Power to the people

The Danish municipality of Ringkøbing-Skjern, partner in the EU-funded project COBEN, has set itself the goal of covering all its energy needs with renewables by 2020. In addition to wind, of which there is no shortage here, it uses solar energy for heating water for example.

Reforming the energy system requires not just technical expertise, but also knowledge of the social structures and processes that support the transition. This is where Oldenburg researchers from various disciplines are giving their input and showing the way forward. They investigate factors such as how the parties involved in the energy transition build mutual trust, and how communities can find ways to cover their own energy demands with local initiatives

An idyllic country village: lonely country roads lined with gnarled trees, cornfields stretching all the way to the horizon, rare birds rendezvousing on the forest edge. Here, where there is so much space for nature and humans, a wind farm is to be built. But among the villagers, recent arrivals and long-time residents alike, a row breaks out: What about protecting the birds? Who benefits from the new wind turbines? And where should they be erected?

Wind energy is only the backdrop for Juli Zeh's socio-critical novel "Unterleuten". But the old and new disputes that flare up between the inhabitants of a fictitious village in Brandenburg illustrate how producing green electricity to support the "Energiewende" (energy transition) raises not just technical questions, but also human ones. "The energy transition is a social process," says Prof. Dr. Jannika Mattes. "And social processes are complicated." Mattes, a social scientist and Professor of Organisation and Innovation at the University of Oldenburg, knows what she's talking about. In the junior research group REENEA, which is funded by the German Research Foundation (DFG), she is studying the social background of the energy transition on the basis of regional case studies. Although the restructuring of Germany's energy system is the subject of continual public debate, little is known about the role of the individual parties involved, she explains. And little is known about which factors advance or hinder it. Mattes and her team of three researchers aim to fill this knowledge gap.

Mattes is focussing on the wind energy sector as a case study for her research. The German government wants 60 percent of the electricity consumed in Germany to come from renewable energy sources by 2030. Currently, wind power accounts for just under 18 percent of the country's gross electricity consumption. There are more than 29,000 land-based turbines in Germany, almost a third of which are in Lower Saxony, along with a growing number of offshore farms. But even though the proportion of wind power in Germany's energy mix has grown steadily since 1987, when the first wind farm was built in Schleswig-Holstein, land-based expansion is now slowing down – for very diverse reasons.

Providing subsidies on a random basis doesn't work

One of them is that energy policy has changed significantly since the amendment of the Renewable Energy Sources Act (EEG). Among other things fixed subsidy rates were abolished, affecting remuneration for electricity fed into the grid. "This has upset many companies and left investors feeling abandoned," says Mattes. Then there's the fact that public opposition to green expansion measures is growing – for example when they interfere with nature conservation, or when citizens feel their own concerns are being ignored. "Most people accept that the green energy transition is necessary," the social scientist stresses, "but they don't want the expansion to take place on their own doorstep."

Mattes experiences this first-hand in her research: she and her team are laboriously interviewing people who are directly affected by the restructuring of the energy system – from turbine manufacturers, service providers and planners to political decision-makers, conservationists and members of the general public. The researchers also comb through documents and attend public discussions. Yet the massive problems with acceptance are just one aspect they are encountering.

"We're interested in the roles the affected parties see themselves in, the knowhow they can contribute, the fac-

tors that influence their decisions, and the power structures in place," Mattes explains. To do full justice to the complexity of the issue, the individual case studies go deep. The team has conducted more than thirty one-to-two-hour interviews based on a common interview guideline in the Oldenburg area alone. The researchers then evaluate the interviews and documents, assigning them to different categories in order to identify overarching themes and similarities as well as contradictions. "We're conducting standard empirical social research," says Mattes.

Although not all the case studies have been completed yet – Mattes' team is studying the energy transition in five other regions in addition to Oldenburg, including the Uckermark, North Frisia and Hamburg – she has already arrived at certain conclusions. The results show that the social dimensions of the energy transition vary from region to region and that requirements also vary. In rural areas like the Uckermark in Brandenburg there is a complete lack of infrastructure, for instance institutions or formal networks that could support the transition and ultimately implement the necessary changes. In Oldenburg, by contrast, wind energy has high priority and numerous companies, most of them connected to the university, have been established over the years. Here, both official and personal networks facilitate dialogue among the various parties involved in the process.

Most people accept that the green energy transition is necessary. But frequently controversies arise when the expansion takes place on their own doorstep.

For Mattes, these initial findings – as predictable as some of them may be – contain an "important message to policy-makers": namely that providing subsidies on a random basis doesn't work because it fails to address specific needs. She also draws another important conclusion: a region will be more receptive to the energy transition if the necessary processes have grown over time and the parties involved trust each other. "In such cases wind energy is not perceived as a burden but forms part of the self-image of a region that supplies itself and others with electricity," says the social scientist.

