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International Passive House Conference 2014 in NRW
The 18th International Passive House Conference will take place on 25 and 26 April 2014 in Aachen. The conference is the largest meeting of passive house experts in the world, and the event will take place under the patronage of NRW Climate Protection Minister Johannes Remmel. The organisers – the Passive House Institute, City of Aachen and EnergyAgency.NRW – are now calling for papers. Abstracts of completed projects with experience of actual operation and innovative, affordable solutions will be given preference. Information on submission of papers is available at: www.passivhaustagung.de

Resource and energy efficiency in companies
“Resources and energy efficiency ‘give-and-go’ – getting the better of rising costs for raw materials and energy” is the title of the conference to be held by Efficiency Agency NRW (EFA) and EnergyAgency.NRW on 15 October 2013 in Wuppertal. In this resources and energy efficiency initiative launched by the NRW Climate Protection Ministry, both agencies will bundle their different advisory instruments and competencies. The conference will give an initial presentation of the initiative and will show successful examples of resource- and energy-efficient production processes.
We have made good progress with the transformation of our electricity supply, which is still for the most part based on conventional energy sources such as coal, into a supply system based on renewable energies: at the present time, around 23% of our electricity is provided from renewable sources. The electricity turnaround is therefore well on its way.

However, the target of the Federal Government which is among other things to reduce carbon dioxide emissions by at least 80% by 2050 compared with 1990, cannot be achieved by means of an “electricity turnaround” alone. Today, the traffic sector is responsible for around 20% of carbon dioxide emissions. This means that there will also have to be a turnaround in the area of mobility. This turnaround affects all areas: heavy goods and private passenger vehicle traffic, which today is almost solely based on diesel and petrol engines, and also shipping and aviation. Use of more efficient drive systems, such as electric motors, is one approach which is being followed. The use of efficient drive systems such as electric motors, moreover, not only protects the global climate, it also reduces the burden of local exhaust fumes and noise. This considerably enhances the quality of life, particularly in urban areas.

The technologies available for generation of electricity from renewable sources have been developed very quickly, which means that already today, they can be used on a large scale. However, in the area of mobility, there is still research work that remains to be done. The Federal Ministry of Education and Research has recognised this and is providing support to universities and research institutions in North Rhine-Westphalia. NRW is an important player, with its many companies and organisations working in the sector, and is making a large contribution to the development of climate-friendly mobility. For example, new lithium-ion batteries are under development at the Münster Electrochemical Energy Technology (MEET) facility at Münster University. And new types of sustainable fuels from biomass are being worked on, for example, at RWTH Aachen University. Electrical power from wind and sun can be converted into fuels like methane with the help of chemically-based processes. This is being followed. The use of efficient drive systems such as electric motors, moreover, not only protects the global climate, it also reduces the burden of local exhaust fumes and noise. This considerably enhances the quality of life, particularly in urban areas.

Svenja Schulze
Minister for Innovation, Science and Research of the State of North Rhine-Westphalia

innovation & energy 3_2013
Good, clean air is a basic prerequisite for human health. And the air in North Rhine-Westphalia has become a great deal cleaner over recent years. Nevertheless, the air quality in densely-populated areas does not yet fulfil the standards for health protection that apply throughout Europe. Pollution from fine dust and nitrogen dioxide continue to cause considerable problems, not only in our own region, but throughout the world.
Readings taken in relation to air quality in 2012, presented by the NRW regional agency for nature, the environment and consumer protection (LANUV), show for NRW that in the case of nitrogen dioxide the limit value is still exceeded in some cases, despite a slight reduction in the measurement at 67 of the 117 NRW measuring points. The importance of this subject was again confirmed by the publication of the EUA Report “Air Quality in Europe – 2012 Report”. This report investigates the exposure of the population to airborne pollution and provides an overview of air quality in Europe. The most important conclusion is that fine dust is the air pollutant which gives rise to the greatest risk to health in the EU. In order to bring this theme even further into the spotlight, the European Commission has declared 2013 to be the “Year of Air”.

In Germany, traffic alone is currently responsible for around 30% of energy consumption and 20% of CO2 emissions, and is also still 90% dependent on mineral oil. Since 2009, the EU has specified that, by 2015 there must be a reduction in CO2 emissions to 130 g/km for newly-registered vehicles. Now, the EU has also decided that CO2 emissions should be reduced to 95g/km by 2020. This reduction is mainly being achieved through optimisation of conventional drives. A contribution of 10 g/km from the use of clean biofuels can be credited, for example. In April 2013, the EU Parliament also proposed that a corridor of 68 to 78 g/km should be discussed for the year 2025. This proposal was met by a counter-proposal from the automotive industry that vehicles which emit less than 50 g/km CO2 should be granted so-called super credits. Super credits are a kind of rebate which are granted for the manufacture of certain vehicles. This means that electric vehicles and vehicles with range extenders are counted with factor 2, in other words double, in the calculation of the fleet average for the year 2020. The specification of the 95 g/km limit can be viewed as a compromise.

These targets apply against the background that a further increase in travel by individual and above all in goods traffic transported by road must be reckoned with. To counteract this, use of 10% regenerative energies in the fuel market as well as decarbonisation of fuels by 10 to 20% compared with 2010 are planned by 2020. Based on the current status, these targets cannot be achieved through the use of one sole solution, and in fact a wide range of advanced fuels and drive technologies will have to be used. In order to achieve the necessary diversification in the energy basis of transport, alternative fuels such as natural gas, autogas, biofuels, synthetic fuels, hydrogen and innovative drive technologies such as plug-in hybrids, battery-driven electric vehicles and fuel cell vehicles will be needed. In addition, further increases in the energy efficiency of internal combustion engines as well as new mobility concepts will be required over the longer term.

The passenger vehicle sector together with the rail sector offers the greatest potential for saving CO2. Natural gas and hybrid applications and also electrification of bus drive systems demonstrate potential for low-emission city mobility using local public transport. Further development of the drive technologies currently used in goods vehicles on the roads and hybridisation and extension of the fuel basis to include gas offer further opportunities. In addition, there are high efficiency potentials in the aviation sector and in shipping. In the aviation sector, biofuels, in other words biokerosene, is the only alternative to fossil-based
kerosene. As regards shipping, it is possible to observe diversification of the fuel base from heavy fuel oil to diesel and liquefied natural gas (LNG).

The energy turnaround can only be realised based on sustainable and environmentally-friendly mobility. Within its energy concept, the Federal Government has set the target of saving 40% of final energy consumption in the transport sector by 2050. This is a considerable challenge, which based on current conditions can only be achieved with an approach which is open to the use of new technologies. New technologies are often not self-explanatory, and therefore demonstration projects for the acceptance of new technologies are particularly important. NRW, as a densely-populated region, is predestined to play an active role in this and, for example, provides important information on the overall state of mobility with its demonstration trials in the Rhine-Ruhr electromobility model region. The project control centre of the Rhine-Ruhr model region, together with EnergyAgency.

NRW with its two networks for fuel cells and hydrogen and future fuels and drives, provides interfaces for holistic mobility in NRW. This approach was confirmed by the mobility and fuel strategy passed by the Federal Cabinet on 12 June 2013.

NRW is at the forefront of climate protection and the energy turnaround and passed the first German climate protection act with legally-binding climate protection targets in January 2013. In addition to the climate protection act, the NRW State Government also initiated a comprehensive climate protection launch programme along with cornerstones for a climate protection plan as early as June 2011. This meant that for the first time, reduction targets for greenhouse gas emissions were legally specified in the Federal Republic of Germany. Currently, strategies and measures are being discussed within a participation process involving municipal districts and local authorities which should enable the ambitious climate protection targets to be achieved. The climate protection plan creates a road map for the new climate protection policy “Made in NRW”. Mobility is a decisive building block when it comes to new orientation of climate protection and energy policy in NRW. So it is possible to say that the energy turnaround will also be decided “at the wheel”.

Advanced biofuels for a bioeconomy

For NRW in particular, it can be assumed that goods transportation by road, rail and air will continue to increase in the coming years. Continuing high fuel prices and high emissions of the greenhouse gas carbon dioxide mean that it is essential to turn away from use of fossil-based energy sources. The changeover to sustainable raw materials can be achieved with new technologies and processes, and alternative fuels will play an ever more important role in heavy goods transport as well as in aviation and shipping. In this
Looking further afield:

China and Mobility

When people think about the future, the most frequently-asked question is – What will China do? For example, in the Security Council, in the conflict between North and South Korea or with regard to CO2 reduction and mobility.

China is following – as it were – a two-track strategy. When speaking to EnergyAgency.NRW, Dr. Wu Zhixin, Deputy Director General of the China Automobile Technology and Research Center (CATARC), explained that China wants to counter both greenhouse gas emissions and shortage of resources by opening up resources and reducing consumption. But great emphasis is also being placed on electromobility – above all in the area of public transport. E-mobility is of strategic importance and China intends to make considerable efforts in the area of research and development.

The complete conversation between Dr. Wu Zhixin and Dr. Frank Köster from the “Fuels and Drives of the Future Network” of EnergyAgency.NRW can be found on the Internet at www.energieagentur.nrw.de (Interview – Im Gespräch) and www.energieagentur.nrw/kraftstoffe.

context, processes for the manufacture of optimised biofuels which do not compete with food production are particularly in demand. Research into substance-based and energy-based use of biomass in so-called biorefineries is a part of the bioeconomy which aims at moving away from industry and society based on mineral oil towards bio-based industry and society – a change that will be made possible by research, development and knowledge. Many research groups and associations in NRW have initiated new development and sales platforms and actively support technology and knowledge transfer. In the area of research into bioenergy, this particularly applies to energy-efficient conversion of biomass and manufacture of fuel components as well as to new types of combustion processes and engines. Current research is being bundled in the Excellence cluster “Tailor-made Fuels from Biomass” in Aachen and in the cooperation project at the Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT in Oberhausen, among others. Increased use of biogenic waste materials within the bioeconomy is also a very promising field of research. The dialogue that has taken place up to now in NRW on the subject of the bioeconomy has shown that players from the worlds of research, the energy industry and agriculture are very willing to implement further measures and strengthen interdisciplinary and international networks.

Technical infrastructure

Infrastructure measures are a necessary prerequisite for climate-friendly mobility. New fuels require a new infrastructure and must also be considered at a higher level than that of individual methods of transportation. In the relevant EU draft directive, those fuels which replace mineral oil as the energy source for the transport sector and can contribute to reduction in traffic-based CO2 emissions are designated as alternative fuels in the sense of a mobility and fuel strategy. They include electricity, hydrogen, biofuels, synthetic fuels, natural gas – including biomethane – in gaseous (compressed natural gas – CNG) and liquid (liquid natural gas – LNG) form, as well as liquefied petroleum gas (LPG). Development of the infrastructure is also important, in order to facilitate introduction of these fuels to the market.

The draft directive proposes that charging plugs should be standardised in Europe. All charging posts should be capable of use with the type 2 plug, so that it is possible for cross-border traffic to charge up in the different EU regions. At least 150,000 publicly-accessible charging points should be available in the Federal Republic of Germany by 2020.

The following targets are also named in the draft directive:

- 300 km as the maximum distance between hydrogen fuel stations
- Natural gas (liquefied, LNG): by 2025, fuel stations should be installed in all 139 sea and inland ports of the Trans-European transport network.

