March 3, 2014

Senate Bill 733
Testimony in Opposition by Dr. Alex Pavlak

Chairman of the Future of Energy Initiative

My name is Alex Pavlak. I am a PhD engineer living in Severna Park. I hold a Professional Engineer engineering license and own patents for solar collectors and wind turbines and I have published a number of papers on wind and how to develop clean energy systems.

My primary occupation is that of Chairman of the Future of Energy Initiative [FoE], a working group loosely aligned with INCOSE, the International Council on Systems Engineering. [In the following discussion, the terms "we" and "our" refer to FoE working group members.] Our mission is to develop sustainable system concepts capable of powering the planet without fossil fuel. Our approach is classic systems development, that is, to start with the ultimate goal (zero fossil fuel); identify and compare alternative system concepts; then present feasible choices to society through the peer reviewed literature. The FoE discriminator is that we focus on ultimate goals and whole systems. We oppose renewable goals and recommend clean energy goals.

LESSONS FROM GERMANY – Maryland gets about 5% of its electricity from renewables, mostly from hydro.[1] and has a retail electricity price of ~11 cts/kWh. SB 733 proposes a large increase to 40%. Germany currently has 25% renewables [2] and an electricity price of 36 cts/kWh. [3] The 3.3x difference in cost between Maryland and Germany should be reconciled.

WHAT IS THE TOTAL RPS COST? - The MEA contracted a theoretical cost analysis (40% Study) that predicted a ~2% increase in electricity price to residential users. The difference between this prediction and the German experience can be explained in part as a result of assumptions in the MEA study.

- Incremental impact - The 40% study presented incremental impact beyond the current RPS obligations. Total RPS cost requires revisiting current obligations in light of new knowledge.
- Indirect cost – The rational for excluding indirect costs from the 40% study are unclear because the consumer pays regardless of whether they are considered direct or indirect. The following costs are imposed on the system by wind generators. In a fair and unbiased market, these costs would be directly allocated to wind generators, but not today.
  - Transmission upgrades – Transmission is likely to explain much of the difference between the 40% study and German experience. The 40% study assumes no transmission constraints internal to the Eastern Interconnect. Increased transmission distances, associated line loss, lower transmission capacity factors and congestion induced curtailment will significantly increase costs.
  - Decommissioning Calvert Cliffs and coal plants - 40% intermittent renewables is incompatible with base load generators.
  - Other indirect costs include idle backup generators, load regulation, storage and spinning reserves.
- Load growth - The 40% study baseline assumes little load growth. This is incompatible with PJM & EIA baseline estimates and biases estimates down by 8%.
- Federal subsidies - The 40% study analyzed the old Production Tax Credit (PTC) at 100%

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and 50% but not 0%. Since there is no PTC today, it is hard to justify a baseline case other than 0% PTC.

THERE IS NO PLAN TO GO FROM 40% RENEWABLES TO ZERO CARBON – If the ultimate goal is big (90%) emission reduction, it is not clear how 40% renewables contributes to that goal. There is a 99% study [4] that explains how to achieve large emission reductions with renewables. It involves overbuilding wind nameplate capacity by 10x (the wind farm for PJM would be the size of West Virginia); discarding 2/3 of the energy produced, retaining the existing fossil fuel backup but running it only 8 hours/year. This is not cheap.

UNINTENDED WHOLESALE MARKET CONSEQUENCES – The bill has no analysis of the impact of intermittent generator incentives on wholesale electricity markets. Incentives encourage owners of intermittent generators to submit negative bids driving low cost base load generators [nuclear, coal, and geothermal electric] off the grid increasing overall system costs.

THE BILL CONTAINS NO ENVIRONMENTAL IMPACT STATEMENT - The physical size of the wind farms required to satisfy this bill will be roughly the size of Garrett County. [5]

INCENTIVIZE CLEAN ENERGY, NOT RENEWABLES - While there is broad support for clean energy; renewable generators are a mixed bag. Biomass may have no fossil carbon emissions but it is not clean. Intermittent generators result in inefficient systems. SD733 is tantamount to picking a wining technology – wind. Clean energy would include sustainable nuclear fission, nuclear fission without the waste disposal and radiation risk of legacy nuclear.

CONCLUSION & RECOMMENDATIONS

1. Maryland needs a clean energy standard that includes sustainable nuclear power. Sustainable nuclear minimizes long lived waste disposal and has acceptable radiation risk under all operating conditions.
2. Leaders need to establish ultimate goals with interim goals derived from ultimate goals. Do not guess at interim goals. Stop picking winners. If the ultimate goal is a big reduction in system emissions, it is necessary to show how 40% renewables contributes to that goal.
3. Establish fair markets. Eliminate incentives for negative bidding. Remove hidden subsidies. Since market competition is between different generation technologies, system level capability cost [e.g. storage] should be allocated to the generation technology that requires that capability.

[1] Maryland Energy Administration, Energy policy 3, 2010. Available at: http://energy.maryland.gov/energy101/index.html
[2] Renewable Energy in Germany, 2012, Wikipedia, available at: http://en.wikipedia.org/wiki/Renewable_energy_in_Germany
[3] Electricity pricing, available at: http://en.wikipedia.org/wiki/Electricity_pricing
[4] Budischak, C., et al. “Cost-minimized combinations of wind power, solar power and electrochemical storage, powering the grid up to 99.9% of the time,” J of Power Sources, 225, pp. 60-74.
[5] Pavlak, A, HB1149 notes, available at: www.pavlak.net/HB1149notes.pdf

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