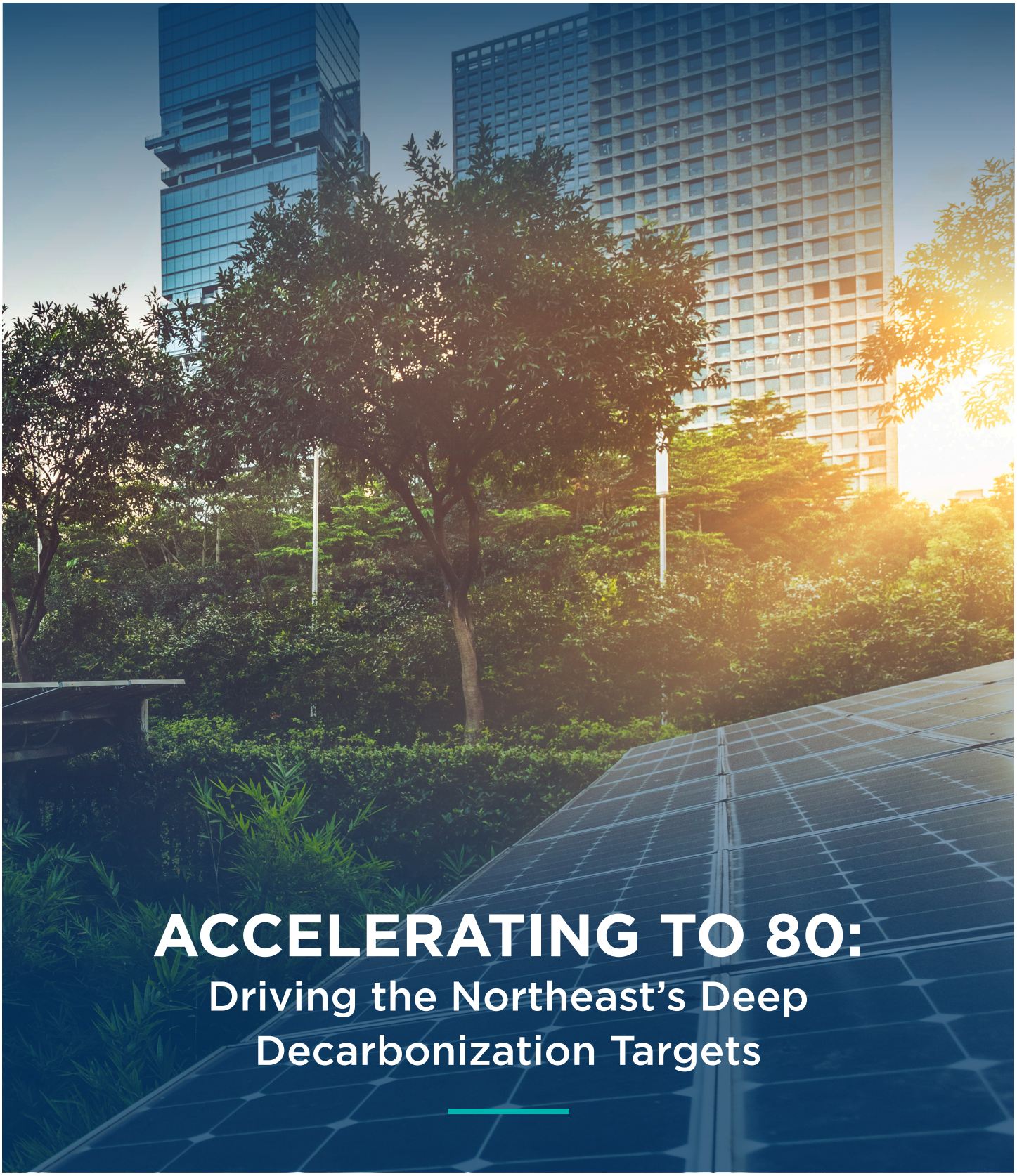
Northeast Region Emissions Reduction Summit



ACCELERATING TO 80:

Driving the Northeast's Deep Decarbonization Targets

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Northeast Region Emissions Reduction Summit

ACCELERATING TO 80: Driving the Northeast's Deep Decarbonization Targets

Highlights from the Northeast Region Emissions Reduction Summit co-hosted by Mintz, the Northeast Clean Energy Council (NECEC), and The Brattle Group. Stakeholders from government, industry, and advocacy groups brainstormed how the region can reduce greenhouse gas emissions by 80 percent by 2050 while overcoming significant technical, market-based, and political barriers.

