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Dear Readers,

NRW, 1961: “The sky over the Ruhr must be blue again” was the impulse with which Willy Brandt made clear that he had accepted environmental protection as a new challenge. At that instant, he was probably thinking just as little about promoting the economy and technological innovations as he was about a sophisticated energy strategy. But a growth-orientated sector of industry nonetheless began to develop from this moment on: technical solutions, in particular, started contributing to the combating of environmental pollution. These took the form, initially, of “end-of-pipe” solutions, such as flue-gas desulphurisation in power-generating plants. The processes used became gradually more complex, and preventative integrated solutions and improved products were evolved. The concerns included not only air pollution, but also contamination of water and the soil, scarcity of resources and climate change. Nowadays, environmental technologies assure not only environmental protection, but also cost-savings in production and working processes.

NRW was able, as a location, to benefit from the initial spark, as is illustrated by the “Environmental Report North Rhine-Westphalia” drafted by Prognos. This supplies, on the basis of extrapolable statistical analyses, an overview of the environmental industry and the appurtenant companies. NRW is the largest supplier of products and services within the German environmental industry. This cross-sectoral industry, employing 320,000 persons – 4.7% of all persons in employment in NRW – now enjoys greater importance than the “classical” industries of mechanical engineering (3.3%), motor vehicles (1.5%) and chemicals (1.3%). Environmental industry products and services are in demand internationally, and North Rhine-Westphalia’s exports amounted here to more than 8.5 billion euros in 2012 alone. And there is still more potential for growth and development. NRW must expand existing capabilities and competitive advantages, and position itself strategically internationally in this high-growth field, in order to continue its world-market success in the future, too.

The ball that Willy Brandt kicked off in 1961 illustrates just how important political impulses are. If the Paris climate conference also achieves clear signals, NRW would be optimally equipped to react to and implement them in the context of its environmental-industry strategy. In the final analysis, impulses for innovation and growth need not always originate from NRW. In a globalised world, Paris could, for instance, set the ball rolling this time.

Christian Böllhoff
CEO of Prognos AG, Berlin
Signed: Under 2 MoU

“Under 2 MoU” stands for a Climate Group Memorandum of Understanding signed by NRW climate-protection minister Johannes Remmel in Minnesota, USA, in October. The Climate Group (TCG) is an international alliance of regions and companies that are committed to the “Two Degree Target” and to a proactive climate policy, and of which NRW has been a member since 2009. The Climate Group as a whole encompasses some 313 million inhabitants and an area the size of the USA itself. In “Under 2 MoU”, some thirty regions affirm their climate-policy commitment by means of a self-imposed obligation to achieve ambitious targets. This means, for NRW: 25 per cent less greenhouse-gas emissions by 2020, 40 per cent less by 2030. Remmel combined the official ceremony with a delegation trip to the USA focussing on climate-protection technologies.

New brochure on energy-system transformation

The EnergyResearch.NRW cluster’s new brochure examines the remodelling of the present-day energy system to achieve a climate-neutral, efficient energy system based largely on renewable energy. Creative solutions generated by science and research are needed to achieve this. The role of science, the challenges from a global and a national viewpoint, the socio-economic and socio-cultural aspects are illuminated, as are existing systemic concepts, under the title of “Transformation research NRW - Roads to a sustainable energy-supply system”. The virtual “Transformation - Energy Turnaround NRW” institute is also showcased.

Plant makes gas from electricity

Essen-based energy-supplier RWE has officially commissioned its power-to-gas plant in Ibbenbüren, NRW. This plant is part of the first-ever use of a system solution for integration of local power, natural gas and district heating supplies. Surplus electricity from renewable sources is converted here to hydrogen, for subsequent storage in the natural-gas grid. From there, it can be used at a later time for generation of new electricity. The power-to-gas process is seen, in the long term, as an important technology in future energy supplies.
Youngsters with know-how: EnergyScouts OWL

More than 130 trainees from forty-two companies and councils have again researched as “energy scouts” into efficiency potentials in 2015. And with success, as climate networker Niels Krüger, who was EnergyAgency.NRW’s member of the competition jury, can tell us. Including his favourites: the trainees from Bielefeld’s Baumgarte iron foundry, whose EnergyScouts successfully converted, with much commitment and their own tests, the formerly continuously operated agitators to an interval-based control system. The trainees of Meyer Jumbo (Porta Westfalica) earned themselves a special prize by noticeably cutting fuel consumption by means of a competition for the company’s lorry drivers. The project and the competition were organised by the Lippe and East Westphalia Chamber of Commerce and the region’s trainee managers. All companies wishing to make not less than two selected trainees competent on the subject of energy and resource-efficiency were eligible to participate. The scouts will then use the know-how acquired in energy-saving projects within their own company, and enter them for the competition. In addition to topics such as LED lighting systems and compressed air, the trainees also tackled the optimisation of valve technology, cooling circuits and computer technology. Our congratulations!

New ESR requirements for new buildings from 2016

As from 1 January 2016, the currently applicable ESR 2014 (Energy Saving Regulation) will revise the energy standard for new residential and also non-residential, buildings. The permissible annual primary-energy consumption will be cut by 25 per cent, and maximum heat-transmission losses by 20 per cent. These requirements can be met by means of improved insulation provisions, for example, or via the use of regenerative and/or more efficient technology. Even today, many house-builders meet similarly high energy-efficient standards voluntarily since, in this way, they can significantly reduce their energy consumption and minimise their heating costs. The aim of these more stringent requirements is that of raising the overall energy-efficiency of new buildings step-by-step, with the result that only ultra-low energy buildings will, in accordance with the EU Buildings Directive, be constructed from 2021 onward. The guide figures for this are to be published before the end of 2018.

Biogas in NRW

In North Rhine-Westphalia, 622 agricultural biogas plants with an installed electrical output of 289 MW currently contribute to the energy turnaround - this is the conclusion of this year’s evaluation of the NRW Chamber of Agriculture’s biogas-plant operators’ data-base. The largest proportion, at 65 per cent, continues to consist of plants with an output of 151 to 500 kWe. The majority of these plants, a full 92 per cent, are fed with energy crops and farm (“liquid”) manure. As forecast, new construction is currently stagnating, due to the now changed funding conditions.

The anticipated increase in additional construction of 75 kW plants with a substrate-rate of not less than 80 per cent “liquid manure” has also failed to materialise, however.

Pellet heating for Essen refugee home

The energy specialists from Döpik Umwelletechnik GmbH, a partner company of EnergyAgency.NRW’s “Wood Pellets Campaign” market initiative, are installing two pellet heating systems in a newly constructed reception centre for asylum-seekers in Essen. This building is to consist to a large extent of wood. The sustainable building is being funded by the City of Essen and will, from late October onward, provide space for 900 to 1,200 persons and office space for up to 250 employees. The two pellet heating systems each have an output of 400 kW and are fed from two silo storage facilities. The appurtenant smokestack and coarse-particle filter systems are also being supplied by Döpik.
Bochum’s Eickhoff group has discovered the production of gearing systems for wind-energy installations as a business opportunity: the bright smooth (barrel finished) surface means that only slight operating noise is generated during subsequent service.
The environment industry in NRW:
Expanding its lead

100,000 new jobs in the next ten years, some 320,000 employees now, plus 70 billion euros of sales, a global-market share of 2.1 per cent and Germany’s largest supplier of products and services to the industry: NRW’s environmental industry is in impressive form. Even now, around one in twenty employed people here work in the environmental sector. To stimulate still further growth, the NRW state government will be providing funding of around 800 million euros up to 2020. The central element of its environmental-industry strategy is the first environmental-industry report, which was published in August of this year.

On behalf of the NRW environment ministry, the Prognos AG firm of management consultants has analysed North Rhine-Westphalia’s environment industry in a far-reaching study. A pioneering work - never before has an empirical data-base of the environmental sector in NRW been investigated comprehensively and scientifically. Eight market subsegments define the environmental industry as a cross-sectoral industry with some 320,000 employees and, with a 4.7 per cent share of North Rhine-Westphalia’s overall economy in 2012, playing a greater role in the state than mechanical engineering and the chemicals industry. “We aim to spotlight the strengths of the environmental industry in North Rhine-Westphalia and extend our lead as Germany’s No. 1 environment-industry state”, declares NRW environment minister Johannes Remmel. “This industry combines benefits for the environment with great opportunities for companies and employees, along with clear perspectives for young people needing to choose occupational training or a course of study. We will always support that. Our target is 420,000 future-viable jobs in the environmental industry by 2025”.

