The magazine of the EnergyAgency.NRW

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innovation &energy

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5th Ruhr Symposium – New future for mobility

Comprehensive funding programmes of the Federal State and the Land have driven forward electrification of conventional drive systems. Numerous electric vehicles are on the market or will soon be launched, and the Ruhr Symposium on 21 June in Dortmund will discuss questions regarding the future of mobility. The Symposium is being organised by EnergyAgency.NRW June and Autohaus Rüschkamp. In addition to contact with experts from the automotive industry, the different energy sectors and users, there will be an opportunity to take test drives. The day will be concluded by a cultural programme in the English park of Schloss Cappenberg. Further information: www.kraftstoffe-der-zukunft.de

Energy efficiency in church properties

Church buildings are often quite difficult to maintain at suitable temperatures. The way in which churches are built cannot be compared with that of normal buildings. Therefore those who work in the field of church administration must be "all-rounders with specialist knowledge". This is the starting point for the conference of EnergyAgency.NRW and the Akademie Franz Hitze Haus which will take place on 22/23 May. The conference is targeted at church administration employees and will offer a wide range of specialist presentations and lectures. Information: www.energieagentur.nrw.de

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Hartmut Miksch

President of the North Rhine Westphalia Chamber of Architects

When you plan a long journey, you need frequent staging posts to take stock, check the route and set interim goals. Buildings that help to protect the environment are certainly one of the most important goals for our society if we wish to contribute to saving natural resources and providing a solid basis for future generations. North Rhine-Westphalia, as "Energy State", has always faced particular challenges in this respect, and is committed to achieving success.

"50 Solar Estates in NRW" – a strong symbol in 1997, which drew attention to the potential of building with the sun. However, with the 37 solar estates that have been built up to now, the recognition has grown that focussing on one single renewable energy is not sufficient. "100 Climate Protection Estates in NRW", the follow-up programme that is currently in progress, has quite rightly widened its scope: now the renewable energies selected for use in any particular estate depends on the particular project, the players and the infrastructure conditions on site. An important staging post on the way to sustainable building and living.

In recent years, the North Rhine-Westphalia Chamber of Architects has drawn attention more strongly to the two central challenges facing the residential property market in NRW: energy-related renovation of existing buildings and "demography-proof" conversion of flats, houses and infrastructure. These things can only be considered together – and should also be planned and implemented together in practice. It is certainly important to provide houses with insulation – but it is not very sustainable if entire areas of towns are supplied with faceless insulating facades, whose durability may be limited and which may not be rentable on a permanent basis because they are not suitable for disabled residents.

With the solar and climate protection estates, EnergyAgency.NRW, participating architects and town planners have provided an important stimulus for innovative development of new estate concepts and forms of living. It would be desirable to follow up the NRW funding programmes with a "200 Future Estates for NRW" programme, which would support exemplary approaches to ecological, innovative and disability-friendly development of our residential buildings and communicate them to the wider public. New forms of living, like community-based or cross-generational models, should be tried out in many locations in NRW. These are useful and necessary projects, both for existing and (replacement)new buildings. And they are important milestones on the road towards a sustainable society!

Yours sincerely,

Hartmut Miksch

President of the North Rhine Westphalia Chamber of Architects

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New buildings for the

50 solar estates and 100 climate protection estates

Around one third of the entire energy consumption in Germany is needed for room heating and hot water supply in houses. This is why energy-efficient and solar building and also energy-related renovation play a central role in climate protection activities. As early as the end of 1990s, three ministries in North Rhine-Westphalia (Construction, Economics and Science) began to call for 50 solar estates. One aim was to provide further stimulus for solar and energy-saving building and to anchor it at the estate level. In the past, energy saving houses were built by individual families. However, the intention is now to build complete estates using this forward-looking technology. Funding was granted to projects based on an integrated concept, and which, in addition to energy-related optimisation of buildings, also place the main focus on town planning and ecological aspects.

"We made a contribution to the solar estates in NRW from the very beginning. Working together, we have achieved a great deal through the project. It is a true milestone. Energy efficiency is now a megatrend throughout the world. The fact that in NRW we started on this path more than 10 years ago shows the farsightedness of some decision-makers in our region. However, there is still a great deal to be done."

Ralph Wortmann, CEO of Wortmann & Scheerer, engineering consultants for heat and energy engineering Bochum

Up to now, 37 estates with more than 3,700 residential units have been implemented, both new buildings and renovations. Now, more than 9,000 people in North Rhine-Westphalia live in solar estates. 14 further estates are currently under construction. This means that NRW is the front runner in Europe when it comes to such estates. The project known as "50 Solar Estates in North Rhine–Westphalia" has also developed into a brand. Three expert conferences have already taken place on the subject, each attended by as many as 400 experts. With its integrative and estate-based approach, the project is unique and is also

"The rapid energy turnaround is now taking place within people's own four walls. The 50 solar estates in NRW show how it can be done: low energy consumption, comfort and convenience and the use of renewable energies create an excellent quality of life. That is climate protection – Made in NRW."

NRW Climate Protection Minister Johannes Remmel

Child-friendly: Solar building construction is a way of building that is also directed towards the needs of real people. Climate protection and solar estates are child-friendly – also in the long term.

energy turnaround

attracting a great deal of interest outside North Rhine-Westphalia. Numerous international delegations have now visited the estates, which means that the project is also making North Rhine-Westphalia known as an important energy state.

And a further development of the "50 Solar Estates in NRW" project is already in existence: the follow-up project "100 Solar Estates in NRW" was in the starting blocks in autumn 2009. The aim is to go on with steady reduction of heat-related CO_2 emissions in residential estates. All technologies which are suitable for saving CO_2 can be used. This means that planners and investors have the freedom to select from a wide range of innovative building standards and modes of supply. Requirements and recommendations for the climate protection estates are contained in a comprehensive new planning guide. The permissible CO_2 emissions for new buildings are around 50 to 60 per cent lower – depending on the type of building – than the levels that result for reference buildings according to EnEv 2009.

In order to ensure that the buildings have the desired qualities, the project proposals are assessed by an interdisciplinary selection committee, and the status of "climate protection estate" is only awarded following intensive consideration. To date a total of 40 estates have achieved the status. The first of the "100 climate protection estates in NRW" can be found in the Ückendorf district of Gelsenkirchen – right next to the science park. A further fourteen estates are under construction.

Continued on Page 6 >>>

"We have lived in the Erkelenz solar estate with our two children since November 2007. We particularly appreciate the comfortable living conditions here. And we even enjoy receiving our heating bills, because they are much lower than in traditional buildings. The positive contribution we are making to environmental protection by saving energy also gives us a good feeling."

Harald Jaquet and Elke Heimlich-Jacquet, solar estate residents

>>> Continued from Page 5

Even if climate protection estates are primarily concerned with avoidance of CO_2 emissions, they should still have something special to offer in terms of urban design and social qualities. The project for 100 climate protection estates is intended to implement environmentally friendly construction methods as an important part of sustainable estate development in the energy state of North Rhine-Westphalia. ■

„Our solar estates not only offer considerable benefits in the area of climate protection because of the enormous reduction in CO_2, but also real and clearly perceptible benefits for our housing association. The low heating and operating costs mean that the properties will be popular for rental in the long term."

Ralf Grobe, Member of the Board of Management of Gemeinnützige Wohnungsbaugenossenschaft Schwerte eG

"What is important in the 50 Solar Estates project is the combination of energy saving with the use of renewable energies in residential building. More than 9,000 people now live in solar estates in the Rhine and Ruhr region. This means that NRW is now the European leader when it comes to solar estates."

Andreas Gries, Project Manager of "50 Solar Estates in NRW" and "100 Climate Protection Estates in NRW" at EnergyAgency.NRW

Documentation on solar estates in NRW

EnergyAgency.NRW has just published an illustrated volume on the subject of "50 Solar Estates in North Rhine-Westphalia". The book offers an overview of the estates in 34 towns and regions. They are presented on 200 pages along with a great deal of information accompanied by interviews and photos. The author is the Coesfeld architect and town planner Friedrich Wolters. Publication of the book was also supported by Andreas Gries, who manages the solar estate project at EnergyAgency.NRW.

Solar estates have already been created in the following towns: Aachen, Altenberge, Ascheberg, Beckum, Bielefeld, Bochum, Bonn, Castrop-Rauxel, Detmold, Dormagen, Dorsten, Dortmund, Düsseldorf, Erftstadt, Erkelenz, Gelsenkirchen, Herne, Herten, Cologne, Krefeld, Leverkusen, Lüdinghausen, Mönchengladbach, Münster, Oberhausen, Rhede, Rheda-Wiedenbrück, Schwerte, Senden, Siegen, Soest, Steinfurt, Troisdorf and Westerkappeln.

In his introduction, author Friedrich Wolters takes stock: "It was often a bit of tightrope finding a path for the project between the desire for attractive architecture and requirements from the energy, building construction and economic points of view. If we ask the question as to whether all the effort has been worthwhile, we would have to say yes, but the work has to be continued in order to achieve effective quality assurance in conjunction with the necessary energy efficiency over the long term. The solar estates described in the EnergyAgency.NRW publication give a signal that inspires confidence."