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// INTRODUCTION

Concerns about climate change and its potential to cause catastrophic damage to communities, infrastructure, and natural areas are increasing across the globe, but many of the changes necessary to mitigate its impact must be driven at a more regional level. In New England, most of the states have pledged to decrease greenhouse gas (GHG) emissions by at least 80 percent by 2050, with a few states, including elsewhere in Northeast, committing to more expansive targets or a faster timeline. Last year, Governor Janet Mills of Maine signed an executive order to achieve carbon neutrality in the state by 2045, New Jersey Governor Phil Murphy issued a plan to reach 100 percent clean energy by 2050, and New York passed legislation to mandate a zero-carbon emission electric sector by 2040.

Yet it's not completely clear how to attain such a massive reduction. Many possible solutions have major political and market-related hurdles, and also require changes in consumer behavior. Overcoming these obstacles, while ensuring that there is enough clean energy supply to meet expected increases in demand, will require cooperation across jurisdictions and among competing business interests and constituencies.

In order to brainstorm ideas for what would be an unprecedented undertaking and to set the stage for regional coordination efforts throughout the Northeast, Mintz, the Northeast Clean Energy Council (NECEC), and The Brattle Group convened an invitation-only summit of senior-level clean economy leaders from the public, private, and nonprofit sectors. The event brought together over 30 thought leaders and stakeholders from a broad range of invested constituents: local and state governments, utility companies, industry associations and trade groups, advocacy groups focused on the environment and transportation, and venture capital and project finance funds that invest in sustainable businesses, and private companies ranging from green energy start-ups to Fortune 500 companies.

// MOVING TOWARDS DECARBONIZATION

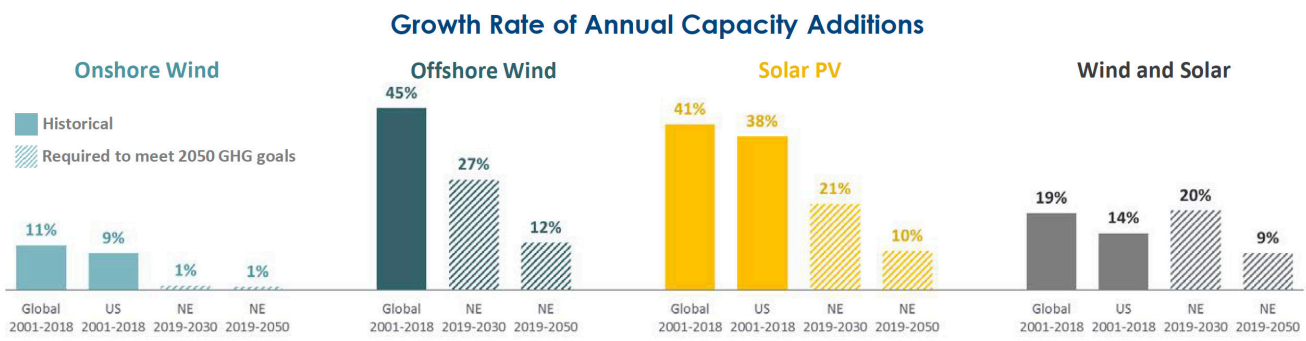
To kick off the discussion, Jürgen Weiss, a leading energy and industrial organization economist and a principal at The Brattle Group, reviewed several scenarios and takeaways detailed in The Brattle Group's September 2019 report, *Achieving 80% GHG Reduction in New England by 2050*. According to the study, there has been a significant upswing in clean energy deployment across the Northeast since 2010, but much more is needed to meet regional climate commitments.