From a resources to an energy economy
Materials, Materials-Efficiency and Resources Management take pole position on the criteria of sales and number of employees. A good 85,000 persons achieved a turnaround of some 25.7 billion euros on this market subsegment in 2012, exporting goods to a value of 2.4 billion euros. The driving forces behind the growth of this market subsegment include the megatrends of increasing scarcity of resources, urbanisation and population growth. For German industry as a whole, many sectors of which are dependent on the importation of resources, the opportunity of recovering feed materials efficiently via recycling constitutes an important competitive advantage.

The NRW environmental industry’s export “hit” is part of the “Environmentally Friendly Mobility” market subsegment, however. The second highest volume of
exports by the NRW environmental industry (around 2 billion euros in 2012) achieved here can essentially be attributed to the sale of railway rolling stock (some 800 million euros in 2012). The top recipient countries for this market subsegment’s products are Belgium, the USA and France, which account for around a quarter of export sales. The proponents of environmentally friendly mobility benefit, in particular, from the megatrend of urbanisation, and can expect new sales markets in the so-called threshold countries, whereas a large potential sales market for the proponents of the energy-efficiency and energy-saving market subsegment can be found right on their own doorstep, here in NRW. The products and services on offer are an important pedestal for the energy turnaround, since they achieve savings on emissions and on the consumption of resources, and can thus contribute to the attainment of the envisaged climate-protection targets. This market subsegment, which employs around 60,700 persons, is shaped, inter alia, by efficient building-automation technology and by the automation and improved control of production processes.

North Rhine-Westphalia is Energy State No. 1. Around 30 per cent of all German electricity is generated, and to a very large extent also consumed, here. Energy-state ranking is also confirmed by employee statistics. Some 32,700 persons work in environmentally friendly energy conversion, in transportation and in storage of energy. Sales rose by 28 per cent, to 12.2 billion euros, in 2012. The market in NRW is shaped, inter alia, by the large suppliers and by their change of strategy in favour of renewable energy sources. Sub-suppliers for the wind-energy sector based in NRW, such as the Eickhoff group, of Bochum, also play an important role. Leading producers of gearing systems, generators, brakes, bearings and cast components for wind-energy installations are domiciled in North Rhine-Westphalia. With an overall total of almost 100,000 employees, the two energy-orientated environmental-industry market subsegments of energy-efficiency/energy-saving and environmentally friendly energy conversion, transmission and storage even now account for one third of the people employed in the environmental industry.

NRW’s water industry is defined, in particular, by its water and waste-water infrastructure. This market segment accounted for more than 50 per cent of sales of 5.6 billion euros in 2012. The water industry has particular strengths in the field of pump technology. Some of the world’s leading manufacturers in this sector operate from NRW. The in some cases deficient infrastructures in the threshold countries, among other things, provide interesting opportunities for NRW’s water industry.

A particularly large number of so-called “Hidden Champions” from NRW, i.e., companies unknown to the public at large, but playing a leading role in their particular markets, can be found in the reducing and protective technologies market subsegment. These include the manufacturers of products for the reduction of emissions, and the suppliers of technologies for the protection of the water and waste-water infrastructure.

“Our target is 420,000 future-viable jobs in the environmental industry by 2025.”

Leading subsuppliers for the wind-energy sector are domiciled in North Rhine-Westphalia.
of air-pollutant and noise emissions, along with materials and products for noise insulation and suppression. This market subsegment is made up of highly specialised small and medium-sized enterprises (SMEs). A total of around 9,000 people work in this sector.

The smallest market subsegments in the NRW environmental industry by sales and number of employees are the sustainable timber and forestry industry and environmentally friendly agriculture. A good 5,200 people achieved turnover of around 1.1 billion euros in the sustainable wood-production segment in 2012. In environmentally friendly agriculture, approx. 2,500 persons achieved sales of a good 686 million euros.

**Metropolis Ruhr in pole position**

At least equally important as assessment of the market subsegments is the analysis of NRW’s individual economic regions for their strengths and weaknesses as environmental-industry locations. The Ruhr Metropolitan Region occupies a leading position here. The figure of 97,000 employees means that virtually one in every three employee in the industry as a whole has his or her place of work here. In addition, 21 per cent of all patents for the NRW environmental industry were filed from this region.

The “Metropolis Ruhr” is followed directly, on the basis of number of employees, by the Cologne/Bonn region. A good 53,000 persons work in this region, 15,000 of them in the environmentally friendly mobility sector alone. Thanks to its central location on the River Rhine, this region constitutes a logistical hub, particularly as the hinterland for the seaports of the Netherlands. The automotive location of Cologne, with its important subsuppliers and associated companies, has the potential to further accelerate the development of environmentally friendly propulsion technologies.

Only a few kilometres to the north, around Düsseldorf, 3.3 per cent of persons in employment work in the environmental industry. The majority of the total of 19,800 persons employed are active in the materials, materials efficiency and resources management market subsegment. The region’s tradition as a location for metalworking is reflected in the relatively great role played by plant engineering for the waste-management sector.

The adjacent Lower Rhine region, on the other hand, demonstrates its strengths in waste collection and treatment, in particular, and in materials- and energy-route recycling. A total of more than 10,000 of the good 28,800 persons employed in the regional environmental industry work in the materials, materials efficiency and resources management market subsegment.

The focus of the third largest region of the NRW environmental industry, East Westphalia-Lippe, with 35,500 persons employed, is on Industry 4.0, i.e., networked production. Materials-Efficient Production Processes and Technologies, in which an above-average number of people work, at 4,400 persons in employment, includes a whole series of hidden champions in the field of automation and control technology.

The Münsterland region, with a total of 27,000 persons employed in the environmental industry, has its focus in the Energy-Efficiency and Energy-Saving market subsegment, with just on 7,200 employees. A particular emphasis here is on building, installation and architectural services. This is also reflected in the predominantly medium-sized company landscape. Initiatives for renewable energy sources, such as the Saerbeck bioenergy park, augment the Münsterland region’s profile.

The timber and forestry industry plays a prominent role in South Westphalia, with a total of 27,500 persons employed in the environmental industry. By

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**Market subsegment** | **Employees, 2012** | **Δ 2009–2012** | **Sales 2012 (million euros)** | **Δ 2009–2012**
---|---|---|---|---
Materials; Materials Efficiency and Resources Management | 85,002 | + 6.0% | 25,662 | + 25.8%
Environmentally Friendly Mobility | 70,903 | + 4.1% | 11,613 | + 31.1%
Energy-Efficiency and Energy-Saving | 60,778 | + 3.9% | 10,872 | + 5.3%
Environmental Industry/Water Industry | 52,537 | + 4.6% | 5,601 | − 11.1%
Environmentally Friendly Energy Conversion, Transmission and Storage | 32,698 | + 10.4% | 12,204 | + 28.0%
Reducing and Protective Technologies | 8,978 | + 5.5% | 1,873 | + 31.6%
Sustainable Wood and Forestry Industry | 5,163 | + 10.6% | 1,214 | + 0.8%
Environmentally Friendly Agriculture | 2,462 | + 7.1% | 868 | + 29.8%
Total market | 318,521 | + 5.4% | 69,636 | + 15.6%
Far the largest percentage of North Rhine-Westphalia’s pine logs originate, for instance, from South Westphalia; the region has, for example, high sawmill capacities, practically entirely in the form of owner-managed companies.

The Aachen region, totalling more than 20,000 persons employed in the environmental industry, exhibits a special feature compared to the other NRW environmental-industry locations. The Materials, Materials-Efficiency and Resources Management market subsegment is, with more than 6,100 persons employed, outstandingly specialised for this region, particularly in the market segments of plant engineering for waste management and materials-efficient production processes and technologies.

The “Bergisch” triangle of towns is a location with a long industrial tradition, in which metal products, in particular, and - to a limited extent - mechanical engineering, chemicals and electrical equipment are of importance. Of the good 9,600 persons employed in the environmental industry, Environmentally Friendly Mobility is the largest market subsegment, with just on 2,900 persons employed. The second largest market subsegment is Materials, Materials-Efficiency and Resources-Management, with around 2,400 employees. A good half of these persons are employed in the Materials- and Energy-Route Recycling market segment. A large number of local networks, such as “surface.net” and “hundertprozentig.ERNEUERBAR”, and the Initiative New Efficiency, support these companies.

