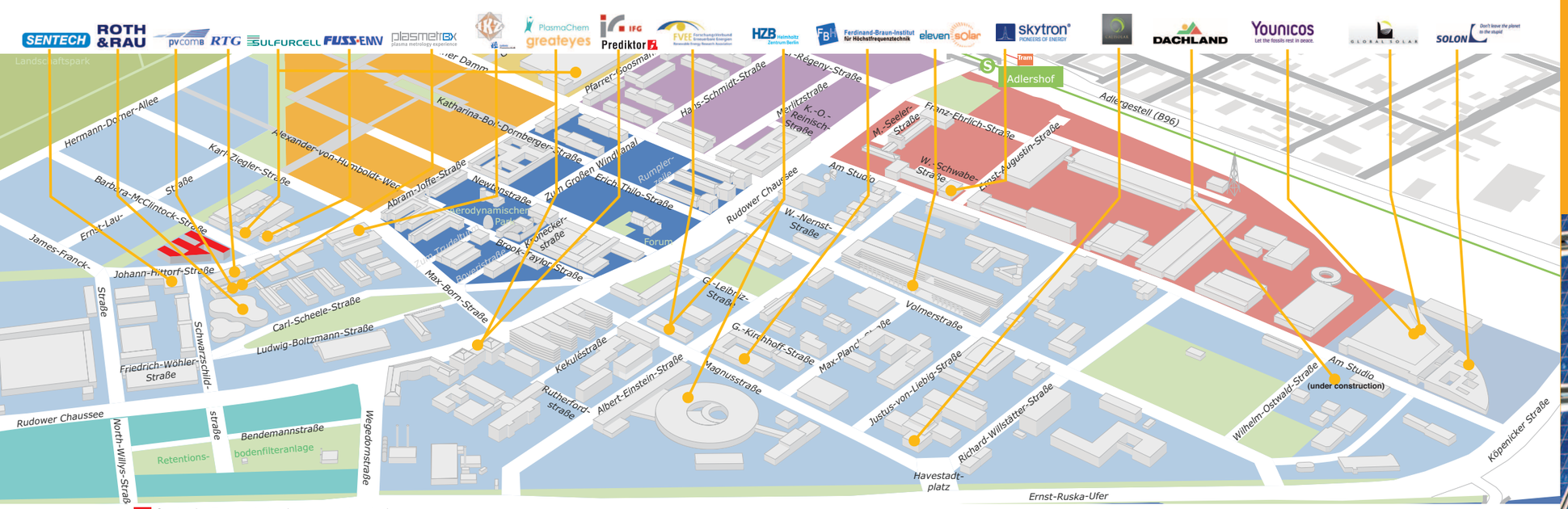


Centre for Photovoltaics (under construction)

Solarcluster Berlin Adlershof 2011

Institutes

Helmholtz-Zentrum Berlin
• Thin film solar cells
• Deposition processes (PVD, CVD, PECVD)
• Cell technology (Si, compound semiconductors, organic materials, thin films)
www.helmholtz-berlin.de, bernd.rech@helmholtz-berlin.de

PVcomB
• Public-Private Project development for Thin film Industry
• pilot production lines for amorphous/microcristalline silicon (a-Si/µc-Si) and CIGS modules on 30x30 cm²
• Technology Transfer
www.pvcomb.de, info@pvcomb.de

Leibniz-Institut für Kristallzüchtung
• Czochralski-semiconductors and dielectrics
• Thin Si crystal layers
• Silicon on glas for photovoltaic modules
www.ikz-berlin.de, jacobs@ikz-berlin.de

Ferdinand-Braun-Institut für Höchstfrequenztechnik
• GaAs technology for specific applications
www.fbh-berlin.com, Guenther.Traenkle@fbh-berlin.de

ForschungsVerbund Erneuerbare Energien
• Association of research institutes on renewable energies headquartered in Adlershof
www.fvee.de, fvee@helmholtz-berlin.de

Companies/Organisations

CaliSolar Inc.
• Utilization of dirty Si for solar cell production
www.calisolar.com, kirscht@berlinsolar.eu

