

Power Down

The mounting failures and costs of green energy. By Michael S. Coffman, Ph.D.

It was inevitable. The world has been warned hundreds if not thousands of times that once wind and solar energy become a significant portion of any power grid, the likelihood of complete failure increases exponentially. Know-it-all green zealots who forced the accelerated pace of converting from fossil fuel to green energy paid no attention to the warnings. After all, they said, they knew that it would work. Not to worry.

It turns out that the skeptics were right again. After repeated warnings and numerous near disasters, the state of South Australia (SA) went completely dark on Sept. 28, 2016, when wind power for the entire state failed completely. The catastrophe was triggered by ferocious storms that damaged one power station and 20 transmission towers and caused the power at the Snowtown Wind

Farm to fluctuate wildly, thereby overloading the entire grid and causing it to crash.

In the blame game, Yahoo's *Finance for Australia* reported that SA's "Premier Jay Weatherill insist[ed] the lengthy outage was caused by an unprecedented weather event and not SA's heavy dependence on renewable energy." This is environmental dogma at its worst—nothing is ever the fault of their brilliant ideas gone bad. Australia's Prime Minister Malcolm Turnbull sharply disagreed. He claimed that several state Labor governments—not just in SA—had set "extremely aggressive, extremely unrealistic" targets that endangered power security for renewable energy use.

It turns out that Turnbull was right. The Australian Energy Market Operator Ltd. (AEMO), which operates the national electricity market, and Electranet, which operates

the national electricity transmission grid, issued a report in 2014 that asserted: "Where SA has zero synchronous generation online, and is separated from the rest of the [national electricity market], AEMO is unable to maintain frequency [stability] in the islanded SA power system. This would result in statewide power outage" (see graph, p. 15).

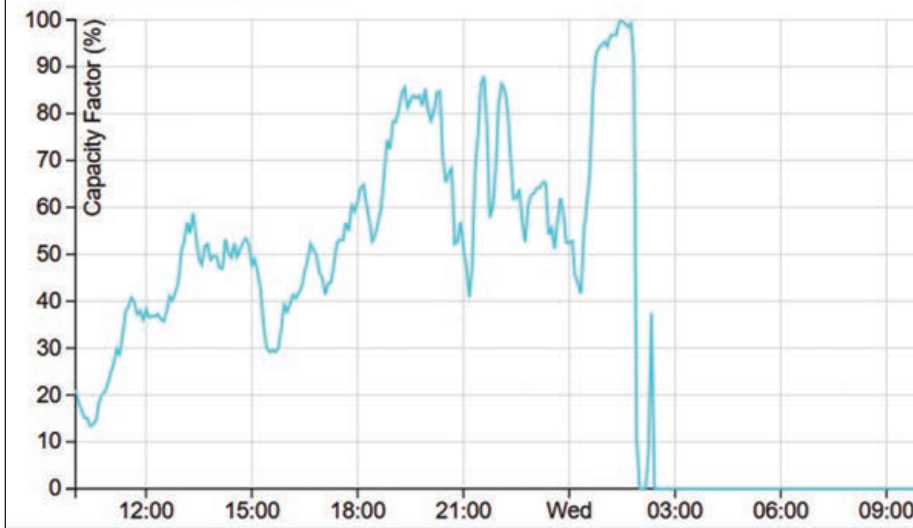
After a thorough analysis of the power failure, AEMO's preliminary report into the recent SA blackout revealed that the primary reason for the total loss of power was a sudden reduction in wind power being fed into the electricity network. Brett Hogan, the organization's director of research, warned:

"The South Australian government and the renewables industry can no longer credibly argue that the reasons for the fault relied solely on the weather. Images of downed pylons do not tell the whole story.... In sim-



The entire state of South Australia suffered from a total blackout when the Snowtown Wind Farm (above) catastrophically failed because of wildly fluctuating power production during a storm on Sept. 28, 2016. SOURCE: TRUSTPOWER.CO.NZ

Snowtown Energy Production in South Australia on Sept. 28, 2016



Ferocious storms that damaged one power station and 20 transmission towers in South Australia caused power to fluctuate wildly, overloading the entire grid and causing it to crash—something numerous analyses prior to the failure said would likely happen sooner or later.

ple terms, the wind increased and some transmission lines went down, but electricity generation continued. It was only the as-yet-unexplained reduction in wind-farm output which overloaded demand on the interconnector with Victoria, causing the whole network to seize up.”

