

February 2015

## **Strategic Plan for CREE – Oslo Centre for Research on Environmentally friendly Energy: 2015-2019**

This strategic plan is intended as a long-term management document for CREE for the final five years of activity, i.e., from summer 2015 to summer 2019, given that CREE get funding for the last three years (2016-19). It is based on the Strategic Plan for 2011-2014 which is an appendix to this plan. The Strategic Plan for 2011-2014 is still the underlying document, and the board has extended this plan to summer 2015. The new plan will, therefore, mainly evaluate the first period, describe strategies for improvements and the changes in research organization and focus for the last years.

### **1. Vision**

As stated in the Strategic Plan for 2011-14, the centre has the following vision for its entire period:

- We want to be a leading international research centre within energy, environmental and resource 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.

### **2. The footprint of CREE**

Based on the vision above, the plan is that CREE research will make footprints after 2019 both when it comes to the research community and for the society at large.

CREE researchers have published extensively in leading field journals as well in general economic journals. We hope that these contributions will have an impact on research also after 2019 by contributing to the future research agenda.

CREE participates broadly in the public debate on climate and energy issues. Our expectations is that this will have an influence on Norwegian energy and climate policy, and that we will contribute to a better understanding of energy and climate issues in the general public. We also believe that the novel insight achieved by our research will help industry in making better decisions for instance decisions that can help us in the transformation to a carbon free society, which is required at the end of this century if the two degree target should be reached (see the latest IPCC assessment reports).

### **2. Achievements of the first 3 years of CREE**

Since the start of the centre in 2011, we have made progress in several areas that we think are important for expanding the knowledge base in the field:

- Better collaboration between the research partners
- Better contact with users
- More multidisciplinary collaboration
- More media activity
- Made new contributions to PhD courses
- Improved the quality of research

The collaboration between the research partners has become very close since the start of the centre in 2011. The Norwegian research partners – and in several cases also the Dutch - collaborate on most research proposals, papers and seminars. The annual research workshop is a meeting place for all national and international researchers who are connected to CREE as partners and subcontractors. The collaboration with users is also much more organized, fruitful and concrete than before due to the regular meeting places. For instance, several Norwegian ministries and agencies have during the recent years made use of our competence.

As we have several subcontractors connected to CREE, we have also much more contact and collaboration with other disciplines, such as technology researchers (IFE and SINTEF Energy), social anthropologists (SUM) and law (University of Oslo). We have also given PhD courses at multidisciplinary research schools, and we are very active in the media, including interviews, debates and chronicles, as much of our research is policy relevant.

The quality of our research publications has increased measured by the quality of journal publications. While most research in energy- and environmental economics are published in field journals, we have been successful in publishing in general economic journals as well as the top 5 economic journals. Examples of the first category are *Scandinavian Journal of Economics*, *European Economic Review*, *Journal of the European Economic Association*, while examples of the latter category is *American Economic Review*, *Review of Economic Studies* and *Journal of Political Economy*. In addition we have also published several papers in the highest ranked field journals such as *Journal of Environmental Economics and Management*.

New models are developed that are important for our research. These include the energy market model LIBEMOD, the petroleum market model PETRO2, and a series of general equilibrium models SNoW.

Based on this, we think we are closer to the primary aims of providing better knowledge in the debate on climate and energy issues, and to be a leading international research centre. However, there are also areas of improvements, which will be the focus of this strategic plan.

### **3. Areas for strategic improvement and adjustments for the final period**

There are two areas that can be improved for the final period; user involvement and multidisciplinary cooperation.

#### *3.1 User partner involvement*

CREE has user partners from both governmental bodies and industry. The communication with the user partners takes place through different channels such as regular user partner conferences, seminars and workshops, the Model Forum where modelling of energy markets

and environmental/technological policy tools are discussed, meetings and joint research proposals. In addition to this, our research, media activity, seminars etc. are documented on our webpage ([www.cree.uio.no](http://www.cree.uio.no)).

The user partners are mainly involved in strategy work and annual work plans through the board of CREE, where two of the board members come from the user partners, and through input to our research at seminars and meetings.

User partners contribute to our research by supporting data and information that are implemented in our economic models, comment on the relevance of our research, and also hopefully through joint projects. The policy of the Research Council of Norway is to include user partners from industry and governmental agencies in Knowledge-building Projects for Industry (KPN) by letting industry fund parts of the project and also contribute to the research questions. This is one of the priorities for CREE in the coming years.

