for about 10 percent of CO<sub>2</sub> emissions in Norway. This thesis analyzes the optimal environmental policy for this sector. More specifically, it argues under which circumstances it would be optimal to introduce subsidies on investment in capital and abatement, which would spur a transition to environmentally-friendly technologies. The theoretical model features a two-stage game. The analysis of results follows from a numerical simulation of the model. The main result of the thesis is that the tax should be the main environmental policy and that introducing subsidies is only desirable under certain circumstances.

Reference: Katarzyna Segiet, Should the Norwegian commercial transport sector be subsidized? CREE Working Paper, 13/2018.

[https://www.cree.uio.no/publications/CREE\\_working\\_papers/pdf\\_2018/segiet\\_transport\\_subsidized\\_cree\\_wp13\\_2018.pdf](https://www.cree.uio.no/publications/CREE_working_papers/pdf_2018/segiet_transport_subsidized_cree_wp13_2018.pdf)

### **Carbon Prices are Redundant in the 2030 EU Climate and Energy Policy Package**

In June 2018, an agreement between key EU institutions – the Commission, the European Parliament, and the European Council – was reached after a long-lasting discourse over the 2030 EU climate and energy policy package. In a recent CREE Working Paper, Finn Roar Aune and Rolf Golombek offer a comprehensive assessment of the 2030 EU package. This package has three main targets: lower greenhouse gas emissions (a 40% reduction relative to 1990), a high renewable share in final energy consumption (32%), and improved energy efficiency (by 32.5% relative to 2005). The study finds that the renewable and energy-efficiency targets have been set so high that the derived emissions reduction exceeds the EU climate target. Hence, carbon prices are redundant in reaching the EU climate goal.

In their study, Aune and Golombek use the numerical model LIBEMOD to identify the equilibrium effects of the EU 2030 climate and energy package. LIBEMOD is a multi-good, multi-period model covering the entire energy industry in 30 European countries. The model determines all prices and quantities in the European energy industry, as well as CO<sub>2</sub> emissions by country and sectors.

Turning to the main results of the paper, the Table below shows a decomposition of the 2030 policy goals; i) no targets, ii) only emissions goals (ETS emissions are reduced by 43% relative to 2005, whereas non-ETS emissions are reduced by 30% relative to 2005), iii) emissions goals and the renewable goal, iv) all goals (the 2030 EU package). In addition, the Table shows the case in which there is one common target for ETS and non-ETS emissions (50 percent lower emissions than in 1990).

Without any policy targets, GHG emissions would be 2% higher in 2030 relative to 1990, whereas the renewable share in final energy consumption would be 11%. If, alternatively, only the ETS and non-ETS emissions goals are imposed, then by construction, GHG emissions in 2030 are 40% lower than in 1990. The implied emissions prices would lead to a renewable share of 22%, whereas the improvement in energy efficiency would be 18%. If a renewable share of 32% is imposed in addition to the two GHG emissions targets, then the implied improvement in energy efficiency would be 12%.

With all targets imposed (the 2030 EU package, henceforth termed the reference scenario), the emissions reduction would be 50%, that is, greater than the requirement of a 40 percent drop. Therefore, the prices of CO<sub>2</sub> emissions are zero. Whereas the emissions prices are identical (zero) in the ETS and the non-ETS sectors, this does not imply that the emissions reduction is cost efficient. If only one policy goal is imposed, namely that total emissions should equal the figure obtained in the reference scenario, the resulting distribution of emissions between the ETS and the non-ETS sectors would differ from that in the reference outcome. Hence, the 2030 EU policy package does not lead to a cost-efficient emission reduction. With one common emission target of 50%, the implied renewable share would be 28%, whereas the improvement in energy efficiency would be 26% (see the last column in the Table).

**Table 3: Policy target sensitivity**

	No targets	Climate targets (ETS and non-ETS targets)	Climate and renewable targets	Climate, renewable and energy efficiency targets (reference scenario)	One climate target (efficiency)
GHG emissions in 2030 relative to 1990	2 %	-40 %	-40 %	-50 %	-50 %
Renewable share in 2030	11 %	22 %	32 %	32 %	28 %
Improved energy efficiency in 2030 relative to 2005	5 %	18 %	12 %	32.5 %	26 %
ETS price (€/tCO <sub>2</sub> )	0	50	7	0	316
Non-ETS price (€/tCO <sub>2</sub> )	0	236	239	0	316

Reference: Finn Roar Aune and Rolf Golombek, Carbon prices are redundant in the 2030 EU climate and energy policy package, CREE Working Paper, 10/2018.

[https://www.cree.uio.no/publications/CREE\\_working\\_papers/pdf\\_2018/aune\\_golombek\\_carbon\\_prices\\_redundant\\_cree\\_wp10\\_2018.pdf](https://www.cree.uio.no/publications/CREE_working_papers/pdf_2018/aune_golombek_carbon_prices_redundant_cree_wp10_2018.pdf)



## **5.2 Snapshots of some collaboration with user partners**

### *CREE Hot Line*

CREE offers CREE Hot Line to its user partners. These are informal meetings where the user can discuss methodological and policy issues with CREE researchers. In 2018, one meeting was organized joint with Norwegian Water Resources and Energy Directorate on methodological issues related to predictions about energy consumption.

### *User partner conference*

Once a year, CREE organizes, joint with CICEP (another research centre on environmentally friendly energy, FME-S) a half-day conference directed at user partners and the general public. In 2018, the topic was energy and climate policy conflicts in Europe. Some key questions discussed in the course of the conference were i) should Norway fear ACER (Agency for the Cooperation of Energy Regulators)? ii) what determines the domestic energy and climate policy targets in Germany and Poland? and iii) what would be the effects for Norway if the EU reaches its ambitious 2030 climate targets?

### *CREE dialogue seminar*

Once a year, CREE organizes a half-day seminar for its user partners on topics of mutual interest. In 2018, the topic was assessment of environmental effects and renewable energy production. During the seminar, both researchers and user partners gave presentations.

### *Other user partners activities*

In order to ensure policy and technology relevance of CREE projects, workshops with user partners have been organized. This is the case for one project on electrification of transport (ELECTRANS) where the participants discussed i) how does the Norwegian electrical vehicle policy work? ii) are the transport policy targets consistent? and iii) will electrical vehicles smooth out electricity consumption? During the workshop, user partners presented results from two work packages.

