Dear Readers,

Our university has unveiled a new film series entitled “Die RWTH und das Rheinische Revier (RWTH Aachen University and the Rhenish Mining Area)”, which was created to highlight the huge challenges facing our region as a result of the German energy transition and especially as lignite is being phased out. RWTH Aachen University, with its very broad academic and research basis, also takes center stage as a highly important player in successfully navigating the coming structural changes. What is true of the university at a macro level also applies to E.ON ERC on a smaller scale. With its seven chairs at four institutes, the center not only embraces a diverse range of topics and research approaches but also offers a wealth of opportunities for interdisciplinary cooperation by design. Our cross-disciplinary approach is also reflected in the diversity of the topics chosen for this issue of Research & News.

I wish you happy reading!

Rik W. De Doncker

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E.ON ERC Energy supply of the future

New film showcases RWTH Aachen University’s contributions to structural change in the Rhenish Mining Area

The Rhenish Mining Area (Rheinisches Revier) is facing major challenges as Germany phases out coal as a source of electricity. At the same time, the coming structural change offers tremendous opportunities. E.ON ERC and the Flexible Electrical Networks (FEN) research campus are working on grid structures and components that can be used to integrate decentralized power generation facilities of different sizes into the energy supply of the future, reliably and on a climate-neutral basis. This requires hardware components alongside intelligent controllers and possibly changes in consumer behavior. The film Energie, part of the series entitled “Die RWTH und das Rheinische Revier (RWTH Aachen University and the Rhenish Mining Area)”, features the various research approaches that E.ON ERC and FEN are taking to contribute to this development.
PGS/FCN | Rapid charging infrastructure

Consortium develops innovative DC-based rapid charging systems as part of IDEAL

In partnership with the chairs of FCN-ESE and Management Accounting (CON) at RWTH Aachen University, as well as with prominent partners from the business sector, the power electronics and drives group of PGS-PED is heading a consortium that is working on the rapid development and expansion of the charging infrastructure for electric mobility in the IDEAL research project. The overarching goal is to develop and evaluate technical components, system architectures, and business models for advanced DC-based rapid charging technologies.

An advanced DC-based charging infrastructure for electric vehicles offers definite environmental and economic potential, based primarily on the use of existing grid infrastructures. Installing rapid charging infrastructure typically requires additional transformers and work to upgrade the supply network. The electrical equipment has to be designed for the maximum load when all charging stations are occupied. On the other hand, the transformers used in existing distribution networks are only used at half capacity at most for historical reasons, but higher loads are possible these days. IDEAL is tapping into existing network structures by having local direct current systems be underlain by upstream central rectifiers. This increases the efficiency of the overall system while also lowering costs, plus the work involved in building the rapid charging stations can be reduced.

For the IDEAL project, PGS-PED is developing the underlying direct current network, the controls for the overall system, real-time-capable simulation models to test the control algorithms, a test bench to test the high-performance charging plug, and a testing environment for rapid DC charging stations rated for up to 500 kilowatts. The high-current charging plugs and stations are being supplied by project partners.

The PGS-PED, FCN-ESE, and CON institutes are working together on an interdisciplinary basis to analyze the cost-effectiveness and environmental friendliness of the systems developed and compare them to the conventional DC-based charging infrastructure. Developing solid business models, performing economic and environmental analyses of the possibility of expanding the system across Germany, and identifying possible impacts on the wider economy are also important elements of the broad-based interdisciplinary approach being taken in the IDEAL research project.

PGS | Direct current technology

Novel control method for DC-DC converters makes DC networks even more flexible

For this project, former PGS chief engineer Philipp Joebges developed, implemented, and successfully tested a novel control method for using modular DC-DC converters in medium-voltage (MV) and low-voltage (LV) direct current networks as part of his dissertation. Modular DC-DC converters are advantageous because they work efficiently under either partial or full loads, so they are highly versatile.

Highly efficient, reliable, fault-tolerant, modular, scalable, and galvanically isolated DC converters are core elements of flexible cellular direct current networks. These kinds of networks enable intelligent and efficient energy routing with comparatively low use of resources. This approach makes optimum use of the existing infrastructure.