Dachland GmbH
• Roofs and photovoltaic installations
www.dachland-berlin.de, dachland@dachland-berlin.de

eleven sOlar
• Planning, Financing, and Construction of PV devices on roof tops and open space
www.elevensolar.de, info@elevensolar.de

Fuss GmbH
• Electromagnetic Compliance (EMC) filters for photovoltaicinstallations
www.fuss-emv.de, info@fuss-emv.de

Global Solar Energietechnik GmbH
• German Branch of Global Solar Energy Inc., Tucson; producer of thin-film photovoltaic Copper Indium Gallium DiSelenide (CIGS) solar cells on flexible materials
www.globalsolar.com, j.muehling@de.globalsolar.com

greateyes GmbH
• Electroluminescence Quality Inspection Equipment for Solar Cells/Moduls (mono-Si, poly-Si, a-Si, CIS,CIGS...)
• Electroluminescence Measurements & Characterisation
www.greateyes.de, info@greateyes.de

Institute for Scientific Instruments
• Manufacturer of X-ray analytical instruments with X-ray capillary optics out of microstructured glass for in-line process control of PV Elements
www.ifg-adlershof.de, langhoff@ifg-adlershof.de

PlasmaChem GmbH
• Quantum dots for innovative new cell concepts
www.plasmachem.com, Plasmachem@t-online.de

Plasmetrex GmbH
• Plasma process diagnostics for thin film solar cells
www.plasmetrex.com, Michael.Klick@plasmetrex.com

Prediktor
• Solar Manufacturing Execution System (MES)
www.prediktor.de, wittig@prediktor.de

Roth & Rau AG
• mc-Si Ingots
www.roth-rau.de, dieter.linke@roth-rau.de

RTG Microanalyse GmbH
• SIMS of thin layers for photovoltaic applications
www.rtg-berlin.de, info@rtg-berlin.de

Skytron Energy GmbH & Co. KG
•Producer of high end Sensor Metrology Techniques and Monitoring Systems also for bigger PV Power Plants (MW Range)
www.skytron-energy.com, info@skytron-energy.com

Sentech Intruments GmbH
• Thin film metrology and plasma process technology for the photovoltaic industry
www.sentech.de, Albrecht.Krueger@Sentech.de

Solon SE
• Production of solar modules
• Photovoltaic systems for solar power plants
www.solon.com, sylvia.ratzlaff@solon.com

SULFURCELL Solartechnik GmbH
• (Copper-Indium-Sulfide) CIS solar module production
www.sulfurcell.de, meyer@sulfurcell.de

Younicos
• innovative energy storage and grid management solutions
www.younicos.com, info@younicos.com

lud/phot/05/011/en

Berlin Adlershof

Photovoltaic City Adlershof

www.adlershof.de/pv

Centre for Photovoltaics (ZPV)

Photovoltaics in Adlershof: Maintenance of the whole value chain

The Science and Technology Park Adlershof provides the environment for PV companies at all maturity stages - from the starting idea at PVcomB or at Humboldt University up to the final industrial product:

- PV FOUNDERS get support by local and international Business Angels and VC Investors on their demand and get their space for development in one of our two Incubators, which are among Germany's most successful ones. International companies are additionally supported by our "Soft Landing Programme".
- PV SMEs are maintained by special rental fees in one of our Technology Centres, for example in the Centre for Photonics and Optics or in the specialised Centre for Photovoltaics* on some 8,000 m² Lab-, Hall-, and office space, under construction since spring 2011 (see also opposite page).
- PV PRODUCTION COMPANIES can build their own facility on fully developed real estate properties between 1,500 m² up to 30,000 m² - like SULFURCELL and Solon SE already did.

Costs: 33 million EUR*
Opening: Januar 2013

*supported by

Designated Areas

Total Area:	**8,000 m²**
• Hall:	2,000 m²
• Offices:	1,800 m²
• Physics Laboratories:	2,800 m²
• Chemistry Laboratories:	200 m²
• Workshop rooms:	500 m²
• Storage rooms:	400 m²
• Canteen:	300 m²

RENTAL FEES BETWEEN 7.20 AND 9.70 EUR/m² X MONTH

Contact **Centre for Photovoltaics (ZPV)**
WISTA-MANAGEMENT GMBH
Dr Bernd Ludwig
Rudower Chaussee 17, 12489 Berlin, Fon +49.30.6392-2252
Email: b.ludwig@wista.de, www.adlershof.de