The book can be ordered free of charge from EnergyAgency.NRW by sending an email to dolief@energieagentur.nrw.de Further information: www.50-solarsiedlungen.de and www.100-klimaschutzsiedlungen.de ■

Münster, Schwerte, Gelsenkirchen: three examples

Solar estate in Münster, Wismarweg

The housing association Wohnungsverein Münster von 1893 eG has erected a solar estate on the site of a former garden centre. The land is to the north of the inner city, and can be reached on foot in around 15 minutes. Three two-storey blocks of flats have been built, with the upper storeys somewhat set back, offering a total living area of 3,337 m². The altogether 39 flats are between 48 and 122 m² in size. This mix is attractive to both senior citizens and young families. The ground floor flats are designed for disabled access.

The blocks are built to passive house standard with central ventilation units and heat recovery. Solar thermal installations with a panel area totalling 115 m² provide around 60 per cent of the hot water. The residual heat requirement for heating and hot water is covered by a central wood pellet installation.

Solar estate in Schwerte, Märkische Strasse

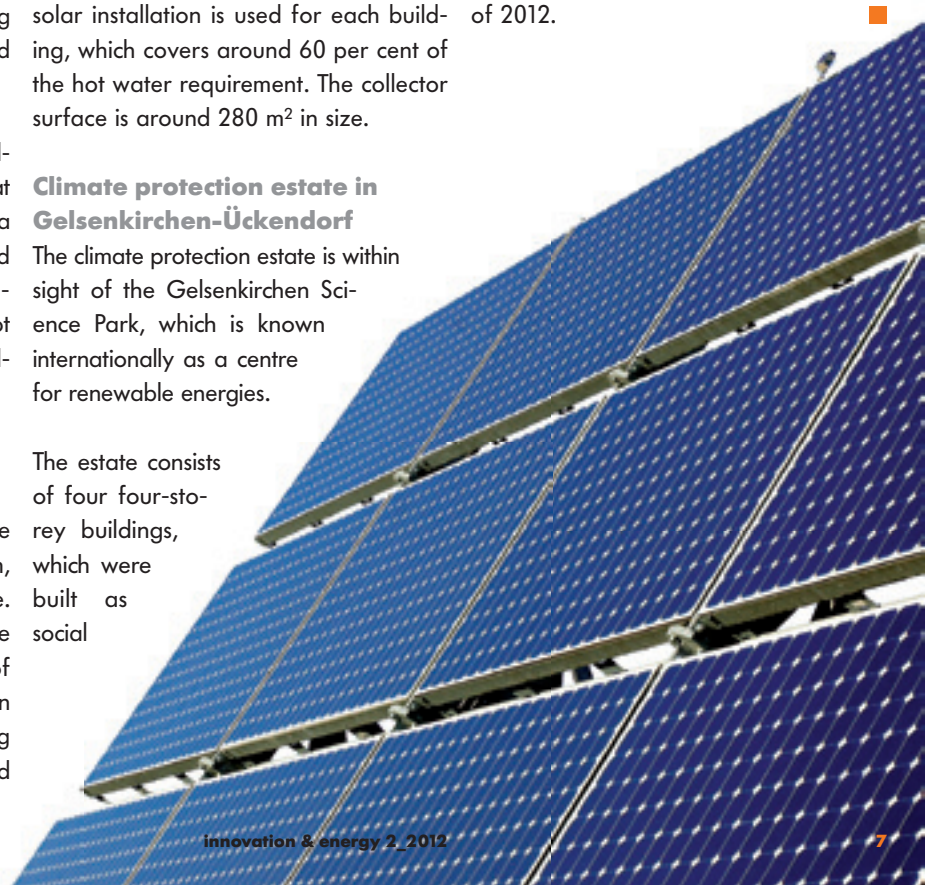
The residential estate of GWG Schwerte lies on the northern edge of the town, around 1.5 kilometres from the centre. This area of housing was built at the beginning of the 1960s and consists of five three-storey buildings with 90 flats in total. These have been upgraded, using holistic principles, to a future-orientated building and living standard. Five additional apartments were created through conversion of the roof space. The entire living area amounts to 7,560 m². The renovation measures include among others insulation of the outside walls, renewal and insulation of the roofs and installation of new windows. The five heating boilers that were previously used have been replaced by a central heating unit, in which a boiler fired by wood chips is responsible for heating at base load. A solar installation is used for each building, which covers around 60 per cent of the hot water requirement. The collector surface is around 280 m² in size.

Climate protection estate in Gelsenkirchen-Ückendorf

The climate protection estate is within sight of the Gelsenkirchen Science Park, which is known internationally as a centre for renewable energies.

The estate consists of four four-storey buildings, which were built as social housing to the passive house standard. In total they consist of a total of 56 flats which are also suitable for use by disabled people, with a living area of 45 to 82 m².

A solar thermal installation in conjunction with a gas condensing boiler serve to heat the buildings, and it is also planned to fit photovoltaic installations on the flat roofs for climate-friendly electricity production. Building work started in spring 2010, and was completed at the start of 2012.



"NRW – wind economy location with a future."

Interview with Stefan Tenbrock, Management Board Chairman of Winergy AG. The company is a manufacturer of innovative wind drive systems and wind turbine components in Voerde.

The reactor disaster in Fukushima has led to a new way of thinking in Germany. Expansion of renewable energies is being pushed ahead more strongly in order to achieve the energy turnaround even more rapidly.

Has this development led to stronger demand for your products?

Fukushima has resulted in increased discussion around renewable energies. However, Germany seems to be virtually on its own when it comes to taking real preventive measures for the future. Global demand for our products has not increased noticeably since Fukushima, and in some markets is even showing a negative trend because of reductions in grants. In Germany, political support will in future mainly be for the offshore sector, although given the current situation this will take a few years yet.

Winergy AG is following a global strategy and also has production facilities in the USA, India and China. The main headquarters is in Voerde. What does the location in NRW mean for the company?

The first wind turbine transmissions were built in NRW. Today we bundle more than 30 years of experience in Voerde in the area of development, production and test scenarios. Germany is our most important location with regard to research and development and prototype testing. The 5 and 6 Megawatt class is today only produced in Voerde, and this site is also favourable from the point of view of the government, who wish to increase use of offshore wind in future.

In the summer of last year, the new NRW wind energy decree officially came into force. This is characterised among other things by the fact that there is no longer a limitation on wind turbine height. What, in your opinion, are the effects of this on the region?

The new wind energy decree is very important for the progress of wind energy in NRW. New high-performance wind turbines have ever-wider blade spans, which also require higher towers. This means that this decree is of great importance for NRW in order to be able to exploit the power of the wind as efficiently as possible. Repowering can now be seen in quite a different way.

NRW has the greatest density of universities and research institutions in Europe. NRW has a very good position when it comes to energy, particularly wind power. How important is cooperation with the region's scientists?

Winergy recognised this favourable opportunity at an early date and has been working together with university research institutions for years now. Winergy in particular maintains a close relationship with technical universities both in relation to joint projects and also in the search for well-trained engineers. Such a situation is ideal for a mechanical engineering company like Winergy.

To what extent can EnergyAgency.NRW and the NRW wind energy network that it manages strengthen NRW as a location and also strengthen the wind sector? What are the tasks you see for the network?

NRW is the Federal State with the highest density of suppliers for the wind industry. The development of a network is an important component in the success of this industry as whole. It is of great benefit for all of us if there is a body that communicates the interests of everyone in the sector. I regard EnergyAgency.NRW to be a powerful ambassador for us. ■

Seasonal heat storage

Superabsorbers combine the benefits of thermal water storage units and geothermal heat storage.

The International Geothermal Centre at Bochum University wants to harmonise supply and demand of renewable energies with the development of seasonal heat storage facilities. The surplus of solar energy in the summer months is to be stored in geothermal storage systems underneath buildings for direct use in the winter months, or is to be used for heating buildings with the help of heat pumps. The immense quantities of energy and the high temperatures, which have to be stored over a period of up to six months, mean that now large-scale storage with as high a heat storage capacity as possible is required.

The storage options that have been available up to now – water or geothermal – both have significant drawbacks. Water storage systems are characterised by a very high specific heat capacity, but require a very high volume if they are to be used for seasonal storage. Their complex design is also expensive. In contrast, geothermal storage systems are comparatively simple and can be created in practically all sizes, but because of their low heat capacity, their storage capability is not very impressive. The positive characteristics of both systems – large storage capacity on the one hand and low-cost and scalable production on the other – are now to be combined in a single new heat storage method.

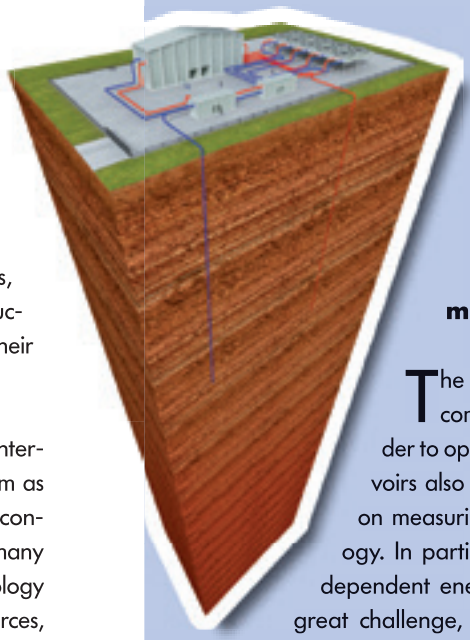
The idea is to create a storage facility under buildings whose heat storage capacity is considerably increased by adding suitable substances to the soil which considerably improve the water storage capability. Through the addition of a so-called superabsorber, the water, which stores the heat from summer into winter, can also be bound at a specific location without the need for additional sealing of the storage area. Such a superabsorber consists of polymers, which because of their interlinked structure, are able to absorb many times their own volume of water.

