– 7 Sep 2013 – “…SUNDAY June 16th this year was a Goldilocks sort of day across Germany, not too hot but not too cool, with bright sunshine and a reasonable offshore breeze. Just right for Germany’s solar panels and wind turbines to produce, at their peak, a record 60% of Germany’s electricity on a slow weekend. But France and Belgium also had lots of nuclear power that could not easily be cranked down. So for several hours, generating companies had to pay customers to take their surplus power.

“Negative wholesale prices have become more common as European countries turn to renewables—particularly Germany, with its forced march away from nuclear power, known as the *Energiewende*. If at times Germany has too much of a good thing, at others it must suck power from nuclear plants across the border in France. And German ministers still worry about the risk of blackouts when the weather is cold, the sun does not shine and the wind does not blow.

“Neighbours such as Poland and the Czech Republic complain that power surges from Germany are playing havoc with their grids. Across Europe a strange consequence of subsidised renewables is that some governments now want to pay power companies to maintain the capacity to produce electricity from fossil fuels to ensure that backup power is available. More perversely, Europe is burning more heavily polluting coal at the expense of cleaner and more flexible gas, because coal is cheap, the gas market is far from liquid and the carbon-emissions systems is broken…”

[](http://www.spiegel.de/)

09/04/2013 07:15 PM

**Germany's Energy Poverty**

**How Electricity Became a Luxury Good**

*By SPIEGEL Staff*

***Germany's aggressive and reckless expansion of wind and solar power has come with a hefty price tag for consumers, and the costs often fall disproportionately on the poor. Government advisors are calling for a completely new start.***

If you want to do something big, you have to start small. That's something German Environment Minister Peter Altmaier knows all too well. The politician, a member of the center-right Christian Democratic Union (CDU), has put together a manual of practical tips on how everyone can make small, everyday contributions to the shift away from nuclear power and toward green energy. The so-called [Energiewende](http://www.spiegel.de/international/topic/german_energy_revolution/), or energy revolution, is Chancellor Angela Merkel's project of the century.

"Join in and start today," Altmaier writes in the introduction. He then turns to such everyday activities as baking and cooking. "Avoid preheating and utilize residual heat," Altmaier advises. TV viewers can also save a lot of electricity, albeit at the expense of picture quality. "For instance, you can reduce brightness and contrast," his booklet suggests.

Altmaier and others are on a mission to help people save money on their electricity bills, because they're about to receive some bad news. The government predicts that the [renewable energy](http://www.spiegel.de/international/topic/renewable_energy/) surcharge added to every consumer's electricity bill will increase from 5.3 cents today to between 6.2 and 6.5 cents per kilowatt hour -- a 20-percent price hike.

German consumers already pay the highest electricity prices in Europe. But because the government is failing to get the costs of its new [energy](http://www.spiegel.de/international/topic/energy/) policy under control, rising prices are already on the horizon. Electricity is becoming a luxury good in Germany, and one of the country's most important future-oriented projects is acutely at risk.

After the Fukushima nuclear accident in Japan two and a half years ago, Merkel quickly decided to begin phasing out nuclear power and lead the country into the age of [wind](http://www.spiegel.de/international/topic/wind_energy/) and [solar](http://www.spiegel.de/international/topic/solar_power/). But now many Germans are realizing the coalition government of Merkel's CDU and the pro-business Free Democrats (FDP) is unable to cope with this shift. Of course, this doesn't mean that the public has any more confidence in a potential alliance of the center-left Social Democrats (SPD) and the Greens. The political world is wedged between the green-energy lobby, masquerading as saviors of the world, and the established electric utilities, with their dire warnings of chaotic supply problems and job losses.

Even well-informed citizens can no longer keep track of all the additional costs being imposed on them. According to government sources, the surcharge to finance the power grids will increase by 0.2 to 0.4 cents per kilowatt hour next year. On top of that, consumers pay a host of taxes, surcharges and fees that would make any consumer's head spin.

Former Environment Minister Jürgen Tritten of the Green Party once claimed that switching Germany to renewable energy wasn't going to cost citizens more than one scoop of ice cream. Today his successor Altmaier admits consumers are paying enough to "eat everything on the ice cream menu."

**Paying Big for Nothing**

For society as a whole, the costs have reached levels comparable only to the euro-zone bailouts. This year, German consumers will be forced to pay €20 billion ($26 billion) for electricity from solar, wind and biogas plants -- electricity with a market price of just over €3 billion. Even the figure of €20 billion is disputable if you include all the unintended costs and collateral damage associated with the project. Solar panels and wind turbines at times generate huge amounts of electricity, and sometimes none at all. Depending on the weather and the time of day, the country can face absurd states of energy surplus or deficit.

