

Power and Profits in the Hands of the People:

Lessons Learned from Germany's
Rural Renewable Energy Renaissance

By Diane Moss



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Published by the Heinrich Böll Stiftung
Washington, D.C., November 2012
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Editor: Rebecca Bertram
Design: Anna Liesa Fero
Cover images by the Heinrich Böll Stiftung

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POWER AND PROFITS IN THE HANDS OF THE PEOPLE: Lessons Learned from Germany's Rural Renewable Energy Renaissance

Germany's rural towns, like their United States counterparts, have struggled in modern times to overcome vulnerability to economic and population decline. In recent years, scores of small town residents in Germany have risen to the challenge by tapping national policies and local renewable resources, like the sun, wind, and biomass to create electricity, well-paying jobs, investment opportunities, local tax revenues, and new industries for their citizens. In September 2012, nine renewable energy policy makers and advocates from the United States traveled to Germany, where they witnessed what amounts to a small town and rural revitalization phenomenon. What they learned broadened their perceptions, set the record straight on several prevalent myths about renewable energy, and spurred new ideas about how to move forward back home.

Rural Renewable Energy Tour Overview

The tour started in Berlin with a series of meetings with German policy leaders who framed the political context of Germany's renewable energy transition. Two striking contrasts to the United States were evident in these discussions. One was that Germany has a comprehensive, long term [national renewable energy policy](#), while the U.S. does not. The second was that all sides of Germany's political spectrum push for renewable energy advancement. Although the various parties may debate degrees and speed of progress, they universally accept the need for policy that leads to aggressive renewable energy development.

Traveling to the town of Kassel, tour participants engaged in a transatlantic exchange at [the 4th Congress on 100% Renewable Energy Regions](#). Organized by the [German Renewable Energy Agency](#), this annual event brings together approximately 800 representatives from municipalities, academia, and industry to discuss issues relevant to achieving their mutual aim of using 100% renewable energy. Remarkably, the 100% renewable target is neither fantasy nor rarity in Germany. In fact, numerous towns and regions are committed to meeting all their energy needs in at least one energy sector with local renewable sources, and many have already reached or surpassed this goal.

For example, the state of Hesse where Kassel (along with its bigger neighbor Frankfurt) is located, has committed to 100% renewable electricity and heating for its more than six million inhabitants by 2050. Notably, as recently as 2010, the conservative government in Hesse was only willing to commit to 20% renewable heat and power by 2020. But the nuclear disaster at Fukushima prompted them to shift to the bolder 100% renewable plan. Resistance to nuclear power has been far

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The Morbach Energy Landscape is turning former U.S. ammunition depot into sites for 14 windmills, 2.9 acres of PV and a biogas plant.

more forceful across party lines in Germany than in the U.S., a position originally rooted in the Chernobyl nuclear catastrophe, which caused elevated radiation in Germany, including the contamination of farmland and the food supply. In 2011, conservative Chancellor Angela Merkel reconfirmed a national mandate to [phase out nuclear power](#).

To witness renewable energy projects in action, the tour paid visits to several towns and small businesses, such as the Mueltnner family organic farm in Bavaria, which gets about half its power from a large rooftop solar system installed on one of its farm buildings, and the other half from renewable electricity purchased from local network providers organized in the form of rural electric cooperatives. The farm's renewable power not only brings in revenue from electricity generated by the on-site solar panels, but also helps attract agro-tourism visitors.

The municipality of Morbach, about an hour west of Frankfurt, combines renewable energy and educational tourism on a larger scale. The Morbach Energy Landscape creatively repurposes brownfields at the former U.S. ammunition depot of Rapperath/Wenigerath and has turned them into sites for 14 windmills, 2.9 acres of solar PV, and a biogas plant. There is additionally a facility that produces wood pellets for heating, along with a pilot project that uses excess wind and biogas power to make renewable methane. The Energy Landscape has also recently converted former air raid bunkers into educational exhibits, one about climate change, for instance.

Lessons Learned

Peering into these windows of Germany's transition to a post fossil and nuclear power age, four primary themes emerged for most tour participants:

1. The shift is happening on a mass scale with a diverse range of renewable resources.
2. Most renewable power projects are locally owned.
3. Renewable energy is widely accepted.
4. People tend to point to one root catalyst of success.