The partners in the project are the International Geothermal Centre in Bochum as scientific institution, the engineering consultancy EUKON from Krefeld with many years of experience in building technology concentrating on minimal use of resources, and SYNCO GmbH(Synergy Consulting) from Krefeld, which can contribute wide experience in the development of products and applications based on superabsorbers.

A substance that looks like a pile of sugar is in reality a superabsorber which is able to take up several times its own weight in liquid.

Within the joint project, the three partners will examine the general technical feasibility and also the thermo-hydraulic behaviour of such a superabsorber-based system, and finally also its cost-effectiveness. By the beginning of 2013, a model is to be created at the University of Bochum which will be used to verify the results of the study under real conditions. ■

Geo fuel cells



Fuel cells ensure autonomous energy supply for deep geothermal wells

The fact that wells are becoming ever deeper in order to open up geothermal reservoirs also places heavy demands on measuring and sensor technology. In particular, providing an independent energy supply presents a great challenge, as traditional supplies using batteries or cables taken down into the well and the associated high temperatures cause problems. This is where fuel cells can help.

On the one hand, a sensor device, which provides information on the drilling and geoscientific parameters, has to be supplied with energy during the drilling process. A further application would be – subsequent to the drilling procedure – continual monitoring of the environmental conditions in the well. The college Westfälische Hochschule Gelsenkirchen and the University of Bochum, together with Backer-Hughes, a large drilling service company, have joined together in order to develop a fuel cell which is able to meet the requirements. Alongside the demands placed by the special geometry of the well, operational reliability at high temperatures and pressures at great depths have to be taken into consideration.

As early as 2005, the School of Geothermal Technology at Bochum University and the Energy Institute of the college Westfälische Hochschule Gelsenkirchen established a competence platform "Applied Energy System Technology in the Ruhr Region". The "Institute for Applied Energy System Technology (ESYS)" which covers both universities, today provides funding for the platform. Both universities also provide funding for the International Geothermal Centre. ■

Acceptance: no energy without impact

Wind turbine or nuclear power, biomass or coal-fired power plant – all installations that generate energy have one thing in common: they are sometimes unpopular. People often do not want them. They either reject them totally, or they do not want them near to their own houses or flats. Energy is necessary, but acceptance of the necessary means is often limited. We spoke to Prof. Manfred Fischedick from the Wuppertal Institute for Climate, Environment, Energy.

Mr. Fischedick, if I may ask a somewhat provocative question: If the power plant right next to me disturbs me – am I the problem or is it the power plant?

In fact it is neither. On the one hand it is quite natural to attempt to eliminate negative factors in one's own direct environment, or at least to limit them. However, we basically have to recognise that there is no form of energy supply which does not have some kind of impact, either direct or indirect.

Has there been greater acceptance since the decision regarding the energy turnaround?

At the level of the Federal State, the answer has to be: unfortunately not. It is possible that after presentation of the Energy Concept in mid-2011, a historic opportunity was wasted. The energy turnaround was at the centre of attention – and members of the public were to a great extent aware of the need for it. That would have been the right point in time to discuss - within the whole of society - the form that the energy supplies of the future should take. It is not sufficient merely to reach an all-party consensus as to the forms of technology – in this case nuclear energy – which we do not want. It is essential that together we set a framework for alternative energy supply which is also supported by the population as a whole. Up to now, this dialogue has not taken place in any form at the federal level. Also, some specific measures which were proposed last year by the Ethics Committee – for example a parliamentary representative for the energy turnaround – have not yet been implemented. This does not create confidence that the energy turnaround will in fact occur, neither does it support the belief that citizens can participate in it.

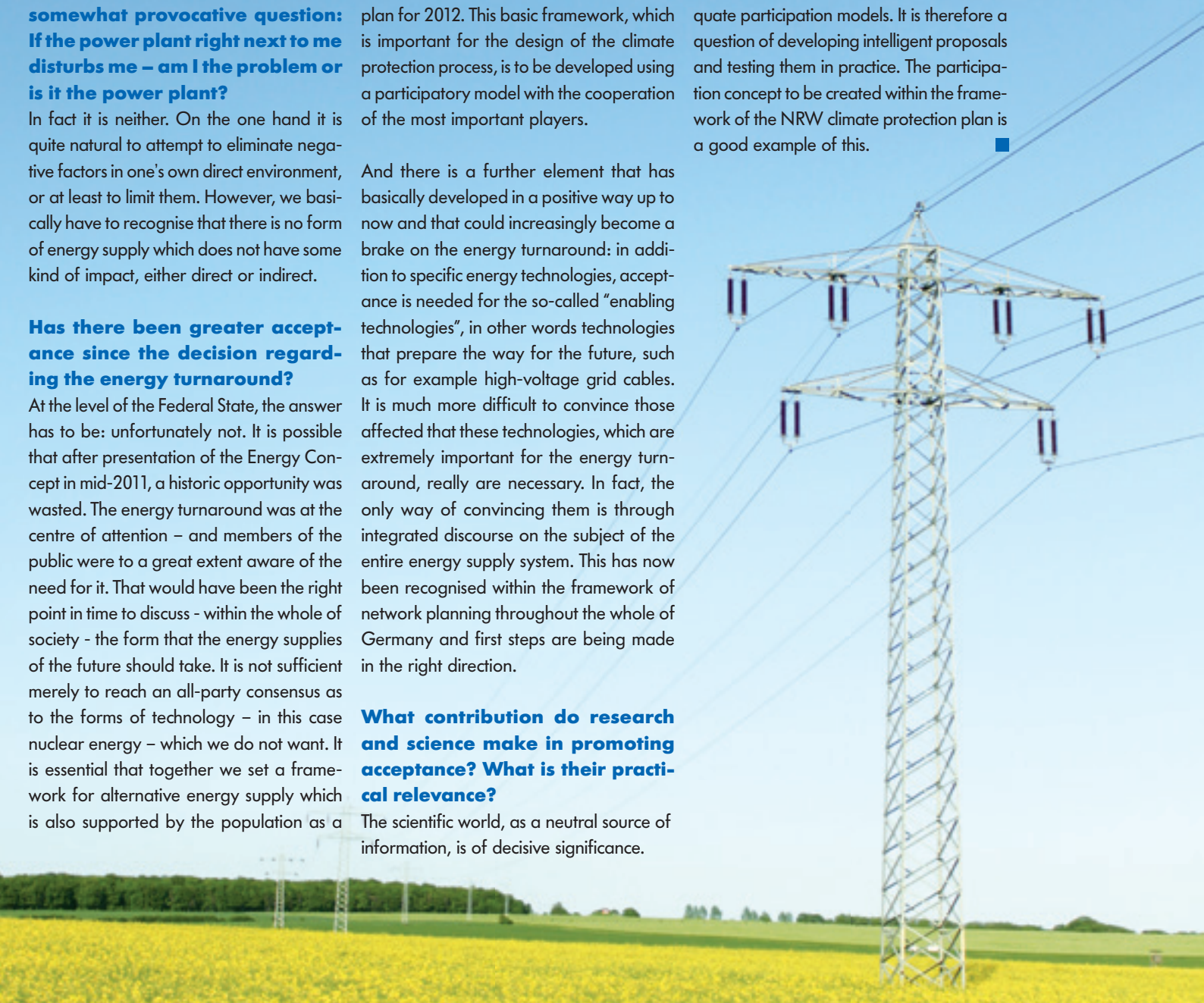
I am pleased that at the regional level, a different path was chosen in NRW for the development of the climate protection plan for 2012. This basic framework, which is important for the design of the climate protection process, is to be developed using a participatory model with the cooperation of the most important players.

And there is a further element that has basically developed in a positive way up to now and that could increasingly become a brake on the energy turnaround: in addition to specific energy technologies, acceptance is needed for the so-called "enabling technologies", in other words technologies that prepare the way for the future, such as for example high-voltage grid cables. It is much more difficult to convince those affected that these technologies, which are extremely important for the energy turnaround, really are necessary. In fact, the only way of convincing them is through integrated discourse on the subject of the entire energy supply system. This has now been recognised within the framework of network planning throughout the whole of Germany and first steps are being made in the right direction.

What contribution do research and science make in promoting acceptance? What is their practical relevance?

The scientific world, as a neutral source of information, is of decisive significance. Investigations show that the scientific world is accorded the greatest credibility, far in advance of that enjoyed by the worlds of politics and industry and also in advance of federations and associations. This potential can and should be utilised. Science can also help us to better understand the complex socio-technical interactions involved in the development of acceptance or rejection so that effective participation procedures can be designed.

No blueprint exists for the energy turnaround, which affects everyone, or for adequate participation models. It is therefore a question of developing intelligent proposals and testing them in practice. The participation concept to be created within the framework of the NRW climate protection plan is a good example of this. ■



From idea to product

Besides suitable energy converters, a future hydrogen economy will require storage facilities. These will have to fulfil differing requirements depending on the particular application. Against this background, the state of North Rhine-Westphalia has provided new stimulus in the hydrogen sector from research up to production with its competition "EnergyResearch.NRW – Innovative hydrogen storage". Initial results from this project are very promising.

