

New Materials / Nanotechnology / Photovoltaic

Best Practice: Successful Siting

sunfire: Tracking down Energy

Founded in 2010 and initially operating with just its three founders, sunfire today is 70 employees strong and dedicated to innovative energy technology.

In order to transform their research to market-ready commercial products, the founders Carl Berninghausen, Christian von Olshausen and Nils Aldag moved sunfire from Bremen to Dresden, where it is close to reaching its goal of making renewable energy systems market-ready. “We founded sunfire with just the three of us and by acquiring the Dresden enterprise Staxera, we grew to 25 employees,” Chief Financial Officer Aldag says. “Today sunfire has a staff of 70 and we intend to double it by 2018.”

Using recycled electricity, the medium-sized company is working toward converting water (H₂O) from the oceans and carbon dioxide (CO₂) from the air into liquid and gaseous fuels, a process called ‘Power-to-Liquids’ and ‘Power-to-Gas’. In this process, base products CO₂ and H₂O are used in combination with electrical energy to produce process gas, which is subsequently synthesized into hydrocarbons. Existing refinery technology is used to convert these hydrocarbons into fuels. sunfire presently builds power-to-liquids systems based on existing water electrolysis technology, with efficiency of around 55% achieved. Chief Financial Officer Aldag says the principle behind ‘Power to Liquids’ and ‘Power to Gas’ is to produce a renewable fuel that can be used to power cars, and that also has an energy storage that binds electricity that is usually stored in batteries in chemical form. “We want to use the resources of our world as efficiently as possible,” Aldag says.

Profitable Move to Dresden

Staxera’s expertise in the development and production of fuel cells and electrolyzers – the main component of the Power-to-Liquid/Power-to-Gas process – was an important expansion of sunfire’s competence: “Together, with the knowledge of our staff, we had the opportunity to form a strong unity and push both technologies forward to become market-ready,” Aldag says, “but the merger was not the only thing that made the move to Saxony’s capital profitable for sunfire,. The Dresden region is attractive for many reasons. The Technical University Dresden (TU Dresden), the Dresden University of Applied Sciences (HTW) both train excellent engineers. About 60 percent of our staff graduated from TU Dresden and HTW.”

Dresden’s many institutes and focus on research are other factors that made the Dresden move a smart decision. “The Fraunhofer Institute for Ceramic Technologies and Systems (IKTS) is one of our main partners,” Aldag says. “We have a close and successful collaboration.”

Collaboration with Fraunhofer Institute as a Model for Success

sunfire’s collaboration with the Fraunhofer Institute has been very successful, Aldag says. “The ‘Integrated Stack Module’ (ISM) that we are introducing to the market together with the Vaillant conglomerate, an internationally recognized specialist for heating, ventilating, and air conditioning

technologies was developed in close collaboration with the Fraunhofer IKTS," Aldag says. sunfire's standard-ISM is currently used in a field test of Vaillant's fuel-cell heating system. The technology can be used for producing electricity and heat in private households; the company plans to have the system market-ready by 2015. "A study predicts a yearly sales volume of 70,000 of these heating systems for 2020." Aldag says.

The Dresden industry location also offers ideal circumstances for sunfire's continued growth. "Next to funding from F&E Landschaft, Saxony's AufbauBank and Dresden's committed business development, we are benefitting from the environment of regional medium-sized suppliers, and the related knowledge exchange among companies," Aldag says.

The business-driven network 'Energy Saxony' is particularly important for sunfire, Aldag says: "It offers a regional and national platform for our company to present our ideas and find partners and customers."

Strong Partners, Powerful World Debut

Today, high-ranking industry conglomerates rely on Dresden technology. Since 2012, Bilfinger's Venture Capital branch holds sunfire shares. In early 2014, the company completed its series "B" financing round that involved the French energy giants TOTAL and EDF groups through the venture capital fund Electranova Capital. "These industry partners help us to quickly integrate our technologies into customer-ready systems, and work the markets as broadly as possible from our Dresden location," Aldag says.

Regarding technology, the Dresden energy experts are taking another big step forward this year. "The world's first Power-to-Liquid system demonstrator will start operations in Dresden in the fall of 2014," Aldag says. "Using regenerative electricity, the high-temperature electrolysis procedure will help create synthetic fuels such as gas, diesel, and kerosene, from carbon dioxide and water. As with the other developments, the goal is to industrialize and commercialize these products."

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