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Heat pump weeks in NRW
The Heat Pump Marketplace NRW will continue until 6th February. More than 200 events will take place in the whole of NRW, at the premises of participants in the marketplace, where it will be possible to get expert advice and hands-on experience with heat pump technology. In buildings where older heating systems are still gobbling up precious energy, heat pumps can offer a modern and convenient alternative. The calendar of events can be found at www.waermepumpenwochen.de.

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The following statement can be found right at the beginning of the Swiss CO₂ Act: “The reduction target should primarily be achieved through energy-related, traffic, environmental, financial policy and voluntary measures”. The fact that the voluntary measures are not only provided for in the act, but can also be seen in reality, is not least attributable to the establishment of the Energy Office for Industry and Commerce (EnAW). EnAW now includes around 1,900 participating companies and therefore covers around 40 per cent of the CO₂ emissions of Swiss industry. The achievements of EnAW in comparison with the year 2000 are considerable: it has been possible to increase the energy efficiency of the participating companies by 15 per cent and 969,000 tonnes of CO₂ were saved last year. Switzerland is well on the way to fulfilling the Kyoto Protocol!

What has led to the success of EnAW? EnAW works on the basis of target agreements. The target agreement is an agreement between the company and the Federal State which is drawn up by EnAW. The agreement can be of a purely voluntary nature or can have an obligatory character. On a voluntary basis, the companies profit from the reduced energy costs, an enhanced image and financial bonuses such as electricity rebates. If a company enters into an obligation, it is freed from the CO₂ payment liability if it achieves the targets set. EnAW helps to identify energy saving measures, but the company is basically free as to how it fulfils its targets. The relevant data are determined each year, enabling the companies to be constantly aware of the stage they have reached.

Therefore a great deal has been achieved. But we can still see considerable potential for reduction of energy consumption. Process optimisation, in particular, can be a source of further enormous savings. In order to achieve this, various improvements must be instigated: optimum utilisation of process heat, use of waste heat, improvement of process sequences and optimisation of products. However, we often find that companies are reluctant to intervene in their complex processes. Instead of analysing the processes in a systematic way, they handle them like a black box. We would like to encourage companies to open their black box and to take a very careful look inside. For with the methods of analysis which are available to us today, it is possible to represent even very complex processes clearly and to discover considerable savings potentials!
A systematic approach to any activity generally promises the best chance of success. And this is no different when considering energy savings within companies: an energy management system - verified by an energy expert - reveals and documents potentials which are available for improving energy efficiency and reducing costs. This results in recommendations as to how energy can be saved.

Efficiency potentials in industry are in particular based on increasing energy efficiency within production processes and cross-process technologies, reducing the use of energy through optimisation of material flows and also on energy-efficient product innovation and services together with energy savings through changes in human behaviour. However, experience indicates that potentials are not realised consistently across the board. This is where energy management can help.

Other countries in Europe have already gathered positive experiences with the introduction of energy management systems. In Finland, Austria and Switzerland for example, energy management is already a tried and tested instrument for improving energy efficiency in trade and industry and therefore for lowering CO₂ emissions. Experience shows that companies can achieve up to two thirds of their fuel-related energy-saving potential within two years of introducing an energy management system.

Neglect of efficiency potentials is attributable to a complex collection of economic, organisational, random and behaviour and communication-related barriers. The requirements placed on an energy management system in practice extends far beyond technical optimisation and includes the following tasks:

- Step-by-step implementation of improvements in operational organisation;
- Intensive communication with and involvement of energy users;
- Coordination of an agreed procedure between different departments such as production engineering, procurement and facilities management.

Standard DIN (BS) EN 16001, published in August 2009, can be used as a basis for introduction of a structured energy management system. This standard describes the requirements for an energy management system (EnMS) which enables a company to continually improve its efforts in the area of energy by means of a systematic approach and to take legal requirements and the specific needs of the organisation into consideration.

The aim is to create the basis for making technical and organisational investments in energy efficiency while assessing their ease of implementation and economic efficiency.

What steps are necessary for the introduction of energy management systems?

Current situation

The first stage in creating an energy management system is to analyse the current situation. This analysis should be general in nature and should show the energy requirement profile and developments over previous years based on:

- Supply contracts and tariffs for the different types of energy supply (natural gas, oil, coal, coke, district heating, electricity etc.),
- "Energy paths" through the organisation - i.e. what plant and equipment is supplied with what form of energy,
- Main consumers in the organisation,
- Situation regarding collection of energy-related data and obvious weaknesses and potentials for optimisation.

Data preparation

It is recommended that the results are prepared in the form of graphics. After this, the areas are laid down which have to be examined more closely. An ABC analysis should be carried out in order to set priorities, with the consumers and plant being placed in order...
Energy management

of their share in the total energy consumption. Experience indicates that it is generally sufficient to examine 50 per cent of the plant and equipment in order to determine 80 to 90 per cent of electricity consumption. This means that the priorities for the following stages can be set so that the limited time and financial resources can be used as well as possible.

Energy controlling

In a next step, the most important energy consumers should be subjected to detailed analysis. Although this so-called energy controlling requires a high level of measuring and organisational effort, this is surely justifiable in view of the comparatively large energy savings that can be achieved. The objectives of the detailed analysis are:

- Gaining of differentiated data regarding the energy supply and use structures of the company,
- Knowledge of the energy efficiency of the most important energy-related systems,
- Discovery, quantification and evaluation of weaknesses and also development of possibilities for improvement.

Energy controlling allows technical malfunctions to be discovered, identifies long-term consumption trends and also means that energy costs can be precisely assigned within cost centre accounting. This is not a project that is limited from the point of view of time, but is a permanent element within operating procedures.

The basis is continual measurement of the sub-consumers in a company and simultaneous determination of the factors which have a major impact on consumption such as:

- volumes produced,
- operating hours of plant and equipment and
- degree day numbers.

This data flows into a calculation of the energy consumption duly allocated to the originator in order - where necessary - to define savings potentials and incentives for reducing the energy costs of the different cost centres.

Introduction to the company

An energy controlling system is introduced in three phases:

- Preparatory phase: Compilation of the basic information regarding organisation and technical equipment of the factory, development of strategy
- Introductory phase: comprehensive analyses of the consumption data that has been collected, development of yardsticks for evaluation (e.g. using sector energy concepts or benchmarking)
- Implementation phase: continuous monitoring of consumption, regular consideration of the evaluation yardsticks and modification if necessary e.g. if plant and equipment are changed).

From controlling to concept

The actual energy concept generally includes both organisational and investment measures. It is basically the task of the company energy representative to draw up the concept, but depending on the complexity of the tasks involved, it is advisable to involve an outside consultant.

The aims of an individual energy concept can consist of:

- Optimisation of usable energy generation (e.g. replacement of obsolete plant and equipment, waste heat utilisation);
- Process optimisation (plant technology and organisation);
- Minimisation of the energy consumption of materials handling equipment, transportation and logistics;
- Realisation of savings potentials as regards building shells, heating, ventilation, climate control and lighting;
- Clarification of depreciation periods and questions of finance.

Energy management

In the medium and long term, introduction of factory energy management provides the conditions for improving the energy situation of the company on a permanent basis. This requires commitment to energy policy throughout the company, in other words energy management must be fully supported by the top management of the company, in the

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Virtual company

now online

EnergyAgency.NRW has now gone online with a virtual company (www.energie-im-unternehmen.de). It is now possible for companies or energy representatives to take a virtual tour and find out “on site” where there could be potentials for energy savings – whether for lighting, ventilation or compressed air generation. The typical weak spots as regards energy savings are shown within the virtual company. EnergyAgency.NRW is thus responding to the growing importance of the Internet. In addition to specialist articles and contacts to industry associations and federations, the Internet has become the most important medium for companies who want to gather initial information and basic knowledge in the field of energy efficiency.
Mod.EEM: modular energy management

Mod.EEM is a new pilot project for introduction of management systems into companies. Mod.EEM stands for "Modular Energy Efficiency Model".

The aim of Mod.EEM is to develop and implement an adaptable, web-based energy management system intended for companies with different structures and of different sizes. During the term of the project, the results and findings will be transferred into a web-based system. The product is due to be available to all companies in Germany at the end of 2010. EnergyAgency.NRW is undertaking this model project on behalf of the Federal Economic Affairs Ministry and that of North Rhine-Westphalia. Mod.EEM is directed towards all production companies in North Rhine-Westphalia – regardless of size. As Mod.EEM has a modular structure, all companies will be able to find a starting point for entry into the project. Mod.EEM also offers yet more in-depth information to companies who already have an integrated management system (for example DIN ISO 9001/14001, EMAS, ECOPROFIT).

Up to 100 companies will participate in the pilot phase of the project. Implementation of the energy efficiency model takes place in three packages or stages (basic package, intermediate package and advanced package). During the implementation phase, EnergyAgentur.NRW or qualified external energy consultants provides advice and support on site.

