

## German consortium holds inauguration ceremony for the Andasol 3 solar thermal power plant

- Largest solar energy site on stream
- Andasol power plants supply the electricity needs of half a million people
- Storage technology enables electricity supply at night

*Aldeire, La Calahorra, 30<sup>th</sup> September 2011*

Today saw the festive inauguration of the Andasol 3 solar thermal power plant by a consortium of five German companies in the Spanish province of Granada. The completion of the third Andasol power plant on a site measuring some two square kilometres has meant the creation of the largest European solar power plant - located in Andalusia, southern Spain. Attending the power plant inauguration ceremony were the General Secretary of Industry and Energy for Andalusia, Isabel De Haro Aramberri, as well as board members of those companies with a stake in Andasol 3: Stadtwerke München, RWE Innogy, RheinEnergie, Ferrostaal and Solar Millennium.

Dr. Kurt Mühlhäuser, Chairman of the SWM managing board: "Andasol 3 is a perfect example of how the energy transition needs to be realised at a European level. It can only succeed if the various parties involved – as here at Andasol 3 – are united in a common aim and if the political conditions are favourable. For SWM this power plant represents another major component in its drive to expand its renewables capacity. By 2025 we aim to be producing enough green electricity in our own installations to be able to meet the demand of the whole of Munich – that's 7.5 billion kilowatt hours. Munich will thus become the first city in the world with over a million inhabitants to reach this target. With the ten-fold increase in our production capacity – already up and running or still in the planning – we are making huge strides in the right direction."

Dr. Hans Bünting, Chief Financial Officer of RWE Innogy: "Andasol 3 proves that converting Europe's electricity production methods can be achieved far more efficiently if we take an international approach, rather than pursuing national concepts. I see this power plant as a role model for the rest of Europe; it may even generate the impetus needed for the development of a European market with common regulations for renewable energy sources."

Construction on Andasol 3 began in mid 2008. Thanks to high local levels of direct solar irradiation, Andalusia is one of a handful of locations in Europe that is ideally suited to solar thermal power generation. The power plant, with an installed output of 50 megawatts, was completed on schedule this summer. It is currently running in test mode; commercial operations are due to begin in the coming weeks. From that point on Andasol 3 will generate approximately

165 million kilowatt hours of electricity a year, saving some 150,000 tonnes of CO<sub>2</sub> when compared with a modern hard coal-fired power plant. In all, the three more or less identical Andasol power plants can meet the electricity needs of about half a million people using power generated by solar energy.

“With the swift phase-out of nuclear energy and the huge challenges posed by the move towards renewables, with the new forms of power generation this entails, the involvement of the German municipal utilities is vital. The companies in Germany’s major cities in particular need to come up with innovative ways of meeting future energy needs. For several years now RheinEnergie has been pursuing its own conversion programme entitled "Energy and Climate 2020". Our portfolio of renewable energy sources to date has mainly focused on wind, biomass and photo-voltaic systems. With Andasol 3 we are investing in production technology which is likely, alongside wind and hydroelectric power, to become a major component of European energy supply”, commented the managing director of RheinEnergie, Dr. Dieter Steinkamp.

The Andasol 3 power plant is made up of approximately 205,000 parabolic reflectors which collect the sunlight. These giant curved mirrors concentrate the heat generated by solar energy and transmit it to a heat transfer fluid. A heat exchanger then feeds the thermal energy into a hot water/steam circuit. The steam drives the turbine, just as in a traditional power plant. The generator connected then produces the electricity. By using a thermal storage tank, any electricity generated during the day can subsequently be supplied on demand. The storage tank holds 30,000 tonnes of a special blend of salts. Its storage capacity is sufficient for eight hours. Meaning that Andasol 3 can go on generating electricity reliably and feeding it into the grid even after sundown. At peak times up to 600 people were involved in the construction of the power plant. About 50 permanent jobs in the operation and maintenance of the facility have been created.

Joachim Ludwig, executive board member with Ferrostaal AG: “The market potential of solar thermal power plants is immense. That’s why we got involved in Andasol 3 from day one, providing financial backing for the development of the project. As a general contractor, we contributed our expertise gained from conventional power plant projects in the area of engineering, procurement and construction (EPC); we will continue to be involved in the project as co-owner following commissioning of the plant. Andasol 3 is a truly European project, which Spain has enabled by creating a positive political environment. It proves that pioneering work in the area of sustainable power generation can be achieved with committed partners and high-performance technology. Our thanks go to the authorities, local government and the numerous suppliers and their employees for their great cooperation.”