Continued on Page 8 >>>
There should also be LNG fuel stations for trucks every 400 km along the trans-European transport network.

The distance between compressed natural gas (CNG) fuel stations should be at the most 150 km by 2020.

LNG can be used in shipping, both at sea and also on inland waterways. However, the LNG infrastructure for fuelling of ships is still in its infancy. Sweden is the only country to have a small LNG bunker installation for maritime shipping, and there are similar plans in some other Member States. The Commission proposes installing LNG fuel stations in all 139 sea and inland ports within the core network of the Trans-European transport network by 2020 or 2025.

Use of hydrogen in mobility

Automobile manufacturers are engaging increasingly with vehicle electrification in order to fulfil the requirements of the mobility of tomorrow. The following new vehicle types exist:

- **Hybrid vehicles with internal combustion engine and electric motor and also a high-performance battery in the vehicle**
- **Vehicles with internal combustion engine and electric motor whose batteries are charged with electricity from the network (plug-in hybrids and range extenders)**
- **Vehicles powered solely by electricity, with fuel cells which convert hydrogen filled into the vehicle into electrical power**

Electric vehicles with batteries based on renewably generated electricity produce the lowest greenhouse gas emissions and exhibit the lowest specific primary energy consumption in terms of their overall carbon footprint. Electric vehicles with fuel cells also permit a considerable reduction in energy consumption and greenhouse gas emissions. A wide-ranging analysis of the hydrogen fuel cell drive has also shown that reduction of greenhouse gas emissions of around 30% in comparison with internal combustion engines is already achieved if hydrogen is manufactured from natural gas.

Storage of excess electricity from renewable energies, where hydrogen is created by means of electrolysis ("power to gas") also offers great potential. In contrast to energy storage in batteries, hydrogen can be stored over long periods of time without losses. This regenerative hydrogen can be employed in transport applications based on use in fuel cell vehicles. As an alternative, but with much lower efficiency, natural gas for CNG vehicles can also be created from hydrogen using the methanisation process.

Automobile manufacturers all over the world are working on the development of electric vehicles with fuel cells. First small production runs of fuel cell cars and buses have already been completed and the resulting vehicles are being trialled with customers (e.g. buses in Düsseldorf and the surrounding area). However, some optimisation is still necessary before this technology can be introduced to a wider market:

- **Increase in the lifetime of fuel cells**
- **Cost reduction through an increase in the gravimetric and volumetric power density**
- **Catalyst optimisation and minimisation of the noble metal requirement**
- **Reduction in the material and manufacturing costs of individual fuel cell components**
- **Integration into the vehicle, including hydrogen storage**
- **Development of the necessary hydrogen infrastructure**

As a first step, 50 hydrogen fuel stations should be built throughout Germany by 2015, 7 of which will be in NRW: the first of these has been in operation in Düsseldorf since 2012. The greatest challenge over the long term will be to provide sufficient renewably-generated electricity and hydrogen with sufficient infrastructure and at affordable cost. Information: www.energieagentur.nrw.de/kraftstoffe, www.energieregion.nrw.de, www.brennstoffzelle-nrw.de and www.cef.nrw.de
With hydropower to solar beer in Warburg

News from the Kuhlemühle hydro-electric power plant in Warburg: two turbines and – following conversion favourable to good water ecology – a new hydro-electric screw will be driven by water from the river Diemel at the historic hydroelectric site. The electricity generated by this environmentally-friendly method will be used by the Kohlschein OHG/Warburger breweries in their brewing operations.

North Rhine-Westphalia may not be a traditional hydroelectric power region like Bavaria and Baden-Württemberg, but it still has a long tradition of generating electricity from water. Above all, development potential is available from modernisation of existing hydroelectric power plants. Most plants still originate from the 1920s and 1930s, and these can be optimised in terms of the technology and water ecology.

The beers from the Kohlschein brewery are brewed using a minimum proportion of 65% renewable energy. In addition, for their Bio Helles beer, the brewery uses local organic barley, grown by farmers from Westphalia and North Hessen. The Warburger brewery was the first in North Germany to be licensed as a “Solar beer” brewery – in 2010.

Originally, two Francis turbines with stationary shafts were used at the Kuhlemühle hydroelectric power plant. The installed capacity amounts to 40 kW and 85 kW respectively, with an annual yield of around 850,000 kWh, of which around 395,000 kWh are consumed by the brewery. However, there was a serious problem: it was not possible for fish to migrate upwards through the plant. Against the background of the European Water Framework Directive, the weir location had to be modified. Help is now at hand in the form of a combination of a hydroelectric turbine screw and a fish ladder, which leads from the original bed of the Diemel to the headrace parallel to the screw. The maximum power output of the screw is 100 kW. The overall sum invested was around 760,000 euros, and the project was also subsidised with grants from the progres.nrw fund via the District Council of Arnsberg. The profits from the plant will serve for refinancing of the fish migration channel. All in all, the new plant will supply around 1.2 million kilowatt hours of electricity per year. This approximately corresponds to the annual requirement of 300 average households. As an additional benefit, around 780 tonnes less CO₂ will be released annually into the environment. Further information: email prott@energie-agentur.nrw.de

Biomass fuels airport

The biomass heating plant from Goldene Mühle Energie GmbH & Co. KG and MEC Münsterland Energy Contracting GmbH in Ladbergen was the 13th stop on the future energy tour of NRW Climate Protection Minister Johannes Remmel and a delegation from EnergyAgency.NRW. In Ladbergen, 34 energy-efficient combined heat and power plant modules with an output of 76 MW_4 and 10.6 MW_4 generate electrical power and heat in parallel based on solid and gaseous biomass. The woodgas-based technology from Burkhardt GmbH which is used in this process is – according to information from the plant operator – the market leader in Germany with regard to capacity and performance, and also availability and operational safety. The pellets used in the CHP modules are converted into their gaseous components in the absence of air at approx. 800 degrees Celsius (pyrolysis), and the resulting gas drives the motors. The modules generate around 55 million kWh of power and 70 million kWh of heat per year. As, with biomass as the energy source, energy is generated in the CHP modules with high efficiency and a carbon-neutral footprint, the climate-related aspects are particularly positive. Compared with a CHP plant based on fossil fuels with separate generation of power and heat, CO₂ emissions are lower by around 60,000 tonnes. Calculated arithmetically, 16,000 households can be supplied with power and 6,500 one-family homes can be heated with the energy that is generated.

“The conception of this future-orientated method of energy production further enhances the economic strength of the region and is therefore totally in line with the “Steinfurt District – self sufficient in energy by 2050” project,” says Prof. Berndt Kriete, Chief Executive Officer of MEC Münsterland Energy Contracting GmbH.

The electrical energy generated by Goldene Mühle Energie GmbH & Co. KG is fed into the public network of the Stadtwerke Lengerich municipal power plant. The heat that is generated in parallel is taken over in its entirety by the company Münsterland Energy Contracting GmbH and supplied in part to local energy-intensive industrial enterprises (process heat and process cooling for the Goldene Mühle and, in future, a pellet factory). District heating is also supplied to Münster-Onsabrück airport via a 6.3 kilometre pipeline. In cooperation with the Greven municipal power plant, the airport and further energy clients in the airport industrial estate are provided with heat, cooling and process energy based on long-term contracts.
Journalist tour
“Energy research in NRW”

North Rhine-Westphalia is on its way to becoming the leading region in the world for research into energy and climate protection. “We have made energy and sustainability into a central economic factor, and North Rhine-Westphalia has established itself as the leading research region for the energy turnaround in Germany. We need science and research in order to clarify how these complex technologies, that up to now have hardly been interconnected, can be used together in a way that is useful from the economic, ecological and social points of view. For this will be the decisive factor, if the energy turnaround, with all its many facets, is to succeed”. These were the words of Science Minister Svenja Schulze during her welcome address to the around 25 representatives from the media who took part in the journalist tour of EnergyAgency.NRW, together with the cluster EnergyResearch.NRW.

However, Minister Schulze emphasised that the fact that the top position occupied by the region when it comes to technology cannot be the only criterion when it comes to success within the energy policies of the future. The most important thing is to create a harmonious triad of ecological, industrial and social elements. This is also the reason why a mix of new and renewable energy sources and conventional fuels will be needed for a very long time to come. The first stop on the tour was the Laboratory and Service Center (LSC) of the Fraunhofer Institute for Solar Energy Systems in Gelsenkirchen (www.gelsenkirchen.ise.fraunhofer.de). Its Director, Dr.-Ing. Dietmar Borchert, made it clear that the energy turnaround will not be feasible without solar energy. The LSC engages in applied research and development in the area of photovoltaics and immediately turns research results into innovative production know-how for solar cells.

At the Gas- und Wärme-Institut e.V. (GWI; www.gwi-essen.de) in Essen, Prof. Dr.-Ing. habil. Klaus Görner, as the Scientific Director, and Dr.-Ing. Rolf Albus, Chairman of the Management Board, demonstrated how important energy storage, and particularly storage of electrical power, will be for the energy turnaround. The “Power to Gas” process could play an ever more important role here. Superfluous electricity from wind and solar sources is used to split water into hydrogen and oxygen. The hydrogen is then used as an energy source and fed into the natural gas network.

The final stop was the Institute of Energy Systems, Energy Efficiency and Energy Economics (ie3) (www.ie3.tu-dortmund.de) at the TU Dortmund University. The Deputy Director of the Institute, Prof. Dr.-Ing. Johanna Myrzik, explained how essential new power grids are for the energy turnaround. The strong growth in decentralised energy conversion plants based on sustainable energy sources sets new challenges for grid operation and when planning electrical power distribution networks. This means that the power grids of the future will not only distribute electrical energy, but will also have to perform further tasks such as communication, in order to enable coordination between energy demand and supply.

Information: www.wissenschaft.nrw.de and www.cef.nrw.de

Solar Campus Jülich: FH Aachen and FZ Jülich cooperate

FH Aachen University of Applied Sciences and Jülich Research Centre (FZ Jülich) want to face the rapidly growing importance of the energy turnaround together in future and have therefore established “Solar Campus Jülich” in collaboration with the German Aerospace Centre (DLR).

The cooperation agreement between FH Aachen University of Applied Sciences and Jülich Research Centre was officially signed in the presence of parliamentary under-secretary of state Thomas Rachel (Federal Ministry of Education and Research) in July 2013. “This agreement represents a new quality of interdisciplinary cooperation,” said Helmut Dockter. “It is a superb example of successful linking of university research and extra-university research and will in the long term make vital contributions to the success of the energy turnaround in Germany”. Information: www.cef.nrw.de
Infotour for PV & heat pumps

Taking photovoltaics and heat pumps into shopping centres. EnergyAgency. NRW recently brought information on both technologies into four large shopping centres in Essen, Düsseldorf, Mülheim a.d.R. and Oberhausen with its two campaigns “Heat pump marketplace NRW” and “Photovoltaics NRW”. This meant that interested shoppers were able to gather information on the benefits of combining photovoltaic installations with heat pumps.

