March 8, 2017

An Economical Low Risk Path to Sustainable Maryland Electricity

Based on a Baltimore Sun Op-Ed published December 14, 2016

Those of us who have successfully built unprecedented systems understand the importance of following a process:

1) Clearly define a stable ultimate goal (leaders)
2) Explore alternative concepts (engineers)
3) Choose one (stakeholders & public)

Bitter experience teaches that migrating forwards from where we are, rather than starting with the ultimate goal, entails a high risk of expensive failed systems.

For example, a developer building a skyscraper starts by hiring an Architect/Engineering firm to develop concept designs: the cost, performance and risk of different concepts. Stakeholders choose one and then building begins. It is a rookie mistake to pour foundations before choosing a concept because the foundations may not support the desired concept.

Public works projects follow this process every day. When Maryland and Virginia decided to replace the Wilson Bridge, they first employed engineers to clarify alternatives: tunnels, high bridge, low bridge and drawbridge. While engineers recommended a tunnel, stakeholders chose a drawbridge. $2.5 billion later we have a drawbridge.

America's greatest achievements have followed this process. When President Kennedy said we will put a man on the moon in ten years, he thought we would build a big rocket, go directly from earth to moon and return. Our rocket scientists wanted to build a rocket in earth orbit, go from earth orbit to moon and return. NASA's John Houbolt championed a lunar orbit rendezvous: go from earth to lunar orbit, drop a guy down, pick him up and return. NASA had the discipline to spend one year to identify the correct concept before committing to a direction. This is why America won the space race.

Both the International Panel on Climate Change and the National Academy of Sciences tell us that we will need very large overall emission reductions to mitigate climate change. This implies an ultimate goal of a zero-emission electric power system. Even climate change skeptics understand that fossil fuel resources are finite and an electric power system without fossil fuel is inevitable. The goal is stable, the question is timing. Do we need zero (or near zero) emissions in 30 years, 50 years, or 100 years?

Maryland's strategy has been to mandate forward migration with an RPS, currently 25% renewables by 2020. We know the RPS will fail to proportionally reduce CO_2 emissions because Germany already gets 30% of its electricity from renewables with no CO_2 emission reduction. Maryland will fail for the same reason: renewables displace zero-emission nuclear while fossil fuel is retained to keep the lights on.

In contrast, Ontario Canada has reduced power system CO_2 emissions by 80% over the past decade. Ontario is 10 times cleaner than PJM (Maryland's transmission provider). The reason for Ontario's success is that their politicians have listened to their engineers while Germany, like Maryland, has been listening to environmentalists and legislating the design of their electrical power system.

For rational planning, Maryland should task a carefully chosen engineering team to clarify concepts for a zero-emission PJM power system. This classic concept definition study would explore all possibilities including renewables, nuclear, hydro… Given what is known today, engineering judgements would be made about the risk of new technologies, e.g. seasonal storage, small modular reactors… The study product would be the cost, performance, risk, and development needs for alternative practical systems. Stakeholders can then choose a path based on engineering fact. In contrast to rational planning, a 25% renewables mandate is a guess, a rookie mistake; like pouring foundations of a skyscraper before choosing the architectural design; or starting to build a moon rocket without exploring all possibilities.

Alex Pavlak is co-founder and chairman of the Future of Energy Initiative); co-founders Harry Winsor and John Rudesill also contributed to this piece, along with Paul Acchione, a Toronto energy consultant.

315 Dunham Ct., Severna Park, MD 21146, 410.647.7334, www.FutureOfEnergyInitiative.org, alex@pavlak.net