In order to make fuel cell systems attractive for private and industrial consumers whilst ensuring the highest possible levels of safety, the company Hertener HyPower GmbH, in cooperation with GSR Ventiltechnik GmbH & Co KG, Vlotho, entered into the LOPES® project. An H_2 storage system was developed for fuel cells which facilities operation of fuel cell systems in particular in safety-critical applications, for example in closed rooms. Within this system, the fuel cell is operated under negative pressure, which means that hydrogen cannot escape if there is a leak, and only flows if it is "actively sucked in" by the fuel cell, or if there is negative pressure at the location where the hydrogen is tapped. LOPES® is TÜV-certified as an inherently safe pressure regulating device, can be used for hydrogen-based fuel cell systems from practically all manufacturers, and obviates the need for time-consuming and expensive enclosure of the systems. This new development was made possible by a magnetically-operated ball valve which allows switching times in the millisecond range and enables extremely precise dosing. Precise dosing and mixing of gases and liquids can be implemented with this technology. A light hydrogen storage unit offering high storage density which is ready for mass production is being developed by the Duisburg Institute for Energy and Environmental Technology, IUTA, in cooperation with the Mülheim Max Planck Institute for Carbon Research. The storage containers and the internal heat transfer structures are made of aluminium, whilst the storage material is a sodium aluminium hydride. This substance has optimum characteristics as regards absorption and release of hydrogen and heat in combination with HT-PEM fuel cells at temperatures of around 180°C and a working pressure of around 15 bar. When the demand for heat increases, the hydrogen for operation of the fuel cell is fed to the storage unit, where it is placed into intermediate storage whilst releasing heat. If there is higher demand for electricity, heat from the fuel cell is fed to the storage unit and the stored hydrogen is released and used for electricity generation. The storage unit is suitable among other things for fuel-cell heating devices in the domestic energy area. The development is being carried out in cooperation with TRIMET Aluminium AG from Essen and F. W. Brökelmann Aluminiumwerk from Ense-Höingen. ■

Königswinter leasing 9,000 m² roof area for PV use

Local authority roof surfaces do not have to lie idle. In contrast: roof surfaces can be a source of cash for the official coffers if they are leased out – for example for use of photovoltaics. Königswinter has now drawn the logical conclusion and, in cooperation with the company abakus solar AG from Gelsenkirchen, has leased out 18 roof areas on public buildings of around 9,000 m². Altogether, PV installations for 1.2 million euros, coupled to the grid, generate a total output of 530 kW_p.

Leasing of roofs on public buildings is above all of interest to cooperatives for implementation of energy projects based on investment by ordinary citizens. However, most local authorities shy away from leasing out roof space. Reasons: the high cost. But Konigswinter has avoided this cost by commissioning a general contractor which finds investors, undertakes technical planning and implementation and makes the contractual arrangements between the investor and the town. The local authority issued an invitation to tender for roof use last summer.

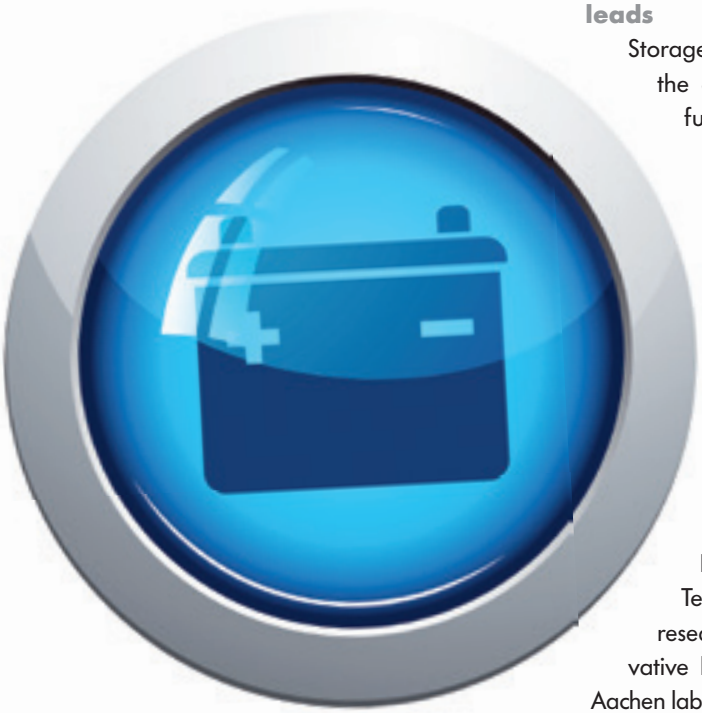
The administration time and cost for the local authority is minimised by leasing all roofs to one single investor. In addition, municipal roof surfaces, which because of the direction in which they face or their slope cannot be marketed as individual locations for PV installations, can be best used in a package along with more suitable surfaces. What matters to the investor is the average return over all roofs. The investor profits from a spread of risk arising from the fact that the overall installations are made up of a large number of small units. In addition, the average feed-in tariff also increases, as this tariff depends on the size of the installations. In Königswinter, people are happy that the roof areas can be used in this way, for in the current situation, the town could not afford to make such investments. abakus solar is, among others, tasked with the implementation of the PV installation on the roof of the Mont Cenis Academy in Herne. Information: email to schreiber@energieagentur.nrw.de, www.photovoltaik.nrw.de ■

Role of batteries in energy turnaround

The NRW Battery Day 2012 in Münster attracted a strong response. A good 300 visitors from the worlds of science, research and industry discussed innovative approaches to battery use in electromobility and far more. The current focus is above all on further development of lithium ion batteries for use in electric vehicles. Here there is particular emphasis on optimisation of performance, lifetime and safety. In order to achieve this, everyone from the energy, automotive, material and material research sector has to work together.

High-performance storage batteries

The Battery Day also focussed on stationary storage batteries used as buffers for sun and wind energy, necessary network infrastructures, new materials and basic research. The range of themes covered by the conference emphasises the significance of high-performance storage batteries for reliable energy supply from renewable sources, but also pointed to numerous open questions which still have to be answered by the worlds of science and research.



North-Rhine Westphalia leads

Storage of energy is one of the central themes of the future. And now it has become even more significant as a result of the energy turnaround. With its two battery research centres in Münster and Aachen, North Rhine-Westphalia offers an excellent research environment in this area. MEET (Münster Electrochemical Energy Technology) carries out research above all on innovative battery materials. The Aachen laboratory for battery system technology is carrying out research into battery packs.

The next NRW Battery Day will take place in March 2013.

The Battery Day NRW is organised by the EnergyResearch.NRW, EnergyRegion.NRW and NanoMicro+Materials.NRW clusters and by the two battery research centres in Münster and Aachen in cooperation with the Essen Haus der Technik.

The next Battery Day NRW will take place on 4 March 2013 in Aachen. The expert "Power Plant Battery" conference will follow on from this on 5 and 6 March 2013. ■

More than 11,000 new heat pumps in NRW 2011

The Heat Pump Marketplace NRW of EnergyAgency.NRW is successfully working on behalf of the NRW Climate Protection Ministry in order to increase use of heat pumps, as the figures for 2011 impressively show: last year around 11,400 heat pumps were newly installed in NRW. Of these, 40 % make use of geothermal heat, 3 % ground water and 57 % ambient air as a source of heat that constantly renews itself. The total number of heat pumps operated in NRW now amounts to 91,200.

Last year, heat pumps were installed in as many as 28% of the newly-built residential blocks in North Rhine-Westphalia. ■

Adapting bioenergy concepts to locations

In cooperation with EnergyAgency.NRW and the clusters EnergyRegion.NRW and EnergyResearch.NRW, Münster University of Applied Sciences (FH Münster) has dedicated the 6th Steinfurt Bioenergy Conference in March to the subject of energy-related use of biomass. We spoke to Prof. Dr.-Ing. Christof Wetter from FH Münster:

Today, bioenergy already makes an important contribution to the implementation of renewable energy systems. What will have to be done in future?

First of all, biomass is today already making a relevant contribution to energy supply. The requirement for renewable energy for electricity, heat and mobility will continue to rise in coming decades. In addition to using biomass for energy, we also have to produce sufficient food and animal feed and so direct use also offers great potential. With so much demand, efficient and integrated production processes have a key role.

There are still a great many opportunities for optimisation here, for example integrated concepts for bio-refineries.

There are many expectations for biomass, and perhaps some of them are even mutually exclusive. What can biomass realistically achieve?

The potential to produce bioenergy is limited and differs from region to region. Bioenergy concepts must therefore be developed in ways that suit particular locations. Increased use of residual and waste material can also reduce the competition for biomass. This means, for example, that a bioethanol plant can produce biofuel that is almost totally CO_2-free. Such small-scale energy and substance loops should be closed in order to allow better exploitation of the available materials in country areas.

How can further resources for biogas be opened up in North Rhine-Westphalia?

In the current German-Dutch joint project "Energieland BIORES", for example, we have developed instructions for appropriate use of residual materials for biogas plants. A heating and cooling register brings the available potential together with local clients (industry, trade and public buildings).

Agricultural land can be better utilised by means of catch crops such as spring barley, triticale and oats, producing raw materials for biogas production.

In future, processing into biomethane and feed into the natural gas grid may become more important. How will mobility be affected?

