



Bergen Energy Lab NEWSLETTER

This fall semester has been full of highlights. In this edition of the Bergen Energy Lab newsletter, you get a chance to catch up on some of them.

Bergen Energy Lab has undergone a few changes this semester. Hans-Kristian Ringkjøb had to resign from his responsibilities due to a busy schedule with his Ph.D. work. Anja Lindgaard Molnes, recent renewable energy graduate student, has temporarily undertaken this important task, trying to fill Hans-Kristian's energetic shoes.

The lunch meetings this fall have covered a wide range of interesting and interdisciplinary topics on renewable energy, such as energy transitions conceptualized through textile art, environmental monitoring in energy production and electrical vehicles – topics which can be read more about in this newsletter.



A brand new look!

The Bergen Energy Lab logo has undergone a small makeover, with the key elements of wind, solar and the ocean captured in a lab flask.



BERGEN ENERGYLAB



Bergen Energy Lab

@EnergyLab_UiB [Følger deg](#)

Følges av MEDEAS, Sustainable Career Pathways, Silje Skjelsvik og 136 andre du følger

A forum for exchange of information on [#research](#) and activities related to [#renewableenergy](#) and [#energytransition](#), hosted by [@geofysen](#) [@uib](#) energylab@uib.no

📍 Bergen, Norway uib.no/en/energy

📅 Registrerte seg august 2016

640 Følger 216 Følgere

Bergen Energy Lab on social media



Twitter: Bergen Energy Lab's Twitter account is finally up and running. Please follow [@BergenEnergyLab](#) for updates on activities, research and energy related news.

Also, we would like to introduce the (somewhat long) Twitter hashtag [#BergenEnergyLab](#) to be used in case you want to tweet something about one of our lunch meetings or half-day seminars.



Facebook: Important events and news will also be posted on Facebook on a regular basis from now on, so we strongly recommend following us on Facebook for the latest updates on Bergen Energy Lab activities.



Thematic day:

Climate and energy transition



UiB's energy director Kristin Guldbrandsen Frøysa presenting the purpose of the thematic day.

Photo: Anja Molnes

Monday 5th of November, all UiB employees were invited to a thematic day on the priority area climate and energy transition. The purpose of the day was to familiarize the academic community with the priority areas, and give them the opportunity to contribute to develop the academic content of these areas. By mobilizing the while academic community, the range of competence at UiB can be used to meet the challenges related to climate and energy transitions.

A short video with some of the key speakers can be viewed [here](#).

Among the presenters were Kristin Guldbrandsen Frøysa, UiB's energy director who talked about the status for the climate and energy transition, and mentioned that external cooperation

between academia and businesses will be necessary. Also, she pointed out that UiB needs to become more visible in the public debate, on a local and national scale.

Professor Finn Gunnar Nielsen presented the priority area *offshore wind*, which will bring new industry opportunities for Norway, along with reducing GHG emissions and contribute to the future of the European energy market.

CET leader Håvard Haarstad talked about the priority area *zero emission transport*, where he emphasized that the transition needs to happen fast in order to deal with high emissions. UiB has a lot of knowledge that can be used in many of these research areas, especially towards the social sciences.



Overview of the lunch meetings this fall

Although not all presentations will be covered in this newsletter, you will find the presentations in the [events archive](#) of our website.

August 21st	An overview on the status of renewable energy
August 28th	Deregulation and Deregulated Electricity Sectors in Central Europe and Scandinavia from 1970 to the present
September 4th	Metal-organic frameworks as energy materials
September 18th	The Japanese Hydrogen Society
September 24th	Competition from Bottom to Top: New Trends in Electricity Markets
October 2nd	Bacterial energy production. An electrifying tale
October 9th	Solar panels at BKK's rooftops at Kokstad
October 23rd	Zero Emission Building (ZEB) 'K2' at Western Norway University of Applied Sciences
October 30th	Potential Exceeds the Demand
November 13th	The importance of environmental monitoring for safe and efficient energy production
November 20th	The political economy of energy transitions
November 27th	Norwegian citizen's perceptions of electrical vehicles



Renewable Energy Alumni

Rouzbeh Siavashi: Structural engineer at Aker Solutions



Photo: Rouzbeh Siavashi

“I’m pretty sure that my master studies will be very useful in my future career, as my ultimate goal is to be a structural engineer in designing and modeling wind turbines.”

Tell us a bit about your background?