CREE has also organized a joint user workshop with the research group on natural resources at the Faculty of Law, University of Oslo, focusing on what are capacity mechanisms, how do they work, and who should have access to these mechanisms?

CREE researchers have been appointed to a number of committees of experts: Taran Fæhn by the Ministry of Climate and Environment to a committee on greenhouse gas emissions, Cathrine Hagem by the Ministry of Climate and Environment to a committee on greenhouse gas emissions from agriculture, Lars Lindholt to the international panel for Arctic Environmental Responsibility, and Finn R Aune to the climate expert group of the municipality of Oslo.

### **5.3 Interdisciplinary contact and cooperation**

Technology research is essential for developing our numerical models. IFE has been an important partner and subcontractor to CREE from the beginning. Their work on modelling various energy technologies in the detailed energy optimization model TIMES-Norway provides valuable input in economic models. Especially IFE has supplied estimates of energy efficiency technologies and potentials in the building sector. Cooperation with IFE has also resulted in research projects from the research programme ENERGIX (RCN), and an ongoing CREE-funded activity on electricity storage technologies, focusing mainly on the interplay between wind power, solar power and batteries in the Nordic countries.

Beyond the collaboration with technology experts, we have initiated and started a series of multidisciplinary collaborative projects with researchers from the fields of anthropology, psychology and law. Social anthropologists at SUM (UoO) are involved in the flagship "Green innovations and utilizations of smart technologies". Joint with anthropologists, CREE has studied welfare loss for households with long-term power outages. SUM has conducted a field study with in-depth interviews among households who have experienced power outages of at least 24 hours during the previous 12 months. We will use this material to analyze how technology choices affect how households adapt to long-term power outages, and how this adaptation affects the welfare loss.

A joint project with psychologists has examined probability assessments. The study contrasts two different traditions on probability assessments: asking participants for probabilities (psychology) versus deriving probabilities from participant's preferences (economics) through investigating whether probabilities add up to more than 100% (additivity neglect) and whether subjects have a preference for known risks over unknown risks (ambiguity aversion). When participants are asked to state probabilities for natural events, the project finds, in line with the psychological literature, that they state probabilities that add to much more than 100%. The two contrasting views on probability assessments have different policy implications. For example, climate economics examines the tradeoff between rather predictable cost of abatement today versus the highly uncertain and ambiguous benefits in the future. If the ambiguity of the effects of future climate changes were desired rather than avoided, that would significantly affect the benefit-cost ratio of abatement measures.

Finally, researchers at the Faculty of Law (UoO) are participating in one of our ENERGIX projects as well as in the flagship “Radical emissions reductions in ETS sectors”.



## 6 International cooperation in 2018

All the research partners in CREE have a large international network, which is shown through extensive co-authorship with researchers from other countries (see <http://www.cree.uio.no/publications/>). When it comes to articles in peer reviewed international journals, 8 of the 18 papers that were published in 2018 had foreign authors or co-authors. This illustrates that CREE works internationally, both through co-authorship and through impacts in the international research community.

CREE researchers also participate actively at international conferences and seminars (e.g., IAEE and EAERE), in international groups (e.g., IPCC and OECD/GTAP), networks (e.g., CESifo and The Danish “Miljøøkonomiske Råd”), and lecture at foreign universities and institutions.

CREE has an international research partner - Tilburg Sustainability Center - and two foreign researchers had a part-time position paid by CREE in 2018:

- Fridrik Baldursson, Reykjavik University
- Christoph Böhringer, Oldenburg University.

In addition to the foreign researchers who are employed part time by CREE, a few foreign researchers have contracts on CREE projects that are externally funded, i.e., not paid by the direct funding of CREE.

CREE organizes an annual research workshop where we invite researchers from our network. At the workshop in 2018 (15-16 November), the following non-Norwegian researchers attended (see

[http://www.cree.uio.no/outreach/events/research\\_workshops/8th-research-workshop.html](http://www.cree.uio.no/outreach/events/research_workshops/8th-research-workshop.html)):

- Fridrik Baldursson (Reykjavik University).
- Inge van den Bijgart (University of Gothenburg)
- Reyer Gerlagh (Tilburg University)
- Corbett Grainger (University of Wisconsin - Madison)
- Roweno J.R.K. Heijmans (Tilburg University)
- Stef Proost (KULeuven).

The following foreign researchers held CREE seminars in 2018:

*Cloe Garnache*, Michigan State University: “When Your View Goes Up In Flames: Effect of Wildfires on Property Values”, April 4, 2018.

*Giulia Pavan*, TSE: “Green Cars Adoption and the Supply of Alternative Fuels”, March 22, 2018.

*Hidemichi Yonezawa*, ETH Zurich: “Higher Price, Lower Costs? Minimum Prices in the EU Emissions Trading Scheme”, March 15, 2018.

*Fridrik Baldursson*, Reykjavik Universitet: “Cross-Border Exchange and Sharing Generation Reserve Capacity”, February 13, 2018.

## **7 Recruitment**

Every year, CREE gives a master scholarship of NOK 20.000 to master students. These are offered an office at one of the Norwegian research partners, supervision by one or two of the CREE researchers, access to all CREE events, and the possibility to publish their thesis in the CREE Working Paper series. For 2018 scholarships were given to Silje Jelness, Eirik Kløw, Anna Strømqvist and Dalibor Vagner. Their theses are or will be published in the CREE working paper series, see [http://www.cree.uio.no/projects/p\\_057.html](http://www.cree.uio.no/projects/p_057.html)

## 8 Cooperation with other FME centres in 2018

CREE has a close collaboration with CICEP, one of the other social science-related energy research centres (FME Samfunn) funded by the Research Council of Norway. CICEP has many overlapping projects with CREE as both centres have a large interest in international climate negotiation and agreements. Every spring CREE and CICEP organize a joint user conference for our research partners and other interested institutions. We also have some joint proposals with CICEP/CICERO.

In addition, we have common interests with CenSES, the third FME Samfunn, in numerical modelling of energy markets and new energy technologies, and we have organized workshops and Model Forums together. We were both involved in the project “Implications of Paris”, a project initiated by Joint Global Change Research Institute (JGCRI), University of Maryland.