For example, the control method that has been developed is used to transform voltages of 5 kilovolts and produce variable voltages in the low-voltage range (such as 380 or 750 volts). Special ISOP (input-series-output-parallel) circuitry allows for a high and adjustable voltage ratio, while power can flow bidirectionally.

The modular DC-DC converter (see image), which was developed with industry partners in the first phase of Research CAMPUS FEN, is housed at the PGS testing hall, where it can be connected to the existing high-performance drive unit to test and characterize electrical high-speed generators. Beyond that, the converter can also be used to test further equipment that operates with DC.

Philipp Joebges’s dissertation is titled Distributed Real-Time Simulation of Modular Bidirectional DC-DC Converters for Control-Hardware-in-the-Loop. It is available to download free of charge here.
Demand-driven ventilation in medical centers has high energy conservation potential

In the dECOnhealth alliance project (see Research & News, 3/2020, p. 4), EBC worked with the Turku University of Applied Science in Finland and a number of industry partners to develop practical methods and control strategies for demand-driven ventilation in existing healthcare buildings. This approach to supplying fresh air and air conditioning to rooms with different occupancy levels is a recognized method of reducing energy consumption while also ensuring comfortable temperatures and high-quality indoor air. The Helsinki University Hospital (HUS) and the RWTH Aachen University Medical Center (UKA) were used extensively as case studies for the project.

A large-scale measurement campaign involving more than 200 sensors was carried out to gather information on the indoor climate in over 80 rooms of the two hospitals. The data were then analyzed to identify potential savings achieved through demand-driven ventilation and determine how this approach influences the indoor climate. The identified demand-driven ventilation strategy was tested and evaluated under real-world conditions in a pilot room at the RWTH Aachen University Medical Center.

The results of the dynamic simulation provide impressive proof that demand-driven ventilation can be used to achieve extraordinarily high energy conservation rates of up to 60 percent – and even more in individual rooms – in the medical centers studied. Air quality, high thermal comfort, and highly effective ventilation are ensured at all times. According to the researchers’ results, these kinds of savings should be expected whether spaces are occupied rarely or frequently, as there are typically far fewer people present in any given space than assumed in the ventilation strategy, which is geared toward maximum possible loads.

New methods simplify simulations of building energy systems

Together with the Institute of Energy Efficiency and Sustainable Building (E3D) at RWTH Aachen University and ROM Technik GmbH, a company that specializes in planning and installing building technology, EBC has developed fundamental methods and tools for deriving model descriptions that lend themselves to direct simulation from a data model for building information modeling (BIM). This makes it easier to design and optimize building energy systems in practice. The methods and tools developed in this project significantly reduce the manual effort involved in creating models, which in turn supports the further spread of state-of-the-art simulation applications in the building sector.

Dynamic simulations in the building sector can be used to come up with relatively accurate predictions for energy consumption from the individual building level up to entire districts. The data collected in this
way can be used to analyze different versions of energy generation and distribution systems on a targeted basis early on in the planning phase in order to identify and tap into optimization potentials at an early stage.

To this end, the project uses OpenBIM data in IFC4 format. The data from the planning process undergo a model check as the first step. Then the information is transitioned into a standardized meta-structure developed as part of the project. This structure makes it possible to create models of various simulation applications. After that, the information is enriched by adding statistical data where needed.

The project developed methods for thermal building simulation, systems simulation, and numerical flow simulation. Beyond that, the researchers also devised approaches for life cycle assessment based on the BIM data.

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EBC Energy network optimization

Innovative concepts improve energy efficiency at the individual property and neighborhood levels

The EnBA-M project focused on further developing and optimizing the Berlin Adlershof energy grid, improving its primary energy efficiency, and validating the grid’s flexibility, with a particular emphasis on its cooling supply system. This model project is working to implement innovative concepts for improving energy efficiency at the individual property and neighborhood levels and lay the groundwork for planning efficient ways to supply energy to urban districts.