I’m from small coastal city in south of Iran with hot and humid weather. I lived, studied and worked in my home town for 24 years. However, after 24 years living in the same city, I thought that it would be nice to experience other countries. At some points of our lives, we all need to be courageous and ambitious to challenge

established truths and dare to move into the unknown.

After searching for possible countries based on my background, I finally decided to come to Norway. I heard two things about Norway; six months of a year are dark and snowy, and there are polar bears in some cities. These two factors determined my destiny and I set off to Norway to



start my master's degree in marine technology (marine structures) at NTNU.

After two years of determination and hard work, I couldn't find any relevant jobs because of the crisis in the oil and gas industry in 2014. But as I fell in love with the polar bears, I decided to change my direction and study renewable energy instead.

Why did you choose to study the master in energy at UiB? Moreover, why did you choose your specialization?

We need to protect our environment and the first step is to move faster towards renewable energy and sustainability and stop to pollute our environment. I decided to study renewable energy partly because of the situation that I just mentioned, and partly because I want to protect my beloved polar bears from extinction. I studied wind energy because it allowed me to combine my background in structural engineering with wind energy in my master thesis. Moreover. The reason why I chose to study here at UiB is because it is one of few well-known universities in Norway which offer this degree, and also there are profound professors which I could learn a lot from at the Geophysical Institute.

What was your master thesis about?

Development of offshore wind turbines shows a clear shift from the fixed-bottom to the floating turbines. The reason for such tendency is due to the fact that moving towards the deep ocean will substantially limit the feasibility of using fixed-bottom wind turbines.

In my master thesis, I performed a study to better understand the sensitivity of the structural responses to various environmental parameters. The focus was on investigating the structural responses of two spar-buoy floating offshore wind turbines, i.e. Hywind Demo (2.3 MW) and OC3-Hywind (5 MW).

Which advice would you give to the current master students at UiB?

Select the topic of your master thesis based on your interests, and do not focus too much on increasing your chances of getting a job after you graduate. You will learn a lot more through your master thesis if you enjoy working on it.

How do you think your master studies can be used in your future career?

I'm pretty sure that my master studies will be very useful in my future career, as my ultimate goal is to be a structural engineer in designing and modeling wind turbines.

I got a sound knowledge base through my studies, and I appreciate the way of thinking and gathering valid information to solve problems through my master thesis. By having these two pillars as a basis, I can develop my skills properly further on in my career.

Could you tell us a bit about your current job?

I'm currently working as a structural engineer at Aker Solutions, and hope to move to wind energy projects as soon as possible. Luckily, Aker Solutions took some steps towards offshore wind energy lately.



Renewable Energy Alumni

Laura Steinsbø Wiken: Project manager at BOV



Photo: Laura Steinsbø Wiken

- Go to all the Energy Lab lunch meetings, seminars and use the resources available to you. Be interested and build a network.

Tell us a bit about your background?

I have a bachelor's degree in Energy technology from HVL, and now I have a master's degree in renewable energy from UIB with specialization in wind energy.

Why did you choose to study the master in energy at UiB/HVL? Moreover, why did you choose your specialization?

In the 8th grade I decided that I wanted to study renewable energy, so the choice was simple. I chose wind energy as my specialization because it interests me, and the school has a lot of professors that makes it even more interesting.

What was your master thesis about?

In my thesis I examined the possibility of using small wind turbines at Norwegian salmon farms. Approximately 50% of the farms are powered by diesel generators, and most of them are not run with an optimal efficiency. There is a great potential of energy optimization.

I made a model in MATLAB where I could analyze the potential of wind energy production along the Norwegian coast. I also looked at the economical perspective of using small wind turbines compared to diesel generators.

Which advice would you give to the current master students at UiB/HiB?

Go to all the Energy Lab lunch meetings, seminars and use the resources available to you. Be interested and build a network!

How do you think your master studies can be used in your future career?

I think this is a great foundation. I am in general better at critical thinking and to know how to acquire knowledge.

Could you tell us a bit about your current job?

I work as a project manager at Bygg og Ventilasjon AS (BOV), mainly with ventilation systems. I currently have two projects located in Bergen. I design ventilation systems and are responsible for implementation of the projects. I am also responsible for the financial follow-up of the projects.



Half-day seminar, September 24th

Competition from the bottom to the top: New trends in electricity markets.

Bergen Energy Lab together with BECCLE organized a half-day seminar on new trends in the electricity markets Monday 24th September at the Faculty of Law, UiB.