If there is too much power coming from the grid, wind turbines have to be shut down. Nevertheless, consumers are still paying for the "phantom electricity" the turbines are theoretically generating. Occasionally, Germany has to pay fees to dump already subsidized green energy, creating what experts refer to as "negative electricity prices."

On the other hand, when the wind suddenly stops blowing, and in particular during the cold season, supply becomes scarce. That's when heavy oil and coal power plants have to be fired up to close the gap, which is why Germany's energy producers in 2012 actually released more climate-damaging carbon dioxide into the atmosphere than in 2011.

If there is still an electricity shortfall, energy-hungry plants like the ArcelorMittal steel mill in Hamburg are sometimes asked to shut down production to protect the grid. Of course, ordinary electricity customers are then expected to pay for the compensation these businesses are entitled to for lost profits.

The government has high hopes for the expansion of offshore wind farms. But the construction sites are [in a state of chaos](http://www.spiegel.de/international/germany/german-offshore-wind-industry-goes-from-boom-to-bust-a-914158.html): Wind turbines off the North Sea island of Borkum are currently rotating without being connected to the grid. The connection cable will probably not be finished until next year. In the meantime, the turbines are being run with diesel fuel to prevent them from rusting.

In the current election campaign, the parties are blaming each other for the disaster. Meanwhile, the federal government would prefer to avoid discussing its energy policies entirely. "It exposes us to criticism," says a government spokesman. "There are undeniably major problems," admits a cabinet member.

But this week, the issue is forcing its way onto the agenda. On Thursday, a government-sanctioned commission plans to submit a special report called "Competition in Times of the Energy Transition." The report is sharply critical, arguing that Germany's current system actually rewards the most inefficient plants, doesn't contribute to protecting the climate, jeopardizes the energy supply and puts the poor at a disadvantage.

The experts propose changing the system to resemble a model long successful in Sweden. If implemented, it would eliminate the more than 4,000 different subsidies currently in place. Instead of bureaucrats setting green energy prices, they would be allowed to develop indepedently on a separate market. The report's authors believe the Swedish model would lead to faster and cheaper implementation of renewable energy, and that the system would also become what it is not today: socially just.

**Trouble Paying the Bills**

When Stefan Becker of the Berlin office of the Catholic charity Caritas makes a house call, he likes to bring along a few energy-saving bulbs. Many residents still use old light bulbs, which consume a lot of electricity but are cheaper than newer bulbs. "People here have to decide between spending money on an expensive energy-saving bulb or a hot meal," says Becker. In other words, saving energy is well and good -- but only if people can afford it. A family Becker recently visited is a case in point. They live in a dark, ground-floor apartment in Berlin's Neukölln neighborhood. On a sunny summer day, the two children inside had to keep the lights on -- which drives up the electricity bill, even if the family is using energy-saving bulbs.

Becker wants to prevent his clients from having their electricity shut off for not paying their bill. After sending out a few warning notices, the power company typically sends someone to the apartment to shut off the power -- leaving the customers with no functioning refrigerator, stove or bathroom fan. Unless they happen to have a camping stove, they can't even boil water for a cup of tea. It's like living in the Stone Age.

Once the power has been shut off, it's difficult to have it switched on again. Customers have to negotiate a payment plan, and are also charged a reconnection fee of up to €100. "When people get their late payment notices in the spring, our phones start ringing," says Becker. In the near future, an average three-person household will spend about €90 a month for electricity. That's about twice as much as in 2000.

Two-thirds of the price increase is due to new government fees, surcharges and taxes. But despite those price hikes, government pensions and social welfare payments have not been adjusted. As a result, every new fee becomes a threat to low-income consumers.

**The Regressive Energy Tax**

Consumer advocates and aid organizations say the breaking point has already been reached. Today, more than 300,000 households a year are seeing their power shut off because of unpaid bills. Caritas and other charity groups call it "energy poverty."

Lawmakers, on the other hand, have largely ignored the phenomenon. In the concluding legislative period, the government and opposition argued passionately over a €5 increase in payments to the long-term unemployed. But no one paid much attention to the fact that those welfare recipients would subsequently see the extra €5 wiped out by higher electricity bills.

It is only gradually becoming apparent how the renewable energy subsidies redistribute money from the poor to the more affluent, like when someone living in small rental apartment subsidizes a homeowner's roof-mounted solar panels through his electricity bill. The SPD, which sees itself as the party of the working class, long ignored this regressive aspect of the system. The Greens, the party of higher earners, continue to do so.

