



# SAXONY-ANHALT

Investment and  
Marketing Corporation

**SOLAR VALLEY  
CENTER OF PV INDUSTRIES**

[www.invest-in-saxony-anhalt.com](http://www.invest-in-saxony-anhalt.com)

# SOLAR VALLEY JOIN THE SOLAR FAMILY IN SAXONY-ANHALT



- ▶ Central Germany – SOLAR VALLEY
- ▶ Highest density of PV supply chain worldwide
- ▶ Technology heart beats in Saxony-Anhalt
- ▶ Center for Silicon Photovoltaics
- ▶ Generous investment incentives
- ▶ Rapid project realization
- ▶ Skilled and flexible labour force

## Solar Valley – get a winning position for your business

- ▶ **Generous investment incentives** to cover up to 50 percent of capital expenditure
- ▶ **Fast-track project-realization** due to close proximity of the world's leading PV equipment suppliers and superior engineering as well as local authority services and support
- ▶ **Close R&D cooperation** with Germany's PV research institutes – e.g. the Fraunhofer Institute – CSP: Center for Silicon Photovoltaic
- ▶ **Skilled and flexible workforces**, lower labour costs are the advantages over Central Eastern European Countries
- ▶ **Leading glass producers and gas suppliers** located in Saxony-Anhalt offer best siting conditions
- ▶ **Shorter “time to market”** by state-of-the-art infrastructure for lower rate of long-term transport inventories
- ▶ Nearby **international schools** to join the Solar family life

## The PV Market

- ▶ Germany is the largest PV market in the world with app. 1.5 GWp of cumulated PV power in 2008
- ▶ Installations in 2009 enjoy a 20 year long feed-in-tariff of 31.94 to 43.01 € cent/kWh
- ▶ German PV industry turnover: EUR 7 billion in 2008
- ▶ The forecast compound annual growth rate for the period 2007 to 2012 is 28.7 percent
- ▶ Significant investment opportunities exist at all stages of the value chain and in all technologies
- ▶ Already located world's leading PV players (around 60) enjoying the myriad advantages of German PV industry cluster know-how and experience
- ▶ Some EUR 190 million was invested in R&D in 2008 (estimation)

# SOLAR VALLEY THE HEART BEATS IN SAXONY-ANHALT

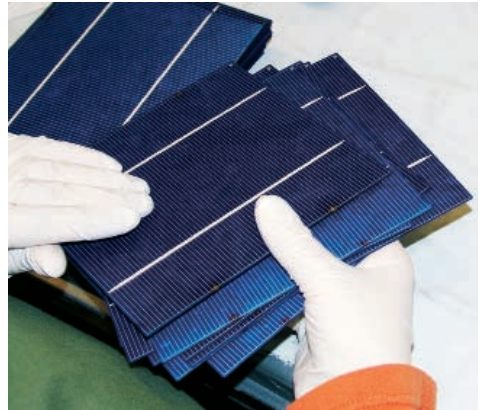


## Technology-heart Solar Valley in Saxony-Anhalt

	▶ Poly- and monocrystalline solar cells
	▶ Cadmium telluride technology
	▶ Crystallin Silicon on Glass thin-film technology
	▶ CIGS technology
	▶ String Ribbon technology
	▶ Amorph silicon technology
	▶ Solar-grade silicon
	▶ High-precision metallisation screens
	▶ Supplier of solar hall systems (VEGA)
	▶ Supplier of superior quality PV-glass
	▶ Repowering of Solar Cells

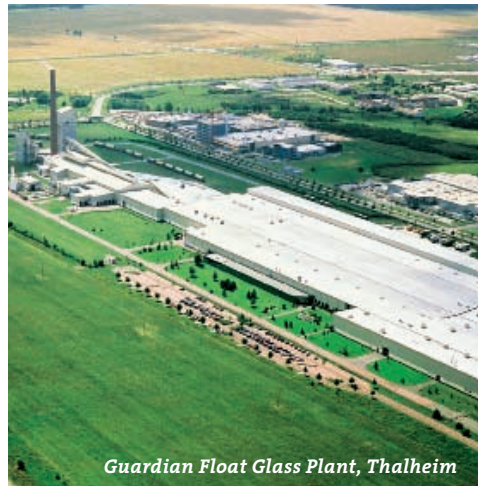
## Glass-industry (capacities)

	▶ Guardian	250.000 t/a
	▶ Euroglas	470.000 t/a
	▶ f-glass	255.000 t/a



### Core region for SOLAR VALLEY

- ▶ Traditional industrial cities with a charming historical background
- ▶ Ambitious core region with high investments of DHL, BMW, Dell, Porsche
- ▶ Several universities, international schools and research institutes are engaged in extensive joint-venture-research programs
- ▶ More than 420 primary schools and 615 secondary schools, with resources of bilingual education, high density of playschools
- ▶ Attractive residential areas in the city center as well as in the surroundings
- ▶ Four and five star hotels in the region