In addition to an analysis of the current situation, the basic package includes a comprehensive analysis of the energy flows within the company, including systematic documentation of the findings.

First step: The Mod.EEM-Check. This is the first stage in determining the situation as regards energy within the company, and is used as the basis for an individual project plan.

The energy report which is written in order to conclude the basic package serves as a basis for creation of an action plan. The action plan is in turn the starting point for a development meeting. This development meeting is held with an expert from EnergyAgency.NRW. In particular, an energy saving programme is developed during the meeting, taking the project plan into consideration.

The advanced package is the most comprehensive stage in Mod.EEM and presupposes intensive consideration of the and meet and exchange experience with others in the sector in national and international federations and knowledge platforms (e.g. 'Metall@proklima.de'). Thanks to all our tried-and-tested processes, we were one of the first companies to be certified for adherence to the EMS requirements according to Clause 41 EEC. Structuring of our energy management proc-

3 questions for
...Heribert Hauck

Energy costs within companies can be considerably reduced by means of energy management systems. Despite this, however, companies who implement such systems are still the exception. One of these exceptions is the company Trimet Aluminium in Düsseldorf. Innovation & Energie asks Heribert Hauck, Director of Energy Management at Trimet why this is so.

Why did you decide to start energy management?

Energy management is a must in the production of aluminium, as energy is our most important raw material and therefore our primary cost factor. We have therefore implemented active energy management since we have been producing aluminium and the fact that we are still in existence proves that we not so bad at it. Otherwise we would have had to close down our production locations long ago for financial reasons. But as we know, it’s always possible to do that bit better, and this also applies in particular to us. For better energy efficiency provides a significant competitive advantage. And this not only applies to our main process, that of electrolysis; in fact, for us energy efficiency is a company philosophy which is incorporated in all of our strategy. If we think and act in an energy-efficient way in all areas and at all levels of our business, the resulting expertise which is so vital to our business develops an impetus of its own - and this must be our overriding aim.

What has been your experience since the beginning?

Since 2000 we have participated regularly in the ECOPROFIT programme, undertake an annual energy benchmarking process with other aluminium smelters in Europe,
subject of energy within the company. The advanced package is intended to ensure the sustainability of the success achieved to date by implementing continuity. Entire improvement cycles are developed from individual measures, which are then optimised continuously based on the PDCA (plan-do-check-act) cycle. Savings targets are systematically followed up and implemented which also leads to achievement of energy efficiency targets and reduction of CO₂ emissions. EnergyAgency.NRW takes on the role of moderator in this.

In the ideal case, energy management is continued independently by the company itself after the end of the pilot project.

Information: EnergyAgency.NRW, Thomas Gentzow, Tel. +49 (0)211/86642-295 or Gerald Orlik, Tel. +49 (0)202/24552-33

esses in accordance with this system has helped us take another important step forward, and awareness of energy efficiency in our company has grown still further. Therefore it is only logical that we participate in the Mod.EEM (Modular Energy Efficiency Model) project.

What do you now hope to gain from Mod.EEM?

By participating in Mod.EEM we are hoping to gain further stimulus for energy-saving technologies and methods from other participants in the project and to share our ideas with them. We are also hoping for possibilities to explore ways of making our energy management tools and processes yet more systematic. We also see Mod.EEM as a “spinoff” as it were, through the implementation of ISO 16001 as a – certifiable – standard for our approach to energy management.

Continued from Page 5 >>>

same way as environmental management.

A sector energy concept can be an important aid when developing sector-specific solutions or energy concepts. As might be imagined, the logic of this instrument is simple enough: companies from the same sector not only exhibit similar technical structures, but also comparable weaknesses when it comes to energy.

Important conclusions

If individual companies within a sector are examined in detail from the point of view of energy, a sector energy concept can be drawn up, in other words the results of the examination with regard to energy savings can be transferred to a large number of companies with regard to possible savings potentials. This results in practical guides and navigation instruments for targeted optimisation as regards energy which takes the special features of the individual sectors into consideration.

Initially, measures can consist of organisational or technical changes that are simple to implement, but can lead to comprehensive modernisation with the support of expert advisors.

Energy efficiency and profitability

An example calculation relating to the textile industry shows the effect that an increase in energy efficiency can have on profitability. With an average return on sales of 2.5 per cent, a 5,000 € decrease in energy costs is equivalent to an increase in sales of 200,000 €.

Key energy figures

For the purposes of orientation and target definition, benchmarking systems and key energy figures already exist for many sectors. Examples are the average share of electricity in the total use of energy or the proportion of energy costs within overall costs. Well-known environmental management systems such as the EMAS environmental audit standard, DIN ISO 14000 and also the ECOPROFIT System also work in part on the basis of characteristic figures which have been introduced or are used in day-to-day company practice. Against this background, many companies will already have a basic stock of energy-related characteristic numbers, which can be compared with values which are typical for the sector.

In many other sectors, industry federations, chambers of industry and commerce and also EnergyAgency.NRW can supply figures for the purposes of comparison.
Heat pump for mosque

The mosque in Neuss-Norf, a town in North Rhine-Westphalia, enjoys energy-efficient heating thanks to two air-water heat pumps. For the 350 members of the “Anadolu Camii” mosque, expensive heating bills and cold feet are things of the past.

The mosque on the outskirts of Neuss not only consists of the large prayer chamber, but also has several event rooms of different sizes and also a large bathroom area with a corresponding need for large volumes of hot water. The mosque is completely financed by a non-profit organisation and therefore by the members of the organisation. This was one of the most important reasons why it was important for the annual maintenance costs not to be too high. Previously the water for the heating system and the service water was heated by a gas boiler. However, constantly rising gas prices and the annual gas bill of 15,300 euros simply became too expensive, so more economical alternatives were sought.

The companies Haus-Tec and Hatus, each with headquarters in North Rhine-Westphalia, have together developed a concept in which two air-water heat pumps, each with a capacity of 33 kW, are responsible for service water and water used in the heating system. Based on the expected savings of around 6,700 euros per year, both the heat pumps will have paid for themselves in eight or nine years. “This example shows very clearly that heat pump technology offers many advantages – also for non-residential buildings” says Dipl.-Ing. Sven Kersten, Head of the Heat Pump Marketplace of Energy-Agency.NRW. Savings as regards fossil fuels, the possibility of also using heat pumps for cooling and reduction of CO₂ emissions are convincing arguments. Kersten: “But heat pump technology also offers economic advantages compared with fossil fuels through the use of regenerative green heat”. Further information: www. waermepumpen-marktplatz-nrw.de or E-Mail kersten@energieagentur.nrw.de.

NRW Power for E-world

The regional government of North Rhine-Westphalia is demonstrating innovative energy technologies at the E-world energy & water exhibition with its energy economy cluster “EnergyRegion.NRW” and “EnergyResearch.NRW” research cluster. The exhibition is taking place from 9 to 11 February 2010 at the Messe Essen site (Hall 3, Stand 370), where there will be a joint stand with an area of 450 m². Here, a total of 20 companies and scientific institutions will demonstrate their expertise in the areas of power plant technology, fuels and drives of the future, energy efficiency and renewable energies for use in buildings and also photovoltaics while EnergyAgency.NRW will present its comprehensive range of services. In addition, experts will provide information on opportunities for German companies in foreign energy markets at the expert Info Point, also at the stand. The Springer-VDI-Verlag publishing house will be attending as media partner.

The 14th Expert Conference on Future Energies is taking place on 9 February 2010 during the exhibition. Christa Thoben, Minister for Economic Affairs in NRW, will officially open the conference and the exhibition. Technical concepts and operating models for electromobility along with the approach to electromobility in the

The organisers have also introduced a new area in the form of “smart energy”. Invoicing service providers, providers in the area of smart metering, energy supply companies, manufacturers of electric vehicles and plant and equipment manufacturers will present their products in a communication area, while an integrated forum will offer corresponding lectures and panel discussions. There will also be a matchmaking event to open up opportunities for new contacts with potential business partners in Germany and abroad. Even before the E-world exhibition itself, it is possible for participants to introduce themselves on an online platform at eworld.b2bmatchmaking.com, to look at the profiles of possible partners and arrange for meetings.

The exhibition will attract even more attention because of the “Consulates Day” scheduled for 10th February 2010. Following its successful premier last year the 2nd “Consulate Day” will again offer exhibitors and visitors the opportunity of making contact with international business partners.