Dialogue in focus

The Environmental Industry Report NRW provides the basis for future economic-policy provisions which the state government intends to draft on the basis of a master plan. Provisions within the framework of the environmental-industry strategy are to be grouped together in this, and their specific implementation regulated in detail. An important element of this process will consist of on-the-spot dialogue with the relevant players. “Location and economic forums will be organised for this purpose”, states the responsible minister, Johannes Remmel. “We are relying on intensive participation by NRW companies, by the regions and by the environmental and industrial associations. At the end of this process, the result is to be initiated as the master plan for the environmental industry in North Rhine-Westphalia”.

An initial contribution is provided by the “Impulses for the environmental industry. Concepts for action for the strengthening of the environmental industry in North Rhine-Westphalia” publication. This examines concepts for action derived from the NRW 2015 Environmental Industry Report. These will also provide the strategic framework for intensive on-the-spot dialogue with the players.

In the context of its supra-departmental environmental-industry strategy, the NRW Ministry for Climate Protection, Environment, Agriculture, Conservation and Consumer Protection has provided around 800 million euros of funding up to 2020. A focus in this funding is on advisory services on efficiency and intensified promotion of foreign trade, the promotion of innovation and projects, and on the promotion of environmentally orientated company start-ups in North Rhine-Westphalia.

“At the end of this process, the result is to be initiated as the master plan for the environmental industry in North Rhine-Westphalia.”

Siemens mobility’s Krefeld-Uerdingen location is one of Europe’s most modern rail rolling-stock production centres.

Information:
Akram El-Bahay, email: el-bahay@energieagentur.nrw.de and www.umweltwirtschaft.nrw.de
In the lead in the environment industry

“innovation&energie” interviewed Rasmus C. Beck on the importance of the Ruhr region for the NRW environmental industry. Beck has been director of the Wirtschaftsförderung metropolieruhr GmbH (wmr) economic development agency, a wholly owned subsidiary of the Ruhr Regional Alliance, since 2013.

Herr Beck, the 2015 Environmental Industry Report highlights the Ruhr metropolitan region as the central region in NRW for this industry. More than 30 per cent of the employees achieved a good 37 per cent of overall turnover in 2012. Were you expecting a result like this?

Beck: These are extremely pleasing figures for this region, but they are not surprising, when you look at the rates of growth for socially insured employees. The Ruhr metropolis increased its figures for socially insured jobs by 7.3 per cent in 2012 to 2013 alone, whereas NRW achieved only 2.1 per cent and Germany as a whole only 1.8 per cent! Many companies have developed new business models for the solution of ecological problems, and are trading successfully on the market with them - both in Germany and internationally.

What is this region for you? What are the strengths of the local environmental-industry companies?

Beck: Since 2011, we have focussed our regional economic analyses on eight lead markets. The Ruhr conurbation’s companies on the lead market of resources efficiency, which include, for instance, the players in energy, water and the circular economy, are especially well positioned. They furnish new products and services that are in great demand beyond the region’s boundaries, and are among the leading international players on their markets. Take pump manufacturer WILO, from Dortmund, for example, or Cornelsen Umwelttechnologie, in Essen, companies which are also notable, in particular, for their great innovational capabilities. At the same time, and that is one of the strengths of the Ruhr, such companies form networks above and beyond their own immediate fields of activities, in which innovations are sought and interchanged.

You mentioned the “Resources Efficiency” lead market. The region is home, in this field, to important companies in the environmental industry, in the form of manufacturers of wind turbines and heat pumps. What are the locational advantages of the Ruhr metropolitan region?

Beck: The companies from the “Ruhr metropolis” are not unreceptive to new stimuli, instead they pursue new routes in their innovation. One good example is the Eickhoff group, of Bochum, which practises “open innovation”. They actively involve customers and users in working procedures, and thus get immediate feedback. Eickhoff has discovered the production of gearing systems for wind-energy installations as a field of business, and rapidly expanded it. This demonstrates this company’s great innovational capabilities. The focus is always on customised solutions, however.

Could you spotlight a project which really embodies this region’s strengths?

Beck: wmr provides totally pragmatic support for companies on-the-spot by facilitating and accelerating the networking, internationalisation and brand-generation of the overall “Metropolis Ruhr” location in the environmental-industry sector. The “Green Tech Ruhr” project, which wmr is planning together with municipal partners from Essen, Oberhausen, Bottrop and the County of Recklinghausen, and which has been submitted for the competition, has been proposed for funding in the context of the current Regio NRW funding competition. This project is intended to generate added microeconomic value for the SMEs in this future-orientated industry located here by contributing content for the formation of an “environmental industry” brand core and implementing this in communications on German and international markets.

Many thanks for speaking to us!

Rasmus C. Beck
Bio and innovation in the park

The energy turnaround can succeed only provided resources are used efficiently and intelligently.

A new University of Bonn research project is studying how previously unused wood from the fruit-growing and horticultural region between Meckenheim and Rheinbach can be materials- and energy-route utilised. The potential of the fruit-growing farms and tree nurseries, and also of urban green areas, the green strip bordering roads, wooded districts and unused communal land for energy supplies from (climate-neutral) wood and other wood-like regenerable raw materials is being defined in a far-reaching analysis. This “site register” will then be utilised as the basis for a concept for use which will integrate “cascade utilisation” from the materials-route to energy-route use, plus energy-optimised land management. The innovation here is not only the resources-efficiency concept, but also the close cooperation between the university’s Faculty of Agriculture, the towns of Meckenheim and Rheinbach, and the local companies, which are included as pilot enterprises. This network is intended to stabilise as the “bio innovation park Rhineland” and trip off other projects combining climate-protection and resources-efficiency in the “orchard” of the Rhineland.

Project management is the responsibility of the Department of Urban Development and Planning at the Institute of Geodesy and Geoinformation of the University of Bonn. The project partners are INRES, with the Regenerative Raw Materials research sector at the University of Bonn’s Klein-Altendorf campus, along with the towns of Meckenheim and Rheinbach. The project is to receive funding from 2015 to 2018 under the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety’s National Climate Protection Initiative.

www.bio-innovation-park.de

NRW, with its dense network of renowned research institutions, is capable of supplying decisive impulses for the energy turnaround. Against this background, the NRW economics ministry in 2009 set up the EnergyResearch.NRW competition. “With this competition, we support the cooperation of science and industry in North Rhine-Westphalia, which is so vitally necessary for progress. Because: progress means finding time for new and better answers to the challenges, and shaping the turnaround for people. For this we need new knowledge, and it must be translated into innovations as quickly as possible”, notes NRW science minister Svenja Schulze. The balance, after a good half decade, is decidedly positive.

Fifty-eight joint projects applied, and fourteen were approved. The participating partners were made up of ten small and medium, and thirteen large companies, fifteen universities of applied sciences, two research institutions and two young and innovative enterprises. The latter were 100 per cent funded via the NRW-EU Target 2 (EFRE) competition. Total funding amounts to 12.4 million euros. The supra-competition funding rate is 76 per cent.

A large portion of these projects were devoted to the subject of simulation in energy technology and energy economics. Others evolved new heliostat concepts for solar energy, improved the process chain in all facets of the use of straw as a fuel for energy generation, the construction of turbines or high-performance welding technology for the production and processing of pipes. The concept of transfer and the expansion of the value chains were the focus. The EnergyResearch.NRW competition has thus contributed to furthering the energy turnaround via the development of innovative energy technologies.

www.cef.nrw.de
Gummersbach-Lieberhausen, in the hilly Oberbergisch Land, can celebrate in 2016: North Rhine-Westphalia’s first wood-fired district heating plant will be 15. “Construction of this plant was unquestionably the right decision”, summarises Bernd Rosenbauer, of the Wald und Holz NRW forestry agency. Wood-based heating enjoys broad popularity here. The Supervisory Board and Board of Management of the Energiegenossenschaft Lieberhausen eG energy cooperative continuously publicise this successful project via information and the involvement of the populace. “Experience shows that the underlying communal idea of self-sufficient energy supplies can work properly only with a lot of unpaid commitment by citizens”, Rosenbauer comments. Both projects were created at that time with assistance from Energy-Agency.NRW’s energy consulting team.