If the heat produced by a cogeneration plant cannot be used to the best advantage locally, it is useful to transport and prepare the green gas so that it can be used as motor fuel.

We will investigate the requirements for production, infrastructure and market development with our partners in the „Green Gas" INTERREG project. In addition to the other biofuels and electromobility, new approaches are being tried to integrated systems and low-CO_2 mobility.

Information: www.fh-muenster.de/wetter, www.kraftstoffe-der-zukunft.de ■

Mobility revolution and car renunciation

When thinking about environmentally-compatible mobility it is not possible to avoid examining our own mobility behaviour critically under the microscope. The "no car" initiative offered a good opportunity to do this. During Lent, participating churches asked their congregations and society as a whole to leave their cars at home and to try our environmentally friendly alternatives.

During their day of action on the theme of "Travelling in a new way – a new style of mobility", EnergyAgency.NRW and the regional project organisation P.R.O. e.V. with their partners in Erkelenz presented alternative fuels and drives which enable us to make a contribution to more environmentally-friendly mobility today. In addition to vehicles that run on vegetable oil and bioethanol-E85, hybrid vehicles from Toyota and also electric vehicles from the company Alliander in Heinsberg and e-Wolf from Frechen were present. This shows that many companies and initiatives are considering how mobility can be organised differently.

Two-wheeled transport was also in the spotlight: the German Cyclists Club, Allgemeine Deutsche Fahrradclub (ADFC) supports the initiative in order to encourage moves towards electric cycles in the area of mobility.

The successful "no car" initiative is certain to take place again next year. ■

Climate protection in clubs and discotheques

Taking stock and proudly presenting the Live Entertainment Award 2012: club owners, energy advisors and GMI representatives.

"Groove to save the world?" - this was the question asked by the Green Music Initiative (GMI) and EnergyAgency.NRW one year ago, when the Green Club Index. NRW" was called into life. Together with six clubs, energy consumption in discotheques and music events was examined. The pilot phase was very successful: the project was awarded the Jury Prize of the nationwide Live Entertainment Awards.

"To achieve the agreed climate targets by 2020, action has also at last been taken in the entertainment industry", emphasises Jacob Bilabel, Initiator of the GMI. As Lothar Schneider, Chief Executive of EnergyAgency.NRW says: "Together with the participating clubs, we were able to find technical solutions and starting points in order to reduce energy consumption. Now they must be established on a broader basis within the sector." Those taking part were the Gloria Theater and the Club Bahnhof Ehrenfeld from Cologne, Ufer 8 from Düsseldorf, Club Butan from Wuppertal, Bahnhof Langendreer from Bochum and Stereo from Bielefeld. With the support of EnergyAgency.NRW and the GMI, they first of all determined their Green Club Index, which defines energy consumption per visitor. The index supplies a first benchmark for club operators regarding their climate protection position. During on-site visits, the advisors from EnergyAgency.NRW determined electricity consumption of between 47,000 and 180,000 kWh per year, which corresponds to costs of between 10,000 and 40,000 euros or up to 90 tonnes CO_2. By means of the advice that was given, it

was possible to initiate measures which in total (over all of the clubs) save almost 80,000 kWh of electricity and also 19,000 kWh of heat, and therefore prevent around 60,000 tonnes CO_2 from entering the environment. This led to cost reductions of around 24,000 euros.

Cold rooms and refrigerators were found to cause the greatest leakage of energy during the measurements. Up to 40 per cent of the electricity consumed is required on average in order to serve drinks and food cold. With energy-efficient appliances (so-called top runners), the energy requirement can be reduced by more than 50 per cent. A further energy-intensive activity is the heating and ventilation of rooms. The clubs were able to gain ground here by means of optimised operating sequences, regular filter changes and smart programming. Innovative technical possibilities were offered above all in the area of lighting. Efficient LED models are now also good enough to fulfil the expectations of the events and entertainment sector. If the lifetime and the costs for electricity consumption and repairs are included alongside the initial investment costs, LED solutions prove to be a viable alternative. The fact that the Green Club partners joined together to form a climate-orientated purchasing group also had a positive effect. The music and sound themselves require relatively little energy. With less than 5 per cent of electricity consumption, sound equipment has little impact on the climate.

Following completion of the pilot phase, the technical and operative know-how is to be placed at the disposal of further clubs, and cooperation is to be continued.

Information: Green Music Initiative, Roman Dashuber, Tel. +49 (0)30/779077912, www.greenmusicinitiative.de and EnergyAgency.NRW, E-Mail michael.mueller@energieagentur.nrw.de, www.energieagentur.nrw.de

Löhne sets standards

The town of Löhne has energy-modernised its Menninghüffen East primary school. The state of NRW is contributing 1.2 million euros to the project, against total building costs of 2.4 million euros. The modifications have reduced overall energy demand by 82 per cent, to 97.37 kWh/m²a, while CO_2 emissions are down by 83 per cent.

Löhne is certain: in energy-modernising this school, it is setting new standards in educational buildings. The town has not only renovated the primary-school building to the highest energy standards, but also simultaneously created an "energy-education base" with the construction of an energy workshop in the school building. The Menninghüffen East school complex consists of a number of building elements: a primary school, a gymnasium with subsidiary facilities, a pavilion and a former caretaker's residence, which is now used as a state all-day school.

Great savings potentials were available in energy terms, in particular. The existing buildings were scarcely, and then only, incompletely insulated: the windows and roof, for example, had U-values of 4.3 and 0.55 W/m²K. The eighteen-year-old heating system was also technically obsolete, and needed replacement. It was ascertained, in addition, that civil-engineering deficiencies, such as lacking and/or defective vapour and wind barriers, had caused more extensive damage (including condensation and resultant mould) in the structure. The calculated heating-energy consumption index was 149.65 kWh/m²a in 2008. The energy-modernisation concept included renewal of both the building elements and the heating system. The interaction of these two provisions permits the attainment of optimum results, and the improvement of the building shell has achieved a significant reduction in transmission and ventilation heat losses, and a decrease in the energy consumption of the new heating system. CO_2 emissions have fallen by 83 per cent, from 91.73 kg/m²a to 15.41 kg/m²a, while primary-energy consumption (including lighting) has been cut by 333.2 kWh/m²a to 71.2 kWh/m²a.

In addition, the energy workshop is intended to assure illustrative teaching. Here, pupils will learn about steam engines, power plants and solar mobiles. ■

The energy improvements:

1. **Installation of triple glazing (Ug=0,7 Wm²K; Uf= 1,4 Wm²K) to replace the original windows**
2. **Insulation of roof surfaces and the top floor ceilings using 30 cm thick mineral wool (thermal Conductivity Class: 0.35)**
3. **Insulation of the exterior walls of the loft; new timber studding: 22 cm cavity insulation and 20 cm EPS (thermal Conductivity Class: 035), in the form of an exterior insulation finishing system**
4. **Porotherm brick masonry, d= 24 cm, with 20 cm EPS (thermal Conductivity Class: 035), in the form of an exterior insulation finishing system**
5. **Replacement of the old gas-fired heating system with wood-pellet facilities (2 x 80 kW)**
6. **A new lighting system, using power-saving technology**

Efficient environment for efficient research

The new main building of the E.ON Energy Research Center (E.ON ERC) at RWTH Aachen University has now been inaugurated, after a construction period of one year. The Center accommodates 150 employees from five institutes with seven professorial chairs and provides them with an ideal environment for their research into the energy supplies of the future: decentralised power generation, DC grids, power-electronics converter systems, smart grids, smart metering, energy-economics, customer needs and behaviour, energy storage, virtual power plants, efficient heat and refrigeration supplies to buildings, geothermics and CO_2 sequestration.

The building itself is also a research project, one which includes practically everything possible in terms of state-of-the-art energy-saving and energy-efficient technology in the field of construction. Optimum exploitation of daylight is assured by ceiling-high windows and exterior light-guiding strip blinds. The workplace lighting system adjusts automatically to the supply of daylight in parallel. A rational combination of concrete-core activation, facade ventilation units and sorption-assisted air-conditioning assures pleasant working conditions with low energy consumption, in both summer and winter. ■

ALTBAUNEU takes off

Network for local authorities

The "ALTBAUNEU" project name stands for a complete programme. This network for NRW municipalities and districts which have committed to energy modernisation of their buildings is to be steered by EnergyAgency.NRW in future, taking over from Essen's Gertec engineering corporation, which initiated "ALTBAUNEU" and has supported it for the state since 2005. Gertec, which has achieved extremely good results in the field of building modernisation in the sixteen municipalities and districts in the network, is to remain available as a co-operation partner.

The ALTBAUNEU network has set itself the task of creating a locally tailored and impartial range of advisory services for energy modernisation of buildings. The central element for building owners and tenants is the www.alt-bau-neu.de Internet platform, which features all local services and contacts for every facet of energy-modernisation of buildings, and a large range of information, including subsidies and advisory services, important for the achievement of worthwhile modernisation. Instruments which can be used by all local authorities are also being developed - PR materials, such as flyers, postcards and exhibition stands have, for example, been created up to now, and enjoy frequent use. Interregional meetings are held at regular intervals, in order to exploit synergies and to benefit from the experience of the other participating administrative bodies. EnergyAgency.NRW is interested in recruiting other NRW municipalities and counties to the network.