Guardian Float Glass Plant, Thalheim

# SOLAR VALLEY THINK TANK: CRYSTALLIZATION POINT FOR RESEARCH AND DEVELOPMENT – CSP



Crystallization of solar silicon (mc)

## Generating more solar power using less silicon

- ▶ The Fraunhofer Center for Silicon Photovoltaics CSP is the world's only crystallization and materials analysis center
- ▶ CSP conducts project-based, market-oriented research and development together with its industrial partners as well as application-oriented basic research in the field of silicon photovoltaics
- ▶ The CSP offers economically attractive, time- and cost-efficient projects
- ▶ It is currently supported with 60 million Euros by the German federal government, the EU and the state Saxony-Anhalt
- ▶ The resident research facilities offer good opportunities for new innovative people who get access to the most varied technologies of the PV industry in the region of Solar Valley

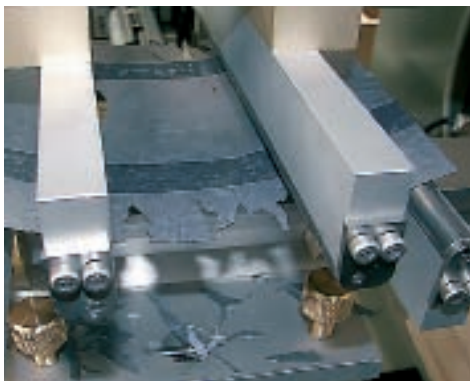


## Integrated education concept Photovoltaics

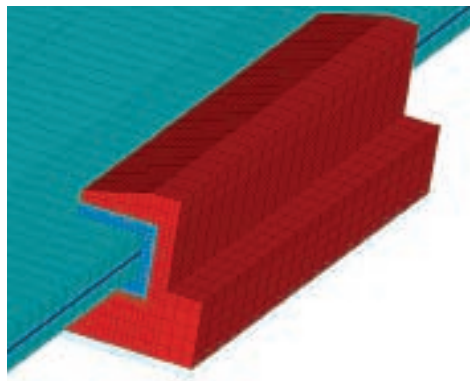
- ▶ Silicon crystallisation, incl. wafer sawing and cleaning
- ▶ Micros-structure diagnostic of solar materials and cells
- ▶ Mechanical assessment of thin wafer and solar cells
- ▶ Electrical characterisation of solar materials
- ▶ Coating technologies
- ▶ Junction technologies in module making
- ▶ Photonenmanagement and optical characterisation
- ▶ Reliability assessment of solar modules

*"The Fraunhofer CSP conducts a combination of crystallisation experiments, micro-structural analysis for the characterisation of Si wafers and material mechanic experiments on solar moduls, including alterations in their properties during the production process and while in operation, all at the highest levels of competence. The results can be used to evaluate the working life and reliability of modules as well as to improve their application properties and functionality."*

**Dr Jörg Bagdahn, Director CSP**



*Testing of mechanical properties of solar cells*



*Long term reliability of solar modules*

**SOLAR VALLEY**  
 LIKES TO HAVE NEW  
 FRIENDS-CUSTOMERS-  
 SUPPLIERS-PARTICIPATORS

- ▶ Solarvalley Mitteldeutschland – a joint project of Saxony, Thuringia and Saxony-Anhalt is one of the Winner of the Excellence Cluster of Germany launched by the German Federal Research Ministry (BMBF)
- ▶ Therefore will be received research grants totalling 80 million EUR over the next five years



- ▶ The research incentives will contribute to further strengthening the leading position of Germany-based solar firms and their headquarters in Central Germany

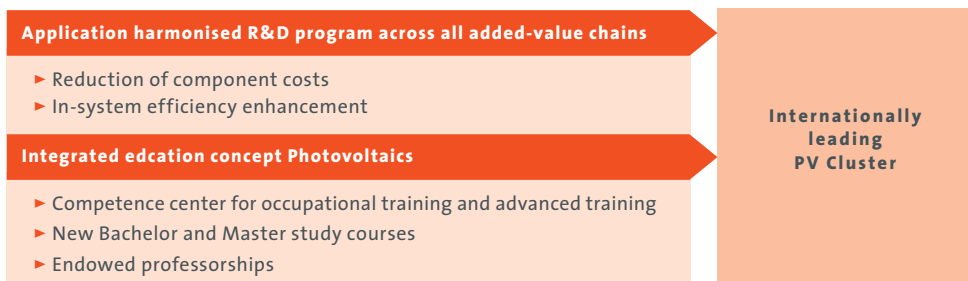
**Goals**

- ▶ Grid parity for PV generated power in Germany up to 2015
- ▶ Joint R&D activities to keep the scientific-technological advantage worldwide

