Massachusetts Low Demand Analysis

October 20th, 2014 Stakeholder Comments

Developed and endorsed by: ENE (Environment Northeast), Berkshire Environmental Action Team, Clean Water Action, Environmental Entrepreneurs (E2), Environmental League of Massachusetts, Groton Stop the Pipeline Coordinating Committee, Massachusetts PipeLine Awareness Network, Mount Grace, Nashoba Conservation Trust, No Fracked Gas in Mass, SPCC Groton, and StopNED.

Our organizations welcome the opportunity to submit initial comments on the design of the Massachusetts Department of Energy Resources (DOER) Low Demand Analysis. We look forward to continuing engagement as Massachusetts evaluates benefits and costs associated with energy resources and policies capable of meeting our energy needs while reducing greenhouse gas emissions and minimizing consumer risk.

Before addressing specific design elements of the Low Demand Study, we want to thank Massachusetts policymakers for recognizing the need to evaluate demand side and distributed resources that can reduce our current over-reliance on natural gas in the region. Many of our organizations requested such analysis in a June sign-on letter to New England Governors,[1] and we appreciate the Patrick Administration's leadership in pursuing additional analysis to address identified deficiencies in earlier analyses of energy resource options.[2]

Analysis Framework

We support the overarching framework of evaluating resources that can reduce energy price volatility driven by over-reliance on natural gas for heating and electricity. We further offer specific feedback on evaluation of extreme weather, the design of the supply curve, and sensitivities.

When evaluating the sufficiency of gas pipeline capacity under extreme winter peak conditions, it is important to consider the likelihood of such extreme conditions occurring in order to avoid over-building expensive and long-lived infrastructure. If analysis considers a three day cold-snap during a cold winter, that resulting pipeline capacity 'need' should be accompanied by statistical analysis of such an event occurring. A cost-optimized system in all likelihood should have elevated prices during a once in 20 years event, as the cost of infrastructure that will only be used once in twenty years would likely be higher than the price escalation.

The supply curve developed as part of the analysis should 1) evaluate resources for their peak winter capacity paired with annual benefits, 2) determine the economically-efficient threshold based on the highest projected cost of the alternative – in this case pipeline capacity, and 3) evaluate resource feasibility under a range of natural gas prices.

Economic valuation of resources should be annual because energy resources will be in place for the whole year. Only by considering the full annual benefits and costs of energy resources can the study evaluate resources that will be of greatest value to the Commonwealth on the few coldest days of the

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[1] Over 100 environmental, consumer, public health, and conservation groups, businesses, and academics signed on to the June 24th letter "Right-Sizing Infrastructure for an Energy System in Transition", available at: http://www.env-ne.org/resources/detail/right-sizing-infrastructure-for-an-energy-system-in-transition

[2] *New England Gas-Electric Focus Group Final Report* states on p, 14:
"Successfully implementing natural gas and electricity energy efficiency programs, renewable thermal heating applications, and distributed electric generation that cause the demand for natural gas and the net electric load to decline in the long-term could eliminate any need for additional infrastructure. The associated cost of achieving a Low Demand Scenario is not known. Further analysis would be required to determine whether policies that would result in a Low Demand Scenario are cost-competitive with infrastructure investments."
Available at: http://www.nescoe.com/uploads/NEGas-ElectricFocusGroup_FinalReport_31Mar2014.pdf

year *and* all of the other days that we rely on energy. Economic valuation should further reflect the requirements of the Global Warming Solutions Act (GWSA) by crediting GHG emissions-free resources with the avoided cost of compliance proposed for similar analysis in the context of energy efficiency programs in DPU 14-86.[3] Including the avoided cost of compliance based other resources that would be required to achieve GWSA's targets is the most appropriate mechanism to reflect the GWSA's legal requirements and accurately account for public policy objectives within this analysis.

In order to reflect and avoid consumer risk, the economically-efficient threshold used to determine resources for inclusion in the Low Energy Demand Case must be based on the highest projected cost of procuring and utilizing additional pipeline capacity. If the objective of the study is to evaluate resources that reduce demand in comparison to adding supply, additional supply should serve as the basis for comparison. Since hydroelectric supply is considered independently, the appropriate comparison would be to additional pipeline capacity. The cost and economic benefit of such capacity should be evaluated under a highest-possible-cost scenario to avoid stranding investments if gas prices increase. This cost would include both the cost to construct pipeline capacity, the annual cost of service, and cost and benefits to Massachusetts under high natural gas prices (see section below on assumptions for additional input on gas prices).

Similarly, in the interest of assessing natural gas price risk, the sensitivities should evaluate hydroelectric imports under high gas prices for both the base and low case. In addition to emissions reductions, one of the main attributes of hydro imports would be price certainty, and the best way to evaluate price-stability attributes of electricity imports is to compare to higher gas prices.

