Contracting: making energy efficiency possible

Battery recycling for electromobility P. 09

Sought: Municipal climate protection managers P. 17

Rebound: When the well-fed want more P. 22
Focus

04  Contracting scene in climate protection state NRW
06  New service “moderation and mediation”
07  New start for theme portal
07  E-world energy & water in February

Innovation

08  Electromobile trucks
08  Superfast charging of E-vehicles on motorway
09  Battery recycling for electromobility
10  Plant research for energy turnabout
10  Jan Peckolt discovers NEMOS
11  Electricity storage
11  New energy research institute in Dortmund
11  CEF.NRW to be continued

Application

12  Versatile fuel cells
12  Pellet stoves get good marks
13  Quality for Lüdenscheid hospital
14  “Made in NRW” industry-energy concepts for China
14  Climate-protection tour: Hydropower and CHP
15  Information, Motivation, Mediation
16  Five German Solar Awards for NRW
17  Sought: Municipal climate protection managers
18  Bulbs for industry
18  Germany’s largest brine/water heat pump
19  Co-operative power generation

Magazine

20  Professional energy controlling in Aachen
20  2011 German Sustainability Award for Remscheid
21  NRW: New climate initiation programme
21  Study on renewable energy potentials in NRW
21  Wilhelm Hartmann retires
22  Rebound, or: When the well-fed want more
23  Grand challenges: Future power plants
23  “EU 2020 going local”

1 March 2012: Energetic use of biomass
In future, the energetic use of biomass can play an important role in the reduction of CO₂ emissions in the energy sector. The challenges that result from this and the innovations to be expected for a region like NRW will be demonstrated in the “Energetic Use of Biomass” conference on 01.03.2012 in Steinfurt. The event will be organised by EnergyAgency.NRW as the 6th Steinfurt Expert Energy Conference in cooperation with the Münster University of Applied Sciences. Further information and registration at www.kraftstoffe-der-zukunft.de

17/18 April 2012: Electromobility Project Day
In cooperation with the Network of Automotive Excellence (NoAE), EnergyAgency.NRW will be holding the 5th Electromobility Project Day in Düsseldorf on 17 and 18 April 2012. The event is directed towards innovative companies, the newly self-employed, start-ups, research institutions, universities, municipal and local authorities and embassies of all countries who are engaged in the area of electromobility. Further information is available from www.noae.com and www.kraftstoffe-der-zukunft.de
In November 1998, EnergyAgency.NRW issued an invitation to an informative event regarding energy contracting in the Wuppertal Stadthalle. The response was impressive; around 900 participants from the worlds of politics, business and administration found their way to Wuppertal and listened to the presentations and lectures on offer. The event made a major contribution towards preparing the ground for energy contracting in North Rhine-Westphalia, and in the last analysis, the establishment of the Contracting e.V. forum in 2002 can be traced back to it. The Contracting Forum is a scientifically-orientated and independent expert association, which has made an important contribution over the past ten years to the advancement in law of contracting through further training events and expert papers.

This example shows quite clearly that EnergyAgency.NRW not only recognised energy contracting as important at an early stage, it has also promoted it decisively over the years through providing information and initial consultancy. Its activities have always been focussed on fact, impartial and results-orientated. In contrast to some energy agencies in other federal states, it never became active as a contractor on its own behalf. It also always made sure to restrict itself to initial consultations and not to enter into competition with engineers and legal advisors.

A great deal of time has passed since the contracting conference in November 1998. Even if the growth rates that were forecast at that time have not been achieved in practice, contracting has now achieved maturity and is a widely-used instrument for realisation of decentralised energy generation structures. The projects and contracts have improved substantially once again in recent years. Contracting has the advantage that the contractor generally not only provides the means of financing the project, but also contributes considerable know-how. If, however, the owner implements the project on his own, he often does not have this know-how himself. This can hinder successful completion of the project.

Energy contracting does not claim to be the one and only solution to all possible problems. However, contracting should be seriously considered as an alternative each time a decision is made regarding implementation of an energy-related project.

Yours sincerely,

Dr. Andreas Klemm
Attorney at Law and Director of Forum Contracting e.V.
Contracting scene in climate protection state NRW

Contracting is highly regarded within the market for energy services. It is not only the Federal Government which has recognised this and included contracting in its 2nd National Energy Efficiency Action Plan, NEEAP, as a way of achieving greater energy efficiency. In its current Coalition Agreement, the State of North Rhine-Westphalia also requires that contracting should be developed further as a means of financing energy efficiency technologies.

Modern energy services for enhanced climate protection

However, to restrict contracting models to the external financing option alone would fail to recognise the comprehensive service aspects of this product, which is continuing to develop. The advantages of contracting are based in its integrative approach, where it is important to link all elements for an energy service - from planning and plant erection, through financing up to efficient operation - so as to achieve as optimum and cost-effective a result as possible. In the variant known as energy supply contracting, the result would be the supply of efficiently generated useful energy such as heat, electricity, cooling, compressed air or another medium. In the case of the very well-known model known as energy savings contracting, the objective would be to achieve as great an energy saving as possible within a defined contractual period. Further factors, which are not quantifiable in monetary terms, such as transfer of risk to the contractor or a binding efficiency or savings guarantee, should also be taken into consideration by the potential user when considering the decision for or against contracting.

The contracting models that have been known in Germany for around 20 years are enjoying increasing popularity. Started in the 1990s as an alternative form of financing for industrial supply solutions, a market has developed up to the present day which now includes up to 500 professional energy service providers from the ranks of municipal energy supply organisations, plant construction companies, the trades and now also many energy service providers specialising in contracting. From the beginning, contracting providers were able to focus on customer groups from the property sector, industry and the trades, hospitals, and above all the public sector with its numerous properties, as particularly suitable partners.

Contracting advisory services of EnergyAgency.NRW

After its establishment in 1990, EnergyAgency.NRW, which works on behalf of the State of North Rhine-Westphalia, rapidly noticed that alongside general questions of energy technology, implementation of energy efficiency projects always played an important role in their advisory activities. Therefore in 1997, a contracting advisory service for companies and local authorities from North Rhine-Westphalia was established at EnergyAgency.NRW, in which two engineers and one legal specialist are currently engaged. The advisory services - which are basically free of charge - extend from initial consultation - providing information on the different contracting models established on the supplier market and their specific suitability for the potential user - through facilitating contact with suitable contracting suppliers and up to support of the customer in the tendering process and the evaluation of proposals received.

Best Practice Examples

The neutrality and independence of EnergyAgency.NRW means that the contracting advisors can offer customised solutions without taking any possible commercial interests of their own into consideration, and can also develop comprehensive contracting known-how through participation in a large number of project developments. The wish to communicate this knowledge has led to the description of a large number of example projects that were successful in practice, some of which are published on the newly designed website www.contracting.nrw.de. Striking examples of best practice include:

The contracting partnership at LVR-Klinik Bonn

The 800-bed hospital, with its 27 real property units, is being provided with steam, heat, electricity and cooling by Imtech Contracting GmbH from Osnabrück for the twelfth contractual year running. A new, tailor-made supply concept, with a combined cooling, heat and power plant and an investment volume of 4.5 million euros has led to a...
reduction in energy consumption of 30 per cent. In order to repeat the considerable reduction in CO₂ emissions of 35,000 tonnes achieved in the first 10 years, the contact was extended in 2010. LVR-Klinik Bonn was one of the first hospitals in NRW to receive the BUND quality seal “Energy-saving hospital”.

Energy supply contracting for Münster apartment block
Verwey GmbH, Duisburg, as the management company responsible for the 17-storey “Am Berg Fidel” apartment block relies on a contracting model of the local municipal utility company Stadtwerke Münster GmbH for energy-efficient heat supply. The company modernised the complete rooftop heating control centre using efficient natural gas condensing boiler technology, supplies heating for the central heating and washwater heating systems and carried out hydraulic balancing of the existing single-pipe heating system. CO₂ saving per year: 106 tonnes.

Savings-contracting for street lighting in Dormagen
In 2007, the municipal services company Technische Betriebe Dormagen decided to optimise the street lighting in the town based on a savings guarantee contract. This provided for replacement of a total of 4,610 inefficient high-pressure mercury lamps (HQL lamps) with corresponding ballasts, replacement of altogether 349 obsolete lamps and installation of 160 energy-saving transformers for light regulation (dimming) during the night when there is little traffic. The company Horlemann Elektrobau GmbH from Uedem as contractor and investor in the measures can save the town of Dormagen around 44% of its electricity requirement or 824 tonnes of CO₂ per year. The project received the Good Practice Label of the German Energy Agency. Uedem is a partner within the EU Greenlight Programme.

