Editorial

Dear Readers,

In addition to our research activities, awards play a major role in this issue of Research & News: e.g. the cover picture is a prize-winning photo, my colleague Professor Dirk Müller was awarded a prize for the quality of his teaching, and GGE assistant Christian Vogt was the winner of the „German Fantasy Prize“. Congratulations to you all!

I wish you an interesting read!

Rik W. De Doncker

The entire team at E.ON Energy Research Center would like to wish all our readers a peaceful Christmas and a successful, healthy and energy-charged 2014!
International research cooperation

Scientific collaboration with Russia on the right track

FCN scientists use trip to Russia as a chance for intensive talks with Russian research partners in the area of energy contracting

Internationalization at E.ON ERC is being realized, among others by the International Energy Cooperation Program (IECP). Numerous renowned research facilities worldwide are now working together in research and education with the Aachen Energy Research Center. In February 2013, the Energy Research Institute of the Russian Academy of Sciences (ERI RAS) joined the circle of renowned partners as the first Russian energy research institute, and a Memorandum of Understanding (MoU) was signed accordingly. MoUs with Russian State Technological University (MATI) and the non-commercial partnership "Interregional Association for the Development of an Energy Market and Energy Efficiency" (SRO NP ESMO) are currently in preparation.

With such MoUs, participating research facilities confirm their will to exchange scientific publications and other information of mutual interest. This also enables the exchange of scientific personnel in research and education programs, e.g. in the form of short-term research visits or block seminars.

It the near future, student in engineering and science will be just as welcome in Aachen as our own students at Russian partner facilities. Furthermore, research topics are to be identified, for which the required studies will be carried out in close, work-sharing cooperation between the partners. The joint planning and realization of seminars and conferences is also part of the extensive catalogue of plans for the German-Russian cooperation.

On 21 October, Professor Reinhard Madlener and his research assistant Maria Garbuzova-Schliffter from the Institute for Future Energy Consumer Needs and Behavior (FCN) successfully strengthened the current cooperation further on the occasion of a two-day trip to Russia. Among the topics discussed in the scope of a first meeting with MATI and ESMO representatives were the prospects for this German-Russian research and education cooperation in the areas of energy conservation and energy efficiency. The partners also demonstrated great interest in issues concerning vocational education, the launching of innovative, energy-efficient technologies and joint research projects in general. In particular, these research projects included studies about the structure of the energy service market (Energy Service Company – ESCO – market) in the Russian Federation and about (possible) investments of German companies in this development. FCN has been running a multi-year research project in this area financed by E.ON ERC gGmbH (Foreign Direct Investment in Carbon Footprint Reduction Projects: The Case of the Russian Energy Market post-2012).

A keynote lecture held by Professor Madlener at the Russian Academy of Sciences in Moscow on 22 October during the "First International Forum Renewable Energy: Towards Raising Energy and Economic Efficiency" (REENFOR-2013) met with a decidedly positive response. Under the rubric "Price- and Quantity-based Promotion of Renewables – The European Experience", Professor Madlener’s talk also confronted the issue of how and with which (regulative) political instruments the use of renewable energies can be promoted in liberal markets in an economically viable way. The current situation in Europe and especially the intensive debate in Germany concerning price developments, guaranteed feed-in tariffs and quantity and price control mechanisms were also discussed (the lecture is available for downloading here).

Prof Vyacheslav Teplishev (ESMO President, Director of TBN Energoservice Ltd., left), Prof Roman Golov (Dean of the Faculty for Business Administration and Engineering, MATI, 3rd from left) and Nikolai Shikut (CEO of ESMO, 2nd from left) showed great interest in a cooperation in issues concerning university and vocational education in energy efficiency management and in general joint research in energy services, management and contracting during their meeting with Prof Reinhard Madlener and Maria Garbuzova-Schliffter.