It is hard for user partners to be directly involved in our research as this requires experience with methodologies and knowledge of economic theory that most of our user partners do not have. Thus, we do not have mutual personnel mobility between user partners and research institutions.

Several users have access and actively use our research, methodology competence and analyses. They are not formal user partners, either because they do not want to be associated with single FMEs or because they establish and maintain relations with the CREE centre in other ways. Examples are ministries (FIN, KLD), Office of Auditor General of Norway and the statistical production at Statistics Norway.

Our experience for the first four years is that the contact between researchers and user partners has not been as good as expected. The communication channels may not be good enough, and we experience that the main channel of information about research, seminars and media activity, namely the webpage ([www.cree.uio.no](http://www.cree.uio.no)) is not often used by user partners. While some of the user partners have been quite active at seminars and meetings and have been interested in organizing CREE seminars, other user partners have been more passive. User partners have only to a small degree initiated joint projects or suggested research topics, and we have not been able to establish KPN projects.

The picture is not only negative. We have been successful in establishing fruitful connections and mutual gains with ministries and other public agencies. Our research is policy relevant and applicable for policymakers, as we contribute to Governmental reports, IPCC, hearings, meetings, seminars etc. However, we have not yet achieved the same level of mutual gains/synergies in relations with industry partner companies. One reason may be that a large part of the topical research ideas and knowledge gaps in social sciences are not particularly relevant for private companies. Examples of this may be policy choices from a social point of view and typically takes the perspective of policy makers. However, there are areas that should be relevant for industry partners, such as analysis of markets, decisions under uncertainty and effects of policy measures for different sectors.

### *3.2 Strategies to strengthen user involvement*

CREE has organized several seminars at the user partners and other stakeholders. However, most of these seminars have been organized for governmental bodies. In the final years the

aim is to give seminars for the user partners that have not been on the list yet. Thus, this also includes industry partners.

We will continue to have communication with the user partners at our regular user partner seminars and conferences. Our experience has been that user partners have been satisfied with these meeting places.

To improve the contact with user partners, one possibility is to establish a user partner contact at CREE, who has the main responsibility for the contact. So far, the responsibility for the user partner contact has been with the centre director, who also is responsible for all the other activities at the centre. A user partner contact may be able to spend more time on improving the contact between users and researchers.

In addition to this, one possibility could be that a CREE researcher visits the user partners for a certain time period. This will give possibilities for mutual exchange of ideas that may also lead to research projects.

One feedback from user partners is that our research is a bit hard to access. To improve this, from 2015 we have started to include a popular summary in Norwegian for all our working papers published in the CREE working paper series.

The information on new research should improve. The plan is to send out e-mails on new research four times a year to all followers of CREE research including user partners.

To improve user involvement in research, we think that the best way of doing this is to apply for funding from Knowledge-building Projects for Industry (KPN) at the Research Council of Norway (RCN). We have invested much effort in building networks and creating suitable projects for this purpose, and have involved users in many projects and project proposals, but so far we have not succeeded to establish a full KPN with 20% funding from users, whereof minimum 10% funding from a private company. We will continue working to try to involve industry in KPN projects in the future.

### *3.3 Multidisciplinary cooperation*

The second area that can be improved is the multidisciplinary cooperation. CREE has several user partners from different that contribute to the research in several of the research packages. In WP1, we have cooperation with political scientists at CICEP as climate negotiations and treatments are of special focus in both centres. The technology institutes have mainly contributed to the numerical modeling of energy markets (WP2 and WP5), while social anthropologists are involved in evaluation of policy measures (WP4). We have also been successful in starting a new cooperation with psychologists, particularly on experiments and behavioral economics. We also have lawyers as subcontractors, and we have got funding for a project (ENERGIX) where we will have close collaboration with them. Efforts taken to strengthen links between the different fields have mainly resulted in applications for joint research projects. Much effort has been spent on this the last few years.

When it comes to cooperation with other FMEs, our main contact is CICEP. This is mainly due to common research subjects as well as geographical proximity. We coordinate with CICEP our annual user conference that is held in April every year. Some research cooperation has been undertaken, and we have submitted several research proposals to the Research

Council of Norway. Further, we contribute to the research school of all the FME centres; NORREN, and we have organized several workshops with CenSES on numerical energy market models with the aim of establishing closer contacts. Note that our subcontractors IFE and SINTEF Energy are also partners in CenSES.

However, while we have a closer contact with other fields through our subcontractors, we still could improve our collaboration by writing joint papers.