Contracting in the housing sector
Based on the impressive results of many successful contracting projects, politicians and parliaments at every level are increasingly putting their faith in the contracting model. However, as is also the case in other forward-looking schemes, the devil is often in the (legislative) detail: for some time now, ways have been sought, among others at the level of the federal state, of facilitating wider use of contracting through simplification of the process. For example, within the framework of the Tenancy Law Amendment Act (Mietrechtsänderungsgesetz) a specific ordinance regarding supply of heat for rented residential properties is under discussion. This ordinance is intended to make the changeover to industrial supply of heat to existing rental residential properties apartments easier. It is also important to ensure that heat supplied in this way is comparable with other sources as regards cost. This ordinance could help to achieve clarity in the handling of contracting in rented residential buildings, and it is hoped that it will create greater acceptance for the contracting model on the part of tenants and landlords.

Municipal contracting
In order to further expand the use of contracting models in boroughs, towns and communes, the regional government in North Rhine-Westphalia specified as a component of the current climate protection “Start” programme that local authorities which are not so strong financially are permitted to make use of energy supply and savings contracting as an explicit alternative to credit-financed investments, taking budgetary reliability into consideration. This also applies if the climate protection measures

Continued on Page 6 >>>>
Moderation and mediation in contracting and district heating projects

EnergyAgency.NRW is not only an important initiator of new environmentally-friendly energy projects. It is also regularly called upon as an advisor if conflicts occur within projects that are either at the planning stage or already in progress.

Two advisors at EnergyAgency.NRW who are trained as mediators support companies, public institutions and private individuals in NRW in initiating projects and in solving any possible conflicts by means of cooperative dialogue with their contractual partners.

Moderation – We promote dialogue

During the development of contracting and heat supply projects, EnergyAgency.NRW offers free support for informative discussions and negotiations. Our moderation activities are to be understood as an independent offering which is available to all those who are involved in the implementation of district or remote heating projects and also in contracting projects in NRW.

Mediation – We act as go-between in disputes

If conflicts have already occurred within a contracting or heat supply project or within a contractual relationship, a method for clarification and resolution which is already well-established in out-of-court settlements is often suitable: mediation.

A brochure issued by EnergyAgency.NRW provides information regarding the new service. Contact: Christian Tögel (Tel. +49 (0)202/24552-34) or Rüdiger Brechler (Tel. +49 (0)202/24552-15)

Current developments and further national addresses

The Contracting Competence Centre of the Germany Energy Agency (dena), which was established in 2010, is currently developing new approaches to the contracting model which include the possibility of combining conventional contracting applications in the area of building energy technology with renovation and modernisation measures. An investigation is under way as to the conditions that have to be created in order that, for example, comprehensive façade insulation can be successfully included into a savings contracting project whose primary focus is on equipment technology. A further consideration is how to design the conditions so that they are acceptable to both the supplier and the customer.

Federations and associations concerned with contracting are also working on continuous further development of this innovative energy service. The organisation Forum Contracting e.V., as a scientifically-oriented and independent expert forum, deals with the areas of law, business and tax and is also a co-publisher of the specialist journal CuR Contracting und Recht.

The federation concerned with heat supply, Verband für Wärmelieferung e.V., has given itself the task of supporting the wider use of energy contracting with heat, cooling, compressed air and electric current, and also of helping to qualify companies as suppliers of useful energy. It ensures the maintenance of quality standards and advises its member organisations in the areas that are important for successful implementation of this service concept.

The energy efficiency federation Energieeffizienzverband für Wärme, Kälte und KWK e.V. AGFW, as an independent and neutral federation concerned with heating, cooling and cogeneration plants, promotes the development and the expansion of local and district heating, and also the use of cooling and CHP (combined heat and power) supply at the national and international levels. It investigates possibilities for low-cost and environmentally-friendly energy generation and for distribution of local and district heating on both a small and large scale.

And finally, the Esco Forum in the German Electrical and Electronic Manufacturers’ Association (ZVEI), supports the interests of the leading contracting companies in Germany within the worlds of politics and business and is committed to designing optimum market conditions for contracting.

Prospects

In order to implement the energy revolution demanded at all levels of government in Germany as fast as possible, it also makes sense to promote the wider use of energy services such as contracting models. Among other things, a start has been made in the form of the Act on Energy Services and Other Energy Efficiency Measures (EDL-V) of 2010. However, these first steps must be followed up consistently and the use of contracting models, for example, must be accorded equal status in funding practice and legislation as an alternative to the implementation of energy supply solutions by the property owner himself – which is still the usual practice.

And no additional state subsidies or other financial incentives from the already limited public purse are required for this – a circumstance which is quite rare today.
New start for theme portal

The website of the Contracting theme portal of EnergyAgency.NRW (www.contracting.nrw.de) was updated in autumn 2011 and was considerably expanded in terms of its content. Starting from now, the interested user is also able to find information on lighting on the site, which describes contracting models and practical examples of contracting that have already been successfully implemented, both for internal and public street lighting. Other new additions include information on the aspect of "Contracting and Budgetary Law in NRW" for public users and also the menu item regarding funding programmes and contracting with internet links to all relevant funding programmes which expressly take contracting models into consideration. The "Contracting" themed portal of EnergyAgency.NRW had around 780,000 visitors in 2011.

And another thing: the homepage of the contracting portal of EnergyAgency.NRW is regularly amongst the top 5 results on the leading search engine Google. Some companies would give quite a lot for a similar ranking…!

E-world energy & water in February

Visitors to the joint North Rhine-Westphalia stand at the E-world energy & water fair will be able to experience many solutions for the energy revolution and for climate protection. The fair will take place at the Messe Essen exhibition centre from 7 to 9 February 2012.

Stand No. 370 in Hall 7, covering an area of 450 m², is being organised by the NRW regional government with the clusters EnergyRegion.NRW and EnergyResearch.NRW, and specialist energy journal BWK will also be present as media partner.

Dr. Frank-Michael Baumann, Chief Executive of EnergyAgency.NRW: "Around 20 companies and research institutions will be represented at the stand, who will demonstrate their competencies in the areas of electromobility, energy-efficient building and living, energy networks and storage, bioenergy, combined heat and power generation and power plants of the future, as well as wind energy. In addition, EnergyAgency.NRW will also be present at the "Contracting Point" joint stand in Hall 2."

EnergyAgency.NRW will be holding its 16th Expert Conference on Future Energies with the clusters EnergyRegion.NRW and EnergyResearch.NRW on Tuesday, 7 February 2012 within the framework of the Essen Energy Fair. The North Rhine-Westphalia Climate Protection Minister Johannes Remmel will open the 16th Expert Conference on Future Energies and will make a statement regarding the energy policy of the region. The morning’s programme will also include lectures and presentations on trends, markets and new developments in energy policy. In the afternoon, there will be five parallel forums on the following themes: wind energy, energy networks and storage systems, combined heat and power generation and power plants of the future, electromobility and bioenergy research.

The North Rhine-Westphalia Evening on 7 February at the NRW stand in Hall 3 with live music will provide an entertaining close to the day. The event will start at 18:00. Information: www.energieagentur.nrw.de und www.e-world-2012.com

Contracting addresses on the Internet:
www.contracting.nrw.de
www.kompetenzzentrum-contracting.de
www.energiecontracting.de
www.forum-contracting.de
www.agfw.de
www.zvei.org/fachverbaende/energietechnik/esco_forum

EnergyAgency.NRW at the Contracting Point of E-world 2012

The joint "Contracting Point", stand which has played a successful role for many years will also be a pillar of the central networking platform for the energy sector in 2012. Under the patronage of the heating supply federation Verband für Wärmelieferung e.V. from Hanover, the joint stand in Hall 2 (No. 2-500) again offers the opportunity to present the many aspects of contracting to an exclusive expert public. The results of a survey recently carried out amongst members of VfW e.V. demonstrate the great and ongoing potential for development of this sector. According to the survey, the number of energy supply contracts of member organisations rose to 39,400 in 2010. This corresponds to growth of 12 per cent in comparison with the previous year. Besides EnergyAgency.NRW, various contracting providers, tax and legal experts and also consulting companies will be represented at the 200 m² Contracting Point stand.

www.contracting.nrw.de
www.kompetenzzentrum-contracting.de
www.energiecontracting.de
www.forum-contracting.de
www.agfw.de
www.zvei.org/fachverbaende/energietechnik/esco_forum

innovation & energy 1_2012
Superfast charging of E-vehicles on motorway

Electromobility not only offers the opportunity to make use of renewable energies for climate-friendly mobility and therefore to reduce noise and greenhouse gases. Currently, there are still hurdles and disadvantages of this technology still to be overcome, such as limited range. Long journeys continue to be a weakness for electromobility. The battery capacities of today are generally not yet sufficient and charging times are hardly acceptable for drivers.