Ignacio Herrera Anchustegui, UiB - Monika Inde Zsak, BKK - Anne Sofie Risnes, Statnett - Svein Harald Bjørlo, Rambøll - Mette Bjørndal, NHH



Copyright: UiB

The seminar involved researchers, people from the industry and even a prosumer – “plusskunde”, and the topics involved everything from engineering to the economic and legal aspects of retail electricity markets that have been prompted by the inclusion of active consumers and a push for the generation of renewable electricity.

- The discussion was detailed, animated and highly practical. Did you know that demand response programmes allow you to reduce your electricity fees up to 20%? And that in Norway there are several programmes designed for this, such as Tibber? Asks Anchustegui.

He further explains that the speakers and the active participation of the audience (more than 70 people!) highlighted the benefits of

these changes but also the challenges we all face in the effort for adapting traditional electricity markets to the future.

- This seminar and the interest generated by it will pave the way to more Bergen Energy Lab events regarding electricity markets and for future research and output from the UiB that has an impact in our society on a daily basis.

Ignacio Herrera Anchustegui was the initiator of this seminar. He explains that the idea for the Bergen Energy Lab seminar was inspired by technological changes and the ability of us – the end-consumers of electricity – to produce our own power.

- Solar panels on our rooftops and electric vehicles with smart batteries are no longer science fiction, but our everyday reality in Norway. These developments are changing how we buy and how much we pay for electricity, explains Anchustegui.



