

Photovoltaics in Baden-Württemberg

Smart energy systems, innovative technologies, extremely high production standards –
Baden-Württemberg is a leading location for the global photovoltaics industry



Baden-Württemberg

Where ideas work.

Facts and figures about Baden-Württemberg

Outstanding innovations

Population

10.8 million – this corresponds to
13.2 % of the population of Germany

Gross domestic product

477 billion euros – this corresponds to 15.2 % of Germany's GDP
GDP per inhabitant: 43,700 euros (Germany: 37,997 euros)

Export

Export volume: 192 billion euros
Export volume per inhabitant:
17,600 euros (Germany: 14,600 euros)
Export state No. 1 in Germany

Research & development

Research & development 2014: 4.9 % of GDP (Germany: 2.9 %)
Patents applied for per 100,000 inhabitants: 132 (highest in Germany)
Innovation region No. 1 in Europe

Baden-Württemberg is the 3rd largest state out of 16 in the Federal Republic of Germany;
figures for 2016 (date: June 2017)



Important solar energy location in Germany

Extremely high production standards

Baden-Württemberg plays an important role in the photovoltaics sector and is one of the leading technology drivers in this rapidly growing market. Numerous pioneers of solar energy as well as globally leading solar energy companies come from the German Southwest. Many of these enterprises operate in the parts-supply industry and profit from the strengths of the federal state's well-established mechanical engineering sector. Possessing comprehensive know-how regarding the integration of renewable energy sources into power supply systems, these Baden-Württemberg companies are world renowned for their cutting-edge technology as well as for their very high production and quality standards.

Moreover, in the area of photovoltaics, they cover the entire supply chain – from manufacturers, parts suppliers and wholesalers to project developers and the companies that actually install the equipment.

The development and manufacture of photovoltaics for the generation of electric current from sunlight are decisive for the strong position of the entire solar industry in Baden-Württemberg. With 7,300 employees working in this sector, the state continues to be one of the leading locations for this market, even in turbulent times.



