

PRESS RELEASE

Place and Date: Düsseldorf/Wuppertal, 2009

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Facts and Figures – Use of Energy in NRW

More energy is converted and used in North Rhine-Westphalia than in any other Federal State, and a wide range of energy-related expertise has grown out of its long tradition of exploiting natural resources. There is a tight network of research institutions in the region, along with a large number of companies who offer innovative energy products and services aimed at increasing energy efficiency and using renewable energies. NRW is the ideal location for many future-orientated companies - from the winning of energy raw materials up to conversion. With the EnergyAgency.NRW, the region has an instrument which has a wide variety of competencies at its disposal to further develop its leading position and to achieve its energy-related goals (climate protection, conservation of resources, cost-effectiveness and supply reliability).

The EnergyAgency.NRW supports a large number of projects on behalf of the Economic Affairs and Energy Ministry, the Environment Ministry and the Innovation Ministry. Within this framework it acts as an operational platform with wide-ranging expertise in the energy sector: From energy research, technical development, demonstration and introduction onto the market, through energy advisory services to professional training. It also offers companies in NRW platforms for strategic alliances by creating competence networks. Energy-related advisory services are also available in the form of initial and contracting consulting for companies and administrative bodies, as are information and training for specialists and the general public. A further area consists of activities aimed at influencing the behaviour of consumers with regard to more efficient energy use. (www.energieagentur.nrw.de)

General subsidies: From 1988 to the end of 2007, around 700 million euro from the State and the European Union (ERDF programme) was spent on more than 57,700 assisted projects in the State's funding programme [progres.nrw](http://progres.nrw.de) for the development, demonstration and introduction on the market of innovative energy technologies and energy consulting. The funds provided attracted further investments of about 3.6 billion euro. In 2008, just under 4,000 projects were provided with funding of around 23 million euro. (www.progres.nrw.de)

Share in German power consumption: In 2008 around 15.3 per cent of the total power consumption in Germany and 9.6 per cent of the end energy consumption was accounted for by renewable energies. Around 120 million tonnes of carbon dioxide were saved at the same time. Wind power ranks in first place when it comes to power generation from renewables; it generated 6.5 per cent of the power consumed in Germany. It is followed by biomass with 3.7 per cent and hydroelectric power with 3.4 Prozent. (www.bee-ev.de and www.bdew.de)

Jobs: According to a study by the International Economic Forum for Renewable Energies (IWR), in NRW 21,000 workers in about 3,200 companies achieved sales of around 5.5 billion euro in 2007 in the field of renewable energies. Nationwide the total sales achieved with renewable energies in 2007 amounted to around 34.5 billion euro and this secured approximately 250,000 jobs.

(www.wirtschaft.nrw.de and www.bmu.de and www.iwr.de)

Biomass: In NRW in 2007 biomass was used to generate 4.5 billion kWh or about 80 per cent of the regenerative heat, 3.4 billion kWh or around 40 per cent of regenerative power and approximately 570,000 tonnes or 100 per cent of the regenerative fuel in the State. In the field of agricultural biogas installations there are approximately 275 facilities in service in NRW. They have an installed electrical capacity of 100 MW. In the different value chains of solid, liquid and gaseous biomass, exciting and innovative projects for the more efficient utilisation of raw materials are emerging at many locations in NRW, supported on an ongoing basis by the EnergyAgency.NRW. In the newly initiated competence network for biomass, 1,300 of those who are active in the sector are coming together to work jointly on new projects and are acquiring knowledge on what is happening on the market.

(www.umwelt.nrw.de)

Biofuels: In NRW, six esterification plants with a capacity of approximately 750,000 t/year are currently in operation. Within the framework of the Excellence Initiatives, RWTH Aachen University was selected for the Cluster of Excellence named "Customized Fuels from Biomass", while the "Biorefinery" concept represents a further step towards the effective utilisation of biomass. The Innovation Ministry (90 per cent) and the Fraunhofer-Gesellschaft (10 per cent) have placed 1.36 million euro at the disposal of the Fraunhofer Institute UMSICHT in Oberhausen for research into material and energy-related use of renewable raw materials. (www.kraftstoffe-der-zukunft.de)

Fuel cells: Through the "NRW Fuel Cell and Hydrogen Competence Network", founded in 2000, the State Government has to date funded more than 80 fuel cell and hydrogen projects in North Rhine-Westphalia. The aims of the projects are to reduce the specific costs, to increase the service life of the fuel cell components and systems and to set up a corresponding hydrogen infrastructure. For this purpose, around 92 million euro have been provided to date from NRW funds and by the European Union (European Regional Development Fund – ERDF), with total investment amounting to just under 160 million euro. In the region 350 mostly medium-sized companies and research institutes have joined together in the "NRW Fuel Cell and Hydrogen Competence Network". With the Centre for Fuel Cell Technology (ZBT) in Duisburg the State of NRW also has a research and development institute which enjoys worldwide recognition and respect. Since 2001 the State Government has been supporting its work with resources from the European Regional Development Fund in order to help it set up and develop its activities. (www.brennstoffzelle-nrw.de)

