



Get ready for Blackouts

**New York's rush to meet self-imposed clean energy goals
Has state hurtling toward an electric supply crisis of its own making**

Officials choose to ignore supply realities as inconvenient truths

**By Richard Ellenbogen
President, Allied Converters, Inc.**

It's difficult for me to imagine that that almost 20 years have passed since I installed a cogeneration system and a solar array at my manufacturing business, Allied Converters in New Rochelle, NY, the first commercial solar array in New Rochelle, and the first grid-connected micro-turbine system in the Con Edison service area. The micro-turbine system is highly efficient utilizing 70-75% of the energy content of the natural gas we burn. By comparison, a new generating plant utilizes just 50% and an older one uses about 33%. Additionally, because we are generating about 75% of our electricity on-site where it is used, we eliminate the 7% loss that occurs on the utility's transmission and distribution system, thus achieving about a 30-40% improvement in energy efficiency and have the associated reduction of carbon emissions.

I cite what may to the average person may seem like obscure facts and numbers for two reasons: First, they attest to my personal knowledge of and commitment to conserving energy and reducing reliance on fossil fuels. Second, the actions I have taken are the type of intermediate step New York officials should be promoting instead of the unrealistic and unachievable goal of a 100% shift to green-energy sources by 2040 that they are blindly committed to.

As a former electrical engineer in the Power Systems Laboratory at Bell Labs and operating my own manufacturing facility since 1980, I have devoted decades of my life to studying how to save energy and reduce our carbon footprint. I have not just talked the talk, but I have walked the walk including designing my home in 2002 to be extremely energy efficient by solar, geothermal and

high mass radiant heat when almost no one on the East Coast was using geothermal. Data collected at the house and the factory was provided to the state in 2008, gratis, and ultimately resulted in large energy and cost savings on the state's transmission system.

Unfortunately, what I am seeing today in terms of New York State's highly ambitious energy reduction policy reminds me of Thelma and Louise speeding full tilt toward the edge of the cliff. The results will not be pretty.

If common sense can't be brought to bear, major electric power shortages, blackouts and human suffering as we have seen recently in California, Texas, and Europe lie ahead. And with the self-induced power shortages will come a deterioration of our quality of life!

Over the last three years I have met with elected officials, electric system administrators, utility experts, and green energy advocates in an effort to have a frank and open dialogue about the impact of their policies relating to energy delivery and supply. None of them questioned or challenged my data. Why? I have concluded that for them, the desire to reach a clean and green energy future easily and quickly simply precludes acknowledging any suggestions to the contrary. Math, Physics, and the inconvenient truths be damned. In this regard, the environmental movement's discounting of science and math makes them no better than the climate deniers they so detest.

Let there be light

In its rapid push to lower New York's carbon emissions, elected officials backed by green energy activists and abetted by compliant energy supply professional overseers, are leading the state down a dangerous, unsustainable path. Their approach is destined to result in major severe power shortages, extended blackouts, property damage, economic losses, and yes, even deaths. And what's most frustrating is that virtually everyone overseeing the process knows the goals of simply shutting down existing fossil fuel power sources and switching to wind, solar and hydro power can't be done by 2040. They just can't say so publicly for fear of losing their jobs. The former Chair of the New York State Public Service Commission authorized the plans for the Danskammer power plant on the day that his term expired, a decision that has since been reversed by the current governor.

New York is hell-bent on a plan that calls for closure of all fossil fuel generating plants by 2040 in favor of using renewable "green" generation coupled with large-scale battery storage facilities to power the entire system. It is a fantasy. Not only will there not be enough renewable generation to offset the existing fossil fuel electric load, but there will be insufficient excess energy that will be required to charge the storage batteries. Documents that were provided to me by the state trying to justify this fantasy have been severely lacking. Had I done that quality of work at Bell Labs, I would have been terminated. Yet fuzzy math is being used to justify power plant closures with no viable Plan B when the idea implodes. The resulting energy shortfall will result in people freezing to death during New York winters, just as they did in Texas last winter where the electric energy shortfall resulted in 200 to 700 deaths and \$195 billion in property damage in just 17 days.