That’s not the only problem with SA’s renewable plan. The network was supposed to provide 100 percent of the state’s demand. According to the Australian Energy Regulator, “In South Australia, wind typically contributes 10 percent of its registered capacity during peaks in summer demand.” Why? Because even though SA is ideally suited for wind-power generation, the wind doesn’t always blow, especially in the summer—a major problem that *RANGE* readers have discovered in past issues. So natural-gas produced power has to make up the lion’s share.

That’s not the worst of it. SA’s last coal-fueled power plant was closed in May 2016 because of heavily subsidized wind energy. Before it was closed, the average daily spot price in SA was \$46.82 per megawatt hour (Mwh). After the power plant was turned off, it rose to \$80.47 and in June to \$123.10, more than 2.5 times the previous year. In July it was \$262.97/Mwh, over 5.5 times the previous year. These kinds of rate hikes are common with wind and solar energy. This is exactly what presidential-candidate Obama promised days before the 2008 election when he said green energy and cap and trade would make electrical power prices “necessarily skyrocket.”

SA’s energy prices have continued to explode. By mid-July 2016 the spot prices had peaked a mind-numbing \$14,000/Mwh, putting the market into turmoil. SA’s heavily

wind-reliant electricity market has forced the state government to plead with the owner of a mothballed gas-fired power station to turn it back on.

The growing dependence of Australia on green energy and its explosive costs has caused business, especially heavy industry, to move offshore, totally or in part. Reports from Anzbusiness.com show that 42 percent of Australia’s industry now produces 30 percent of its revenue outside of Australia.

Europe

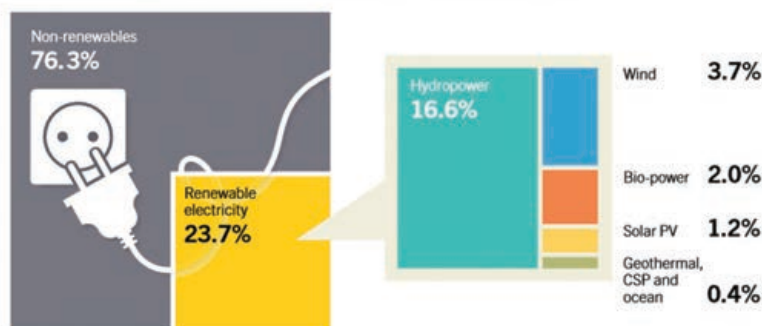
Renewable-energy failures are not confined to Australia. In “The Disconnect” (*RANGE*, Fall 2013) we explained that electrical power costs in Europe were skyrocketing due to green energy. The increasing costs were causing heavy industry to complain it couldn’t compete with the rest of the world and would likely have to move its production to other nations with dependable low-cost energy. The exodus of heavy industry, especially from Germany, is now underway.

Germany

As “The Disconnect” explained, Germany is building 23 new coal-fired power plants to overcome the very serious deficiencies of green energy, despite its bragging about being a leader in the green-energy transformation. Following the COP21 (Conference of the Parties, 21st session) Paris Agreement reached in late 2015 (see “The Big Cure,” *RANGE*, Spring 2016), Germany set a goal in its national climate action plan for 2050 of phasing out coal-fired power production “well before 2050” to help Berlin achieve its climate goals.

