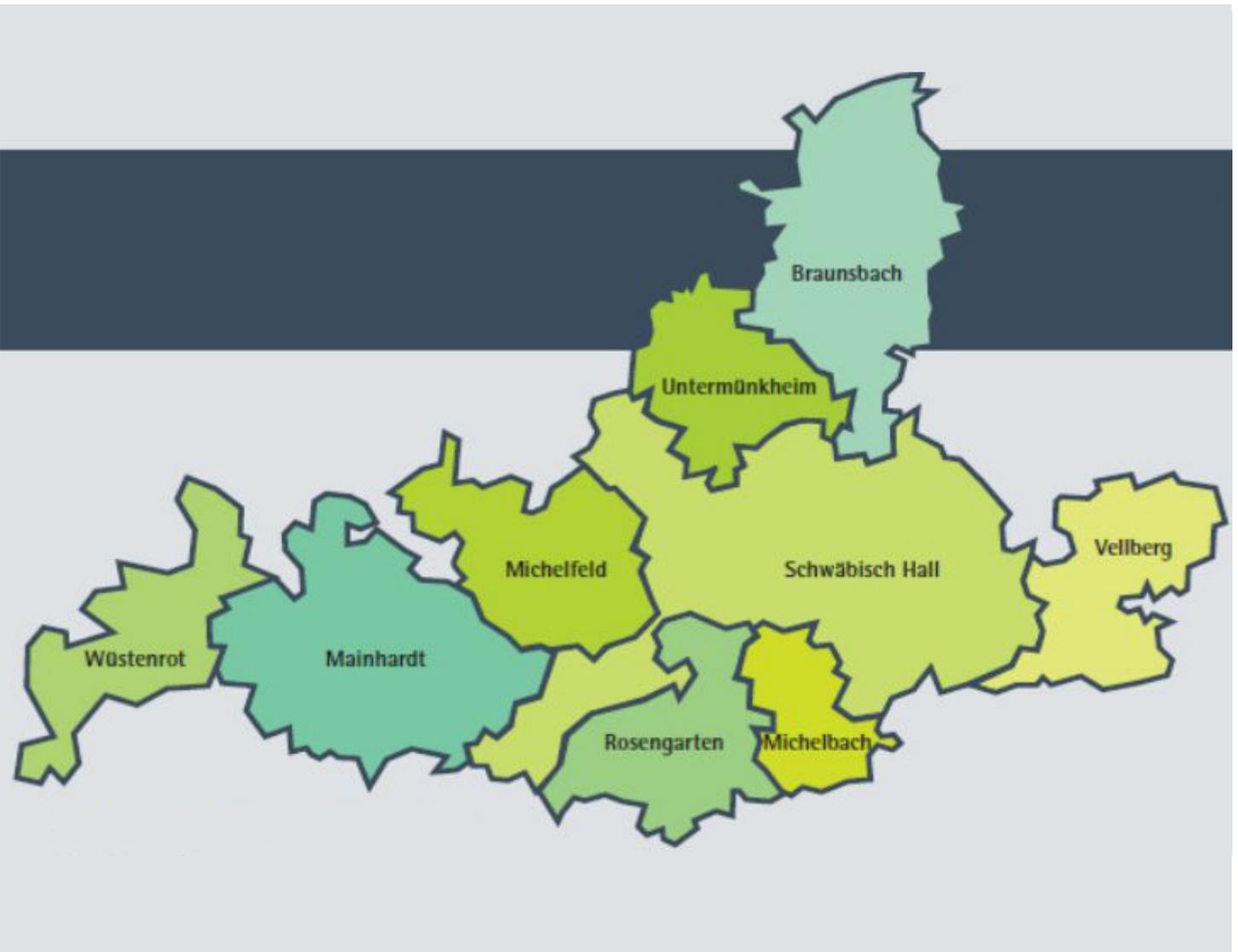


Local, Decentralized, Innovative:

