

## Letter from America—Perry Sioshansi

### German retail tariffs decouple from wholesale prices

**Too much renewable generation is leading to unintended consequences.**

California's 2000-01 electricity crisis was caused by a confluence of factors, including the unintended and unanticipated decoupling of wholesale and retail prices. While wholesale prices on the dysfunctional spot market unexpectedly spiked to unprecedented levels, retail prices charged to customers were capped creating an unsustainable financial

haemorrhage of the two major investor-owned California utilities. That, of course, is history.

Now, Germany is facing a reverse version of the mis-match between wholesale and retail prices. With so much renewable capacity flooding the market (see graph left)—which has zero or, at times, negative marginal generation cost—wholesale prices are depressed, hurting thermal plants.

Simultaneously, retail tariffs—historically high in Germany due to an assortment of taxes and levies—are further rising due to levies and subsidies to support the growth of renewables.

The effect of this decoupling, also unintended and perhaps unanticipated, is to encourage more customers to by-pass expensive grid-supplied electricity through self-generation as well as additional investments in energy efficiency. While

self-generation, be it combined heat and power (CHP), solar rooftop photovoltaics, using municipal waste or biomass may seem expensive, it allows customers to avoid the substantial renewable levies and taxes that accompany grid-supplied electricity (see table below).

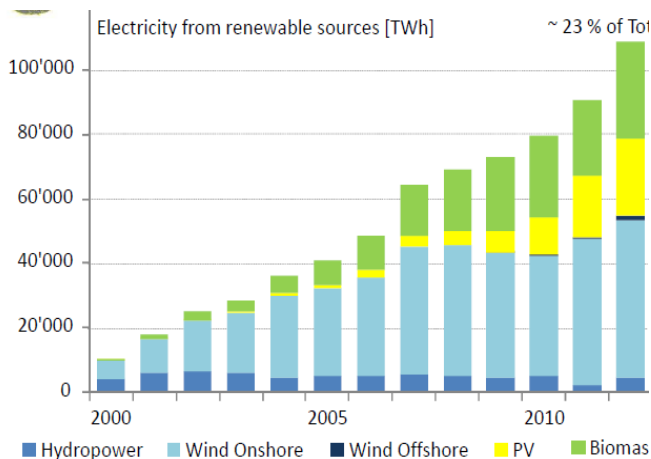
It is not difficult to do the math, as increasing numbers of customers have already done. Professor Georg Erdmann at Technical University of Berlin, estimates that as much as 10% of all kWhs used in Germany today are self-generated, including CHP, and the percentage has been rapidly growing.

This explains the growth of CHP, the rise of so-called independent villages and the continued popularity of solar rooftop PVs in Germany.

The overall impact of Germany's renewable push is illustrated by the following fact. While hovering around €40bn per annum for much of the 1990s, the aggregate German electricity price tag has grown to €63.3bn and rising. The energy turnaround or Energiewende, which includes phasing-out the country's remaining seven nuclear reactors by 2022, mostly replaced by more renewable generation, is expected to lead to further price increases, mostly through the renewable levies.

What is more striking is that the Energiewende and other policies in place are encouraging a significant capacity expansion, perhaps as much as 240GW by 2023 when the peak German demand may be around 80GW or so. The various levies, which are added as a surcharge on top of retail tariffs have grown to €0.5/kWh and amount to a

**Renewables flooding the market**



Source: *Macroeconomics of German Energiewende*, Prof. Georg Erdmann presentation at IAEE Conf. In Dusseldorf, Germany

#### Generation cost is NOT rising

	Billion Euros	Share %
<b>Total electricity expenditures for final consumers</b>	<b>63,6</b>	<b>100,0</b>
<b>Government induced elements</b>	<b>22,0</b>	<b>34,5</b>
<b>thereof</b>		
Electricity tax	7,2	11,4
Concession fees	2,2	3,4
<b>REN levy</b>	<b>12,3</b>	<b>19,4</b>
CHP levy	0,2	0,3
<b>Government regulated elements</b>	<b>17,6</b>	<b>27,7</b>
<b>thereof</b>		
Power transmission fees	2,2	3,5
Power distribution fees	15,4	24,2
<b>Market driven elements</b>	<b>24,0</b>	<b>37,8</b>
<b>thereof</b>		
Market value of REN electricity	4,4	6,9
Generation and marketing	19,6	30,9

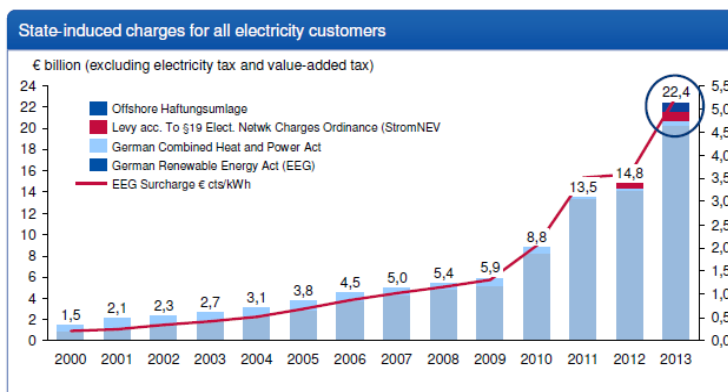
Source: *Macroeconomics of German Energiewende*, Prof. Georg Erdmann, Aug 2013

substantial fiscal drag as illustrated in graph below. These levies, which are projected to grow over time, are what self-generators are trying to avoid.

And it is not just the rising retail tariffs that are cause for concern but also the reliability of the grid. In mid-September 2013, Jochen Homann, the president of grid regulator Bundesnetzagentur, speaking at a conference in Munich said German power market is “showing signs of declining security of supply.” Mr. Homann noted that all four grid operators, but especially Tennet TSO GmbH and 50Hertz Transmission GmbH, had to “intervene” in the market for “stability reasons.” The intervention—we assume he meant renewables curtailment—occurred in 7,200 hours in 2012 compared with 1,800 hours in 2010, and rising. Considering that there are only 8,760 hours in a year, that represents 82% of all hours, an astoundingly high number.

Homann explained that the interventions were the result of renewable generation capacity putting a strain on the grid.

### Renewables “drag”



Source: BDEW January 2013, *preisvergleich, de*, BDEW Erneuerbare Energien und das EEG: Zahlen, Falden, Grafiken (2013)

Germany’s share of renewable energy was 23% in 2012, up from 17% in 2010, and rapidly rising as the government phases out the remaining operating nuclear reactors by 2022.

“There are alarming signs that point to a decline of security of supply, such as a higher number of interventions into the grids by operators, the use of winter reserve plants and the reduction of renewable output on some days,” Homann said, while also indicating that he did not foresee an “imminent” blackout. The solution, as he sees it, is to further fortify the transmission network. Others believe that an overhaul of the EEG scheme, the renewable levy, (see chart left) may also be needed.

**Perry Sioshansi is a specialist in electricity sector restructuring, and he has been actively involved in discussions in a number of developed, developing and transition economies. He is founder and president of Menlo Energy Economics and is the editor and publisher of *EEnergy Informer*, from which we have sourced this article, and which we commend.**

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