### *3.4 Strategies to improve multidisciplinary cooperation.*

Economics in itself is in many ways an interdisciplinary field as it uses methodologies from mathematics and statistics. In addition to this it also uses knowledge from different fields when studying for instance behavior, ethical questions and innovation. However, funding from RCN often requires multidisciplinary cooperation to be successful in research proposals, and not interdisciplinary approaches. This means that researchers from other fields than economics should also be included in the proposal to be successful.

Multidisciplinary research is a process that takes time. The best way of having a multidisciplinary cooperation is to involve subcontractors in research proposals, and this will be the strategy for the coming years. Being involved in a specific project requires much more direct contact than just presenting at the same seminars.

## **4. Challenges for the final period**

We see two main challenges for the final period; the potential tradeoff between **research that may be useful for users** and academic research, and the possibilities for funding.

### *4.1 The potential tradeoff between user relevant and academic research*

The first challenge is the potential conflict between internationally relevant social scientific knowledge gaps and the knowledge needs of domestic stakeholders. To be a leading international research centre, we need to show our competence by publishing in leading international research journals. This requires research that is quite general in its analysis and the methodologically used should be transparent. Also, this requires a lot of time to be spent on analyses that may not necessary change the conclusions of the work, for instance to make elegant formal proofs, to do many empirical tests and to run several sensitivity analyses. On the other hand, stakeholders often demand more detailed analysis that are not necessary interesting for a broader research audience, and may also not have the competence to go into detail about the methodology. They may not also be willing to fund the time that is necessary for good academic journals. Such reports may be harder to publish in good journals. There are of course exceptions to this. Econometric works are based on real data and may be useful to users. Top journals also publish a high number of econometric papers. Pure theoretical papers, on the other hand, are also published in these journals, but are probably of less interest to users.

### *4.2. Strategies to meet the potential tradeoff between user relevant and academic research*

As mentioned above, being a leading academic research institution may be hard to combine with doing applied research that may be considered relevant for users. The best way to meet

both requirements may be to divide our portfolio in different projects such as research projects, KPN and Governmental reports. Thus, this means that we should be active in applying from different sources of funding. We think that the strategies mentioned under paragraph 3.2 above may help to be successful in this.

#### *4.3 The possibilities for funding*

The main challenge for CREE is the external funding for the final period. Funding for environmental and resource economics (and in general funding for social science on environmental and energy projects) seems to follow cyclical fluctuations. Our external funding from the Research Council of Norway has decreased, and we experience that we have less success with our research proposals than we had when the centre started (from an acceptance rate of about 50% to 10-20%). This is particularly true for climate research, while the success rate has been higher for energy research. In our opinion this is not due to a lower relative quality of our research, rather the following aspects may be relevant:

- There has not been a real increase in funding of climate and energy research
- More disciplines than before compete for these funds
- Calls for research proposals are much more specific than before (e.g., ENERGIX)
- There has been much more focus on technology in the calls
- A larger proportion of the announced funds require co-funding from industry, which makes it harder for social science research
- One main objective of the research policy in Norway is that research should be industry relevant and increase industry competitiveness.

Based on the lack of external funding, the number of CREE working papers has been significantly reduced from 2013 to 2014. The lower activity follows from the fact that more time is devoted to writing research proposals, and that some of our researchers have also started working in other fields. Thus, a big challenge for the centre is to ensure a stable funding of our activities.

#### *4.4 Strategies to increase external funding*

As our funding from RCN has declined over the last few years, CREE should actively apply from funding from other sources. KPN has been mentioned already. In addition to this, we should search for international funding from for instance the EU and Nordic Energy Research. Important steps have already been taken in this direction as we will coordinate a proposal to HORIZON 2020 and has submitted a preproposal to the Nordic Energy Research Flagship projects. We will continue to work on this in the final period of CREE.

### **5. Strategies for the research subjects and work packages**

Much of the state-of-the-art of the research topics for the centre is described in the latest IPCC assessment report working group III: Mitigation of Climate Change, which was published in 2014, and where several CREE researchers were involved. In brief, this report states that we have a carbon budget if we want to limit the concentration of greenhouse gases (GHGs) at a level that fulfills the 2 degree target; we need to reach a carbon free society at the end of this century. One important challenge is that emissions are increasing fast in upper middle income countries, countries that so far have limited regulations on GHG emissions and are not included in the Kyoto Protocol. Global poverty reduction has led to higher GHG emissions.