Pioneer in research

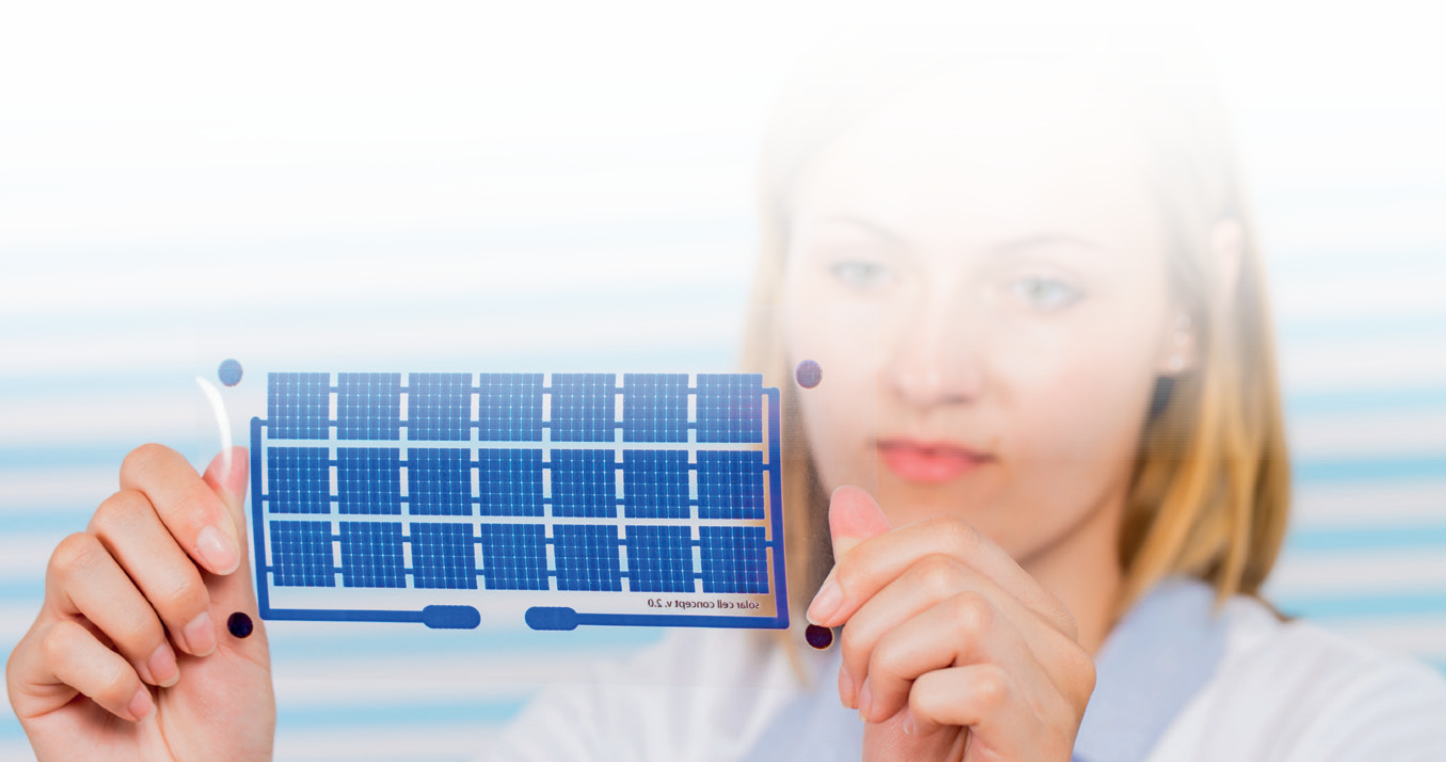
Smart, clean, sun-kissed

A dense network of research institutions for renewable forms of energy makes Baden-Württemberg a pioneer when it comes to research and development. In the area of solar energy, many such establishments have made a name for themselves worldwide. For example, the Fraunhofer Institute for Solar Energy Systems (ISE) in Freiburg with around 1,100 employees is the largest solar research facility in Europe. Its scientists are working intensively on organic photovoltaics and solar cells of the third generation, in addition to conventional technologies.

The Centre for Solar Energy and Hydrogen Research (Zentrum für Sonnenenergie- und Wasserstoff-Forschung = ZSW) in Widderstall in the Swabian mountain region has one

of the biggest open-air solar testing fields in Europe. The International Solar Energy Research Center (ISC) in Constance is also conducting research aimed at more efficient photovoltaic solutions.

Other focal points of research in Baden-Württemberg are, on the one hand, the integration of fluctuating renewable energy sources into the existing power system and, on the other hand, the development of better storage technologies.



Networks for innovation

Cleverly networked

Within Baden-Württemberg, numerous clusters and networks with players from the diverse areas of renewables and photovoltaics are generating synergetic benefits, stimulating innovation and creating new market potential for companies that are resident in the federal state. This kind of cluster platform is being actively supported in Baden-Württemberg in order to intensify the dialogue between industry and science and thus strengthen the competitiveness and export capability of the solar technology industry in the German southwest.

The Solar Cluster of Baden-Württemberg, which has its headquarters in Stuttgart, is a state-wide affiliation of more than 40 companies, research institutions and associations concerned with solar energy. Examples of regional networks in the field of renewables are the Karlsruhe Energy Forum, the Green City cluster initiative in Freiburg and the StoRegio cluster initiative for energy storage systems in the Rhine-Neckar region.



Baden-Württemberg as a science location

Excellence in teaching and research

With more than 70 universities and over 100 non-university research institutions, Baden-Württemberg is one of the top science locations in Germany. The quality of teaching and research here is extremely high, an advantage that companies in the renewable-energy and photovoltaic sectors also greatly profit from.

The universities in Baden-Württemberg offer numerous courses of study in the areas of energy engineering, process technology, renewable forms of energy, photonics, wood energy, bio-energy and renewable raw materials. Thanks to

this diversity, there is a steady flow of young new talent. In close cooperation with the Fraunhofer Institute for Solar Energy Systems (ISE), the University of Freiburg offers master degree courses in photovoltaics and in renewable energy engineering & management. In addition, professional training courses in environmental engineering are turning out competent, qualified experts in their field. In this important branch of industry, Baden-Württemberg is thus ensuring a constant reliable supply of highly qualified personnel for the needs of today and the future.