Over the last decade, an average of 280 megawatts of renewable energy capacity has been installed across the six states each year — and the region is on track to more than double that activity by deploying an average of 830 megawatts of renewable resources each year until 2030. These investments provide a solid foundation, but according to the report, New England needs annual renewable energy deployments of four to eight times the current level, or an approximately nine percent annual increase in installations, through 2050 to reach 80 percent emissions reductions. That's an achievable target given that the region's clean energy buildout is already accelerating. By comparison, annual global deployments of wind energy projects have increased by more than 11 percent per year over the past 20 years while global solar energy installations have increased by 41 percent per year during the same period. Three primary approaches will enable the region to meet emissions targets: reducing electric sector emissions, expanding energy efficiency of new and existing buildings and vehicles, and adopting electric-powered technologies, including electric vehicles (EVs) and clean heating systems for buildings.

If the region takes these steps, The Brattle Group projects that demand for electricity will likely double in New England by 2050. In examining that conclusion and the underlying economic scenarios, attendees discussed a number of concerns and related issues. These include technical difficulties associated with storing wind- and solar-generated power, the lack of available land in the region for large-scale solar projects, and stranded or unrecoverable costs related to investments in new technologies that fail to establish a foothold. Utilities may incur stranded costs related to transmission pipes that deliver natural gas to buildings for any structures that convert to a new source of heating energy. Using clean gas derived from hydrogen, biogas, or other net zero sources with the existing infrastructure could avoid that obstacle, a possibility described in more detail in the report. An additional concern is the possibility of increased consumer demand for electricity if technological changes lead to price drops.

Underlying these questions and the overarching issue of whether the region can expand clean energy capacity quickly enough was a shared recognition that technology breakthroughs would change the variables in any GHG reduction plan. Although planning over such a long term is difficult, taking ambitious steps now to cut GHG emissions is critical because we can't simply count on technology to close the gap. In the event that technological improvements are slower or smaller in scope than expected, an aggressive plan will help ensure that the region meets its 2050 goals.

With these issues in mind, the attendees engaged in a candid discussion of challenges the region faces in meeting the 2050 goal as well as a broad spectrum of potential solutions. Before adjourning the summit, they began the arduous process of outlining next steps to ensure that the region stays on track to meet its emissions goals.



Source: IRENA, Renewable Electricity Capacity and Generation Statistics, July 2019. Note: New England ("NE") bars represent the needed annual growth in the Balanced Portfolio to achieve 2050 goals.

// SIGNIFICANT HURDLES

Reducing emissions by at least 80 percent across the region by 2050 will not be achieved without momentous efforts to accelerate the region's transition to a clean energy economy. Drawing on their insiders' perspectives, knowledge of wholesale and retail energy markets, and experience with the political realities of effecting reforms, participants generated a list of significant hurdles related to the lack of a national vision, technical limitations, retail and wholesale market designs, and the potential negative impacts on communities, including the energy sector workforce. While non-exhaustive, the below summary of the discussion illustrates the breadth of issues that will need to be addressed.

Lack of National Vision

Many of the specific challenges identified by the group were linked to one primary issue — the abdication of leadership on climate issues at the national level, which makes the region's decarbonization goals far more difficult to achieve. A national effort to address emissions is needed to quickly spur commercialization of EVs and other technologies that require high demand to be successful. An absence of national guidance coupled with the lack of state alignment on policies related to key issues, such as the buildout of generation capacity, also hinders investments in new technologies and energy sources, as well as public buy-in.

Technical Limitations

Although deeply committed to promoting a low-carbon economy, attendees noted a number of constraints associated with the current and future technical limitations of clean resources. Matching load and demand is likely to emerge as a major challenge unless renewable penetration increases along with similar scale-up of flexible demand, given that renewable resources, like wind power, are intermittent. Fossil fuels, in contrast, are energy-dense, transportable, incumbent, and abundant.