**Partners representing the whole PV supply chain**

- ▶ 29 companies
- ▶ 7 R&D institutes
- ▶ 4 universities
- ▶ 3 federal states

**Development concept from fundamental research to innovative**



# SOLAR VALLEY SUPPORTS YOU IN SAXONY- ANHALT – STEP IN “MADE IN GERMANY” QUALITY



*Solar field in Solar Valley*

## REDUCTION OF YOUR PROJECT COSTS

<i>Reduction of capital expenditure</i>			<i>Reduction of operating costs</i>	
<b>Non-repayable grants</b>	<b>Loans / financing equity capital</b>	<b>Public guarantees</b>	<b>Labor-Related Incentives</b>	<b>Promotion of R&amp;D</b>
Investment grants	KfW Loans	Federal state	Recruitment	Grants
Investment allowance	State Development Bank Loans	Combined state / Federal state Saxony-Anhalt	Training	Loans
	Silent / Direct Partnership		Wage subsidies	Silent / Direct Partnership

<b>Silicon</b>	<b>Wafers</b>	<b>Cells</b>	<b>Modules</b>	<b>Systems</b>
German PV companies, backed by strong financial investor, are willing to financially support a silicon / wafer company		Potentials for new production concepts in collaboration with the leading German glass industry	Local production enables lower “landed” costs (logistics costs for cells are relatively lower compared to modules)	Growing market for new PV system products (e.g. Power roofs: combination of solar heating and photovoltaic)
New possibilities for lowering wafer material costs are on the way (new recycling techniques; usage of different silicon qualities, etc.)			Local production reduces exchange-rate risk and ensures faster “time to market”	Collaboration opportunities with leading German engineering companies for e.g. tracking systems
<b>Saxony-Anhalt offers highest research and development support within the European Union</b>			<b>Saxony-Anhalt is the location of leading industry partners for innovative collaboration</b>	

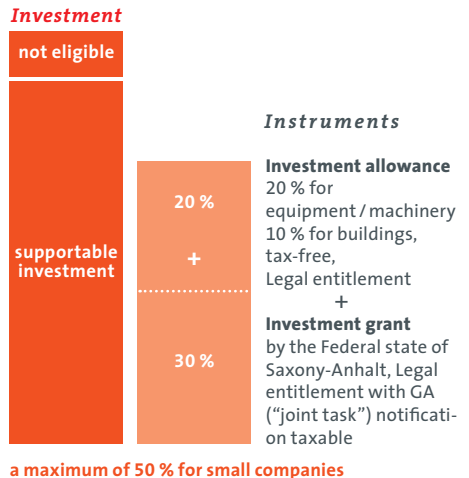


Q-Cells SE

Sample Medium-sized companies:

MEDIUM-SIZED COMPANY WITH INVESTMENT INTENTION	
<i>Assumptions</i>	
investment budget entitled to non-repayable grants (without property)	€ 25m
newly created permanent jobs	50
<i>Investment allowance</i>	
20 % x €23m (equipment, machinery)	€ 4.6m
10 % x €2m (buildings)	€ 0.2m
<i>Investment grant</i>	
20 % x €23m	€ 4.6m
30 % x €2m	€ 0.6m
<b>Total: allowance and grant</b>	<b>€10.00m</b>

Sample Small companies:



Less tariff bonding than in West Germany

- ▶ 75 % of companies are not unionised

Flexibility, motivation, education are very high

- ▶ 90 % of all employees are professionally trained
- ▶ Readiness for flexible work time models (about 13 % part timers) and high mobility (about 12 % commuters)
- ▶ 24/7 working time is possible – shortest permit periods for this model
- ▶ moderate unit labour costs

SEMICONDUCTOR INDUSTRY

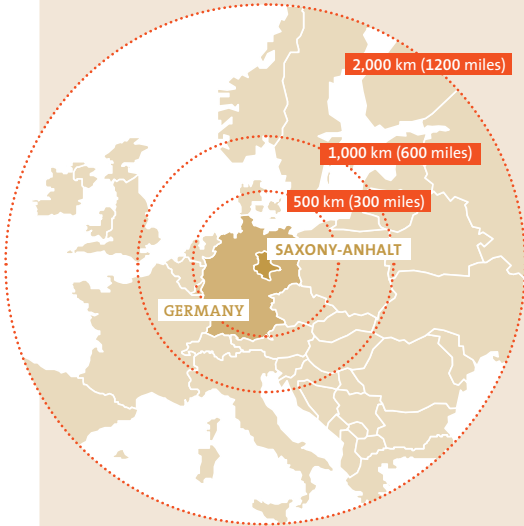
Group	Gross wage	
▶ Technican	14,00–14,50 per h/EUR	2.400–2.500 per month/EUR
▶ Operator	10,00–11,00 per h/EUR	1.750–1.850 per month/EUR
▶ Semi prof.	8,80–9,20 per h/EUR	1.500–1.600 per month/EUR

Source: DIS AG; Destatis

## YOUR PARTNER

- ▶ for site selection
- ▶ for subsidy and financing issues
- ▶ for dealing with authorities
- ▶ for full line project management

*All inquiries are kept strictly confidential.  
Our services are free of charge!*



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