Contact: Lale Salur, Tel. +49 (0)202/ 24552-71, email salur@energieagentur.nrw.de ■

Energy-efficient quarter supplies

The KfW reconstruction bank has been offering a new promotion programme for energy optimisation of urban quarters since February 2012. The new "urban energy-modernisation" family of KfW programmes provides further impulses for greater energy efficiency in the municipal sector. Since the start of this year, it has been possible to develop and implement so-called integrated quarter concepts for the enhancement of the energy-efficiency of buildings and the infrastructure and, in particular, of heat supplies, and for energy-efficient water supply and disposal, with state assistance. The federal building ministry and the KfW are supporting these projects with low-interest loans and grants.

Support is being provided for the following:

- Drafting of integrated concepts at urban quarter level
- Modernisation managers, to support and co-ordinate the planning and implementation of the provisions elaborated in the concepts
- CHP units and systems for the utilisation of industrial waste heat, including the construction of decentralised heat storage facilities
- Construction of new and expansion of existing heat grids on the basis of cogeneration and/or industrial waste heat
- Methods for enhancement of energy-efficiency in water supply and disposal in the quarter

A "quarter" is in all cases defined as consisting of a number of congruent private and/or public buildings, including the public infrastructure. It thus comprises an area of less than "district" size. Municipalities, municipal corporations, such as municipal utilities, residential property companies, and also residential property owners and local property owners' co-operatives, are eligible to apply.

Further information: www.kfw.de (Programme Numbers 201, 202 and 432) ■

EnergyLounge.NRW

Energy turnaround and climate protection made visible to visitors

The EnergyLounge.NRW recently opened its doors at the Gelsenkirchen Science Park. Here, for the first time ever, is a site at which specialist delegations and groups of visitors from both Germany and abroad can get an overview of the diversity of the relevant activities, and discuss them with experts. North Rhine-Westphalia is a top European location for environmental and climate-protection technologies. Both private companies and research institutions are already implementing a large range of ground-breaking projects in the land of the Rhine and Ruhr rivers.

The EnergyLounge.NRW is the successor to the "International Visitor Centre RuhrEnergy", which has welcomed visitors from around the globe to the Science Park since 2004. "North Rhine-Westphalia possesses capabilities unique in both their breadth and their depth in the development of solutions to combat climate change. The EnergyLounge.NRW is intended to disseminate this diversified know-how beyond the boundaries of our state and to win over new partners for implementation of the energy turnaround", commented Dr. Heinz Baues, head of the Energy department at the NRW climate protection ministry during the opening ceremony. This new information and encounter venue augments the "Competence Atlas Energy NRW", which has showcased the EnergyRegion.NRW cluster in two languages in the Internet since 2010 (www.energystate.de). "Venues such as this illustrate, on the one hand, that there are powerful engines driving the energy turnaround and climate protection in NRW and, on the other hand, displays visually the economic force generated by energy-efficiency and renewable energy sources, and thus by climate protection", noted Dr. Frank-Michael Baumann, the "EnergyRegion.NRW" cluster manager and director of EnergyAgency.NRW. "The EnergyLounge.NRW is extremely useful to us, particularly since we receive frequent visits by foreign delegations who wish to see for themselves how NRW is implementing the energy turnaround", Baumann affirmed. The EnergyLounge.NRW is located in the immediate vicinity of the main entrance to the Science Park, which provides an ideal setting, with its around 80,000 visitors each year, and the event focus on Energy. Information: www.wipage.de

PE film replaces glass

Horticulture is a long tradition in the Schneider family. The company was founded no less than around 110 years ago in Potsdam, and moved to Moers in 1959. The brothers Herbert and Thomas Schneider jointly took over their parents' business in 2004, and now raise geraniums and cyclamen on a greenhouse area of 13,000 m^2, having commissioned a new 3,200 m^2 greenhouse last year. The special feature of this new structure is its low energy consumption, which permits energy cost savings of around 50 per cent compared to conventional greenhouses.

This is the result, above all, of the unusual outer skin, which consists of a 0.2 mm thick double PE film which is filled with air and significantly reduces heat losses. "It is true that the film is not as translucent as glass, but it needs far fewer supports, with the result that the final light yield is the same", explains Thomas Schneider. In addition, this greenhouse permits better cooling in summer, since some 50 per cent of the roof area can be opened, compared to only around a quarter in a glass roof.

An innovative height-adjustable heating system is the only heat source used, and can be lowered to just slightly above the potting benches when necessary. At a supply temperature of a maximum of 50 to 60° C, the plants are then conditioned by means, above all, of radiated heat, thus reducing the amount of thermal energy needed by approx. 10 per cent compared to conventional heating arrangements. Energy screens produce further energy savings of 10 per cent. These are made of a semi-transparent fabric and they are drawn together like curtains under the roof of the greenhouse on cold nights. A smart control system monitors temperature, air humidity, light intensity and wind strength, and regulates the heating, ventilation and energy-screen systems correspondingly. In addition to its energy-saving characteristics, the new greenhouse also features other benefits: the films react flexibly to hail and storms, and to frequently occurring mining subsidence, eliminating splintering. The Schneider brothers therefore consider the higher investment costs (around 30 per cent more) to be entirely worthwhile in the mid-term.

The Schneider gardening centre is "an old friend" of EnergyAgency.NRW, having participated in the JIM.NRW climate-protection project with an environmentally friendly wood-chippings boiler system since 2008, saving around 1,000 tonnes of CO_2 annually. Further information: email leuchten@energieagentur.nrw.de

CO_2-balancing – fast and compact for local councils

Municipal climate-protection concepts are "in". Twenty years after the UN climate conference in Rio, towns, cities and municipalities are now a fixed element in both national and international climate policy, despite their often scanty financial and human resources. Municipalities run up against the limits of their capacities when the question of systematic registration of emissions data and CO_2 balancing comes up, however.

For this reason, the NRW state government is supporting the municipalities on their road to their own "CO_2 footprint" in the context of a "climate-protection initiation programme". Since early 2011, all municipalities in North Rhine-Westphalia have been able to use the EcoRegion CO_2 balancing tool free-of-charge, and to register themselves for this purpose on-line via the www.CO_2.nrw.de Internet site. In parallel, EnergyAgency.NRW has initiated an extensive training programme to enable every municipality to gain experience in using this tool.

Practical experience demonstrates that obtainment of data has been the greatest hurdle to municipal CO_2 balancing up to now. In the view of EnergyAgency.NRW, polling of the necessary data should be as quick and straightforward as possible for the municipalities. The agency has therefore drafted specific data-obtainment profiles that simplify this procedure. A practical plus for users: an initial balance has been generated in advance for every municipality. In other words, top-down federal data have been broken down to municipal level on the basis of statistics on residents and persons in employment. Users are thus able to consult a rough balance for their municipality at their very first log-in. This can then be continuously refined as their own data surveys progress. The data for the solar thermics sector have, in addition, also been centrally available for all NRW municipalities via the balancing tool since October 2011.

Around two hundred municipalities currently make use of the facilities for drafting of their own CO_2 balance. A number of counties also intend to draft, in co-operation with their municipalities, a county-wide balance based on the bottom-up approach. NRW municipalities that receive financial support for the European Energy Award (EEA) have been required to submit a CO_2 balance since early 2011. The target for the next two years is that of persuading all NRW municipalities to participate, if possible. Other federal states and the federal environment ministry have already declared their interest in these activities in NRW.

Further information: Michael Müller, EnergyAgency.NRW, email michael.mueller@energieagentur.nrw.de, www.co2.nrw.de ■

"Full house" – to be continued!

Four conferences on involvement in the energy turnaround, and four "full houses" - the final date of the "Getting the energy turnaround right at local level – municipal value chains and citizens' participation in renewable energy" conference in Düren, with more than one hundred participants, demonstrated the great interest which exists in future energy supplies. To be continued!

At these co-operative events organised by EnergyAgency.NRW and the NRW Renewable Energy Alliance (LEE NRW) experts illustrate how municipal value-creation effects from renewable energy sources look, the potentials for control which the municipalities possess in the promotion of citizens' energy systems, and how local residents can become specifically involved in projects. New energy supply systems with increasingly decentralised structures naturally function on the basis of new rules. "To succeed with the energy turnaround, it is vital to inform participants of statutory parameters and to showcase existing models that have an exemplary character. Our aim is to enable municipal decision-makers to shape the energy turnaround themselves, and to give them extra impetus", declares Dipl.-Ing. Gerd Marx, head of the Energy-Efficiency and Renewable Energy department at EnergyAgency.NRW.

The success of the first series of conferences means that there will be further "Getting the energy turnaround right at local level – municipal value chains and citizens' participation in renewable energy" events, on May 31, 2012 in Xanten, for example. Further information: email von.de.berg@energieagentur.nrw.de ■

mod.EEM: 97 per cent satisfaction

mod.EEM, the project for introduction of energy management systems within companies, has been underway for three years now - and the "interim assessment" could not be better: "According to our poll, 97 per cent of the now around 200 companies participating in the project are satisfied - or very satisfied - with mod.EEM", notes Dipl.-Ing. Gerald Orlik of EnergyAgency.NRW. EnergyAgency.NRW is conducting this country-wide pilot project on behalf of the Federal Environment Ministry and the Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection of the State of North Rhine-Westphalia.

The user friendliness of the software available on-line for introduction of energy management scores particularly highly with the companies involved. The provision of information and useful examples of implementation are also extremely well received, however. As Orlik comments: "The examples are always of great practical use to these companies. They assist in orientation and in structuring procedures for action, and also provide specific tips when projects for raising efficiency are to be practically implemented".