However, 40-70 % reductions in GHG emissions are necessary by 2050 if we want to be on track for the 2-degree target, meaning that most fossil fuel reserves should stay in the ground. Model simulations with CGE models and other macroeconomic models show that this does not have to be expensive, but there are still barriers such as transition costs and distributional effects. Anyway, to reach this we need to have an increased electrification of the economy, a decarbonization of the power sector, possible land use changes, use CCS, be more energy efficient, and to plan infrastructure investments. Therefore, innovation and urban planning are important. Further, when it comes to climate agreements, game theoretical models are still pessimistic about the outcome of negotiations. Thus, there seem to be need for institutional changes to reach a significant agreement. Finally, ethical questions have received much more attention, especially in studies of climate agreements, the last few years.

Nationally, the research challenges we face are the same as for the international community. CREE researchers are on the research frontier in energy- and climate economics, and we want to follow up the challenges pointed out by IPCC. Our future research agenda will, however, be dependent on external funding. As the competition for funding is much harder than when the centre started, we expect to have less degrees of freedom in future research.

One main activity during the first four years has been to build our numerical models to make them available for studying important research questions. These models are now mostly available, and will be actively used in policy analyses during the last years of the centre funding.

WP1 (The International Politics of Climate and Energy) has been the working package with the largest activity during the first four years of activity. We still think that this will be the biggest working package for the last four years as most of our researchers are involved in climate issues, but the plan is that the funding and the use of resources on the different working packages will be more even after the first four years. Our experience the last three years is that it is harder to get funding for climate projects than for energy projects, and this will also lead to less focus on activities that fall under WP1. We do not intend to expand the number of working packages, but new ideas will always come up that will be included under the existing umbrella of working packages. Good communication with user partners and sub-contractors within the meeting places established by the centre, and the new strategies described above, will be important for the generation of research ideas.

## **Appendix**

### **Strategic Plan for CREE – Oslo Centre for Research on Environmentally friendly Energy**

This strategic plan is intended as a long-term management document for CREE. Below we describe the general vision, aims and strategy for the centre with an emphasis on the three first years of activity, i.e., from 2011 to summer 2014.

#### **1. Vision**

The centre has the following vision:

- We want to be a leading international research centre within energy, environmental and resource 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.

#### **2. Aims**

The centre's aim is to satisfy the Research Council's success criteria for the FME Centres for Social Science-related Energy Research (FME Samfunn). These criteria are documented in the governing documents from the Research Council ("Requirements and Guidelines" and "Information for applicants for the announcement of the Research Centres of green energy within the social sciences (FME Society)"). Thus, we adopt these criteria as CREE's long term aims:

##### **Research activity**

- The centre has a distinct research profile, conducts long-term, thematically relevant research of high international calibre in the field specified in the project description, and demonstrates this through its production of doctorates, scientific publications, papers for presentation at recognised international conferences and other measures of scientific excellence.
- The centre utilises a multidisciplinary approach in its research activities; i.e. it forges close links between various subject areas within the field of social science. The centre also strengthens the links between social science-related energy research and technology-related energy research.
- Researchers from the host institution and research partners participate actively in the centre's research.

##### **Relevance and benefit to users**

- The centre participates visibly in national and international arenas in which energy and climate-related questions are discussed.
- The centre has implemented measures to ensure that the expertise and results achieved by the research activity are effectively transferred to and utilised by the user partners, and actively disseminates research results to broader user groups and the public at large.



- The centre has achieved reciprocal mobility of staff between the centre's partners.
- The centre's user partners have increased their research commitments over time through participation in the centre's activities.

### **Internationalisation**

- The centre has been successful in achieving recognition at the international level (e.g. researchers associated with the centre have received awards or been invited to be keynote speakers at international conferences).
- The centre has been successful in international research cooperation, e.g. as a player under the EU's framework programme.
- The centre engages in active and binding collaboration with international research groups and has contributed in other ways to the internationalisation of Norwegian research. The centre has at least one recognised international partner.
- The centre attracts outstanding international researchers, including research fellows and senior staff, as visiting researchers.

### **Researcher training and recruitment**

- The centre has an effective framework in place for researcher training, and helps to train highly skilled personnel in the centre's areas of specialisation.
- The centre is actively engaged in education, especially at the master's and doctoral levels, and promotes recruitment to the centre's subject areas, including increased recruitment of women.

### **Partners and funding**

- The centre receives long-term funding from the host institution and partners.
- Active efforts are made to attract new partners.
- The centre has been successful in securing other external funding.