The companies RWE Effizienz GmbH, Autobahn Tank & Rast GmbH and also the Secretary of State in the Federal Transport Ministry, Rainer Bomba, showed that the problems can be overcome by opening the ultra-rapid electric charging point at the Lichtendorf-Süd motorway service station on the A1. Electric vehicles can “fill up” with electricity ultra fast between Cologne and Hamburg at a total of eight filling and service stations (in NRW: Lichtendorf-Süd, Tecklenburger Land Ost & West, Resser Mark) and one filling station in Westphalia (Autohof) along the A1 and A2 and also in Lower Saxony. At six of these, charging is even free of charge in 2012.

The combi-station developed by RWE combines the technology of direct current and alternating current charging at a single charging station. At the charging point for direct current, the DC-capable electric vehicle is charged with 100% bio-electricity in up to 30 minutes, and it only takes 20 minutes to reach 80%. This is certainly compatible with a normal break at a service station. In addition, the charging stations keep an AC charging point in readiness, which enables vehicles that can only be charged with alternating current to be charged within an hour. This means that gap-free recharging over a total distance of 400 kilometres is possible.

The project will be supported by the BMVBS within the framework of the funding project entitled “E-mobility in commuter traffic” of the model region programme. Within this framework, RWE Effizienz has set up more than 300 charging points in the Rhine-Ruhr region alone. The model regions Hamburg and Rhine-Ruhr were networked for the first time in the course of the project. Infos: Christopher Olvis, EnergyAgency.NRW, Tel. +49 (0)209/167-2812, email olvis@energyagency.nrw.de, www.kraftstoffe-der-zukunft.de

Electromobile trucks

Urban regions are finding it increasingly difficult to organise the supply of goods and services efficiently and in a way which is viable from the economic point of view. In addition, there are uncertainties with regard to future introduction of a city traffic charge in environmental zones and in urban regions.

The objective of the Elmo project concerning electromobile urban commercial traffic – is therefore to make use of electric utility vehicles for making deliveries in inner city areas. Here, restrictions such as, for example, charging and vehicle range must be taken into consideration and solutions must be sought. In addition, charging infrastructure must be provided at possible loading and unloading locations. A further requirement is to train operators in the use of the technology and to build a network of qualified servicing personnel in order to minimise down times. The partners in the project are Fraunhofer Institute for Material Flow and Logistics (IML) in Dortmund, the City of Dortmund Economic Development Agency and also the companies ABB Busch-Jaeger, CWS-boco, TEDi and UPS Deutschland, who want to make use of the electrically-driven trucks in their delivery fleets.

Particular emphasis is placed upon making entry into electromobility as simple as possible for participating countries. Processes should only need to undergo minimal adaptation in the organisations themselves in order to increase acceptance for the electric vehicles. The project is a constituent of the model region Electromobility Rhine-Ruhr (Phase II) and is funded by the Federal Ministry of Transport, Building and Urban Development.
Battery recycling for electromobility

The performance and costs of batteries will also in future play a considerable part when it comes to the attraction and cost-effectiveness of electromobility. One aspect is that of battery recycling. Already during the development of the battery manufacturing process, the battery manufacturers consider advanced recycling concepts in relation to safety when taking back the batteries and the recycling that follows. Furthermore, it must be assumed that efficiency and environmental standards will become more important all over the world over the next years, and that raw material prices for materials, such as cobalt or lithium, will increase. Therefore, early development of effective recycling processes with high recovery rates are of strategic importance.

Development stage
Recycling processes for lithium-ion batteries from vehicles are currently still at an early development stage in international terms. Initial cooperations of vehicle manufacturers have been announced or have already been received, such as for example General Motors with the Swiss company ABB, Nissan with a joint venture with the Sumitomo Corporation and also the Californian automotive manufacturer Tesla Motors with the Belgian company Umicore. Umicore will, for example extract different materials such as cobalt and nickel from end-of-life lithium-ion batteries in its UHT plant, and after this convert the cobalt into a high-quality cobalt-lithium oxide, which can be sold on to battery manufacturers, such as for example clean integrated slag. The recycling technology means that the CO₂ that is generated in the manufacture of lithium-ion batteries can be reduced by 70%.

Different recycling processes
In order that the automotive and supply industry in Germany will profit from battery recycling in the future, the Federal Ministry for the Environment (BMU) funds research and development work into recycling processes for lithium-ion traction batteries, taking economic and ecological aspects into consideration. As it is already clear today that in future lithium-ion traction batteries with different material combinations will be on the market (e.g. lithium iron phosphate, cobalt-based systems), different recycling processes can also prove to be suitable. Therefore within the funding focus of battery recycling, two projects are receiving funding which follow different approaches in the area of metallurgical processes – the project LithoRec with hydrometallurgical processes, and the project LIBRi with pyrometallurgical processes.

With the early development of recycling processes for Li-ion batteries, the LIBRi and LithoRec projects are making a contribution to the future competitiveness of the German automotive and automotive supply industry. In addition, the processes for recovery of lithium and cobalt are of both ecological significance and also of strategic significance for securing of raw materials for battery production in Germany.

2nd life
Increasing attention is also being paid to further use of old batteries in stationary applications, the so-called “2nd life concepts” for batteries, and also to the theme of battery logistics. Only recently, Renault signed a cooperation agreement with DHL International GmbH for the battery logistics of the coming generation of electric vehicles. According to the contract, the global logistics company will undertake despatch of the lithium-ion batteries to Renault sales outlets in Europe and Asia. In addition, the Bonn transportation specialist takes care of the return of used batteries to the Renault recycling centre at its Flins factory.

Battery Day NRW
“Battery Day NRW”, which as its name implies is centred on battery-related themes, will take place from 05-07 March 2012, followed immediately by the “Advanced Battery Power” expert conference in Münster. The event will again be organised by Haus der Technik in Essen, the clusters NanoMicro+Materials, Energy Research and EnergyRegion.NRW and also the university institutions ISEA and Meet. The events will take place under the patronage of NRW Science Minister Svenja Schulze.

Further information is available at www.battery-power.eu and www.kraftstoffe-zukunft.de
Jan Peckolt discovers NEMOS

Plant research for energy turnabout

The Klein-Altendorf campus is the teaching and research station of the faculty of agriculture at Bonn University. The focus is on plant and horticultural sciences, renewable raw materials, agricultural engineering and business management. Klein-Altendorf lies in the region between Rheinbach and Meckenheim, a region specialising in agricultural and fruit cultivation.

The AgroHort project is embedded in the “Garten der Technik” concept within the framework of the Regionale 2010 of the state of NRW. It is funded by the EFRE programme of the EU and is supported by the NRW Science Ministry. AgroHort consists of six parts: in the “AgroHort :phäno” project, a greenhouse is being constructed in which stress scenarios such as dryness and the impact of salt and also lack of nutrients are investigated in-depth. A sensor makes it possible to undertake non-destructive examination of the plants. In “AgroHort :med” work is in progress on the optimisation of production of medicinal and spice plants in a new type of greenhouse which offer a high level of transparency to light and a percentage of natural UV radiation. The “Rain shelter planting area”, which is to be included in the “.rainout” project, is intended to keep rainfall away from plants without changing the basic conditions of outdoor cultivation in order to adapt plant species to future climatic conditions.

In order to provide independent wood-chip fuelled heating for the campus, a solar dryer for biomass from sawn timber and wood cleared from fruit plantations and plantations with a rapid turnover is being developed within the “AgroHort :solar” project. The dryer should be as simple as possible, low-cost and practicable for the intended areas of application. The second partial project, which is concerned with energy concepts, is “AgroHort :energy”. In this project, new process chains for efficient provision of alternative biogenic fuels from fruit plantations and those with a rapid turnover, and also from elephant grass (miscanthus) are under investigation. In addition to cultivation and crop management, new harvesting methods are also being considered. The final element within the project is the development of “designer fuels” in the form of mixed pellets and briquettes of the aforementioned alternative biogenic fuels for use in small- and large-scale heating installations.


Jan Peckolt discovers NEMOS

As a former Olympic sailing champion, 30-year-old Jan Peckolt knows all about the power of the waves. Who else, one would think, would be able to convert the energy of ocean waves into electrical energy?! NEMOS (which stands for use of energy potential of waves in offshore wind farms for electricity generation) is the name of the project, which has won several prizes for Peckolt, currently working towards his doctorate at the Institute of Ship Technology, Ocean Engineering and Transport Systems of Duisburg-Essen University.