However, Reuters reported on June 29, 2016, that that goal was ultimately found to be unattainable, in part because an analysis showed the total cost of conversion, called Energiewend, will be 520 billion Euros

Estimated Renewable Energy Share of Global Electricity Production, End-2015



Based on renewable generating capacity at year-end 2015. Percentages do not add up internally due to rounding.

Globally, renewables produced nearly 24 percent of the world’s energy. But that is grossly misleading. Of the 24 percent, hydropower produced 16.6 percent, while wind and solar only produced 3.7 and 1.2 percent, respectively. Yet, thousands of articles have gloriously pontificated about how “renewables” (wind and solar) are becoming competitive with fossil fuel and are rapidly taking over electricity production. In fact, they have barely increased from their historical averages, despite billions of dollars spent.

through 2025, according to a report commissioned by the Düsseldorf Institute for Competition Economics. That translates into an unacceptable 25,000 Euros per family of four for the period. The new draft action plan is to “achieve its goal of cutting CO₂ emissions by up to 95 percent compared to 1990 levels by the middle of the century.”

However, economic reality is likely to shatter that goal. According to EurActiv.com on Oct. 31, 2016, Sigmar Gabriel (Germany’s minister for economic affairs and energy) will not set a firm date to end Germany’s reliance on coal. He said on Oct. 26, 2016, that coal would remain a part of the German energy mix until at least 2040. That is also bad news for the European Union, as the European Environment Agency highlighted. The closure of the EU’s coal-fired power stations is essential for the EU to reach its 2050 target of cutting greenhouse gas emissions by 80 to 95 percent.

Other European Cutbacks

In 2016, France produced more energy from fossil fuels, especially coal, as Electric de France was forced to close 18 of its 58 nuclear plants for inspection. Output from coal and natural-gas plants doubled during this time. Green energy has never played a big role as nuclear power provides the backbone of France’s power grid. As the nuclear power plants finish their inspections and maintenance, France should return to historic nuclear power production.

After nearly a decade of bitter infighting between green politicians, environmentalists and natural-gas proponents, Great Britain seems to finally be turning the corner to natural gas after realizing that green energy was having a disastrous impact on its economy and its escalating energy poverty. On Oct. 6, 2016, Secretary of State for Communities and Local Government Sajid Javid gave the go-ahead to start hydraulic fracking on three sites in Great Britain. It is about time.

In June 2016 Poland passed legislation to favor coal and discourage green-energy development. Poland is one of the biggest coal producers in Europe and by reducing the role of green energy in its energy mix, it is likely to expand its use of coal beyond the current 80 percent. In yet another decision to put the brakes on green energy, Denmark has canceled all coastal wind-farm construc-

tion until 2025.

These are just a few of the cutbacks of green energy and increases in coal in the EU. The *Guardian* reports that a confidential EU impact assessment reveals that EU green

Almost all investment is now being made by the federal and state governments by making outrageously false promises to taxpayers.

energy is likely to lose its priority over other sources, which would increase carbon emissions by up to 10 percent. All these cutbacks and increases in the use of coal are the direct result of crippling skyrocketing energy prices and the undependability of green energy.

Asia

As explained in previous articles (see “The Big Cure,” *RANGE*, Spring 2016), China and India lead the world in building coal-fired power plants. China is still bringing online two new coal-fired power plants a week, perhaps dropping to one a week after 2020, according to a Bloomberg analysis released Nov. 2, 2016. (Also see “The Inmates Are In Charge,” *RANGE*, Spring 2015.)

Although China has pledged to reduce its use of coal, it is instead ramping up coal production for its power plants. Major coal mines in China have been ordered to raise coal output by another 500,000 tons per day, apparently reflecting growing panic about China’s long-term commitment to reduce coal burning after 2030.

China’s increase in production doubles the recently increased output of coal production to 30 million tons per month, which is still not enough to meet demands. The fact that China is planning or actually building coal-fired power plants in other nations from Indonesia to Pakistan, Turkey to the Balkans, as well as in Africa and Latin America, does not bode well for its promises to go green.