Information: www.e-world-2010.com

Please note: NRW Evening on 9th February starting at 18:00 at the exhibition stand (Stand 370) in Hall 3.
The current forecast for the heat pump sector was presented by the Federal Heat Pump Federation in Berlin. The aim of the study is to investigate the potential of heat pumps for sustainable heating provision and, in order to achieve this, two scenarios were formatted based on realistic assumptions. In the first scenario, in which the political situation remains virtually unchanged, growth of 90 per cent to around 120,000 units in 2030 is used as a basis. Based on more favourable conditions, such as a strong market stimulus programme, considerably accelerated modernisation of heating systems, and tax breaks for renewable heating sources, the second scenario forecasts the much higher number of 311,000 heat pumps sold in the year 2030. This would mean a considerable increase in sales of heat pumps amounting to 390 per cent. The share of heat pumps in the total market would rise from around ten per cent (2008) to more than 36 per cent (2030).

In this context, heat pumps not only become increasingly important for new building construction, they also play a greater part in renovation projects. In 2008 heat pumps had a market share of around seven per cent in the area of heat sources for renovated buildings, but, under favourable conditions, this would rise to more than 31 per cent in 2030. If one considers the increased sales and greater efficiency of heat pumps together, there is a forecast use of around 36.6 TWh of green energy for 2030, if framework conditions remain the same and 2.1 million heat pumps are in use. According to the analysis, under optimised conditions with 3.9 million heat pumps installed, use of 66.5 TWh of green energy would be possible by 2030 - in other words around 80 per cent more. Overall, the study concludes that heat pumps are becoming more and more efficient and are helping to reduce use of primary energy sources while encouraging use of renewable green heat.

Information: www.waermepumpe.de

Innovative and efficient energy technologies offer opportunities for the export-oriented economy and energy sector of the Land of North Rhine-Westphalia. Products from NRW offer superb chances for export to world markets - as exemplified by modern power plant and network technology, solar energy and biomass, fuel cells, use of mine gas and geothermal potentials and also modern high-performance wind turbines and components.

"Energy technologies from NRW stand for innovation and quality and demonstrate the strength of the NRW energy economy," says Stephan Lintker, responsible for the international programme of EnergyAgency.NRW. "A high level of exports on the part of the energy sector also makes a considerable contribution to climate protection."

In order to support small and medium-sized exporters, industry, the trades and also institutions such as universities, research institutes, associations and federations from conventional and renewable energy sectors and the networks of EnergyAgency.NRW, various international trips for companies, special subject areas and international projects will be coordinated by EnergyAgency.NRW. This will take place in cooperation with NRW-International GmbH and its funding organisations, with NRW-Europa and with further cooperation partners.

The following events and delegations are being planned for the first six months of 2010 either in the form of trips for representatives of individual companies or trips concerned with themes of technical interest:

<table>
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<tr>
<th>February 2010</th>
<th>During E-World Energy &amp; Water, Essen, 09.-11.02.</th>
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<td>Cooperation forum and Invest Promotion of the Flanders region</td>
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<td>March 2010</td>
<td>Company managers trip to RenewTech India, PUNE, 09.-11.03.</td>
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<td></td>
<td>This trip is planned by the Ministry of Economic Affairs and Energy for the top management of companies in NRW. The aim is participation and presentation of NRW-companies at the exhibition and in a symposium focused on NRW</td>
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<tr>
<td>May 2010</td>
<td>Windpower Dallas, USA, 04.-07.05.;</td>
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<td>within the framework of the partnership between the Commonwealth of Pennsylvania and the State of NRW</td>
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<tr>
<td>June 2010</td>
<td>Fact-finding tour on the occasion of SIREME, Paris, 09.-11.06.</td>
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Participation in these trips, events and contact forums is open to all companies and institutions in North Rhine-Westphalia. An overview of the annual programme for 2010 can be downloaded at www.energieagentur.nrw/Internationales. Information to help prepare for European markets can be found in the publication “Funding Programmes for the Environment and Energy in selected European Countries”, a project of NRW. Europa, drawn up by NRW.BANK.

Further information is also available by telephoning +49 (0) 211/86642-11 (Stephan Lintker) and from the cooperation partners and co-organisers of NRW-International GmbH on the internet at www.EnergyRegion.nrw.de. It is also possible to send an email to beratungscenter_ausland@nrwbank.de.
ruhrmobil-E

North Rhine-Westphalia wants to become the market leader in the area of electromobility. More and more projects, which are forming throughout the region and publicising the subject, are helping this ambition to be realised. Creation of charging infrastructure is being driven forward in many towns (Aachen, Düsseldorf, Cologne, Mülheim an der Ruhr, Essen, Bochum, Dortmund, Lünen).

In Bochum, the municipal energy supply company has set up first charging points based on an integrated invoicing system of 365 Energy Group. For six months, now, Bochum has been able to make use of a lively network, which in addition to many small and medium-sized companies, includes the municipal supply companies, the Bochum Environment Service, GLS Bank and last but not least the Opel works itself. The focus is also on the use of renewable energies.

The ruhrmobil-E network has the aim of making Bochum into a model city for electrical mobility. Within the network it can be imagined that vehicles are not only supplied with electricity and driven, but also designed and built in Bochum. These aims are supported by Bochum University of Applied Sciences and Ruhr University Bochum. In order to facilitate this transformation from science to production, Bochum is developing a new centre of competence entitled “Knowledge Creates Production”.

The main focus of the network is on public relations work. The second Ruhr Symposium entitled “New Future for Mobility” took place in collaboration with Energy-Agency.NRW and had 150 visitors. Further info: www.kraftstoffe-der-zukunft.de

“Green” coal from wet biomass

Together with companies from the region, a regional centre of hydrothermal carbonisation (HTC process) is being constructed at the Höxter site of Ostwestfalen-Lippe University. Here, research is carried out as to how coal can be produced from waste which is collected in bio-waste containers, and then used for energy generation.

Under the leadership of Prof. Hans-Günther Ramke the process is being developed further and possible uses for the green coal are under investigation. Prof. Ramke teaches in Höxter in the department of “Environmental Engineering and Applied Computer Science” at OWL and is a specialist in waste management and waste dump technology. The expertise of Prof. Ramke and his colleagues and project partners is recognised through research funding from the federal government and the region. North Rhine-Westphalia is funding a new pilot plant with 260,000 euros from EU grants available for the structural development of the region. A new growth core for science and the economy in Eastern Westphalia is developing from the implementation of an innovative technology. The goal in the medium term is the further development of the HTC process into a continuous operation.

The process of hydrothermal carbonisation holds a key position in the cluster EnergieForschung.NRW within the theme of biomass conversion. In addition to the experts from Höxter, other research institutions and companies from the Ruhr region are following this line of development. It will soon be possible to talk about further pilot plants.

Further information: www.hs-owl.de/fb8/fachgebiete/abfallwirtschaft

An important benefit of the HTC process is that wet or damp organic waste can be transformed directly into coal without the need for prior drying. Hazardous organic substances as can be present in chemical factory sludge or any pharmaceutical residues in hospital sludges do not present any difficulties and are totally destroyed through the thermal transformation.

The green coal can be used for as a fuel for heating purposes as an addition to other fuels. However, the possibility of using the coal as a soil improver is also under investigation. Prof. Ramke is researching this field in a joint project with soil experts and agricultural scientists.

Further information: www.hs-owl.de/fb8/fachgebiete/abfallwirtschaft
More electricity with less coal

Evonik is building the new “Walsum 10” hard-coal-fired power plant unit in Duisburg-Walsum with a gross rated electric power of 790 megawatt, which will be the most modern and efficient such plant with an efficiency rating of more than 45 per cent.

Walsum 10 was planned on the basis of the “Clean Competitive Electricity from Coal” concept study developed by Evonik. A series of potentials for optimisation were opened up in this process: steam temperatures of 600 or 620°C at the steam generator outlet or after the intermediate superheating stage and a live steam pressure of more than 250 bar lead to highly efficient coal utilisation. These parameters are only possible though the use of newly-developed materials which have only very recently been capable of cost-effective, large-scale industrial application. For example, corrosion-proof stainless steels with a chrome content of up to 25 per cent are used in the area of the steam generator. Tubes subject to high thermal stresses are treated with a new and specially developed shot-blasting process in order to increase corrosion resistance. The requirements as regards the design, the manufacturing processes and the assembly technology are constantly harmonised and fine tuned by the engineers from Evonik together with plant and equipment suppliers and other partners.

Optimum energy utilisation

In order to realise maximum efficiency within the entire power plant, the high live steam temperatures at the end of the turbine have to be brought down again to a lower level. A low temperature and therefore low steam pressure can be achieved by means of a high cooling tower. The coal grinder air heat exchanger transfers surplus heat from the air side of the coal grinder to the steam process of the power plant.

The energy content of the hard coal is used to the greatest possible extent by returning the recombustible furnace ash to the coal feed loop. Because the air and flue gas system are designed as a single line and the system has also been simplified in other ways, the individual system components each work at full loading and therefore at the optimum level from the point of view of energy. This reduces the electricity consumed by the plant and also lowers investment costs. The costs for the new block in Walsum amount to around 800 million euros.