Christian Busse, Professor of Sustainable Production Management at Oldenburg University, and his colleague Julien Minnemann are also well aware that trust is a key aspect in the energy transition – and that the people involved at the local level play a fundamental role. "The debate about the energy transition is highly emotional and politicised," says Busse. In addition, the global discussion of the topic is inevitably followed by action at a predominantly local level, Minnemann points out. But to be able to implement the energy transition locally it is vital to secure acceptance among the public. This requires a basis of trust between members of the public on the one hand and the implementing agents, such as energy suppliers, on the other, Busse stresses.

In a project funded by the state of Lower Saxony, the researchers are therefore focussing on municipal utilities that take this aspect of the transition into account. "As local, municipally-run energy suppliers, these utilities are in direct contact with their customers. This makes them important partners for implementing the energy transition at the local level," Busse explains. "And in most cases their customers trust them."

In nine case studies planned for the next three years, the researchers aim to learn how municipal utilities are rethinking and revising their existing business models and strategies to meet the economic challenges of the energy transition. In this way the researchers hope to integrate the utilities – as important agents of the transition – into the vital dialogue between the public and the politicians, thus paving the way for greater acceptance.

Dr. Thomas Klenke and Gerard McGovern, two scientists at the university's Centre for Environment and Sustainability Research (COAST), are also involved in initiatives aimed at encouraging communities to assume responsibility in the energy transition. They are leading the COBEN project, which is supported by the European Regional Development Fund. The project focusses on concrete approaches that enable local players to actively shape the energy transition. A major challenge is to embed climate protection in communities by creating new energy infrastructures while at the same time combining this with other local development goals. "We want to enable communities to generate and consume energy independently and set up efficient structures to do so – from energy sources to energy generation and marketing," says Klenke.

Communities themselves become drivers of the energy transition

By setting up local energy initiatives, the six regions participating in the project in Germany, the Netherlands, Belgium, Scotland and Denmark are pioneering a transition that has only just begun at the European level. "Civic energy" is the name of this approach, for which the European Commission paved the way in May 2019 with its latest decisions on the legislative package "Clean Energy for all Europeans". Under the new legislation, energy producers and consumers will no longer have to follow the specifications of major power grid operators. Instead, they will be able to generate, store and distribute electricity and thermal energy independently. This has not been possible until now, for legal as well as other reasons. "Civic energy thus offers a genuine alternative to the traditional, centralised energy supply network," McGovern, the project coordinator, explains. "That's pretty revolutionary."

This brings the scientists in the COBEN project closer to one of their goals, which is to ensure that ultimately communities and the people who live in them benefit from the results of the energy transition. The idea is that the added value and thus the financial revenues remain within the community. "But that's easier said than done," says McGovern. So the participants in the six pilot regions first of all work out the requirements of each community: How much heat or electricity do they need? What about mobility? What are the potential energy sources? And what are the advantages for communities of setting up their own value-creation cycles for energy?

"What's special about this is that we are combining the energy transition with other goals in community development," says Klenke. "But the focus is always on the people". The Danish municipality of Ringkøbing-Skjern, for example, has set itself the goal of covering all its energy needs from renewable sources by 2020. The advantage in this windy region is that wind power already generates more electricity for the community than its companies and residents actually need. "The Danish partners are now looking at how they can use this surplus to secure further advantages for rural structures," McGovern explains – for example a new local transport system that is not dependent on fossil fuels.

This example shows how the entire community can benefit from the goals of the project, says Klenke. "The advantage is that communities themselves become the drivers of the energy transition." The task of the Oldenburg scientists is to draw general conclusions from the six regional initiatives. To do this they outline the various processes that are necessary to implement the structural changes for paving the way to climate-friendly communities. This will gradually result in a roadmap for civic energy. In addition, the researchers will summarise their findings from the case studies in twelve different business models with the aim of encouraging other regions to follow suit. "The most important aspect in this process is that communities or regions clearly define their social, societal and environmental development targets from the beginning," McGovern emphasises.

Ultimately, COBEN aims to put the energy supply process back into the hands of communities – independently of the control of big energy companies and network operators, the researchers explain. Naturally there are still technical challenges ahead, such as the creation of local networks, Klenke stresses. He points out that new decentralised structures could take over tasks of centralised systems, for example. The idea of producing and distributing electricity in new ways also has to be financially attractive, he adds. But the work has begun: "As a project partnership we are quite proud that the positive interim results of our project have been incorporated into the amended EU resolution," he says. Now the EU member states must implement the new directives into national law. Klenke and McGovern hope that the concept of civic energy will not be watered down in the process, so that efficient, community-run civic energy systems can become a reality. (cb)