Why Germany's Municipal Utilities are Right for the German Energiewende

by Paul Hockenos



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Schwäbisch Hall, Germany

Lanky, urbane, and impeccably dressed, Johannes van Bergen exudes self-confidence from behind his neat desk at the *Stadtwerke Schwäbisch Hall* (SSH), a municipal utility near Stuttgart in southern Germany. Indeed during his 23-year tenure, the community-owned utility and its 63-year-old director have been showered with prizes and distinctions for their progressive energy policies. Most recently, the old market town of Schwäbisch Hall, which has a population of 37,000, was named the country's "energy municipality of the year" and van Bergen as 2012's number-one energy executive.

About his own plaudits, van Bergen is modest. But not when it comes to those of the best-practice utility: "Local energy utilities like our SSH are ideally suited to the purpose of a decentralized energy transition," explains van Bergen, who was a close friend of the late Hermann Scheer, a fellow Social Democrat considered by many the visionary father of the *Energiewende*. "We just started before most everybody else did," says van Bergen, referring to the municipality's renewables strategy and switch to a district heating network. "Our model can be reproduced when municipalities are prepared to plan for the long-term."

Indeed, long before the *Energiewende* was in vogue, the native Rhinelander van Bergen, an electrical engineer by profession, set to work transforming the traditional utility, with about one hundred employees, into one that is a model for progressively minded municipalities across Germany.

Today it has a staff of 500 and boasts an annual turnover of €237 million, the lion's share of it from renewable energy production. Under van Bergen, SSH

invested in a range of renewables – including photovoltaic, onshore wind, hydro, biogas – and other cutting-edge technology, above all in combined heat and power (CHP) plants. Today, sixty percent of Schwäbisch Hall's electricity is produced in the city's 30 CHP facilities – one of the highest shares of any similar-sized city in the country.

"SSH realized very early on that liberalization of the energy market [begun in 1998] was going to change everything for the *Stadtwerke*, just as it did for the Big Four," explains Robert Werner, energy expert at the firm Hamburg Institut Consulting, referring to the four major energy utilities that controlled Germany's energy market before the European Union mandated liberalization. "It was extremely hard for many small or medium-sized utilities to make this transition and remain competitive. But SSH took advantage of the opportunity to break away from the Big Four, establish its own production facilities, and invest in CHP. It brought IT, heating systems, and commercial know-how into its team."

CHP, also known as cogeneration, is the use of a heat engine or power station to simultaneously generate electricity and useful heat. In Schwäbisch Hall, it is natural gas and bio-gas plants across the municipality that heat water for indoor heating and hot tap water in near-by neighborhoods. The excess heat can also be turned into cooling energy in the summer.

"Ultimately, it's just energy efficiency," says van Bergen, referring to CHP.

This is how CHP works: In generating electricity, considerable energy is lost as waste heat. Usually, it re-

leased into the air through the likes of cooling towers. But in cogeneration this thermal energy is put to good use. CHP captures some or all of the by-product for heating. The process can save 40 percent on primary energy use and cut carbon emissions by 65 percent. For this reason, the German government subsidizes the construction of CHP facilities as part of the *Energiewende*.

SSH may be a trailblazer, but it is not alone in the world of Germany's municipal energy utilities. *Stadtwerke* are a time-honored institution in Germany dating back to the 19th century. They are local utilities that can provide a palate of public goods, from the likes of water, electricity, gas, and basic infrastructure, for example streets, transmission grids, and sewage systems, to services like garbage disposal and snow removal. The 1,400 municipal utilities in Germany come in all shapes and sizes, with different forms of ownership and priorities. Some are even owned in large part by the big conventional energy companies, such as E.ON and RWE. About 900 of the *Stadtwerke* are involved in energy, and 60 percent of those are in the business of renewable energy.