It all started with an idea, which led to a degree thesis – and then resulted in NEMOS. The NEMOS installation consists of a long floating body, which is attached to the ocean floor with three cables. This moves with the waves and transfers mechanical energy via a cable to a generator which is positioned on the tower of a wind turbine, protected against sea water. The new features of Peckolt’s development are above all the path of movement of the buoyant body and the control strategy, which means that up to 80 per cent of the incoming wave energy can be used to drive electrical generators. Conventional systems with purely vertical movement have an efficiency rate of well below 50 per cent. Five buoyancy bodies can be used in conjunction with one wind turbine, providing electrical energy for the equivalent of 1,000 households.

The potential is considerable. “In this decade, up to 7,000 offshore wind turbines will be installed in Europe alone. The areas of water where they will be placed offer considerable energy potential from waves”, explains Prof. Bettar el Moctar, Director at the Ship Technology Institute of Duisburg-Essen University. Various commercial enterprises have already expressed their interest in the NEMOS project, including a large technology group and an energy supply company. Jan Peckolt: “The aim is to install a pilot plant in the North Sea in 2013/2014.” A tough environment, but one that he knows well. Infos: Dipl.-Ing. Jan Peckolt, email info@nemos.org, www.nemos.org.
Convergence of power and gas grids:

**Electricity storage**

It is urgently necessary to build sufficient storage capacity for the fluctuating supply of electricity from wind farms and photovoltaic installations. One possibility that is already known is seasonal storage using electrolytic production of hydrogen and eventual use within the existing gas supply network. Wherever CO$_2$ is available, for example from the refining of biogas up to natural gas quality, it is possible to process it further in conjunction with hydrogen to produce methane.

It is fundamentally the case that conversion losses occur each time energy is stored. Therefore the basic principle applies: avoid storage as far as possible! When storing energy via hydrogen, therefore, only those portions should be used which cannot be directed used. In addition, the proportion of wind energy can be raised if the turbines do not have to be taken out of operation when the energy cannot be transferred on for use or storage. If the calculations of the integrated energy and climate protection programme of the federal government are taken as a basis, which forecast a 20 per cent surplus of wind energy yield for the year 2020 (around 15 TWh/a) a quantity of methane is obtained which – produced with the help of hydrogen and fed into the natural gas grid – accounts for a proportion of 4% of the energy.

The potentials of different methods of energy storage and their usability for storage on an hourly, daily or seasonal basis vary. The potential performance of the gas infrastructure in this context is not limited to its actual storage capability, but must also be seen in terms of the efficient use of the chemically-bound energy. In order to take advantage of this, the electricity and gas networks have to be linked by means of “agents” which are equipped with the necessary electronic systems. While conventional natural gas provides the necessary “backbone” for the different partial networks at the different pressure levels, increasing volumes of biomethane are also being fed in – supplemented by the hydrogen-based and synthetic methane created by electrolysis within the electricity network. In addition to highly-efficient conversion into heat and use within industrial processes, combined heat and power plants will also find their place, their use also helping to avoid a large proportion of CO$_2$ emissions.

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Dr.-Ing. Bernhard Klocke, Gelsenwasser AG, email bernhard.klocke@gelsenwasser.de and Margit Thomeczek, Power Plant Technology Network of EnergyAgency.NRW, email thomeczek@energieregion.nrw.de
NRW is on the way to becoming the leading research and business region in Europe for energy and climate protection. “Far-reaching changes in the way we deal with energy are essential if we are to achieve the ambitious climate protection targets of the regional government. These changes will affect all areas of our society: industry, transport, the trades, wholesale, retail and services, and also private households. Progress not only links the economy and our ecology, but also includes social and cultural questions.” So said Dr. Beate Wieland, Head of the Research and Technology Department at the NRW Science Ministry, before 200 visitors to the 11th Annual Conference of the Fuel Cell and Hydrogen Network of Energy Agency NRW. This is why Science Minister Svenja Schulze started the “Progress NRW” initiative, which follows an integrative approach in NRW which also includes social and policy aspects.

This holistic approach takes NRW into consideration as a leader in the development and introduction to the market of fuel cells and hydrogen technologies and also in the Model Region Electromobility Rhine-Ruhr. “NRW wants to develop its leading roles in the area of innovative electromobility with battery and fuel cells, of stationary use of fuel cells, e.g. for combined heat and power regeneration and of uninterruptible power supply, and the storage of renewable energies even further. For export of high-performance components and systems for future energy solutions “Made in NRW” ensures the development of universities in the region and creation of innovative employment in very many organisations”, said Dr. Andreas Ziolek, Director, when describing the tasks of the future.

Further information: www.brennstoffzelle-nrw.de and www.energieagentur.nrw.de

Pellet-burning stoves are becoming more and more popular. According to forecasts of the German federation of wood for energy and pellets, DEPV, the number of pellet-burning stoves in Germany will continue to rise markedly.

Pellet-burning stoves are suitable for supporting other heating systems. In transitional phases, they may even mean that the main heating system does not need to be used”, said Heike Wübbeler, Director of “Action Wood Pellets” of Energy Agency NRW.

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Further information: www.aktion-holzpellets.de, email wuebbeler@energieagentur.nrw.de
Quality for Lüdenscheid hospital

As the first organisation in the Märkischer Kreis district, the hospital in Lüdenscheid (Klinikum Lüdenscheid) has been awarded the “Energy-saving hospital” seal of quality by Friends of the Earth Germany (BUND). The seal of quality is awarded to hospitals that are particularly committed to energy efficiency and climate protection. The Klinikum Lüdenscheid is the 33rd hospital to receive the seal: there are currently six hospitals with the seal in North Rhine-Westphalia.

The Klinikum Lüdenscheid has reduced its annual CO₂ emissions by 25.4 per cent within the last five years, fulfilling a central criterion for the seal of quality. This means that the hospital released over 3,200 tonnes less CO₂ into the atmosphere last year than in 2006 and saved energy costs of 930,000 euros. Altogether, the consumption of natural gas was reduced by more than 4,800 MWh and that of electricity by 3,600 MWh.

“We are very pleased that Klinikum Lüdenscheid fulfils the requirements of the BUND seal of quality and therefore demonstrates by example how energy requirements can be drastically reduced through intelligent solutions and the use of renewable energies. The hospital profits from the reduction in its energy costs and the enhanced value of the institution”, said the Regional Director of BUND - Paul Kröfges - when presenting the award before representatives of the NRW Climate Protection Ministry, the Märkischen Kliniken and the companies involved in the energy savings. Dr. Heinz Baues, Head of Department in the NRW climate Protection Ministry testified to the example set by the prize winner to other hospitals on the occasion of the award ceremony.

The most important energy savings were made in adapting the air conditioning equipment to real requirements: the control system was optimised, the central air conditioning equipment was fitted with a highly-efficient heat recovery system with adiabatic exhaust cooling and the cooling requirement for climate control was decisively reduced. This means that an output of 1,000 kW is sufficient for the new cooling installation, instead of the 2,000 kW used up to now.

New fan systems, consisting of radial fans with flat belt drive and high-efficiency motors and new frequency converters alone provided electricity savings of 2.2 million kWh. The investment for this area, amounting to 500,000 Euro, relates to annual savings of 300,000 euros. The new fans run more quietly and smoothly even at high belt speeds. Because there is practically no wear caused by belt friction, the lifetime of the belt is three to five times longer than that of V-belts. They are also 10 to 20 decibels quieter in operation than V-belt drives. To this was added commissioning of a gas-operated cogeneration plant with 1.2 MW electrical output, conversion of hot water production from steam to heating water, use of energy-saving lighting and also commissioning of first sun protection panels with solar cells.

The BUND seal of quality is initially awarded for five years. At the end of this period it has to be proven that additional energy has been saved. Renewal of the cooling stacks of the central climate control equipment in the main building is already in progress. Installation of photovoltaic systems and four small wind turbines on the hospital roof is already planned.

According to a study by the Fraunhofer UMSICHT institute, hospitals in Germany (Status 2007) consume around 12.5 million MWh of heat per year and 3.9 million MWh of electricity. According to the experience of the EnergyAgency.NRW, energy cost savings of up to 40 per cent can be achieved in hospitals. Even reduction of energy consumption by only 5 per cent would save a hospital with 500 beds 84,000 euros each year.

Further information: email toegel@energieagentur.nrw.de
NRW climate minister Johannes Remmel, on his “Tour de Climate Protection” through EnergyRegion NRW, recently focused public attention on the topics of heat+power cogeneration and energy storage. Remmel has been touring the state since last summer to demonstrate the diversity of work in the field of climate protection, to showcase innovative projects, business opportunities and companies, and to show that: “The energy turnaround is feasible”. Remmel’s tour was organised by EnergyAgency.NRW.

The co-operation agreed between the GIZ German Agency for International Co-operation and EnergyAgency.NRW has launched its first joint projects. GIZ has, for example, resolved to have EnergyAgency.NRW’s industry-specific energy concepts for hospitals, the paper industry and the recycling industry translated into Chinese.