Source: ESMO
FCN | Strategy discussion on sales in the energy transition

"Energy providers must think in a needs-based, customer-oriented way"

When the journal "Energiewirtschaftliche Tagesfragen" – largely familiar among experts under the abbreviation "et" – extends an invitation for an expert discussion, one can assume that a highly interesting exchange is in store. In line with the title of the renowned publication, energy management issues of the day were indeed discussed in detail and illuminated from a variety of vantage points in mid-November – in this case concerning the topic of sales in the light of the current energy transition. Uwe Schöneberg, member of the executive board at RheinEnergie AG, covered the aspect of energy economics. Jan Lengerke, member of the Executive Board of Verivox GmbH, emphasized the customer’s point of view. Alexander Holst, Director of the consulting agency Accenture GmbH, participated as a strategic consultant and Professor Reinhard Madlener from the FCN Institute of E.ON ERC explored the subject of sales from the viewpoint of a social scientist and economist.

In an energy world that is getting increasingly complex, customers above all want simple solutions. Reasonably priced energy services based on the (varying) needs of customers are crucial. Whether this is to be realized with Smart Home, Smart Meter, decentralized generation or customer generation on the roof or the cellar-housed power station is less of a concern. The experts are more or less in agreement as to the growing importance of customized energy services and customer proximity (spatial, as well) in the future. However, as Professor Madlener proposed, one must also realize that even the most innovative service cannot be successful unless the customer chooses to embrace it. It is thus highly advisable for energy providers to adopt a needs-based, customer-oriented way of thinking. Jan Lengerke corroborated the statement: “It is beyond doubt that customers want to be taken more seriously than in the past.”

The full sales strategy discussion was published in the December issue of the journal “et” can be downloaded here.

RWTH/E.ON ERC | Scholarship programs

American Research Center, E.ON SE and other companies promote RWTH students

A total of 630 scholarship recipients at RWTH Aachen University will receive support in the Winter Semester from the Educational Fund, the central study programme of RWTH University. RWTH and the association “proRWTH – Friends and Sponsors of RWTH Aachen” have successfully attracted funds from private sponsors for this purpose to the tune of over 1 million. This sum is doubled by means of resources of the German National Scholarship Program and the NRW Scholarship Program. These programs are intended to promote talented and promising students of all branches of study – both beginning students and hardworking students in advanced semesters – irrespectively of parent income and family background.
This year, Professor Ernst Schmachtenberg, Rector of RWTH, met with sponsors prior to the awarding of scholarships for a get-together at E.ON ERC. The place was chosen with care, as many business and academic partners of the Aachen Energy Research Center play a major role in financing the scholarship program. For example, United Technologies Research Center (UTRC) from East Hartford, Connecticut, donated a considerable sum to support RWTH students in the areas of power electronics (Professor Rik W. De Doncker, ISEA and PGS at E.ON ERC) and integrated production technologies (Professor Christian Brecher, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering). As Dr. Isaac Cohen from UTRC explains, the get-together was intended to strengthen existing contacts with German colleagues outside the scope of research cooperation.

Over the course of the ceremony, which took place in the Coronation Hall of the Aachen City Hall, Cohen awarded a total of 19 students with scholarship certificates.

E.ON SE, which also supports the scholarship program with a generous sum, is concentrating its sponsorship this winter semester on students from the Idea League Master programme “Applied Geophysics”, organized by the Faculty for Georesources and Materials Technology, a joint effort of TU Delft, ETH Zürich and RWTH Aachen. In addition to three scholarships from E.ON SE, five additional scholarships were donated for this programme by RWE Dea AG, Wintershall AG and Enel Green Power S.p.A (Professor Christoph Clauser, Chair of Applied Geophysics and Geothermal Energy – GGE – at E.ON ERC).