Do the math

Some basic math paints the true picture. The difference between fossil fuel or nuclear generation and renewable generation is measured by “capacity factor” (CF). Where a fossil fuel or nuclear plant operates about 95% of the time for a CF= 0.95, a solar array in New York (where many days are overcast) only operates an average of 12% of the time for a CF=0.12. Land based wind has a CF=0.3 and offshore wind has an CF=0.46. The results of those differences on the utility system are both obvious and profound.

The recently closed Indian Point Energy Center was a two-gigawatt (GW) nuclear plant. It generated $2 \text{ GW} \times 365 \text{ days} \times 24 \text{ hours} \times 0.95 \text{ CF} = 16,644 \text{ Gigawatt hours}$ of energy annually.

A 2-gigawatt solar array will generate $2 \text{ GW} \times 365 \text{ days} \times 24 \text{ hours} \times 0.12 \text{ CF} = 2,102 \text{ gigawatt hours}$ annually, or one-eighth as much energy.

Even if – and it’s a very big if -- all of New York State’s goals for renewable generation were in place by 2040-50, the state will still be about 100,000 gigawatt hours short of what is needed to meet the fossil fuel reduction goals, and that includes the dubious plan to cover at least 400 square miles of upstate farmland, about 4% of all farmland in the state, with solar panels plus 9 GW of downstate solar when they can't even get 2 Megawatts installed in the Westchester County Town of Greenburgh because of neighborhood opposition, 0.0022 as much capacity as what they plan for.

Not in my backyard

What goes largely unnoticed or ignored as one of many inconvenient truths is that while New York has commenced its rapid shift away from fossil fuels, the renewable energy projects needed to replace them are facing extensive delays or termination because of community resistance.

For example, something as basic as installing a power cable to bring hydropower from Quebec to Queens has been stalled in litigation for over seven years. If that isn’t bad enough, the state’s plan calls for five more of these power cables to be up and running in the next 18 years.

Energy generated from wind turbines, another key element in the state’s renewable energy future, faces similar opposition from property owners, fishermen and other sources. In 2011, for example, nearly every county along the Great Lakes voted to block Project GLOW (Great Lakes Offshore Wind) which was never built.

The energy storage projects that are needed to support the system during periods of low generation and are a critical component of the state’s plan have historically faced community opposition and lengthy review processes. The state plan specifies the creation of nine gigawatts of peak load storage by 2040. The state doesn't specify how much battery capacity would be installed. However, if the 9 Gigawatts of peak load is supported by 100 gigawatt-hours of batteries, the cost estimate is between \$28 billion and \$80 billion, depending on how it is executed. Without the storage, the entire plan crumbles. The Climate Action Council, responsible for the plan, after

two years of work released an 860-page document of ideas with no plans to pay for them and no viable plan to offset the lost fossil fuel energy.

Regarding the battery storage facilities, it is worth noting that even if built, the \$28 billion battery network would be capable of operating for only 11 hours a day assuming enormous amounts of off-peak energy generation, another unrealistic assumption. By comparison, three large nuclear plants would cost less than \$28 billion to build and would operate 95% of the time and might play a crucial role in assuring adequate power is available during heat and cold waves that in New York can last days or weeks, not eleven hours.

Compounding the Problem

It's no small irony that while New York's future electric power supply is in jeopardy, the state's green energy requirements will create massive new demands for electricity! New York has calculated that it will need to double generation capacity just to support the conversion of onsite heating. However, even while acknowledging this inconvenient truth, the state plan calls for simultaneously decommissioning existing generating plants.

An example of the blatant self-contradictions of the elected leaders is on clear display in New York City. While the NY Independent System Operator has released documents stating that the downstate electric system will be highly stressed beginning in 2023, the City Council has voted to ban natural gas hookups in new buildings below seven floors by 2024 and in all new buildings in seven years. The announced alternative: all electric buildings. The source of this massive new amount of electric power? No one is providing a realistic solution.