In order to continue to meet peak demand, the region would also need to invest in a much higher installed capacity of renewable energy than it has today. Yet there are many barriers to a quick clean energy buildout, ranging from geographic limitations to political opposition to flaws in governance systems. Large-scale development of solar power, for example, is hindered by the region's relatively small footprint of unforested land coupled with many stakeholders' desire to avoid clearing wooded areas for solar installations. More generally, most proposals to build new, large power generation capacity encounter political pushback and significant opposition throughout the siting and permitting processes, including offshore wind, hydropower, and transmission projects that are currently under review. A lack of regional coordination around renewable energy projects also hampers new development, as does the reluctance to invest in projects that may not come to fruition and incur stranded costs.

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Several attendees also expressed concern about technology weaknesses exacerbated by the cold climate in the Northeast, especially with regard to the electrification of the heating sector. Cold climate heat pumps are able to displace a significant portion of a customer's heating needs from oil or natural gas, but may not be completely effective as a replacement for fossil heating, especially during extremely cold temperatures. Barring technological advances, performance during cold snaps may be an impediment to deploying heat pumps.

Misaligned Incentives

While acknowledging that the regional wholesale electricity markets administered by ISO New England since 1997 have been effective in procuring a cost-effective and reliable generation fleet, many agreed that those markets are not effective at procuring low- or no-carbon resources. Although the states have long-term contracts to satisfy emissions goals, those procured resources are often unable to participate fully in the wholesale markets. Energy producers also face the risk of incurring stranded costs when investing in clean resources. The result is higher costs for customers and diminished benefits of clean energy.

Retail incentives, likewise, are also misaligned in all of the states' markets. Today, most retail rates for residential customers, as well as most commercial and industrial customers, do not provide a link between consumption and cost at the time of use. This hampers the effectiveness of flexible demand resources, such as demand response and energy storage.

Community Impact

As industry and governments establish programs and systems that enable states across the Northeast to meet their emissions goals by 2050, they also need to consider potential opposition and take steps to mitigate negative impacts to communities and workforces.

The siting of clean resources and the necessary grid infrastructure is a significant hurdle given that such projects often generate political backlash and adverse impacts on vulnerable communities. Increases to the cost of power could generate consumer pushback and lead to inequitable outcomes since costs and benefits are likely to accrue unevenly across different demographic groups. The reconfiguring of the energy workforce emerged as another major concern. For example, although new jobs will be created, some fossil-fuel dependent jobs will likely be lost.

The desire to avoid unjust outcomes — for individuals who lose their jobs and are unable to participate in the clean economy and communities that have historically borne the brunt of the burden of fossil-fuel infrastructure and emissions — also presents roadblocks to change.

// TRANSFORMATIONAL SOLUTIONS

Reduce Electric Sector Emissions

Expand Energy Efficiency

Electrify Transportation and Buildings

The challenges associated with the conversion of a capital-intensive, essential sector over a long time horizon are many. To help frame the options for overcoming those challenges, summit participants tapped into their collective knowledge and individual professional experiences to identify solutions and strategies to develop solutions. They came up with dozens of transformational ideas, which are summarized below. Suggestions involved regional cooperation, the removal of barriers to market entry, market reforms, and leveraging stakeholder engagement.

Regional Cooperation

In the absence of national action to address GHG emissions, it is critically important for the Northeast to assume a leadership role. Even though the states are not fully aligned on policy goals, there are significant opportunities for collaboration focused on stimulating innovation and meeting climate commitments. For example, New England state governors and their ISO New England representative, the New England States Committee on Electricity (NESCOE), could advocate and build momentum for reforms in the ISO New England markets.

Three other key areas for multi-state collaboration were discussed: the development of a regional procurement plan for energy resources; a regional clean transportation planning, emission reduction, and investment initiative; and information sharing. Large-scale clean energy procurements have typically been undertaken state-by-state, but a combined plan would lead to efficiencies in the siting process and enhance each state's influence in promoting decarbonization. In order to create better pilot programs for technologies or rate design structures, states could share details about outcomes, which will help accelerate the commercialization of these products and systems.

