



WIEN ENERGIE

Wien Energie World Spittelau





Spittelau 1987



Spittelau today



Spittelau 2.0

When you think about district heating in Vienna it doesn't take long before you think of Spittelau. Since 1971, a major share of Vienna's waste has been incinerated at this site in the 9th District. The result is plenty of power and clean energy which is fed into the district heating and district cooling networks.



Detail of Hundertwasser-facade



Waste storage bunker

A fire in 1987 destroyed much of the Spittelau facility. But this was the beginning of a new era: The exhaust gas cleaning procedure was completely upgraded, making Spittelau into one of the most modern plants for the thermal recycling of waste worldwide. At the same time, Friedensreich Hundertwasser redesigned the facade of the entire building. This renowned Austrian artist and environmental activist created a spectacular work of art which is unique worldwide and one which unites technology, the environment and art.

After 40 years in operation, the thermal waste recycling facility at Spittelau underwent a further major technical upgrade between 2011 and 2015. This has made the site fit for the future. Spittelau 2.0, also known as Wien Energie World Spittelau, now offers Vienna's inhabitants:

- Clean heating and cooling energy as well as electricity production from waste
- Customer care and energy-related advice at the customer service centre
- An e-vehicle charging station and two photovoltaic facilities
- Tours for various target groups
- Art, exhibitions and events

The facility at Spittelau has a total output of 400 megawatts and annually produces an average of 120 gigawatt hours of electricity and 500 gigawatt hours of district heating. This makes it the second most important production facility in the district heating network of Wien Energie after the power station site at Simmering.



Hot technology

The heart of the Wien Energie World Spittelau is the thermal waste recycling plant, which turns waste into valuable energy. The first step involves the delivered waste being weighed on a weighbridge. The waste is then temporarily stored in a waste container with a capacity of around 7,000 cubic metres. A crane transports the waste to the two incinerators so that it can be thermally recycled.

The incineration of the waste produces hot exhaust fumes which turn water in pipes into steam. The steam is fed into a turbine which drives a generator to produce electricity. District heating is extracted by means of a heat exchanger.

The Spittelau facility has a series of state-of-the-art filter systems in order to clean the flue gases produced. The purified flue gas is released from the chimney at a height of 126 metres.

Annually, the thermal waste treatment plant at Spittelau processes around 250,000 tons of household waste, creating:

- 120 gigawatt hours of electricity
- 500 gigawatt hours of district heating

The environmentally-friendly heat produced at Wien Energie World Spittelau heats more than 60,000 Vienna households. The site also produces electricity for the equivalent of 50,000 households. Around 50 percent of the energy generated annually (heat and electricity) by means of waste incineration comes from biogenic (renewable) sources.



An open Ear

The service centre opened by Wien Energie in 2012 sets new standards in customer advice and service. Integrated into the Wien Energie World Spittelau, this new service centre provides customers with answers to all their questions related to electricity, natural gas and district heating.

Up to 500 customer enquiries and advisory sessions are handled every day. Leading-edge technology behind the scenes ensures that everything runs smoothly. People with physical handicaps can also access and move around the service centre without problems. It is possible to give more than 100,000 Vienna residents advice every year.

The Wien Energie World Spittelau also offers energy-related advice. Energy experts from Wien Energie provide information about issues such as how to best save electricity, make use of renewable energies or how to optimise energy consumption when building or renovating properties. One very popular service offered relates to heating cost comparisons, which highlight which source of energy is most cost effective in any given case.

A cultural area also exists in the lobby area. This serves as a ticket sales office for the Wien Energie magazine „*Stadtvorteile*“ (only available in German) and for evening events.

Wien Energie also offers site tours. These give visitors a chance to learn many interesting facts, for instance about heating and cooling.