### **Organisation**

- The centre has a visible profile, a strong identity and a successful collaboration with its partners.
- The centre is organised in a manner that is well adapted to the host institution's organisation.
- The centre has a board and management which ensure that the intentions and plan for the centre are followed up.
- The centre has a common administration with a high degree of scientific and administrative autonomy.

## **3. Partners and cooperation**

A major aim of CREE is to facilitate cooperation between the research partners, as well as with researchers in other countries and in other disciplines. Such cooperation is essential for reaping economies of scale and scope and for realizing the research ambitions set out above. Establishing and maintaining cooperation between researchers across different institutions, different countries and, especially, different disciplines, is very demanding. It requires an institutional framework, a well-functioning administrative apparatus and sufficient funding for bringing researchers together. Below we detail how CREE will contribute to overcoming hurdles to successful cooperation, as well as bringing other benefits, such as more systematic contact with users and recruitment of researchers to the field.

The three national research partners of CREE constitute a large share of the researchers working in the field of environmental and energy economics in Norway. At the same time, each of the institutions has its own unique competence. The Department of Economics has its main strength in theoretical research and the Frisch Centre in modeling international energy markets, whereas the Research Department at Statistics Norway has long experience in developing large macroeconomic and energy market models. All the partners have considerable experience with empirical research, and both the Frisch Centre and the Research Department at Statistics Norway have built a strong competence in the analysis of Norwegian register and survey data. Also, the Frisch Centre and the Department of Economics run a laboratory for experimental economics.

While there is already cooperation among the Norwegian partners, CREE will facilitate a deepening of this by providing resources and an organizational structure for collaboration both within the community of economists and with the wider research community. The field of energy and climate is naturally multidisciplinary, making it important for CREE to be closely integrated with researchers in other social sciences, law and technology. As multidisciplinary research is more resource demanding than research within a given discipline, CREE will be an important factor for success in this respect.

CREE will be part of MILEN, the University of Oslo's interfaculty research network on environmental change and sustainable energy. To facilitate interfaculty and multidisciplinary research, MILEN aims to improve the competence of university researchers in working across disciplines, and will organize cooperation at workshops, seminars and conferences, as well as through the development of multidisciplinary courses at the PhD and master's level. We will work together with MILEN to organize seminars and workshops, and present our PhD students and researchers to the multidisciplinary environment and methods that MILEN represents.

Researchers from MILEN will also actively participate within CREE. From the network, we will draw on researchers from social anthropology, law and political science. From the discipline of social anthropology, SUM – the Centre for Development and the Environment, will participate. The centre has long experience on topics related to sustainable consumption, which is relevant for understanding behavior when evaluating policy instruments. In addition, we will work closely with the research group in Natural Resources Law at the Faculty of Law. The group's activities are multidisciplinary and comprise research on natural resources, energy, environment and property. Law expertise is crucial in gaining an understanding of topics studied at CREE such as international energy and climate policies, innovation and policy instruments. Further, to achieve a better understanding of politics, political science is important. Since the political scientists in the MILEN network are involved in CICEP (Strategic Challenges in International Climate and Energy Policy) another FME funded by the Research Council, we have agreed with CICEP to establish a formal cooperation between the two centres, which means arranging joint workshops, seminars and graduate courses. This may also lead to joint research papers. Lastly, we are also in contact with the Department of Psychology. We share a common interest in behavior economics, and hope that they will be a discussion partner on our future research in that field.

Collaboration with experts on technology is also important if we want to perform relevant energy research. Therefore, we have engaged SINTEF Energy Research and IFE (Institute for Energy Technology) as subcontractors. SINTEF Energy has a long experience in modeling electricity markets and IFE possesses a deep knowledge about different technologies, e.g.,

through their development and use of the energy system models MARKAL and TIMES, which have been developed in a cooperative multinational project over a period of almost two decades by the Energy Technology Systems Analysis Programme (ETSAP) of the International Energy Agency (IEA). SINTEF Energy, IFE and the University of Oslo are already involved in existing technology FME centres. Based on these channels, we will keep in contact with these centres to be informed about the latest international trends within technological development and the energy markets.