Removing Barriers to Market Entry

Developing policies to help clean resources gain a foothold in the market was identified as a critical step toward decarbonization. For instance, a re-envisioning of the interconnection process to treat interconnecting clean energy customers the same as other distribution customers will significantly improve the process and allow for more interconnections. A forward-looking distribution grid planning process would also give the utilities a pathway for making system upgrades necessary to accommodate clean energy resources, and give clean energy companies and investors confidence that interconnection issues will not impede their projects.

The concept of aligning incentives to increase adoption of clean technologies triggered a lively discussion. Examples offered included streamlining the

paperwork and number of entities consumers have to work with to obtain rebates for purchasing EVs and incentives for installing EV charging stations, and establishing incentives for automobile dealerships to sell EVs. Some of the ensuing discussion centered on developing an electric vehicle incentive program modeled on Mass Save — an energy efficiency rebate and education program sponsored by utilities and clean energy providers with support from the Massachusetts Department of Energy Resources (DOER).

Another approach zeroed in on the need to future-proof long-term investments customers are already making. For instance, ensuring that new boilers are hydrogen-conversion ready will enable consumers to use that technology when it is commercialized, which may be years into a new boiler's lifetime.

> ***Advancing changes that mobilize governments, energy businesses, and financial backers to invest in renewable energy projects while supporting communities and workforces will be critical to ensuring that deep decarbonization efforts are successful.***

Market Reforms

A number of potential market reforms, targeted at wholesale and retail electricity providers as well as the transportation sector, were offered as ways to enhance emissions reductions. Ideas related to wholesale electricity included explicitly pricing carbon in the market and creating a southern New England ISO to enable the three southern states — Connecticut, Massachusetts, and Rhode Island — to prioritize emissions reduction efforts. Other suggestions focused on retail electricity market reforms, including time-of-use pricing, both to encourage customers to reduce usage at times of peak demand and innovators to develop technologies that increase the flexibility of demand. An alternative approach would be to transform the utility business model to reward distribution companies for reducing customers' emissions per square foot.

Reducing transportation sector emissions is also essential. Applying time-of-use tolling on roadways, for example, would encourage drivers to use roadways at nonpeak times or find alternative modes of transportation. Electrification of the public sector transportation fleet, including school buses, possibly through public-private partnerships, would also advance decarbonization goals.

Leveraging Stakeholder Engagement

Advancing changes that mobilize governments, energy businesses, and financial backers to invest in renewable energy projects while supporting communities and workforces will be critical to ensuring that deep decarbonization efforts are successful.

Employing creative financing vehicles to raise funds is an essential part of this equation. Fixed-income climate bonds, or so-called green bonds, for instance, can be issued by governments, banks, or corporations to raise capital for climate change solutions, including greenhouse gas reduction projects. Government entities also have the option of issuing private-purpose bonds to help fund privately built renewable projects that provide a public benefit. To finance their own renewable energy upgrades, such as large-scale solar energy installations, schools, municipalities, and other public entities can partner with organizations that offer financing with no capital outlay.

Along with attending to the financial component of any clean energy proposal, government and energy producers also need to make a conscious commitment to mitigate costs and deliver benefits to historically burdened populations, including through siting decisions made through the lens of environmental justice, retraining programs for displaced workers, and ensuring that emissions reductions benefit all communities.

Educating customers and contractors is also critical. Honest communication about initial costs coupled with an explanation of how the lifetime benefits will outweigh lifetime costs is necessary to counter consumer wariness and pave the way for contractors offering clean solutions. Bold, visible pilots, such as a hydrogen home and a hydrogen-powered 18-wheeler, can also be used to generate public enthusiasm for clean energy.

// NEXT STEPS

To leverage the momentum and cautious optimism generated by the brainstorming session on solutions, the organizers closed the summit with a discussion on next steps.