E-charging station at Spittelau

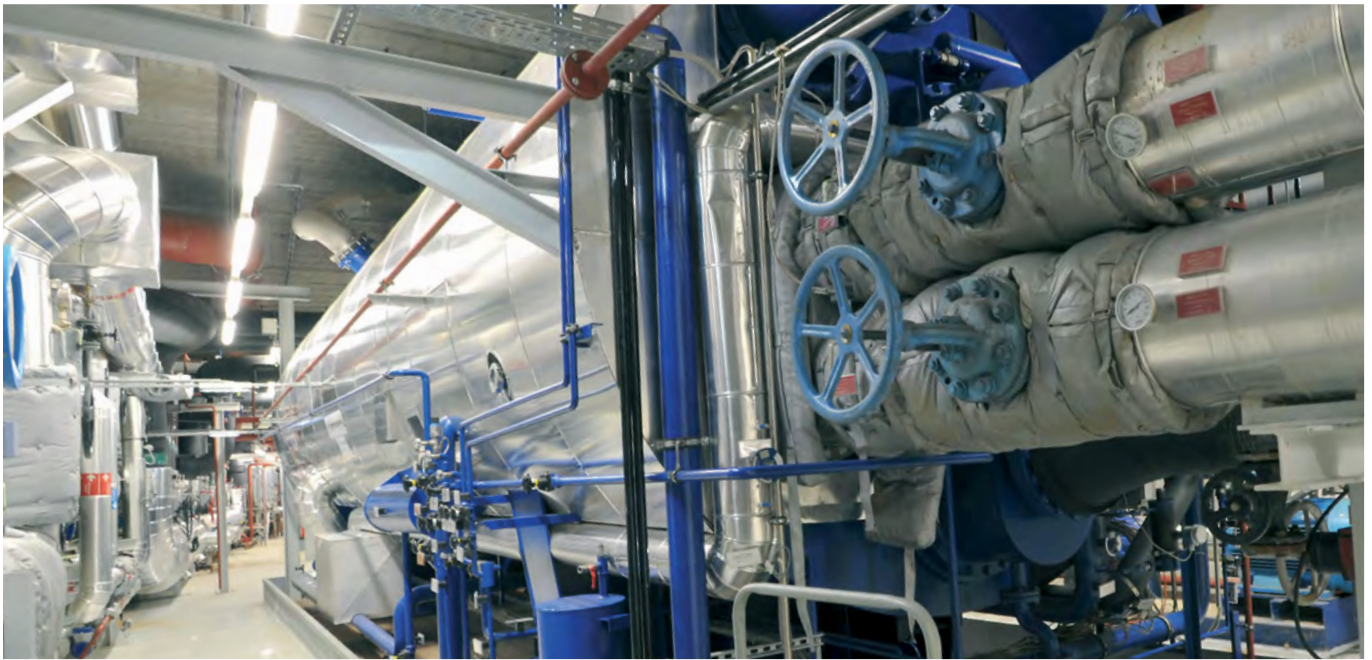
Our electricity

Photovoltaic technology relies on solar cells to convert solar radiation into electrical power. Two such solar power plants are located at the Spittelau site. One of these is mounted on the partially greened roof of the service centre. This photovoltaic plant generates electricity which is entirely renewable, saving several tonnes of harmful CO₂ emissions. The second facility has been installed on the roof of the thermal waste recycling plant and also reduces CO₂ emissions by several tonnes every year. This installation is also used for research purposes, clarifying how Wien Energie can best produce solar energy in urban Vienna.

Wien Energie World Spittelau is also the right place to come if you want to use e-mobility. There is an e-charging station for electric cars and scooters where these can be charged with environmentally-friendly energy from Wien Energie. Two charging points with standard sockets and two rapid-charging points are available.

This e-charging station at Spittelau is part of the strategy of Wien Energie to promote e-mobility. Charging points and the provision of energy to charging stations aim to encourage sustainable mobility for individuals in Vienna.

www.tanke-wienenergie.at



Spittelau district cooling centre

Staying cool

The use of air conditioning in Europe is increasing. According to expert estimates, demand for cooling energy could be as high as that for heating in just a few years. But it is also possible to stay cool in a climate-sensitive way: District cooling is Wien Energie's environmentally-friendly alternative for urban areas.

The district cooling plant at Spittelau went online back in 2009. This facility is one of the largest producers of district cooling in Vienna, with a capacity of 17 megawatts, meaning it produces around the same amount of refrigeration as 115,000 standard household fridges. Each megawatt hour produced by the district cooling plant leads to CO₂ emissions of only 50 kilogrammes. Conventional air conditioning units would produce around 290 kilogrammes. The principle behind the production of district cooling is similar to that of district heating. The big difference: The heat produced is converted into cooling energy by heat exchangers before being distributed to customers.

The Spittelau district cooling facility supplies the following buildings (among others) with environmentally-friendly district cooling:

- Vienna General Hospital (AKH)
- The Skyline and Space2move office buildings
- The University of Natural Resources and Life Sciences, Vienna (BOKU)
- The Ö3 building on Muthgasse



Fernwärme Open Air event, Jimmy Cliff and Band



Heiß und Kalt, Arik Brauer

Culture for everyone

Wien Energie World Spittelau is a work of art full of life: The district heating open air event was first held here back in 1998. As part of the Vienna Jazz Festival, this major music event has since become an institution and one very close to the hearts of Vienna's inhabitants. Every year, this musical highlight held on the forecourt of the thermal waste incineration plant is a must-go event for thousands of music lovers. The artists on stage represents the Who's Who of the international music scene. James Brown, Bob Geldof, Bonnie Tyler, Manfred Mann, Herbie Hancock, Sergio Mendes and Joe Zawinul – these and many others have already played at Spittelau.