Feasibility Analysis

We appreciate the broad initial list of energy resources and policies that will be considered in the feasibility analysis, and we recommend adding to the list rate reforms, solar thermal, heat pump water heaters, and transmission for wind firmed by hydro. Rate reforms including time-varying rates, peak time rebates, and demand charges have the capacity to shift electric load away from peak demand periods, and smart appliances increase the opportunity to seamlessly take advantage of different rate structures. While summer peaks have historically been the focus of load-shifting, it is worth exploring whether winter peaks can be smoothed as well, drawing on literature in the Massachusetts Grid Modernization proceeding and analyses in other jurisdictions. Solar thermal has been identified by Massachusetts as one of the technologies that will contribute to achievement of GWSA targets, and the potential for solar thermal has been evaluated in Commonwealth Accelerated Renewable Thermal Strategy report[4] and prior analyses. Heat pump water heater technology has improved significantly in recent years, and should be evaluated for capacity to reduce natural gas and electricity demand. Wind firmed by hydroelectricity may not require additional feasibility analysis, but the combined benefits and costs of transmission lines carrying 30% wind and 70% hydro (to reflect wind's capacity factor) should be evaluated in addition to pure hydroelectric imports, as a number of transmission lines proposed for electricity import into the region may carry wind.[5]

Assumptions

In relation to assumptions, we make two main suggestions related to gas prices and energy efficiency potential. First, the high gas price scenario should be utilized to evaluate consumer risk under a plausible

[3] These values are determined to be $52/metric ton in 2020, and $59/ton in 2030, see http://web1.env.state.ma.us/DPU/FileRoom/dockets/bynumber

[4] Available at: http://www.mass.gov/eea/docs/doer/renewables/thermal/carts-report.pdf

[5] Additional information on transmission proposals available at: https://www.snl.com/InteractiveX/Article.aspx?cdid=A-28202667-13099

scenario where increased natural gas exports drive a rapid and significant increase in gas prices. Without evaluating such a scenario, the study will fail to address the core challenge related to making long-lived investments in energy infrastructure, namely how to support investments that create the greatest benefits and lowest costs in across a range of future circumstances. EIA's gas price forecasts in the 2014 Annual Energy Outlook appear to inadequately reflect the risk of increased natural gas exports driving a near-term price increase. EIA's base case assumes that the US becomes a net exporter in 2018, and net exports increase to approximately 5bcf by 2030.[6] However, the high gas price scenarios layered over this base case focus on high economic growth and low recoverability of oil and gas resources, and do not specifically evaluate the price impact of accelerated exports. Due to increasing political support for exports to support geopolitical objectives and the accelerated pace of approval for liquefied natural gas (LNG) export terminals, market-watchers have recently begun to assume a more rapid rate of increase in exports.[7] A more appropriate assumption for the high gas price scenario can be derived from EIA's deep dive on the impact of increasing exports in *Effect of Increased Natural Gas Exports on Domestic Energy Markets*.[8] Of the four scenarios explored in this analysis, the rapid increase in exports to a high level is most appropriate. The US exported 1.6bcf in 2013,[9] which is in line with their projection for the rapid expansion, and the high level of export should be utilized as the most appropriate means of addressing risk.

Assumptions related to energy efficiency should reflect the proceeding in MA DPU 14-86 to evaluate the avoided cost of compliance with the GWSA. Only by accounting for the legal requirements of the GWSA can the analysis accurately reflect the economic potential for energy efficiency in comparison to other resources.

Clarifications

The analysis and final report should also make a number of clarifications related to the analytical scope and limitations. First, the analysis is limited to resources that Massachusetts can procure, but additional resources in the region can provide additional wintertime price relief and help the region meet its energy needs in the future. The analysis, for example, will not evaluate energy efficiency potential outside of Massachusetts, yet other New England states are far from achieving energy savings comparable to Massachusetts' programs, let alone capturing all cost-effective potential. Second, GHG impacts evaluated in the study do not reflect lifecycle emissions. This limitation is particularly important to acknowledge in light of the high global warming potential of fugitive methane from the production, processing, and transportation of natural gas, and in light of the high uncertainty related to leakage rates across the natural gas lifecycle. Third, as explained verbally at the October 15th stakeholder meeting, the report should state clearly that the quantity of electric transmission imports is not intended to reflect any particular transmission proposal. Fourth, the analysis should make clear that energy efficiency measures may be economically preferable as a means of addressing wintertime price volatility even if they are not strictly cost-effective – but so long as they are more cost-effective than alternatives. This holds for all resources evaluated in the study, but in light of the standard cost-benefit analysis applied to energy efficiency, it will be particularly important to explain that efficiency measures with a benefit-cost ratio of less than one may be preferable to alternative investments that have fewer benefits in relation to costs.

[6] See: http://www.eia.gov/forecasts/aeo/mt_naturalgas.cfm
[7] See: http://www.eenews.net/energywire/stories/1060006051/search?keyword=LNG+wall+street
[8] Available at: http://www.eia.gov/analysis/requests/fe/
[9] See: http://www.eia.gov/naturalgas/importsexports/annual/

Thank you for your time and attention to these comments, and we look forward to continuing engagement in this analysis and subsequent policy development as we work address promote energy resources that provide the greatest consumer and environmental benefits.