Renewable Power of Many Kinds Is Ramping Up On a Mass Scale

Renewable power uptake is vastly more robust in Germany than in most of the United States. It is surprisingly normal in Germany to see windmills dotting the hillsides. Where there is a farm, there is often a biogas digester. And solar rooftops are ubiquitous. In statistical terms, Germany has installed about 30 GW wind – or more than twice as much per capita as the U.S. [in end of 2011 figures](#). The nation installed more solar power in [2010 \(7.4 GW\) and 2011 \(7.5 GW\)](#) than the [US has in 30 years](#). Germany has nearly [8,000 anaerobic digester biogas plants](#), while according to the [American Biogas Council](#), there are only 191 farm based digesters in the U.S. and 250 wastewater treatment plants that use the biogas they produce. Also, an aspect that some folks on the tour found unusual compared to their experience back home was that Germans often use the different technologies together

and see them as complementing one another, rather than viewing them as separate or competing energy solutions.

Local Ownership

Whereas renewable power installations in the United States are typically being developed and owned by utilities, utility subsidiaries, investment banks, and third party businesses which favor large projects, this is not so in Germany. [Over half](#) of Germany's renewable power projects are relatively small and owned by citizens or farmers. These individuals have remarkably invested \$100 billion in private capital into renewable power projects.

According to the German Renewable Energy Agency, [more than \\$1 billion](#) of these funds have been pooled by rural cooperatives, which consist of [about 80,000 members](#) throughout Germany. Resembling U.S. limited partnerships in structure, these cooperatives have been key to making local renewable power ownership more accessible in Germany. Many require investment of as little as 100-500 euros (\$130-650). The [German Cooperative Societies Act](#) set up the rules by which these cooperatives become a sound business model that is immune to insolvencies. Loans for cooperative renewable energy projects tend to come from the local cooperative banks. Tour participants noted the rural cooperatives also smartly make use of experienced consultants who guide local citizens through the process of setting up and operating the business structure.

One shining example of local renewable power ownership visited by the tour was the Bavarian village of Großbardorf. Over four years, local citizens have invested and leveraged outside capital worth \$19 million to develop rooftop and larger scale solar systems, along with a biogas plant that feeds both a combined heat and power (CHP) plant and a district heating network. Combined, the projects generate 400% of the electricity the village needs and 50% of its heating demand. Großbardorf is now also looking for new business opportunities that rely on its advanced heating network, and will be investing in local fish farming tanks which will use heat from the biogas plants to heat the water.

Großbardorf is not only ramping up massive amounts of locally owned renewable energy, but is also the "poster child," as economist James Barrett affectionately coined it, of how to cleverly motivate citizens to pitch in. For instance, when the town's home football team moved up in the ranks, regulations called for a new stadium roof. Rather than turn to a bank or big business to finance the project, the town solicited its citizens to invest in solar panels for the new roof, in exchange for season tickets to the popular football games. The locals went for the deal, leaving the income from the electricity produced by the solar panels to pay off the expense of the new roof.

Almost Everyone Seems Happy About It

Several participants noted that the broad opportunity for economic benefit seems to have spawned broad public acceptance. From conservatives to progressives, parliamentarians to farmers, financiers to laborers, Germans appear largely pleased with their renewable power expansion. Surely heated debates arise, like current

In Großbardorf, local citizens have capital worth \$19 million to develop rooftop and large scale solar systems and a biogas plant that feeds both a CHP plant and a district heating network.

Utilities must take all renewable power fed into the grid, with priority and streamlined grid interconnection granted to all renewable energy projects.

partisan tensions over continued federal support for solar and wind power. However, even the current conservative federal administration embraces a [target](#) of 35% renewable electricity by 2020 and 80% by 2050 and [has proposed](#) expanding the 2020 goal to 40%. That looks bold, particularly given that the U.S. meanwhile lacks any national renewable power target.

The Root Catalyst of Success

Why is this not happening in the United States? Why do towns in the U.S. that want to advance renewable power typically turn to outside corporations, rather than their own citizens? Certainly Americans, known for their innovation, are not less entrepreneurial. And surely towns and regions in the U.S. don't want to deprive their constituents of a profitable asset.