The project is based on a scientific measurement program that is being used for the holistic analysis of the measures developed in the preceding Berlin Adlershof Energy Network project. Thanks to an intelligent energy management system, the data obtained through these efforts can also be fed back in for operational management. The primary objective here is to achieve an energy-efficient and automated operation of the connected energy infrastructure.

The project should be viewed in particular against the background of the growing importance of decentralized energy systems as part of a sustainable energy supply. Successfully demonstrating a supply struc-

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HANNOVER MESSE 2022 EBC presents exhibits from research projects in the smart energy supply area

Associates of the EBC Institute will be a part of HANNOVER MESSE 2022 from May 30 to June 2. The Institute will be presenting research and industrial projects from the fields of automation, digital solutions, and applied energy technology together with partners from academia and industry at the booth operated by the Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia (MWIDE NRW).

The EBC Institute will showcase several exhibits from research projects in the fields of smart energy supply for buildings and neighborhoods. Among other things, an HTX cube (pictured, at left) and the EBC IoT test bench (pictured, at right) will be on display at the booth. The HTX cube is a movable measuring station used to log comfort-related parameters and user feedback in indoor spaces so that data can be collected easily, regardless of the space being measured. Beyond that, the researchers aim to improve comfort in indoor spaces by comparing objectively measurable parameters against subjective perceptions. The IoT test bench features a traditional SPS system, an edge gateway, and decentralized, radio-based low-cost gateways, which means it has three control systems, allowing for study of cloud-based automation systems in building technology. Beyond that, EBC is scheduled to present current research approaches and methods drawn from the fields of optimized heat pump technology and digital energy neighborhoods, which will contribute to the success of the German energy transition.

The HANNOVER MESSE is scheduled to take place from May 30 to June 2. EBC will be present in Hall 11, B13, at the joint MWIDE NRW booth. To request free tickets, please contact: ebc-hm22@eonerc.rwth-aachen.de.
ture that can respond flexibly to fluctuations in energy supply and demand is hugely important these days, as the proportion of energy from fluctuating renewable sources continues to rise.

As part of its work on the project, EBC collected operational data on the energy network via a cloud-based platform and then analyzed the data using automated algorithms with an eye to the network’s energy efficiency. As the next step, the existing control strategy was compared against a control method proposed by EBC and further refined on that basis. The improved version was implemented in the system afterward.

**ACS  Horizon Europe**

**ACS already participating with seven research projects**

ACS is extremely well represented in Horizon Europe, the EU’s new and most important funding program for research and innovation (see page 10, JARA-ENERGY Talks), right from the outset. The Institute has received approval for seven research projects in all so far.

Horizon Europe is the successor to the Horizon 2020 program, in which researchers from ACS were also involved to a considerable extent. The overall budget for the program, which is scheduled to run until 2027, is 95.5 billion euros. Particular areas of focus include climate action, achieving the United Nations sustainable development goals, as well as supporting and advancing competitiveness and growth in the EU. The goal is to create and spread the adoption of excellent knowledge and technologies.

**FCN  Climate protection**

**Negative CO₂ emissions slow global warming**

The goal of limiting global warming to 1.5 degrees Celsius can only be achieved if CO₂ emissions are drastically reduced in the next few years. However, there are no decarbonization options available for many fossil fuel applications, or the available options are too costly. One alternative to the very high costs of prevention might be to capture carbon from the atmosphere and trade these kinds of “negative” greenhouse gas emissions to offset unavoidable “positive” emissions. In the long term, negative emissions may be a way to slow down the impact of climate change.

As part of the NEMISSIONS project, FCN worked with the sus.lab (Sustainability in Business Lab) of ETH Zurich to study a broad spectrum of different approaches geared toward negative emissions from a holistic perspective and determine how suitable they are for commercialization. The measures considered included the following:

- Reforestation
- Soil-based carbon sequestration
- Deep sea carbon storage
- Accelerated weathering of carbon-absorbing rock
- Capturing CO₂ from the exhaust generated by bio-energy processes
- Direct sequestration (carbon capture) and biomass storage
- Directly capturing carbon from the air.