Particularly pleasing: around 80 per cent of companies participating in this pilot project have examined the subject of energy-efficiency more intensively only since the introduction of mod.EEM.

Energy-efficiency in cents + euros

The awareness thus inculcated is reflected in specific projects aimed at increasing efficiency. The Friedrich Gustav Theis Kaltwalzwerke GmbH rolling mill in Hagen, for example, has optimised heat supplies to its amenities building by using the surplus heat generated by its compressed-air production facilities for space heating and for heating of the utility water in the amenities building by installing heat exchangers, instead of releasing it into the atmosphere, as was previously the case. The costs were around 24,000 euros, to be set against savings of some 13,000 euros/a resulting from the reduced consumption of gas. CO_2 emissions have also been cut by an annual 100 tonnes.

The positive balance drawn for three years of this project would be only half as valuable were it not for the simultaneous derivation of new fields of activity, in addition to this already notable success. Gerald Orlik: "The feedback from these companies clearly illustrates that they desire greater networking between the participants". More than 80 per cent of these companies would like interchange at regular intervals and, according to Orlik, this is to be one of the work topics for the remaining term of the project.

mod.EEM is a pilot project for the introduction of energy management systems within companies. Energy management systems make it possible to structure and implement routines for the discovery and exploitation of efficiency potentials. These routines are then certified in conformity to DIN EN ISO 50001. Further information: email orlik@energieagentur.nrw.de, email gentzow@energieagentur.nrw.de and www.modeem.de ■

Federal Association of Energy and Climate Agencies

Ideas exchange in NRW

The representatives of thirty-two German energy and climate protection agencies recently met, in response to an invitation by EnergyAgency.NRW, at the Lighthouse in Solingen-Gräfrath, and in Wuppertal. The focus of the meeting of the Federal Association of Energy and Climate Protection Agencies Germany, or "eaD", for short, was on an interchange of experience and ideas for the promotion of energy-efficiency and renewable energy. The central topic this time was the renaissance of wind energy. The "Stromspar-Check" power-saving check-up for low-income families conducted by the eaD and the Caritas charity organisation, under which long-term unemployed persons are certified to identify potentials for saving power in needy households, was also highlighted. These power-saving checks have up to now enabled more than 50,000 households throughout Germany to save an average of 90 euros each year. ■

Building efficiency means climate protection

Is the energy potential of our existing buildings really that great, and how does perfect energy-modernisation of buildings actually look? Around 250 experts recently discussed these questions at EnergyAgency.NRW's "Building Efficiency Means Climate Protection" specialist conference held recently in the civic hall at Wuppertal. Their conclusion: much remains to be done in terms of climate protection and cutting energy costs in existing German buildings on the way to the accelerated energy turnaround. "Energy-modernisation of buildings is an important element in the energy turnaround. Supplying energy from renewable sources becomes incomparably more difficult, or even impossible for the foreseeable future, if there is no broadly based reduction in the energy consumption of buildings, for example", noted Udo Paschedag, under-secretary of state at the NRW climate-protection ministry. Specialists from all over Germany had taken up the agency's invitation to discuss planning law requirements, rational modernisation strategies and zero-defect performance.

The unmasking of older buildings as energy gluttons is not a new development. "1950s and 1960s buildings, the energy standards of which have in the meantime not been uprated to match modern technical potentials, energy necessities and climatic imperatives, consume well over 200 kWh of heating energy per square metre per year - a figure which can be reduced to well below 100 kWh after the right modernisation work", affirms Lale Salur, an EnergyAgency.NRW architect.

The political targets are well defined: CO_2 emissions are to be cut within the European Union by 80 to 95 per cent by 2050, in order to achieve global climate protection targets. "It is possible in the buildings sector, unlike

most other fields, to achieve 100 per cent reductions with a rational level of expenditure and using technologies already commercially available", as Burkhard Schulze Darup, a Nuremberg architect speaking at the congress noted. The federal government's energy concept, he stated, requires, approximately, climate neutrality in all buildings by 2050. Schulze Darup: "We can achieve this target only if we use the best efficiency standards applicable for modernisation and in new projects, and double the current rate of modernisation". It will be necessary, as he commented, to select a long-term forward-looking sustainable approach for modernisation of buildings. Any rational modernisation concept, he explained, must include the execution of the energy-efficiency components of the building shell to the best possible standard. In his estimation, the cost differences between mediocre and extremely good can be seen as relatively moderate.

The legislators appear, at least at present, to be speaking another language. Peter Rathert, head of department at the Federal Construction Ministry, and also responsible there for the EnEV Energy Saving Regulation, pointed out that the new, more intensive amendments to the EnEV expected this year could, on a current view of the situation, turn out to be significantly more moderate than originally envisaged. The tendency in new construction, contrary to earlier statements, is only toward greater stringency of a single-digit percentage magnitude, while essentially no greater stringency should be anticipated in building modernisation. Considerably higher requirements will be necessary in the foreseeable future if global climate protection targets are nonetheless to be met.

Another problematical field is the modernisation of listed buildings. All work which would affect the listed elements of a building is, for example, subject to approval by

the listed buildings authority. Energy uprating of the building shell is indeed technically possible, but necessitates greater financial input. The preservation of historic buildings and energy modernisation are, nonetheless, not irreconcilable. The KfW bank has been supporting the energy modernisation of historic buildings and listed building elements by means of its "KfW Historic Building Efficiency" programme since April 1, 2012.

Information and congress documentation is available from: www.energieagentur.nrw.de (dates).

Energy turnaround – vast real-life experiment

It never takes long for the buzzwords to start flying around when people start discussing the energy turnaround: wind power instead of nuclear power, grid expansion, storage technologies, electromobility - usually consistently reduced to the technical challenges to the "art of engineering". The voices warning that the energy turnaround will mean more than just replacing one technology by another are growing ever more strident. We spoke to Harald Welzer.

Herr Welzer, there seems to be a technical solution for every problem, and it's effectively an article of faith that the newer technology is the better one. How do you explain that?

Our thinking here is historically shaped, and is an expression of our culture of trying to solve problems using technology. All this goes back to the times when we believed that all technology was founded on adherence to the laws of nature, and that the use of technology was therefore behaviour conformant to these laws. The present-day motivation for sticking to this model can be found, inter alia, in the desire that nothing fundamental in our world should be changed. This desire leads to many self-deceptions. As an example, I recently read in the advertising for a modern heating system that it would be good for the environment - which, of course, is nonsense. I might perhaps admit that the new system is better than the old one, but that still doesn't mean that it's in fact good for the environment. The new heating system will also harm the environment, albeit to a lesser degree.

A slightly heretical question, while we're on the subject of culture: how do you think painting and music will look after the energy turnaround?

Culture is more than just painting and music; it's the way we shape life and survival. Painting and music might not change so very drastically, in fact.

You just spoke about self-deception, where do you see this happening?

Our need for continuity, for "everything stays the way it is", makes us blind to facts. It is illusory, for example, to believe that the energy turnaround will not have any implications for individual mobility and for our living habits. It will be necessary to reappraise the individual value of the motor-car, and also the current trend toward ever bigger residential buildings. It will not be possible in the future to maintain the level of affluence we are familiar with. Ignoring this will deprive us of the possibility of developing and discussing alternative affluence models.

Politicians talk about the third or "ecological" industrial revolution when the energy turnaround is mentioned. Are there any parallels from the past, and are we heading for revolutionary turmoil? Or are we already in the midst of it?

The first industrial revolution involved the total transformation of all relationships - the family, as we know it, social structures, teaching, everything transformed, or was transformed. Thinking in these terms, we're a long way from another industrial revolution at present.

Prof. Dr. Harald Welzer, PhD and licensed sociologist and social psychologist, is the director of Berlin's "FuturZwei" future-viability foundation. He worked at the Institute for Advanced Study in the Humanities in Essen until 2011, where he headed among other things the "ClimateCulture" project.

So why is this term used?

It all goes back to a concept from the ministry by Sigmar Gabriel. In 2006, the as then environment minister talked about the necessity of a third industrial revolution. The first industrial revolution was, without doubt, linked to the change in energy structures, and we are perhaps experiencing a comparable phenomenon today.

What do you mean with this statement?

Energy structures will change again, when the energy turnaround takes place, citizens' energy systems, for example, will pave the way for local involvement.

So revolutionary things are going on?

Well, it is, at least, an interesting process; let's say: We are both the witnesses of and participants in a vast real-life experiment. ■

First climate networker sets off

The effects of climate change are clearly apparent in NRW, too. People in this industrially dominated federal state feel a special responsibility, and wish, in the future, to play a pioneering role in climate protection. As a high-capability contact in the fields of renewable energy and energy-efficiency, EnergyAgency.NRW has, for decades, provided advice to municipalities and counties, companies and private citizens.

Since the start of this year, EnergyAgency.NRW has been pursuing new paths, with the aim of becoming involved more intensively in the field of climate protection, and of integrating "regional carers" into the climate-protection activities of the government districts.

Getting down to work: Marcus Müller (r.) is now active in Arnsberg

Marcus Müller, the first "climate networker", started his work in the Arnsberg government district early in 2012. His task, as an EnergyAgency.NRW employee, is to ensure universal interchange of information above and beyond all municipal and political levels, publicise the advisory and other services available from EnergyAgency.NRW in the region, set up links between partners at local level, and support them in the implementation of their projects.