The interaction of all these measures lead to a considerable increase in the efficiency of the plant compared with the technology previously used.

On a worldwide basis, coal-fired power plants have an average efficiency of 30 per cent. In Germany, the average is around 38 per cent. If existing coal-fired power plants all over the world were replaced by plants like the one in Walsum, CO₂ emissions could be reduced by 30 per cent at the same level of electrical output. Therefore the new type of plant uses less fuel and produces less CO₂ than conventional plants, in other words: “More electricity from still less coal”.

Further information:
e-mail thomeczek@EnergyRegion.nrw.de
or www.kraftwerkstechnik.nrw.de

Research institution extended

New laboratories are being provided for the Energy Economy Institute at Cologne University. The expansion of energy research in North Rhine-Westphalia was clearly demonstrated by the opening of the new rooms of the Institute in the “Old Car Factory” conversion in Cologne. As NRW Innovation Minister Prof. Dr. Andreas Pinkwart emphasises: “The Institute fits perfectly with NRW. For, as Germany’s number one energy region, we also want to take the leading position in energy research. And the Institute, with its role as think tank for the energy economy is unique in the whole of Germany.” It is planned that in the next five years, the research institute will establish itself as one of the leading institutes for energy economics in Europe.
A visit from heat pump doctor

In Switzerland, there is the Matterhorn, chocolate, marmot grease - and the heat pump doctor. This sounds amusing at first, but really it is quite a serious matter. If a heat pump as it were “spits” or “coughs”, in other words when the system isn’t running smoothly, the heat pump doctor comes and helps. You can get a free prescription for this “medicine man”, he does not cost anything and gives recommendations for fine tuning. He is called upon around 40 times a year by owners of heat pumps - in most cases this “doctor on call” can also “heal” the units.

The “heat pump doctor” exists for a reason. Several trades have to cooperate in order to plan and install heat pump systems. At the end it may happen that the interaction of plant technology, connection of the heat source and energy efficiency of the building has to be fine tuned. The aim is to raise the potentials of all these areas in order to further enhance overall efficiency. The Swiss Federal Office for Energy is therefore actively driving forward with quality improvement and quality assurance. In addition to soundly-based training for technical specialists, a seal of quality for plant and equipment and special emphasis on research and development in the area of heat pump technology, the Office also offers the services of so-called “heat pump doctor”.

Switzerland is a country of heat pumps. Against the background of rising oil and gas prices, the risk of shortages of these raw materials and their damaging effect on the environment, a country which is poor in raw materials, like Switzerland, is increasingly forced to increase energy efficiency and above all to win greater support for heat pumps in the renovations market. Already, it is possible to achieve annual performance coefficients of 5.0 using geothermal heat pumps and without the need for exotic designs. The current average for Switzerland is 3.4.

Around 21,200 heat pumps were sold in Switzerland in 2008. Housebuilders and experts have long since learned to trust the new technology. Heat pumps are now used in a large proportion of new single-family homes. In NRW around 70,000 heat pumps are in operation. It was possible to increase the proportion of heat pumps used in new buildings to 25 per cent in 2008. Information at www.waermepumpen-marktplatz-nrw.de

100 climate protection estates for NRW

The Land of North Rhine-Westphalia intends to implement no fewer than 100 climate protection estates over the next few years. Christa Thoben, Minister of Economic Affairs and Energy, officially opened the project within the framework of the energy economy cluster “EnergyRegion.NRW” and called on local authorities, architects and engineers, the residential property sector and investors to take part.

“We don’t only want to talk about climate protection, we want to take concrete measures to significantly reduce CO₂ emissions from residential buildings”, said the Minister.

The combination of energy efficiency and use of renewable energies not only offers opportunities for climate protection, it also creates jobs and new perspectives for the future of the construction industry. In these climate protection estates, the CO₂ emissions for new buildings - depending on the precise type of construction method - must be 50-60 per cent less than the minimum requirements of the new Energy Conservation Ordinance (EnEV 2009). The specific requirements and framework conditions are summarised in a planning guideline which is available on the Internet.

Further information: www.100-klimaschutzsiedlungen.de

Info on the cluster EnergyRegion.NRW: www.EnergyRegion.nrw.de

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Further information: www.100-klimaschutzsiedlungen.de

Info on the cluster EnergyRegion.NRW: www.EnergyRegion.nrw.de
Mine gas technology from NRW for Shanxi province, China

China is to profit more in future from NRW’s expertise in the use of mine gas. This is the intention of the new framework agreement between the Mine Gas Initiative NRW and Shanxi Province in the north-east of China, which was signed in Taiyuan by Michael Geßner, Department Head in the NRW Economic Affairs Ministry, Dr. Frank-Michael Baumann, Managing Director of EnergyAgency.NRW and Prof. Dr. Axel Preuße, Director of the Mine Gas Initiative NRW.

“The agreement is an expression of the successful work of our mine gas initiative. North Rhine-Westphalia is foremost in the world when it comes to the use of mine gas as an energy resource. The framework agreement documents the strength of companies and research institutes in this area, and has established a promising starting point for the sector in a vital future market”, explained Geßner. Around 130 unit-type cogeneration modules and a turbine set with electrical output of totalling 198 megawatt are in operation in NRW. Last year, around 980 million kWh of electricity was produced in this way, enough to supply around 220,000 households. Through this use of the mine gas methane, which already has to be regularly extracted from hard coal mines for reasons of safety, the climate will be sustainably protected against emission of this greenhouse gas into the atmosphere. At the same time, a first cooperation agreement was signed between a company in NRW and a Chinese company for utilisation of mine gas in Shanxi province, which is twinned with North Rhine-Westphalia. The joint venture partners are Shanxi Dubao Clean Energy Resources Investment Co., Ltd. and RWE Power Climate Protection China GmbH (RPCPC GmbH) from Essen. Together, it is planned to develop CDM projects in Shanxi province within the framework of emissions trading, in particular in the form of climate protection projects for use of mine gas. The joint venture - which has been given the name Bao Lai - will first develop the Wangpo mine gas project. The project - with an installed capacity of 3.6 MW, will go into service at the start of 2011, and will then be extended by a further 2.7 MW by the middle of 2011.

Further information: www.energieagentur.nrw.de

German-Chinese partnership for sustainable fuels

China and North Rhine-Westphalia have intensified their joint efforts towards harmonisation of approval of electric vehicles within the German Chinese Sustainable Fuel Partnership (GCSFP). The GCSFP was founded in 2003 at the instigation of the Federal Ministry of Transport, Building and Urban Development (BMVBS) and the Chinese Science Ministry.

Alongside renowned oil producers and vehicle manufacturers such as Shell, Lurgi, Daimler and Volkswagen, North Rhine-Westphalia is also a partner of the GCSFP. NRW and China are here pursuing a unified fuel and vehicle propulsion strategy, which very much encourages the development of joint projects. Recently, the electrification of vehicle engines has also very much come to the fore in both countries.

In the same way as in Germany, model regions for electromobility are being formed in China, and China has also set ambitious goals in order to reduce emissions in its cities.

Within the framework of the GCSFP, EnergyAgency.NRW was commissioned to handle the "Regulation" project in the area of hydrogen infrastructure. This project is concerned with a comparison of traffic rules in Germany and China. The aim of the project is to discover possible areas for harmonisation and to make proposals for cooperation between Europe and China, especially in matters of licensing.

Although at first sight Chinese law does not appear comparable with German law, they still have many features in common. The legal framework conditions for hydrogen production and its use in vehicles are similar in content in Europe and China, specifically as regards categorisation and handling of hydrogen. A follow-up project has now been started on the subject of “Electric Vehicle Regulations”, which has also been assigned to EnergyAgency. NRW. Further information from: garche@energieagentur.nrw.de and wolff@energieagentur.nrw.de
Improvement of buildings efficiency throughout Europe:

Foundation laid

The EU member states have unanimously welcomed the compromise with the European Parliament and the Commission for reformulation of the directive concerning the energy performance of buildings which was mediated by the Swedish President of the Council. This means that the road is clear for the political conclusion of the negotiations at the Council of Energy Ministers on the part of the Council.

The member states will lay down national minimum standards in future. These will apply for new buildings, comprehensive renovation projects and the renewal of major building components, like roofs, for example. This corresponds to what has been practised in Germany for many years now. Within this framework, the national standards should be based on a Europe-wide method of comparison. Existing and tried-and-tested national systems such as the German Energy Conservation Ordinance (EnEV) need not basically be changed. Heating and cooling which are still needed should for the most part be provided from renewable energy sources.

The possibility of choosing between a requirement and consumption orientated energy pass will remain in place. This will help to avoid unnecessary costs for owners. In the case of commercial and industrial buildings, a characteristic energy number should in future be stated in advertisements to provide information about the building’s energy efficiency.