Tilburg Sustainability Centre (TSC), a new multidisciplinary centre hosted by Tilburg University, working on topics such as environmentally friendly energy, innovation and international environmental agreements, is engaged as our international partner. While the national partners have collaboration with researchers at TSC, CREE will strengthen and extend this contact, as well as give Norwegian researchers access to the multidisciplinary sustainability network in Tilburg and give Dutch researchers access to the Norwegian network. The ambition of TSC is to become a leading international centre for scientific expertise in the field of sustainability, in addition to providing support to companies, governments and other organizations. The cooperation with the Norwegian partners may help both centres to become internationally leading in their respective fields.

The resources and the organization of CREE will also make it easier to maintain better contact with the users of energy and environmental research. This requires resources in the form of regular meetings, conferences, and other interaction, all of which will be provided by CREE. The organizational structure of CREE will also establish a formal meeting point with our user partners. These represent industry and government and include Gassnova, Norwegian Climate and Pollution Agency, Norwegian Ministry of Petroleum and Energy, Norwegian Water Resources and Energy Directorate, Statkraft Energy, Statnett and Statoil. All the user partners possess knowledge on energy markets and climate issues that are very relevant for our research. The plan is to have a two-way communication with the user partners so that both user and research partners can gain.

An additional value added to the centre is that funding over an eight-year period allows for the possibility of long-term planning. This is particularly important when it comes to recruitment to the field.

#### **4. Organization of research**

CREE will focus on research mainly connected to renewable energy and climate issues. The aim is to have a broad research portfolio and to work with all of the issues mentioned in the announcement from the Research Council of Norway. This makes us more open to include good ideas that come up and to employ good people within the field.

The research is organized in five different working packages, for more details see the *Project Plan (revised proposal to the Research Council of Norway)* and the *Annual Work Plans*:

- Working Package 1: The International Politics of Climate and Energy
- Working Package 2: Innovation and Diffusion policy
- Working Package 3: Regulation and Market
- Working Package 4: Evaluation of Environmental and Energy Policy Measures
- Working Package 5: The Next Generation of Numerical Models

Our research will be based on a broad set of methodologies. We will conduct theoretical analyses and empirical studies. The partners have specialized expertise which will be merged within the various parts of the research. Both the theoretical and empirical studies will be anchored in microeconomics, but will also draw on perspectives from other social sciences. On the empirical side, the research will be based on numerical economic models, econometric studies in which we make use of our large datasets, qualitative analyses of different cases and laboratory experiments. We will bring together researchers from various fields, who will be engaged in multidisciplinary activities such as conferences and workshops in addition to working on projects.

The output from CREE will be directed at both the research community and potential users including user partners and a broader interested public. CREE will introduce a new working paper series in which our research partners will publish their works. Furthermore, all of our research partners have a long tradition in presenting research at international conferences and publishing papers in peer-reviewed journals, and we will continue this tradition. We will also focus on popular publications such as newspaper articles, policy notes and popular science journals, as communication with users is important for scientifically based policy making.

While the Frisch Centre is the host institution of CREE, all national research partners are involved in directing the different working packages to. For more details about the different working packages, see the project descriptions.

## **5. Strategies to obtain the aims of the centre**

### *5.1 Research activity*

CREE has a distinct research profile described in the *Project plan* and *Annual work plans*. The long-term funding ensures that we can plan large projects that build on each other. The multidisciplinary approach is taken care of via collaboration with our sub contractors.

While the main research profile of the centre is outlined in the above mentioned documents, more detailed projects will develop as a result of the general progress of research in the field, international collaboration, the competence of the researchers connected to the centre, discussions with user partners and political and industrial developments. This will require meeting places for researchers and also for researchers and user partners.

All research partners already encourage their researchers to participate in the international research community, to collaborate with other researchers nationally and internationally, to publish in international peer-reviewed journals, and to be active in popular and/or user-oriented dissemination. The centre has thus not established additional strategies for publishing, attending conferences etc. that go beyond those of the different research partners. We will encourage our researchers to attend relevant conferences such as those of the EEA, EAERE and IAEE. A main aim is to continue to publish in good international journals, in addition to other publications such as books. We do not, however, focus on quantitative goals for publications, as research quality is considered more important than output quantity. The quality will be ensured with extensive contact with the international research community via publications, conferences, workshops and collaboration.

To facilitate cooperation among the research partners and also among research partners and sub-contractors, we will organize several activities:

- An annual research workshop that includes presentations from researchers from the different research partners, subcontractors and other researchers connected to CREE. This will be held in September each year.
- A seminar series that will be coordinated with the seminar series at Department of Economics, Frisch Centre and Statistics Norway. This will be held continuously during the year.
- Exchange of researchers among research partners for longer or shorter periods of time.
- CREE has a web-page that is always updated on CREE activities.
- A CREE working paper series has been established electronically.
- Regular breakfasts and lunches where CREE researchers meet and exchange information.
- Social activities such as summer party and “julegløgg”.

