TOP 10 REASONS ALL-ELECTRIC IS A BAD IDEA

THE RISKY PROPOSITION OF RUSHING ELECTRIFICATION

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Politicians and government officials at every level seem to be entranced these days by a specific goal when it comes to pushing forward on clean energy: shifting to an all-electric energy system. The idea may seem to make sense because fossil fuels and their carbon emissions have become a pariah in the face of climate change, but does it, really?

When looking at a national energy system comprised of an electric grid (powered by a mix of fossil fuels like coal and gas); gas distribution systems for heating, cooking and other energy needs; and direct burn of fuels ranging from propane to wood chips to petroleum, the all-electric thought process seems to go like this:

1. Let's remove all direct fuel burning from the energy ecosystem, given they release greenhouse gas emissions, and
2. Let's make sure the electric grid is powered only by carbon-free sources to remove the rest of the fossil fuels from our energy use.

Leaders under pressure about climate and clean energy issues, who also don't have direct energy experience or understanding themselves, see no flaw with this logic. And by adopting that way of thinking, they can make big sweeping promises like a carbon-neutral grid by 2040 or a 100% clean energy system by 2050. These goals seem so simple, and for them, it starts with going all-electric in buildings, all-electric in transportation, all-electric in industry … all-electric, all the time!

But is this goal a good idea? Are we collectively rushing to this conclusion? And have we looked past how great of a slogan 100% electrification sounds like to consider potential unintended consequences?

To kick-start that discussion, here are just 10 potential risks to consider of an all-electric energy system that may have you pumping the brakes on such goals:

1. **Electric systems are awfully wasteful.** The most climate-friendly way to approach energy is not to waste any of it, but centralized electric systems actually bring with them great inefficiencies. These inefficiencies start at the source, with **EIA noting** that more than 60% of the energy used for electricity generation is lost in the conversion process. Add to that the 8% to 15% of the power that's lost due to **inefficiencies during transmission and distribution**. And if an operator needs to use energy storage, which becomes more and more necessary as intermittent renewable generation is added the grid, tack on another **10% to 60% of energy losses** during that round trip.
2. **Weather makes electrical transmission even more inefficient.** The dream of a 100% electric-based energy system, full of renewable energy, ignores weather-related challenges. Clean sources of electricity, solar, wind and even hydropower are all reliant on weather patterns cooperating, which history has shown is tough to count on. But further, the heat of the summer months will lead to greater inefficiencies in transmission. This impact can amount to **transmission capacity dropping by 2% to 6%** during the summer, at a time when the grid must already contend with downed power lines, excess demand from cooling needs, and even interruptions from hurricanes and wildfires.
3. **Coal-powered electricity isn't leaving quickly enough, elevating the carbon intensity of the grid.** Transitioning to 100% electric assumes that fossil fuels can be wiped from the grid. However, coal-fired power plants still represent a significant portion of the nation's generating capacity and account for **nearly one-quarter** of total annual generation. Even regions that are forward-thinking on clean energy can't just shake coal out of their systems. For example, in Austin, Texas — the place **Elon Musk dubbed an ecological paradise** — the dirty secret is that **the Fayette Power Plant** provides a big chunk of the city's power. So, even ecological paradises would find that as soon as they shifted to all-electric, they would end up replacing coal with gas and other fuels, resulting in lower, but not zero carbon emissions.
4. **Electricity simply isn't practical for all energy needs.** Over the past decade, innovation and progress have made the idea of electric vehicles not only feasible but also a practical choice for many people. That shift represents a great success in replacing gasoline with electricity, but it doesn't mean we should put the carriage before the electric-powered horse for all means of transportation. For large electric ships, **studies show** to sail from Asia to Europe, 40% of the ship's cargo weight would have to be replaced with batteries. Replacing long-haul trucking with electric vehicles in the EU would require 10% of the continent's power generated alone. And given the inefficiency of burning fossil fuels to create power and the stubborn part of the generating capacity stuck on fossil fuels, **experts say** this change would be economically and ecologically pointless. Electricity may work for some use cases, but many industries would not thrive under an all-electric paradigm.
5. **Common "clean electricity" sources, such as biomass, carry environmental questions of**