The new version of the Energy Performance of Buildings Directive of 2002 is planned to enter into force in spring 2010. It must then be applied by member states within two to three years.

New street lighting

One does it, all the others follow: the town of Dormagen has reduced its costs for street lighting by 44 per cent within one year thanks to modernisation. It is estimated that, throughout Germany, it would be possible to save 2.7 billion kilowatt hours, or around 400 million euros through the use of energy-efficient street lighting alone. “The fact that local authorities are on tight budgets actually means that necessary investment into energy-efficient street lighting is carried out. Modern forms of financing such as contracting are opening up new possibilities”, said Energy Minister Christa Thoben in front of around 200 representatives of towns and local authorities during a conference on the subject of “Energy-efficient Street Lighting”. In Contracting, a third party – in the case of the Dormagen project, the company Horlemann Elektrobau GmbH from Uedem – invests in the energy-saving measure. Horlemann refinances its commitment over five years by means of the energy costs which are saved. And local authorities in North Rhine-Westphalia are not left on their own when they implement energy efficiencies by means of contracting and want to save money. EnergyAgency.NRW advised the local authority during the course of the project, which is documented in a new brochure.

The newed 350 lights and installed 4,600 ballasts and in so doing has reduced electricity costs for street lighting by almost half within one year. The renovation was completely financed by means of contracting. EnergyAgency.NRW advised the local authority during the course of the project. The need for renovation in almost all areas of lighting is immense. According to estimates by the German Association of Electric Lamps and Electric Lights 50 per cent of local authorities in Germany still operate street lighting which embodies 1960s technology. “Only three per cent of these efficiency ‘dinosaurs’ are replaced each year”, explains Dipl.-Ing. Rüdiger Brechler, Contracting Advisor of EnergyAgency.NRW. Further information and the new brochure “Einspar-Conacting für die Straßenbeleuchtung in Dormagen” (Savings through Contracting for Street Lighting in Dormagen) is available from: EnergyAgency.NRW, Kasinostr. 19-21, 42103 Wuppertal, Germany, Tel. +49 (0)1803/190000, www.energieagentur.nrw.de, www.nrw-spar-energie.de
Cities are agglomerations of human life and, at the same time, agglomerations of the problems and consequences caused by humans. And cities have always been the starting point for the solutions to these problems and consequences. Cities are also major energy consumers - as operators of properties such as schools, town halls and swimming pools, they consume above-average amounts of power, heat and water, and emit corresponding quantities of CO₂. The "Energy - Climate - City" conference organized by EnBW and EnergyAgency.NRW provided reason enough to interview architect and urban planner Prof. Dr. Albert Speer on the importance of urban areas as a factor of great relevance for sustainable development and for the consequences of contemporary urban development.

Sustainability is frequently understood as a technological, and occasionally as an economic challenge. So what role then remains for urban and residential planners?

I define sustainability as behaviour which consumes at most only as much of our resources as we can provide for the next generation. Our energy consumption, however, is just as insatiable as our desire to maximize our mobility or to use land. One reason for this is that, in Western societies, in particular, cyclical thinking still remains too much of a rarity: domestic waste is heating material, heating can supply power, rainwater is utility water. Another important point is that inner-city sites once used - or even exhausted - such as abandoned industrial land and former barracks sites, should be integrated into new developments, instead of building on new greenfield sites. The task of urban planners is to broaden people's perspectives and translate them into real projects.

And is this aim achieved?
Architects and urban planners have an influence of only 5 per cent on the decisions taken at municipal level. The remainder is centred around political and economic interests. What we need is interdisciplinary cooperation, which is still lacking in many city administrations. The benefits I envisage, entirely pragmatically, would include, in particular, acceleration of the decision-making processes. The translation of declarations of intent into projects still takes too long at present.

But doesn't the use of complex efficiency technology demand thorough planning?
Of course, but the planning comes before the technology! Technologies are an important instrument in conserving resources, without doubt, but the search for energy-saving potentials which do not involve the use of complicated technology should come first. We shield south-facing all-glass facades against the sun with automatic blinds, or with electrically tinted glass, when we should, really, firstly have asked whether it would not be better to arrange windows to face in another direction. It's an elementary error to assign technology absolute priority over imagination.

How can the future-viability of cities, as residential zones, be improved?
Urban planning must proceed along ecological, economic and social lines. Cities will be able to come up with sustainable, viable and comprehensively sustainable responses to present-day challenges only when this "holy trinity" of sustainability is taken into account.
Modernity in Goch: old building beats many new ones

It really can come true, the story of the plough horse that clever “tuning” did turn into a racehorse, or of the ugly duckling that was transformed into a beautiful swan. In the town of Goch, at least, a residential building comprising eighteen dwellings has been converted by means of consistent modernization from an energy Cinderella to an energy star. Its primary energy consumption, at 22.5 kWh per square metre per year, is now 73 per cent below the standard for new buildings, and within passive-house limits.

The modernization program for this 1965 property did, indeed, go well beyond the customary repainting of the facades and replacement of kitchen and bathroom suites. The central aim was, in fact, to cut energy consumption as far as possible and economically rational. And it worked: consumer has now been reduced to around two litres of oil per square metre per year – savings of 91 per cent (for primary energy) compared to the original building.

“Modernization projects of this scope in buildings of this size are a technical challenge and are comparatively rare. Fulfilment of the passive-house standard after completion of the project is proof that virtually the energy optimum has been achieved here”, affirms Dipl.-Ing. Joachim Decker, of EnergyAgency.NRW. “In modernizing this building, we selected for the first time the especially energy-efficient passive-house standard. Passive houses are also known for their special levels of warmth and comfort”, noted Manfred Tielkes, chairman of WohnBau eG. “True, the technical and financial input is somewhat higher, but a passive house rewards this with its future-safety, thanks to its high energy-efficiency. Future energy-price increases don’t bring us out in a sweat, because the building scarcely consumes energy for heating any more”, adds Tielkes.

The building, with its 1,389 square metres of residential area, has been equipped with additional 26 centimetre thick insulation, the ceiling of the top floor has been insulated with 42 centimetre thick rigid foam insulation board, the windows have been replaced, and the apartments fitted with a ventilation system incorporating heat recovery. The old gas-fired apartment heating systems have been taken out, and a modern version featuring gas-condensing technology put in. In addition, a 36 m² solar-thermal system (solar collectors) has been installed on the roof, to boost heating output and to generate hot water.

Further information: www.mein-haus-sport.de, e-mail decker@energieagentur.nrw.de, Tel.: +49 (0)202/24552-69

Renewable energy: Potentials for cooperatives

They are springing up everywhere: photovoltaics cooperatives, initiated by loan cooperatives, and implemented jointly with municipalities, residents and specialist companies. Thanks to the desire to make use of solar-energy investments, the residents’ take-up rate is enormous. In the town of Willich, for example, around 830,000 euros have been subscribed for shares in cooperatives, by 156 local people, within just a few months.

NRW can now point to more than twenty similar cases.

Cooperatives stand for self-help, individual responsibility and self-administration, and thus assure economic freedom. They are economic enterprises, with the aim, however, not of maximizing profits, but instead of furthering their members’ interests. This mission finds its expression in the co-identity of the member and the customer, and the democratic involvement of the members on the “one man – one vote” principle. Because: all members are equal in their requirement for subsidies, irrespective of their capital input. Cooperatives provide the opportunity for small and medium-sized companies, craft-trade firms, local citizens and municipalities to generate and use energy jointly, rather than placing their energy supply in outside hands. The cooperative is a flexible legal entity, which can be tailored to the needs of its particular members. Regional wealth creation is strengthened, and local structures are made more independent. In Gummersbach-Lieberhausen, in the Oberbergisch district, for example: since 2001, the Energiegenossenschaft Lieberhausen eG (energy cooperative) has operated a wood chip production plant with its own community-heating system. The village thus supplies itself with heat, at costs lower by around 1,000 euros each year than for alternative concepts.

The Rhineland-Westphalia cooperatives confederation can provide advice free of charge and with no commitment for those interested in founding such a cooperative. Contact: Bruno Simmler, e-mail bruno.simmler@rwgv.de
Cool servers

The use of heat from the depths of the earth is especially interesting when it is used for cooling. In Solingen, geothermal heat ensures cool heads in data-processing. At the Bechtle system house there, an innovative route has been pursued since the company moved into its new building in the Piepersberg Business Park, in the form of integration of the data electronics into the heating and air-conditioning system.

When computers are working hard, you can almost hear - purely in the figurative sense - the steam building up. Or, put another way: a vast amount of heat is generated. The waste-heat potential of servers has scarcely been exploited up to now, however: quite the contrary - the air-conditioning systems installed to keep them cool add even more to energy consumption!