Heiß und Kalt, Andreas H. Bitesnich

The *Heiß und Kalt* (hot and cold) exhibition series hosted by Wien Energie provides the entire population of Vienna with free access to art. Artists from various genres have been publically displaying their works of art here since 2006. A major focus is on the close cooperations with artists. The results are diverse – besides paintings and artwork, *Heiß und Kalt* also showpieces less well known forms of art such as projections, video art, sculptures, sounds and installations.



Simmering power station, high pressure heat storage facility



Inside view of a gas turbine

The Vienna Model

By means of the Vienna Model, Wien Energie has embarked on a path which has attracted considerable international attention and renown, and one which highlights how urban areas such as Vienna can be supplied with energy efficiently and environmentally sensibly.

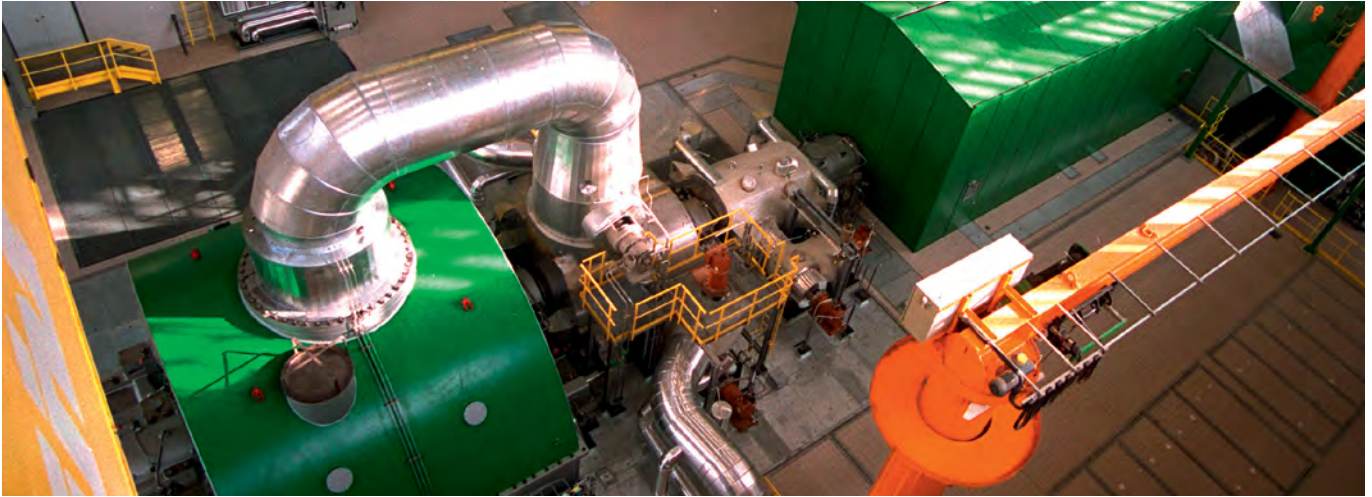
The basis of the Vienna Model is reducing demand for primary energy by means of using waste heat. The waste heat emitted by thermal power stations when producing electricity is used as district heating. This so-called cogeneration technology makes it possible to produce both electricity and heat, and therefore to maximally exploit the energy content of the fuels used.

The Vienna Model and its elements save up to three million tons of CO₂ emissions every year.

Around two-thirds of the thermal energy required is extracted using the cogeneration technology. The remaining third of the district heating produced, which is fed into the approximately 1,200-kilometre-long district heating network in Vienna, is derived from thermal waste recycling.

Central element of the Vienna Model

- The combined generation of electricity and heat by means of efficient cogeneration technology.
- The use of energy from thermal waste treatment.
- Increased reliance on renewable sources of energy.
- Comprehensive energy-related advice to increase efficiency.
- Decentralised energy production such as citizen solar power plants and technological combinations of solar energy and geothermal energy (so-called green heating products).



Inside view of a cogeneration power plant

Cogeneration

The principle behind cogeneration is simple and yet effective. The energy produced as heat by conventional thermal power stations is only used to generate electricity. Through the use of cogeneration technology, gas and steam-powered turbines are combined and the energy released is used to produce both electricity and district heating.

Efficient gas turbines alone achieve an electrical efficiency ratio of around 50 percent. The additional use of the hot exhaust gases to produce steam and the channelling of this steam to steam-powered turbines for the generation of electricity increases the efficiency ratio by around 20 percent.