## *5.2 Relevance and benefit to users*

One of the basic requirements of the centre is that the research must be relevant, both for our users, but also for the international research community on environmental and energy economics. While the latter is included in our research strategy, the first will be ensured through regular contact with user partners and other users. Increased communication will also provide an incentive to policy relevant research.

As mentioned above, the resources and the organization of CREE will make it easier to maintain better contact with the users of energy and environmental research. This means regular meetings, conferences, and other interaction where we can have a two-way communication with our users. CREE has a responsibility for research dissemination, both to users and to the public. We will use the following communication channels:

Communication to users:

- Dissemination of research through the Web
- Hold an annual user conference (April). This will be organized together with CICEP.
- Organize user activities such as meetings and seminars as required
- Organize a Model Forum (once or several times a year) where users together with researchers in other disciplines, can make contributions to economic modeling.
- Publish in Norwegian-language journals such as *Samfunnsøkonomen* and *Økonomiske analyser*.

Once a year we will organize a meeting with all user partners where we will present the different working packages, the new research findings as well as new plans. The user partners will then have an opportunity to comment on this. This could be a part of the annual user conference or as a user seminar.

In addition to this, researchers from CREE should be available for meetings with user partners to discuss relevant topics. User partners may also fund research projects directly that are of high relevance to them.

The research partners can also do analysis for the user partners, but these should primarily be based on the research activity in the centre.

The user partners can contribute to the research activities by, e.g.,

- Contribute with data

- Contribute with funding
- Contribute to discussions around modeling (e.g., in the Model Forum)
- Comment on research and suggest research tasks for instance at meetings and other user activities
- Participate at seminars and conferences organized by CREE

The user partners will also contribute to the governance of the centre as two representatives in the board should come from user partners (see under organization below).

Communication to the public:

- We will publish opinion pieces, feature articles, interviews and policy commentaries on our website under "CREE in the media". These can be in Norwegian or English.
- We will contribute to hearings in the Parliament and public debates.

CREE will make a *Dissemination plan* that goes more into detail on this topic.

### 5.3 Internationalization

In addition to the usual research channels such as collaboration on projects, publishing, presentations at conferences, etc., CREE formalizes its international contacts through

- An international research partner (Tilburg Sustainability Centre). We will aim for collaboration, discussions and exchange of researchers for short time periods.
- Employing internationally recognized researchers in part time positions at all three national research partners (see also the Project Plan)
- Invite renowned researchers to our workshops and to hold PhD courses.
- Actively participate in applications for EU funding.

CREE will participate in EU-projects as a partner. However, we do not intend to lead EU-projects as this requires a much larger administration than what we have established. Studies based on our numerical models are particularly relevant for EU-projects.

### 5.4 Researcher training and recruitment

CREE will fully fund two PhD students and two post-doctoral researchers over an eight year period. This means that we will recruit a PhD student in 2011 and 2015 respectively, as well as post-doctoral researchers in 2012 and 2016. These research recruits will be employed by the Department of Economics. In addition, the other research partners will also employ research assistants and research recruits. The research recruits will be given supervision by their supervisors and project leaders and will be invited to the ordinary CREE activities.

CREE will contribute to an interest in environmental and energy economics by providing up to three scholarships annually to students who want to write a master thesis in the field.

Researchers from CREE will teach at the master's and doctoral program at the Department of Economics as well as the summer school at the University of Oslo, and supervise master students and doctoral candidates.

CREE supports MILENs Research School, an multidisciplinary research school at the University of Oslo in environment and energy, both financially and through organizing and

teaching courses and seminars.

CREE supports the national research school in renewable energy for all the FME centres; NorRen. This means that we help organizing courses and seminars.

CREE also want to contribute to the exchange of PhD candidates among our research partners and also with other international collaborators.

### *5.5 Partners and funding*

CREE will actively work to increase funding for the centre's activities through

- User Partner Funding
- Search external research funding from the Norwegian Research Council and other external sources such as the EU's framework program.