their own. Much of the transition to all "clean electricity" turns out to be more accounting exercise than actual benefit to the environment, and the biomass industry represents that issue well. Biomass supporters claim that burning trees, wood mass and other biofuels is technically carbon neutral, because all the carbon that is emitted was first vacuumed out of the atmosphere by the plants in the first place, meaning there is no net effect. Experts call that conclusion into question. Bill McKibben, the founder of 350.org, **notes**, "Burning wood to generate electricity expels a big puff of carbon into the atmosphere now. Eventually, if the forest regrows, that carbon will be sucked back up. But eventually will be too long … we're going to break the back of the climate system in the next few decades. For all intents and purposes, in the short term, wood is just another fossil fuel, and in climate terms, the short term is mostly what matters." So even the clean electricity sources we're looking to shift to could be doing more damage than good in the long term.

6. **Rural and disadvantaged populations have specific reliability needs electricity can't meet.** The energy needs between rural and urban residents come with inherent differences, and so the best solutions for them will naturally differ as well. Across the world, **940 million people** don't have access to electricity. Although that might not seem like a problem in the U.S., many rural and low-income areas across the U.S. find themselves with **poor electricity service**, even when it's available. Within these areas, access to nonelectric sources of energy means they can continue to heat their homes, cook their food and ensure reliable energy use. Given the limited amount of funds available for the electric sector, money in these regions would be better spent to tackle a whole-energy system approach that recognizes electricity isn't always the best option for them.
7. **The grid isn't equipped to handle full-blown electrification.** Clean electricity generated is only as good as it can be reliably and affordably delivered to end users, and the state of that transmission and distribution system today is **well behind where it should be**. In the rush to advocate for an all-electric system, advocates may be overlooking the reality that the deployment of electric cars, heat pumps and other electric technology is poised to increase power consumption by **40% by 2050**. Given that the present-day demand on the grid has led to **blackouts, brownouts and unreliable power**, this shift towards greater electricity consumption will only make these painful interruptions more frequent.
8. **Individual buildings need energy resilience.** If a customer, a building or even an entire community are forced to rely just on electricity for all of their energy needs — heating and cooling, food storage and preparation, transportation, etc. — then a single point of failure can interrupt all of those systems. Customers are unlikely to accept a nonresilient energy system and the idea that all their modern amenities could go down in the blink of an eye because of a single downed powerline. In contrast, customers who still retain a gas line will still have heating and cooking options, and customers without electric cars can still fill up at the gasoline station.

9. **All-electric homes, on average, have greater carbon footprints.** Assuming the goal of addressing climate change and reducing carbon emissions, the move to electrify all homes and actors on the grid is a short-sighted idea. When comparing all-electric homes with homes of comparable size and profile that use natural gas, studies find that the gas homes are responsible for about **one-third fewer greenhouse gas emissions** PDF. So, if you're seeking to reduce the carbon footprint of a building, required electrification is not considered a win. And given the common knowledge that the time remaining is narrowing to suitably address climate change before the effects are irreversible, pumping extra emissions into the atmosphere now does those efforts no favors.
10. **Customer preference doesn't lie with electricity for many applications.** Consumer choice is a good thing, and the simple fact remains that for many applications requiring energy, customers prefer the efficacy and results they get with gas. **Surveys show** that almost 70% of customers prefer natural gas for home heating, water heating and cooking. Similarly, in homes with cold environments, many customers **refuse to give up their wood-burning household heating** because of the ability to store the wood in their home and the comfort this heating method gives them. Forcing all these nonelectric uses to be electrified limits application, effectiveness and utility that these customers desire for important reasons.

ABOUT THE AUTHOR

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