**E.ON ERC Ticker**

Conca Gürses-Tran of the ACS institute and Clara Köhnen of the Institute of High Voltage Equipment and Grids, Digitalization and Energy Economics (IAEW) at RWTH Aachen University have been designated as national experts to serve as representatives of Germany in the International Smart Grid Network (ISGAN). In the area of power transmission and distribution systems, their aim is to evaluate and compare national projects operated by transmission and distribution system operators in an international context to identify new challenges and opportunities. Because large-scale grids are interconnected internationally, it is essential for operators, manufacturers, and research institutions to work together closely across borders. The ISGAN technology initiative was founded to advance the use of smart grids worldwide.

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Philipp Ostmann of the EBC Institute and colleagues received a best poster award at this year’s DAGA Annual Conference on Acoustics. The poster, which deals with the numerical study of the aero-acoustic behavior of a generic slit outlet, shows how simulation can be used to visualize what is initially a generic air outlet. The researchers also succeeded in predicting the dominant tones found in the experiment through simulation. The results will serve as a basis for constructing real-world air outlets.
Various standards were used to evaluate these approaches:

- Global scalability
- Economic cost
- Duration and stability of storage
- Additionality
- Availability of suitable technologies
- Risk of unintended environmental impact.

The study showed that some of the methods can already be implemented and marketed cost-effectively today. On the other hand, the options that come at low economic cost, particularly reforestation, are not very reliable in terms of sustainability. Forest fires, die-offs spurred by climate change, and human actions can all wipe out decades of progress in just a short time, for example. More reliable options that are more permanent while having only modest side effects on the environment, especially direct sequestration of biomass and capturing carbon directly from the air, are still very expensive these days, costing about 500 euros per metric ton of CO₂.

These methods do, however, feature high learning rates and pronounced economies of scale. From the economic perspective, the participating institutes assume that the costs of negative greenhouse gas emissions might fall below those of alternative ways of preventing CO₂ emissions (such as hydrogen or synthetic fuels) within just a few years.

Biological sequestration, a relatively new approach, has been little researched so far, but offers a promising potential. A follow-up project is currently studying methods in this area.

Energy price crisis

600,000 additional households slip below the poverty risk threshold

With prices rising as a result of the war in Ukraine, the Chair for Energy Systems Economics at FCN (FCN-ESE) used energy economy simulation models and methods to study the potential impact of this development on private households.

The results are striking. If prices hold steady at their current levels, an average four-person household that receives heat via a gas heating system should expect their annual energy costs to be 1624 euros higher than was the case at the start of 2020. Of that amount, electricity accounts for 172 euros (10.6 percent), natural gas for 753 euros (46.4 percent), and gasoline and diesel for 699 euros (43 percent).

With sharp differences in consumption, wealthier households face a heavier burden in absolute terms than those with lower income. However, if the burden is viewed in relation to the respective household income, the image is reversed. With energy prices rising since early 2020 and currently spiking due to the war, this brief study shows that an additional 600,000 households in Germany have slipped below the poverty risk threshold. Heating costs are being felt especially keenly in lower-income households, while higher-income households tend to feel the pinch from higher fuel prices.

Based on existing studies, the researchers also show that households are very
price-sensitive when it comes to energy consumption. In terms of electricity, the decrease in consumption expected as a result of the current surge in prices is 4.9 percent for an average four-person household. A decrease of 25 percent is expected for natural gas, and consumption of fuels is expected to be down by 14 percent.

The researchers say the effects of the relief measures proposed by the government should be viewed from a split perspective. Relief from fuel prices will tend to benefit higher-earning households, while lower-income households (with gas heating) will notice more relief in terms of natural gas.

The researchers advise against directly lowering energy prices, as high energy prices tend to curb the use of fossil fuels – and thus also limit dependency on imports.

In a study, FCN-ECO has developed a method of economically optimum configuration of what are known as “minigrids.” These are small-area electric grids that can be operated either autonomously or connected to the larger grid.

As natural disasters become both more frequent and more severe due to worldwide climate change, the resilience of electrical supply grids is becoming more and more important. Isolating these kinds of minigrids from the wider grid is viewed as an effective way of ensuring a local supply of power in the event of a more widespread blackout. Thanks to a decentralized local or regional generation structure, these minigrids can be used to satisfy demand regardless of whether there is an overarching larger grid.