A different solution was selected at Bechtle: to cut data-processing energy consumption, the number of servers was firstly reduced by means of virtualization. Servers generally operate at only a fraction of their potential, and need computing capacity at differing times. Now, thanks to a special software package, multiple servers can run as individual virtual machines independent of each other on only one real server. The server population at Bechtle has been cut from more than seventy to just five, reducing power consumption from around 100 to 150 watt to 23 watt per virtualized server, and permitting annual savings of some 60,000 kWh. The simultaneous reduction of the energy needed for cooling was an extra bonus.

The hot air leaving the servers is cooled by means of two side coolers, with integrated air/water heat-exchangers, and removed via the cooling-water circuit. A temperature level of 26°C, rather than the customary 22°C, is maintained in the actual server cabinets.

The cooling water, for its part, is cooled via a geothermal system, which is used to heat the building in winter. The energy expended for the pumps is only around 17 per cent of that needed for split cooling, while the “waste” heat stored in the soil assures a better annual coefficient of performance (COP) for the heat pump when in heating mode.

Energy-savings resulting from efficient cooling in the soil amount to an additional 30,000 to 50,000 kWh per year.

And Bechtle saves energy not only with its data electronics. Energy efficiency is the chief criterion in the building’s predominantly passive cooling arrangements, heat recovery from the seminar suite’s ventilation system and the flexible office lighting installation. Here, energy-efficient planning has made it possible to save around 83 per cent of primary energy needs compared to a conventional office building.

Information: e-mail buschmann@energie-agentur.nrw.de, Tel. +49 (0)1803/190000

1.1 m euros for Saerbeck climate community

The NRW climate community Saerbeck receives support worth 1.1 m euros from the state’s environment ministry. “Saerbeck has developed an impressive climate-protection and climatic adjustment concept. After months of planning and preparation, the implementation phase is now finally starting”, commented NRW environmental minister Eckhard Uhlenberg at the handing over of the subsidy decision.

The aim of NRW climate community Saerbeck is that of balancing out the total CO2 originating from energy sources such as oil and gas by the use of regenerative energy sources by 2030 at the latest. Saerbeck is installing, inter alia, a modern and transparent community-heating network, focused around a new centralized heating installation, fuelled using renewable raw materials, for the town’s primary school. A nursery school and a rectory will also be connected to this system. The “see-through” control room and a transparent sidewalk make the energy system visible for all. “This renders the abstract subject of energy generation impressively transparent”, enthused Uhlenberg about this innovative concept.

An important influence on the development of the region as a whole will come from the new bioenergy park, which is being constructed on the site of a disused federal German army depot, and will feature several photovoltaics, wind energy and biogas installations. Also planned is a bio-refineries, where regenerable raw materials from the region can be processed to make heating and vehicle fuels, and other products.

Saerbeck also set itself the target of reducing the health risks potentially resulting from climate change. The periods of exceptional heat anticipated constitute for older persons a problem which must never be understated. The municipality intends to take positive action in this field, in the form of a health network of doctors and care facilities.

For further information, visit: www.klimakommune.nrw.de
Impossible - no way!

No prospects of modernization, or a heat pump? Wrong - in many cases, at least! In the Mülheim district of Cologne, the Deutsche Wohnungsgesellschaft (Dewog) housing company has, in an initial phase, modernized 224 apartments in thirty-one buildings - and their heat in future will come from a gas absorption heat pump (air/water).

The buildings, constructed in the fifties, had already been fitted with double-glazing and, in some instances, with facade insulation, in the 1980s and 1990s. Starting in 2008, the facades, basement ceilings and lofts have now been insulated, and the central-heating, hot-water supply and electrical systems modernized, using low-interest loans from the Kreditanstalt für Wiederaufbau (KfW) bank. Three independent engineering consultancies commissioned to draft a concept came to the same conclusion for the central-heating and hot-water systems: a two-component hybrid system is best. The engineers calculate average final-energy savings of some 15.4 per cent. Gas absorption heat pumps (for the base load) and the combination with a gas condensing boiler (for peak loads) have now been providing warm comfort since November, 2009.

A further 266 apartments in thirty-four residential Dewog buildings are to be modernized and converted to the hybrid heat-pump/gas condensing boiler system in a second project phase, starting in January 2010.

Information: www.mein-haus-spart.de and www.waermepumpen-marktplatz-nrw.de

More bio for gas grid

Since January 1, 2010, the around 30,000 natural gas customers of Detmold’s municipal utility corporation have been receiving bio natural gas. Up to 900 cubic metres of methane are produced hourly at the Bad Meinberg biogas plant, and added to the natural gas supply, under this cooperative scheme between R&S Energy and the RWE Westfalen-Weser-Ems Verteilnetz transmission utility. Calculations by R&S Energy indicate that this will eliminate around 4,000 tonnes of CO₂ emissions annually.

The participating companies each contribute differing core capabilities to the biogas project in Horn-Bad Meinberg. R&S Energy produces the gas, the Detmold municipal utilities condition and market it, and “RWE Westfalen-Weser-Ems Verteilnetz” takes the processed biogas and distributes it via the public natural gas grid.

“Biogas is a highly efficient energy source which, in addition, closes local industrial, nutrient and biomass cycles. Farmers thus have a further opportunity of marketing their products locally, boosting their incomes, and thus the region’s value chain”, explains Ralph Sutter, CEO of R&S Energy. The biogas plant is fed entirely with regenerable input materials from the surrounding region, primarily feed rye, maize and grass silage. The fermentation substrate is returned to the farmers and used as fertilizer. Cooperation with the farmers is thus a closed cycle.

It is less the biogas production system, and more the supply of the biogas conditioning plant with heat and the feed arrangements that are innovative, however. The conditioning plant, which is operated by the Detmold city utilities, runs on the BCM process. Developed by the DGE Dr.-Ing. Günther Engineering GmbH technology enterprise, this is based on an atmospheric-pressure amino scrubber. It is used to condition biogas to natural gas quality and then feed it into the gas transmission system. It is distinguished, in comparison with conventional conditioning routes, by its extremely low methane losses, of less than 0.1 per cent, while simultaneously achieving extremely high methane purities of above 99 per cent. The high heat requirement for the amino scrubber is met from the adjacent chipboard production plant, which operates a biomass-fired cogeneration plant; the heat is supplied to the conditioning plant via a local heat-transmission system. Feed to the grid is the function of RWE Netzservice. The gas pressure is boosted, and the product then fed into the public supply system.
A barrier for the
Master Blaster

Practically everyone is familiar with Europallets. Since the turn of the year, however, there are also pellets classified under a European standard. Standardized wood pellets will now be available throughout Europe as from 2010. The European standard for wood pellets (EN 14961, Part 2) replaces the previous national specifications. Standardization of wood pellet fuel is intended to simplify market and trading relations in this field between the various EU member states, the target being to assure supply of high-quality pellets, expansion of European markets, and greater transparency in trade in this commodity. Wood pellets are thus the first biomass fuel to be produced in accordance with an EU standard. The quality requirements for this fuel have, up to now, been defined in Germany by DIN 51731. In future, there will be only the A1, A2 and B quality grades.

The pellet boiler in the consumer’s basement will from now on be fed with A1 pellets; these conform to the strictest standards. A1 category pellets may have an ash content of only 0.7 per cent. The A2 category permits a broader range of raw materials, and an ash content of up to 1.5 per cent. Pellets classified up to now only fairly vaguely as “industrial pellets” are governed by the rules for Category B, and are intended for systems with outputs of 100 kW to 5 MW. Category B has an even higher ash content and an expanded range of input materials.

The “DINplus” seal has up to now served in Germany as an aid to orientation for high-quality wood pellets. The German Pellet Institute (DEPI) has now developed, jointly with the German Biomass Research Centre (DBFZ), the new “ENplus” certification system, on the basis of the European standard. “ENplus” certification takes account not only of the high product quality of wood-pellet fuel, but also the entire process chain from production, via storage, to transportation. Further information: Heike Wüsseler, e-mail wuebbeler@energieagentur.nrw.de

Indoor swimming pools are a large cost factor in municipal budgets, due to their high consumption of energy for lighting, ventilation, heating and water treatment. Würselen was no longer prepared to simply accept this, so the city authorities confronted energy consumption with a range of innovations. Water consumption, for example, has been cut by 80 per cent thanks to an osmosis-based water-recycling system. A mini cogeneration plant with an overall efficiency of above 90 per cent is now used to produce heat and power. The majority of the new features remain unseen by users; lighting levels have been adjusted, the air pressure in the compressed-air generators reduced from 10 to 8 bar, and the heating in the sauna activated on a time-based cycle, cutting out peak consumptions. In addition, the Jacuzzi now has a control system, so that air bubbles no longer flow continuously, but only after - and then for - ten minutes, when the user presses a button, as in the shower.