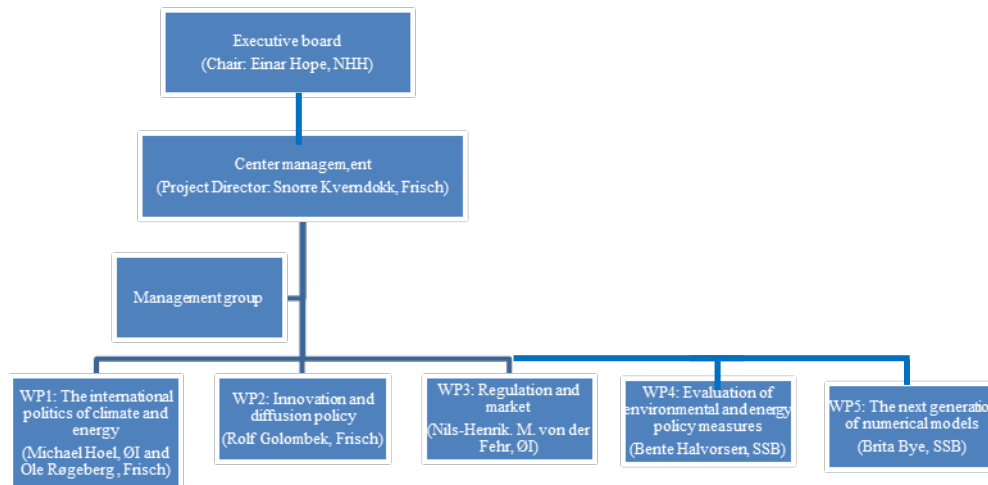
### *5.6 Organization*

The organization of the centre in 2011 is as shown in the figure below. It is also described in a separate document in Norwegian (*Styringsstruktur – CREE*).

The chair of the executive board should not represent any of the research partners, user partners or sub-contractors, and is therefore independent of the partners in CREE. The board also consists of one member from each of the three Norwegian research partners, while the user partners should be represented by two members, one from industry and one from government.

The board has the overall responsibility for the direction of future research activities, including adoptions of research issues and potential modifications of the working packages. The board is also responsible for constructive interaction between the centre, the host institution and partners in the consortium. More precisely, the board is responsible for ensuring that the Centre's vision and activities formulated in the Strategy document, are followed up in key documents such as project and work plans as well as budgets. This means adoption of the strategic plan, annual work plan, annual report, progress reports, budget, and to recommend the accounts.

The administration of CREE is located at the Frisch Centre. It should have regular meetings with the management group consisting of all the working package leaders to discuss matters of importance for the centre.



## 6. Focus the first three years, 2011-14

The centre will continuously work to meet the vision and aims of this strategic plan, also during the first three years of the centre's activity.

However, in the beginning we will particularly focus on getting the organization in place, such as all the formal contracts and documents, creating collaborative relationships, set up a seminar series, workshops and conferences, work to create a centre identity, and to ensure a stable funding.

CREE is working to improve centre identity through

- Regular lunches / breakfasts
- Seminar series and other professional events
- Own website
- Social events
- Opportunities for exchange of scientists for shorter or longer periods
- Visits to the user partners.

When it comes to funding, the “fixed costs” of running the centre such as administration, PhD students, post docs, sub contractors and external part time positions, take a large part of the base funding from the Research Council of Norway. Thus, the aim is to increase external funding to be able to ensure a stable funding of the research activity of the senior researchers. We do not aim to expand the centre much, but we plan to keep up a steady recruitment to the field of energy and environmental economics.

When it comes to research, one main activity during the first three years is to build our numerical models to make them available for studying important research questions. As a mean to do this, we have set aside NOK 1,000,000 each year for numerical modeling. We also have a large activity on WP1 (The International Politics of Climate and Energy) in the first phase of the centre, which is mainly due to existing funding from research council programs. The plan is that the funding of the different working packages will be more even after three years. We do not intend to expand the number of working packages, but new ideas will



always come up that will be included under the existing umbrella of working packages. Good communication with user partners and sub-contractors within the meeting places established by the centre will be important for the generation of research ideas.

The main challenge for the first phase of the centre activity is to make the different research partners and subcontractors work together, and to ensure a useful multidisciplinary relationship with our subcontractors. They are now involved in different projects, and we will have an annual internal evaluation of the cooperation in order to make the projects work smoothly.

It is important to include user partners in a way that is to a mutual advantage of both the research and user partners. A good communication with the user partners through meetings, seminars and conferences is required to make this happen. During to 2012 the Project Director and researchers will have meetings with all user partners to discuss their needs and their involvement in the centre. Based on feedbacks from user partners, we will revise communication plans.

This strategic plan will be revised after three years.