The translations are initially to be supplied in electronic form to Chinese renewable-energy and energy-efficiency experts. If sufficient interest is aroused, the concepts will also be disseminated in print. There are, in the industrial sector, in particular, enormous potentials for enhancement of the efficiency of pumps, and of compressed air, hydraulic and drive/actuation systems.

EnergyAgency.NRW has been drafting industry-specific energy concepts since 1996. The idea behind them is seductively simple: small and medium-sized enterprises in an industry generally exhibit identical energy weaknesses - so what could be more obvious than to list these, together with corresponding potential solutions?

The heart of the Rönkhausen pumped-storage power plant

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Information, Motivation, Mediation

Interview: EnergyDialog.NRW advisory platform

EnergyDialog.NRW started its work in late June, 2011. This information and advisory platform for renewable energy in NRW is an NRW climate-protection ministry project, operated by EnergyAgency.NRW. Gerd Marx, head of the EnergyDialog.NRW project, and a departmental manager at EnergyAgency.NRW, along with Heinz-Jürgen Schütz, an EnergyAgency.NRW consultant, speak below on project targets, and on their activities and impressions during the first few months. Visit www.energiedialog.nrw.de for the complete text of the interview.

Climate-protection minister Johannes Remmel unveiled EnergyDialog.NRW six months ago. The info platform has been in the starting blocks since then - what has this project done up to now?

Marx: We’ve already launched more than twenty events on-the-spot in the municipalities, and supplied the necessary information. These "topic evenings" have been organised by the parties, who invited the citizens. All events were extremely well attended, and it is clear that there is great interest in this subject. We’ve also held seventy-five mini and fifty full-scale advisory events and talks in the localities.

Schütz: We offer not only advice and information, but also mediation and communications clearing. EnergyAgency.NRW advisors assist when there is a specific need for clarification on projects between various groups. A qualified external mediator is available for instances in which differences of opinion have occurred, and we’ve already forwarded several cases to him since June. But our main aim, of course, is to use EnergyDialog.NRW to inform and motivate people, to prevent conflicts in the first place. Two of our mediation projects have already been successfully completed, by the way.

With what concerns do people approach EnergyDialog.NRW?

Marx: Usually they have specific questions concerning the potentials for implementing particular projects. Let’s say, for example, someone has some money available, wants to invest it in renewable energy, and asks us what would be the best course. It may involve repowering, i.e. the replacement of old wind turbines with new, more efficient ones. Many representatives of the municipalities also ask for our help.

Schütz: Often, people ask about approval-law aspects. We can, of course, answer all legal and tax-law questions in detail, and we’re not allowed to, either - but we can provide initial orientation, and recommend experts whom citizens and municipalities can consult.

And what are your intentions for the EnergyDialog.NRW project in the near future, what has been planned?

Marx: Since November 2011, we have offered a circular event, initially on four different dates at four different locations. All these events had their own regional topic. Our partner was the NRW State Workgroup on Renewable Energy. We’re also co-operating with the Repowering Info Exchange - we place our faith in our co-operation partners, and in concentrating capabilities.

Schütz: We also want intensified talks with project planners - this enables us to hear what is happening in the municipalities, what they are planning, and where there are any problems concerning sites and actual projects. We can then pass on feedback to the politicians, which, for us, is also an important part of the dialogue.

Does EnergyDialog.NRW also have a declared specific target, in addition to impartial advisory and agency services?

Marx: We’re promoting the idea of more citizens’ energy facilities - it’s important to us, and we’re committed to it. We’re pleased to say that more and more such citizens’ projects are springing up - a pleasing trend, since it helps to keep the value chain in our region. We’re always pleased to advise people interested in founding operator corporations. Every approach of this type is a pleasure to us, but we also contact the municipalities on these topics directly, and provide them with suggestions for actively supporting such citizens’ projects.

Further information:

www.energiedialog.nrw.de
Five German Solar Awards for NRW

The German Solar Award covers eight categories - and, in November 2011, NRW took the prize for five of them. One recipient, in the “Solar Building and Urban Development” category, was the Schaffrath solar estate, in Gelsenkirchen, for its electro-mobility concept, inter alia. Other awards went to Asselner Windkraft GmbH & Co. KG, of Paderborn, Cologne’s Energiebau Solarstromsysteme GmbH, the “Heim-statt Tschernobyl e.V.” initiative from Bünde, in the “One World Co-operation” category, while Dr. Dieter Attig received a special prize for his personal commitment. These annual prizes are awarded by EURO SOLAR.

“The German Solar Award is of considerable renown. The fact that five of the prize-winners are from NRW underlines the importance of our state for future-viable energy supplies. Anyone wishing to find out how tomorrow’s energy will work will find sufficient successful examples in NRW”, enthused the state’s climate-protection minister, Johannes Remmel. “These awards are an incentive for acceleration of the energy turnaround at local level”, he continued.

Solar estate
THS Wohnen GmbH’s estate in Schaffrath, Gelsenkirchen, with its 422 residential units, has been upgraded to a solar estate across a number of years in the context of EnergyAgency.NRW’s “50 Solar Housing Estates for NRW” project. The estate’s existing buildings originate from 1960; the first energy-saving provisions were implemented as long ago as the 1980s, when the existing residential properties in this former miners’ estate were energy-modernised to conform to the then state-of-the-art. To complete upgrading to a “solar estate”, a photovoltaics installation with a total output of 825 kWp was installed on south-facing roofs in 2008. The solar power generated meets the average annual demand for around 340 households.

The Solar Award jury found the pilot project, involving two electric vehicles and initiated by THS Wohnen, to be particularly worthy of praise. These “electromobiles” are fed with “eco-power” at a charging station within the residential area, and are available free-of-charge to tenants under a car-sharing arrangement.

Asselner Windkraft
Since 1997, Asselner Windkraft GmbH & Co. KG has operated a wind farm featuring seventeen wind turbines in eastern Westphalia. The facility is owned by fifty-three citizens from Lichtenau and the surrounding area. Since May 2011, users in the town have been able to obtain their power directly and permanently from this wind farm. A new feature in direct electricity marketing is a price guarantee extending for not less than ten years. At 19.5 euro-cents per kWh, the price is, in addition, some 5% less than the regional power utility’s standard tariff.

Since 1992, the Heim-statt Tschernobyl e.V. initiative in Bünde has been working on behalf of the victims of the Chernobyl disaster, with the aim of improving their prospects. Two wind turbines, a number of solar installations and pellet-fuelled heating systems, a reed-panel production facility for building insulation and an out-patient treatment centre housed in the country’s first low-energy building have been completed in Belarus during the intervening years.

Energiebau Solarstromsysteme GmbH, of Cologne, received the German Solar Award for the “Companies” category. Founded in Cologne in 1983 as a consulting and engineering agency for energy-efficiency and renewable energy, the enterprise has grown into an internationally active photovoltaics system supplier with more than three hundred and fifty employees. Its core functions include marketing of solar-power systems and components to a Germany-wide network of specialist partners in the electrical trade. The company is also known for its work in the development and production of a module-fixing system for flat and sloping roofs. Energiebau Solarstromsysteme GmbH is a partner in EnergyAgency.NRW’s “Photovoltaics NRW” campaign.

Dr. Dieter Attig
Dr. Dieter Attig was presented with the German Solar Award as a special acknowledgement of his personal commitment. Attig, a PhD engineer, was initially the director of the Stadtwerke Lemgo municipal utility for a period of twenty years, and gained a reputation for his commitment to the expansion of the town’s district heating system and the development of standardised CHP plant units. He was appointed chairman of the board at STAWAG (Aachen) in 1997, and was a prominent pioneer in the use of bio-energy throughout these years. Together with three other municipal utilities, he founded, as the initiator and an important contributor of ideas, Trianel GmbH, as a trading platform for independent municipal utilities. Attig now works for the Saarbrücken municipal utility, and is president of the German Cogeneration Association.

Further information: www.eurosolar.org; www.klimaschutz.nrw.de
Sought: Municipal climate protection managers

The first further-training event for municipal climate protection managers, held in Essen in late 2011, was brimming with climate-protection know-how. The event was jointly organised by the Training Centre for the Disposal and Water Management Industry (German abbreviation: BEW), EnergyAgency.NRW and the State Agency for Nature, the Environment and Consumer Protection. Ninety-three climate protection managers, both male and female, are currently at work throughout Germany, twenty-nine of them in NRW. This new occupation derives from the federal government’s “Integrated energy and climate protection programme”, which provides financial subsidies for deployment of such managers at municipal level.