The message of the partner organisations was clear: purchase of a photovoltaics installation is still worthwhile, despite the reduction in feed-in tariffs specified in the German Renewable Energies Act (EEG). This applies in particular when power is consumed by the owner of the installation himself. At current electricity prices of around 25 eurocents per kWh – and rising – it could make sense to convert the owner’s house for energy self-sufficiency. Heat pumps make use of renewable environmental heat and can reduce CO₂ emissions by up to 50% in the heating and cooling of buildings. If the required electrical energy is also mainly produced from the house photovoltaics installation, the building is heated with a 100%-neutral carbon footprint. Example: a new single-family home consumes 4,000 to 6,000 kWh/a of electricity, if it is heated and cooled by means of a heat pump. A photovoltaics installation 60 m² in size produces around 6,000 kWh/a of electricity, if it is favourably positioned. If an intelligent control system is used, which compares the current electricity production with current consumption, and utilises the electricity generated 100% for the heat pump or further electrical consumers, it is possible to provide the house with 30 to 50% of its total electricity requirement from its own PV-generated power. If an accumulator battery is also used, own supply can be raised to up to 80%. If too much electricity is produced, it can be fed into the public network. The corresponding feed-in tariff currently amounts to around 15 eurocents per kWh (for an installation up to 10 kWₚ capacity). If too little electricity is produced, the difference is taken from the public network.


NRW promotes bioeconomy

At the end of May, NRW Science Minister Svenja Schulze launched the Bioeconomy Science Center (BioSC) project, which is the only project in Europe directed towards the development of integrated approaches to the bioeconomy. “NRW has great potential when it comes to development of a knowledge-based bioeconomy and is one of the leading bioeconomy regions in Europe. The BioSC will play a leading role within bioeconomy research in NRW,” says Schulze. Jülich Research Centre, RWTH Aachen University and Bonn and Düsseldorf universities are contributing their individual scientific expertise to the so-called NRW BioSC Strategy Project, which will receive funding of altogether 58 million euros over a period of 10 years.
Young NRW researchers for energy turnaround

8th Fuel Cell Box Competition decided

Around 130 teams took part in the first phase of the 8th NRW competition for school pupils, “Fuel Cell Box 2013” of EnergyAgency.NRW. The competition is concerned with hydrogen and fuel cell technology. This school year it was based on the idea of storage and use of renewable energies via hydrogen in a municipality of NRW which wishes to be at the forefront of the energy turnaround. The municipality faces the challenge of utilising the available renewable energy in the most efficient and environmentally-friendly way possible: from efficient power generation from wind and solar energy, through transport and distribution of electrical energy and storage in the form of hydrogen and reconversion in fuel cells up to economical use by industry, in buildings and in the traffic sector.

The competition has been organised since 2004 by EnergyAgency.NRW and H-TEC EDUCATION GmbH, and is intended to bring the future technologies of hydrogen and fuel cells closer to pupils of grades 9 to 11.

During the award ceremony in the Gelsenkirchen Science Park, Peter Knitsch, parliamentary under-secretary of state in the NRW Climate Protection Ministry, presented a cup to each of the three best teams, which came from Gladbeck, Cologne and Duisburg. Knitsch: “The pupils of today are the urgently needed engineers and specialists of tomorrow, who will be responsible for execution and further implementation of the energy turnaround. We can only ensure the competitiveness and innovative strength of our region for the next decades if we encourage our young people to enter the worlds of natural and engineering sciences. Targeted action now will provide qualified employees and innovative and crisis-proof employment for the energy, industrial and climate protection region of North Rhine-Westphalia.” And the results of the competitions that have taken place so far are something to be proud of: more than 1,280 teams with around 3,500 pupils have participated in the eight competitions held up to now. “The proportion of girls taking part has only been just under 20%, but teams of girls have actually won the competition twice,” observed Dr. Frank-Michael Baumann, Managing Director of EnergyAgency.NRW.

Internet: www.facebook.de/WettbewerbFuelCellBox www.fuelcellbox-nrw.de

Fuel Cell Box Competition 2013: The three winning teams

1st place
Ingeborg-Drewitz-Gesamtschule (comprehensive school), Gladbeck, with Yaren Yücelmis, Zelîha Tasci and teacher Guntram Seippel

2nd place
Gymnasium Köln-Pesch (grammar school), Köln, with Lucien Jellinghaus, Max Ruland, Alexandra Saj and teacher Heinz Sandmann

3rd place
Albert-Einstein-Gymnasium (grammar school), Duisburg, with Fynn Pauwels, Fabian Heidt, Jeremiah Bohn and teacher Marc Brode
10 YEARS OF WOOD PELLETS IN NRW

Anniversary: Ten years ago, Energy-Agenty.NRW launched the region-wide campaign “Wood Pellets Campaign” on behalf of the NRW Climate Protection Ministry. Since 2003, the aim of the campaign has been to provide information on the use of wood pellets for heating, to increase trust in this young market and to raise the market share of pellet-fuelled heating systems in NRW. Since the start of the campaign, the number of wood pellet heating installations in NRW has multiplied many times over. After the traditional wood heating regions of Bavaria and Baden-Württemberg, NRW in now in third place in Germany with around 28,000 installations. This achievement has been possible, among other things, because of the networking of the players involved.

Because the new fuel met with a great deal of suspicion in the first years, it was above all the basic principles had to be explained:

- Wood pellets are made of residual materials from the wood-processing industry
- 2 kg of wood pellets provide the equivalent energy content of one litre of heating oil
- Pellets can be used in special stoves and furnaces and in fully-automatic central heating systems.

Today a broad base within the population understands the principles of pellet technology and the questions that are now asked have become more detailed.

- Which form of certification guarantees the highest fuel quality?
- How does a pellet store have to be ventilated?
- Satisfied users
- It is not only the young pellet industry that is happy with the alternative heating system. Many users also want to pass on their experiences. During “Wood Pellet Week”, from 28 September to 6 October, private users of wood pellets as boiler fuel will open their doors to interested members of the public. These users include Dr. Helmuth Küffner, who has himself been heating with wood pellets for 10 years. Küffner is the Spokesman of the Berchumer Initiative für solare Energien e.V. (BINSE). He knows his subject from his own experience and has been able to persuade 18 other private users and also the community centre in his area of the town to put their faith in renewable energies. “There is a lot of wood here in our region, and modern technology makes it possible to feed heating systems automatically. This means that the advantages of carbon-neutral wood combustion can be combined with the convenience of a normal central heating system, and it was what persuaded me personally to change over to pellets. We want to make ourselves more independent of finite fossil fuel resources.” Wood pellets are ideally suitable for generating heat, from the small domestic stove up to central heating in schools or swimming pools. But that is not all: biomass is basically an all-rounder when it comes to energy: heat, electrical power and fuels can be won from a wide variety of raw materials. The conference “Bioenergy in NRW” held by EnergyAgency.NRW offers signposts for the efficient use of biomass. On 18 September 2013, different players within the sector will meet in Düsseldorf to discuss how biomass can be used most efficiently. Further information on “Wood Pellet Week” from 28.9. to 6.10. can be found online at www.aktion-holz pellets.de. Information on the “Bioenergy in NRW” conference can be found at www.biomasse.nrw.de

Committed sector

Holger Haupt, a tradesman from Gelsenkirchen and a pioneer on the pellet market, installed one of the first wood pellet heating systems in NRW. In those days, he tried out the technology for suitability himself in his own home – before he offered it to customers. “At that time, pellets were not manufactured in NRW, but still came from Austria – where this modern heating technology was established at an earlier date and then spread slowly northwards.” However, those early days have long since passed, and the first pellet factory was put into operation as early as 2003 in the Sauerland region. A handful of factories now produce pellets in NRW, ensuring supply to the whole region. A large number of heating oil suppliers are now also selling pellets as part of their range. Heiner Ahlert, whose father purchased one of the first heating oil tankers in the Münsterland, is one example, having now expanded the business to include the “renewable side,” and eight modern pellet trucks are now working to supply customers. In contrast, Bernd Kleeschulte comes from the agricultural trading sector. His firm goes one step further and uses vegetable oil produced in-house to fuel the pellet trucks. This means that the pellets are delivered carbon-free.
Wind energy innovations from nature

Many manufacturers of wind turbines know the problem only too well: sharp bends and low bridges are making it more and more difficult to transport ever larger wind turbine towers. For this reason, many tower manufacturers have decided to develop alternatives. Hybrid towers are already a particular favourite, but one company is daring to go one step further.

The company TimberTower GmbH from Hanover develops wind turbine towers made of wood. This means that they are meeting two basic challenges within the sector: more difficult logistics caused by increasing hub heights and dependence on strongly fluctuating steel prices. An additional requirement is, if possible, to improve the carbon footprint at the same time.

Around 1,000 firs with a height of 30 m from sustainably managed forests are needed to construct a 100 metre-high timber tower. After being sawn to the correct size, the solid timber planks are laid crossways over one another, glued and made into sheets 15 metres long by maximum 2.72 metres wide. The sheets are 30 cm in depth, which makes sure that they are strong enough. Ten standard-size trucks are needed to transport the sheets to the assembly site, where the elements are made into a closed hollow body with a polygonal cross-section. The foundations can then, depending on the nature of the ground, be built as a surface or deep construction. The centre of the wooden tower consists of a steel substructure extending over the whole height, which is connected to the foundations and carries the lighting and ladder systems, electrical connections and working platforms at various levels. During assembly, the timber sheets are simply leaned against this structure and glued to perforated steel plates inserted into the foundations. This means that they carry the entire weight of the gondola. From the visual point of view, the tower hardly looks any different from a conventional steel or concrete version. It measures 7 x 7 metres at the foot, 2.40 x 2.40 metres at the top and weighs approximately 192 tonnes. The gondola and the wooden tower are connected by means of an adaptor element. Finally, the tower is sealed with an outer film, which guarantees that the surface is protected and, according to the manufacturer, should last for at least 25 years.

More information on the subject of innovative tower concepts can be found at the Wind Power Network NRW of EnergyAgency.NRW at the annual conference “Wind Updates.NRW 2013” due to take place on 25.09.2013 in the Science Park Gelsenkirchen. Further themes to be covered in the conference will be current political developments in NRW and innovations in gearbox technology. Please register at www.windkraft.nrw.de.

First wind power electrolysis plant in NRW

The “red button” has been pressed – the first wind power electrolysis plant in NRW has now been officially opened. This innovative installation in the “H2Herten User Centre”, Germany’s first municipal user and technology centre for hydrogen and fuel cell technology at the site of the former Ewald coal mine, is not only capable of producing electricity. It can also transform renewable energy into hydrogen and store it in this form – a step forward which will make the handling of renewable energies much simpler in future. The plant will generate around 250 megawatt hours of electricity and around 6,500 kilograms of hydrogen per year for use by the centre. The basis for the supply of energy from renewable sources is the neighbouring wind turbine at Hoppenbruch. The NRW Economics Ministry supported the installation using funding from the regional funding programme (RWP) of the NRW Bank amounting to 2.7 million euros, from a total investment of three million euros.