Germany's renewable energy policy is particularly unfair with respect to the economy. About 2,300 businesses have managed to largely exempt themselves from the green energy surcharge by claiming, often with little justification, that they face tough international competition. Companies with less lobbying power, however, are required to pay the surcharge.

In this respect, at least, all of Germany's political parties are pushing for change. They want to close loopholes and more widely distribute the costs of clean energy subsidies. But even this improvement would translate into a relatively minor financial benefit to citizens. According to the SPD plan, an average household would see only about 70 cents a month in savings -- slightly less than under the plan Environment Minister Altmaier proposed a few months ago. In the end, what actually drives up costs would remain unaffected: the haphazard expansion of wind and solar energy.

**The Offshore Trap**

Far out in the North Sea, about 70 kilometers (43 miles) from the island of Norderney, there is a large, bright yellow steel box. It's as wide as the Brandenburg Gate and taller than the Federal Chancellery building. It's essentially a giant electrical socket, which collects the electricity from the nearby offshore wind farms and transmits it to the mainland via a thick cable. The system, along with the cable, cost grid operator Tennet about €1 billion and is designed to last 20 years, although there is no data to show that this will actually be the case. According to an official at Tennet, the company has no experience with such cables. It knows only one thing: Always obstacles are in the way.

In the case of Germany's offshore projects, those obstacles currently include weather and porpoises. In heavy seas, work on the wind farm is suspended. The same applies when porpoises and their young are spotted, because of the potential damage to their sensitive hearing by construction noise. As a result, there are still many spots where metal stumps protrude from the water instead of wind turbines.

Still, the government is pressing ahead with wind expansion, and the plans are breathtaking. By 2020, offshore wind turbines are expected to generate up to 10 gigawatts of electricity, theoretically as much as eight nuclear power plants. To attract investors, the government has created the best possible subsidy conditions, so that operators will be paid 19 cents per kilowatt-hour of offshore electricity, or about 50 percent more than from land-based wind farms. The government has also assumed the liability risk for the wind farm operators. If anything goes wrong, taxpayers bear the cost.

**Hidden Costs**

A fascinating plan for engineers, economically it's a potential disaster. Experts believe that because of the more challenging conditions, the power offshore wind turbines generate will be consistently two to three times as expensive as on land. Although the wind blows more consistently at sea, this comes far from offsetting the higher costs.

The less visible costs are also high. There is little demand for electricity in the thinly populated coastal region. New high-voltage power lines will be needed to transport the energy to industrial centers in western and southern Germany. The government already estimates the costs of expanding the grid at €20 billion, which doesn't include the additional ocean cables for offshore wind power.

If the government sticks to its plans, the price of electricity will literally explode in the coming years. According to a current study for the federal government, electricity will cost up to 40 cents a kilowatt-hour by 2020, a 40-percent increase over today's prices.

Worse yet, it remains completely unclear whether the offshore facilities are even needed. The Federal Environment Agency believes it's enough to install modern turbines in the best terrestrial wind sites. It would also be cheaper.

But even if that were the case, the environment minister still believes consumers can expect to see rising prices. Experts say the miniscule impact wind energy has had on current prices is due to an uncooperative Mother Nature: 2013 has been an unusually windless year so far.

**The Storage Conundrum**

The Cossebaude reservoir is Dresden's largest and most popular open-air pool. On summer days, up to 8,000 sunbathers lounge on its sandy beach or cool off in the 10,000-square-meter (2.5-acre) lake.

Cossebaude is also part of the enormous Niederwartha pumped storage hydroelectric plant. At night or on weekends, when there is plenty of available power, lake water is pumped electrically through big pipes into a second reservoir 140 meters above the main reservoir. At noon, when electricity is scarce, the water is released from the higher-elevation reservoir, spinning giant turbines as it descends. The system generates electricity when the cost is high and consumes it when the cost is low. Plant operator Vattenfall makes its profit on the difference. When the plant was connected to the grid in November 1929, it was considered the technology of the future.

Now the power plant, along with the recreational lake attached to it, could soon be gone. The company plans to shut down the energy storage facility within the next two years. This is bad news for Dresden's swimmers, but it's especially detrimental to Germany's energy transition, which depends on backup power plants like the Niederwartha facility.

When the sun isn't shining and the wind isn't blowing, gas-fired power plants and pumped storage stations are supposed to fill the gap. A key formula behind the Energiewende is that the more green energy is produced, the more reserves are needed to avert bottlenecks.