"Where communities or local residents are involved in the decision-making of the *Stadtwerke*, they've been able to influence their agendas by insisting upon the production of clean energy," explains Benjamin Dannemann of the Renewable Energies Agency, a Berlin-based institute. "SSH has been a pioneer in the heating sector, which has so far been a glaring weakness of the *Energiewende* [in contrast to electricity]." SSH also plays an active role as the partner of localities across the country copying the SSH three-part strategy of CHP, renewables, and energy efficiency. As far away as North Rhine Westphalia it is partnering with municipalities aiming to copy SSH's three-prong model of renewable energy production, CHP, and energy efficiency.

Still other examples of innovative *Stadtwerke* are dotted across the country. The municipality of Wolfhagen, located in the middle of Germany, is the biggest producer of green energy in the state of Hesse and functions with direct citizen involvement. It has developed a five-point program to produce one hundred percent of its electricity needs by 2015. *Stadtwerke* Aachen along the Belgian border is experimenting with a hi-tech smart grid. Other municipal utilities have come up with trend-setting energy savings measures, new ways

to involve citizens in utility governance, and state-of-the-art smart-meter programs.

To date, municipal utilities own only about 6 percent of Germany's clean-energy capacity. But, for several reasons, this is changing. For one, best-practice cases like Schwäbisch Hall, which generates 26 percent of its electricity from renewables, show how communities can benefit from clean energy. It sells its green electricity on the power exchange in Leipzig to the major clean energy suppliers as well as to its own customers in the Schwäbisch Hall region. The revenue is reinvested in the *Stadtwerke* and the city.

Moreover, in Schwäbisch Hall citizens may participate as part-owners in the *Stadtwerke's* PV parks by investing directly in them, and thus partake in the planning as well as the profit. "You can't compare SSH with the municipal utilities of the past," says van Bergen, referring to SSH's business model. "Our market is all of Germany, and even beyond our borders."

Schwäbisch Hall "actually went ahead and did what others had only speculated about doing," said one jury member issuing SSH an award last year. "It combined environmental goals with economic success."

The local utilities will become ever more important in the overall equation of the *Energiewende* as more clean power capacity is added to Germany's mix. "They are positioned at crucial nodes in Germany's increasingly decentralized networks," explains Dannemann. "They're on the ground, close to both clean energy production and the consumers."

When they are operators of local transmission grids, they are the feed-in points for commercial producers and local prosumers of renewables, above all for photovoltaic solar power in southern Germany. Moreover, they will be even more integral as grids become "smarter" and more of the distribution process becomes local. And, finally, as "direct marketing" expands, namely the selling of electricity directly to buyers (rather than selling at the EEX), local municipalities could stand to profit.

SSH is just one of the *Stadtwerke* that has pledged to go fully renewable in the near future. It has plans (see graphs in powerpoints) to have its electricity production fully green by 2030 and its heating 95 percent zero-carbon by the same date. Energy efficiency is a

major part of the program. The municipality has begun with its own buildings, refitting properties, and setting high efficiency standards for all new buildings. It has already reduced municipal electricity and heating needs by 12 percent since 2008.

Van Bergen and SSH aren't resting on their laurels. The future is packed with new plans and investments. Wind and PV generated electricity are currently so plentiful in the Schwäbisch Hall municipality that technology to store it has to catch up. This is why van Bergen is looking into power-to-gas and battery storage technology for the municipality, as well as solar thermal and wood biomass to eventually replace some of the CHP plants' natural gas-generated electricity and heat.

"Renewables must play a bigger part in heat generation in Germany. This is important not just for Schwäbisch Hall, but for the whole country," says Werner of Hamburg Institute Consulting. "With renewables rather than gas or oil generating electricity in a CHP plant, there's a much greater potential to lower CO2 emissions and to make progress in greening the heating sector."

Options like these are being discussed across the country. But SSH isn't waiting for a green light from the federal government or anyone else. Just as it has in the past, it's forging ahead on its own.

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