Pressing the famous red button to start up the plant (from left): Thomas Wessel, Member of the Management Board of Evonik Industries AG, Climate Protection Minister Johannes Remmel, Dr. Uli Paetzelt, Mayor of Herten, Cay Süderkrübs, Head of the District Authority of Recklinghausen, Prof. Dr. Bernd Kriegesmann, President of the Westphalian University of Applied Sciences, Gelsenkirchen

As NRW Climate Protection Minister Johannes Remmel says: “Without further development of storage technology, the fast energy turnaround that we want will not succeed. The concept of wind power electrolysis shows us what is already possible in the area of hydrogen storage and use. Use of hydrogen as a fuel is also a promising means of integrating renewable energies into the transport sector and moving towards the climate targets set by the State Government.” Information: www.wasserstoffstadt-herten.de and www.brennstoffzelle-nrw.de

Pressing the famous red button to start up the plant

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Wind energy situation: 5th Wind Event in Düsseldorf

This time, directly on the Rhine: in its fifth year, the wind industry issued an invitation to the Congress Centre Düsseldorf at Messe Düsseldorf, where the Wind Energy Industry Day NRW took place. The event was again organised by the Lorenz Kommunikation agency in cooperation with EnergyAgency.NRW. More than 400 experts from the wind sector and local councils met in order to discuss technical, business and society-related aspects of the wind industry, and to focus on current trends and perspectives. Altogether 60 exhibitors presented their products and services. In addition, EnergyDialogue.NRW, organised by EnergyAgency.NRW, had a stand and was independently offering representatives of local councils advice for the first time at an event of this kind.

The welcoming address for the two-day event was given by the North Rhine-Westphalia Climate Protection Minister Johannes Remmel, who also assumed the patronage of the Industry Day. “North Rhine-Westphalia is the main centre for machinery and plant construction and therefore an essential location for development of wind energy. Our products from the renewable energy sector can be seen as exported climate protection, made in NRW, which secures existing sustainable employment in our region and creates new employment opportunities,” explained the Minister.

A lot of power and wind in NRW
Dr. Frank-Michael Baumann, Managing Director of EnergyAgency.NRW and the cluster EnergyRegion.NRW, was also optimistic: “North Rhine-Westphalia is, despite its high population density, a very good location for wind energy. Even if the region still only holds fifth place compared with the other German States, the State Government – with the active support of the Wind Power Network NRW in EnergyAgency.NRW – continues to work on bringing NRW into the “Top Three” in Germany for wind energy. When it comes to wind power supply, North Rhine-Westphalia is already today one of the leading regions in the world, for both the onshore and offshore markets.” In the breaks between the numerous expert presentations, the participants had the opportunity to gather information at exhibitors’ stands. The model of a wind turbine with a wooden tower was a particular attraction. The company TimberTower from Hanover has developed a tower design which means that wood can be used in the construction of a wind turbine, and they consider that it promises to provide both financial and environmental benefits. A prototype of a turbine of this type has stood at the A2 near Hanover since December 2012 and has successfully started operation. Detailed descriptions of this new development can be found on the company website at www.timbertower.de.

The 6th Wind Energy Industry Day NRW has been planned for 3 and 4 June 2014, again to take place at Messe Düsseldorf. Information: www.nrw-windenergie.de

Further information: Stephanus Lintker, email lintker@energieagentur.nrw.de, Tel. +49 (0)211/86642-12, www.windkraft.nrw.de

NRW at WindEnergy

Joint Regional Stand: Exhibitors welcome

From 23 to 26 September 2014, Hamburg will be the gateway to the world of wind energy. The new global specialist trade fair WindEnergy Hamburg at the trade fair site of Hamburg Messe, with the entire value creation chain of the onshore and offshore wind industry, will offer a comprehensive overview of the current status and future of the sector. Together with the clusters EnergyRegion.NRW and Production.NRW, the NRW Regional Government will organise a joint regional stand on the subject of “Innovations from NRW: Impetus for the Energy Turnaround”. Companies and institutions which are interested in taking part in the joint exhibition stand are requested to make contact by 27 September by email, using the address hommen@energieagentur.nrw.de.

As from 2014, the wind exhibition locations will alternate between Husum and Hamburg on a yearly basis.
South Africa and Ghana are making considerable efforts to diversify their energy portfolios and increase the proportion of renewables. In South Africa, the third of five tendering rounds for renewable energy projects has already concluded. In total, projects with a total capacity of 3,725 MW are on offer. The bidding system that is used tends to favour large projects. In Ghana too, the energy requirement is continuously rising and here again the government is putting its faith in renewable energies. In contrast with South Africa, feed-in tariffs are to be introduced in Ghana, which also makes smaller installations more attractive. The basis for this has already been created with the passing of the Renewable Energy Act 2011. The target is to achieve a 10% share of renewables by 2020. Both countries are at the forefront when it comes to promotion of renewable energies in Africa.

North Rhine-Westphalia has maintained partnerships with provinces in both countries for several years now. Ghana and South Africa were among the Top 3 out of 49 export markets for German companies in Sub-Saharan Africa. Against the background of the good political relations and the positive developments in the energy sector, EnergyAgency.NRW together with NRW.International and International Chamber of Commerce for the Central Lower Rhine is organising a business promotion tour to Ghana and South Africa. The businesses taking part will visit the WACEE Trade Fair in the Ghanaian capital Accra, which was first held in 2012 and which underlines the increasing significance of environmental and energy technologies in Ghana. On 10 September, the organisers of the trip are offering an informative event in cooperation with NRW.Bank on the subject of “Market opportunities and financing possibilities for energy and environment projects in Ghana and South Africa” in Düsseldorf. Further information on the event can also be found on our homepage at www.energieagentur.nrw.de (International).
Ruhr: soon largest district heating network in EU?

The Ruhr Region has the potential to become the largest district heating network in Europe, as shown by the study “Entwicklungen von Fernwärmeperspektiven im Ruhrgebiet bis 2050”, which has now been published by BET, office for the energy industry and technical planning. The study was ordered by the Climate Protection Ministry in North Rhine-Westphalia, in order to find out if the target of the NRW regional government to raise the cogeneration-supported share in power generation from its current 13% to over 25% by 2020 with the inclusion of district heating is attainable.

Linking district heating “islands”

Through active development of the individual district heating islands in the western Ruhr Region (from Duisburg to Herne) and of the bordering Lower Rhine region (Moers, Dinslaken and Voerde) into one district heating network, even more residents and industries in the area could profit from the use of highly-efficient power and heat cogeneration, in other words, they could be directly connected to the district heating network. Through the linking of the existing heating islands into a so-called “Western Network”, up to three million tonnes of the greenhouse gas CO2 could be saved by the year 2050 through joint use of cogeneration plants and other infeeds. Through integration of further heat and waste heat sources – for example power plants, waste-fuelled heating plants and above all industrial and trading operations – the primary energy used can be used still more efficiently than with separate generation of power and heat.

The study drawn up by the BET demonstrates that creation of the “Western Network” can achieve similarly favourable CO2 avoidance costs as is the case when building plants that are supported with funds according to the Renewable Energies Act. It is recommended that a network company be established which will take over the building and operation of the new network in the Ruhr Region. The owners of this company should be the district heating suppliers of the Ruhr Region, in order to ensure “barrier-free” transportation of heat.

The NRW regional government also wants to actively support development of cogeneration in the district heating sector by means of its stimulus programme. The potentials that are opening up are immense, and now it is up to the market players to grasp them and invest in the future.


Solar power plant from Cologne for the world

A solar-thermal trial power plant from the Cologne company protarget AG has just gone into test operation in Bad Aibling. The plant was built in cooperation with the German Aerospace Centre and with the support of the climate protection support organisation KlimaKreis Köln. It works with concentrating collectors, which do not directly generate electricity, but heat thermal oil up to 400 degrees and then generate steam for a turbine. This solar power plant from Cologne with capacity of 5 MW could supply around 4,000 households with energy – and save up to 10,000 tonnes of CO2 per year. The demonstration plant covers an area of 560 m², and is composed of standardised and industrially-manufactured components. This reduces the investment costs by 30% per megawatt of installed capacity in comparison with traditional solar power plants. Following a successful test run of the reference plant, it is planned to install further power plants in sunny regions of the world.
Slow speed ahead!

Energy-saving travel does work: one million kilometres by car

The energy turnaround means new forms of mobility – for example with electric vehicles. But a contribution can also be made to climate protection by using traditional means. Peter Kirchhoff from Sprockhövel has been saving fuel with his small car since the year 2000: his fuel consumption has amounted to only 3.7 litres per 100 kilometres. And because that is not only good for his wallet, but also saves wear and tear on the car itself, he has now passed the one million kilometre mark with his Skoda Fabia.

And this is also a kind of sustainability: “From the point of view of ecology it makes more sense to drive the car as long and in as fuel-saving a way as possible, instead of buying a new one every three or four years,” explains Lothar Schneider, Managing Director of EnergyAgency.NRW. “Peter Kirchhoff has shown beyond doubt: you can drive a car and use less – if you really want to.”

Peter Kirchhoff follows a consistent plan: whether he is on the way from Sprockhövel to his office in Hamm or going on holiday – he does not drive faster than 90 or 95 km/h. And above all, he drives smoothly. No acceleration, no overtaking. “If I did that, fuel consumption would go up instantly”, says the 47-year-old. And it is not only petrol that is saved. A set of winter tyres also lasts for 120,000 kilometres. The business management expert keeps a precise tally: 877 full tanks and 36,700 litres of diesel – in 13 years that amounts to 39,800 euros. A normal driving style would have cost him 15,000 euros more – and the environment would have to deal with around 30 tonnes more CO₂.

If everyone in Germany were to drive like Peter Kirchhoff, the savings potential would be enormous. The 40 million cars in Germany travel on average 16,000 kilometres a year. Petrol consumption could be reduced by half a litre per 100 kilometres. “That would be an annual saving of around 3.2 billion litres of petrol and diesel, which would not be consumed by cars. And that again would be around 8 million tonnes of CO₂ which would not pass into the environment,” demonstrates Lothar Schneider in his calculation. At present, passenger cars in Germany blow around 100 million tonnes of CO₂ into the air each year. EnergyAgency.NRW has named Peter Kirchhoff’s project as “Project of the Month August 2013”. Information: www.energieagentur.nrw.de (Project of the month)
For around 12 years, further education institutions, energy supply companies, associations, clubs, universities, municipalities and companies have been able to download seminars for training and further training of specialists and end consumers free of charge from the prizewinning “Wissensportal Energie” knowledge portal on the Internet. Now, EnergyAgency.NRW is offering the next stage of web-based further training with ENFOLIO. The new concept: from user to co-contributor.

Knowledge and training in times of Web 2.0
More efficient use of energy and the use of renewable energies are some of the most important challenges of our time. Schools, adult education and vocational training, and also information and publicity events held by institutions and companies contribute to dispersal of the necessary knowledge. Against the background of this task within society, efficient cooperation when communicating knowledge is becoming ever more important.

The Internet plays a key role in this context. In the past, only a few producers created content and information on the web for a large number of users. Today, the users are themselves becoming active (co-)contributors. This philosophy of Web 2.0 has been successfully implemented, for example, by the internet encyclopaedia Wikipedia.

EnergyAgency.NRW has now adopted this concept for itself. With ENFOLIO, teachers, presenters, trainers and all those working in the energy and climate protection sectors can upload, edit and newly create content onto a common portal. They can also update and modify existing content and develop it further in dialogue with other users. In this way, a growing pool of extremely current joint presentations, slides, images and multimedia materials come into being which can be used for lectures, presentations and sales meetings. EnergyAgency.NRW makes sure that the quality of what is on offer comes up to its usual reliable and highly-respected standard.