This new, infinitely adjustable control system made it possible to reduce the output of the two air intake and discharge motors (45 and 35 kW) from 50 to 40 per cent at night, this alone saving as much as 20,000 kWh/a of power consumption. The precise reduction during the day can not be accurately calculated, due to the fluctuating loads occurring. Investment costs totalled around 20,000 €. Information: Jörg Buschmann, e-mail buschmann@energieagentur.nrw.de
Rheinberg:

130 EnergySaver-NRW plaques

Traditions - if they are useful - should be continued. True to this motto, NRW’s economic affairs and energy minister, Christa Thoben, was again a guest in Rheinberg, to award the “EnergySaver.NRW” seal to particularly successful modernization projects. This year, in the Old City Hall, she handed over no less than twenty-five blue plaques to householders now enjoying particularly energy-efficient living, following successful conversion projects. “Mass” award ceremonies have already taken place in Rheinberg in the past two years, and the town is now NRW’s unacknowledged energy-saver capital. “The figure of around 130 EnergySavers.NRW who have now received awards demonstrates that our incentives for modernization to contemporary energy standards has been extremely well received and successfully implemented”, notes Markus Feldmann, of EnergyAgency.NRW.

The state of NRW rewards exemplary upgrading of existing buildings and the installation of modern technologies for utilization of renewable energy with a blue plaque. The modernization of existing buildings offers great energy-saving potentials; the primary energy needs of an apartment block near the Pulverturm, for example, were reduced by means of cost-effective provisions by some 60 per cent, from 280 to around 110 kWh per square metre per year after modernization. The modifications included 14 centimetre thick insulation of the exterior walls, insulation of the roof and the roller shutter housings, renewal of the windows, and the replacement of the circulation pump in the heating system with a high-efficiency model. The “EnergySaver.NRW” project is coordinated by EnergyAgency.NRW, and is part of NRW’s joint “My House Saves” building modernization campaign. Nearly 1,400 plaques have been awarded since “EnergySaver.NRW” started.

Information from: www.mein-haus-spart.de, or via the EnergyAgency.NRW Hotline: +49 (0)1803/190000

Burgbad boosts energy-efficiency

Wood or gas? This was the question confronting Burgbad, of Bad Fredeburg. Finally, the bathroom furnishings manufacturer decided in favour of the regenerative fuel from the forests. A decision with a payback - the modifications to its heating system now assure annual cost-savings of some 60,000 euros for this company from the hilly Sauerland region south and east of Dortmund.

The heat supply - for a dryer used in production, among other facilities - was originally provided by one wood- and one gas-fired boiler. In the closing phase, however, the wood boiler was being used for only around 30 per cent of the heat needed. Cooperation with a local wood supplier again made wood more economically attractive, however. It is now delivered by a wood-using company in the vicinity and fed via a container, screw feeders and the existing hacker into the wood silos.

Natural gas savings

The extra expenditure for the wood is more than balanced out by savings for natural gas - the use of wood eliminates monthly gas costs of around 20,000 euros. Further planned optimization of the system will involve the replacement of the existing, nearly 20-year-old hacker by a modern machine with an appreciably lower power consumption.

And the changeover from natural gas to wood has had not only economic benefits - the ecological balance is also one to be proud of. The use of wood cuts emissions of CO₂ by approximately 1,300 tonnes annually.

Further information: Bernd Geschermann, Tel.: +49 (0)202-24552-14, e-mail geschermann@energieagentur.nrw.de
Norbert Hüttenhölscher leaves EnergyAgency.NRW

Professor Dr. Norbert Hüttenhölscher, head of EnergyAgency.NRW for twenty years, is to move to Wuppertal’s municipal services department with effect from 1 February 2010.

The Ph.D. physicist is to take over the “New Energy Concepts” department of WSW Energie & Wasser AG. Hüttenhölscher has been CEO and managing director of EnergyAgency.NRW, based in Wuppertal, since 1990, and has built up and formed the organization. “During his tenure, Prof. Hüttenhölscher has made significant contributions to the improvement of energy-efficiency in industrial and commercial premises, public institutions and properties, and in private households throughout North Rhine-Westphalia”, declared NRW economic affairs minister, Christa Thoben. “Prof. Hüttenhölscher has worked with great success for the achievement of EnergyAgency.NRW’s aims, and has been instrumental in making it an institution acknowledged and acclaimed throughout Germany”.

“The furtherance of energy-efficient technologies and renewable energy have been the focuses of his work for twenty years - we, as energy suppliers, see this as an important future market for us. We are therefore extremely pleased that we have succeeded in obtaining Professor Hüttenhölscher’s services as the head of this department within our organization”, commented WSW chief Andreas Feicht on Prof. Hüttenhölscher’s move.

“Only my employer will be changing, not my work”, stated Professor Hüttenhölscher on his new appointment. His new challenges will be to make reality of efficiency targets in a responsible position within an energy-industry company. “This fits ideally into the WSW corporate strategy”, he added.

Headed EnergyAgency.NRW for more than two decades: Professor Dr. Norbert Hüttenhölscher

Prof. Dr. Norbert Hüttenhölscher was born in Dortmund on 1 March 1954, and studied physics at his home town’s university, obtaining a doctorate for a thesis on the utilization of solar energy. He was project manager for new technologies at Deutsche Babcock AG, Oberhausen, from 1985 to 1990, before moving to become CEO of EnergyAgency.NRW. Norbert Hüttenhölscher was awarded the Order of Merit of the Federal Republic of Germany in 2002 for his commitment to environmentally responsible use of energy and the use of inexhaustible energy sources.

Schools competition: fuel-cell-powered ships

The fifth NRW “Fuel Cell Box” school pupils’ competition in hydrogen and fuel-cell technology is now starting. The aim of the competition, organized by EnergyAgency.NRW in cooperation with h-tec Wasserstoff-Energie-Systeme GmbH, is that of improving even further knowledge and understanding of hydrogen as an energy source and of the “Fuel Cell” efficiency technology in institutions of further education in NRW. This year, the competition’s patron is again the state’s economic affairs minister, Christa Thoben: “This competition enjoys great popularity - more than 650 teams, made up of over 1,500 pupils of both sexes, have taken part in the four events held up to now”.

This academic year, the young people will be required to solve a task based on the real-life operation of fuel-cell-powered ships. The kit of parts, the “Fuel Cell Box”, must be used to develop a corresponding model ship, including the necessary hydrogen infrastructure. The pupils’ competition is held in close cooperation with industry; sponsors include Air Liquide Deutschland GmbH, RWE AG, Hydrogenics Corporation, HOPPECKE Batterien GmbH, Deutscher Wasserstoff- und Brennstoffzellen-Verband (DWV) and HyCologne - Wasserstoff Region Rheinland e.V.

Further information: www.fuelcellbox.nrw.de
NRW joins “The Climate Group”

The state government of NRW joined “The Climate Group”, an international climate-protection alliance, at the end of 2009. “The regions play an important role in the attainment of ambitious climate-protection targets. The international poker game over reduction targets will never, on its own, produce any reductions in greenhouse gas emissions. That’s why we are looking at “The Climate Group”, for partner regions who, like North Rhine-Westphalia, are working on concrete climate-protection measures, and with whom we can interact constructively”, explained NRW economic affairs minister, Christa Thoben.

“The Climate Group” is an alliance of regions and companies that are pursuing an active climate policy. Some forty regions, from the USA, Europe, Canada, Australia, South America and Africa, have acknowledged that climate change and its consequences concern them and have, targeted, under the so-called Montreal Declaration, “a coordinated joint response for reduction of greenhouse gases and for the wellbeing of present and future generations”. Networking is developing rapidly, between the European regions, in particular. The Spanish partner regions, for example, enquired concerning energy know-how very shortly after NRW’s entry to the group. Aragon, for instance, is intensifying its commitment to the development and use of hydrogen in fuel cells, and has repeatedly used EnergyAgency.NRW expertise to assist it in this aim.

Catalonia has its campaign focuses on further training and energy management, and also on rational user behaviour. The Spanish are also seeking interchange in the field of electromobility, a subject in which the French Ile de France region has also registered its interest. Located around the vast conurbation of Paris, Ile de France is researching innovative energy-efficiency concepts and climate-friendly mobility. Like NRW, Ile de France is also promoting the use of electrically propelled buses. A fleet of initially 2,000 vehicles is to be deployed for inner-city transport in Paris, and a further 2,000 in towns and cities in the surrounding region, from late 2010 onward.