## 9 Communication and dissemination

The main users of CREE are, in addition to the research community, industry, Government and the general public. The communications to users are mainly through the following channels:

- Dissemination of research and media activity through our webpage ([www.cree.uio.no](http://www.cree.uio.no))
- An annual user conference (April). This is organized together with CICEP
- Organize user activities such as meetings and seminars
- Publish in Norwegian-language journals such as *Samfunnsøkonomen* and *SSB analyse*
- We contribute to public debates.

CREE has invested heavily in communication, for instance through an internal reward system for communicating through the media. We have dedicated a website for news on CREE research, see <http://www.cree.uio.no/outreach/>, and had 13 reports in the media in 2018. Researchers from CREE have been involved in debates in the media over the past year on subjects such as climate treaties, electric vehicles, bio fuels, energy efficiency and supply side policies.

When it comes to user-oriented communication measures, we usually give about 60-90 presentations each year. This includes meetings with all user partners, seminars, workshops and conferences. In addition to the two regular user arrangements in the spring and the fall, we organize seminars for users that are interested in certain topics.



## **CREE - Oslo Centre for Research on Environmentally friendly Energy**

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Web: [www.cree.uio.no/](http://www.cree.uio.no/)

# Appendix:

## A1 Personnel

[https://www.cree.uio.no/contact\\_us/people/](https://www.cree.uio.no/contact_us/people/)

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### Key Researchers

Name	Institution	Main research area
Gaure, Simen	Frisch Centre	Statistical, Algebraic and numerical methods, Applied mathematics
Golombek, Rolf	Frisch Centre	Environmental Economics, Energy Economics, Applied Game Theory
Hauge, Karen	Frisch Centre	Environmental Economics
Kittelsen, Sverre	Frisch Centre	Production theory, Efficiency measurement, Regulation, Health Economics, Energy Economics
Kverndokk, Snorre	Frisch Centre	Environmental and Resource Economics, Health Economics
Nævdal, Eric	Frisch Centre	Resource Economics, Economic management of ecological systems, dynamic optimization, modeling of the risk of disasters, animal behavior
Røgeberg, Ole	Frisch Centre	Welfare analysis, endogenous preferences, rational addiction theory, consumer theory
Strøm, Steinar	Frisch Centre	Microeconomics
Asheim, Geir	Department of Economics, University of Oslo	Game theory, intergenerational justice, green national accounting
Brekke, Kjell Arne	Department of Economics, University of Oslo	Behavioral Economics, Experimental Economics, Resource and Environmental Economics, Real options and stochastic analysis
Framstad, Nils Christian	Department of Economics, University of Oslo	Stochastic optimization
Harstad, Bård	Department of Economics, University of Oslo	Political Economics, Public Economics, Contract Theory, Environmental Economics
Hoel, Michael	Department of Economics, University of Oslo	Energy and climate economics, environmental economics, resource economics
Nyborg, Karine	Department of Economics, University of Oslo	Environmental economics, economic analysis of social and moral norms, behavioral economics.
Piacquadio, Paolo Giovanni	Department of Economics, University of Oslo	Microeconomic Theory, Welfare Economics, Public Economics, and Environmental Economics.
Traeger, Christian	Department of Economics, University of Oslo	Environmental Economics, Intertemporal Welfare Analysis, Decision Theory
Vislie, Jon	Department of Economics, University of Oslo	Microeconomics, environmental economics, incentives, public economics
Von der Fehr, Nils	Department of Economics, University of Oslo	Microeconomics, Industrial Economics, Regulation, Competition Policy.
Aune, Finn Roar	Research Department, Statistics Norway	Energy and environmental economics
Bye, Brita	Research Department, Statistics Norway	Macroeconomic
Fæhn, Taran	Research Department, Statistics Norway	Macroeconomic
Greaker, Mads	Oslo Business School, OsloMet	Energy and environmental economics
Grimsrud, Kristine M.	Research Department, Statistics Norway	Energy and environmental economics
Hagem, Cathrine	Research Department, Statistics Norway	Energy and environmental economics
Halvorsen, Bente	Research Department, Statistics Norway	Energy and environmental economics
Holtmark, Bjart	Research Department, Statistics Norway	Energy and environmental economics
Larsen, Bodil Merethe	Research Department, Statistics Norway	Energy and environmental economics
Rosnes, Orvika	Research Department, Statistics Norway	Energy and environmental economics
Storrøsten, Halvor B.	Research Department, Statistics Norway	Energy and environmental economics
Gerlagh, Reyer	Tilburg Sustainability Center	Climate Change, Economics, Energy economics, Environmental economics
Smulders, Sjak	Tilburg Sustainability Center	Energy and environmental economics
van der Heijden, Eline	Tilburg Sustainability Center	Energy and environmental economics

## Associated Researchers

Baldursson, Fridrik	Reykjavik University	Financial Economics, Industrial Economics, Environmental and Resource Economics
Banet, Catherine	Scandinavian Institute of Maritime Law, University of Oslo	Energy law – petroleum law – environmental law – EU/EEA law – state aids – internal energy market.
Böhringer, Christoph	University of Oldenburg	Energy Economics
Carbone, Jared	University of Calgary	Environmental and Resource Economics
Eyckmans, Johan	Hogeschool-Universiteit Brussel	Economics of climate change, emissions trading, applications of game theory to the formation of international environmental agreements, cost benefit analysis, general equilibrium and integrated assessment modeling, evaluation of environmental policies, economics of waste management, industrial organization and normative economic theory
Gravir, Anders	Ringerikskraft	Energy markets
Green, Richard	Imperial College London	Energy markets
Isaksen, Elisabeth Thuestad	The Londo School of Economics and Political Science	Environmental and resource economics; Applied econometrics, Efficiency and equity impacts of environmental and climate policies, Behavioral economics
Jensen, Sverre	Norewegian University of Life Sciences	Environmental Economics
Liski, Matti	Aalto University School of Economics	
Rosendahl, Knut Einar	Research Department, Statistics Norway	Energy and environmental economics
Spiro, Daniel	Uppsala Universitet, Department of Economics	Environmental and resource economics, Behavioral economics and political economics
van den Bijgaart, Inge	University of Gothenburg web page	Environmental, Climate policy, Growth.