The central element of the forestry wood-chip-fed system is a pusher-grate stoking system with a rated output of 970 kW. The heating plant does not need to be continuously manned; staffing needs are restricted to one 30 minute inspection round each day. An oil-fired boiler with a thermal output of 1,400 kW is available as a guard against failures, but long years of experience have shown that this is needed neither for low-load operation during the summer months, nor for peak-loads during the winter.

And another installation is also celebrating a minor anniversary: the biogas plant in the Ebbinghof district of Schmallenberg has been supplying surrounding houses with heat since as long ago as 2009. The biomass used - such as liquid manure, animal-stall manure, animal-feed scraps and grass silage, for example - occurs predominantly locally. Sufficient biogas to operate a CHP plant unit with an output of 250 kWt and 320 kWt was firstly generated in the plant’s digester. But Ebbinghof would not be Ebbinghof if the concept had not been further elaborated: the gas yield from the biogas plant is now sufficient for another four CHP plant units, including a satellite unit in Bad Fredeburg, which meets the heat requirements of a school complex, the SauerlandBad swimming centre, and the local academy.

Reliable operation can be assured only by means of regular maintenance, however. “The CHP unit is a complex system which can be kept continuously ready for operation only by means of intensive attention, so precise real-time monitoring of system faults, including the heat grid, is of immense importance”, adds Georg Muth-Köhne, operator of the CHP unit at Schmallenberg-Ebbinghof. This CHP unit is maintained both by the operator and by the manufacturer. This is augmented by a daily approx. 30 minute on-site inspection, plus remote monitoring. These provisions make it possible to keep downtimes and the concomitant extra costs at a low level, as is also reflected in the cost calculation, which assigns only around 2 cent/kWh of electricity generated for supervision and repair costs. Ebbinghof is also planning more optimisation in the future: not only improved engine-capacity utilisation, but also, and above all, needs-orientated network-controlled CHP unit operation is targeted. In this context, direct use is made of the CHP unit’s output via the electricity exchange in Leipzig, in order to balance out short-term demand fluctuations in the electricity grid.

The positive conclusion for both projects: both the biogas plant and the wood-chip combustion system have proven their worth over many years, thanks to the good planning, support and cooperation of all those involved.

Bioenergy with no use-by date

Even after years of operation, systems for recovery of energy from biomass continue to impress with their reliability and their modest maintenance needs.
Barbara Bludau has changed modes, from her car to her bike - at least on days when the weather permits. She commutes approx. 17 km, from southern Mülheim an der Ruhr to Essen-Altenessen, benefiting increasingly from the “High-Speed Cycle Track Ruhr”, which runs, with no traffic lights, parallel to the A40 autobahn.

Electrical propulsion ensures that the differences in elevation in the valley of the Ruhr are child’s play. “My route to work is practically relaxation, especially in the mornings, at sunrise”, says Barbara Bludau. Greenery to the left and right, while the A40 passes through the urban townscape, overloaded with motor traffic, day in, day out. The so-called “modal split” provides information on the modes of transport we use for our daily travel. It is being surveyed in a mobility panel, in which around 1,000 households are being polled on their mobility behaviour for a period of three years. The motor-car, of course, scores highest, at 53 per cent (MOP 2012), followed by walking (21 per cent). Local public transport scores 11 per cent, and the bicycle 15 per cent.

The bicycle’s quota could rise significantly in the future, however. The rapidly growing market for e-bikes and Pedelecs is generating totally new uses for it. It is nowadays possible to tackle longer and hilly routes without difficulty. And the market triumph of the e-bike is being accompanied by the expansion of the cycling infrastructure. We mean here, in particular, high-speed cycle tracks, many of which lead straight to the destination. This, in the former Ruhr industrial region, is a beneficial result of structural change. The High-Speed Cycle Track Ruhr in part follows an old abandoned rail route from Ruhrort, in Duisburg, via Meiderich, to Mülheim an der Ruhr. This former “Rheinische Eisenbahn” line of the Prussian State Railways was used for haulage of coal up into the 1960s. After that, wild vegetation began to grow between the rails, for a period of nearly fifty years.

In the Mülheim district of Heissen, the route then again runs alongside the railway tracks. Here, too, the existing rail infrastructure is used. Several sections along this line were cleared and restored for bicycle traffic during 2015, and are even now extremely popular. The bicycle’s share of the modal split is thus set to climb even further upward. Barbara Bludau, who was not in the least discouraged when her bike’s electrical motor once failed during a trip, intends to play her part in this. Electromobility is still in its infancy, and here, as everywhere, numerous innovations are still needed to make everything run smoothly.

www.energieagentur.nrw.de/mobilitaet
Married couple the Papes acquired the Old Friedenthal Knife Factory in Nümbrecht eight years ago. Both the site and its buildings were in a totally dilapidated state, firstly necessitating comprehensive restoration work. Rainer Pape, a restoration specialist, took on this task. The site’s previous owner had, in addition, left the couple a hydroelectric plant, including ancient Prussian water rights. And, because the Pape family really does take climate- and environmental protection seriously, they decided in favour of investing 250,000 euros in installing a new hydropower system.

This system naturally also includes integrated fish-protection systems for the conservation and improvement of the ecological conditions. The new system on the Homburg Bröl river, with a “head” of 3.60 m and flow rate of 1,600 l per second, generates 53 kW of electricity for around fifty households - an average of 175,000 kWh annually for climate protection. The installation now also meets more demanding ecological requirements. “Thanks to automated applications, we can now do many things much better than we previously could; the water level, for instance, is now kept guaranteed constant, which ensures that sufficient water always remains in the river. In addition, the 15 mm vertical screen is also cleaned automatically and continuously”, notes Rainer Pape.

Their commitment to climate-protection gives the Papes a pleasant feeling for their life - but this is not only due to the fact that they now generate emissions-free electricity, use a sustainable heat source thanks to the heat pump installed and can travel 100 kilometres with their electric car for only the equivalent of 1.50 euros. No, the conservation of their region’s cultural heritage is also extremely important to the Pape family. As they comment: “Particularly in times of climate change, we consider it especially important to use hydropower sustainably”. So in this way, bit-by-bit, the couple have made the energy turnaround their own and combined various ways of using regenerative energy innovatively and creatively. Sculpture seminars for beginners and those more advanced are available on this site, naturally including a visit to the hydropower installation for those interested.

By the end of 2014, more than four hundred hydropower installations with a combined output of around 200 MW were generating electricity from hydropower in NRW (data: Federal Network Agency, State Environment Agency [LANUV], Amprion GmbH, Tennet B.V., information status: March 2015). All together, they achieved a calculated annual power yield of more than 500 GWh - sufficient to supply nearly 65,000 people in NRW with electricity.

www.energieagentur.nrw.de/wasserkraft
Due to changing boundary conditions, energy cooperatives are currently coming under great pressure. Their classical purpose, the construction of photovoltaics installations feeding into the public grid, is now scarcely worthwhile.

Many energy cooperatives are therefore looking for new spheres of activity, with the least possible dependence on the RESA.

One possibility frequently mentioned is the broad field of energy-efficiency projects. A recent study by the Institute for Energy and Environmental Research Heidelberg (ifeu) compiles and systematises examples of this from all over Germany. Around 160 of the some 1,000 energy cooperatives registered in Germany are already active in this sector, by far the majority in local heating. Joint supply of heat enables the energy cooperatives to achieve a higher energy-efficiency than is possible using individual heating systems. A major portion of the (currently relatively few) energy-cooperative start-ups are also active in this field.

One sector which up to now only few energy cooperatives have ventured to enter, however, is the implementation of energy-savings modifications in existing buildings. Professional contracting firms have been working on realising the enormous savings potentials of existing buildings for more than two decades. Energy cooperatives could be a rational augmentation here, particularly in the case of small project volumes.

There are a number of energy cooperatives who, following the completion of projects in the renewable-energy field, have then tackled their first energy-efficiency projects; modernisation of lighting systems is the most frequent application in such cases. In Aachen, among other locations, work is progressing, in the context of a subsidised pilot project, on the founding of “Regional Energy-Efficiency Cooperatives” (REEC), which are to be involved only in such efficiency projects. A number of challenges remain to be overcome, and boundary conditions to be improved, before this concept can be implemented without subsidies, or is able to trip off a new wave of energy-cooperative start-ups.

