

TO: Advanced Energy Economy

FROM: Douglas Jester, Partner, 5 Lakes Energy

DATE: 3 March 2020

SUBJECT: Residential Bill Impacts of SB 851/HB 1526

You requested that 5 Lakes Energy provide analysis of the effects of the current version of SB 851/HB 1526 on a typical residential customer bill in 2030. This memo summarizes our findings. We used both STEP, our integrated resource planning tool, and various direct calculations. Results are presented in 2020 dollars, ignoring the effects of general inflation that might occur between now and 2030.

As a starting point, we used a bill calculator that is available from the Dominion web site. The following shows the bill that would be expected in 2020 by a customer using 1000 kWh per month:

Bill Component	Amount
Distribution Service	\$28.37
Electricity Supply Services	\$49.09
Transmission	\$19.72
Fuel	\$23.25
Sales and Use Surcharge	\$ 0.31
Consumption Tax	\$ 1.55
TOTAL	\$122.28

SB 851/HB 1526 will have little effect on distribution or transmission. Even though they are priced volumetrically, the underlying costs will not be much affected by energy efficiency and under standard ratemaking practices the unit rates will be adjusted to offset changes in total consumption. We therefore calculate the effects of S 851/HB 1526 on the \$72.34 combined cost of electricity supply services and fuel for a customer using 1000 kWh per month.

SB 851/HB 1526 requires energy efficiency programming that will reduce the average customer's electricity use 5% by 2025 and, subject to decisions by the SCC should continue reducing usage by 1.5% per thereafter. We therefore calculate that an average customer using 1000 kWh in 2020 will use 905 kWh in 2030. For this analysis, we exclude increases in electricity usage from adoption of electric vehicles and similar structural changes in the economy. In our judgement based on detailed examination of energy efficiency programs in 14 states, we believe this level of energy efficiency can be accomplished at the mandated spending level of \$140 million per year and we add that cost onto the cost of supplying power.

We assume that the renewable generation that will be implemented by 2030 will include the 2600 MW offshore wind project proposed by Dominion. Their estimates that this will require \$7 billion investment and have a capacity factor of 42% are both reasonable. Capacity factor is the amount of energy that will be produced in the average hour as a % of the nominal capacity of a plant. Based on the way that utility

annual revenue is calculated, we determine that the 2030 revenue requirements for this offshore wind generation will be about \$488 million and that it will produce about 9.566 billion kWh. This cost is well below the proposed statutory cap of the levelized cost of energy from a combustion turbine, as determined by the US Energy Information Administration.

The least-cost, best-fit way to meet the rest of the required renewable generation is to provide 100 MW commercial/industrial rooftop solar, as required, and 13,400 MW of utility-scale solar. This amount of solar capacity will produce about 24.835 billion kWh per year. Based on the solar cost forecasts prepared by the US Department of Energy's National Renewable Energy Laboratory in its Annual Technology Baseline, we estimate that the annual revenue requirements in 2030 will be about \$844 million.

The combined generation from these amounts of offshore wind and solar will exceed the requirements of the RPS in 2030.

Closing fossil and biomass plants as prescribed will eliminate the fuel costs and operations and maintenance costs of those plants and eliminate the generation from those plants. Based on 2019 operating records, we find that this will reduce generation by about 9.281 billion kWh and reduce utility annual required revenue by about \$225 million.

The projected generation from offshore wind and solar exceeds the generation from fossil and biomass plants that will be eliminated by about 25.119 billion kWh. We expect that this would reduce wholesale market purchases and/or gas plant operations. Since gas plants usually set the marginal cost in the wholesale markets, these are equivalent costs. Based on Energy Information Administration's reference case price projections, we calculate that the costs avoided will be about \$801 million.

We estimate that about half of the energy storage mandated by the bill by 2034 will be operational by 2030. Based on the costs of storage as reported by Lazard investment bank in its annual report, we project that the annual revenue requirement in 2030 will be \$120 million.

Combining all of the above calculations, we find that the bill will increase the average cost of electricity supply services and fuel in 2030 by \$0.0038 per kWh. This is more than offset by reduced usage due to energy efficiency.

We estimate that the SB 851/HB 1526 will reduce the monthly bill for electricity supply services and fuel to a representative residential customer from \$72.34 to \$68.93. This would reduce the total bill for such a customer from about \$122.28 to about \$118.87.