The Arnsberg district government is also tackling the challenges of the energy turnaround and in 2011 had a "Potential renewable energy in the Arnsberg government district" feasibility study drafted, and formed a supra-departmental and supra-disciplinary project group on "Renewable Energy". The target here is that of making this government district a model energy region within NRW by expanding the use of renewable energy. Marcus Müller is to provide the district government with support in achieving this.

Our "climate networker" has been working at the district government offices in Dortmund since March, in order to assure rapid interchange with all responsible persons.

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Focus on power plant processes

The Institute for Power Plant Technology, Steam and Gas Turbines (IKDG) of RWTH Aachen University provides outstanding research capabilities in the field of power plant processes. The IKDG, headed by Prof. Manfred Wirsum, possesses a number of large test facilities, on which the processes occurring in the combustion chambers of gas turbines, and flow phenomena in both steam and gas turbines can be studied among other things. The infrastructure available at the institute permits both the performance of component tests for larger systems and of small-scale fundamental analyses.

The IKGD also conducts optimisation and state-analysis of power-generation processes, using numerical simulation; here, the interaction of individual machines in a complex energy-conversion system is analysed, in order to permit the derivation of strategies for optimisation of the system as a whole and of its components. New concepts for the enhancement of generating plant flexibility, hybrid concepts, and also concepts for the storage of electrical energy, are additionally developed and studied, on the basis of analysis of the processes used in energy facilities, at the institute.

Further information:
www.idg.rwth-aachen.de

Prof. Manfred Wirsum heads the Institute for Power Plant Technology, Steam and Gas Turbines (IKDG) of RWTH Aachen University

"Power, heat – what?"

"Combined Power and Heat" design competition

With the simultaneous production of heat and electricity, combined power and heat generation utilises resources more efficiently, saves energy and can make a significant contribution to protecting our climate. A study drafted in 2011 on behalf of the NRW Climate Protection Ministry and EnergyAgency.NRW shows that there is in our state considerable potential for the use of CHP and for a large district heating network. This technology could, in principle, eliminate 35 per cent of CO_2 emissions and 35 per cent of present feed materials consumption. CHP is versatile, and can, for example, be installed in multi-dwelling buildings, homes for the aged, hospitals, administrative and commercial buildings, and also in agriculture. Trade, commerce, service-providers and private companies can use so-called CHP units, while mini-CHP plants are available to cover smaller needs. The technology is tried and tested, and is demonstrably highly efficient, both ecologically and economically. The term "cogeneration" remains difficult, perhaps even incomprehensible, for the public at large, however. It is a topic which appears to be highly technologically complex, and the expression "cogeneration" is, indeed, not self-explanatory.

Cogeneration. Awkward expression, inspired idea

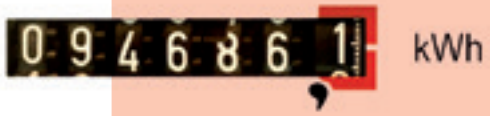
In order to make the term more comprehensible, even reformulate it if necessary, and thus arouse interest in the use of this technology, EnergyAgency.NRW has, on behalf of the state's Climate Protection Ministry, organised a competition for would-be communications designers attending universities and colleges in NRW.

The task: the graphics and copy for DIN A0 posters advertising the use of cogeneration, and the development of an advertising slogan where appropriate, also the coining of a new term which would "rebrand" this efficient principle of combined generation of power and heat. The visual and copy ideas were also to be suitable for use in other advertising and information material, in the form of printed and electronic media.

A jury of well-known names, including Prof. Uwe Loesch, of the workgroup for visual and verbal communication, Prof. Thomas Rempen, of the Rempen GmbH consultancy, Michael Rohde, senior PR manager Stage-Entertainment, and Prof. Iris Utikal, of the QWER agency and the Cologne International School of Design, was co-opted, and rounded off with Dr. Frank-Michael Baumann (Director of EnergyAgency.NRW) and Dr. Joachim Frielingsdorf (Head of Communications, EnergyAgency.NRW).

EnergyAgency.NRW's co-operation associate here is "Dirty Dancing – the Original Live on Stage" (www.dirtydancing.de). The awards ceremony is to be held at the Stage Metronom Theatre at the CentrO Oberhausen shopping complex in November. More details of the schedule, entry conditions, registration and the cash prizes can be found here: www.energieagentur.nrw.de/kwk-kreativ

Maximum funding for mini-CHP



April 1 2012, was the opening date for submission of applications to the Federal Office of Economics and Export Control (BAFA) for funding of high-efficiency small-scale cogeneration (mini-CHP) systems of up to 20 kW rated output.

Under this programme, new mini-cogeneration plants of up to 20 kW rating installed in existing buildings are eligible for a once-only investment grant, which is graduated on the basis of the system's electrical output. Extremely small systems suitable in particular for detached and semi-detached houses, with an output of 1 kW, for example, qualify for 1,500 euros in funds, larger installations of 19 kW, on the other hand, 3,450 euros.

The systems are required to meet certain efficiency standards in order to receive financial support. They must, in fact, better the requirements set out in the EU CHP directive for ultra-small systems. Savings of primary energy must amount to not less than 15 per cent in the case of systems up to 10 kW in output, and to not less than 20 per cent in systems of 10 up to and including 20 kW output. An overall annual efficiency of not less than 85 per cent must be achieved.

The requirements also include the presence of the following features:

- A heat-store with an energy capacity of not less than 1.6 kWh per kW of installed output;
- a control and instrumentation system permitting heat- and power-regulated operation, including smart heat-storage management and
- a measuring system for determination of current power consumption (a "smart meter") in the case of systems above 3 kW output.

The BAFA is to publish a list of eligible systems. Further information: post@energieagentur.nrw.de

In brief

Am 2nd Bergisch Congress 100 per cent.RENEWABLE

Specialists and interested parties from the NRW region are to meet at the Freudenberg campus of the University of Wuppertal on June 22 to continue accelerating the energy turnaround in the hilly Bergisch region. Their focus will be on the topics of renewable energy and energy-efficiency. As in 2011, the congress is being organised by the University of Wuppertal, the Bergisch Development Agency, the Wupperverband water authority, the Wuppertal Institute, the regional crafts and trades association and EnergyAgency.NRW. Information is available at www.hundertprozentig-erneuerbar.de and www.energieagentur.nrw.de.

New CO_2 event calculator

Starting immediately, the climatic effects of conferences, congresses and festivals can be quickly calculated. EnergyAgency.NRW provides a new CO_2 event calculator for this purpose on its Internet site. This makes it possible for event organisers to determine the emissions of any planned event free-of-charge by means of simple on-line registration. The calculator has been developed by CO_2OL, and has already undergone successful testing. EnergyAgency.NRW also uses it for its climate-friendly events. www.energieagentur.nrw.de

NRW day: Magical Encounters in Hermann Land

The 2012 North Rhine-Westphalia Day is to be held on May 27 and 28 in Detmold, under the motto of "Magical Encounters in Hermann Land". EnergyAgency.NRW will be there showing energy-charged exhibits on numerous facets of climate protection on the NRW Climate Protection Ministry's stand. Visitors will, for instance, be able, at the energy advice mobile, to obtain information on the benefits of modern technologies, and to win attractive prizes in an energy quiz. More information on NRW Day: www.land-des-hermann.de

NRW mini-wind systems exempt from permission

The route to privately owned mini-wind power systems just got shorter: thanks to an amendment to NRW's state building regulations, mini-wind energy installations of up to 10 metres in height are now exempted from the need for planning permission. This exemption applies only to installations in purely, generally and particularly residential zones, and in mixed zones. The amendment is based on the NRW Wind Energy Directive. Operators of mini-wind systems remain obliged to adhere to all relevant construction-law regulations and, in particular, to the requirements concerning stability, noise emissions, distances from buildings, structural statics and preservation of historic buildings. Further Information: www.klein-windkraftanlagen.com

2012 ThyssenKrupp Ideas Park: Climate Protection – Made in NRW

In the context of its "Future Technology" initiative, ThyssenKrupp is organising from August 11 to 23 the "ThyssenKrupp Ideas Park" in Essen, a technological experience centre aimed in particular at young people, families and school pupils. In recent years, more than 550,000 visitors have taken up the invitation to look behind the scenes of Research & Development, to experiment and to discover. EnergyAgency.NRW and the EnergyRegion.NRW and EnergyResearch.NRW clusters will also be showing exhibits on the subjects of renewable energy and energy efficiency; the motto: "Climate Protection - Made in NRW". Also present will be the "Gradwanderung" exhibition by the German Climate Foundation, aiming to impart knowledge on climate protection using interactive models. Information: www.ideenpark.de and www.energieagentur.nrw.de

Residential ventilation: New test report on-line

Dortmund's European Test Centre for Domestic Ventilation Systems (TZWL) is to publish its new and comprehensive comparative test of residential ventilation equipment, both including and not including heat recovery, in the form of an eBook in the Internet. The report includes thirty-two previously untested systems, and covers in all 167 residential ventilation units. The new on-line bulletin (Issue 12) can be downloaded now from TZWL's homepage, www.tzwl.de (Market and Consumer Information). The eBook containing the test reports provides information on the energy-efficiency of heat-recovery and residential ventilation equipment.