Christian Beltle, member of the executive board of Solar Millennium: “Solar thermal power plants are a successful concept for sensible and predictable renewables-based energy on a grand scale. Spain has adopted a pioneering position in promoting this technology and has thus created the first European market for solar thermal power plants. As one of the prime movers, Solar Millennium was quick to recognise this potential and has consistently addressed its expansion. We were responsible for planning the three Andasol power plants and were involved in every single stage of their development – from initial concept to completed facility. The inauguration of the third power plant in this location is visible confirmation to us of our successful work in recent years.”

The companies involved founded the project enterprise Marquesado Solar S.L. for the realisation of the Andasol 3 project. Stadtwerke München holds a 48.9 percent share, RWE Innogy and RheinEnergie a joint 25.1 percent via a holding company (RWE Innogy: 51 percent; RheinEnergie: 49 percent). Thirteen percent each is held by Ferranda GmbH (Ferrostaal) and the Andasol Kraftwerks GmbH (Solar Millennium).

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### **Stadtwerke München GmbH**

The Stadtwerke München (SWM) is the municipal utilities and services provider for the state capital of Munich. For decades the SWM has stood for the reliable and energy-saving supply of the Bavarian city with power (electricity, natural gas, district heat) and drinking water fresh from the natural springs of the Bavarian Alpine foothills. Its transport subsidiary MVG is responsible for underground, bus and tram services and is thus a major player within the Munich public transport network (ÖPNV). In addition the SWM runs one of the most modern leisure portfolios in Germany, featuring 18 indoor and outdoor swimming pools. With its affordable products and customer-oriented services the SWM makes a major contribution to the local provision of general interest services and quality of life in Munich. The SWM group employs approximately 7,500 staff. Group turnover for 2010 was in the region of 3.8 billion euros.

### **RWE Innogy GmbH**

The RWE Group combines its renewables expertise and power plants under the name RWE Innogy. We plan, build and operate facilities that produce electricity and power from renewable energy sources. Our aim is the swift expansion of the renewables industry throughout Europe. One major focus of our activities is on- and offshore wind power. However, RWE Innogy is also looking to expand in the areas of hydroelectric power and biomass. At the same time we promote the development of new future-proof technology. To this end we plan and operate biogas installations, geothermal and solar thermal power plants. We sponsor innovative companies in the start-up or growth phase, granting start-up funding for a limited period.

### **RheinEnergie AG**

Based in Cologne, RheinEnergie is one of the largest municipal utilities companies in Germany. Together with its investment partners, the company supplies approximately 2.5 million people in the Rhineland with energy and water. RheinEnergie is active in all phases of the energy industry value-added chain – from generation and distribution to energy trading, sales and marketing. Its regional supply network covers the districts of Rhein-Kreis-Neuss, Mettmann, Oberberg, Rheinisch-Bergischer Kreis, Rhein-Sieg, Rhein-Erft, as well as the cities of Cologne, Leverkusen and Bonn. In addition the RheinEnergie has a stake in MVV Energie in Mannheim. The company is promoting the transition to alternative energy sources in Germany with its “Energy and Climate” programme. In 2010 RheinEnergie (workforce: 3,000) achieved an annual turnover of approximately four billion euros.

### **Ferrostaal AG**

Ferrostaal is an international provider of industrial services to the plant and mechanical engineering sector. As a technology-independent system integrator, the company offers project development and management, financing concepts, and the construction of turnkey plants for the petrochemicals, power, solar, oil & gas sectors, as well as other special projects. As a supplier-independent, full service provider, Ferrostaal assembles sophisticated modules for automotive manufacturers and suppliers of automotive components, and acts as an independent sales and service partner for machinery and plant associated with the printing and packaging, plastics processing and recycling industries. With a workforce of approximately 5,300, Ferrostaal operates in more than 40 different countries; the company achieved an annual turnover of 1.8 billion euros in 2010. The International Petroleum Investment Company based in Abu Dhabi (IPIC) holds a 70 percent stake in Ferrostaal AG, the remaining 30% is owned by MAN SE (Munich).

### **Solar Millennium AG**

Solar Millennium AG, based in Erlangen, (ISIN DE0007218406) is a global player in the field of renewables, its prime focus being solar power plants. Together with its subsidiaries and investment partners, the company specialises in solar thermal power plants, especially parabolic trough plants, and is currently one of the world’s leading providers in this area.

Solar Millennium is currently consolidating its expertise with the aim of developing and securing its technological leadership in the field long-term. In the process it covers all major business segments within the solar power plant value chain: from project development and finance through to technology, turnkey construction and plant operation. Solar Millennium developed Europe’s first parabolic trough power plant in Spain and is also responsible for building Egypt’s first modern parabolic trough solar field. Solar Millennium is currently developing the world’s largest solar power plant in (California). Additional projects with an output of several thousand megawatts are being planned around the world: the current focus is on areas such as Spain, the USA, the Middle East and North Africa.

[www.SolarMillennium.de](http://www.SolarMillennium.de)