Cogeneration technology makes it possible to achieve higher efficiency ratios and therefore more efficient use of fuels.

Cogeneration technology increases this efficiency ratio yet again. The cogeneration power stations operated by Wien Energie effectively use the energy contained within the fuel two-fold – for the generation of electricity and for the production of district heating. The use of this cogeneration technology allows heated water to be fed into the district heating network. The overall efficiency ratio rises as a result of cogeneration to as high as 86 percent. Wien Energie operates combined gas and steam power stations with cogeneration technology at its sites in Simmering and Donaustadt.



Waste treatment plant at Simmeringer Haide



Waste storage bunker at Spittelau

Thermal waste treatment

If necessary, the latent potential of the heat produced in summer can be used for air conditioning during warm periods. The obvious solution was and is to use district heating as the energy to produce district cooling. Numerous large buildings in Vienna are already supplied with district cooling.



It is not permitted to use landfill sites for untreated waste in Austria. The thermal recycling of waste plays an important role today. By means of thermally recycling waste, pollutants are almost entirely eliminated and the remaining volume of waste deposited in landfills is significantly reduced. The incineration process is monitored and environmental damage is avoided through the use of proven waste air cleaning technology.

The concept of using Vienna's waste as a source of energy dates back to the 1960s. It was then that the first facility was built to supply hospitals in the vicinity with the heat extracted.

Four thermal waste recycling plants are currently in operation in Vienna. The facilities at Spittelau, Flötzersteig, Simmeringer Haide and Pfaffenau annually process around 900,000 tonnes of waste, special waste and sewage sludge. The energy extracted as heat is fed into the district heating network throughout the entire year. In total, the four facilities produce around 1.5 million megawatt hours of district heating per year.



Steinriegel wind farm



A citizen solar power plant

*The citizen power plants of
Wien Energie offer many
advantages.*

*For details please visit
www.buergerkraftwerke.at*

Renewable sources of energy

Wien Energie was an early pioneer in the adoption of water, wind, biomass and photovoltaic as sources of renewable energy. The use of environmentally-friendly sources of energy has a long tradition in Vienna. More than 100 years ago hydroelectric power was already in use and Wien Energie's first wind turbine was commissioned as early as 1997.

The aim of sustainably increasing the share of renewable energies in the overall energy production mix to a level of 40 percent by 2030 is being pursued by Wien Energie through a number of approaches. Besides building further wind farms and expanding the use of hydropower, another key focus area is photovoltaics. Wien Energie is already capable of supplying more than 800,000 people with green electricity.

Besides committing itself to greater reliance on renewable sources of energy, Wien Energie is also enabling those members of the population interested to invest in its citizen power plant projects. At the end of 2015, there were already 24 citizen power plant projects in operation, supplying around 8,000 households with environmentally-friendly electricity. Wien Energie is also forging ahead with the expansion of solar energy in its Lower Austria supply area.



Renewable sources of energy are leading the revolution in energy supplies away from a centralised structure in the direction of decentralised generation.

Decentralised heating and cooling

Decentralised energy production facilities are playing an increasingly important role in future-oriented energy supply strategies. Local energy production close to the point of consumption is particularly interesting in the case of customers with high energy requirements. Wien Energie is making an important contribution here by means of innovative products and solutions. This strategy is based on innovative technological combinations of solar and geothermal energy, 'green' heating products, acting as incentives for heating and cooling with renewable sources of energy installed at the customer site.

Grüne Wärme – Sonnenwärme This product relates to the combination of solar thermal energy and a natural gas condensing boiler in order to supply a building with heating energy and hot water.

Grüne Wärme – Erdwärme This product relates to the combination of photovoltaics and a heat pump to supply a building with heating and/or cooling energy as well as hot water. The electricity produced by the photovoltaic installation is used locally to meet the energy requirements of the heat pump. Heat pumps which are also used in summer for air cooling purposes are particularly efficient.

Imprint

Wien Energie GmbH
Thomas-Klestil-Platz 14
1030 Vienna, Austria
info@wienenergie.at
www.wienenergie.at

Photos: Wien Energie, Michael Appelt, Georg Baresch, Ludwig Bernhard Eder,
Ian Ehm, Christian Hofer, Christian Houdek, Ernst Schauer, Ludwig Schedl, Fotolia

Vienna, December 2015



WIEN ENERGIE

Wien Energie World Spittelau

Spittelauer Lände 45

1090 Vienna

Phone: 0800 500 800

Fax: 0800 500 801

info@wienenergie.at

www.wienenergie.at

Contact for guided tours

georg.baresch@wienenergie.at