The installation of new illuminants has reduced power consumption at Papier Union GmbH significantly. This project is an example cited in the new ifeu study.

www.energieagentur.nrw.de/buergerenergie
Urgent: Energy audit

Companies not classified as small or medium-sized enterprises (SMEs) are required to perform an energy audit in accordance with DIN EN 16247, Part 1, by 5 December 2015. This audit must be repeated after four years. This is a requirement of Article 8 of the Energy Services Act (EDLG). The audit is currently a cause for anxiety in whole industries. The Federal Office of Economics and Export Control (BAFA) provides on-line information and documentation, including a list of accredited energy auditors, for example. Important: these energy audits are to be performed on a random-sample basis.

Funding news

SMEs who wish to make use of a subsidised “Energy consultation for medium-sized enterprises” should also act quickly. The BAFA’s funding programme officially runs only to the end of 2015. The BAFA informs us that it is hoping for an extension, but advises the prompt submission of applications in cases of doubt. The SME Groups Germany (Mittelstandsverbund) can also provide information: www.mittelstandsverbund.de

In recent years, the “Subsidising of investments for the use of high-efficiency cross-sectional technologies” has been no less than sensational success: well over 30,000 applications were received by the BAFA from small and medium-sized enterprises. Support is provided, for instance, for the replacement of electric motors and drive systems, pumps, fans and heat-recovery and compressed-air generation systems, for instance. The subsidy programme has thus gone beyond all expectations. The downside of this success: because of the extraordinarily high volume of applications, prolonged waiting times must be anticipated for application processing, despite the assignment of extra staff for this purpose.

Contracting

Information from the Internet

Finance and contracting – a subject that causes headaches for many municipalities in North Rhine-Westphalia. Contracting has now proven its value as a modern financing method for projects which boost energy-efficiency. The legal boundary conditions for contracting vary from federal state to federal state, however. EnergyAgency.NRW has compiled a digital compact-information service on the various criteria of municipal budget-law handling of contracting projects under the “Applications/Public Buildings” heading: www.energieagentur.nrw.de/contracting.

Municipalities in NRW who wish to implement contracting projects are required, for example, to take into account domestic-law classification and handling in accordance with the Municipal Budget Ordinance NRW and the Municipal Code NRW. Unlike the situation in some other federal states, there is no requirement in principle for approval in NRW.

As operators of, for example, swimming pools, properties such as town halls and schools, and street lighting systems, municipalities are, alongside industry, among Germany’s largest consumers of energy. The costs simply for the supply of energy for the buildings operated by all German municipalities (175,600 buildings) come to no less than 2.2 billion euros annually. Nearly 70 per cent of these costs are for the supply of heat. Energy consumption amounts to 37,100 GWh. The challenges to municipalities concerning adaptation to climate-change are also growing simultaneously.

Fuel-cell heating system subsidised

The State of North Rhine-Westphalia has been successfully promoting the market launch of fuel-cell heating appliances via its “progress.nrw – CHP” programme of subsidies for more than two years. Over 150 funding applications have already been approved. Starting right now, private users can also benefit from the NRW state’s generous investment-cost grant. Combination of state subsidies with funding from the federal Mini-CHP impulse programme is necessary for this purpose. The amount of funding depends on the system’s output, and covers around 40 per cent of purchasing costs. A large range of tried and proven fuel-cell heating appliances is now available. Units of various outputs can be added to the existing heating system, or can be supplied as an all-in system. These appliances are suitable in private use for coverage of the base electricity load in a residential building using waste-heat for the production of hot water. www.kwk-für-nrw.de
What has long been true for refrigerators and washing machines this year also applies to boiler rooms: certain heating systems affected by the Ecodesign Directive have, since 26 September 2015, been required to bear an energy label. This label states how energy-efficient the heating system and its components are. The bandwidth extends from A++ for very good to G for deficient efficiency (combination systems: A+++ to G). The use of renewable energy is included as a criterion.

Affected first are new appliances, including heating boilers, heat pumps, combination heating appliances and hot-water generators with up to 70 kW rated thermal output, hot-water storage tanks up to 500 l capacity inclusive, and CHP units of up to 50 kW electrical output. There have, in addition, also been minimum requirements for certain new heat generators since 26 September 2015. In many cases, condensing appliances, which utilise the energy contained in the waste gas, will be necessary for combustion of fossil fuels.

The new efficiency label will also apply to existing heating equipment as from 1 January 2016. Chimneysweeps, heating technicians and guild building-energy advisors and energy-pass issuers (Article 21 ESR) will then be entitled to affix the label. This regulation is to apply initially only to heating equipment using gaseous and liquid fuels which have a rated output of up to 400 kW and are older than fifteen years. As from 2017, district chimneysweeps will be obliged to affix any missing labels during the combustion-equipment inspection. Legislation requires that all heating systems must be fitted with a label by 2024, starting in 2016 with appliances manufactured in 1985. Affixing of the label is free-of-charge for the property owner and for tenants. Both need to take no action for labelling, but must permit the affixing of the labels.

The aim of obligatory labelling is that of informing consumers on the efficiency of their heating systems, facilitating decisions on the purchase of climate-friendly heating equipment, and motivating the industry to develop more energy-efficient appliances.

www.energieagentur.nrw.de/4569
New wind turbine for Hoppenbruch spoil heap

Ruhrwind Herten GmbH is planning a new installation costing 4.5 million euros in the south of Herten. The location: the Hoppenbruch spoil heap. The existing installation there is to be “repowered”.

The wind-power installation on the spoil heap in Herten has become a familiar landmark in this region, and is, simultaneously, a symbol of structural change in the Ruhr conurbation. Located in the Hoheward landscape park, it forms part of the Industrial Heritage Trail. “This wind turbine was one of the first anywhere to be mounted on a spoil heap”, notes Thorsten Rattmann, director of Herten’s municipal utilities. The wind turbine in Herten has generated around 42,610 MWh of electricity since its commissioning in 1997, and thus saved some 32,000 tonnes of CO₂.

The system is now to be replaced by a more modern, higher-power model. So-called repowering is necessary because this installation can no longer be operated cost-effectively using the existing technology and under the remuneration regulations of the Renewable Energy Act (EEG).

“Wind energy is making a great contribution to climate-protection. We, with our system, thus support an important element in Herten’s Climate Concept 2020+”, affirms Frank Girke, director of Ruhrwind and head of the electricity division at the Herten utilities. The new installation on the Hoppenbruch heap is to supply an annual around 6,700 MWh of power, sufficient to provide some 1,900 households with electricity and, in addition, eliminate an average of 5,000 tonnes of CO₂ each year.

All shareholders in Ruhrwind Herten GmbH are to participate in this investment. “The state parliament recently passed new laws strengthening the Ruhr Regional Alliance (RVR), and this enables us to devote ourselves intensively to the further development of Ruhrwind Herten GmbH”, emphasises Ulrich Carow, the RVR’s head of division for the environment. The RVR, at 51 per cent the majority shareholder, is to contribute a maximum of 500,000 euros of equity, while up to 440,000 euros will come from Herten’s Energiehandelsgesellschaft energy-trading corporation (shareholding: 44 per cent). Jürgen Schmidt, a private investor and shareholder (5 per cent), is to take a stake of up to 50,000 euros.
Parking in pole position

The Act on “ Preferential treatment of the use of electrically powered vehicles”, known for short as the “ Electromobility Act”, has been in force since June 2015. Its provisions have special importance for the municipalities, since they empower them to implement priority rights for electric vehicles for parking on public roads and surfaced areas. In addition, car-parks for electric vehicles can now be designated as such with legal certainty.

A number of towns and cities now wish to make prompt use of these new laws and set up e-parking-space management systems. These include the town of Iserlohn, in the Märkisch County. Here, the administration has been instructed to permit free-of-charge parking for electric vehicles within the town boundaries. Maximum parking time on these parking spaces will be three hours. Developments are to be evaluated at regular intervals during the three-year project period.

The introduction of free-of-charge parking for electric vehicles is also an element in the Electromobility plan of action under the EU’s “Emobility Works” project, in which Iserlohn and twenty-seven other European municipalities are participating. An important component of this project is the expansion of the infrastructure for recharging the batteries of electric cars, which will thus gain in market appeal.