Previously, there was no standardized method of measuring the economic value of the resilience of minigrids. Currently available methods of studying the resilience of small-area networks generally leave out the economic parameters. However, these very factors are especially important when it comes to deciding on investments to improve resilience.

To close this gap, the researchers have developed methods that can be used to determine the optimum level of resilience, also from an economic point of view.

The newly developed methodology can be used to determine the value of a secure power supply in the area of a minigrid and compare it against the spending needed for technologies to enhance resilience. The methodology developed also offers a way to review and assess monetary and energy policy tools such as feed-in rates and subsidies with an eye to their economic impact.

For possible follow-up projects, Professor Reinhard Madlener and his team plan to expand the methodology they have developed so that the duration of power outages and demand fluctuations can be taken into account more effectively.

The brief study is available online here.

The results of the study are summarized in an FCN working paper available for download here.

FCN | New financing mechanisms for efficiency measures

Conserving energy is expensive. At least when investments in home heat insulation, efficient heating systems, or energy-efficient appliances are needed. This is a big issue for low-income households. In the INVEST research project supported by the German Federal Ministry for Economic Affairs and Climate Action, FCN is working with the Institute of Energy Economics and Rational Energy Use at the University of Stuttgart and adelphi, a consulting firm that works on climate, environmental, and development issues, to develop financing mechanisms to enhance the energy efficiency of existing buildings. These mechanisms will then be tested in case studies in Germany, followed by a quantitative survey. FCN has two major tasks in the project:

- conducting qualitative interviews with stakeholders to identify potential obstacles to investment decisions, and
- verifying the effectiveness of the mechanisms developed by way of a quantitative experimental survey that is representative for Germany.

To develop the qualitative analyses, numerous stakeholders with expertise on energy efficiency investments in the building sector were surveyed in detail. FCN will also be collecting qualitative data from practitioners and private households for a case study in North Rhine-Westphalia. The researchers plan to use expert interviews and workshops to identify financial and non-financial barriers to measures intended to boost energy efficiency in low-income households. Professor Madlener and his team will use the data they collect to develop a web-based survey experiment that can then be used to measure the effectiveness of financing instruments in quantitative terms.
FCN has performed a study on the sustainability of the power supply to rural areas in developing countries via solar power generation and “minigrids.” To this end, two existing minigrids in West Africa – one powered by solar energy and one by a diesel generator – were compared with an eye to economic feasibility and the subsidies needed. Both versions require subsidization, due in particular to low demand and comparatively high grid losses. At the same time, the results show that a minigrid that is fed with solar energy can indeed work cost-effectively if the purchasing power of the supplied region allowed electricity prices of €0.57/kWh or more. In addition, Professor Madlener and his team identified significant cost-cutting potentials through targeted stimulation of demand.

According to studies by the World Bank, the cost-effectiveness of minigrids depends heavily on overall local conditions such as the size of the region supplied, population density, distance from the national power grid, and further geographic and socio-economic factors. Since developing large-scale supply networks comes at a steep price, minigrids can be a preferred solution for dense population centers surrounded by rural areas, even with all these factors in play.

The minigrids studied are located in a West African country. The researchers assumed that the number of customers would be constant over the technical life span of the system (diesel generator: 20 years; solar power system: 30 years), at 700 for diesel and 560 for solar.

As expected, the current rate of €0.48/kWh is far below what is needed to operate a solar-powered grid cost-effectively: the subsidies needed amount to 1.3 million euros over the life span of this option.

Operation would be feasible in economic terms starting at a price of €0.86/kWh. Contrary to expectations, it is even harder to operate a minigrid running cost-effectively on diesel. The minimum electricity price required is €0.89/kWh.

A minigrid with a solar power system requires a hefty initial investment, but the running costs are relatively low. In a minigrid with a diesel generator, by contrast, the focus is on ongoing costs, particularly the costs of purchasing fuel. In light of these findings, it should be no surprise that electricity costs in minigrids powered by solar can be significantly reduced by stimulating demand. In one scenario with rising demand and lower installation costs, the researchers found that the price of power could be lowered to as little as €0.57/kWh.

