

# SUN & WIND ENERGY

**WORLD MAP 2010**  
*Solar cell and module producers*

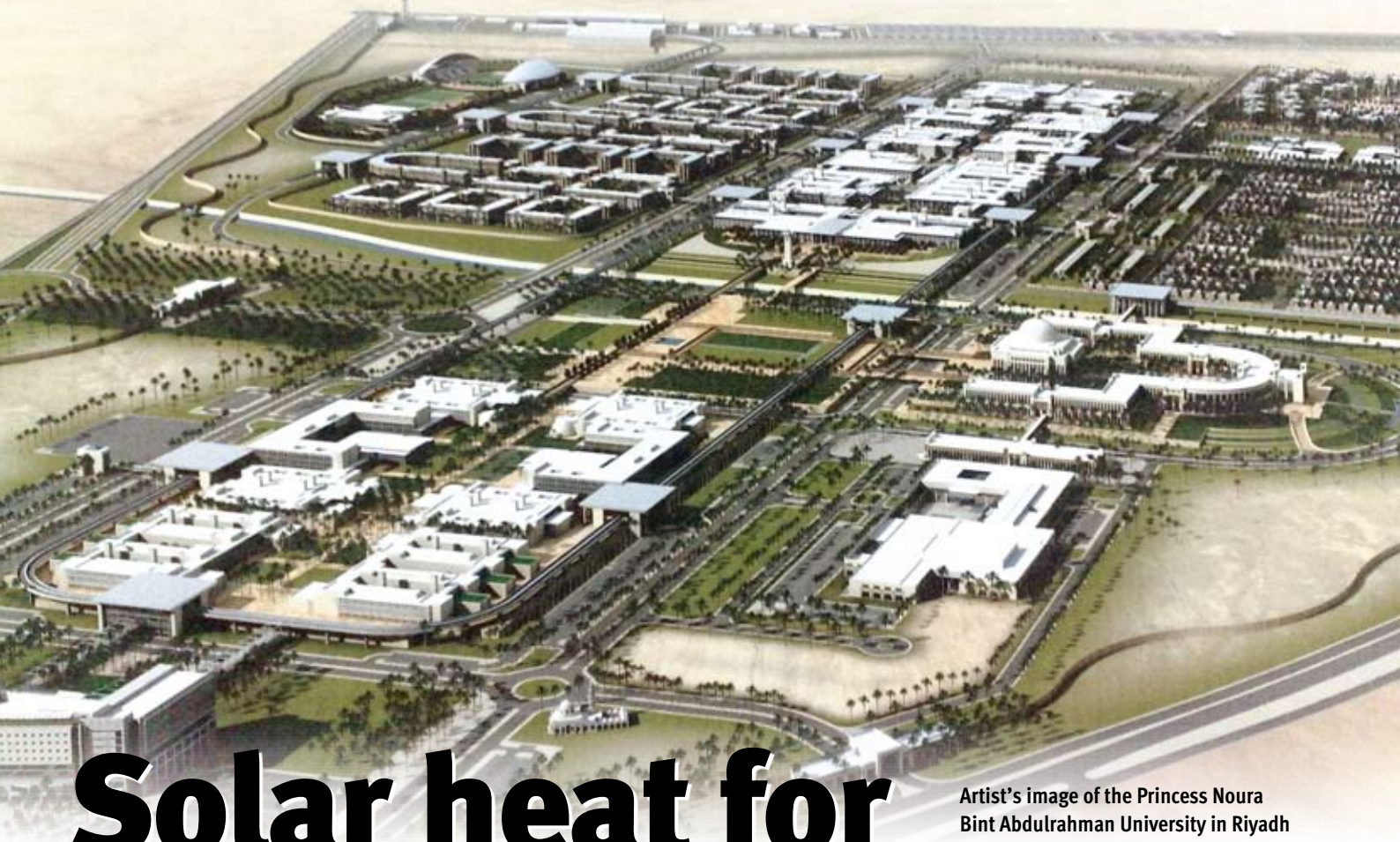


**PHOTOVOLTAICS**  
**Mass production and vertical integration**

**PHOTOVOLTAICS**  
New cell concept for more efficiency

**SOLAR THERMAL**  
The right formula for solar fluids

**WIND ENERGY**  
Market report: Germany



# Solar heat for the oil state

The world's biggest solar thermal plant is being constructed in the world's No. 1 oil exporting country. It will provide heat for a women's University in Saudi Arabia.

