Germany energy storage research and development

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Germany has historically been a global leader in renewable-energy research, thanks to its sustainable-energy agenda and high levels of public funding. The result has been a wealth of opportunities for scientists working in the private and public sector. The renewable-energy field employs nearly 340,000 people in Germany, and according to the Federal Ministry for Education and Research (BMBF), there are now more than 180 universities and 120 research institutes involved in the country"s energy-transition programme, Energiewende.

However, over the past decade, Germany"s renewables industry has been challenged by strong competition from elsewhere in the world. Its once-dominant solar-panel-manufacturing industry, for example, has largely been gutted by cheaper competitors in Asia (see "Top 10 solar-cell producers in 2016"). The impact has rippled beyond industry to laboratories around Germany, causing many scientists to re-evaluate their study priorities and career plans. "That affected research," says Eva Unger, a chemist at the Helmholtz-Center Berlin for Materials and Energy. "There"s a sense that we should get out of solar and do something else."

Asia"s photovoltaics manufacturing companies dominate the global market.

* manufacturing base in mainland China

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"Funding levels are continually climbing," says Niklas Martin, head of the German Renewable Energy Research Association in Berlin. "You can count on funding when it comes to planning a career."

There is still a lot of work to be done when it comes to encouraging societal adoption of renewable energy and support from businesses, and research priorities in Germany have changed to reflect a new phase of the transition. "It"s no longer enough to focus on technology," says Tobias Sontheimer, chief research manager for energy at the Helmholtz Association in Berlin. The priority now, he says, is understanding the larger picture: how will Germany weave proven renewable-energy technology into a coordinated network capable of supplying industry and society with reliable power? The country"s grid system and storage capacities in particular need to be overhauled to accommodate fresh forms of energy generation.

Research priorities and funding reflect this updated reality. Solar, for example, used to be a vibrant sector.

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Although there is still funding for cutting-edge solar research (see "The second coming of solar"), investment is increasingly being targeted at battery and storage technologies to stabilize fickle solar- and wind-power flows. And the biggest investments have been in projects that emphasize cross-sector collaboration. "Topics like how do we integrate technologies and sector coupling are gaining more and more attention," says Verena Fluri, an energy-systems analyst at the Fraunhofer Institute for Solar Energy Systems in Freiburg.