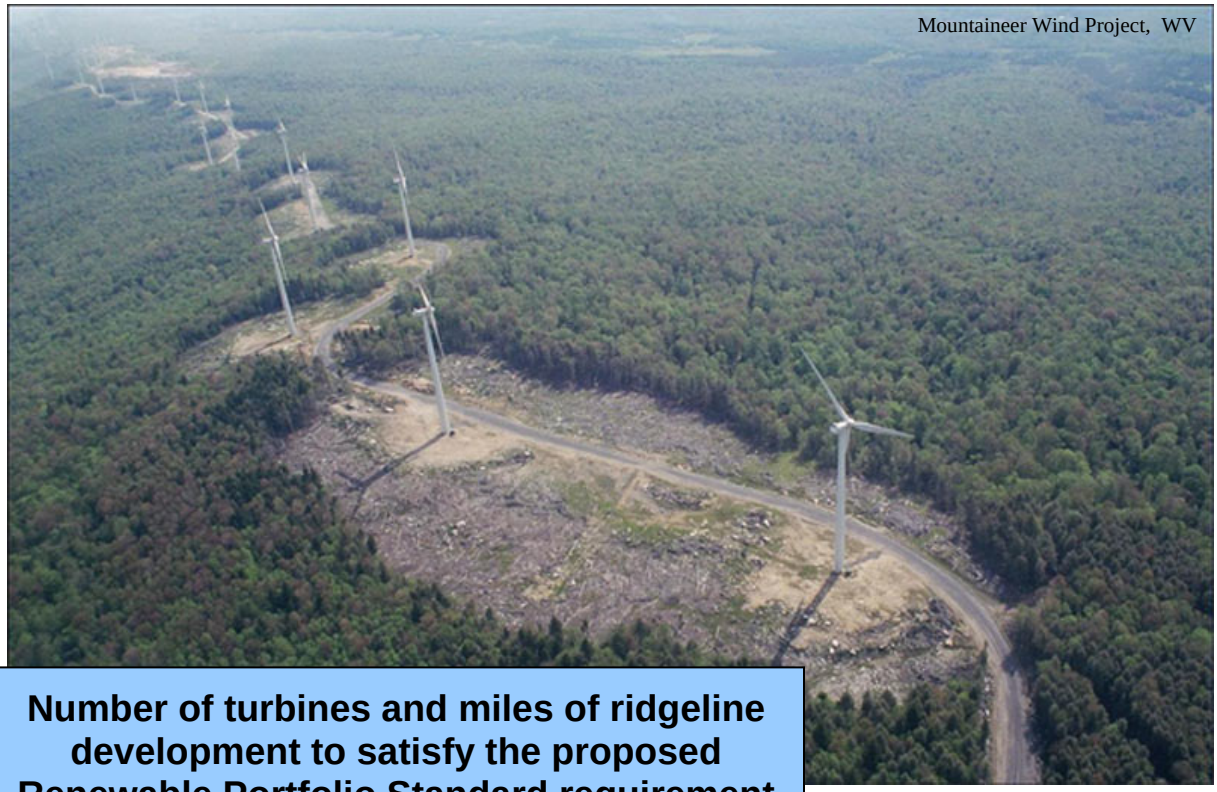
Mountaineer Wind Project, WV

Number of turbines and miles of ridgeline development to satisfy the proposed Renewable Portfolio Standard requirement

The RPS legislation would require that 8.7% of Virginia's electricity demand in 2020 come from "Category 2" sources, which include utility-scale wind power, low-impact hydropower, geothermal power, ocean energy sources, combustion of gas from landfills, closed-loop biomass, and digestion of organic waste, and active solar heating of swimming pools.

The estimate of 3500 wind turbines and 400 miles of ridgeline development assumes:

1) Most or all of the 8.7% Category 2 requirement will be met with utility-scale wind power.
2) Production for Appalachian region wind turbines is limited by the intermittency of wind. For a 1.5 MW turbine with a capacity factor of 28%, the annual electricity production is:

   1.5 MW x 0.28 x 24 hours/day x 365 days/year = 3679 MWh/year/turbine

3) Demand for electricity in Virginia will continue to grow at 2.5% per year. Estimated electricity use in Virginia in 2020 would thus be 156,350,646 MWh.
4) Turbine spacing on Appalachian ridges is approximately 8 turbines per mile.

Number of turbines: (0.087 x 156,350,646 MWh) / 3679 MWh/turbine = 3697 turbines

Miles of ridgeline: 3697 turbines / 8 turbines/mile = 462 miles

These estimates would be reduced somewhat if: (1) larger capacity turbines are deployed and technology improvements increase capacity factors; (2) energy efficiency measures reduce the rate of growth in Virginia's electricity demand.