“The further-training course is aimed at giving climate-protection managers practice-proven tools for the energy turnaround at local level”, explained Michael Müller of EnergyAgency.NRW. The first candidates from NRW possess a diverse range of qualifications - but not all of them, of course, can offer experience in building modernisation, financing or environmental certification. The practice reports by the “old hands” from municipalities with longer experience in climate protection concepts were therefore correspondingly well received. These reports focussed on:

- Financing models for towns and cities
- European climate-protection networks
- CO₂ balancing
- Guidelines for municipal climate protection
- Effective climate-protection communications

The entire Oberbergisch District has committed to climate protection. Due to this region’s special topography, however, not all provisions can be implemented. Our towns nonetheless demonstrate that it is possible in principle to recover energy from renewable sources, whether from the wind, from water or from biogas, virtually everywhere. Upcoming years will show whether we can achieve our aim of the electrically self-sufficient town and county, Daniel Rutz, Climate Protection Manager, Wipperfürth

New application phase!
The federal environment ministry’s climate protection initiative provides incentives for the achievement of modern, reliable, climatically safe energy supplies in the long term. The ministry’s aim in this national initiative is the exploitation of the potentials available at municipal level. There is great demand for “promotion of climate protection projects in social, cultural and public facilities”, and no less than 362 projects had been implemented in NRW alone up to 2011. New applications for financial support can be submitted to Projektträger Jülich, the project organiser, from 1 January to 31 March 2012. Subsidies are again available, inter alia, for the appointment of climate-protection managers and for the drafting of climate protection concepts. Information on what and who is eligible for subsidies, and on subsidy rates and available advice, can be found at: www.kommunaler-klimaschutz.de. Further information: email m.mueller@energieagentur.nrw.de

“85 per cent of the municipalities in our government district operate with budget restrictions. This does not mean that climate protection is not possible here, however, but municipal climate protection managers must have precise knowledge of the rules, and consult with their treasurers as early as possible”, Udo Kotzea, Cologne Regional Government

“Participants’ feedback, and also the long waiting-list for future seminars, have convinced us that this programme meets precisely the needs for extended and further training”, is the conclusion expressed by Monika Flocke of the BEW. The next further-training block is therefore to be introduced in 2012. Of particular interest to municipalities in NRW: from January 2012 onward, applications for subsidies for the deployment of climate protection managers can again be submitted.
Bulbs for industry

EU directives will result not only in the incandescent bulb disappearing from the market: the mercury-vapour lamp widely used in industry and frequently referred to by the trade designation “HPML” is also to be banned in the near future. The “incandescent bulb of industry” is to lose its CE approval and marking from 2015 onward, and may no longer be sold, once existing stocks have been exhausted. Although the mercury-vapour lamp performs better than the conventional incandescent bulb on efficiency criteria, more environmentally friendly and efficient light sources are to be given market priority in the future. As might (almost) have been anticipated, many companies are reacting by laying in stocks of mercury-vapour lamps even now. The change to more economical lighting systems is the more rational solution, however. Our graphic illustrates the efficiencies of the lighting technologies most widely used in industry.

A number of different variants are available when selecting the most appropriate lighting system:

- Conversion to LED technology.
- Use of metal halide lamps, with their higher efficiency and improved light quality. Conversion achieves not only higher cost-efficiency, but also improved colour rendition and a lower loss of luminous flux across service-life.
- Conversion from high-pressure to low-pressure technology (fluorescent lighting). The advantage of fluorescent illuminants: depending on their

Germany’s largest brine/water heat pump

Many existing school buildings were constructed in the 1970s, a period in which a litre of fuel oil cost less than 10 euro-cents. The focus of the time was on generously dimensioned building complexes, and much less on lifetime operating costs. Economies were made on the building shell and technical equipment, and the words “thermal insulation” and “energy-efficiency” were effectively unknown. The costs for heating and cooling of such buildings have now risen to such a level that it is necessary to defer many necessary modernisation provisions, due to lack of financing. Another problem is the fact that the technical equipment in the classrooms no longer meets the needs of modern education. What can be done in this situation?

Efficiently thermally insulated buildings that can be heated using renewable energy are the solution. An example can be found in Duisburg, where the new Centre for Occupational and Further Training ( abbreviated ZBW in German) has been constructed as a PPP (Public Private Partnership) project. The new training centre, with a total floor area of around 56,000 m², provides modern, well lit workshops, laboratories and classrooms for some 2,600 pupils. An auditorium, a students’ refectory and a four-court gymnasium with a spectator stand are integrated into its central core. A two-level underground car-park provides 450 spaces for use by students, teachers and visitors. The complex has been planned and constructed, and is to be operated, by Goldbeck Public Partner GmbH, of Bielefeld; the building itself was designed by the Dohle + Lohse Architekten GmbH firm of architects, from Braunschweig. Germany’s currently largest brine/water heat pump, with an output of 1.5 MW, is used for heating and cooling; a probe array of 180 bores extending down as far as 130 metres provides the heat source.

Event venue

The ninety participants at the 11th Specialist Heat Pump Conference had the opportunity of seeing the building and its energy concept in action for themselves last autumn. Papers on VDI 4640, on noise suppression in air/water heat pumps, on the Germany-wide heat-pump field test, on smart grids and on heat-pump optimisation provided...
Co-operative power generation

Continuously rising electricity prices and the will to achieve the energy turnaround are motivating more and more people to seek alternatives. Photovoltaic (PV) systems and mini combined heat+power (mini CHP) plant units, with electrical outputs ranging from 5 to 50 kW, can reduce dependence on the large power generators. PV generates electricity only when the sun shines, whereas a mini CHP plant supplies around the clock.

The current trend is toward citizens’ energy facilities. In the cogeneration (heat+power) field, too, co-operation, resulting in the construction of a citizens’ energy installation, can also offer interesting amortisation periods. One such project has, for example, been successfully implemented in Bergheim, where two mini CHP units, each of 5.3 kW, have been installed in an owners’ cooperative with more than sixty residential units. This facility generates around 60,000 kWh of electricity, and cost-savings of some 9,000 euros, annually.

The principle of a CHP plant unit is based on a generator (for generation of electricity), driven by an internal combustion engine. The surplus heat from the engine is recovered for use via heat exchangers. In modern CHP plants incorporating heat+power cogeneration, the input fuel is utilised up to 80 to 90 per cent, thus achieving an efficiency significantly greater than that for conventional, separate, generation of heat and power. A CHP unit is particularly interesting in the case of properties which require large amounts of electricity and heat throughout the year, such as a multi-dwelling building with a central hot-water supply. The question of power utilisation also arises, in addition to the technical design of the CHP unit. Where power is fed into the public grid, the CHP plant operator receives not only the market price, but also a bonus under the Cogeneration Act. Operation is nonetheless frequently not cost-efficient, and direct consumption of the electricity generated by the residents is the more profitable option. Great administrative complexity arises when the CHP plant operator officially becomes an energy supplier as a result of selling electricity to residents, however. This situation can be avoided if the residents found, for instance, a civil law partnership which operates the CHP plant unit to supply them. Expert advice is extremely useful here for clarification of the associated fiscal and legal questions.

A calculation tool for CHPs is available on EnergyAgency.NRW’s Internet site at www.energieagentur.nrw.de/bhkw-rechner. Further information: email kabus@energieagentur.nrw.de or gehles@energieagentur.nrw.de

ballast, they can be dimmed, and can be switched more frequently without problems occurring. They are therefore particularly suitable for environments illuminated on a daylight- or presence-dependent basis. As innovative examples drawn from practice illustrate, the fluorescent illuminants used can, depending on the ballast unit selected, achieve a significantly longer service life.

Detailed planning and calculation of light distribution is vital whenever lighting systems are due for renewal; the at first glance “cheap” standard lighting solution generally results in high lifetime costs in terms of power consumption, maintenance and replacement illuminants. EnergyAgency.NRW can provide comprehensive know-how on all aspects of lighting. Contact: email buschmann@energieagentur.nrw.de

an overview of the current status of heat-pump technology in Germany. The conference was an event organised in co-operation between EnergyAgency.NRW and the NRW Chamber of Architects, the NRW Association of German Master Builders, Architects and Civil Engineers, the NRW chapter of the National Association of Independent Property and Housing Enterprises, the NRW Chamber of Civil Engineers and the VDI Society for Energy and Environment (VDI-GEU). Information: www.waermepumpen-marktplatz-nrw.de

innovation & energy 1_2012 19
Professional energy controlling in Aachen

Anyone wishing to save energy firstly needs to know his or her energy flows, and what loads consume how much. The City of Aachen uses the E-View controlling instrument for its municipal energy management. The energy consumption of municipal buildings thus - when the users are included - becomes transparent and controllable. The investment of 380,000 euros has repaid itself since the start of the project in 2007.