This is true in theory, but not in practice. On the contrary, an ironic result of the green energy expansion is that many of the reliable pumped storage stations could be forced out of the market. There are roughly 20 of these power plants in Germany, with Vattenfall being the most important operator. The plants were very profitable for utilities for decades, but now the business has become highly unreliable. Dresden is a case in point.

When it's sunny and people are most likely to head to the lake, solar power is abundant and electricity prices drop. This means the pumped storage station earns less money, so the power plant is shut off. In 2009, for example, the turbines in Niederwartha were in operation for 2,784 hours. Last year, Vattenfall ran the facility for only 277 hours. "Price peaks that last only a few hours aren't enough to utilize the plant to full capacity," says Gunnar Groebler, head of Vattenfall's German hydro division.

**No Incentives for Storage**

Not surprisingly, the company invests very little in its pumped storage plants today. In Niederwartha, the buildings are filled with the musty smell of earlier floods, the paint is peeling from the walls and the reservoir leaks.

It would cost Vattenfall €150 million to modernize the plant. But company executives are hesitant, fearing they won't recoup that money with future profits. Vattenfall has also hit the brakes elsewhere, like in Hamburg suburb of Geesthacht. Plans to increase the capacity of the existing reservoir there have been put on hold. Instead, the plant is used only as a backup.

Meanwhile, competitors RWE and EnBW have also shelved plans to build a large pumped storage power station in the southern Black Forest. Trianel, an association of about 100 municipal utilities, withdrew from a similar project at Rursee Lake in the western Eifel Mountains in late June.

All this gives credence to the claim that Germany's energy reform is its own worst enemy. Despite the erratic expansion of wind and solar projects, the backup power capacity those projects require is lacking. One study found that Germany's expansion of renewable energy will require additional storage capacity for 20 to 30 billion kilowatt-hours by 2050. So far the storage capacity has grown by little more than 70 million kilowatt-hours. And hardly anyone is interested in maintaining the existing storage facilities.

At least that isn't the case in Dresden, where a grassroots movement is working to keep the old pumped storage facility open -- partly because of the popular swimming lake.

**Incentives for Pollution**

More and more wind turbines are turning in Germany, and solar panels are basking in the sun, yet the amount of pollutants and greenhouse gases emitted by smokestacks increased last year. This dramatic turn of events is especially evident in small town of Grosskotzenburg, just east of Frankfurt.

Germany's largest energy provider, Düsseldorf-based E.on AG, has been operating a large coal-fired power plant in Grosskotzenburg for many years. The oldest of the five units at the Staudinger plant was built in 1965 and operates at a ridiculous 32-percent efficiency level. Even at E.on, the Staudinger plant is now seen as "completely unacceptable, both economically and environmentally."

State-of-the-art gas-fired power plants, like the one in the Bavarian town of Irsching, operate at almost double the efficiency levels of coal plants, or about 60 percent. They are also more flexible and emit far less carbon dioxide. This may explain why E.on officials were not particularly upset when the operating license for the oldest of Staudinger's five units expired on Jan. 1 of this year.

"To be on the safe side, we informed the relevant authorities several times that we are shutting down the unit," says E.on CEO Johannes Teyssen. When regulators did not object, the company began in May to dismantle key components of the power plant and transfer employees to other sites. E.on had planned to complete the work by the end of the year and remove what was left of the ancient plant.

But the situation suddenly changed on June 30, when E.on received a letter from the grid operator associated with the plant, Tennet, and the regulatory agency. The unit, the letter read, was needed to maintain grid stability, and E.on was to reestablish the coal plant's operational readiness without delay.

This is one of the most curious developments in the story of German energy reform. The country's most heavily polluting plants are now also its most profitable: old and irrelevant brown coal power stations. Many of the plants are now running at full capacity.

This leaves a dirty stain on Germany's environmental statistics. While the amount of electricity from renewable energy rose by 10.2 percent in 2012, the first year of the new energy policy, the amount of electricity generated in hard coal and brown coal plants also increased by 5 percent each. As a result, German CO2 emissions actually increased by 2 percent in 2012. Environment Minister Altmaier was clearly upset, saying: "This development cannot become a tendency."

But experts expect Altmaier will be humiliated once again at the end of the year, if he's still in office. A study released last week by the Federal Network Agency shows that energy generated with brown coal will remain virtually stabile, at 148 terawatt-hours, until 2022. It reached the depressing conclusion that brown coal's competitive position will be "hardly diminished by an increasing share of renewable energy in the mix."



