Lunch meeting, October 30th

Potential Exceeds the Demand

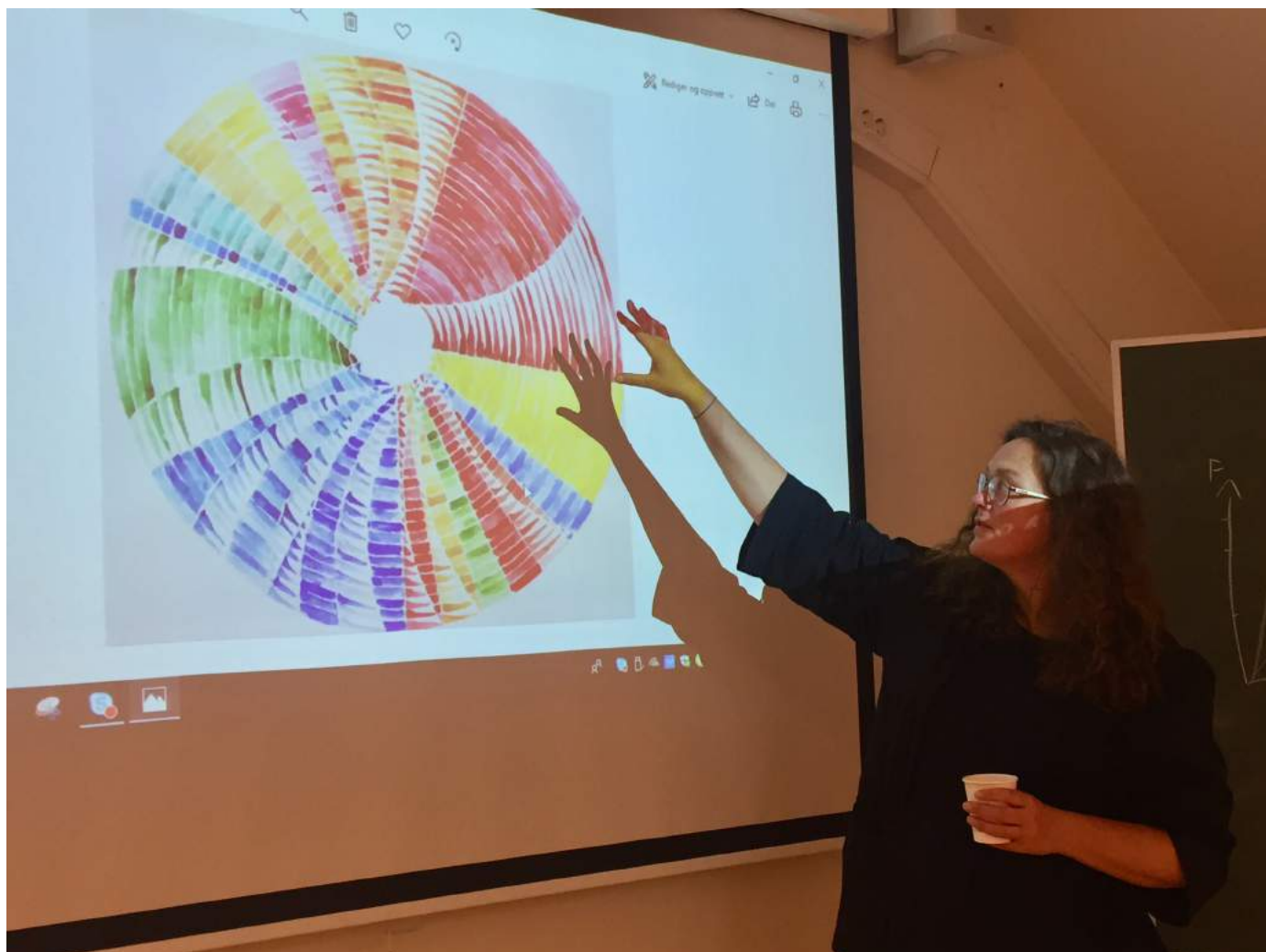


Photo: Anja Lindgaard Molnes

The project is a series of visual artworks, based on a selection of essential key questions defining the complex and messy process of energy transition.

Textile artist Margrethe Kolstad Brekke has for a number of years developed projects contextualizing the paradigm shift currently taking place within the energy sector.

On Tuesday October 30, she visited Bergen Energy Lab to enlighten us on her creative project, "Potential Exceeds the Demand", that will be displayed at Hordaland Art Centre in May next year. The exhibition opens May 10th at 19:00, and

Bergen Energy Lab will arrange for a guided tour on the 14th.

Brekke explains that the exhibition project at Hordaland Art Centre will, in some way, be the last project in a wide range of other activities that have experimentally contextualized renewable technology development through artistic expressions.



- It was towards the end of the study period at the faculty of art, music and design (KMD) here at UiB in 2013, I decided to try to make art of solution proposals in context of the sublime climate crisis. This was first very fumbly and difficult, as the undisputed consensus in the cultural sector is that the responsible task is to highlight “problems” in critical tradition.

Brekke further explains that this means that the aesthetics of new solutions – like new technology – are mostly presented by the approach that has been developed through the marketing profession; like advertising aesthetics, which also characterize politics.

- Here, I think there is a huge need for nuance.

This exhibition will be the first solid physical manifestation of much eclectic artistic research that goes back to 2015, when she attended Fornybarkonferansen here in Bergen. Here, Norwegian company Kitemill presented their renewable energy solution where kites are used to produce power from wind. This inspired a variety of art projects for Brekke, resulting in a collaborative hangglider art project with an air ballet show at Ekstremsportveko (extreme sport week) at Voss and at The Western Norwegian College of Applied Sciences through Public Art Norway (KORO).



Project in progress

Photo: Anja Molnes

Her current project is a series of visual artworks, based on a selection of essential key questions defining the complex and messy process of energy transition.

- I think the most important and meaningful task for me right now is to contribute by doing communal work in order to convey these main principles. The principles originate from the core of the discipline I think should be heard to ensure that the most efficient energy transition can take place.

She has been working in close collaboration with experts on renewable energy and the energy transition from UiB in order to develop the key questions and myths that will be the focus of this exhibition:

- **Myth:** The world cannot do without fossil energy the next 30 years
- **Myth:** The world’s energy demand will increase significantly the next 20 years
- **Myth:** There is not much you can do
- **Challenge:** The lack of perspective, understanding of magnitude and which measures that provide results
- **Challenge:** Focus must be directed towards structural solutions, not individual

- I hope this exhibition can inspire more cultural people, with greater scope than myself, to move into the exciting terrain that is about trying to find the best ways to deal with the super wicked problems human induced climate change represents. I believe that after all, enough cultural expressions have been produced that show everything that went wrong – we all know that very well – and that the creative challenges ahead will be to contribute constructively to strengthening the solution-oriented narratives.

Lunch meeting, November 13th

Environmental monitoring for safe and efficient energy production

- When talking about renewable marine energy, understanding and monitoring the harsh environmental conditions is a necessity, says Emilie Dorgeville from Aanderaa Data Instruments.



Emilie Dorgeville
Photo: Private



Aanderaa buoy located off the coast of Karmøy close to the Hywind test site.
Photo: Aanderaa Data Instruments

Aanderaa Data Instruments have, for several decades, worked on developing a large variety of environmental monitoring solutions. The MOTUS Wave Buoys was launched in the spring of 2017. These buoys are being used worldwide in different types of applications, providing its users valuable long-term directional wave data.

- The advantages with the MOTUS buoys are their flexibility and scalability; they are able to collect wave, currents, water quality and meteorological measurements and provide data in real time, according to Emilie.