E-View signifies, inter alia, the introduction of a fully automated fault and alarm management system which monitors flows of energy to municipal buildings. Operational problems can thus be detected, and countermeasures initiated, immediately. The consumption of municipal properties is currently monitored, 24/7, by an automated system which includes more than 1,000 meters in 167 buildings. The data registered are transferred to corresponding data-bases for monitoring of consumption. Plausibility and security checks are performed prior to this transfer, to verify the correctness of the data. A fault report is generated automatically if the transfer record indicates errors or if a meter stoppage occurs.

In addition, the fault and alarm management system implemented makes it possible to submit all consumption meters to a plausibility check as a function of outdoor temperature and/or of specified minimum or maximum consumption figures. The results are relayed for each specific property to the controlling department by email and analysed if significant deviations occur.

The data obtained can be viewed at any time via the Internet. Thanks to the use of E-View, around 61 per cent of the City’s electricity consumption, 64 per cent of its water consumption and 67 per cent of its heat consumption are now monitored. Information: Bernd Deil, Head of Technology Department, email bernd.deil@mail.aachen.de

2011 German Sustainability Award for Remscheid

The German Sustainability Award was presented for the fourth time in late 2011. Prizewinner in the Products/Services category was the NRW town of Remscheid. The Vaillant company received an award for its ecoPOWER 1.0, a cogeneration-based micro-CHP plant. As from 2012, municipalities will also be eligible to win the German Sustainability Award.

The jury praised the micro CHP plant as Europe’s first cogeneration system suitable for use in detached and semi-detached houses. It is said to achieve an efficiency of 92 per cent. Decentralised generation of heat and power avoids internal power-plant and transmission losses, with the result that CO₂ emissions can be reduced by up to 50 per cent in supply of smaller properties. The system’s efficiency thus better even that of conventional decentralised cogeneration systems for larger properties, and consumers benefit from savings on heat and power costs, and from their increasing independence of external electricity suppliers.

In the jury’s opinion, a significant market potential for the Remscheid cogeneration system can be expected in the next few years, even on the basis of conservative estimates, since it is suitable for both new properties and modernisation projects.

The “KI.KA Children’s Sustainability Day” was also held, for the first time, in the context of the German Sustainability Day. Under the motto of “Children build the Future”, around sixty children from all over Germany formulated a petition demanding, inter alia, “Air-conditioning off, windows open, less heating”, and also “Mandatory social-service hours for people earning more than 100,000 euros annually” and “Every politician should spend one day a year in a wheelchair” - and sent it to the Federal Chancellor, Angela Merkel.
NRW: New climate initiation programme

NRW’s state government has resolved on a further module in its climate protection policy, in the form of an extensive initiation programme on climate protection. This package includes a total of twenty-two individual provisions in ten topic areas, and has a volume of several hundred million euros of subsidies and loans, of which 200 million euros annually for energy-modernisation of buildings, and a “Heat+Power Cogeneration” impulse programme, valued at 250 million euros spread across a number of years. The provisions extend from the state government’s own initial undertakings on its road to climate neutrality, via the provision of low-interest loans for the promotion of energy-modernisation of buildings, up to and including a power-saving initiative for low-income households. A number of the planned measures have already been launched in recent months. The overall programme comprises the following provisions, inter alia:

- Climate protection package for municipalities
- Climate protecting construction and living (energy-modernisation)
- Power-saving initiative for low-income households
- New impulses for the energy structure of the future: 250 million euros for heat+power cogeneration programme
- My energy turnaround: Information campaign, in co-operation with the consumer centre, for private households
- New wind-energy directive
- Energy- and resources efficiency in companies: NRW.Bank loan programme, and expansion of the “Mod. EEM” pilot project
- Networks/storage facilities: setting-up of a virtual institute on the topic of energy networks and boosting of these subjects at EnergyAgency.NRW
- Initial steps toward climate-neutral state administration, including conversion of state ministries to eco-power.

Alongside the planned Climate Protection Act and the Climate Protection Plan, the initiation programme on climate protection is the third element in the state’s new climate-protection policy. The state cabinet launched the draft of the first German Climate Protection Act incorporating mandatory climate-protection targets in late June. Here, for the first time in the Federal Republic of Germany, reduction targets for greenhouse gas emissions are actually specified in an Act of Parliament. The overall total of greenhouse gas emissions in NRW is to be reduced by not less than 25 per cent by 2020, and by not less than 80 per cent by 2050, referred, in both cases, to total emissions for 1990. In addition to the immediate action programme on climate protection and the Climate Protection Act, the cabinet also resolved on the initial orientation points for the climate-protection plan, which is to be drafted in the context of broad social dialogue. Alongside sectoral, regional and chronological specification of climate-protection targets, the central aim of this plan is, above all, the drafting of provisions and strategies for the achievement of the climate-protection targets set out in the Climate Protection Act. The climate-protection plan is to be drafted in 2012, and then submitted to the state parliament for approval and corresponding resolution. Further information: www.klimaschutz.nrw.de

Study on renewable energy potentials in NRW

On behalf of the NRW climate-protection ministry, the NRW State Agency for Nature, the Environment and Consumer Protection is currently conducting a study into the potentials for renewable energy sources in the state. This study is intended to supply comprehensive information for the designation of sites and for the planning of installations. For wind energy, for example, state-wide wind charts for great heights corresponding to the current state-of-the-art are being calculated. In the field of solar energy, state buildings are being evaluated for the use of photovoltaics and solar ther- mics. The potentials at county or municipal level are being determined for every type of energy. The results of this study of potentials are ultimately to be incorporated into a technical information system. Knowledge of current use of renewable energies and the potentials determined will make it possible to read off, for every city and municipality, the level of self-sufficiency already achieved, and the areas in which further potentials exist. Initial results can be anticipated in mid-2012. Information: www.lanuv.nrw.de/klima/home_klima.htm

Lohmar adorns itself... with a so-called “addition to the city limit sign” bearing the title “European Energy and Climate Protection Municipality”. The town recently received the European Energy Award from NRW climate-protection minister Johannes Remmel in Wuppertal. Each of the fifteen winners received their own individual roadside sign as a prize - a trophy much in demand in these times of energy turnaround, and well received by the town’s citizenry. NRW municipalities and counties wishing to participate in the “European Award” municipal energy management programme should contact EnergyAgency.NRW.

Innovation & Energy 1_2012

21
Wilhelm Hartmann retires

After thirty-five years of work, Wilhelm Georg Hartmann, commercial director of EnergyAgency.NRW and ee energy engineers GmbH, has, since late 2011, been enjoying well-earned retirement.

The native of Bottrop firstly completed commercial training with the Karstadt department store chain, and subsequently studied economics in Essen. His first employment started on 1 April 1976 in the invoicing department of RWTÜV, also in Essen. Hartmann was seconded to Erfurt from January 1991 to June 1993, to provide support for the foundation of TÜV Thüringen GmbH, in the capacity of board member at TÜV Thüringen e.V. He was appointed head of the “General Commercial Services” department at RWTÜV e.V. in Essen in 1993.

With Dr. Frank-Michael Baumann, Wilhelm Hartmann became joint Director of ee energy engineers GmbH upon its foundation in 1996. This company was initially the sponsor for the NRW state future-energies initiative.

In conjunction with the founding of the joint EnergyAgency.NRW GmbH project company in early 2008, Wilhelm Hartmann then assumed joint management of this project corporation with Dr. Baumann, Lothar Schneider, and Prof. Norbert Hüttenhölscher.

Wilhelm Hartmann’s two adult sons, Thorsten and Matthias, and his wife, Helmar, now look forward to him having more time in future for trips to Greece which, thanks to his Greek friends in Bottrop, and to many previous visits to the country, has truly become his second home. The EnergyAgency.NRW team expresses its most sincere thanks to him, and wishes him and his family all happiness, continuing good health and, as German miners say, wishing each other safety and health: “Glückauf”!

Rebound, or: When the well-fed want more

There must be something wrong if energy-efficiency rises, but consumption doesn’t fall - in the case of heating energy, for example. Construction and modernisation are improving efficiency everywhere, but overall consumptions remain the same.

Or take mobility: engines are becoming more efficient, but cars are not consuming any less than twenty or thirty years ago. Experts refer to this phenomenon as the “rebound effect”. But what do they mean exactly? Thomas Reisz spoke to Dr. Michael Kopatz, of the Wuppertal Institute for Climate, Environment and Energy, Research Group “Energy, Transport and Climate Policy”, for “innovation & energie”.

