Press Release
MAN Ferrostaal Aktiengesellschaft

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MAN Ferrostaal: Fresnel technology on the way to mass production

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- **Demonstration plant to prove the commercial viability for cost-effectiv solar power**

Fresnel technology, currently being tested in Almería, is the most cost-effective of the four solar thermal technologies currently available. Unlike a parabolic mirror, which requires multiple curved mirrors, the Fresnel facility only needs flat mirrors, which substantially reduces costs. A so-called “solar power tower”, on which a large array of two-axis tracking mirrors are mounted, which direct the sunlight towards a tower fitted with absorbers, requires a vast number of separate components and is therefore a very expensive solar thermal power plant model.

Parabolic trough power stations are the most technologically-advanced in terms of engineering and have already proved themselves commercially. All the components are already manufactured industrially and have therefore reached a good level in terms of production costs.

However Fresnel power stations are even more cost-effective to build than parabolic trough power stations. Their key components are very simple in terms of construction, production and processing and can therefore be manufactured for low costs. The mirrors, for example, are very simple, industrially-available flat mirrors. The fitting mechanism has only one continuous axis and is required to carry very little weight.

The entire facility catches very little wind and thus does not need a particularly solid foundation or a particularly robust support structure, as is the case with parabolic trough power stations. As only the mirrors, and not the absorber tube, move in the Fresnel technology model, there is also no need for flexible high-pressure compensators, which are required to enable the parabolic trough mirrors to pivot towards the position of the sun.

The purpose of the demonstration plant is to prove the commercial viability of Fresnel technology. The project partners will therefore be conducting a number of cost-efficiency and technical evaluations. On the cost side, the investment costs and the ongoing operational and maintenance costs will be determined and extrapolated for use with large-scale power stations.

From a technical point of view, the optimum thermal and fluidic properties will be examined. This will involve, among other things, determining the optimum efficiency of the optical collector and the thermal efficiency of the absorbers and

pipework. Crucial in this are the optical measurements to determine the contamination and ageing of the materials and the contour accuracy of the collectors. Any optical inaccuracies, possibly caused during fitting, tracking or torsional moments, can also be established.

The operation and maintenance of the plant will also be carefully observed and evaluated during the test run. A key objective of the project is to operate the Fresnel collectors at operating temperatures of as high as 450 degrees Celsius, in order to find out any weaknesses in the system, which can then be technically improved. New cleaning schemes for the mirrors and the receiver will also be developed during the test run, which can then be partially-automated on the larger-scale power plants. And finally the costs of running the larger-scale Fresnel power plants can be extrapolated on the basis of this valuable operational experience. The project partners are already planning power stations of up to 50 megawatts and more.

Technical data – Fresnel demonstration plant

Length	100 metres
Width	21 metres
Height	8 metres
Output	1 megawatt thermal energy
Duration of test	July 2007 – December 2008
Project partners	MAN Ferrostaal
	Solar Power Group
	Fraunhofer Institute for Solar Energy Systems (ISE)
	German Centre for Air and Space Flight (DLR)
	PSE
Investment volume	€ 2.6 million
Sponsorship	German Ministry for the Environment, Nature Conservation and Nuclear Safety