Worse, Bloomberg reports that India’s coal use is increasing at a rate of six to eight percent annually, even exceeding that of China. These nations have to increase their energy output if their rural citizens are ever going to get pulled out of their 19th-century economies and hardships into the 21st century. Because of this, *Forbes* reports that the world’s use of fossil fuels for power production has never been higher, even though the

use of renewable energy has also never been higher. However, the rate of increase for fossil fuels is 2.6 times higher than for renewables.

Globally the capacity for renewable energy is about 19 percent of total energy consumption. Wind and solar capacity make up about 40 percent of that 19 percent. What you are rarely told is that wind and solar farms do not operate at capacity. Not even close. At best they operate at 25 to 30 percent. Often, when power is needed most (on windless days, at nighttime or when cloudy), they operate at zero percent of capacity.

Using an average of 25 percent of capacity, wind and solar only produce about nine percent of all renewables—or about one percent of all forms of energy. That’s not so stellar. With all the problems with solar and wind energy, they still only make up less than five percent of the world’s energy, despite all the happy talk from promoters of green energy.

United States

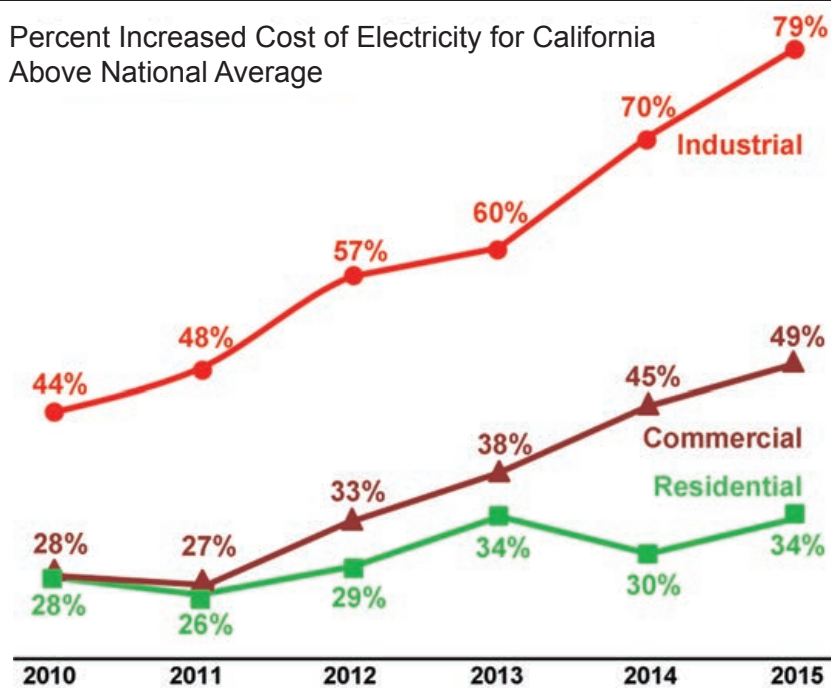
Green zealots in the United States crowed and preened when it was announced the United States invested \$270 billion in renewable energy in 2014, including annual solar subsidies of \$39 billion. This is among the highest in the world. Today, there are tens of thousands of articles literally glorifying renewables (wind and solar) as rapidly penetrating the energy market as it becomes cost competitive with fossil fuels. Is this true?

Not so much. The *Wall Street Journal* announced in September 2016 that venture capitalists lost half of the \$25 billion they pumped into startups of wind and solar between 2006 and 2011. They are no longer supporting wind and solar because it won’t work as advertised. Almost all investment is now being made by federal and state governments by making outrageously false promises to taxpayers.

With billions spent already, what has the American consumer gotten for his/her dollar? Slightly less than 10 percent of our energy came from renewables. That sounds good, but it’s very misleading. As discussed above, only a small portion of renewables comes from wind and solar.