Baden-Württemberg International

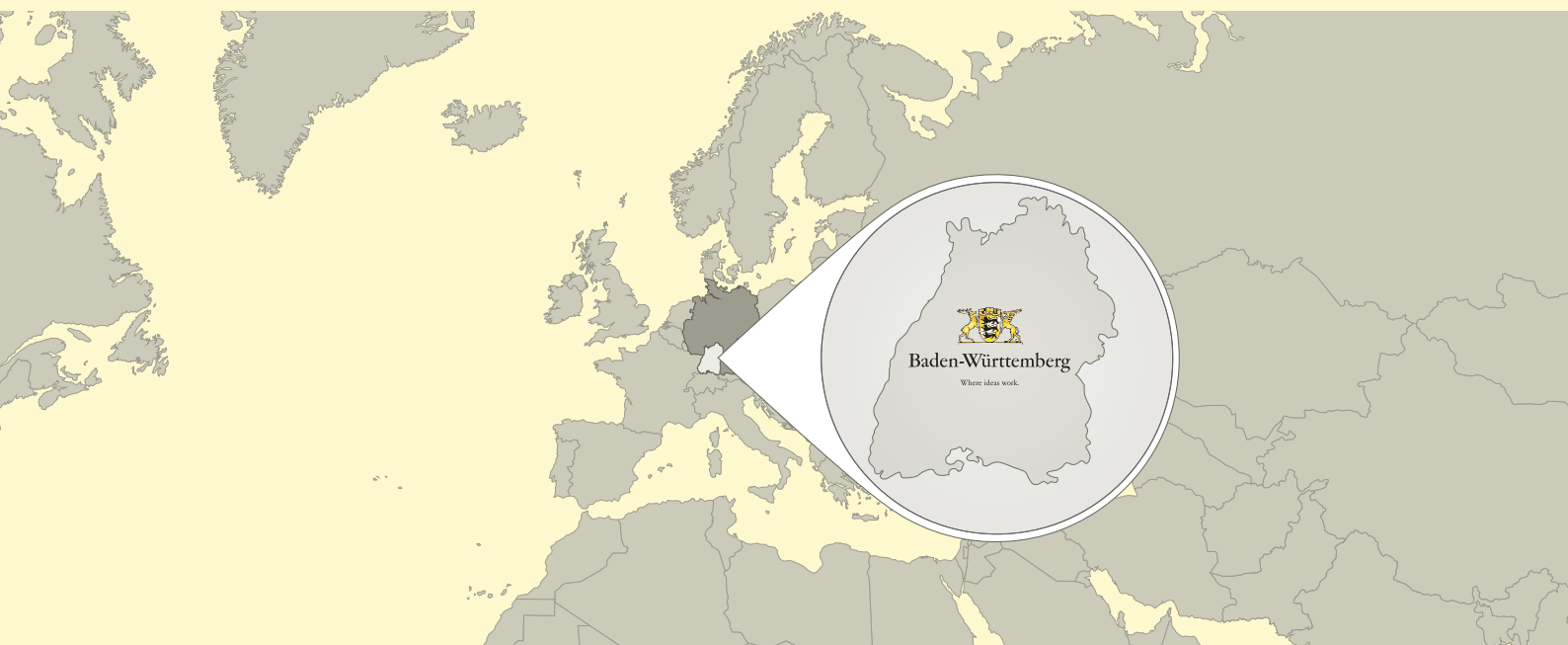
Your partner on the way to success

Baden-Württemberg International (bw-i) is Baden-Württemberg's centre of competence for the internationalisation of business and science. We lend support to Baden-Württemberg companies, clusters, universities and research institutions as well as to regions and municipalities, in all questions relating to internationalisation. For foreign investors, we serve as our state's central point of contact.

When looking to settle in a new region, companies are confronted with diverse questions and challenges. bw-i supports them in their projects – quickly, simply and competently. We provide information on Baden-Württemberg as a location, supply details regarding the general legal situation, identify suitable partners for business and research, assist in the search for a suitable site and stand by to help you in all phases of the planned settlement process.

For more information visit www.bw-invest.de/en.





 **Baden-Württemberg International**

www.bw-i.de/en

Solar  **Cluster**
Baden-Württemberg

www.solarcluster-bw.de

Published by: Baden-Württemberg International, Agency for International Economic and Scientific Cooperation

Picture credits: P. 1: © Bosch, P. 2: © Fraunhofer-Institut für Solare Energiesysteme (ISE), P. 3: © Fichtner GmbH & Co. KG, P. 4: © science photo, Fotolia.com, P. 5: © ag visuell, Fotolia.com, P. 6: © ZU/Ilja Mess, P. 7: © Baden-Württemberg International. P. 8: © stringerphoto, Fotolia.com

Date: August 2017