The data provided by this technology has proven highly valuable to the offshore wind industry, and two MOTUS buoys have been deployed off the coast of Karmøy close to the Hywind test site since February 2017. This provides information that can

be used for planning and risk assessments and allows for the wind farm to operate more cost-effective.

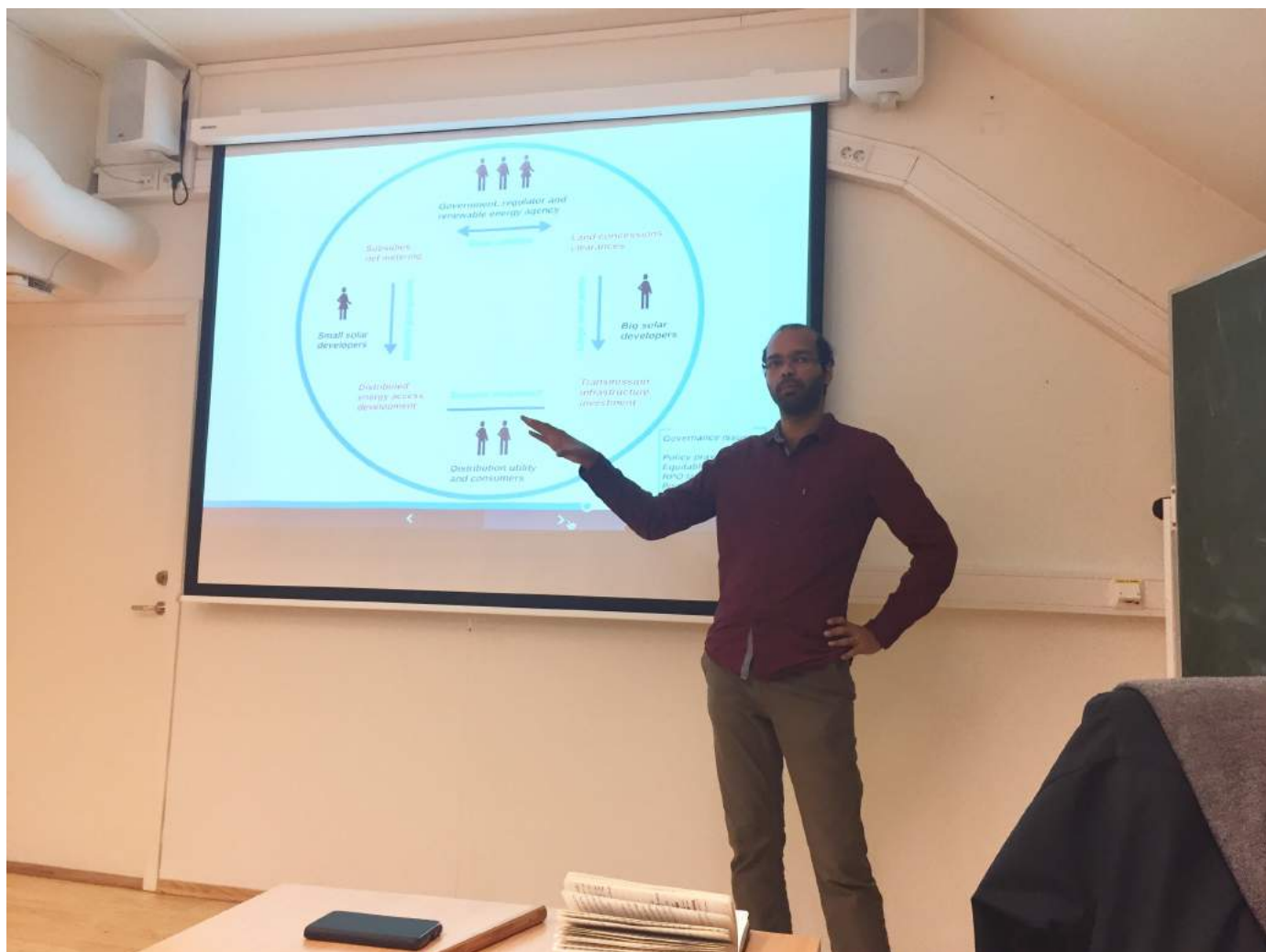
- When talking about renewable marine energy, understanding and monitoring the harsh environmental conditions is a necessity.

Operation and maintenance account for up to 30% of the wind farm costs. Data provided by the Aanderaa buoys allows for a more efficient vessel utilization, as correct environmental data are provided. Moreover, unnecessary inspections can be avoided as the data helps predict the weather windows for maintenance. This way, the environmental monitoring helps optimize operation, which is crucial to lower the costs related to energy production from the offshore wind industry.



