

Assessing Virginia's hidden wind and solar costs

Governor Youngkin and Virginia must address ecological and human costs of 'green' energy

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Among Governor Glenn Youngkin's first actions was [Executive Order #9](#) initiating Virginia's withdrawal from the Regional Greenhouse Gas Initiative, the Northeastern US "carbon market" that sets and enforces emission limits for coal and gas power plants. RGGI also lets utilities buy "carbon credits" when emissions exceed those limits, and pass costs on to families, businesses, hospitals and schools.

Special interests will contest withdrawal, but the EO sets the proper tone for reforming Virginia's energy system. Meanwhile, though, the 2020 "[Virginia Clean Economy Act](#)" still requires that utility companies close all fossil fuel generating plants – and replace them with wind and solar power by 2045.

The VCEA also stipulates that "not less than 5,200 megawatts" (rated capacity) of that "clean, renewable" power must come from offshore wind. That translates into 370 14-MW turbines, 430 12-MW turbines or 865 6-MW turbines off the Virginia coast. Construction of the first 180 has already hit cost overruns and [could reach \\$10 billion](#).

The offshore turbines will supposedly power 660,000 homes. But that will happen only when winds are blowing at speeds required for full rated capacity, perhaps 40-45% of the year, sporadically and unpredictably. When winds do not cooperate, Virginia will need backup power.

So the VCEA says utilities must "build or acquire" 3,100 "megawatts" (megawatt-hours?) of "energy storage." This likely means battery modules. If Tesla 85-kilowatt-hour modules are used, some 37,000 would be needed – to provide several hours or days of electricity requirements, depending on how widespread a blackout might be following a hurricane or other storm, or simply amid inadequate wind.

Virginia's carbon-free energy plan doesn't contemplate new hydroelectric or nuclear power. It mostly means thousands of onshore and offshore wind turbines and [millions of solar panels](#), covering 10-25 times the [area of Washington, DC](#) – depending on the types of turbines and mix of wind and solar power. Hundreds of miles of [new transmission lines](#) will bring this far-flung electricity to Virginia urban centers.

Threats to raptors and other birds, bats, whales, dolphins and other wildlife are significant. But the act "declares" that all these installations are "in the public interest," because they will help "combat climate change." That suggests that environmental reviews could be fast-tracked and cursory.

That cannot be permitted. Indeed, the realities of wind, solar and battery power demand that any assessment of their supposed "clean, renewable and sustainable" virtues be *global* in its scope. Land use, pollution and human rights issues surrounding these highly touted energy sources affect people, habitats and wildlife all over Virginia, the USA and the world, in significant, disparate and disproportionate ways.

Wind and sunshine certainly are clean, renewable and sustainable. However, *harnessing* them to meet society's huge and growing energy needs is *not*.

Wind, solar and battery facilities can be deemed clean, renewable and sustainable *in Virginia*, if land use, scenic, wildlife, [infrasound](#), [light flicker](#) and [other impacts](#) are ignored. However, they require greatly increased mining, fossil fuel use, emissions and environmental impacts in China and other countries that provide most of the raw materials and manufacturing for these technologies.

A recent [International Energy Agency report](#) says onshore wind turbines require nine times more raw materials per megawatt than combined-cycle gas generating plants. Offshore turbines require 14 times more materials. Solar panels and backup battery modules also require prodigious amounts.

Virginia's 5,200 MW of offshore wind alone will require nearly 20,000 tons of copper. At an average of [0.44% copper](#) in ore deposits worldwide, the copper alone would require mining and processing 4.5 million tons of ore, after removing some 7 million tons of overburden to reach the ore bodies.

A single 3-MW onshore turbine foundation needs [600 cubic yards](#) (1,500 tons) of concrete, plus rebar.

These technologies also require vast amounts of steel, aluminum, lithium, cobalt, nickel, rare earth metals, plastics, fiberglass and other materials – all of which involve extensive drilling, mining, processing, manufacturing and shipping. Because the United States increasingly restricts or prohibits such activities, or regulates them into unprofitability, most of that work is now done in China or by Chinese companies in other countries – using fossil fuels, and under pollution control, mined-land reclamation, workplace safety, and child and slave labor standards far below what US laws permit.

Coal and gas-fired generating units typically operate at nearly full nameplate capacity for 40 years or more; nuclear power plants for decades longer. Onshore wind turbines, solar panels and battery modules may have 15 to 20-year life spans; offshore wind turbines far less than that, because of salt corrosion. Their efficiency, electricity output and already-low reliability also decline from Day One.

Virginians need to know: How much electricity will these VCEA-mandated facilities actually generate every day, week and year? Who gets to decide where they go? What are their expected life spans, especially for offshore turbines? How many could be destroyed in a hurricane, tornado or ice storm? How long will it take to repair or replace them? Where will electricity come from in the meantime?

Since most of their systems and components cannot be recycled, where will the obsolescent or ruined turbines, turbine blades, solar panels, batteries, power lines and concrete foundations be disposed of? How much will the repair, replacement, removal and landfilling cost? Who will pay?

How will wildlife habitats, [raptors](#), bats, and other rare and endangered species be protected as these industrial-scale installations proliferate? What fines and penalties will be assessed for violations?

How many tons of metals, minerals and other materials will be required to build all these “clean economy” facilities? How many tons of ore will have to be mined? How many tons of overburden removed? How much coal, oil, diesel and natural gas fuel will be involved? How much land?

Will Virginia actively campaign to have more US lands opened to exploration, mining and drilling for these materials, so that Virginia and the United States are not 90-100% dependent on China, Russia and other often less-than-friendly foreign sources for these essential materials and technologies?

How many African, Asian, Uighur and Latin American children and parents will work in the mines, processing plants and factories that provide these “clean, green” technologies? How will Virginia ensure workplace health and safety, fair living wages and human rights for them?

The VCEA was promoted as a solution to “dangerous manmade climate change.” In evaluating the *global* costs and benefits of energy programs initiated under the act, how many tons of carbon dioxide and other greenhouse gases will be emitted by all these overseas operations?

Under this law, Virginia will shut down some 6,000 megawatts of coal-based electricity generation. But China already had 900,000 MW of coal-fired power plants, put [another 380,000 MW](#) into operation in 2020, and is financing or [building hundreds](#) of coal and gas power plants in Asia and Africa.

China alone will soon have 200 times more coal-fired generation than Virginia will eliminate – plus all the fossil fuel units it is building in other countries. Chinese units will improve people’s living standards – and build “clean, renewable” energy equipment for export.

What specific global greenhouse gas emission, land preservation, wildlife, climate change and extreme weather benefits will the VCEA actually generate (assuming CO2 actually drives climate and weather)?

A Youngkin-appointed commission could study all these matters. Its findings could help determine whether the Virginia Clean Economy Act can possibly deliver on its promised benefits; whether the global damages actually exceed any Virginia, US or global benefits; and whether the VCEA should be modified, or repealed outright. (For more details, see this [CFACT amicus curiae brief](#).)

The time to act is now – before this wind, solar and battery “transformation” is any further along.

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