Name	Funding	Nationality	Period	Sex M/F	Topic
<b>Post Doc with financial support from other sources</b>					
Holtmark, Katinka	Department of Economics, University of Oslo	Norwegian	2016-2018	F	Microeconomics, political economy, environmental economics
<b>PhD students working on projects in the centre with financial support from CREE and other sources</b>					
Dalen, Hanne Marit	Research Department, Statistics Norway	Norwegian	2010-2018	F	
<b>PhD students working on projects in the centre with financial support from other sources</b>					
Coelli, Federica	Department of Economics, University of Oslo	Italian	2016-2020	F	International trade, Innovation, Environmental economics, Climate change
Hjort, Ingrid	Department of Economics, University of Oslo	Norwegian	2015-2019	F	Environmental Economics, Political Economy, Resources, Climate Change
Nesje, Frikk	Department of Economics, University of Oslo	Norwegian	2014-2018	M	Welfare economics, environmental economics, development economics

## Master thesis CREE

Name	Institution granting degree	Adviser	Year	Sex	Title of thesis
Abrahamsen, Kamila Lund		Spiro, Daniel	2014	F	Elektrisitetspriser: En empirisk og teoretisk analyse av tilbud og etterspørsel
Andersson, Runa Haave		Nyborg, Karine og Holtmark, Bjart	2013	F	"STABILITY OF INTERNATIONAL CLIMATE TREATIES THE IMPORTANCE OF HETEROGENEITY"
Andenes, Liv Jorunn		Wilhite, Harold Langford	2014	F	Bicycle Commuting in Oslo - Practices, Constraints and new Directions for Policy
Beisland, Christina Stene	CREE	Greaker, Mads	2013	F	<a href="#">From Targets and Timetables to Technology Investments</a>
Birkelund, Henriette	CREE	Halvorsen, Bente	2013	F	<a href="#">Oppvarming og innetemperaturer i norske barnefamilier - En analyse av husholdningenes valg av innetemperatur</a>

Boroumand, Yasaman Elkadi, Nour-Eddine Gavenas, Ekaterina	CREE	Rosendahl, Knut Einar Bye, Brita Rosendahl, Knut Einar	F 2017 M F	Price Elasticity of Non-OPEC Supply <a href="#">Husholdningenes transport og miljøpolitikk - Modellering og virkemidler</a> On the way to a Cleaner Future: A Study of CO2 Emissions on Norwegian Continental Shelf
Hjort, Ingrid C. Jakobsen, Anja Lund Jemsek, Misha	CREE	Greaker, Mads Rosendahl, Knut Einar Winther, Tanja	2015 F F M	<a href="#">Innovation Prizes for Environmental R&amp;D in Presence of Lobbyism</a> Does the Polluter Pay in the EU ETS, or does the EU ETS Pay the Polluter? <a href="#">Heat Pumps and Household Energy Consumption in Norway</a>
Jiang, Shan Landmark, Marie Brun Lorentzen, Linnea Khan, Ahmer Zaman	CREE CREE CREE CREE	Kverndokk, Snorre Harstad, Bård Vislie, Jon Nyborg, Karine	2016 F 2016 F 2018 F 2018 M	<a href="#">Pareto improving Climate Policies for the Main CO2 Emitting Countries/Regions</a> <a href="#">Environmental effects of international electricity trade</a> <a href="#">Grønn teknologi eller klimakrise: En teoretisk studie med to stokastiske terskler</a> <a href="#">Why Say No to Solar Energy? - An Exploration of Residential Reluctance towards Solar Energy</a>
Kontny, C. F.	CREE	Rosendahl, Knut Einar	2017 M	<a href="#">The road to meeting Norway's non-ETS climate goal in 2030 - Is an electric vehicle subsidy the way to go?</a>
Matungwa, Bernard		Wilhite, Harold Langford	2014 M	An Analysis of PV Solar Electrification on Rural Livelihood Transformation: A Case of Kisiju-Pwani in Mkuranga District, Tanzania
Nesje, Frikk	CREE	Ekstern	2013 M	<a href="#">Distrust, but verify?: Theoretical insights into auditing carbon sequestration in tropical forests</a>
Nesvik, Linn Camilla		von der Fehr, Nils-Henrik M.	2012 F	Geografiske kostnads- og prisforskjeller i det norske kraftmarkedet : En tidsserieanalyse av de norske kraftprisene fra 2006 til 2011
Reinlie, Kristine Borgeraas		Brekke, Kjell Arne	2014 F	Er elsertifikatene grønne? En analyse av samspillet mellom det svensk-norske elsertifikatmarkedet og det europeiske kvotemarkedet
Røed, Tiril Salhus		Hoel, Michael	2014 F	Klimagassutslipp og subsidiering av fornybar Energi: En numerisk analyse av klimagevinst ved innføring av grønne sertifikater
Salvesen, Ingerid		Wilhite, Harold Langford	2014 F	Practicing the preaching?: A study of the Transition Movement in Norway and its effort to change energy-related practices
Sletten, Thea Marcellia Syrstad, Ragnhild Sjoner	CREE	Hoel, Michael Golombek, Rolf and Müller, Andreas	2012 F 2016 F	<a href="#">A Framework for Studying the Environmental Impact of Biofuel Policies</a> <a href="#">Climate and Energy Security Policies in the EU: Conflict or Cohesion?</a>
Valseth, Asmund Sunde Velten, Cassandra	CREE CREE	Harstad, Bård Greaker, Mads	2014 M 2017 M	<a href="#">Competing Climate Policies</a> <a href="#">Network effects and excess inertia: Do Carbon Capture and Storage Technologies Suffer from Technology Lock-In?</a>
Verlo, Kjell Rune	CREE	von der Fehr, Nils-Henrik M.	2015 M	<a href="#">Is low carbon taxation optimal climate policy for a developing country? A numerical simulation of technology adoption</a>
Vik, Martin Andreas		von der Fehr, Nils-Henrik M.	2012 M	Node- eller soneprising i kraftmarkeder: Hvilket markedsdesign løser best markedsrett ved flaskehals?
Weidle, Maiken Katrine	CREE	Greaker, Mads and Nyborg, Karine	2014 F	<a href="#">Is low carbon taxation optimal climate policy for a developing country? A numerical simulation of technology adoption</a>
Weyer, Ingrid Semb	CREE	Greaker, Mads	2015 F	<a href="#">Directed technical change in clean and dirty technologies: Is it possible to redirect R&amp;D in a multiregion world?</a>

## A2 Statement of Accounts

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(All figures in 1000 NOK)