“Everyman licences” make distribution easier
In order that the results are accessible to as large a circle of target groups and clients as possible, all media content can be used free of charge or is subject to so-called “Everyman licenses” of the non-profit organisation Creative Commons (CC). These licences mean that the content can be used by every user for presentations or as information material free of copyright concerns. The precise freedoms granted depend on the individual CC licence. For example, the originator of an image can specify during uploading if he wishes to insist on being named in connection with the further distribution of his work, and if he is prepared to allow further processing or modification of the image. Material content in text form can even be changed and passed on without any restrictions on use.

Future technologies for efficient work
ENFOLIO does not only stand for simple creation of high-quality presentations, but also for a new generation of internet applications which offer the user the functions and convenience of desktop applications using the web browser. In addition, the latest web technologies are used, which mean that is possible to work from anywhere using an Internet connection, to access the material and also to present online. Naturally, users can adapt their user interface individually in order to achieve optimum working processes. Search functions and a comprehensive set of keywords for the available materials lead to rapid results. All the images, slides and presentations contained in the portal can be evaluated, discussed with other experts and uploaded to the user’s own computer in various different formats.

EnergyAgency.NRW will also continue to develop ENFOLIO in future based on the experiences of its users, in order to provide optimum support for all those involved. Information: www.enfolio.de
Rheinberg now has almost 300 “Energysavers NRW”

With 56 new Energysavers NRW insignia, Rheinberg has impressively defended its title as unofficial energy saver capital of the region. Since 2006, the title “Energysaver NRW” has been awarded almost 300 times in Rheinberg for old buildings that have been upgraded from the energy-saving point of view and also for new buildings and use of renewable energies. The efficiency of residential buildings is a vital constituent of climate protection policy. Almost two thirds of the entire energy in private homes is used for room heating. The key to low home running costs often lies in replacement of old windows and insulation of facades, roofs, upper storey and cellar ceilings. If suitable insulation is in place, the need for heating energy falls – and the new central heating system can be one size smaller.

“It is precisely the energy-related upgrading of old buildings and the use of renewables that offer considerable energy saving and climate protection potentials which can be utilised in a cost-effective way. Savings of up to 75% are feasible. Recognition as “Energysaver NRW” is a visible sign of the exemplary nature of the buildings in question. And as can be seen in Rheinberg, the recognised buildings inspire many others to follow,” says parliamentary under-secretary of state Peter Knitsch (Ministry of Innovation, Science, Research and Technology NRW), during the award ceremony in Rheinberg.

More than 4,500 awards were presented throughout the region during this initiative, organised by EnergyAgency.NRW. All house owners can apply for the badges from the District Council of Arnsberg in the categories passive house, three-litre house, upgraded house, photovoltaics, solar collectors, heat pump, biomass and power and heat cogeneration. Application forms and information are available from www.energiesparer.nrw.de.

“CHP model community” contest: 21 concepts selected

The NRW State Government wants to drive forward the accelerated energy turnaround in North Rhine-Westphalia through the development of combined heat and power generation (CHP). For this reason, NRW Climate Protection Minister Johannes Remmel announced the “CHP model community” initiative, which is intended to fund municipal cogeneration projects with a total of 25 million euros. 51 municipalities submitted a total of 48 project proposals, and from these a jury selected 21 promising concepts.

Aachen, Alpen, Bad Laasphe, Bergheim, Bielefeld, Bottrop, Brakel, Düsseldorf, Eschweiler, Geldern, Herten, Hamminkeln, Isselroth, Krefeld, Much, Münster, Oberhausen, Olten, Soerbeck and the joint concepts of Solingen, Remscheid and Wuppertal, as well as Ostbevern and Telgte were asked to undertake detailed planning. Funding of up to 90% is granted for development of a detailed concept. On this basis, the three best cogeneration concepts which can act as models should be funded. In addition, a concept with a particularly innovative character can be awarded the special “Cogeneration Innovation” award. The municipalities had eight months in order to develop their detailed concepts.

“With the ‘CHP Model Commune’ competition, we want to support municipalities with building and further developing the share of cogeneration within their electricity production,” said Remmel. In particular, projects which can act as models should be funded and should act as a “blueprint” for other municipalities. Remmel: “Development of district heating is useful above all in large cities. In contrast, in smaller municipalities individual cogeneration units are more useful, for example on farms or in plant nurseries, where in addition to their barns and greenhouses, they can also supply heat to their neighbours.

All the submissions show the wide range of applications for combined heat and power generation – for example over a whole municipal area, in individual parts of towns or cities or in even smaller premises. They offer individual measures within an integrated bundle. EnergyAgency.NRW and the Jülich project organiser ENT gave advice to the municipalities before the competition took place. The detailed concepts and later selection of the model municipalities will be selected by a jury. Further information is available from: www.fz-juelich.de/etn (KWK Modellkommune) and www.energieagentur.nrw.de
Efficient use of daylight

If you type the keywords “energy efficiency” and “climate protection” into the best-known search engine in the world, you will receive a total of 10 million results. Interest in these subjects is obviously growing as the energy turnaround progresses and energy prices rise. The latter development not only affects private households, but also manufacturing industry. Therefore the theme of daylight illumination is of interest to industrial architects, as it means that interior spaces can be lit naturally, and a reduced need for artificial lighting offers the prospects of financial savings.

It should be noted that the amount of daylight that is available varies greatly depending on the season of the year and time of day. Because of this, lighting solutions must be found which maximise the amount of daylight available in winter, when there is usually no clear sky, and which in summer guarantee protection against heat and dazzle. So-called prismatic daylight systems are one way of using daylight to its best advantage. The aim is to achieve even and improved lighting at workplaces or in rooms and at the same time to avoid dazzle. Prismatic lighting systems are based on a design that draws upon the principle of light refraction. This means that the daylight that falls directly onto the prism system changes direction.

The latest generation of prismatic light domes comes from the USA. As the light domes transmit more light into a room than traditional windows in the roof, the number of windows that are needed for optimum illumination of the room is reduced. This means that the free roof surface is bigger, which basically leaves more room for photovoltaic installations or greening of the roof. The installations have the further advantage that they can be included into the firefighting system as heat and smoke extractors. In addition, the amount of heat given off by prismatic light domes is only one third of that emitted by artificial light sources, which is particularly attractive in the summer months, as electricity consumption of daylight creates a high level of comfort and a good ambience for staff and customers. Fewer days lost to illness, improved sales and the ability to attract qualified specialist staff are positive aspects for all those involved.

The Lledó Group, with its German sales headquarters in Brüggen, describes initial European projects, such as for example the Sainsbury’s Supermarket in Great Britain, which received the award for the best retail building in 2012 from ‘Sustain Magazine’. One of the first projects in Germany is the installation of prismatic light domes in a supermarket in South Germany with an area of 8,000 square metres. Lledó was able to demonstrate to the supermarket operator that energy costs amounting to 19,000 euros can be saved.

In addition to the energy efficiency of daylight systems, the health-related and economic aspects are also considered as parts of the whole. For daylight has a positive effect on performance and concentration and also on mental and psychological wellbeing. In addition, clients stay longer in a well-lit environment as they feel more comfortable, and this can lead to more sales.

As Dipl.-Ing. Ulrich Goedecke, Energy Advisor at Energy-Agency.NRW, says: “We can light our rooms artificially and waste the natural light of the sun. Or we can think again and use our renewable natural resources in a sensible way and reduce consumption of fossil energy sources. Use of daylight creates a high level of comfort and a good ambience for staff and customers. Fewer days lost to illness, improved sales and the ability to attract qualified specialist staff are positive aspects for all those involved.”

Contact: Ulrich Goedecke, Tel.: +49 (0)202/24552-16, email goedecke@energieagentur.nrw.de
Köln-Porz climate estate heats with ice

The climate protection estate in Köln-Porz, which was completed in June, combines obstacle-free living for older residents with an innovative energy concept. 12 flats have been created in the new building of the VIVAWEST with good insulation corresponding to the 3-litre standard.

The central 1,200 m³ water tank is at the heart of the energy concept, in association with solar absorbers and heat pumps. The energy won in the summer from solar installations is in part used for hot water – and any superfluous solar energy and energy from the waste air are stored underground for the coming heating period. In the heating period, the heat pumps draw so much energy in a targeted way from the underground storage system by the spring that the storage medium turns to ice. The energy that is released during the changeover of phase from water to ice can therefore also be used. In the summer, this ice is used directly in order to cool the apartments and the storage system is again regenerated.

In addition to the particularly climate-friendly installations in the buildings, the individual residential units are designed to be as obstacle-free as possible and therefore fulfill the current and future needs of ageing residents. For example, there is direct access from the pleasant underground garage to the stairwells and the lifts. For wheelchair users, all access doors are provided with motorised openers. Comprehensive healthcare is also available from the nearby medical competence centre, with attached therapy, preventive medicine and care facilities. The attractive design of the buildings and generous areas of green space and the links to the nearby banks of the Rhine are also intended to ensure attractive living conditions for families, thus creating a balanced age structure in the new estate.

With the State Project "100 Climate Protection Estates in North Rhine-Westphalia", it is intended to consistently reduce the heat-related CO₂ emissions in residential estates (new buildings and upgrading of existing properties). EnergyAgency.NRW is responsible for coordination of the project.

Further information: www.100-klimaschutzsiedlungen.de

Coal to diamonds, biological waste to electricity

The Ennepe-Ruhr-Kreis is now generating electrical power from biological waste on a grand scale. NRW Climate Protection Minister Johannes Remmel himself travelled to Witten for the opening of the new biogas plant. “The biogas plant in Witten is exemplary when it comes to climate protection, and I hope there will be many who emulate it in other regions, towns and cities,” said the minister.

The plant, which was built and is being operated by the specialist waste disposal company AHE on behalf of Ennepetal District Council based on an investment of 15 million euros, transforms around 25,000 tonnes of biological waste into 4.5 million kilowatt hours of electricity each year. According to District Chief Executive Dr. Arnim Brux, the plant supplies around 2,000 households each year and saves around 4,000 tonnes of carbon dioxide. In order to ensure that there is no odour pollution, supply of the waste, along with rotting down, treatment and further processing, are carried out in closed buildings, and modern filter and exhaust air installations prevent the air from escaping to the outside in unfiltered form. Klaus Erlenbach, Chief Executive Officer of AHE, praised the commitment of local residents to waste separation. “Our district is far in the lead with 75 kilograms per resident and year. However, 30% of the waste material in the residual waste bins after waste separation is still biological. This is where every individual resident can bring about a change.” Information: www.enkreis.de
Dormagen: 800 flats energy-upgraded

The Gemeinnützige Baugenossenschaft Dormagen eG housing association in collaboration with gc Wärmedienste GmbH (german contract) has completely upgraded the obsolete central heating unit of its property in Buchenstraße in Dormagen. The 44 year old pumps, valves and pipelines and the heating boiler, which was a good 30 years old, have been replaced by modern technology. The local central heating unit supplies 43 apartment blocks in the suburb of Horrem.