In the long run, the researchers believe that the economic advantage rests with minigrids run on solar power. However, further studies of possible ways to reduce operating costs and financing costs with an eye to regulatory aspects will be needed before reliable conclusions can be drawn. Studies should also be performed to see how and to what extent grid capacity utilization can be intensified in order to reduce the costs per kilowatt-hour.

The team at the FCN institute assumes that the investments in the use of renewable energies to electrify rural areas in developing countries will be ramped up significantly in the near future. Still, the goal of electrifying rural regions in these countries will remain out of reach in many cases unless substantial subsidies are provided.

In a recently published FCN study on grid-friendly clean energy communities and induced intra-community flows of money resulting from direct local or regional trading of electricity (peer-to-peer, or P2P, trading), Professor Madlener and Robert Crump examined the tradeoffs between grid friendliness and autonomy for various types of clean energy communities (CECs) and the intra-community flows of money resulting from P2P activity.

Based on three reference distribution networks – rural, village, suburban – and on household load profiles and meteorological data, the authors analyzed the self-supply potential on the basis of decentralized photovoltaic systems and wind turbines. Grid friendliness was measured by the change in the net load gradients for the community.

For the study, the authors assumed that CECs can take up to four measures:
• improving energy efficiency,
• joining together to purchase decentralized PV systems,
• introducing P2P trading, and
• installing a wind turbine owned by the community.

Intelligent combinations of measures help to improve the grid friendliness of co-owner communities, even though the cash flows generated from P2P trading are relatively modest. The tradeoffs between autonomy and economic benefit to CEC members also vary widely, depending on the structure of the community and how the measures are combined.

An essay on this topic, titled “Grid-Friendly Clean Energy Communities and Induced Intra-Community Cash Flows through Peer-to-Peer Trading” has been published by Elsevier/Academic Press as Chapter 17 in Energy Communities. To order a copy, click here.
E.ON ERC | International Energy Cooperation Program

Three months in Edmonton with E.ON ERC’s IECP exchange program

Martin Sollich, a business and engineering student focusing on mechanical engineering, spent three months doing research at the University of Alberta (UofA) in Edmonton, Canada, with the International Energy Cooperation Program (IECP) operated by E.ON ERC. He reports back on his experiences:

“When I first started my study program, I knew I wanted to spend time abroad for research or study for two reasons. First, I wanted to keep improving my English, and second, I hoped to prove myself in a completely new environment and get to know new cultures and people in the process. The IECP, offered by E.ON ERC, is a great opportunity to do this. The program involves cooperation with partner universities around the world and focuses on research rather than study abroad. There is also a lot of flexibility in terms of location, duration, and specific areas of focus.

There were several factors that appealed to me about Alberta. The UofA is a very well-known technical university, English is one of Canada’s official languages, and I had been wanting to travel around and see Canada’s stunning natural landscapes for a long time. The application process and contacting the Department of Electrical and Computer Engineering went smoothly.

My research centered on smart contracts for energy markets, which was a whole new field for me as a student of mechanical engineering. I really learned a lot as a result. I would really urge anyone who is interested not to be scared off by research topics outside their specific subject. You learn a lot of new things, and getting interdisciplinary exposure is definitely helpful for your later career as well.

Interested students should find out about the rules for arrival and entering the country well in advance and take them very seriously. In extreme cases, failing to meet the requirements can mean you are barred from entering the country.

In terms of the overall financial conditions, interested students should talk to their professors early on and ask about options for financial support for their research stay. These kinds of options aren’t necessarily published on the university website. Canadian professors evidently have some individual room to maneuver there. Still, there is no claim to these kinds of aid and support.

I found a place to stay in a house south of the university campus via Airbnb. There were six people living there, including students, so it didn’t take long for me to meet people, and friendships developed over time. I had a convenient train commute to and from campus. It’s also easy to get around Edmonton by bus, but I can’t recommend bicycling as an alternative.