### Funding

	Amount
The Research Council	6 945
<b>Research Partners (own funding)</b>	
Frisch Centre (Host Institution)	6 587
Statistics Norway	6 869
Department of Economics, UoO	1 000
Tilburgs Sustainability Center	250
<b>User partners</b>	
Statkraft Energy AS	100
Statnett	250
<b>Public partners</b>	
University of Oslo	500
<hr/>	
<b>Total</b>	<b>22 501</b>

### Costs

#### Research Partners

Frisch Centre (Host Institution)*	10 661
Statistics Norway	9 070
Department of Economics, UoO	1 000
Tilburgs Sustainability Center	500
Centre for Development and the Environment, UoO	600
The Faculty of Law - Natural Resources Law, UoO	170
Institute for Energy Technology (IFE)	500

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<b>Total</b>	<b>22 501</b>
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\* Includes transfer to other research institutions as TØI and OsloMet from other project than NFR 209698

## A3 Publication

<http://www.cree.uio.no/publications/>

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### Journal papers

**Andersen J.J., M. Greaker (2018):**

Emission Trading with Fiscal Externalities: The Case for a Common Carbon Tax for the Non-ETS Emissions in the EU

[\*Environmental and Resource Economics\*](#),

Vol. 71, Issue 3, pp. 803-823, 2018.

**Baldursson, F.M. and N.-H. M. von der Fehr (2018):**

Natural resources and sovereign expropriation

[\*Journal of Environmental Economics and Management\*](#),

Volume 92, November 2018, Pages 580-607

**Baldursson, F. M., E. Lazarczyk, M. Ovaere and S. Proost (2018):**

Cross-Border Exchange and Sharing of Generation Reserve Capacity

[\*The Energy Journal\*](#),

Vol. 39(4), pp. 57-84.

**Bjørnebye, Henrik, C. Hagem and A. Lind (2018):**

Optimal location of renewable power

[\*Energy\*](#),

Vol 147, 1203-1215

**Bye, B., T. Fæhn and O. Rosnes (2018):**

Residential energy efficiency policies: Costs, emissions and rebound effects

[\*Energy\*](#),

Vol 143, 191-201

**Bye, B., M. E. Klemetsen (2018):**

The Impacts of Alternative Policy Instruments on Environmental Performance: A Firm Level Study of Temporary and Persistent Effects

[\*Environmental and Resource Economics\*](#),

Vol 69, Issue 2, pp 317-34

**Bohringer, C., Rosendahl, K.E., and Schneider, J. (2018):**

Unilateral Emission Pricing and OPEC's Behaviour

[\*Strategic Behavior and the Environment\*](#),

now publishers, vol. 7(3--4), pages 225-280, February.

**Dengler S., R. Gerlagh, S. T. Trautmann, G. van de Kuilen (2018):**

Climate policy commitment devices

[\*Journal of Environmental Economics and Management\*](#),

Volume 92, November 2018, Pages 331-343

**Drupp, M., M. Freeman, B. Groom, R. Nesje (2018):**

Discounting Disentangled

[\*American Economic Journal: Economic Policy\*](#),

American Economic Journal: Economic Policy

**Fischer, C., M. Greaker and K.E. Rosendahl (2018):**

Strategic technology policy as a supplement to energy standards

[\*Resource and Energy Economics\*](#),

Vol 51, 84-98

**Gerlagh, R., van den Bijgaart, I., H. Nijland, and T. Michielsen (2018):**

Fiscal policy and CO2 emissions of new passenger cars in the EU

[\*Environmental and Resource Economics\*](#),

69(1): 103-134

**Hauge, K.E., K.A. Brekke, K. Nyborg, J.T. Lind (2018):**

Sustaining cooperation through self-sorting: The good, the bad, and the conditional

[\*Proceedings of the National Academy of Sciences\*](#),

**Klemetsen M. E., B. Bye and A. Raknerud (2018):**

Can Direct Regulations Spur Innovations in Environmental Technologies? A Study on Firm-Level Patenting

[\*Scandinavian Journal of Economics\*](#),

Vol 120, Issue 2, pp 338-371

**Kverndokk, S. (2018):**

Climate Policies, Distributional Effects and Transfers Between Rich and Poor Countries

[\*International Review of Environmental and Resource Economics\*](#),

Vol. 12: No. 2-3, pp 129-176.

**Leroux, J. and D. Spiro (2018):**

Leading the unwilling: Unilateral strategies to prevent arctic oil exploration

[\*Resource and Energy Economics\*](#),

Vol. 54. page 125-149

**Lindholt, L. and S. Glomsrød (2018):**

Phasing out coal and phasing in renewables - Good or bad news for arctic gas producers?

[\*Energy Economics\*](#),

70: 1-11.

**Nyborg, K (2018):**

Social Norms and the Environment

[\*Annual Review of Resource Economics\*](#),

Vol. 10:405-423 , Oct 2018

**Skjerpen, T., Storrøsten, H.B., Rosendahl, K.E. and P. Osmundsen (2018):**

Modelling and forecasting rig rates on the Norwegian Continental Shelf.

[\*Resource and Energy Economics\*](#),

53, 220-239.

## **CREE working paper**

[http://www.cree.uio.no/publications/CREE\\_working\\_papers/](http://www.cree.uio.no/publications/CREE_working_papers/)

**Bye, B. K. Espegren, T. Fæhn, E. Rosenberg, O. Rosnes (2018):**

Energy technology and energy economics: Analyses of energy efficiency policy in two different model traditions

[CREE WP](#), No. 01/2018

**Storrøsten, Halvor (2018):**

Regulation of markets with sluggish supply structures

[CREE WP](#), No. 02/2018

**Nesje, F., D. Lund (2018):**

Risikojustering av kalkulasjonsrenta i samfunnsøkonomiske analysar

[CREE WP](#), No. 03/2018

**Khan, Ahmer Zaman (2018):**

Why Say No to Solar Energy? - An Exploration of Residential Reluctance towards Solar Energy

[CREE WP](#), No. 04/2018

**Fæhn T. et. al. (2018):**

Parisavtalen og oljeeksporten

[CREE WP](#), No. 05/2018

**Lorentzen, Linnea (2018):**

Grønn teknologi eller klimakrise: En teoretisk studie med to stokastiske terskler

[CREE WP](#), No. 06/2018

**Harstad, Bård (2018):**

Pledge-and-review bargaining

[CREE WP](#), No. 07/2018

**Aune F. R. and R. Golombek (2018):**

Carbon prices are redundant in the 2030 EU climate and energy policy package

[CREE WP](#), No. 10/2018

**Crampes C. and N.-H. M. von der Fehr (2018):**

Decentralised Cross- Border Interconnection

[CREE WP](#), No. 11/2018

**Kverndokk S. (2018):**

Climate Policies, Distributional Effects and Transfers Between Rich and Poor Countries

[CREE WP](#), No. 12/2018

**Segiet, Katarzyna (2018):**

Should the Norwegian commercial transport sector be subsidized?