Around 800 apartments profit from the new heating system. After upgrading the core of the system, german contract installed a natural-gas fuelled system with a condensing and a low-temperature boiler. In addition, the entire hydraulic system – consisting of shut-off valves and pipelines – has been renewed and the old pumps have been replaced by modern high-efficiency models. The results are positive – gas consumption is lower than before. The energy now reaches the substations of the individual apartment blocks via the existing local heating network. These have also been renewed and provided with regulation technology, so that they can function autonomously in controlling the heat. German contract ensures that the system is working efficiently by means of a remote monitoring centre incorporating efficiency control. The incorporated failure warning system ensures further gas and electricity savings.

The contractor will provide its customers in Dormagen with the latest technology over a term of 15 years. The full service package also includes regular servicing and maintenance and a 24-hour emergency service with efficient control via remote monitoring. At the same time, constant adjustment and optimisation of the energy consumption achieve enormous energy savings and improved annual utilisation rates. The total gross investment amounts to around 800,000 euros. Including all the full-service performance of the Contractor, monthly heating costs are around 0.83 euros per square metre of living space. For comparison, the German average is one euro per square metre. Further information: email: abel@energieagentur.nrw.de

CHP plants – small, but effective

Cogeneration (KWK) – the term alone is reminiscent of large engine blocks. However, cogeneration can also be small and refined: the Hübner family from Stadtlohn replaced their almost 50 year old oil-fired heating system with a micro-cogeneration plant as early as two years ago.

“Cogeneration does not make much sense in new buildings, because the installations do not operate for sufficient hours and then do not work economically. But they are always worth considering when upgrading old buildings,” explains Dipl.-Ing. Peter Lückerath from EnergyAgency.NRW. For the Hübners, the comparatively high electricity requirement of around 9,000 kWh was added to the need to heat the 220 square metres of living space. There are also pumps for watering the garden and further consumers with relatively high consumption,” says Lückerath. When upgrading the heating system, an internal combustion engine of the type ecoPower 1.0 from Vaillant was selected. This engine has a capacity of 1 kW and thermal output of 2.5 kW. After two years of operation, the initial accounts are positive. The engine runs for 6,000 hours a year, and covers two thirds of the electricity and one third of the heating requirement. The remaining heating requirement is covered by a conventional condensing boiler. The verdict of Gerd Hübner is quite clear: “We would certainly choose an installation of this kind again.”

Cogeneration (CHP) plants are considered to be an important bridge technology in connection with the energy turnaround – also because of their high efficiency rating. The State Government has set itself the target of increasing the proportion of cogeneration in energy supply with a cogeneration stimulus programme. By 2020, the proportion of electricity produced by means of cogeneration should be increased to at least 25%. Equal use of electricity and heat means the overall utilisation rating of energy generation plants can be increased to 80 to 90%.

Further information: email lueckerath@energieagentur.nrw.de, www.energieagentur.nrw.de/kwk
School wind energy competition

For the first time, EnergyAgency.NRW is organising a competition for all schools in NRW on the subject of wind energy. The competition, ("Schulen machen Wind") is intended to raise the awareness of teachers and pupils with regard to "renewable energies" in times of climate change and scarce resources, and in particular to bring the subject of "wind energy" into the spotlight with the help of small-scale wind turbines. The first schools were taking part shortly after publication.

Small-scale wind turbines have one great advantage: the projects can be implemented fast and simply. Up to now, only a very few schools in NRW have engaged with the subject of "wind energy". And this is precisely where the competition is intended to help: innovative school projects on the subject are being sought. Projects such as example project weeks, new wind turbine models, pupils' films on the subject of wind power, wind energy documentation etc. – projects which demonstrate a school's engagement with the subject. And there is no limit to creativity.

All schools from NRW can take part. The closing date for applications is 1.10.2013, and the order in which applications are received is decisive. The first 20 applications will each receive project funding of 500 euros. The prizes will be four small-scale wind turbines (one each per type of school) for the best school activities. In May 2014 the four best submissions will be awarded the prizes by NRW Climate Protection Minister Johannes Remmel, who is taking over the patronage for the competition. Schools will also receive support by means of information on the new Internet page and by means of a further training course for teachers, to take place on 24.9.2013 in Wuppertal. Information: www.schulen-machen-wind.de.

Active on the ground: Climate networkers

All District Councils have begun to oversee and support the energy turnaround in their particular areas. Reason enough for the NRW Climate Ministry to place five climate networkers at their disposal, starting from now, which are intended to provide active help on the ground in the implementation of the North Rhine-Westphalia climate protection plan. By working at the locations of the District Councils, they should ensure that municipalities, administrations, companies and other actors in the climate protection sector are networked in a useful way. "All climate networkers have been welcomed with open arms by the District Councils, as they can act as an interface between "their area" and the State level, can initiate further climate protection projects and also communicate them throughout the region," says Gerd Marx, responsible for the subject at EnergyAgency.NRW. The climate networkers can tailor the know-how of EnergyAgency.NRW specifically to individual districts. Examples of this are helping with applications for the European Energy Award and the ECORegion programme for achievement of neutral carbon footprints or support with the initiative for "climate-neutral regional administration and subsidiary official bodies". The five networkers can also follow their own individual preferences in the organisation of events and initiation of projects.

Nils Krüger (4th from left) has started work in the area around Detmold. Krüger, who initially studied geography, worked during his studies in Osnabrück and Vienna among other things on projects for the automotive and music industry clusters and on network and cluster theories and climate change. Initial contacts have already been made with the International Chamber of Commerce for the East Westphalia and Lippe areas, Bielefeld University of Applied Sciences and the energy stimulus programme OWL. Klaus Linde (3rd from left), as a European solar engineer, contributes known-how in the area of renewable energies. He is working in the administrative region of Cologne. Challenges result from the many different types of activities that are relevant in his area: from climate protection in the Eifel nature reserve to the changes in the industrial and chemical region in the Rhineland. He is also directly involved in the development of Cologne into a "Smart City". Rüdiger Brechler (5th from the left) looks after the district around Münster. This is a change of occupation for him within EnergyAgency.NRW, as in the past he worked in the areas of contracting, district heating and lighting. The District Council developed action guidelines in 2012 with regard to CO₂ reduction, which have created a useful basis for his work. The first focus will be on developing a neutral carbon footprint. Starting from now, Patrick Abel (1st from left) will be working in Düsseldorf, in the most highly-populated area. As a trained wholesale and retail manager and a sociology graduate, he contributes know-how on the linking of the various actors and markets in the sector. Abel has already also gathered experience in marketing in the USA and is planning first projects for various companies. Marcus Müller (2nd from left) has already been working in the District Council of Arnsberg since 2012. Müller, who studied geography, can look back over many years of experience in local government and is already known as someone who goes the extra mile. For example, he acted as moderator in the South Westphalia Wind Forum and, along with the international chamber of commerce and chambers of trade and crafts, ensured that NRW’s CHP (combined heat and power generation) investment grant programme would be presented in a practical way within the region.
Good example on the Wupper

The large number of hydropower plants in Germany prove that hydropower has earned its place alongside the other renewable energies. In 1993, Mr And Mrs Keuen purchased the Schaltkotten hydropower station on the Wupper, near Solingen, and then overhauled, automated and regularly optimised the plant and machinery and adapted it to the changing legal framework. Representatives of the nature and environment service of the town of Solingen and also representatives of different political groupings were guests at the Schaltkotten hydropower plant during one of the water exhibitions which regularly take place on the Wupper.

A rated discharge water volume of 78 m³/s with a fall of 2.90 m is directed to a double-regulated Kaplan turbine. The plant has an installed capacity of 150 Kilowatt (kW) and outputs approximately 900,000 kilo-watt hours (kWh/a) per year, which provide around 225 households with electrical energy. This means that each year, around 585 tonnes of CO₂ are saved through the use of hydroelectric power. As early as 2002, hydro-ecological passability for fish and other aquatic organisms was created as a joint project between the Keune family and the Wupperverband river management association through creation of a bypass acting as a fish ladder. In the following year, the fish barrier in front of the turbine was improved through the installation of a 20 mm fine grid with a water drop profile.

Optimisation of the location in Schaltkotten from the point of view of energy was continued in 2008, when the heating concept was optimised. Today, two heat pumps are operated in place of an oil-fired system. An air-water heat pump makes use of the waste heat from the turbine and heats the workshops at the Schaltkotten site. The second, water-water heat pump takes water from the River Wupper and supplies the neighbouring Haus Münstgen building, which is managed by the Lebenshilfe support organisation for the disabled, with heat.

A climate-friendly restaurant

The Fissenkicker Mühle mill in Bad Meinberg will in future operate in a particularly energy-efficient way. The cafe and restaurant in the historic windmill building acquired the know-how to reduce its energy costs from the energy advice for SMEs offered by KfW bank. The advisors found energy-savings potentials in particular in connection with the lighting, the cooling and refrigeration equipment and the room heating. In addition, the staff were consciously included in the climate protection measures, in order to optimise operating procedures. Nils Krüger, climate networker of Energy-Agency.NRW at the District Council of Detmold, made use of the project presentation at the end of July in order to introduce the climate-friendly restaurant to the public.

Further information: SMART ET, Frank Meyer zur Heide, email info@smartet.de and email krueger@energieagentur.nrw.de

Up to now, the State Government of North Rhine-Westphalia has helped to fund 186 installations with a total output of more than 18 megawatts, and thereby initiated investment of over 60 million euros. In NRW, at the end of 2011 more than 400 hydropower plants with a capacity of around 207 megawatts were generating electricity from water (not including water storage power plants) and were feeding it into the network. In total, they yield more than 500 gigawatt hours, which can supply more than 65,000 power stations in NRW with electricity. In Germany overall, four per cent of the electricity generated each year comes from hydropower.
New initiative for companies in NRW

“Resource and energy efficiency – give-and-go”

Sometimes everything is easy: this time, the circle has to fit into the square and not the other way round! And this is where Efficiency Agency NRW and EnergyAgency.NRW are playing give-and-go in a new joint project. In the project, initiated by the NRW Climate Protection Ministry, both agencies bundle their different advisory instruments and competences – in order that SMEs in North Rhine-Westphalia can work more efficiently and therefore in a more climate-friendly way. This means that the companies profit from the know-how of EnergyAgency.NRW with regard to energy efficiency and renewable energies, and Efficiency Agency NRW can advise on resource- and energy-efficient production processes. The two agencies have already successfully cooperated with one another in the past, and have been able to make use of each other’s expertise.

“With Efficiency Agency NRW and EnergyAgency.NRW, the region has two active and respected agencies at its disposal which are experts in their fields. In this initiative, we want to be able to offer companies an integrated advisory service,” says NRW Climate Protection Minister Johannes Remmel. Synergy effects will also result from the cooperation, from which SMEs will be able to profit. “When it comes to industrial production, the subjects of energy efficiency and resource efficiency are of equal importance. For example, waste that can be used to produce energy is generated in sawmills. Or in bakeries, which count amongst the most energy-intensive enterprises, the waste heat from ovens can be used to gain energy in heat recovery plants,” explains Remmel. Management which aims to save resources often means that less energy is needed and therefore provides a double benefit.” Companies that are interested in the initiative can register with the agencies immediately.

