

August 7, 2017

## Maryland Offshore Wind

The Public Service Commission's (PSC's) cost-benefit analysis is inadequate

In a recent Baltimore Sun Op-ed ([Md. offshore wind projects may hurt, instead of help, environment](#)) Robert Borlick correctly argued that Maryland's Public Service Commission (PSC) did not conduct an adequate cost-benefit analysis of Offshore Wind (OSW). Borlick's piece was followed by several letters-to-the-editor and comments generally expressing the opinion that OSW is great. But without a sound and comprehensive cost-benefit analysis, that critical opinion is unsupported belief.

Borlick's main point is that OSW cost and performance needs to be evaluated from the context of the whole PJM system (PJM is the local independent system operator). The root flaw in the PSC assessment is the implied assumption that wind farms and fossil-fuel plants are interchangeable. The science shows that the system impact is more complex. When the system loses a fossil-fuel plant it is generally a random event, one plant. When the system loses wind, it often loses all wind on the system. For a real system, the consequence is that wind generated electricity does not reduce fossil fuel consumption as much as expected; the system needs retain the fossil fuel plants to provide power when there is no wind; and not all of the electricity generated by wind [will be sold at market prices](#).

The complexity of real systems is illustrated by the experience of Ontario Canada. Ontario [reduced grid emission by 80% over the past decade](#). Today Ontario's grid is 12x cleaner than PJM. But in 2012 they discovered a problem. During hours of low load and high wind all fossil fuel plants were shut down and they still had too much power. They had to decide whether to shut down wind or nuclear. The policy then was to buy-wind-first so they shut down nuclear, an expensive and disruptive event because restart takes 4 days. Meanwhile strong winds abated after a few hours and it was necessary to use fossil fuel plants to keep the lights on until the nuclear plants were restarted. In 2016 they decided that buy-wind-first is a high emission, high cost policy. The low emission low cost policy is to shut down the wind and keep the nuclear running. The result is that in 2016 roughly 25% of Ontario's wind production was dumped, nearly 50% sold to Americans at low market prices, and 25% was used in Ontario at market prices. Yet ratepayers are footing nearly the whole bill as if 100% of available wind energy was being consumed.

In 2016 Ontario produced [61% of its electricity from nuclear, 24% from hydro, 9% from gas and 6% from wind](#). They have the cleanest grid in the world except for some all-hydro grids in Scandinavia and South America. But the transition was not planned and consumers are complaining that [electricity prices have nearly doubled](#).

The required cost-benefit analysis is not novel. It is the same method Maryland and Virginia used when they decided to replace the Wilson Bridge. The States tasked nonpartisan engineers to quantify all alternatives: tunnels, high bridge, low bridge and drawbridge. Even though engineers recommended a tunnel, stakeholders (the public) chose a drawbridge. \$2.5 billion later, we have a drawbridge and everyone seems content. While it is not necessary for the States to choose the lowest cost option, that value choice should be based on rational alternatives, not a guess.

A sound OSW cost-benefit analysis is more difficult because unlike bridges, power system concepts with intermittent generators are unprecedented. The analysis needs to compare whole PJM systems that deliver zero fossil-fuel electric power. The analysis needs to compare the full range of system



alternatives from intermittent generators to nuclear fission. Since wind production is correlated with space, time and load, wind farms are not interchangeable with fossil-fuel plants and system performance needs to be simulated using empirical data rather than simple models.

A [concept definition study](#) would provide the PSC with the factual basis it needs for a sound cost-benefit assessment. The method is the same as that which Maryland uses to build bridges. The method is the same that NASA used for the Apollo project. America won the space race because after President Kennedy set the goal, to put a man on the moon in 10 years, NASA had the discipline to spend one year up front to get the right concept – a lunar orbit rendezvous. NASA did not guess and neither should Maryland.

*Alex Pavlak is a PhD engineer and chairman of the Future of Energy Initiative (FOEI), a working group dedicated to simplifying transition to sustainable energy. FOEI members have contributed to this paper. Dr. Pavlak has been the president of a solar concentrator development company and has led teams that have successfully developed unprecedented systems for the US Navy. ([www.futureofenergyinitiative.org](http://www.futureofenergyinitiative.org))*