[CREE WP](#), No. 13/2018

## Other publications

<http://www.cree.uio.no/publications/>

**Banet C. (2018):**

Prosumers regulation in Norway: a First Step for Empowering Small Energy Consumers  
*in Roggenkamp and Banet (eds.)*

European Energy Law Report XII, Intersentia, 2018, Chapter 8, ISBN 9781780686721

**Fæhn, T. and P. E. Stoknes (2018):**

Significant and plausible futures - Global surroundings of Norway's climate strategies

*Rapporter*

2018/2 Statistisk sentralbyrå

**Fæhn, T., G. Asheim, M. Greaker, C. Hagem, B. Harstad, M. Hoel, D. Lund, K. Nyborg, K. E. Rosendahl, H. Storrøsten (2018):**

Parisavtalen og oljeeksporten

*Samfunnsøkonomen*

Nr 3 2018

**Fæhn, T., G. Asheim, M. Greaker, C. Hagem, B. Harstad, M. Hoel, D. Lund, K. Nyborg, K. E. Rosendahl, H. Storrøsten (2018):**

Parisavtalen og oljeeksporten

*Energi og klima*

21.6.18

**Hoel, M. (2018):**

The Rise and Fall of Bioenergy

*CESifo Working Paper*

No. 6971

**Karp L. S. C. Traeger (2018):**

Prices versus Quantities Reassessed

*CESifo Working Paper*

No. 7331

**Nesje, F., D. Lund (2018):**

Risikojustering av kalkulasjonsrenta i samfunnsøkonomiske analysar

*Samfunnsøkonomen*

Nr 4 2018

**Nyborg, K. (2018):**

Skriftlige kommentarer til Vismandsrapporten Økonomi og miljø 2018

*Danmarks Miljøøkonomiske råd. 2018*

s. 251-253

**Searchinger, T. D., T. Beringer, B. Holtsmark, D. M. Kammen, E. F. Lambin, W. Lucht, P. Raven, and J.-P. van Ypersele (2018):**

Europe's renewable energy directive poised to harm global forests

[\*Comment, Nature Communications\*](#)

Nature Communications, 9 (1):3741

**Weitzman, M. L. and B. Holtsmark (2018):**

On the effects of linking voluntary cap-and-trade systems for CO2 emissions

[\*Discussion Papers\*](#)

No. 883 2018, Statistisk sentralbyrå

## Conference and seminar presentations

<http://www.cree.uio.no/outreach/presentation/>

<b>Forfattere</b>	<b>Tittel</b>	<b>Sted, dato</b>
Baldursson, Fridrik M., Ewa Lazarczyk, Marten Ovaere and Stef Proost	Cross-Border Exchange and Sharing of Generation Reserve Capacity	Seminar at the Frisch Centre, University of Oslo, 13 February 2018
Banet, Catherine	Utenlandsk deltagelse i nasjonale kapasitetsmekanismer: en juridisk analyse	Seminar om kapasitetsmekanismer, arrangert av FME CREE, Nordisk Institutt for Sjørett og Forskergruppen for naturressursrett, 7. juni 2018, Oslo, Norge
Fæhn, Taran	Og i bakgrunnen truar klimapolitikken	Oljerikdom, klimapolitikk og økonomisk utvikling: Kva kan me lære av forskinga?, Universitetet i Stavanger, 17.10.18.
Fæhn, Taran	Og i bakgrunnen truar klimapolitikken	Oljenæringa – Oppgang eller undergang?, Debatt, Kåkånomics-festivalen, 17.10.18
Fæhn, Taran	Supply side policies under the Paris regime - (still) a good idea?	2nd International Conference on Fossil Fuel Supply and Climate Policy, Oxford, 24.09.18
Fæhn, Taran	Supply side policies under the Paris regime - (still) a good idea?	Avdelingsseminar, Holmen fjordhotell 4. mai 2018
Fæhn, Taran	Supply side policies under the Paris regime - (still) a good idea?	Forskermøtet 2018, NHH, Bergen, January 4. 2018
Fæhn, Taran	Global surroundings of the climate strategy of a small coalition	ECOMOD Conference, July 3.-6.18, Venice
Fæhn, Taran	Virkninger for Norge hvis EU når sine energi- og klimapolitiske 2030-mål	Paneldebatt brukerseminar CREE-CICEP, Litteraturhuset 19.april 18
Fæhn, Taran og Catherine Hagem	Framskrivninger på SSBs generelle likevektsmodeller for norsk økonomi	Workshop NVE, 26. februar 2018

Fæhn, Taran	Energy & environment - workshop break-out group	Facilitator, GTAP Workshop "Shaping long-term baselines with CGE models" OECD, Paris, 24.-26.1.18, OCED, Paris
Golombek, Rolf	Economic Analysis of Energy Markets.	LUCS Summer School 2018: Future Energy Information Network, sept 2018.
Golombek, Rolf	Should environmental R&D be supported more than other R&D projects?	Nasjonalt forskermøte for økonomer, Bergen, januar 2018
Golombek, Rolf	Should environmental R&D be supported more than other R&D projects?	Italian Association for Environmental and Resource Economists, 6 <sup>th</sup> annual conference, Torino, februar 2018
Golombek, Rolf	Should environmental R&D be supported more than other R&D projects?	6th World Congress of Environmental and Resource Economists, Gøteborg, juni 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	BEEER, Bergen, april 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	Oslo Energy Transitions Workshop, april 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	The first Nordic Electricity Market Research Forum, mai 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	Florence School of Regulation Climate Annual Conference, november 2018
Golombek, Rolf	Investment in electricity technologies under climate policy uncertainty - is R&D in backstop power supply under-provided? 41 <sup>st</sup> IAEE International Conference, Groningen, juni	41st IAEE International Conference, Groningen, juni 2018
Golombek, Rolf	Fremskrivninger av konsum ved bruk av modellenn LIBEMOD	Workshop NVE, 26. februar 2018
Golombek, Rolf	Økonomiske virkninger av EUs energi- og klimapolitikk	CICEP-CREE brukerseminar, april 2018

Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	OED, juni 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	NVE, juni 2018
Golombek, Rolf	Allocation of wind and solar capacities in a green Europe	Statkraft, juni 2018
Greaker, Mads	The future of biofuels for transport	Dual plenary presentation at IAEE Gröningen, Nederland, juni 2018
Greaker, Mads	The implication of different charging stations for market uptake of EVs	Presentation at World Conference of Environmental and Resource Economists, juni 2018
Greaker, Mads	Global impacts of Nordic climate policies	Presentation at Energy Transition work-shop, Tampere, Finland, oktober 2018
Greaker, Mads	Global impacts of Nordic climate policies	Presentation at Nordic Economic Policy Review Conference, Stockholm, Sverige, oktober 2018
Greaker, Mads	The implications of vehicle-to-grid for the electricity market and the roll-out of EVs	Presentasjon på NAEE, Oslo, desember 2018
Grimsrud, Kristine M	Ikke-markedsverdsetting og vindkraft	Den Norske Turistforening, juni 2018
Hagem, Catherine	Windland, et forskningsprosjekt om Økonomi versus miljø – Hvordan kan konfliktene håndteres?	NVEs Vinkraftseminar, Drammen 11-12 juni 2018.
Hagem, Catherine	Optimal battery size for EV and storage services to the grid	Workshop Holmen Fjordhotell, Oslo, Norway, April 23-25, 2018.
Hagem, Catherine	Vehicle to grid; Impacts on electricity markets and the consumer costs of EVs.	CREE Workshop, 15-16 November, Statistics Norway

Hauge, Karen	The Good, the Bad, and the Conditional: Sustaining Cooperation through Self-Sorting	ESA World Meeting, June 29-July 1, Berlin. 2018
Hoel, Michael	The rise and fall of bioenergy.	SURED, Ascona, Sveits, juni 2018
Holtsmark, Katinka	Supply-side climate policy in Norway	Nordic Economic Policy Review Conference. Stockholm, Sweden. 2018
Holtsmark, Katinka, Kristoffer Midttømme	The dynamics of linking permit markets	Women in Economics Mentoring Retreat. Cologne, Germany. 2018
Holtsmark, Katinka, Kristoffer Midttømme	Public goods provision and strategic delegation	EEA-ESEM conference. Cologne, Germany. 2018
Holtsmark, Katinka, Kristoffer Midttømme	The dynamics of linking permit markets	Frontiers of research on carbon markets (WCERE pre-congress event). Gothenburg, Sweden. 2018
Kittelsen, Sverre A. C.	Tilpasning av LIBEMOD til problemstillinger i Electrans, Electrans brukerseminar	SSB Okt 2018
Kverndokk, Snorre	Klimamigrasjon, lunsjseminar	Finansdepartementet, 8. januar. 2018
Kverndokk, Snorre	Økonomiske studier av lønnsomhet for CCS: En gjennomgang av CREE-arbeider	Presentasjon på seminar om samfunnsvitenskap og CO2 håndtering i Norges Forskningsråd, 7. mars. 2018
Kverndokk, Snorre	Would my driving habits change if my neighbor were to buy an emissions-free car? Unintended effects of environmental policies	Presentasjon på Klekkenseminar, Frischsenteret, Son Spa, 31. mai. 2018
Kverndokk, Snorre	Would my driving habits change if my neighbor were to buy an emissions-free car? Unintended effects of environmental policies	SURED conference, Ascona, Switzerland, 3-7 June. 2018

Kverndokk, Snorre	Correcting the climate externality: Pareto improvements across generations and regions	Conference on “Incidence of Climate Change and Climate Policies”, Oldenburg, Germany, 19-22 June. 2018
Kverndokk, Snorre	Would my driving pattern change if my neighbor were to buy an emissions-free car?	World Congress of Environmental and Resource Economists, Gothenburg, Sweden, 25-29 June. 2018
Kverndokk, Snorre	Would my driving pattern change if my neighbor were to buy an emissions-free car?	Department of Business and Management Science and the ENE Centre, NHH Norwegian School of Economics, 2018
Kverndokk, Snorre	Hvordan påvirkes de som kjører bensin og dieselbil av politikken for å fremme elbiler?	Brukerseminar ELECTRANS, SSB, 30. oktober. 2018
Kverndokk, Snorre	Would my driving pattern change if my neighbor were to buy an emissions-free car?	CREE workshop, Statistics Norway 15-16 November. 2018
Kverndokk, Snorre	Verdsetting av klimaskade i FN's klimapanelers (IPCC) rapporter	CREE dialogseminar - Verdsetting av miljøkonsekvenser for fornybar energiproduksjon, Forskningsparken, 20. november. 2018
Lind, Arne	The role of biofuels in IEA's 2 degree scenarios	WCERE 2018 - 6th World Congress of Environmental and Resource Economists, Gothenburg, Sweden.
Nyborg, K. (with K.A. Brekke, K.E. Hauge, J.T.Lind)	The Good, the Bad and the Conditional: Sustaining Cooperation through Self-Sorting	World Congress of Environmental and Resource Economics, Göteborg, Jun 2018
Nyborg, K. (with K.A. Brekke, K.E. Hauge, J.T.Lind)	The Good, the Bad and the Conditional: Sustaining Cooperation through Self-Sorting	Research seminar, Grantham Institute, London School of Economics, Mars.18.
Nyborg, K. (with K.A. Brekke, K.E. Hauge, J.T.Lind)	The Good, the Bad and the Conditional: Sustaining Cooperation through Self-Sorting	Arthur M. Sackler Colloquium of the National Academy of Sciences: Economics, Environment, and Sustainable Development, Irvine, CA, Jan. 2018