Focus on heating pumps

Heating pumps are generally small and look insignificant – but they are responsible for considerable electricity consumption. This is why NRW Climate Protection Minister Johannes Remmel visited Grundfos GmbH in Erkrath, a manufacturer of high-efficiency heating pumps, at the twelfth station of his Future Energy Tour. An old heating pump with excess capacity accounts for up to ten per cent of a household’s energy consumption. According to information from the Federal Environment Agency, modern high-efficiency pumps are only in use in two per cent of all heating systems in Germany.

“Heating pumps which were installed ten or more years ago are generally very thirsty when it comes to power. On their own they consume more than the refrigerator and washing machine put together. If such a pump, which generally is too large, is replaced by a modern pump, energy consumption is reduced by up to 80%. This can make a difference of between 80 and 120 euros each year,” says Minister Remmel. The investment cost of around 400 euros for purchase and installation of a modern recirculation pump therefore pays for itself within three to five years.

Efficiency Agency NRW is the contact for manufacturing companies in NRW when it comes to resource-efficient processes and products. It analyses the production processes in individual advisory sessions and develops action packages in order to improve resource efficiency. All the raw and operating materials and all auxiliaries are taken into account. “Material flows are considered in depth, down to the level of the production sequences, and individual process steps are analysed in detail with regard to their resource efficiency,” says Dr. Peter Jahn, Director of Efficiency Agency NRW. In accordance with their different areas of emphasis, each agency has its own advisory approach and, resulting from this, different methods, which can complement each other well in the “give-and-go” model.

Contact:
Effizienz-Agentur NRW, Andreas Kunsleben, email doppelpass@efanrw.de or EnergieAgentur.NRW, Gerd Marx, email doppelpass@energieagentur.nrw.de
"Give-and-go" initiative: tailor-made funding

Tailor-made funding – for example with the NRW.BANK.Effizienzkredit is also needed if the "give-and-go" game of resource and energy efficiency which EnergyAgency.NRW and Effizienz-Agentur NRW are now playing by bundling their advisory instruments into a joint initiative (see Page 26) is also to lead to a "goal" for people, industry and the environment.

With the NRW.BANK.Effizienzkredit, the NRW.BANK supports operational projects which lead to permanent increases in energy and resource efficiency. Such projects can consist of measures resulting in lower consumption of water or raw materials, lower volumes of waste water or waste materials or to lower noise or pollutant emissions. Measures which lead to closing of the cycle of materials also qualify for funding.

Interest rate advantage for energy savings

Access to loans at particularly favourable interest rates is linked to achievement of particular savings quotas in the areas of energy, materials and resources. If production machinery is replaced in a manufacturing plant, for example, the new machinery must demonstrate a reduction in energy consumption of at least 20% for manufacture of the same volume of the same products in order to qualify for financing with the new loan. In the area of resource efficiency, the yardstick is that the pure raw material consumption, measured in kilograms, is reduced by at least ten per cent for the same production volume through a change in the production process.

"Gold leaf" from biomass

A lot of money can be made from autumn leaves. Using the process developed by two companies in Riesenbeck, leaves from trees and shrubs can be pressed into briquettes, which can then be used as fuel – an innovative way of helping districts and municipalities to save costs.

A very large volume of autumn leaves can be found in Germany’s municipalities each year – on average one tonne for every 100 inhabitants. Collection and disposal of these leaves has up to now meant only one thing for local councils – spending money.

NETZ Ingenieurbüro GmbH has developed a industrial plant together with medium-sized plant construction company RIELA which creates leaf briquettes that can be used for heating. There are three process steps – "drying – crushing – briquette making". These carbon-neutral "eco briquettes" can be used in municipal biomass boilers as a low-cost alternative for other fuels.

Around 500 to 700 kilos of briquettes can be won from each tonne of wet leaves. The calorific value, at around 4.3 to 4.5 kWh/kg lies somewhat below the energy density of pellets, but as a rule is above the value achieved by many types of wood chippings. "Around 10 to 15% has to be taken into account in the environmental impact study for the energy used in briquette manufacture," says Dipl.-Ing. Tobias Peselmann from NETZ Ingenieurbüro GmbH in Riesenbeck.

Since 2011, both Münsterland companies have been gathering experience with the technology they have developed at the RIELA Energiehof in Püsselbüren. And the two innovative companies are also investigating manufacture of "energy apples" made of horse manure. Mobile plants are also under development for demonstration purposes, which have already made stops in various towns and cities in Germany. The town of Schortens (Friesia) was recently gained as a municipal client for a stationary briquette plant. Eight further projects – also in NRW – are at the negotiation stage. According to information provided by NETZ, the time needed for the briquette plant to pay for itself is between four and eight years. In view of tight municipal finances, NETZ and RIELA are also considering financing solutions based on the contracting model.

Further information: Rüdiger Brechler, Climate Networker for the District Council of Münster, Tel.: +49 (0)151/18822602, email brechler@energieagentur.nrw.de
Study: Great solar potential in NRW

NRW has a great deal of potential when it comes to solar energy. This is the conclusion of the second study of the NRW State Agency for Nature, the Environment and Consumer Protection (LANUV) regarding the use of renewable energies in NRW. “NRW is not only the land of coal and steel, NRW is also the land of future energies,” says NRW Climate Protection Minister Remmel. “We want to produce around 30% of the electricity in NRW from renewable energies by 2025. And the solar energy study shows that this is a realistic goal.” According to the calculations, in NRW there is a technical photovoltaics potential for net electricity production of up to 72.2 terawatt hours per year. Of this, 53% of the potential is attributable to roof surfaces, 47% to non-built up areas (e.g. strips of land alongside motorways and railways, tips or car parks). This means that more than 50% of the entire electricity requirement in NRW can be covered by renewable electricity, using this photovoltaics potential. Minister Remmel: “Solar energy is generated close to the place of use – this means less need to develop the electricity network and enables many residents to take advantage of the energy turnaround ‘made in NRW.’” Cologne, with 2,428 gigawatt hours per year, offers the greatest technical PV potential. The study also describes the technical potential for solar thermal technology used for water heating at approx. five terawatt hours per year. If the entire solar thermal potential available on residential homes was used, approx. 30% of the hot water requirement in the private sector could be covered. In a large city like Cologne, the solar-thermal potential amounts, for example, to 289 gigawatt hours per year. The results of the solar potential study will be made available on the Energy Atlas NRW information system of the LANUV, alongside the results of the wind potential study, and will therefore be accessible to the general public. Further information: www.energieatlas.nrw.de; www.energieagentur.nrw.de (see also Solar Check NRW; PV.rechner, Kampagne Photovoltaik NRW)

Airing is essential

Rita Maria Jünemann knows all about the dangerous interaction between high air humidity, low room temperature and lack of air circulation and replacement. It can quickly lead to ugly black patches on the walls or to clammy clothes. “Mould spores occur naturally in the environment,” says Jünemann, “active measures are required in order to ensure that they do not find a favourable environment in homes”. The architect and expert on noise and heat insulation works as energy efficiency expert at the consumer protection organisation Verbraucherzentrale NRW, and provides expert knowledge regarding room climate to around 100 energy advisors within the organisation. She also established the regional network for advice on moulds for NRW at the end of 2012, which brings together experts from the countryside and town, and from trades, science, associations and other bodies. The network collects specialist information and offers of help in combating mould and also provides expert information.

Even if those affected do not like talking about it: mould is a real plague in all sectors of the population, and at least every fifth household is affected. It can damage the basic substance of buildings and is also a health hazard. And there is often conflict between landlords and tenants as to who is responsible for the mould. The advisors at the consumer protection agency know how to fight it, but Jünemann above all advises prevention – through household behaviour and technical aids. “It is often sufficient to follow our rules for airing rooms, check humidity regularly and to use heating accordingly.” As the expert says:

- Open the windows wide for an air surge, and do not keep windows ajar at the tilt position during the heating season.
- Turn the heating off while the rooms are being aired.
- Bedrooms must be aired at least after getting up, and the bathroom should be aired after taking a shower.
- Avoid temperature differences of more than five degrees Celsius between rooms.
- In summer, only air cool cellars in the evening.

In rooms without windows, or if the home is often empty, a ventilation appliance can provide the necessary exchange of air. Landlords and tenants should find out the possibilities at the latest when homes are to be upgraded in order to save energy. If older buildings are insulated, the roof is sealed or new windows are fitted, there must be greater exchange of air than before, in order that damp air can escape. It makes sense to consider this as early as the planning stage by providing a ventilation concept. Experts then establish if openings are needed in outside walls or ventilation equipment is needed in order to prevent damp from occurring.

The advisors from Verbraucherzentrale NRW (www.vz-nrw.de/energieberatung) advise on ways of achieving a healthy room climate. A printed brochure on the subject of damp and mould in residential property is available in any of the 59 locations within Germany or online at www.ratgeber-verbraucherzentrale.de. Information: email ritamaria.juennemann@vz-nrw.de, Tel.: +49 (0)211/3809-393

Text: Claudia Reischauer, Verbraucherzentrale NRW
Energy cooperatives proving popular

Already 130,000 members in Germany

Energy cooperatives are playing an increasingly important role when it comes to the decentralised energy turnaround. More than 130,000 members – of which 90 per cent are private individuals – have already invested 1.2 billion euros in so-called "citizens’ power plants". These are the findings of a current survey by the German Cooperative and Raiffeisen Confederation (DGRV), carried out jointly by the DGRV, the German Solar Industry Association (BSW-Solar) and the German Renewable Energies Agency (AEE).

These figures testify to the growing significance of the cooperatives within the energy turnaround. They mean that in the past twelve months alone, the number of members of energy cooperatives has grown by more than 50 per cent – whereas in 2012 it was still around 80,000. The number of cooperatives is also continuing to grow at a rapid rate. It is a notable aspect of these cooperatives that they implement their projects with a high proportion of own capital, at around 50 per cent. The authors of the study consider this as proof that citizens want to invest their own money into the energy turnaround – and in the process also to support value creation in the region. And participation in the cooperatives is not only a privilege for the rich, as it is possible to join in with small contributions of in some cases less than 100 euros.

The citizens’ power stations built by the cooperatives already today generate around 580 million kilowatt hours of green electricity and therefore can, according to arithmetical calculations, cover the electricity requirement of 160,000 households each year. The majority make their investment into solar energy. Photovoltaic installations also continue to be very popular: every second energy cooperative (53 per cent) is planning additional investment in solar in the coming twelve months. And 41 per cent want to invest in wind, which is also not a negligible proportion.

However, for a long time now building of clean energy generation plants has not been the only concern of the energy cooperatives. At the moment, every second cooperative (52 per cent) is considering direct regional marketing of the electricity they generate.

One reason for this is certainly the change in the legal framework. The medium-sized solar energy installations which are typical for cooperatives will no longer receive a feed-in bonus for one third of the electricity generated. However, because of the reductions in prices in previous years, this proportion can be used by the cooperative or can be sold. Nowadays, solar energy costs considerably less than the electricity from the network provided by electricity supply companies. In addition, municipal power plants are taking increasing advantage of the opportunity to integrate more environmentally-friendly electricity from citizens’ power plants into their portfolio. At an event on 10.9.13 in Saerbeck, EnergyAgency. NRW will among other things be providing information on the framework conditions for marketing of self-generated electricity for energy cooperatives and other citizens’ energy installations (see Page 30).

