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Abu Dhabi switches on to solar

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Abu Dhabi residents will begin to benefit from clean energy in March, marking a first for the region when the renewable energy company, Masdar, connects its solar power station to the grid.

The solar plant, which will have a capacity of 10 megawatts, is designed to cover the power needs of the construction phase of the Masdar City project, a carbon-neutral city being built near the capital's airport.

When the Masdar Institute opens its doors in September to its first batch of postgraduate research students it, too, will be powered by the field of dark panels converting the sun's rays into electricity.

"Excess energy generated will be supplied to the Abu Dhabi grid, providing Abu Dhabi customers with their first experience of alternative energy," the company said in a statement yesterday.

It is not only a first for Abu Dhabi and the UAE, but also for the entire Middle East, where facilities of this kind and scope are lacking.

Currently, the UAE relies on natural gas for its energy needs – it has the fourth-largest reserves in the world. Natural gas, although a cleaner fuel than oil and coal – the other two mainstream energy sources – releases into the atmosphere carbon dioxide (CO₂), a greenhouse gas, when burnt. Increasing concerns about climate change as well as the finite nature of fossil fuels have prompted Abu Dhabi to look for cleaner, renewable alternatives.

The new plant, which cost Dh185 million (US\$50.3m) to build, saves 15,000 tonnes of CO₂ from being released into the atmosphere every year. It is only the first step in Masdar's programme to bring clean energy technologies to the UAE, whose residents currently have one of the world's largest carbon footprints.

Designing the 200,000 square metre installation took two months. Construction started last September. The plant is scheduled for completion at the end of next month. The electricity generated by the plant will be used for Masdar's own energy needs, with the remainder being fed into the main grid. The plant is expected to start sending electricity to the grid in March, after two weeks of testing.

"It is a very aggressive schedule," said Khaled Ballaith, a project manager at Masdar's property development unit. "So far we are doing great."

At present, half of the 87,777 solar modules comprising the system have already been installed. Two suppliers have been chosen for the modules. Half of the electricity will be generated by modules supplied by Suntech Power holdings, which has regional headquarters in China, Switzerland and the US. The company has supplied modules made of crystalline silicon solar cells – the world's most commonly used PV semiconductor.

The solar farm will also feature modules by an American company, First Solar. The company, which has manufacturing facilities in the US, Germany and Malaysia, supplies modules known as thin-film – a relatively cheaper alternative to the crystalline panels that require the use of large amounts of expensive semiconductor materials.

Using a mixture of modules was not unusual in solar farms, said Sander Trestain, the vice president, technical, at Enviromena Power Systems, an Abu Dhabi-based company that was handed the design, build and operation contract for the facility.

"There are a number of farms that implement several different types of modules," he said, explaining that one reason for this was that until recently, few production companies had large enough outputs of modules.

"In other parts of the world, the mix of modules was because of the issue of time for procurement of modules. This is not the case here," he said, explaining that the decision to have a mix was deliberate.

"Some modules are better in warmer weather, some in colder weather."

While solar energy is a cleaner alternative to fossil fuels, the technology is still viewed with distrust by some experts in the UAE who fear that the country's harsh weather conditions – heat, humidity and dust – will impact on the efficiency of the panels. Electricity and water authority officials have also expressed doubt over how smoothly solar-generated electricity can be incorporated into the main grid.

Mr Trestain and Mr Ballaith were quick to point out the technology's reliability.

"Any doubt you hear expressed is a question of education," said Mr Trestain. "Something of this kind has never been done in the region before."



Sun power: an employee inspects the array of solar panels at Masdar City outside Abu Dhabi. **Stephen Lock / The National**

At a test site located near the PV farm, Masdar is comparing the performance of 41 solar panels for an 18-month period. Although the study will continue for another six months and it did show that none of the panels achieved the performance advertised by its manufacturers, the Masdar executives were satisfied enough with the results of the experiment to give the farm the go-ahead.

Besides lack of knowledge, another challenge to solar's large-scale adoption in the UAE is cost. Mr Trestain was not able to offer specifics about the cost of the electricity generated by the plant. But he admitted solar could not yet compete with natural gas.

Masdar's solar plans do not end with the 10-megawatt farm. The company has invested in a factory in Germany, projected to produce 70 megawatts of thin-film panels per year. It will start production later this year, and will act as a blueprint for technology and knowledge transfer to a 140-megawatt Abu Dhabi plant, which will begin production in 2010.

In addition, building-integrated PV panels and concentrated solar power will be used to supply energy to Masdar's carbon-free city, to be fully completed in 2016.

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