For this purpose, the town of Iserlohn and the local municipal utilities have initiated a model project in cooperation with the Berlin infrastructure and service-provider, ubitricity GmbH. Owners and renters of electric vehicles will soon be able to tank up on “local electricity” at seventeen locations in the town without having to worry about complicated on-the-spot payment. “The municipal utility will provide the electricity, and the city, together with ubitricity, will take care of the infrastructure”, notes Ulrike Badziura, Iserlohn’s Climate Protection Officer. As she continues, establishing Iserlohn as a model municipality for electromobility is a further important step in reducing traffic noise and exhaust-gas levels in the town, and thus making a contribution to local climate-protection.

KLIMA TEENS

Saving energy and plastics

Skateboards, Smartphones, laptops, televisions – numerous consumer durables contain plastics derived from oil. The energy-intensive production and the disposal of plastics generate a very large range of greenhouse gases harmful for the climate and the environment, however.

To arouse the awareness of pupils in the 7th to 9th school years for this topic, EnergyAgency.NRW has set up the “KlimaTeens” project and developed the “Energy and Plastics” teaching unit for all institutions of further education.

In a double school period, these boys and girls jointly perform exciting experiments using various plastics. Using the burning remnants of a plastic bag, for example, they heat up a glass of water, in order to demonstrate the plastic’s high energy content. This helps the pupils evolve a natural awareness of just how omnipresent oil is in our everyday life.

Despite the serious topical background, the emphasis in the supervised experiments of the “KlimaTeens” teaching unit is on the pupils’ enjoyment and their curiosity. The unit stimulates them to discover and researching, testing, puzzling and being amazed are all on the agenda. The boys and girls are technically guided by EnergyAgency.NRW lecturers who visit their schools.

The “KlimaTeens” project is free-of-charge for NRW schools. Further information: Katja Hensel, Tel. 0202/24552-27, email hensel@energieagentur.nrw.de

www.energieagentur.nrw.de/klimakidz
What we can learn from the Danes:

**Different district heating**

The energy turnaround comes from Germany, doesn’t it? “Sorry, but I’m afraid I have to tell you that the energy turnaround was invented in Denmark!” This is how the CEO of a major Danish consultancy shocked a group of district-heating experts from NRW last August.

This time round, the NRW specialists on the study trip organised by EnergyAgency.NRW were to learn something. Denmark, in fact, is not only a pioneer in the energy turnaround, but also in expansion of district heating. The country is backing a large range of different solutions, without ever losing sight of the ultimate target of sustainable energy supplies. At their first visit, in the small town of Albertslund, for example, the NRW group learned that renovation for efficiency purposes is not always accompanied by tenants’ protest movements. The buildings connected to a district-heating system in 1960 have been renovated one-by-one since 2013. This has reduced heat losses from 20 per cent to 5 per cent. All this is achieved by means of a low-temperature heating system, new piping and building-efficiency provisions. But how do the residents regard such compulsory renovation, the experts from NRW asked sceptically. Here at home, you have to fight for every tiny infrastructural project. In Albertslund, the tenants have to move out for at least six months and then accept a rent rise when they move back in. The answer: a user council, representing tenants. The council, elected by all the tenants, keeps them informed on the project from the inception, and they can ask questions and become actively involved. The fact that they can, after completion, move back into a completely renovated house with many new conveniences is, no doubt, also a consolation. This user council is a successful example for NRW in raising acceptance of such projects. But participants were also surprised in technical terms: up to now, only high temperatures of up to 120°C have been used in NRW. The supply temperature in Albertslund is 65°C.

Innovation continued at Hvidebaek. There, the heating network is supplied by a solar-thermal installation in combination with a straw-fired system and an oil-fired burner. Ten farmers from the region supply straw, and thus have a worthwhile alternative to illegal open-air burning. The NRW experts’ great interest resulted in numerous questions and discussions. The differing supply temperatures used in Denmark and in Germany do not constitute any problem in the integration of renewable energy sources, however. Düsseldorf’s municipal utilities are already integrating their first solar-thermal installation into their district-heating system. This option is also under consideration in Bochum. The Münster University of Applied Sciences, from which a large group took part in this trip, is also an expert on the subject of biomass. Research is currently going on there under the leadership of Professor Christoph Wetter into raising the percentage of renewable energy sources used in heat generation in the Euregio region’s district-heating systems. Denmark uses primarily straw and wood, whereas NRW also uses waste materials. This takes the form, in urban areas, of domestic refuse, in particular.

Following the highly informative excursions on the first day of the trip, the second day featured active interchange of ideas and opinions with Danish experts in the context of a conference.

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innovation & energy 4 | 2015
3 December 2015
IRES Symposium in Berlin

“Political boundary conditions and financing aspects of the storage of renewable energy” is the subject of this year’s IRES Symposium, organised by Eurosolar and EnergyAgency.NRW for 3 December 2015 at the NRW state legation in Berlin.

Registration: www.eurosolar.org

13 to 16 January 2016
EnergyAgency.NRW at the DEUBAUKOM

The DEUBAUKOM is 2016’s kick-off event for the building industry. A range of companies, associations and institutions will be spotlighting their products and services at the international building-trade fair held in the Messe Essen exhibition centre from 13 to 16 January 2016. The link between building and energy will be illustrated, above all, on EnergyAgency.NRW’s 220 m² stand (A17) in Hall 3, the “Heat Pump Market Place NRW” and “Wood Pellets NRW Campaign” market initiatives, the “Photovoltaics NRW” network, the “CHP.NRW - Power meets Heat” campaign and experts on energy-modernisation of buildings will provide information on “Energy-saving building - Fun, and benefits for the environment and your wallet”.

www.deubaukomet.de

23 to 31 January 2016
EnergyAgency.NRW at the boot

Düsseldorf’s “boot” boat show has evolved over more than forty years of its history into the world’s largest water-sports exhibition. More than 1,650 exhibitors from both Germany and abroad nowadays show their products and services, and this fair welcomes around 250,000 private and trade visitors from more than sixty countries every year. EnergyAgency.NRW will be present on a 40 m² stand and show specialist visitors a place where they can “recharge their energy”. Visitors will also see energy-efficiency building-automation technologies.

16 to 18 February 2016
16th E-world energy & water in Essen

The E-world energy & water will again be a meeting point for the international energy industry from 16 to 18 February 2016. This leading European fair for the energy and water industry will be held for no less than the 16th time at the Messe Essen exhibition grounds. Also attending will be NRW’s climate and environmental ministry, to be found, along with EnergyAgency.NRW, on Stand 370 in Hall 3. Twenty companies and research institutions will be showing key technologies for the energy systems of the future. EnergyAgency.NRW is organising its 20th specialist Future Energy congress in cooperation with the EnergyRegion. NRW and EnergyResearch.NRW clusters within the framework of the energy fair on Tuesday, 16 February. On 16 February from 6 p.m. onward, there will be an NRW evening with music on the state’s exhibition stand to provide an entertaining conclusion to the exhibition day.

www.e-world-2016.com

26 to 27 January 2016
Energy Forum West

EnergyAgency.NRW will be present at the Energy Forum West, to be held in the “Philharmonie” in Essen in late January, with an event on the subject of “Energy-efficient building-automation technology and its financing”. The forum is being organised by the European Property Management Training Center.

www.e-b-z.de

28 January 2016
CHP.NRW out in Viersen

EnergyAgency.NRW invites visitors to view Groschopp AG’s CHP plant unit and local-heating system at a “CHP on the ground” event in Viersen from 4 p.m. to 6 p.m. on 28 January 2016. Potential uses of heat+power cogeneration in industry and commerce will be illustrated in cooperation with the Chamber of Commerce for the Central Lower Rhine region and Energiekonzept GmbH.

Registration: www.kwk-für-nrw.de

9 to 12 March 2016
SHK in Essen

The SHK ESSEN is the best visited German trade fair for the sanitation, heating, air-conditioning and renewable energy sectors. It is, in even-numbered years, as the year’s first technical trade fair, the kick-off point for the presentation of industry innovation ready for market launch. EnergyAgency.NRW will be attending this fair on a 220 m² joint stand. The “Wood Pellets Campaign” and “Heat Pump Market Place” market initiatives, the Photovoltaics network, CHP.NRW and building modernisation networks will be exhibiting. Market-initiative partner companies will also be exhibiting on this stand.
Everything was stock-still in the great hall of Haus Witten manor. Not even the low hum of a laser pointer could be heard. All Ursula Sladek needs to get people under her spell are her voice and her reminiscences, from which she weaves fascinating tales. Thus did the around 100 climate-protection activists listen, entranced, to her address entitled “The facets of the inner resolve of an electricity rebel”, a modest but nonetheless impressive biographical portrait of the benevolently smiling “grande dame” of the new German energy industry.

