

“Well that didn't work out the way we hoped”

When negative unintended consequences far outweigh the original positive benefits it's essential to step on the brakes and reassess the way ahead. Maine is failing to do that with respect to the mandated installation of ever more solar energy paid for by electric ratepayers with disastrous consequences for family budgets and large and small businesses.

This is very much like Ahab and the white whale in Moby Dick. No matter what the cost in lives lost and the Pequod itself being destroyed Ahab pushes on. In this very cold winter the exorbitant cost of electricity in combination with heating bills is breaking family budgets across the state. This has an immediate knock-on effect where families in this situation are in no position to think about going to a restaurant or a movie or other types of recreation. Many of those businesses are on the edge of collapse. They had never really recovered from COVID and now this has happened. In addition, those businesses themselves are being bankrupted by the high costs of electric power in combination with the high costs of basic foodstuffs like eggs for restaurants and the scarcity and high cost of Labor to help run those businesses.

To brush aside all concerns about this immediate and the very visible harm that's being done in the name of the idealistic quest for Maine to be 100% renewable by 2040 rises to Ahab level madness.



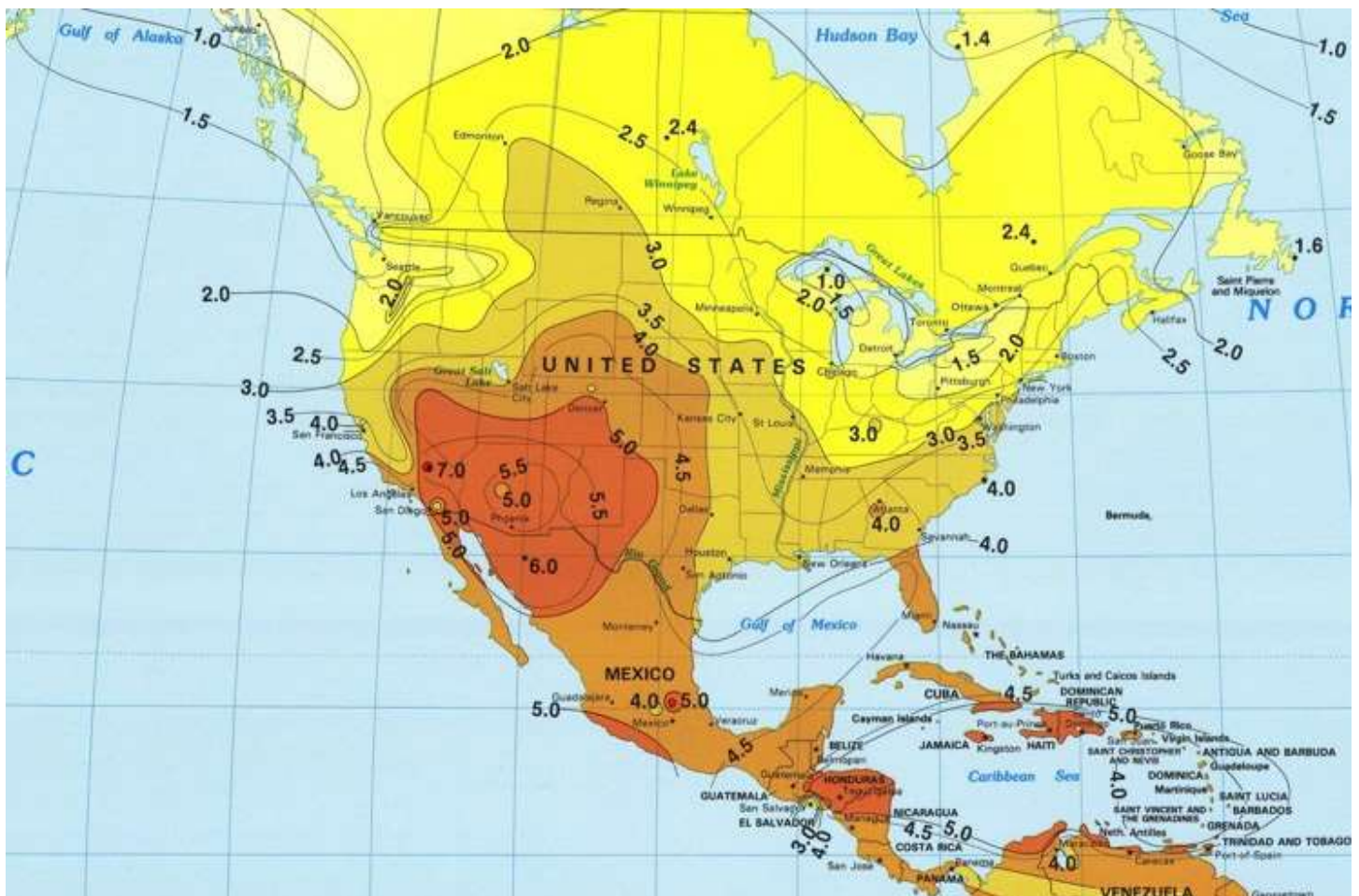
Although commendable it's an idealistic goal which in practice has had an impact on the state that has been devastating. Businesses large and small from restaurants to Dragon Cement have decided to shut their doors. The high cost of electric power in Maine guarantees that no manufacturing or industrial companies will decide to locate here. That forces many Maine young adults to have to think of moving out of state for any kind of secure employment at a time when artificial intelligence is replacing millions of paper-pushing jobs across the country. Realistically Maine's ability to affect climate change is truly less than a drop in the bucket because of its low population and already high level of conservation. There is no excuse for not executing a hard and quick course correction in the face of these realities.