Energy refurbishment of buildings: As part of the joint action "My House Saves" around 800 buildings nationwide were awarded the "Energy Saver NRW" from 2006 to 2008 and around 1,200 individual plaques were presented. The NRW Economic Affairs Ministry issues the plaque to buildings which are exemplary in their low energy consumption. From the beginning of 2006 to the end of 2008 around 46,800 loan applications with a volume of about 2.4 billion euro were approved across the region by the reconstruction bank Kreditanstalt für Wiederaufbau (KfW) to finance housing modernisation. (www.mein-haus-spart.de)

Energy advisory services: Last year, the engineers from the EnergyAgency.NRW processed more than 22,000 requests for advice from the fields of industry, commerce and administration (including 600 instances of consulting on specific projects, and 100 requests for contracting consultancy); there were 9,000 visitors to the NRW mobile information centre, a specially converted bus, over the 93 days when the bus was in use. 46 local authorities participated in the "European Energy Award" energy management programme, while more than 1,100 schools took advantage of the "Energy School NRW" project.

In addition, 1,800 building checks and 2,450 solar checks were performed by craftsmen and detailed advice was offered by engineers and architects in homes housing one or two families in around 490 cases. On average, an energy building check triggered 7,500 euro and a solar check 5,700 euro of investment; in other words, these instruments alone were the initiator for investment of around 27.5 million euro in the area of energy-related building modernisation. Since these initiatives were started, investment of more than 258.5 million euro has been triggered by means of more than 37,500 checks, while more than 39,000 professionals and private individuals have participated in seminars, conferences, web-based training or in special "E-Fit" action weeks for workforces. (www.energieagentur.nrw.de)

Energy research: Renewable energies, fossil and solar power plant technologies and the associated development of materials, fuel cells and hydrogen, and also nuclear energy are the subject of research at more than 20 locations in NRW. Against the background of this superb research environment, companies with worldwide operations have decided in favour of undertaking R&D in the area of energy and associated areas in NRW: E.ON is investing 40 million euro in the E.ON Energy Research Centre at RWTH Aachen University, RWE and ThyssenKrupp are supporting the chair in nuclear technology at RWTH Aachen University and the University of Applied Sciences in Aachen with around 4 million euro over 5 years. Thyssen funds material research in Bochum to the tune of 22.5 million euro with ICAMS. Hitachi is investing 30 million euro at RWTH Aachen University and at the universities in Bochum and Dortmund in the area of the very latest power plant technology. And by 2014, RWE intends to build a low-CO₂ power plant in the brown-coal mining area based on coal gasification with sequestration.

The research landscape as regards energy research is undergoing a change. RWTH Aachen University and the Research Centre Jülich have come together to form the "Jülich Aachen Research Alliance" (JARA). One of the four areas is JARA Energy. The German Aerospace Centre (DLR), RWTH Aachen University and University of Applied Sciences Aachen and also the Belgian University of Leuven have established a joint virtual institute for solar thermal power plants. Within the framework of the excellence cluster "Customized Fuels from Biomass", which is funded by the Excellence Initiative, RWTH Aachen University is establishing a competence centre for fuel design. (www.innovation.nrw.de)

Energy information: The impartial information supplied on all subjects associated with energy efficiency and renewable energies is very important within the work of the EnergyAgency.NRW: the Internet landscape registered more than 21 million visits and 786,888 different visitors downloaded 1,387,137 pdf documents. Multipliers can access a material and slide pool of more than 2,800 slides and these were downloaded 185,000 times. The quarterly magazine "Innovation & Energie" now has more than 27,000 subscribers, while more than 9,250 people subscribe to the fortnightly Newsletter of EnergyAgentur.NRW.

Geothermal energy: The subject of geothermics is at present steadily growing in importance among the energy technologies. NRW, and more specifically the Ruhr metropolis, plays a key role here as the base for numerous companies who are market leaders. This is verified not least by the study "The Value Chain of Geothermics", which was drawn up by the Geothermics Centre Bochum in 2008 and was commissioned by Wirtschaftsförderung metropoleruhr GmbH and the town of Bochum. Within the Ruhr metropolis alone about 230 companies were determined as operating in the geothermics market. About 80 per cent of the companies asked assume there will be a positive development in the geothermics division in the period 2009/10. In NRW the geothermics sector creates about 4000 to 5000 jobs. Just under two thirds of the companies asked assume that they will be taking on new workers in the geothermics division in the next few years.