In North Rhine-Westphalia too, it has long been recognised that active participation by citizens themselves increases acceptance of the energy turnaround within the population. The magic word here is “participation”. This is why the NRW Climate Protection Ministry along with EnergyDialogue. NRW has established a dialogue platform at EnergyAgency.NRW (www.energiedialog.nrw.de). In addition, initiatives and projects for implementation of citizens’ energy installations – in other words of projects which involve citizens financially or from the organisational point of view, are supported with both word and deed. For example, further training of project developers for energy cooperatives was carried out by EnergyAgency.NRW on behalf of the State of NRW in cooperation with the “Energy Turnaround Now” network. In addition, the State agency has published a guideline on the subject of “Climate protection with citizens’ energy installations”. The guideline is available on the Internet. From the side of EnergyAgency.NRW, additional useful tips and information on the subject of citizens’ energy and also a collection of projects for citizens’ energy installations in NRW (energieagentur.nrw.de/buergerenergie). Further information: email gehles@energieagentur.nrw.de
Climate events in Saerbeck in September

The NRW climate community of Saerbeck is to the fore in North Rhine-Westphalia when it comes to implementing climate protection and adaptation measures, and its leading position is underlined by numerous awards, such as the European Energy Award. More than one half of the Saerbeck’s electricity requirement is already today covered by renewable energies. Over the long term, Saerbeck aims to changeover the energy supplies of the entire municipality to renewables. By 2030 at the latest, all fossil CO₂ emissions should be compensated for by renewable energies, representing achievement of carbon-neutral autonomy. In the meantime, the projects already demonstrate comprehensive results. Reason enough for Saerbeck to present the Saerbeck Climate Protection Days from 10.-15.9. EnergyAgency.NRW will organise two conferences within this five-day format and will also attend on the day for ordinary citizens with the special “Energy Advice Bus”. Among other things, EnergyAgency.NRW will be covering the subjects of so-called citizens’ energy installations and efficient use of biomass, and will also offer the opportunity to experience installations directly at first hand. During the conferences, it will be possible to visit the Saerbeck bioenergy park and the “glass” heating installation, visible to all behind a huge glass window.

Citizens’ energy installations, in other words renewable energy projects which are jointly organised or financed by citizens – have enjoyed a real boom in recent years. Often these projects consist of photovoltaic installations or wind turbines, whose electricity production was paid for by the EEC. Now, citizens’ groups are occupying themselves increasingly with new business models such as direct marketing of electricity and heat supply based on local heating networks. During the event on “citizens’ energy installations – practical examples for new fields of activity” on 10.9.2013, these new business models will be explained in specialist lectures and presentations and the “bioenergy park” of the climate community of Saerbeck will be presented, in which mixed use of different centralised energy generation installations have been built.

The use of biomass is an important component within future energy supplies. Its development is subject to tensions due to the fact that it competes with food production for the use of land and also because of its possible material- or energy-based uses for electricity, heating and fuels. In order to remove the aspect of competition for land, efficient processes for decentralised energy conversion must be used and energy efficiency measures must be implemented, in order to reduce emissions of the greenhouse gas CO₂. The 7th Steinfurt Bioenergy Experts’ Conference conference on bioenergy of FH Münster University of Applied Sciences and EnergyAgency.NRW on 12.09.2013 is therefore based on the theme of “Bioenergy and Climate Protection in the Region”. It links the activities of the NRW climate community with selected specialist lectures on the subject of regional biomass potentials and ways of opening them up, and also on possibilities of reducing traffic emissions. In addition, neighbouring initiatives will be showing their ideas and strategies for renewable energies and climate protection. Registration and further information: www.energieagentur.nrw.de (dates)

New online manuals for local councils

As a successful energy turnaround is without doubt linked to the climate protection activities of the local and district councils in the State, the online manual on the subject of climate protection in the community is now available to them, which contains a great deal of information and many essential facts. With the manual, EnergyAgency.NRW is offering a vital tool which can be referred to at all times and is always right up to date. The virtual manual provides information on the most important areas of activity for a community wishing to reduce its CO₂ emissions. Tried-and-tested ideas, measures and projects related to climate protection are augmented with descriptions of procedures to be used, checklists, additional brochures, templates and project examples. www.energieagentur.nrw.de/handbuch-klimaschutz

Successful test of fuel cell vehicles

Two Opel/GM HydroGen 4 vehicles have been test ed for one year by EnergyAgency.NRW within the framework of the CleanEnergy Partnership. The service performance exceeded all expectations. Both fuel cell vehicles were used by employees of the Fuel Cell Network for test drives and fuel cell publicity purposes. In all, a distance of 25,000 was travelled – free of noise and emissions. The vehicles were filled more than 170 times at the Air Liquide hydrogen fuel station in Düsseldorf. Neither vehicle suffered operational disturbances of any kind during the test period. The savings potential in comparison with the basic model (6 cylinders) using green hydrogen amounts to 74 t CO₂. Information: www.brennstoffzelle-nrw.de
App overcomes high electricity costs

Energy.Agency.NRW has developed its first app. It enables manufacturing companies, engineering consultancies, energy suppliers, associations, the International Chamber of Commerce and other multipliers to record and evaluate their energy management online.

This instrument came into being within the framework of the “mod.EEM” joint pilot project by the Federal Environment Ministry and the Ministry for Climate Protection, Environment, Nature Conservation and Consumer Protection of the State of North Rhine-Westphalia.

The mod.EEM project – which stands for “Modular Energy Efficiency Model” will be implemented in practice by Energy Agency NRW, is an effective instrument for reduction of energy costs in the participating organisations.

The new iOS and Android App now augments the Online Portal www.modeem.de of EnergyAgency.NRW and therefore not only offers the opportunity to input data whilst travelling, but also allows registered users synchronisation of the data between the website and the app. Using the app is also child’s play. On the start page, the user can choose between analysis of the current energy management level and continuation of a check that had been started beforehand. The analysis starts with a list of questions, which covers eight different themes. Questions to be answered relate to responsibilities for EMS (Energy Management Systems) in organisations, various energy consumption figures, measures already taken for increasing energy efficiency and also documentation and communication of energy savings potentials.

The questionnaire ends with evaluation of the responses.

The term EMS designates the sum of all measures which an organisation can initiate and implement in order to reduce use and consumption of energy to a minimum, without slowing or presenting obstacles to work processes. Introduction and establishment of an EMS is a continual and permanent process, in which the energy data of the organisation are monitored, measured, controlled and corrected at regular intervals in order to recognise energy savings potentials and to use them effectively for energy saving.

The app can now be downloaded from iTunes or Google Play Store free of charge. Further information on the app and on mod.EEM can be found at: www.modeem.de

Under preparation:

Sector Directory for NRW wind energy

At last: the wind energy sector in NRW will receive its own sector directory for the first time, published by the Wind Power Network of EnergyAgency NRW. Companies, research institutions and associations located in North Rhine-Westphalia, which work within the wind energy sector, whether suppliers, manufacturers or service providers, will now have the opportunity to be listed free of charge in a directory covering the entire region.

The directory will be augmented by detailed articles and interviews on the subjects of wind potentials, politics, data and facts, industry, research, small wind turbines and the offshore industry – all related to North Rhine-Westphalia.

The aim of the sector directory is to present the strengths and services of those working in the sector in NRW at both the national and international level, and to market North Rhine-Westphalia as a significant location for the wind sector.

Companies, associations and institutions can place themselves within one of 13 categories. Their name, address, products and services will be printed, and also their logo. The directory will be produced in both German and English.

Further information and the respective categories can be found at www.windkraft.nrw.de. Any further questions can also be addressed to Magdalena Sprengel, at the Wind Power Network of EnergyAgency NRW, Tel.: +49 (0)211/86642-243, email sprengel@energieagentur.nrw.de

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Green energy for towns and villages
Energy from biomass can represent a useful addition within the energy mix both for rural areas and also for towns and villages. Two conferences of EnergyAgency.NRW (Biomass Network) can help to reveal both opportunities and limits. The event concerning bioenergy for municipal power plants (Bioenergie für Stadtwerke) will take place on 30.10.2013 in the rooms of Cologne University of Applied Sciences, whilst the conference on bioenergy from waste (Bioenergie aus Abfall) is to be held on 13.11.2013 in Lindlar at the metabolon site in cooperation with the Centre for Countryside Development (ZeLE). Registration and further information: www.biomasse.nrw.de

CHP campaign: online CHP calculator for companies
The Online tool regarding cogeneration plants for companies is now available on the website of EnergyAgency.NRW. The calculator delivers an estimate of whether installation of a combined heat and power plant makes sense from the economic point of view. Use of a CHP plant in a company offers a great many advantages: the fuel is used for two purposes through simultaneous generation of power and heat, decentralised energy generation on site is possible and the waste heat that is created in the generation of electricity is used effectively. Information: www.energieagentur.nrw.de/kwk

City of Wuppertal takes part in ALTBAU/NEU®
The ALTBAU/NEU® project for renovation of old buildings has become even more important. The city of Wuppertal wants to intensify its activities in the area of energy upgrading of older buildings and to make use of ALTBAU/NEU® in order to provide its citizens with more help. The Bergisch triangle, consisting of the towns of Remscheid, Solingen and Wuppertal – which carry out many activities and projects together – is now completely represented within the project.

Schneidewind now Scientific Advisor to the Federal Government
The Federal Cabinet has agreed on the composition of the Federal Government Advisory Council for “Global Environmental Change” (WBGU) on the agreed periodic basis. The newly-appointed members include Prof. Dr. Uwe Schneidewind, President of the Wuppertal Institute. The Council was established by the Federal Government in 1992 prior to the United Nations Conference on the Environment and Development (“Rio World Summit”) as an independent advisory body. The subjects to be considered in the major reports, which are written every two years, are selected by the Council itself.

Eighth edition of IRES
From 18 to 20.11.2013, the 8th International Renewable Energy Storage Conference and Exhibition (IRES) will take place in Berlin. IRES has established itself as a central venue for exchange of knowledge and experience on one of the key issues of future energy supply. Since 2006, more than 3,100 visitors have made use of IRES in order to gather comprehensive information on the subject of energy storage. IRES is an event of Eurosolar e.V., in cooperation with, among others, EnergyAgency.NRW. Further information and registration online via www.energiespeicherkonferenz.de.

Climate Protection & Friends in social networks
EnergyAgency.NRW also tries to reach its target groups through social networks such as Twitter – and a Facebook page has also recently been established. On Facebook, the spelling “energieagentur.nrw” is used, because Facebook does not recognise the capital “A” in the middle of the name. The page was designed as a company page, following the example of the Federal Environment Ministry. This means that it can be seen without users having to be registered with Facebook.

Energy price comparison web tool for companies
The energy comparison web tool Energiepreis.spiegel of EnergyAgency.NRW now provides detailed information and possibilities for comparison with regard to the development of industrial electricity prices for industrial and trading companies which consume more than 100,000 kilowatt hours per year. With Energiepreis.spiegel, EnergyAgency.NRW is making a contribution to greater transparency in the price of industrial electricity. www.energieagentur.nrw.de (Tools/Marktspiegel)