E.ON ERC Ticker

The success of E.ON ERC can also be noted from its spatial expansion. At the end of October, a project group moved into rooms of a modular building in immediate proximity to the test hall and the main building (see How to find us). Under the project name SENSE (Smart ENergy SErvices), the team of the two institutes ACS and EBC are conducting interdisciplinary research in the development of thermal and electrically coupled control strategies for low-voltage producers and consumers. An overarching goal of the project is to continue to improve the integration of renewable sources of energy across all voltage levels. For this purpose, the existing test and simulation infrastructure is set to be expanded into a flexible test platform for decentralised energy concepts.

This year too, E.ON ERC was represented with its own information stand at the Night of Science at RWTH Aachen University. Once again, numerous Aachen citizens took the opportunity to inform themselves about everything that’s going on in the labs and research facilities at the university.

EBC | Outstanding teaching

Excellence in research is among the basic requirements at E.ON ERC. At least as important are the education and advancement of the next generation of engineering scientists. Students enjoy ideal conditions for this at the center. Even the opportunity granted to students to broaden their professional horizons is something rarely offered in such a concentrated form as here.

Professor Dirk Müller, Head of the Institute of Energy Efficient Buildings and Indoor Climate (EBC) exemplifies how committed scientists at E.ON ERC are to education. The professor and his assistants at the institute were recently awarded with the 2013 Best Teaching Award for “special educational achievements in teaching” during the alumnus gala of the Faculty of Mechanical Engineering at RWTH Aachen University.

A focal point of interest for both young and old at the E.ON ERC stand in Super C was the eQuad – the four-wheel variant of an electrically powered motorcycle (see image).
The work conducted at the research campus “Future Electric Networks” (FEN) (see Research & News No. 3/2013) focuses, among others, on direct current networks and their suitability for boosting the efficiency of transmission and distribution networks, something that has become an urgent necessity in the light of the energy transition. In the current first year of the project, which, in total, has a planned project time of 15 years and is being funded by the BMBF with up to Euro 30 million, the basic structure of FEN will be developed, partners will be recruited and research topics will be specified in detail.

Currently, the research topics are being agreed upon both within the university - a total of 14 RWTH professorships are participating in the project under the auspices of E.ON ERC - and with industrial partners. It is already clear that the main focus of the research and development work to begin in autumn 2014 will lie in the development and expansion of distribution networks in the medium-voltage range. The work will provide not only for theoretical studies and their implementation in the laboratory, but also for a practical on-site application and appraisal of the new transmission technology - a sort of field test under real working conditions. In this case, “on site” means on the new campus of RWTH Aachen University.

A goal of the project is to build a demonstration grid that connects the test facilities of different research institutes together using a high-performance underground DC cable, supplying them with energy both reliably and efficiently. DC converter technologies will be applied at each of the integrated test facilities, which together operate in a megawatt power range (see also Research & News No. 2/2012). The set-up of this innovative DC demonstration network is planned for completion within the first main phase, i.e. by 2019.

Important research topics include:

- Electronic distribution stations (substations) with electronic power converters, protective components and measuring technology
- DC cable connections
- Automation, regulation and stability
- Economic efficiency, acceptance among the public and spatial integration in the urban and rural landscape (complementary research topics).

GGE | And the winners are ...

With their steampunk novel “Die zerbrochene Puppe” (The Broken Doll), Judith and Christian Vogt have won this year’s German Fantasy Prize in the main category, “Best German-language novel”.

The two authors are fascinated by steampunk, a literary genre committed to generating visions of the future based on the standpoint of the Wilhelmine period. Although Judith Vogt is now an experienced author, she got her husband Christian on board as a physicist with a doctorate in geophysics and currently staff member at GGE, to help develop ideas and to ensure the correct representation of physical elements.

“Die zerbrochene Puppe” tells the story of a young scientist who, for the invention of the fuel cell, pays with her life. Her widower then embarks on a search for his wife’s murderers and for the plans for the fuel cell – accompanied by a doll that speaks to him with his wife’s voice.

Judith & Christian Vogt: Die zerbrochene Puppe, 400 pages, soft-cover

The book is available in bookstores under ISBN 978-3-86762-156-4 or directly from the publisher.