Rosendahl, Knut Einar	Effekter av miljøpolitikk	Foredrag på fagseminar i Samfunnsøkonomi, Oslo. 16 april 2018
Rosendahl, Knut Einar	Kan teknologipolitikken redde klimaet?	Foredrag for Unge Venstre, Oslo. 9 mai 2018
Rosendahl, Knut Einar	The future of Russian gas exports to the European market	Presentasjon på dual-plenary sesjon på IAEE-konferanse, Groningen. 13 juni 2018
Rosendahl, Knut Einar	Smart hedging against carbon leakage	Keynote presentasjon på Subconference in Environmental Economics ved IRMBAM-2018, IPAG Business School, Nice. 5 juli 2018
Rosendahl, Knut Einar	Parisavtalen og oljeeksporten	Foredrag for miljøøkonomiseksjonen i Miljødirektoratet. 27 august 2018
Rosendahl, Knut Einar	Parisavtalen og oljeeksporten	Foredrag for Bellona. 11 september 2018
Rosendahl, Knut Einar	Parisavtalen og oljeeksporten	Foredrag for UDs Aspirantprogram. 26 september 2018
Rosendahl, Knut Einar	Parisavtalen i et samfunnsøkonomisk perspektiv	Foredrag på møte i Tekna. 31 oktober 2018
Wethal, Ulrike	Household interviews: Understanding disadvantages, costs and willingness to pay in relation to power outages	CREE lunch. Frischsenteret, Oslo, Norway.

## **CREE in the media**

<http://www.cree.uio.no/outreach/news/in-the-news/>

### **Mener regjeringens drøm om klimavennlig biodrivstoff er en illusjon**

Brukt frityrolje, slakteavfall og skogsavfall skal redde norsk biodrivstoffpolitikk fra regnskograserende palmeolje, håper regjeringen. Men heller ikke dét er bærekraftig, advarer forskere.

Blant flere uttrykker CREE forsker Bjart Holtmark (SSB) bekymring til hva som brukes til å lage biodrivstoff.

[NRK 28 nov. 2018](#)

### **Norge kan hindre kappløp om pol-oljen**

Norsk utsettelse av oljeleting i Arktis vil redusere investeringer i teknologi for oljeboring der. Da blir oljeutvinning i andre arktiske land mindre lønnsomt.

Innlegg av forsker J. Leroux (HEC Montreal) og CREE forsker D. Spiro (Uppsala Universitet og OsloMet)

[Dagens Næringsliv 24 november 2018](#)

### **Teknologi for en troverdig klimaavtale**

Parisavtalen er ikke bindende. For at den likevel skal være troverdig, må vi investere mer i grønn og mindre i brun teknologi.

Kronikk av CREE forsker Bård Harstad (UiO)

[Dagen Næringsliv 23 november 2018](#)

### **Nobelprisen i økonomi 2018:**

#### **Prisvinnerne bringer oss nærmere en løsning for global bærekraftig vekst**

Paul Romer og William Nordhaus får prisen for å integrere teknologisk utvikling og klimaendringer inn i langsiktige makroøkonomiske analyser. Årets Nobelpris i økonomi er eksternalitetenes Nobelpris.

[forskning.no 28 oktober 2018](#)

### **Fæhn: - Om kutt i oljeproduksjonen og klima**

CREE forsker Taran Fæhn (SSB) intervjuetom artikkelen «[Parisavtalen og oljeeksporten](#)» publisert i «Samfunnsøkonomen 3/2018».

[Stavanger Aftenblad 17 oktober 2018](#)

### **Debatt: Er oljekutt god klimapolitikk?**

I artikkelen [Parisavtalen og oljeeksporten](#) i Samfunnsøkonomen 3/2018 drøfter 10 CREE forskere sentrale fagøkonomiske argumenter for å begrense oljeutvinningen som en del av klimapolitikken. Etter denne artikkelen har det foregått en debatt i flere mediaer. Her fra Dagens Næringsliv og Teknisk Ukeblad om dette temaet.

[Debatt i Dagens Næringsliv](#)

### **Can public policy spur innovations in environmental technologies?**

by [Brita Bye](#), [Arvid Raknerud](#) and Marit E. Klemetsen

Environmentally friendly technologies are an important example of an area where innovations have a high social value, but where markets would be scarce – or even absent – without public interventions. In our article “[Can direct regulations spur innovations in environmental technologies? A study on firm-level patenting](#)” we address this timely question and find that such public policies indeed encourage innovation in environmentally friendly technologies. [Blog on OSIRIS May 23, 2018](#)

### **Hva skal vi med kvotemarkedet?**

CREE forsker Michael Hoel blir intervjuet om kvotemarkedet for CO2 og hva noe av fordelene er ved at prisene nå stiger. Hoel er professor emeritus på Universitetet i Oslo. [ENERGI og KLIMA 17 april 2018](#)

### **Øk avgiften på elbil, ikke bensinbil**

Elbiler og andre lav- og nullutslippsbiler bør ha høyere engangs- og årsavgift enn bensin- og dieslbiler. Høyre-landsmøtet bør avvise avgiftshopp for «fossilbiler».

[Dagens Næringsliv 7 april 2018](#)

### **Faktisk.no: Nei, Norge sponser ikke elbileiere med 40 milliarder i året**

CREE forsker Bjart Holtmark (SSB) er med på å vurdere om påstanden "Norge sponser elbileiere med 40 milliarder i året" er riktig.

[Faktisk.no 27 mars 2018](#)

### **Total avvising av oljekutt**

I en meningsytring i Dagens Næringsliv 9 mars uttrykker CREE forsker Knut Einar Rosendahl (NMBU) savn etter forskningsbelegg for påstanden om at norsk oljekutt er "Ren ekstremisme". Denne påstanden ble gitt av toppsjefen i oljeselskapet Total Patrick Pouyanné i DN 7 mars.

[Dagens Næringsliv 7 mars 2018](#)

[Dagens Næringsliv 9 mars 2018](#)

### **Bygges ut på "feil" sted**

I et intervju i Finansavisen beskriver CREE forsker Cathrine Hagem (SSB) noe av problemet ved at vindmøller i Norge blir plassert etter privatøkonomiske incentiver og ikke samfunnsøkonomiske.

- [Til forskningsartikkel](#)

- [Til norsk sammendrag](#)

[Finansavisen 24 februar 2018](#)

### **Hevder feil tall overdrev oljeinntekter med 170 milliarder**

- Oljen og gassen i Barentshavet framstår mer verdifull enn den faktisk er, hevder CREE forskerne Mads Greaker (OsloMet) og Knut Einar Rosendahl (NMBU). Terje Søviknes og Ola Borten Moe er ikke enig.

[Dagbladet 9 februar 2018](#)