A critical lever of Germany's renewable electricity progress, and one that allows citizens from all echelons the opportunity to profit from the clean energy transition, is the [Renewable Sources Act \(EEG\)](#), commonly known as the feed-in tariff (FIT). The German FIT essentially provides three basic guarantees that renewable energy generators in the U.S. still largely do not enjoy: 1) Remuneration to all renewable electricity producers for the energy they "feed" into the grid at fixed rates over a long-term. Rates are based on a transparent survey of general installation costs plus a reasonable profit and are differentiated by technology. 2) Utilities must take all renewable power fed into the grid, with priority and streamlined grid interconnection granted to all renewable energy projects. 3) Utilities must pay for any necessary grid upgrades.

These and [other effective design components](#) of the German FIT have resulted in what Deutsche Bank analysts say is the kind of transparency, certainty and longevity (or "TLC") needed to attract investment. It is what made it a smart move for the local citizens of Großbardorf to put their money into their town's renewable power projects.

Busting Renewable Energy Myths

Learning about Germany's experience first hand cleared up several misconceptions often heard back home. Here are the top three busted energy myths reported from the tour:

Myth: *German Renewable Energy Policy is a big socialist government scheme with no place in a free market society like the U.S.*

Fact: Germany's renewable electricity projects are not owned by the state. [Nor are they subsidized](#). German policy simply guarantees renewable generators payment for the power they produce. The policy sets the price signals and helps even the playing field, so the free market has a chance to function without being so heavily biased toward conventional sources.

Myth: *German renewable power policy is an economic non-starter. It makes the public pay big sums for renewable energy, just so environmentalists can put solar panels on their roofs.*

Fact: Germany's economy is, first of all, hardly the picture of failure, with 3% GDP growth in 2011 compared to 1.5% in the U.S. and roughly 7% unemployment during the same period compared to 8.9% in the U.S.. Germany's FIT has been responsible for catalyzing about three quarters of the clean energy jobs in the country – or roughly [380,000 out of nearly 400,000](#).

Moreover, while some industrial power customers in Germany pay nothing at all, the rest of consumers pay only modest sums for renewable power. Average households paid only about [0.3% of their income](#) in 2011 for renewable energy. This means a typical single person paid about \$90 annually, roughly the cost of a cup of coffee (\$1.70) a week. The sum is expected to [rise in 2013](#), which could bring that weekly total up to about \$2.20, or about the cost of a latte.

This investment is partly offset by direct benefits to local citizens. Because most of the renewable power projects are owned by private citizens, small businesses and farmers, most of the utility bill surcharge for renewable electricity flows directly back to communities where the power was generated. And because the FIT income is taxed, the renewable power projects also generate revenue for local municipalities. Clearly, those who own renewable power projects also enjoy added revenue.

Additionally helping to balance out the FIT surcharge are lowered imported fuel costs, which amounted in Germany to as much as [11 billion euros](#) in 2011. Reduced detrimental environmental and public health impacts of greenhouse gas emissions, nuclear waste, and other conventional energy pollutants also save funds.

What's more, Germany's abundant solar panels cost on average about 60% less to install than in the U.S. [Why?](#) Because Germany's policies have cut red tape, and by catalyzing more rapid installation, have fostered a mature industry. For example, Germany has eliminated sales taxes on solar panels, which accounts for a \$.21/watt cost reduction compared to the U.S. Likewise, shorter permitting, inspection, and interconnection times in Germany have amounted to added savings. The Germans have actually done away with permits for residential rooftop solar altogether. Duplicating Germany's streamlined permitting model [could save U.S. customers \\$1 billion](#) over the next five years.

Lastly, a well-designed FIT, complemented by local ownership models as seen in Germany, lets almost anyone get in on the financial benefits of the renewable energy economy. The neighbor's solar panels might not look so bad, if the few bucks a month you pay also allow you to put solar on your roof and make a nice return, or invest a bit of cash in the nearby wind farm or biodigester and make yourself a stable, long-term profit.

Renewable energy investments are offset by direct benefits to local citizens and communities.