Shocked by the catastrophic nuclear disaster at Chernobyl, she firstly founded, together with her husband and a number of friends, a citizens’ initiative in 1986 and, later, the Elektrizitätswerke Schönau electricity company, to assure local power supplies without the use of nuclear energy. “Even in those days, it was my conviction that, if something has to be changed, you have to do it yourself. Also, my experience has been: never exclude anything, more is possible, than you think! But you need allies at your side, and a good helping of humour can also be very useful. As can, sometimes, a bottle of red wine!” Ursula Sladek continues, her eyes twinkling. As one of the guests later noted, during evening dinner together: “I had a warm feeling in my heart during this address. It’s very encouraging to see what can be achieved if you believe in yourself and just get started”.

The attitude shown by the “electricity rebel” from Germany’s Black Forest met with very little encouragement from the Kraftübertragungswerke Rheinfelden electricity utility, the incumbent “king of the roost” in power supplies in southern Baden at that time. But no way were the Sladeks and their friends going to be deterred. And this is why this pioneer in the energy turnaround, who has now even been honoured by Barack Obama, was invited by EnergyAgency.NRW to pass on her experience at the “Energy turnaround in the head” workshop in Witten on 25 and 26 August 2015. Because: the central question at this year’s workshop was: How can space for action for climate protection be kept - despite increasing formal requirements?

The dominant tone of this interdisciplinary event was set by Prof. Jörg Probst, chairing, in his pithy introductory talk: “Today and tomorrow, it is not the cause which counts, but people. Not projects, and also not Brussels, Berlin or Düsseldorf, but you: What motivates you, what do you need, when will something succeed?”. The event’s guests discussed precisely these questions in a World Café. They received stimulation in the form of various impulse addresses, with the workshop speakers also participating in the café’s changing mini-groups: Prof. Ingo Gabriel, the critically lateral-thinking architect, Dariusz Szymanski, the entertaining music historian, Dr. Christian Ankowitsch, the inspiring and witty writer and journalist and, of course, Ursula Sladek, the benevolently smiling, heart-warming “electricity rebel”.

Rebound – the Achilles heel of energy-efficiency?

Energy-saving technologies have in recent years become well established in many areas of daily life in private households, and also in industry and the service sector. Alongside the expansion of the use of renewable energy, improvements in energy-efficiency constitute the second pillar of Germany’s energy turnaround. The so-called “rebound effect” reduces the degree to which increases in energy-efficiency are reflected in the overall economy in the form of reduced energy consumption, however. The joint brochure published by the EnergyResearch.NRW cluster and the RWTH University of Aachen contains the results of a two-year research project into this subject. The project was conducted by Prof. Dr. Reinhard Madlener (RWTH University of Aachen, FAN) in cooperation with RWI in Essen.

Reporting on her energy turnaround in the head: Ursula Sladek, one-time “electricity rebel from the Black Forest” and present-day “grande dame” of the new German energy industry
EnergyAgency.NRW and the Green Music Initiative (GMI) present this award each year to personalities from the industry who actively promote climate protection. The first prize-winners were the organisers of this year’s Eurovision Song Contest at Austria's ORF radio and TV station, who organised the event in conformity to recognised environmental standards. The Austrians thus demonstrated that even the world’s largest TV entertainment event, with 100,000 visitors attending and some 200 million TV viewers, can be brought off in an environmentally friendly manner. ORF deployed energy-efficient event technology, green electricity and climate-friendly mobility, inter alia, for the event, and was thus able to save more than 400,000 litres of diesel fuel.

Other recipients included Cologne's Sony Pictures Film und FernsehProduktions GmbH. The film team had systematically reduced energy and resources consumption for the production of the “Heldt”, “Der Lehrer” and “Und jetzt noch Paula” series, set up regional procurement routes for film sets and offices, and used climate-friendly modes of transportation. In total, therefore, 234 filming days and 1,282 minutes of television were produced “green”. Heldt star Kai Schumann provided resolute support for this process. As production manager Aurel Beck of the Sony team notes; “We were lucky in being able to co-opt the star and the management as driving forces, this helps enormously in establishing sustainability as part of production”. Sony is thus one of the first organisations in this industry to systemically include the aspect of sustainability in film and television productions. Innovation was also demonstrated by Stuttgart’s “Übermorgen Magazin” programme. This broadcast uses new and creative communications concepts to approach young target groups on sustainability topics. The producers won their award for organisation of the “Clubmob Stuttgart”. Here, the organisers and club operators together invited the largest possible number of party fans to party for a good cause. The club has undertaken to invest a certain percentage of the resultant turnover in climate-friendly projects.

“mission E”:
Licensees sought

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Ever more administrations are discovering the in some cases enormous energy-savings potentials of energy-aware behaviour by their employees. These potentials can, for example, be exploited using “mission E”, a tried-and-proven - and multiply prize-winning - concept for internal motivation campaigns. EnergyAgency.NRW has offered the basic “mission E” module for this reason since 2008: this service package enables users to plan and implement a medium- to long-term motivation campaign, largely using their own resources, for their employees, with the aim of helping people to help themselves. This basic module includes, inter alia, a two-day introductory seminar for up to eighteen information disseminators, six copies of the campaign’s “The human factor” compendium, and an annual interchange of experience. Since EnergyAgency.NRW will not be able to exhaustively exploit the “mission E” user potential existing throughout Germany without regional partners, the agency is looking with immediate effect for six licensees to hold the “mission E” introductory seminars for users in their regions, on the basis of a tried-and-proven methodological and pedagogical seminar concept and the materials provided. Starting in February 2016, EnergyAgency.NRW will systematically train its licensees for their task of qualifying users’ information disseminators for their respective task of continuous user motivation. Detailed information on licensing for “mission E” can be found on EnergyAgency.NRW’s homepage and at www.missionE.nrw

Infos: kuester@energieagentur.nrw.de

Three high-calibre personalities from the entertainment industry this year received the accolade of the “Green Music Award”.

EnergyAgency.NRW and the Green Music Initiative (GMI) present this award each year to personalities from the industry who actively promote climate protection. The first prize-winners were the organisers of this year’s Eurovision Song Contest at Austria’s ORF radio and TV station, who organised the event in conformity to recognised environmental standards. The Austrians thus demonstrated that even the world’s largest TV entertainment event, with 100,000 visitors attending and some 200 million TV viewers, can be brought off in an environmentally friendly manner. ORF deployed energy-efficient event technology, green electricity and climate-friendly mobility, inter alia, for the event, and was thus able to save more than 400,000 litres of diesel fuel.

Other recipients included Cologne’s Sony Pictures Film und FernsehProduktions GmbH. The film team had systematically reduced energy and resources consumption for the production of the “Heldt”, “Der Lehrer” and “Und jetzt noch Paula” series, set up regional procurement routes for film sets and offices, and used climate-friendly modes of transportation. In total, therefore, 234 filming days and 1,282 minutes of television were produced “green”. Heldt star Kai Schumann provided resolute support for this process. As production manager Aurel Beck of the Sony team notes; “We were lucky in being able to co-opt the star and the management as driving forces, this helps enormously in establishing sustainability as part of production”. Sony is thus one of the first organisations in this industry to systemically include the aspect of sustainability in film and television productions. Innovation was also demonstrated by Stuttgart’s “Übermorgen Magazin” programme. This broadcast uses new and creative communications concepts to approach young target groups on sustainability topics. The producers won their award for organisation of the “Clubmob Stuttgart”. Here, the organisers and club operators together invited the largest possible number of party fans to party for a good cause. The club has undertaken to invest a certain percentage of the resultant turnover in climate-friendly projects.
Investments in energy-efficiency are in many cases profitable for companies. Many decisions-makers are nonetheless wary of starting corresponding initiatives. The background to this is frequently the fact that there are difficulties in communication between the people who develop and propose project ideas and those who assess them for their economic rationality. Ulrich Nissen, Professor for Controlling and Energy Management at the Hochschule Niederrhein University of Applied Sciences, is now on hand to bring the various viewpoints together and supply “aids to communication” with his formula for added-value effects.

Prof. Nissen, what are the benefits of your new cost-effectiveness analysis?