**T**he world's largest solar thermal plant will only be a small part of a big project. And for most people who hear about it for the first time, it is an even bigger surprise. The solar plant will have a collector surface of more than 36,000 m<sup>2</sup>. That is almost twice as much than the current world leader – a district heating plant in Denmark. But despite its huge area and its 300 m<sup>3</sup> storage tank, the solar plant will only be able to provide one fourth of the energy the Princess Noura University for Women in the Saudi Arabian capital Riyadh will need for hot water and space heating. Saudi Arabia's king Abdullah named the university after his aunt princess Noura, the sister of the founder of Saudi Arabia. It will be the first women-only state university in Saudi Arabia. Most of today's universities have separate campuses for women and some do not allow women at all. According to current statistics, the majority of students in Saudi Arabia today are female. As a contrast, the Princess Noura University in the southern suburbs of Riyadh will be a city of women: 40,000 female students, lecturers and other staff will live, learn and work at the

Artist's image of the Princess Noura  
Bint Abdulrahman University in Riyadh

Photos (2): MEI

13 faculties on the 8 km<sup>2</sup> campus. The university will even have its own hospital. Although construction will take until the end of 2011, in Arab web blogs women are enthusiastic about the project and are already discussing whether they will apply. Another Saudi web site says that more than 40,000 women have applied for the 218 administrative and technical jobs on the campus, which were already announced last year.

Both the university and the solar plant are part of a slow change that is taking place in Saudi Arabia. King Abdullah is said to be a moderate reformer in many ways. In terms of energy that means that oil has been the main source of wealth for Saudi Arabia and it will be in the near future too. For Saudi citizens, energy is almost free of charge. The Saudi population is increasing rapidly and the energy consumption is growing even faster. Saudi Arabia is one of the few countries in the world that uses oil to generate electricity in power plants. The abundance of oil is the reason why solar energy has not played a role until now, although it is at least just as abundant. Whether it is for cooling, for desalination or for water heating – until now, there has been no point in exchanging running systems for solar systems. "It will never pay back economically," says Ennis Rimawi. Rimawi is the Chairman of Millennium Energy Industries (MEI), which is by his own account the biggest engineering company for solar thermal systems in the Gulf region. But despite the country's richness in oil the Saudi government is well aware that it is only the export of fossil fuels that brings money into the country. That makes the rising domestic energy consump-

tion a critical issue. "There are projections that say if energy consumption keeps developing like now for 20 years, they will not be able to export oil and gas anymore," says Rimawi. Another reason for the state's interest in solar is that the Saudi Arabian government sees an economic chance in becoming a materials provider for the world's solar industry.

Among other projects, MEI did the engineering for the solar plant that will help in heating the Princess Noura University. "In showcase projects like this, King Abdullah gives his personal input on the concept. The actual client was the Ministry of Finance and the consulting was done by Dar Al-Handaseh, a consulting company from the MENA region. But for sure the consultant was given a direction to use innovative and advanced technologies," says Rimawi. He is convinced that his company got the assignment because of its experience in building complex solar systems. "We are able to advise our customer as a neutral system integrator," he says. That includes the selection of adequate components. The whole system has to work reliably in the tough desert climate, with high temperatures that can stress the collectors during stagnation periods and with harsh winds blowing the sand over the solar field. For the collectors, Millennium Energy opted for the Austrian manufacturer GREENoneTEC, who installed a new production line for large collectors to meet the tight deadline. The collectors that will provide the heat for the university have an area of 10 m<sup>2</sup> each. GREENoneTEC has modified the mounting system so it can resist the high wind speeds in the desert and more collectors can be fitted into the same area.

Since May, and at the collector manufacturing at GREENoneTEC alone, 21 people have been working in a three-shift roster at the relevant collector assembly line. At Millennium Energy, about 15 engineers are engaged in this project. Altogether, about 4,000 people are working on the construction site. Whilst construction work on the university will continue until the end of 2011, the solar plant is scheduled to start test operation at the end of this year.

Princess Noura University is drawing a lot of attention from bloggers from the MENA region and news websites from around the world, although the solar plant is only being mentioned on some websites specialized in construction and renewable energies. But both have in common that most people would not

expect something like them in Saudi Arabia. Hopefully, more surprises will follow.

*Eva Augsten*



**Ennis Rimawi is the Chairman of Millennium Energy Industries, the company that did the engineering for the world's largest solar plant.**