The campus is large and all in one place, so it didn’t take long for me to get my bearings and feel comfortable in the university environment. Even with the pandemic, I was able to work primarily at the institute, so I got to know the professor and several of my fellow students better as well. And that had a really positive effect on my English language skills.

The UofA offers a wide range of physical activities right on campus (swimming, fitness, squash, basketball, and so on), all at affordable prices. There are also a number of college teams (basketball, ice hockey, and more), and you can watch them play other college teams for a fair price. Sadly, there is no dining hall like the ones we have in Germany. Instead, meals are available at any of the many fast food restaurants on campus for about nine euros each.

There are a lot of things to do in Edmonton. Whyte Avenue, about a 15-minute walk away from campus, is home to a lot of nice bars and restaurants that are especially popular with students. In the winter – I was at the UofA from October to December – there are lots of opportunities to ski. Although it isn’t cheap, attending an Edmonton Oilers game is also well worthwhile. They’re one of the best teams in the NHL, the North American ice hockey league.

A weekend trip to the Rocky Mountains was a real highlight of my stay from a tourist perspective. The mountain and lake landscapes in Banff National Park (pictured) and Jasper National Park as well as the diversity of flora and fauna were just amazing to me, coming from Central Europe. And then, if you’re lucky enough to come across a grizzly bear, like we did – no joke – the trip is a complete success.

My takeaway is that the time I spent doing research at the UofA was one of the best experiences I have had in my life so far. I learned a lot, not just academically but also linguistically, and in terms of interpersonal relations. And I now have friends all over the world. I really recommend everyone to take advantage of options like the IECP!”
The Horizon framework program for research supports the EU’s Green Deal

“The European Green Deal and how Horizon Europe supports it” was the title of a talk given by Mark van Stiphout, Deputy Head of Unit for Research, Innovation, Digitalization, and Competitiveness at the European Commission Directorate-General for Energy, on key goals of the European Green Deal and how it is connected to Horizon Europe. The online talk took place in January as part of the JARA-ENERGY Talks series.

The German energy transition is a long and difficult road, feasible only if we can map out a clear strategy involving concrete measures. The European Union unveiled a package of strategies and measures to this end in late 2019, calling it the European Green Deal. In the course of the JARA-ENERGY Talks, van Stiphout explained the European Green Deal and how it is connected to Horizon Europe. His talk focused on the key goals of the two programs.

The overarching goal of the European Green Deal is to ensure climate-neutral life in Europe, with low resource impact. To that end, the continent is to become the first in the world to reduce net emissions of greenhouse gases to zero by 2050, making it climate-neutral. The idea behind this ambitious goal goes much farther, as van Stiphout explained. “Our aim is for Europe to be a leader and a role model, so other countries follow our example. Climate neutrality is something we have to think about at a global level, which is why our perspective is geared toward the whole world.” So the energy transition can be achieved, all the different energy sectors must be viewed collectively.

The European Green Deal offers a wide range of measures and specifications to help achieve the goals of the energy transition. Important drivers include the decarbonization of industry and transportation and the price of carbon emissions. The pricing structure is intended to help balance things out in the future, not just in Europe but globally. “With an eye to production in Europe and other countries, we aim to ensure fair conditions,” van Stiphout notes. “Companies that are already climate-neutral in their production activities should not be placed at a disadvantage. On the contrary: the idea is to make climate neutrality more attractive.”

Achieving the goal of a climate-neutral continent will depend in crucial measure not only on decarbonization, but also – and especially – on investment, in digitalization specifically and in innovation and research in general. Horizon Europe is the EU support package that is intended to help implement the Green Deal. Van Stiphout says a greater investment is needed in innovation and research in particular. Europe is not top-ranked in the world in this regard; far from it, in fact.

Alongside adequate financing, van Stiphout notes that existing research alliances need to be expanded and new ones established. Joint research has many advantages that should be harnessed, he says. “Europe has to be and remain competitive. We already have wonderful ideas and expertise in fields such as photovoltaic technology. Now the goal is to build on that and keep up in terms of production as well,” van Stiphout said, summing up the situation in the research sector.

The Q&A session following the talk brought a lively discussion of a wide range of issues having to do with these topics.