Lunch meeting, November 20th

The political economy of energy transitions in two Western Indian states



Siddharth Sareen presenting the political economy of energy transitions at Bergen Energy Lab.

Photo: Anja Molnes

Dr. Siddharth Sareen gave a presentation on the political economy of energy transitions at Bergen Energy Lab on Tuesday November 20th.

Sareen talked about important political and economic drivers and barriers for energy transitions. In India, the electricity distribution sector is modulated indirectly by the central government's interventions and more directly by the broader political economy at the state level. Centre-state politics, electoral politics, state finances, the structure of the state economy, and

developments in cognate sectors such as agriculture and transport influence sectoral trajectories in each state.

- The political economy within each state's electricity sector is characterised by the demand for service quality, the demand for subsidies, available financial space and the cost of supply.



Their interplay with a wide range of sectoral reforms determines electricity distribution outcomes such as service quality, the financial health of the sector, and environmental quality, explains Sareen.

In his presentation, Sareen gave a comparison between two different Indian states, Gujarat and Rajasthan.

- The two Western Indian states, despite their similar geographies and partly comparable demographics, differ vastly in sectoral performance. These differences can be traced to contrasting decisions on the manner of sectoral unbundling, energy infrastructure priorities, investment in renewable energy, and administrative support to implement policies, in response to political economic pressures at critical junctures over the past quarter century, Sareen elaborates.

Sareen explains that Gujarat's relative success can be credited to gradual unbundling with coordination between the finance and energy departments; strategic interventions in energy infrastructure to prevent electricity theft, backed by administrative support for the field staff;

strong political support for renewable energy uptake; competence based human resource promotion mechanisms; and a reputation for being a business-friendly region.

- Demonstrating positive outcomes from early successes has made it easier to exercise political gumption, says Sareen, and continues:

- By contrast, Rajasthan's relative failure can be credited to lack of transparency in book-keeping despite unbundling; sustained low tariffs for political purposes despite high supply costs; resistance to stopping electricity theft and associated losses due to political patronage; yet it has used its favorable geographical conditions to progress on solar energy uptake on better financial terms than the first-mover state.

This work evidences the relevance of understanding political economic drivers of energy governance under sectoral transition. Addressing the electricity sector to secure improved outcomes is an easier task if these drivers are recognised as being part of how governance functions.



Lunch meeting, November 27th

Norwegian citizens' perceptions of electrical vehicles

Ole Martin Læg Reid from NORCE presented the topic «Norwegian citizens' perceptions of electrical vehicles» on Tuesday November 27th.



Photo: Colourbox

Læg Reid began the presentation with an introduction to the Norwegian Citizen Panel, which is a web-based survey of Norwegians' opinions toward important societal matters.

According to the website, the participants represent a cross-section of the Norwegian population. They gather information on everything from age and gender to education and income in order to provide useful information about the people who respond – or doesn't respond - to the surveys.

The participants is invited to take the surveys a few times a year to give their opinion on important questions to Norwegian society and politics. By following the same respondents over time, the Norwegian citizen's panel can map changes in perceptions over time on an individual level, which provides very useful information.

Climate and Environment is one of six themes within the Norwegian Citizen Panel, and the associated research group is currently working on





Lægheid is a political scientist and senior researcher at the Norwegian Research Centre. Photo: Ole Martin Lægheid

studies concerned with Norwegian citizens' perceptions of electrical vehicles. In Lægheid's presentation, Western Norway was compared with the rest of the country, with interesting findings. For instance, it appears that more

people in Western Norway owns an electrical vehicle (EV), and the reasons for choosing EVs are slightly different in this region; in Western Norway, the most important reasons for choosing EVs are 1) cheap fuel, 2) environmentally friendly and 3) free tolls, while the rest of the country have chosen an EV due to 1) environmentally friendliness, 2) cheap fuel and 3) free tolls.

In another survey question, participants are asked to rate their car according to how easy or difficult they find fuelling their cars to be. The results indicated that most people think charging an EV is easier than both diesel and petrol cars.

Also, the general perception amongst the population towards EVs is very positive, although trends show that younger people and women are generally more positive towards EVs. Still, the majority of the population thinks that it should still be possible to buy new passenger cars running on diesel and gasoline past 2025 (about 60%), while less people thinks that only EVs and hydrogen vehicles should be allowed (40%).