Herr Kopatz, what is a rebound effect?
Rebound effects are basically nothing new - we’ve known for years that efficient products and services also set off additional demand. The awareness of having saved something trips off the feeling of being able to afford more. Modern central-heating systems have completely replaced inefficient coal fires, but then people started heating all their rooms. Or: people invest in energy-saving bulbs, and add a couple more straight away, because they consume so little. Or look at refrigerators with a zero-degree compartment, and tumble dryers. Overall, power consumption in private households has risen by around one and a half per cent over the past thirty years.

How does this happen?
The problem used to be to feed the hungry - now, it’s making the well-fed want more! This is the aim of advertising - products are given a certain status, and then generate a need to possess. The economy can only grow in this way.

Can I measure rebound effects? How large are they?
There are various causes for and definitions of rebound effects, so a general statement is difficult. There are studies which put the reduction in efficiency gains caused by such effects at up to 30 per cent. A broadened definition leads to the discovery that the general increase in affluence has up to now effectively negated practically all advances in efficiency.

So what can I do? Don’t education and enhancing awareness help in preventing this any more?
It would be awfully naive to think that awareness campaigns and education are enough! In most cases, they give people a guilty conscience - but not sufficiently to achieve any change in their behaviour! Rebound effects are an element in complex systems which overtax individuals when they search for solutions. In my experience, only a policy which has the courage to set a future-oriented framework can help in such cases.

A residential-building moratorium, with no new residential space being added on the net average, would be conceivable, for example. Or limitation of the weight of cars to 1.4 tonnes, and then down to one tonne in incremental steps. This could reduce gasoline consumption drastically. Anyone who considers his or her freedom restricted by such measures should take a look at Article 2 of the German Constitution: Everyone has the right to the untrammelled development of his or her personality, provided he or she does not infringe the rights of others. We are, in fact, currently abusing the rights and freedom of future generations.
“EU 2020 going local”

Expert delegation visits show projects in Düsseldorf

A total of fifteen regions from nine European states are investigating, in the context of the European “EU 2020 going local” project started in the autumn of 2010, how the decisive regional and local participants are implementing European climate-protection targets for the year 2010. The focus here are on climate change, renewable energy, energy efficiency and sustainable transport, the aim being to learn from one another on the basis of inter-regional interchange of experience, accomplished via workshops and study visits, across a two-year period.

At the halfway point of “EU 2020 going local”, the NRW, Duisburg and Achterhoek regions organised the Midterm Event, which was held in November in Düsseldorf, Duisburg and the Netherlands. The interchange between the individual regions at political level was backed up by conferences and a range of workshops, a highlight of the overall event being the visit of the European delegation to the Vaillant company and the Monastere residential district, in Düsseldorf, under the leadership of the climate protection ministry and EnergyAgency.NRW. The two excursions took place under the motto of “Applied efficient and regenerative energy generation”.

The delegation examined modern technological solutions from one of Europe’s leading heating equipment corporations at the Düsseldorf customer forum of Vaillant, a member company of the NRW Heat Pump Market Place. Particularly innovative developments examined included the Zeolith gas-heat pump and the company’s micro-cogeneration plant. The party then moved on to Düsseldorf’s Monastere residential quarter, which is notable for an out-of-the-ordinary energy concept implemented by the Düsseldorf municipal utility. A climate wall located at the entry absorbs solar energy, which is then used, together with geothermal heat, to supply the heating needs of the residential buildings. In summer, surplus heat is returned to the soil in a water-permeated layer of gravel and sand, to be reused when needed in the colder winter months. The system as a whole achieves annual CO₂ savings of just on 100 tonnes.

Grand challenges: Future power plants

The assurance of sustainable energy supplies is one of the world’s greatest challenges. A further rise in demand for electricity is also forecast for the next few decades. New research concepts will be necessary to master these problems. At the “Grand Challenges: Answers from North Rhine-Westphalia” series of events, the federal state is unveiling its conceptual solutions for these great challenges. At a November meeting in Brussels, for example, around eighty experts discussed with NRW economics minister Svenja Schulze the requirements made on a high-flexibility fossil-fuel-based power plant and market-mature solar thermal tower power plant technology.

High-flexibility fossil-fuel power plants

In Europe and, after a time lag, also in North America and Asia, wind and solar energy systems will feed high but greatly fluctuating amounts of power into transmission grids. It will be necessary to regulate these flows to match demand at all times, for which purpose not only storage facilities, but also, and above all, fossil-fuel-based power plants will be used. These facilities will, however, have to overcome totally new technological challenges in terms of flexibility, minimum loads and efficiency.

Market-mature solar thermal tower technology

Market-mature solar thermal tower power plants are suitable solution technologies in the sunnier regions of the earth. Such power plants need, for this purpose, to become significantly cheaper and more productive, however. Significant synergies result in the vicinity of the power units, due to the technical proximity of the two power plant types, and are to be systematically utilised in upcoming Research & Development efforts and in later production processes.

NRW is one of the world’s Top 3 power plant industry regions. Nowhere else can one find a partnership structure between science and industry of such density, extending across virtually the entire value chain. These unique preconditions are to be used to supply global markets with these two products. Concerted efforts will be assured by the “Rhine Ruhr Power” cluster, a co-operation project involving more than eighty companies and institutions from the Rhine-Ruhr region. Further information: www.cef.nrw.de and www.rhein-ruhr-power.net
Lippstadt commissions CHP plant unit

Lippstadt’s municipal utility has been operating a combined heat+power (CHP) plant unit at Eickelborn since early January. This unit, located on the municipal drains and sewers department’s site, supplies heat to the clinics run by the Westphalia-Lippe Landscape Alliance at Benninghausen and Eickelborn. The local energy supplier invested a total of around two million euros in this 2 MW CHP facility. The Eickelborn cogeneration unit is to operate for not less than 5,000 hours annually, and should cover at least 50 per cent of the clinics’ heat requirement – together, these buildings need more than four million kilowatt hours (kWh) of power and twenty-five million kWh of heat for their around 1,000 patients and residents. The utility feeds the power also generated in the CHP unit into its own electricity grid.

HyRaMP now HyER

The HyRaMP region partnership founded in 2008 and already boasting thirty-two members is now also focussing on battery-electric mobility. “HyER” (Hydrogen Fuel Cells and Electromobility for European Regions) has the aim of accelerating the market launch of fuel cell technology in general, and electromobility based on electricity (battery and hydrogen, the fuel cell), along with the necessary infrastructure, in particular”, states chairman Andreas Ziolek, of EnergyAgency.NRW. Further information: www.hyer.eu

2012 Photovoltaics NRW market survey

The new Photovoltaics NRW market survey accompanying the “Photovoltaics NRW – Solar Power for North Rhine-Westphalia” project is now available. This is where the campaign partners, from module manufacturers up to and including specialist installation contractors, highlight their companies and their products and services. Throughout Germany, more than one million photovoltaics installations now generate electricity from sunlight. The market survey can be viewed at www.photovoltaik.nrw.de, or can be ordered free of charge from EnergyAgency.NRW on 01803 19 0000.

13 March 2012: On the road to climate neutrality

Many companies and municipalities have realised that climate-neutral action can generate competitive advantages and distinguish them from their competition. But what instruments are available to them? What provisions for achievement of climate-neutrality have been tested and proven in practice? These questions are the focus of the “Avoiding, reducing and compensating CO₂. Municipalities and companies on the road to climate neutrality” event to be held by EnergyAgency.NRW and the Technische Akademie Wuppertal in the Wuppertal municipal assembly hall on March 13, 2012. An agenda is available at: www.energieagentur.nrw.de

First “home power plants” in the Ruhr

The first so-called “home power plants” have now been installed in Essen, Gelsenkirchen and Castrop-Rauxel. Energy-supplier LichtBlick installed the ten natural-gas-fuelled mini power plants in private houses, where they generate power and heat for each building. Surplus heat is stored, while power is fed into the public grid. The facilities, built by VW, are centrally controlled from Hamburg by means of mobile radio. NRW thus becomes the fourth federal state, after Berlin, Lower Saxony and Hamburg, in which the energy supplier has commissioned such systems. Three hundred and thirty home power plants, with a total output of 6.5 MW have been connected to the grid up to now. Information: LichtBlick AG, email ralph.kampwirth@lichtblick.de

Two new biomass brochures

Throughout Germany, renewable energy contributes 11 per cent of final energy consumption. Energy from biomass alone accounts for some 8 per cent of final energy consumption. The Renewable Energy Sources Act has been amended, and many exciting projects have started – occasion enough for Energy-Agency.NRW and its Biomass network to publish two new brochures: “Bio-energy - the multitalent among the renewable energy sources” provides an overview of the use of biomass for energy purposes. This brochure has been revised and reset. “Biomass - Specimen projects from North Rhine-Westphalia” is a completely new publication, focussing on projects worthy of imitation.

To order or download either or both brochures: www.biomasse.nrw.de