

COMPANY
Solidpower GmbH

LOCATION
Heinsberg, Germany

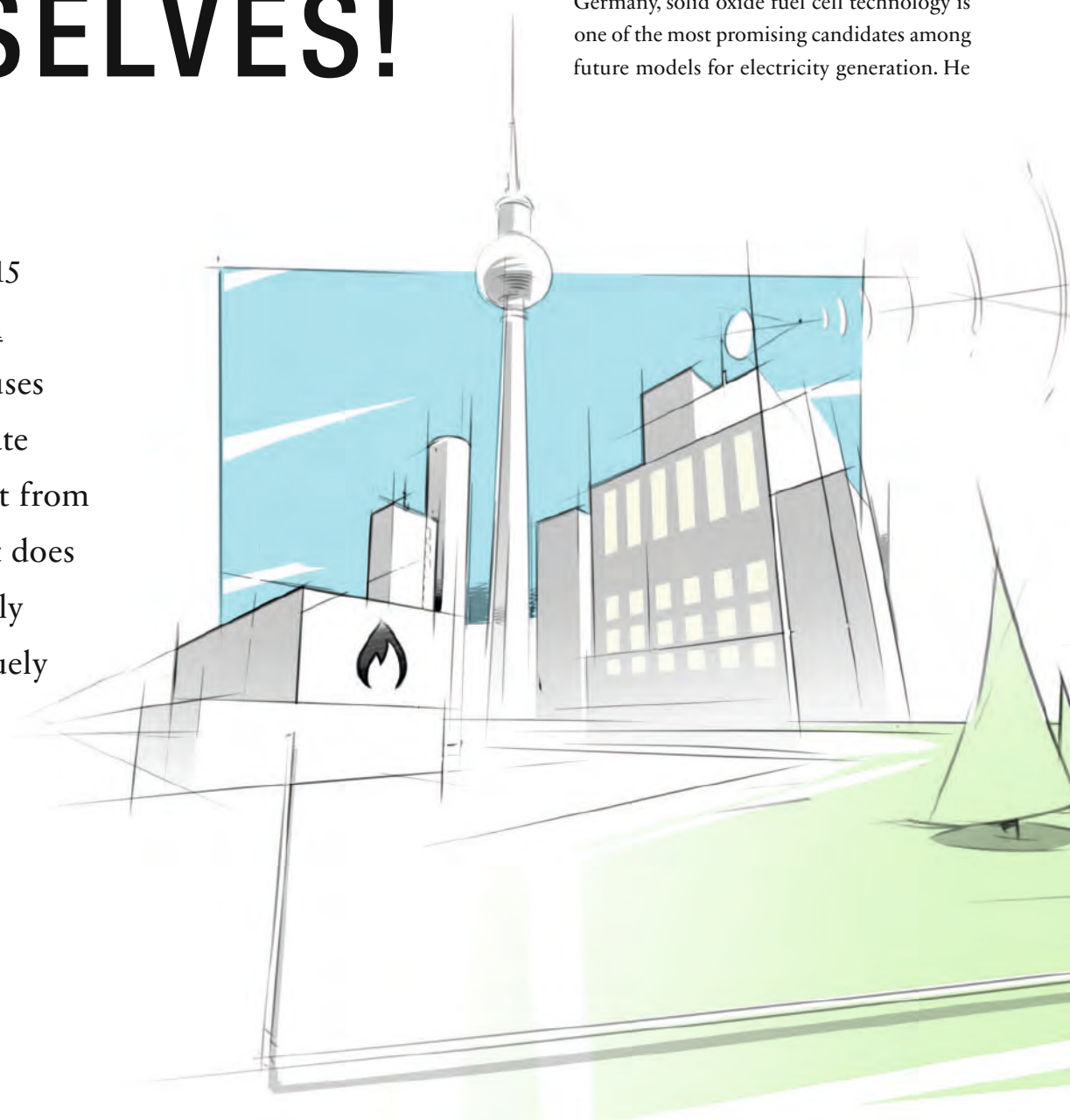
ELECTRICITY? WE MAKE IT OURSELVES!

The BlueGEN BG-15 micro CHP system from Solidpower uses fuel cells to generate electricity and heat from natural gas. And it does it very economically thanks to its uniquely high electrical efficiency.

The unit is somewhat larger than a washing machine, but much fancier with its dark gray and black surfaces and shining blue LED display. But as is so often the case, outward appearances are not what matters. In continuous operation, the BlueGEN BG-15 fuel cell unit generates about 13,000 kilowatt-hours of low-emission electricity per year. And since waste heat results from the conversion of natural gas to electricity, the power plant also generates up to 250 liters of hot water per day.

Cool improvement

Clean electricity is a key issue for the future, and interest in green energy is growing. So decentralized power generation using combined heat and power systems is gaining in importance. For Frank Dahlmanns, product manager at Solidpower GmbH in Heinsberg, Germany, solid oxide fuel cell technology is one of the most promising candidates among future models for electricity generation. He



says, “With the natural gas-powered BlueGEN family, it has been possible to achieve a considerable shift in the efficiency ratio for the first time. Thanks to their high electrical efficiency of over 55 percent, the units can — in contrast to motor-driven micro CHP systems — operate continuously and produce enough electricity for private homes and medium-sized commercial buildings.” Solid oxide fuel cells (SOFCs) convert natural gas into hydrogen-rich process gas from which electricity is produced through an electrochemical reaction — the fuel cell reaction. The rugged design of the fuel cell stack in the BlueGEN BG-15 makes it possible to modulate the output.

“Users can send their personal load profiles via a cell phone app and a Web app to the system to control it,” says Dahlmanns. “Depending on requirements, they can operate the BlueGEN BG-15 at outputs from 500 to 1,500 watts.” So its output can be reduced during vacations and increased again to

recharge the battery in an electric car. The reduction of the exhaust gas temperature to less than 120 degrees is an important improvement in the unit. Reducing the exhaust gas temperature enables the use of conventional plastic exhaust systems like those typically used in gas burners. That makes installing the BlueGEN BG-15 easier. Dahlmanns says, “That’s an important aspect for marketing the unit, because heating installers are important multipliers for us. They’re the ones who ultimately recommend our product to end customers.”

Clever mixing

Fans from ebm-papst play an important role in both reducing the exhaust gas temperature and supplying the process gas. Dahlmanns says, “We’ve been using NRG118 EC centrifugal blowers since we began to develop the BlueGEN technology. They’re powerful and rugged, characteristics that are indispensable

for continuous operation.” One of the centrifugal fans makes sure that the exhaust gas temperature remains below 120 degrees. The other supplies the air for the electrochemical conversion process in the fuel cell stack and cools it at the same time. The supplied control valve with stepper motor regulates the amounts of reaction and cooling air with a 3/2-way valve.

Gas for the future

With its improvements in BlueGEN technology for a modulated power generator for continuous operation, Solidpower overcame several challenges for future-proof power supply models. Now it is time to establish the conditions for making the BlueGEN BG-15 more attractively priced independently of state subsidies. Dahlmanns says, “We’re working on the service life of the units and of course on establishing fuel cell technology as green technology.” ●

BlueGEN makes very low-emission electricity from natural gas for households, electric cars and the power grid. Its waste heat generates hot water. And maintenance can be done easily via online monitoring.

