

Clean Energy Resource Options for Massachusetts to Meet GHG Reduction Goals under the Global Warming Solutions Act (GWSA): A Synthesis of Relevant Studies

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OVERALL RECOMMENDATIONS

Given our understanding of the state's energy-related objectives, we suggest the following approaches to minimize customer cost and risk and to ensure reliability:

- The state's clean energy policy should be characterized by a **diversity of resources**, (including hydro, offshore wind, onshore wind, solar, energy efficiency, and storage) and by the ability to facilitate the entry of promising new technologies into the market. Such a portfolio approach will be important for Massachusetts to comply with the emissions reduction requirements of the GWSA and to help the Commonwealth reach its goals of reliability, affordability and sustainability.
- The procurement requirement for hydro, offshore wind, and onshore wind should be sufficiently robust to give a **clear signal to developers about the size and durability of the state's commitment**. This is the "market visibility" to which the NREL and University of Delaware studies refer in the context of offshore wind.
- The condition that a procurement requirement be large enough to **create market visibility** is one appropriate guidepost for Massachusetts policymaking. A second guidepost is that the aggregate procurements of offshore wind, onshore wind, and hydropower—when integrated with projected existing power resources, new storage, energy efficiency programs, and other determinants of Massachusetts GHG emissions—**meets the requirements of the GWSA**. Although we have not done an independent analysis of either the precise total amount or the least-cost combination of additional carbon-free resources required to meet this important state requirement, it appears to us that the procurements that have been suggested in various pieces of legislation and analyzed in various studies—2,000 MW for offshore wind and 2,200 MW of hydropower/onshore wind by 2030—seem consistent with this requirement if purchased using the efficient, risk-balancing mechanisms we recommend.

- Procurement mechanisms should **utilize competition to the maximum extent feasible**. The potential for vigorous competition is one of the chief benefits of market visibility.
- The procurement design should **specify the use of purchase tranches**, rather than simply mandating a total purchase amount. This will allow subsequent tranches to take advantage of technology improvements and benefit from increasing market visibility and growing workforce experience, and will allow for a “glide path” of decreasing emissions and decreasing costs.
- **Timing of tranche purchases** should be carefully considered to allow for sufficient experience, but also for opportunities to make adjustments that can be applied to subsequent tranches. For instance, the procurement requirement should be sufficiently flexible to allow for increases and decreases in the magnitude and timing of the tranches of procurement to protect ratepayers from persistent high costs for certain technologies and to capture the value faster when cost reduction materializes.

In addition to the recommendations related to resource procurement, we make the following three long-term planning-related policy recommendations:

- First, the fact that the Commonwealth has struggled with these complex issues on a regular basis without the benefit of **comprehensive energy planning** recommendations from a highly qualified and credible source, exposes the need for a planning mechanism. We suggest that the legislation under consideration include the creation of such a mechanism.
- Second, the addition of more renewable resources requires an **increase in the RPS requirement** or, more precisely, an increase in the rate of increase of future RPS requirements. With more renewable resources entering the market supported by long-term contracts, the price of RECs will inevitably decrease, which in turn creates risks for those resources that have relied or will rely on the REC market for their entry. To prevent a crash in the REC market, the rate of increase in the RPS will need to escalate to maintain the price signals for additional renewable resource needs. Thus, increasing the RPS requirement is consistent with the overarching clean energy objectives. We note that the Massachusetts RPS requirement is currently lower than that of many other states that have stringent GHG emissions reduction mandates.
- Third, although not addressed in the studies we have reviewed, energy storage can help integrate variable renewable energy generation. The addition of more variable resources, such as wind and solar, argues for the development and deployment of cost-effective **energy storage** technologies. For this reason, we recommend that the Commonwealth explore policy options that continue to support research and development in storage technologies and to advance the maturation of energy storage.

Electricity rates are not the only cost considerations for customers or for the economy. For instance, energy policy should focus not just on rates, but also on total customer bills. Comparatively high rates may translate into relatively low bills when progressive energy efficiency policies enable customers to use less electricity, or when rates are designed to provide customers incentives to reduce electricity use at times of system peak demand. Finally, certain energy policies, like those mandating energy efficiency, solar PV, and offshore wind, can be engines of economic growth as new opportunities for employment are created in Massachusetts.