PVcomB

PVcomB – Competence Centre Thin-Film- and Nanotechnology for Photovoltaics Berlin

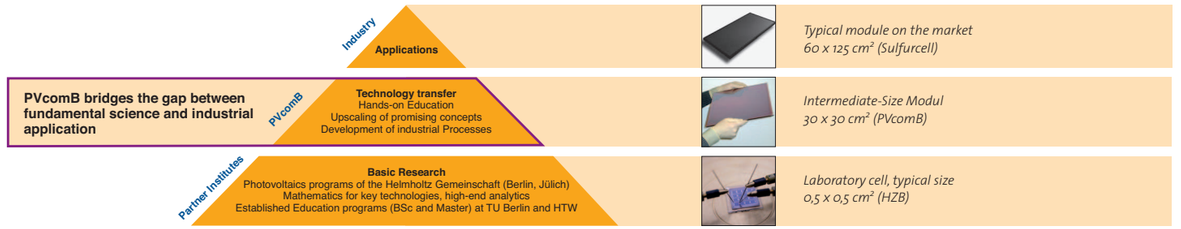
Bridging the gap between Science and Industry

Germany has gained a leading position in the photovoltaics (PV) market. To stay ahead, it is crucial to increase the technological effort in the rapidly expanding field of thin-film PV as well. Here, swift transfer from lab developments into cost effective production is a key factor. PVcomB's main goal is to support world wide growth of thin-film photovoltaic technologies and -products by providing the much needed technology transfer. The structure of PVcomB is unique in its combination of research & development with high-level education and training. In cooperative R&D projects with industry, all relevant aspects of the production of thin-film modules are addressed. Additionally, education and training provides the industry with highly skilled thin-film PV professionals. Founding partners of PVcomB are HZB – Helmholtz-Zentrum Berlin für Materialien und Energie GmbH and TUB – Technische Universität Berlin.

The unique approach of PVcomB has been recognised by the BMBF (Federal Ministry of Education and Research): In May 2009, PVcomB has been appointed as one of the funded projects in the program ***Spitzenforschung und Innovation in den Neuen Bundesländern*** (Leading-edge Research and Innovation in the new German Länder) and will receive 15 million Euro over the next 5 years.

Complete manufacturing process in Pilot-Lines

There is a large gap between production of lab-sized photovoltaic cells and industrial-sized modules. PVcomB bridges this gap by operating two dedicated pilot-lines for intermediate size PV modules with an area of 30 x 30 cm². A truly unique feature of these research lines is that both technologies, thin-film silicon as well as CIS, will be studied within a single laboratory.



This convenient arrangement offers the potential to unlock significant synergies in many topics common to all thin film based technologies. Using the pilot line as benchmark, alternative processes and analytical steps will be developed and tested, including the development of new materials. The great variety of analytical tools at PVcomB available ensures that changes in the product performance can be linked to fundamental material properties.

Helmholtz-Zentrum Berlin für Materialien und Energie

Materials Research for Solar Energy Technology

The main goal is to develop future generations of cost-effective thin-film solar cells. To reach this objective, the scientists work on high efficiencies and a substantial reduction in the costs of solar power generation. One focus of the work lies on developing existing thin-film technologies to a stage where industrial applications can follow as the next step. At the same time, new materials and new concepts for future devices for solar cells are explored. The high scientific and technological expertise at the HZB is applied upon both empirical work and basic research. For the design of innovative nano-technological materials and devices, fundamental aspects are becoming increasingly important. A new research area is exploring the possibilities of producing chemical energy carriers directly from photovoltaic processes, the so called solar fuels. Finally, the outstanding highly sophisticated analytical tools for investigating materials, cells and modules make the HZB a unique research partner within the scientific community.

Contact **Competence Centre Thin-Film- and Nanotechnology for Photovoltaics Berlin (PVcomB)**
Helmholtz-Zentrum Berlin für Materialien und Energie GmbH
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Schwarzschildstr. 3, 12489 Berlin, Fon +49.30.8062-15679
Email: info@pvcomb.de, www.pvcomb.de