



P E R S P E C T I V E S

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Positive Power Progress

The Middle East Fuel Commodity of the Future

The last two columns in this space revealed the ridiculousness of burning more natural gas as a way to combat climate change just because it is half the carbon of coal.

In case everyone isn't already aware, the time for half measures is way gone! Greece, France, and other major areas of Europe are on fire; Kentucky has been devastated by the largest flood in anyone's memory; and the Maricopa fire, California's largest one of the year, created air quality challenges all the way from Yosemite to San Francisco. Unfortunately, this is not the new normal. The new normal is far worse and will continue to accelerate indefinitely every year from now until human civilization as you know it is no longer survivable. Let's realize that is the unavoidable outcome of the trajectory we are on unless we drastically reduce our fossil fuel consumption immediately. Our fossil fuel addiction is now threatening our very survival.

So, what's the answer? If nuclear isn't even an option (drop us a note and we'll send you a free copy of our "white paper" entitled "Nuclear Power: Totally Unqualified To Combat Climate Change"), and using more natural gas is a non-starter, what is the solution? It isn't responsible merely fault what doesn't work. It is far more responsible to propose what would work.

Let's start by describing what could be the solution to radically reducing fossil fuel consumption. What do we need to create? In September 2020 this column addressed that topic and answered the question like this:

"We need a new system that: 1) won't catch fire, 2) is not subject to terrorist acts, 3) can't ever be hacked, 4) won't require us to ever have a PSPS event, and 5) can't fail even if a squirrel goes crazy again! This new system...will cost less to create and maintain than merely maintaining the existing system! What is this miracle solution called? It's called an interconnected fuel cell-assisted microgrid network. It requires no transmission lines to operate.

Interconnected microgrids are like a honeycomb where each side is attached to a neighbor comb. Think of each of those local combs as self-sufficient Direct Energy Resource ("DER") generators and users of electricity. "

That column went on to address the most frequently uttered challenge to rapidly adopting renewable energy: "What do you do when the sun doesn't shine, and the wind doesn't blow?" That preposterous shibboleth, together with utility power companies' incredible greed and political power, has done more to retard the growth of 100 percent "green" renewable energy that literally is cheaper to build and maintain than the power grid we currently pay for that is the cause of 85 percent of California's forest fires, and has left most of the rest of the country with enough energy to power the ever-humming air conditioners—that

will be installed in growing numbers in the year or two ahead. Well, that same column answered the question as follows:

“The answer is you electrolyze cheap “green” energy into hydrogen, with on-site storage, and run it through fuel cells as needed to create supplemental power for the microgrids. And, in those rare instances where one microgrid goes down, neighbor microgrids would be able to “port” power from one microgrid to another. With rural microgrids where there are no contiguous microgrids to draw power from, plenty of hydrogen will be available from on-site storage and be supplemented by centrally stored hydrogen.

Microgrids are the answer to electrical resilience. They are the way to stop forest fires and free ourselves of the PG&E and Edison monopolies that keep our prices high and our forests on fire and block the full deployment of green energy sources even as we mothball one fossil fuel plant after another.”

That answer hasn’t changed in the last two years and won’t change in the future no matter how long it takes society to realize it is the way to create and use electricity. In fact, it is clearer now than ever that we need to reimagine how we create electricity, how we distribute it (locally will always be far superior to distance origination), and how we use it.

If, in addition to beginning to construct fuel cell-assisted microgrids in very large numbers, we also begin shifting our electricity sector over to Direct Current (“DC”), the energy crisis would rapidly dissolve. DC, which represents the power one uses in boats and recreational vehicles, is many multiples more efficient than Alternating Current (“AC”). Everyone who has ever plugged in a laptop knows that the power from the wall socket is converted to DC in order to power the computer. And, since it is 4-5 times more efficient than AC, why don’t we have it now? Simple: DC doesn’t travel well over distance so we built huge power plants in places like Brooklyn (the actual story from the 1880s) so the folks in Manhattan wouldn’t have to see a big, ugly power plant out their windows. At the time, Brooklyn was lightly inhabited so those folks, as are the disadvantaged communities around the country today, live where we choose to locate these fossil fuel-belching behemoths. That has to change. And now it can. Fuel cell-assisted microgrids are “local” by nature, are not large behemoths that belch fossil fuel pollution into the air, and are a great transition strategy we can use, along with building code adjustments, to power the appliances in our homes while dramatically reducing our total power consumption.

Equally important for the mobility sector, we have to have fuels to replace those that currently power our cars, buses, trucks, locomotives, and ships. We now have that fuel, and it is rapidly coming to market. It’s called hydrogen, and in the future, it will all be made from renewable resources like sun, wind, geothermal, Ocean Thermal Energy Conversion (OTEC), and hydropower.

When it does come from renewable resources hydrogen is called “green” because there is zero pollution from its creation by electrolysis, and zero pollution from its use in a fuel cell—pure H₂O is the only byproduct.

In case you think your desire to have green hydrogen is unique to our developed nation, think again. Saudi Arabia, the United Arab Emirates, and the other nations of the Middle East have declared that the future commodity fuel product they will be shipping to the world starting next year is green hydrogen—replacing fossil fuel as their source of wealth.

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