When all factors are considered, the U.S. Energy Information Agency reports that in 2015 the percentage of energy actually produced in the United States by wind was only 4.7 percent and 0.6 percent for solar. The question is, is it worth hundreds of billions of

Percent Increased Cost of Electricity for California Above National Average



SOURCE: U.S. Energy Information Administration as adapted by California Manufacturing & Technology Association, June 14, 2016

California is the only state where solar energy has reached five percent of the total power the state consumes because of its aggressive renewable policy. However, to meet this aggressive goal, the cost of industrial electricity has soared from 44 percent above the national average to 79 percent since 2010. Commercial electrical rates have also gone up. Residential rates have increased slightly. Is the low residential rate an attempt to hide the huge increase in industrial and commercial rates?

dollars? Will it even help prevent the disaster that the U.N.'s International Panel on Climate Change hysterically promotes unless we destroy our economy and ourselves?

In 2007, Google committed tens of millions of dollars to develop green technology that would be able to compete economically with fossil fuels, even with the capacity penalty of green energy. By 2011 it abandoned the project asserting it had hoped that with "today's renewable-energy technologies, our society could stave off catastrophic climate change. We now know that to be a false hope." It concluded, "Renewable-energy technologies simply won't work; we need a fundamentally different approach."

Using every technology available, Google engineers could not come close to the energy production and price of coal and natural gas. Sadly, the best they could do was to reduce carbon dioxide (CO₂) emissions 13 percent by 2030 and 55 percent by 2050. That's not even close to what the IPCC claims is needed to prevent the world from burning up, with us along with it.

Energy economist Robert Lyman agrees with Google engineers. According to his 2016 in-depth analysis, "Why Renewable Energy Cannot Replace Fossil Fuels By

2050—A Reality Check," Lyman found that "the capital costs of renewable-energy plants are almost 30 times as high as those of the natural-gas plants that could have been built instead. When operating costs are also taken into account, onshore wind plants are 4.6 times as expensive as gas plants and large-scale photovoltaic [PV] solar farms are 14.1 times as expensive as gas plants."

Just as the Google engineers found, Lyman determined that the actual versus maximum rated capacity of wind and solar killed any hope for cost-effective wind and solar energy—something that skeptics have said for a decade. Cheap energy storage (batteries) is the only thing that may make wind and solar power competitive by storing energy when the sun's out and the wind's blowing and then using it when they are not.

Dozens of articles have been published claiming that the cost of battery storage has been slashed by over 200 percent and the energy it produces is becoming competitive

with that of coal and natural gas. There is one major problem with this optimistic view. It's not true. None of these pie-in-the-sky claims take into consideration the capacity penalty of wind and solar. It takes about three megawatts of solar power to offset one megawatt of natural gas. At \$200 per kilowatt-hour solar PV with storage would run about \$58/Kwh to fully offset natural gas that costs \$0.06/Kwh. While we can hope that new technologies will make wind and solar competitive, that dream is a long way off. Meanwhile the world is spending trillions of dollars on this bankrupt effort.

The simple truth is that wind and solar *do not work as promised* and that is forcing nations to revert back to coal, thereby increasing—not decreasing—greenhouse gas emissions.

We should take the advice of Bjorn Lomborg, author of "The Skeptical Environmentalist," his bestselling but highly controversial book: "The World Health Organization estimates that climate change since the 1970s causes about 140,000 additional deaths each year, and toward the middle of the century will kill 250,000 people annually, mostly in poor countries. This pales in comparison with much deadlier environmental problems such as indoor air pollution, claiming 4.3 million lives annually, outdoor air pollution killing 3.7 million, and

lack of water and sanitation killing 760,000. Outside of environment, the problems are even bigger: Poverty arguably kills 18 million each year."

Is it too much to ask that we get

our heads out of toxic green clouds and redirect these billions of dollars to where they will do the most good? Based on our zealous politicians, apparently it is. Perhaps our new president will do just that. ■

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