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Scotland has proposed interchange with NRW on Carbon Capture and Storage (CCS). The country’s regional government has had research work performed into potential CO₂ storage facilities off the Scottish coast, and perceives potentials for a new offshore industry which would be of interest to operators of coal-fired power generating plants, in particular. EnergyAgency.NRW is acting in this context as a contact. For more information: Rainer van Loon, van.loon@energieagentur.nrw.de

Energized: NRW at the 2010 Hanover Trade Fair

The NRW state government will be highlighted with the EnergyRegion. NRW and EnergyResearch.NRW clusters, along with EnergyAgency.NRW, at the Hanover Trade Fair from 19 to 23 April 2010. The joint stand in Hall 27 is to feature more than twenty companies and scientific institutions, showing innovative products and services in the fields of “Fuel cells and hydrogen”, “Mobility”, “Photovoltaics” and “Bioenergy” on around 600 m² of exhibition space. In addition, foreign trade experts will be providing information at the Info-Point on potentials for German companies on energy markets abroad. Media partner Springer-VDI-Verlag will also be present.

The Network Power Plant Technology NRW will also be showing the state flag in Hall 13, along with industry federations VGB PowerTech (Essen), FDBR (Düsseldorf) and a large range of small and medium-sized enterprises. Technologies for the planning, construction, operation and maintenance of power generating plants will be shown in the immediate vicinity of the Power Plant Technology User Forum. The partner country for the 2010 Hanover Trade Fair is Italy. Information: www.messe.de

Signatories to the Montreal Declaration:

- **USA / Canada**
  - British Columbia, Connecticut, Maine, Manitoba, Massachusetts, New York State, New Brunswick, North West Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Vermont, Yukon

- **Europe**
  - Aragon, the Basque Country, Bavaria, Brittany, Brussels, Burgundy, Flanders, Ile de France, Jutland, Carinthia, Catalonia, North Rhine-Westphalia, Upper Austria, Scotland, South Holland, Wales, Wallonia, Wielkopolska

- **Australia**
  - New South Wales, South Australia, Victoria

- **Africa**
  - Fatick, Western Cape

- **Central and South America**
  - Quintana Roo, Sao Paulo
Fuel cells accelerate electromobility

Whether in research or in practical use - anyone intending to utilize fuel cell and hydrogen-technology developments will not be able to avoid EnergyRegion.NRW. This was demonstrated by some 250 energy experts at the 9th annual meeting of the Network Fuel Cell and Hydrogen NRW in Düsseldorf - an event, organized by EnergyAgency.NRW, which has now become the No. 1 forum in this industry. The focus this year was on a new idea - accelerating electromobility using the fuel cell.

“2010 is set to be the year of the fuel cell”, declared undersecretary Dr. Beate Wie-land (photo) of the NRW innovation ministry, looking forward to the 18th World Hydrogen Energy Conference in Essen in May, 2010. In combination with the highlighting of the Ruhr region as European Capital of Culture (www.ruhr2010.com), this event presents an exceptional opportunity of familiarizing a broad audience with this topic. “And we intend to seize this opportunity”, affirmed Dr. Frank-Michael Baumann, CEO of EnergyAgency.NRW. Dr. Andreas Ziolek perceives the route to electromobility, adopted not only in NRW, as a further important potential for the fuel cell and other technologies. “Electromobility was an important focus of our network activities in 2009 - we define it as electrical vehicle engines, irrespective of whether the power is supplied from fuel cells or from batteries. Our partners were thus able to successfully submit eight project proposals in the context of the ‘Model region electromobility Rhine-Ruhr’ project”, noted the head of the network. “The first projects in the ‘NRW Hydrogen HyWay’ program have already started”.

The event participants also had the opportunity of experiencing the interaction of electromobility and the fuel cell “live” - a latest-generation Daimler Citaro hybrid fuel-cell/battery-powered bus was waiting outside to give test rides during the intervals. Internet: www.energieregion.nrw.de, www.whec2010.com and papers: www.brennstoffzelle-nrw.de

Steady as she goes!
Ruhr Atoll ahead!

A floating energy park? Only art can make it possible! In conjunction with Ruhr2010, the “Ruhr Atoll”, a group of islands publicizing sustainability and the use of renewable energy sources, is under construction on the Baldeneysee reservoir in Essen.

It was only just 250 years ago that energy consumption began to rise, more or less “naturally”, to keep pace with economic growth. Since then, energy has frequently been the leitmotif for development. A short time later, industrial sociology invented the “human engine”, and the value of work was quantified as the ratio of energy input to energy output - and “energy-cultural history” meant that culture develops - due to the mutual interdependence of technology and society - as a result of technological change in the generation and use of energy.

The Ruhr Atoll surfaces in the lake in the wake of these intellectual currents. The four islands, each up to 300 m² in area, approach the topics of “Art - Science/ Energy - Ecology” in a rather different way. In the “Teahouse”, by Kazuo Katase and architect Michael Wilkens, the tone is contemplative, while “Iceberg”, by Andreas Kaiser and physicist Lars Kin-dermann make it scientific, whereas Ilya and Emilia Kabakov’s “Project for the rescue of natural resources” promises with a wink of the eye to be ironic, and, finally, “U-boat”, from Andreas M. Kaufmann and Hans U. Reck, expressly political. The islands examine the potential uses of biomass, hydropower, the wind and the sun, forming a continuous landscape, the whole being visible both from the banks and the dam of the Baldeneysee. The primary aim is to stimulate visitors to discuss energy generation and use. Visitors can also hire boats and expend their own - human - energy to examine the works up close, “land” on the islands, and thus play an active role in the project. The sustainability of energy generation and use will be examined in various projects forming part of the overall Ruhr2010 program.

Information: www.ruhr2010.de
The new Press Pocketbook of the Energy Industry 2009/2010, from Upper Bavaria’s Kroll publishing house, is a work of over seven hundred pages. More than 14,000 contact persons, verified and up-to-date, are ready to help you find the right addresses in corporate, political and scientific circles. The compact-format book has been a valuable aid in national and international energy communications since 1976. Internet: www.kroll-verlag.de/tb-energie

Zenergy wins 2009 Environmental Award
The German Environmental Foundation (DBU) has bestowed its 2009 Environmental Award on the directors of medium-sized technology producer Zenergy Power GmbH, of Rheinbach, and Bültmann GmbH, of Neuenrade. Dr. Carsten Bührer and Petra Bültmann-Steffin received the accolade for the introduction of superconductor technology to industrial plant engineering; their enterprises achieved a significant breakthrough in the use of superconductors as the key technology for the sustainable generation and use of electrical energy. Federal German President Horst Köhler lauded the success of these entrepreneurs as an “outstanding example of the innovative capabilities of medium-sized German companies” at the handover of the award to Zenergy Power, Bültmann and two other winners. Information: www.zenergypower.com

“Exemplary innovations” brochure published
The EnergyResearch.NRW (CEF.NRW) cluster has now published its new “Energy research in North Rhine-Westphalia. Exemplary innovations” (Energieforschung in Nordrhein-Westfalen. Beispielhafte Innovationen) brochure; at sixty pages, it provides for research institutions’ and universities’ projects an impressive insight into the innovative potential of NRW’s energy-research landscape. The discussions are orientated around the CEF.NRW’s focal topics. The brochure can be downloaded from www.cef.nrw.de.

“i.GREEN” focuses capabilities
The i.GREEN Institute for Green Technology & Rural Development has now been opened at the University of Applied Sciences South Westphalia. i.GREEN is run as a university-affiliated institute at the Soest campus of the University of Applied Sciences South Westphalia, and has been granted start-up financing for an initial period of five years by the university. The content focus is to be on the topics of renewable energy, energy-efficiency and the development of rural areas, the aim being to concentrate research activities. The institute is intended to promote the institutional interaction of technical and agronomic capabilities in the region. “Even the project-related examples of technical and agronomic cooperation achieved up to now are indicative of the broad range of future interdisciplinary research projects”, declares CEO Dr. Ralf Biernatzki.

New hydrogen brochure published
In its new brochure, EnergyAgency.NRW illustrates why, when and to what extent hydrogen can be provided and must be used for a sustained energy infrastructure. The emphasis is not only on production of H2, but also on the logistics necessary for the H2 infrastructure, with conceptual solutions for H2 storage. As far as use of hydrogen is concerned, both stationary and mobile applications for fuel cells are highlighted, as are the initial applications for early-stage special markets. Numerous examples from North Rhine-Westphalia, ranging from production to use, illustrate EnergyRegion.NRW’s outstanding positioning against the background of sustainable change in the energy infrastructure. The brochure can be obtained from www.energieagentur.nrw.de.

EnergyResearch.NRW competition starts
The NRW innovation ministry has now launched the “EnergyResearch.NRW - innovative energy technologies for tomorrow” promotional competition, the central focuses of which are the use of simulation tools in energy technology and energy economics, the machining and processing of high-temperature materials in energy technology, the use of high-temperature process heat in conjunction with fossil, nuclear and solar power plant technology, and the biological generation of energy sources. The competition is aimed at achieving a higher profile - in Germany and internationally - for energy research in NRW. Project outlines can be submitted up to 18 March 2010. Information: www.cef.nrw.de