In order that geothermal energy can be used by all those living in the region, the NRW State Government commissioned the "Study of the Potential of Geothermal

Energy in NRW" to discover the potential available from the utilisation of near-surface geothermal heat . The results have now been published for further use in a second edition on a CD-Rom. In addition the NRW Geological Service offers a free check for each plot of land in NRW over the Internet plus a detailed geological-geothermal report for a charge. Specifically this means that it is now possible to check immediately if it is worthwhile in a particular case to drill a borehole both in relation to new buildings and if a heating installation is to be replaced. It is also possible to check if the land in question is located within a water conservation area. Furthermore the interest of companies in the exploitation of geothermal heat for commercial purposes has increased. To render geothermal heat usable for commercial purposes there were in NRW 25 mining authorisations in 2008, and 3 others were issued at the beginning of 2009. 26 mining authorisations have been applied for from the Arnsberg district government.

(www.energieagentur.nrw.de/geothermie and www.geothermie.nrw.de)

GeoTechnikum-Bochum: The State of NRW supports the setting up of a research-oriented facility, a "GeoTechnikum", at the Geothermics Centre on the campus of Bochum University. In this, the largest European joint research institute for the exploitation of geothermal heat, universities and commercial companies are conducting joint technological development work. The research focuses on drilling, reservoir and heat pump technologies. The University of Bochum is responsible for operating and co-ordinating the Geotechnologies Competence Centre; in addition the higher education institutions of RWTH Aachen University, FH Gelsenkirchen (College of Applied Science) and University of Ostwestfalen-Lippe are involved. On the corporate side more than 20 companies are already committed to working in the Bochum Geothermics Centre (GZB). (www.geothermie-zentrum.de)

Mine gas: The "NRW Mine Gas Initiative" is continuing to develop the technology of mine gas extraction and utilisation and intensifying the technology transfer. In NRW there were, according to provisional figures, 94 mining authorisations for mine gas utilisation in 2008. At the end of 2008 the provisional figures indicate that there were 128 unit-type co-generation power plant modules as well as a turbine set in service with an electrical output totalling 198 megawatt. The 980 million kWh of power generated in 2008 is capable of supplying around 220,000 households. The total mine gas potential exploited resulted in a CO₂ reduction of around 4.3 million tonnes in 2008. (www.wirtschaft.nrw.de)

Wood pellets: By means of targeted public relations, and with the help of State and federal funds, the number of wood pellet heating systems in use in NRW has risen substantially over the past five years: whereas in 2003 only 600 of these systems had been installed, by the end of 2008 around 10,000 households in NRW were already supplied with this environmentally friendly heat. In the area of sales support for wood, more than 6,800 installations were funded with around 30 million euro up to the end of 2006. These installations generate 325 MW of heat and 6.5 MW of electricity. Nationwide, around 100,000 systems were installed at the end of 2008. (www.aktion-holzpellets.de)

Power plant technologies: The State of NRW supports the development of modern and highly efficient power plants – partly with money from the EU structural funds. The NRW Power Plant Technology Competence Network coordinates various tasks on behalf of the State Government. In NRW alone it is planned to construct new power plants and renew old ones with a total capacity of more than 10,000 Megawatt and an investment sum of more than 10 billion euro until the year 2012. This means a powerful boost to employment for North Rhine-Westphalia; specialists expect up to 7000 jobs in the erection phase, jobs which will be preserved and created through an investment of billions by the energy industry alone. The new investments needed make it possible among other things to create a hard-coal-fired power plant with state-of-the-art plant engineering and an efficiency of up to 46 per cent. This innovation boost is further strengthening North Rhine-Westphalia's leading position on the world market for power plant technology. (www.kraftwerkstechnik.nrw.de)

Solar energy: To date, 11,000 photovoltaic systems with an installed capacity of more than 61 MWp have been granted funding in NRW, with the State of NRW providing more than 87 million euro. Funding of just under 40 million euro was invested in more than 26,600 solar heat installations. In 2007 NRW had a total installed photovoltaic capacity of just under 480 MWp and was therefore in third place behind Bavaria (1,600 MW) and Baden-Württemberg (850 MW). In total, around 4,000 MWp had already been installed in Germany in 2007. The installed capacity at the end of 2008 in Germany was more than 5,300 MWp. The sales for the German PV industry rose in 2008 to around 7 billion euro. The new campaign "Photovoltaics NRW – Solar Power for North Rhine-Westphalia" is a joint initiative of the State of North Rhine-Westphalia and the North Rhine-Westphalian photovoltaics industry. The aim is to substantially increase the market share accounted for by photovoltaic installations in North Rhine-Westphalia.