But beyond all that there's a disturbing fact that neither solar energy nor offshore wind power make any economic sense for massive implementation in Maine. I say that as the person who single handedly catalyzed the offshore wind effort in Maine in 2007 and 2008. As Habib Dagher could vouch for it was my two-day series of lectures at U Maine Orono in December 2007 that prompted Habib to begin the offshore wind effort. In fact in that first year of 2008 Habib and I often traveled together all over the United States and Europe putting together the master plan of what would happen for

Maine. I also was the person who in the early spring of 2008 spent days with Angus King at his home in Brunswick constructing the energy calculations and the economic arguments for the Gulf of Maine being The Saudi Arabia of Wind. That was the title of the talk he gave at Bowdoin in April of 2008. Later that year in December I delivered the kickoff keynote address at the Governor's Task Force on Ocean Energy in Augusta.

So what changed? In 2008 there was every expectation that the price of oil per barrel would quickly head towards \$200. This was before fracking entered the scene. At that price for fossil fuels, roughly 3 times what it is today, offshore wind for Maine made all the financial sense in the world. It was competitive, it was clean, and it would create Maine jobs. It was a triple win. But in the spring of 2009 the first papers came out showing the potential of what fracking would do to reduce energy prices making the \$200 per barrel oil figure no longer possible in the near or intermediate future. I dug deeply into those papers and it was clear that they were reality based. I tried to spread the word of this dramatic change in the oil price situation but nobody in Maine wanted to hear it. That included my employer at the time Matt Simmons who had generously funded my 80 hour a week work in getting offshore wind off the ground. Nor was this welcome news to the fledging effort at U Maine Orono. To put it mildly Senator Angus King was not pleased. The only person who understood and acted on the message was Don Perkins Co chair of the Governor's Offshore Energy Task Force. He invited me to the Gulf of Maine Research Institute in June of 2009 to more publicly explain just what had so drastically changed.

How does this apply to solar? For Maine solar energy is an extremely non economic proposition. It's understandable that some people as a matter of principle would want to install it on their own homes. It's a really straightforward calculation to determine just how much the electric power produced by solar in Maine will cost. It's a matter of how much solar energy falls on Maine per square meter per year. That is called insolation. The key number there is 125 kilowatt hours per year per meter squared. That gets multiplied by the conversion efficiency taking solar energy into electric energy which is about 20%. That indicates how much each square meter of solar panels can capture as electric power.



Then couple that with the total installation cost per square meter in a utility scale solar farm which currently averages \$200. There is no cost for fuel so the cost per kilowatt hour (not including profit or maintenance) comes from a simple “mortgage” calculation of how much the “mortgage payment” on the square meter will be for a 20 year lifetime and 5% interest as a baseline case. That’s \$15.60/year. That then means the cost per kilowatt hour will be $\$15.60/125 = \$0.125/\text{kWh}$.

To that are added transmission and distribution costs of 10-12 cents /kWh. It ends up very expensive.

The generation cost of efficient combined cycle natural gas is about 4 cents per kWh. A factor of 3 less expensive

What’s the point? In the US southwest the isolation (solar energy falling on each square meter per year) is close to 3 times as great near 750 kWh/year per square meter. So in that region solar energy cost 4 cents/kWh – completely competitive with natural gas . There solar makes perfect sense in spite of its intermittency.

Maine is an entirely different case. It makes no sense. And it is destroying budgets.

To the objection of “But what about climate change?” Two considerations. First, how much is too much before the harm far outweighs the good? \$1.20/kWh? \$12.00/kWh. The constituent and business protest leading to this hearing indicate that line has already been crossed. Second, if climate change measures are to be taken, aim them at things appropriate to Maine’s geographic location, weather and average income. A push toward hybrid vehicle subsidies and much further energy efficiency such as superinsulation would make much more sense. The wrong paths have become painfully clear, like electric buses for Maine.

Above all do not lose sight of the reality that energy is the universal “money.” If the above calculation seems too complicated or unnecessary you unfortunately are in no position to be making a decision with such important economic effects on families and businesses. It’s exactly like figuring the mortgage payment on a house that with 5 to 10 minutes quiet thought it will become clear. It then stops being so much a decision driven solely by politics and emotion. More like thinking through the cost of re-insulating your house, or installing a heat pump Cost and payback.

By the way, and importantly, precisely the same calculation can and must be done for offshore wind. At \$5 per installed watt and a “capacity factor” of 40% (how often the wind usefully blows) and 8766 hours in the year each installed watt produces 3.5 kWh per year. The “mortgage payment” on that installed watt is 40 cents per year so the power before any profit or maintenance cost 11.4 cents/kWh. Expensive.

It's important to mention that I am not at all against measures to cope with climate change. Over the decades down here in Tenants Harbor it’s easy to see the weather getting stranger. I am on the local sea level rise planning committee. If solar were only 50% more expensive than natural gas generated power it would be worthwhile extra expense. Perhaps even at two times the cost. But when it becomes a factor of three it has left the realm of common sense. Time for Plan B