Nissen: In practice, the investment expenditure for energy-efficiency ideas are the only factor examined in the foreground, while the economic benefits are stated only superficially, or orally, at best. To actually implement provisions, and thus exhaustively exploit the savings potentials within the company, it is also necessary to determine precisely the predicted savings, the reductions in energy-costs and/or additional income, such as feed-in payments, for example, across the entire planning horizon. These must be computed as return income flows in the context of models for calculation of net present value (NPV) investments and with the same weighting as the investment expenditure and operating costs. Such a comparison achieves an economically unequivocal statement, which can be used as a compact and verifiable aid to decision. When the net present values of all energy-efficiency ideas assessed as positive are then summed, the result is the added-value effect, the added value generated by a package of potential efficiency provisions, which provides the solution to precisely what frequently causes problems: the translation of initially technical problem statements into commercial language.

Is this factor also suitable for motivating employees to find potentials for cutting energy-costs and to think up ways of implementing them?

Nissen: Yes, exactly. All the essential factors in energy-efficiency are depicted in compact form, verifiably and with relative ease of calculation. The added-value effect can, therefore, easily be used for control purposes - in the context of a systematic continuous improvement process, for example - in “technical language”, the CIP system for bonus systems or even for corporate comparisons, in the context of efficiency-award competitions, for instance. The formula depicts the correlations which permit complete and thus target-orientated evaluation of conceptual provisions.

And how should we envisage application within a company?

Nissen: A range of different energy indicators which, in my opinion, are too abstract and in many cases do not produce results, circulate in many companies. Our value-orientated concept registers the correlations per provision systematically in a table, and therefore assures great transparency for the calculation, and thus the ideal basis for decision-making. A detailed microeconomic analysis, including corresponding prioritisation of all the efficiency provisions which would generate significant savings potentials is important for successful implementation. Great energy and economic savings can then often be achieved by means of only a few small improvements. Rapid implementation thus facilitated will generate positive learning processes, convincing all those involved.

$$WSB_{ges.} = \sum_{x=1}^{N} \sum_{t=0}^{T} \frac{RF_{x,t} - AZ_{x,t}}{(1 + i)^t}$$

The formula for added-value effects translates technical problem statements into commercial language (WSB: added-value effect; N: number of profitable efficiency provisions; x: efficiency provision; T: time of action of a provision [years]; t: time [years]; RF: return; AZ: expenditure; i: discount rate)

www.energie-agentur.nrw.de/19984
State backs solar research

The state of NRW is supporting the construction of a multi-focus solar tower in Jülich with 5.2 million euros of funding. The aim of this project is that of significantly increasing capacities for experimentation under concentrated solar power at the Jülich solar-thermal test power plant.

The new solar tower is to be built during the next three years adjacent to the power-plant tower completed in 2009. Scientists will in future be able to perform multiple experiments in parallel on three test levels, each equipped with measuring systems and test apparatus. The existing heliostat array is to be expanded to permit its use for both towers.

“The new research potentials created by the multi-focus tower in Jülich are excellent. They will create innovative new jobs, and they are another important element in the ‘Jülich Solar Campus’, and thus have great importance for the energy turnaround ‘Made in NRW’. The project demonstrates that North Rhine-Westphalia holds pole position in application-oriented research into solar technology”, affirmed environment minister Johannes Remmel when presenting the funding decision.

“The multi-focus tower will enable the German Aerospace Center (DLR) to intensify its research into solar-thermal generation of electricity and into the production of solar fuels. These developments will contribute to the greater and more efficient use of solar energy”, noted Prof. Pascale Ehrenfreund, chairman of the DLR at the presentation. The Federal Ministry for Economic Affairs and Energy (BMWi) is also providing 1.05 million euros of funding for the new tower, in addition to the NRW environment ministry’s contribution.

The solar-thermal power plant is operated by the DLR’s Institute of Solar Research at Jülich. NRW’s science ministry has provided financial support of 15 million euros for the entire process and the setting-up of the institute. The state government also continues to fund the expansion of this institute, since experiments intended to develop this technology up to market maturity are conducted here.

The objective of the DLR’s research activities is that of developing such power plants and their components, such as the receivers and the appurtenant heat accumulators, further and thus reducing costs for power generation. DLR scientists are also working on processes for the production of fuels from solar energy. Here, solar-chemical reactors utilise the thermal energy of a tower-type power plant for the production of hydrogen, methane and other energy bearers.

This project will enable the DLR to expand its R&D potentials at Jülich. Numerous industrial companies both in North Rhine-Westphalia and throughout Germany, produce components for solar-tower and parabolic-trough power plants. These companies, and also research institutions, will be able to use the research facilities at Jülich for their development work, and thus increase their competitiveness.
Since 1994, the German Solar Award has been presented every year by Eurosolar, the European association for renewable energy, to persons who have particularly distinguished themselves in the use of renewable energy. More than two hundred winners from various spheres of society have received the award over the past twenty-one years.

“The awards testify not only to the performance of top research and science. I interpret the fact that the Schüren bakery, a 100-year-old family-run company, is among the winners, as an indication that changes that benefit the energy turnaround and climate protection are generated within society itself”, affirms Lothar Schneider, director of EnergyAgency.NRW. EnergyAgency.NRW - itself a previous winner of both the German and the European Solar Award - was the host, along Eurosolar, for this year’s ceremony, which was held in the Ibach Haus, a former piano manufactory, in the town of Schwelm. The laudatory address for the winners was given by journalist Ronald Feisel.

The “Your baker” Schüren bakery won in the “Industrial, Commercial or Agricultural Organisations” category. The firm is notable for its all-encompassing conversion of its wholesale bakery, and its entire infrastructure, to renewable energy and e-mobility.

The German Solar Award in the “Transport Systems” category went to the Bochum University of Applied Sciences’ SolarCar project. The jury emphasised in its verdict above all the many years of involvement in university/industrial cooperation on the development of solar-powered vehicles.

The German Solar Award in the “Education and Training” category went to the Jülich Institute of Solar Research. The high level of commitment shown for thirty years now in the annual Summer School for Renewable Energy was, for the jury, decisive. The remaining prize-winners can be found at: www.eurosolar.org
**District-heating decision in Cologne**

A new district-heating line under the Rhine will also have been completed when the Niehl 3 combined-cycle turbine cogeneration plant takes up regular operation in August 2016. The project to supply Cologne’s Mülheim district, including passage under the Rhine, will aid climate-protection immensely, because district heating is one of the best means of combining energy-efficiency with the prevention of air pollution in conurbations and major cities. This is why state environment minister Johannes Remmel visited the construction site in the Riehl district of the city, bringing the state’s funding decision with him. NRW is contributing more than 7 million euros of the overall project costs.

**Fuelcellbox at the gamescom**

The “Fuelcellbox” is a construction kit that contains, among other things, a fuel cell, an electrolyser and a solar module. For the 2015 NRW Fuelcellbox school-pupils’ competition, participants were required to build from these components a hydrogen-powered Mars Rover, which didn’t quite make it to Mars, but did get to the gamescom games fair. EnergyAgency.NRW’s competition promotes not only understanding of the fuel cell, but also enjoyment of developing, tinkering and inventing. As Mirco Fischer (right) and Robin Plugge of the Lennestadt High School’s winning team, reported: “The competition aroused general interest for new technologies in us: how all this will develop in the future in general, and how I can make my contribution”.

**“LANUV” now hydrogen fuelled**

The NRW State Environment Agency (LANUV) is testing a fuel-cell car for suitability for everyday use. NRW climate-protection minister Johannes Remmel has handed over a vehicle powered using hydrogen technology for this purpose. LANUV is testing the fuel-cell car in the context of a model trial. This technology will play a key role in climate-friendly mobility concepts, since hydrogen-powered vehicles have a greater range than purely electric cars, and can be refuelled in just a few minutes. www.lanuv.nrw.de

**“Theo’s dreams”: Children’s book of wind energy**

Nowadays, children grow up seeing wind-turbines in the landscape. But there is, at the same time, scarcely any children’s literature on this topic - although the youngsters often find wind-turbines fascinating. The recently published children’s book, “Theo’s dreams”, takes them on a fantasy trip to airy heights, informing them on the uses of wind energy. The conveniently compact book can be obtained free-of-charge from the County of Steinfurt Climate Protection and Sustainability Agency, contact Stefanie Starp (Tel. +49 (0)2551 692127 or stefanie.starp@kreis-steinfurt.de) or in PDF format at www.kreis-steinfurt.de/servicestellewindenergie

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