The utility Stadtwerke Jülich is currently erecting a solar-thermal test power plant as a demonstration plant. Together with renowned industrial partners (Kraftanlagen München) and research institutions (Deutsches Luft- und Raumfahrtzentrum, Solar-Institut Jülich der FH Aachen) a test and demonstration plant will be constructed in 2009; it is to convert solar energy into electrical energy without burning mineral resources. The Federal Ministry and the States of Bavaria and North Rhine-Westphalia are providing support in the form of funds amounting to around 10 million euro to a plant designed for an output of 1.5 megawatt; it is intended to highlight North Rhine-Westphalia's pioneering role in the utilisation of renewable energies beyond the State's borders. (www.photovoltaiik.nrw.de ; www.solarwirtschaft.de ; www.iwr.de and www.photon.de)

Solar estates: The focus of the 50 Solar Housing Estates project to achieve a combination of energy savings, energy efficiency and the use of renewable energies in housing construction. The solar estates demonstrate on an estate level the possibilities for active and passive solar energy use to generate heat and power. They thus support the wide-ranging introduction of solar and energy-saving building. There are now 28 new estates in the stock with nearly 7,000 residents. 19 further estates are currently under construction and this means that NRW is Europe's leader in the matter of solar housing estates. (www.50-solarsiedlungen.de)

Heat pumps: "Give high heating costs the cold shoulder" – that's the maxim of the NRW Heat Pump Market Place. Heat pumps save heating costs and protect the environment by utilising environmental heat to a major extent. Environmental forms of energy, such as ground water, geothermal energy or energy from the outside air are supplied by "Mother Nature" absolutely free of charge and can be used anywhere. This is why about 10 per cent of the new structures in NRW, and also many existing buildings, are now heated using heat pumps. The ten "heat pump weeks" held to date in NRW have been highly successful. In 2008 around 62,500 new heat pumps were installed in Germany; one third more than in the previous year. Of the 350,000 heat pumps installed nationwide, around 70,000 (20 per cent) provide for environmentally friendly heat in NRW. (www.waermepumpen-marktplatz-nrw.de)

Hydroelectric power: The use of hydroelectric power to generate energy is able to make a worldwide contribution to the reduction of climatic problems. The technically useable potential of hydroelectric power is defined in NRW today as 800 GWh/a electricity, of which 200 GWh/a have to date not been exploited, however. The office for hydroelectric power of the EnergyAgency.NRW provides information and consultancy. Against the background of the EC framework water directive, the State of North Rhine-Westphalia is endeavouring to expand hydroelectric power in a way which does not harm the water ecology by reactivating and optimising installations and by using hydroelectric technology on existing dam and infrastructural installations. The NRW State Government has to date funded 165 plants with a total capacity of around 16 megawatt. The total assistance amounting to approx. 12 million

euro has attracted further investments of more than 46 million euro.
(www.wasserkraft.nrw.de)

Further training: Within the framework of the energy efficiency programme, EnergieAgentur.NRW offers a wide range of further training events. In addition to the Seminar Pool with around 25 event concepts for different target groups, in 2008 EnergieAgentur.NRW performed in-house events such as workshops and coaching events as follows: more than 2,100 specialists visited the seminars, 350 conferences and workshops, and more than 32,000 took advantage of the "E-Fit Action Week". Experience indicates that it is possible to save between five and 15 per cent of energy used in office buildings by raising the energy awareness of those who work in them. Within the subject area "Energy-efficient and Solar Building", it was possible to reach 2,700 specialist participants and more than 6,000 end consumers with the 37 event concepts and 6 modules. Approximately 3,200 further participants attended events and lectures in 2008. (www.energieagentur.nrw.de) More than 7,100 participants were reached by the energy training offers on the Internet. (www.wissensportal-nrw.de)

Wind energy: For the first time since 1997 the USA is again the world leader in wind energy with around 25,000 megawatt installed capacity, ahead of Germany and Spain, and also of China. Nationwide in Germany more than 20,300 wind turbines had been installed by the end of 2008 with a capacity of just under 24,000 MW. Power generation from wind amounted to around 40 billion kilowatt hours in Germany in 2008. This means that wind turbines cover around 6.5 per cent of Germany's power consumption, substantially more than hydroelectric power. In NRW alone more than 2,600 wind turbines are currently turning and providing an installed capacity of more than 2.600 MW. The export rate of the German wind industry is again, according to figures from the relevant associations, more than 80 per cent. (www.iwr.de ; www.wind-energie.de ; www.windtest-nrw.de)

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