Meanwhile, automobile manufacturers have announced that they will stop producing internal-combustion engine vehicles within just 13 years and NY State has banned the sale of them after 2035 while also passing clean truck rules that will eliminate diesel trucks in favor of biodiesel and electric trucks. The new source to power the vehicles? That's easy. Renewable generation, of course. But then we'll have to charge the batteries of an all-electric fleet, placing an estimated added demand of 80,000 gigawatt hours on our electric power system. To put that amount of energy in perspective, it is five times the annual energy output of a two-gigawatt nuclear plant operating 95% of the year.

What is also overlooked is the 25-year life cycle of a solar array. Any arrays that are installed now will output about 25% less energy in 15 years. By 2040, 20% of the new arrays will simply replace aging capacity and will not add capacity. The same is true of wind turbines.

New York is not alone in rushing to 100% green energy

New York, while very aggressive in its approach, is not alone. Other states are embarking on similar projects. And the rush to go green triggers special needs of its own. For example, as of 2019, a total of 55 of the 70 ships were available to install the wind turbines needed for a potential 1.7 gigawatts of offshore wind facilities on the East Coast. This number of vessels is a fraction of the number that

will be necessary to install the state's 9 GW - 13 GW. So, why not just build more ships? Well, not so fast, literally. Not only do ships take years to build, but the Jones Act passed by Congress in 1920, requires that ships sailing from U.S. ports and working in U.S. waters must be built in the United States. That means no foreign-built ships can be used

Massive funding will be required for New York to upgrade existing transmission systems and to install a charging network for the electric vehicle surge that is fast approaching. It will also need billions of dollars to reinforce the state's highways and bridges to handle the increased electric vehicle weights. Because of their batteries, EV's can weigh significantly more than their gasoline powered counterparts. A Tesla Model 3, for example, can weigh up to 1,300 pounds more than a comparably sized Toyota Corolla.

Yet, despite the obvious needs for greater amounts of electric power, New York is fighting the recertification of a greatly improved NRG power plant in Queens and a new Danskammer power plant in Newburgh. While the existing power plants are a problem, the proposed reconfigured plants at the two locations would be far cleaner and have greatly reduced levels of sulfur oxide and nitrogen oxide emissions. The energy from the two upgraded generating plants will be needed to power the coming electric vehicle fleet, while their greenhouse gas emissions will be more than offset by the reduction in greenhouse gases achieved by switching to electric vehicles.

There are viable solutions that can be implemented now

There are viable ways to greatly reduce New York's carbon footprint without causing a potentially catastrophic electric power supply shortage. The most cost-effective solution is to eliminate the most inefficient sources of fossil fuel combustion. A gradual reduction in the number gasoline automobile engines, which are only 22% efficient, diesel engines in trucks that are 43% efficient but have elevated levels of NOx emissions, and older generating plants that are only about 33% efficient are achievable goals. But this can work only if alternative sources to charge vehicle batteries and offset lost power plant capacity occur simultaneously.

Unfortunately, the lack of renewable generation and the lack of transmission capacity for a large, distributed generation system will be inadequate for at least 60 years. Knowing this, the state's focus should be on supporting vehicle electrification efforts and localized highly efficient fossil fuel co-generation as that will be the fastest way to reduce greenhouse gas emissions.

We are headed towards blackouts

The obstacles to renewable generation installation at the scale that the state needs to achieve its plan are insurmountable in the near term. Current technology and the present mindset of too many New Yorkers simply will not support the scope of the plan.

It takes years to install a large-scale utility project of any type. A wind farm proposed in 2018 was supposed to start operating in 2024 but has been delayed until 2026. It will have taken eight years to start operating since its inception and even then, it will provide just a small fraction of what New

York needs to achieve its green power goals. What our state leaders are proposing is a program that defies the laws of physics.

The time is now to have a robust and honest discussion of the realities of what is truly involved and how long it will take to achieve the dream of an all-green energy future before we're all left sitting in the dark.

Note: For additional reading, the unabridged version of this document, along with other relevant information on the topic, appears at: www.savenyenergy.com

Media Contact:

Geoff Thompson

Thompson & Bender

(914) 409-3433

geoff@thompson-bender.com