Myth: *Large amounts of renewable energy will cause blackouts due to intermittent power sources, like solar and wind.*

Fact: While the way the grid load is managed must be updated as the transition to renewable electricity progresses, the fact is that to date, renewable power has actually had a [stabilizing effect](#) on Germany's grid. Germany's Network Agency reported that the German grid reached record reliability in 2011, this despite record amounts of renewable power coming online and the shut down of 8 of the country's 17 nuclear power plants as part of the national nuclear phase out mandate. Denmark's and Spain's grid reliability has also increased, as the countries have installed more wind and solar power.

Returning Home With A Renewed Outlook

The unraveling of these myths helped to open minds and generate hope. Alice Madden, Wirth Chair of University of Colorado Denver's School of Public Policy and former Colorado House Majority Leader, reflected, "Sometimes we talk ourselves out of things, but the Germans seem to have not said 'no' to anything."

There is a need to strengthen the economic arguments for local climate solutions.

Nearly all participants returned to the U.S. inspired about how to build a stronger coalition of the willing in their communities. One municipal advisor concluded that he and his colleagues would be wise to strengthen their local economic arguments for climate change solutions, including advancing renewable energy. In Germany, he had observed that local leaders have been successful in part because they are skillful at articulating the concrete added monetary value of renewable energy to their communities. Addressing climate change and strengthening the economy is not an either/or proposition in Germany, as is so often seen in the U.S.

Drawing from the communication savvy of Germany's villagers, another participant began to think of how she might garner more regional interest in a FIT by appealing to familiar desires. For instance, farmers in her chilly state may more likely buy in to a FIT, if they learn it could help them power greenhouses to grow tomatoes year round.

Similarly, new ideas emerged for how to motivate skittish rural communities that are home to deeply entrenched fossil fuel industries. How about developing a FIT for power technologies that use the least water, for instance? Local farmers may be reluctant to talk about renewable power, given the influence of local conventional energy companies, but they all understand water, especially in the wake of recent droughts. As most renewable electricity technologies use no water or less water than conventional energy, the results could be remarkably similar without toppling the cultural apple cart.

An additional thought that arose upon returning home: Instead of continuing to debate what to call a "feed-in tariff," a title which some people in the U.S. find cumbersome, American policymakers should focus harder on getting the design right. Whether it is called FIT, CLEAN contract, standard offer, or whatever suits

a particular locale, to borrow from a familiar phrase, a feed-in tariff that makes a lot of people money and energy by any other name is still as sweet.

Vermont House Representative Margaret Cheney gave hope that seeds of progress are already being sown in the U.S. Senator Cheney introduced Vermont's feed-in tariff legislation in 2009 - called the SPEED (Sustainably Priced Energy Enterprise Development) program - after hearing a keynote speaker from Germany. "To go Germany," she remarked, "and hear them repeat that over and over again, and to see how their FIT has led to their 25% renewable power achievement, as well as to see the rural cooperative projects in Bavaria, which is so similar to Vermont, all gave me further help and inspiration." The Germans she met also were glad to meet a leader, as she put it, "from a slice of America that is getting work done."

To be sure, if American individualism, ingenuity and love of freedom could be harnessed to put electricity generation and its profits back into the hands of the people, realizing a thriving renewable energy economy in U.S. rural communities should be as doable as it is in Germany. Let's not forget that thirty years ago, when the world's first feed-in laws in California helped launch the modern wind industry, many in Germany looked to the U.S. for how to build a renewable energy future.

"To go to Germany and learn about the renewable energy achievement and seeing the rural cooperative projects in Bavaria, which is so similar to Vermont, gave me further help and inspiration."

**-Margaret Cheney,
Vermont House
Representative**

Acknowledgements: We would like to thank the following people for participating in the tour and for sharing their thoughts for this report:

*The Honorable Margaret Cheney, Vermont House Representative
The Honorable Alice Madden, Wirth Chair, School of Public Affairs, University of Colorado, Colorado House Majority Leader (former)
Leslie Aiden, Aide to Marin County Supervisor Kathrin Sears
James Barrett, Chief Economist, Applied Solutions
Andrew Kell, Program and Policy Analyst, Wisconsin Public Service Commission
Jonathan Koehn, Sustainability Director, City of Boulder
Anya Schoolman, Executive Director, Community Power Network
Joseph Steffel, Utilities Director, Buffalo Municipal Utilities
Bob Walker, Executive Director and Board President, Sustainable Energy Resource Group*