An early suggestion — to pick two or three of the proposed solutions and create working groups tasked with developing road maps for implementation — revealed the importance of continued dialogue. Other proposals included working to secure early wins on high-impact short-term projects, inviting environmental justice groups and community representatives to participate in any ongoing process, and exploring how to structure a clean energy wholesale market. One stakeholder recommended stress-testing using financial modeling tools in order to evaluate options for expanding the region's solar power and the cost of power if demand for electricity doubled. Another proposed using a network of demonstration and early adopter sites, possibly at universities, to generate excitement for clean energy innovations.

Building on an idea germinated during the solutions session of the summit, one participant said that designing government programs that can offer one-stop shopping for consumers interested in purchasing green technology should be a priority. In response, another attendee suggested working with companies and activists over a two-to-five-year period to develop programs to promote clean technology through attractive incentives for companies and consumers.

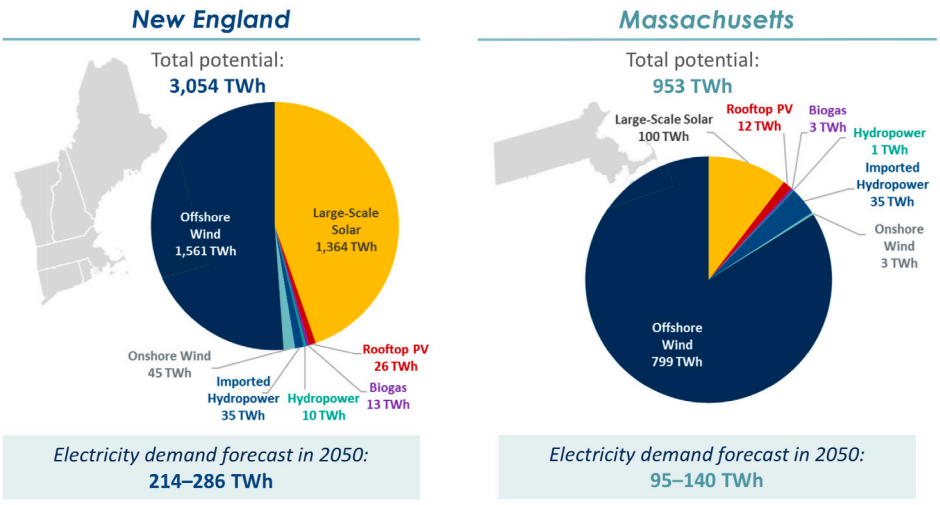
The group also weighed broader questions, including whether to concentrate on Massachusetts issues or retain a regional focus. There was widespread consensus that regional efforts are essential, given that states face common challenges and the regional grid benefits from the ongoing buildout of offshore wind power and early efforts to transform the clean transportation sector, which operates in many ways as a regional market. One attendee noted that regional collaboration doesn't mean every state must adopt a particular solution at the same time.

In a deliberation about possible breakout groups, attendees proposed a number of categories: offshore wind, solar, buildings, transportation, the electric generation sector (including wholesale market reforms, grid modernization, and the utility role in interconnection), and alternative fuels. There was also a strong counterargument for forming groups around broad topics, such as finance issues and the consumer perspective, to avoid creating silos of participants from the same industry.

// CONCLUSION

Although the unknowns in this massive, decades-long undertaking are many, government and other stakeholders need to agree on and embark on a number of initiatives that will radically reduce greenhouse gas emissions. Achieving this regional goal is almost certain to disrupt energy markets, consumers, and employees in the sector, but only teamwork that leverages the expertise of energy-sector decision makers and sustained effort can bring this vital goal to fruition.

Clean Energy Resource Technical Potential
Total potential: 3,054 TWh (terawatt-hour)



Sources: For New England renewables, see: NREL, Renewable Energy Technical Potential, https://www.nrel.gov/gis/re-potential.html. For Imported hydropower, see: EER, et al., Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Quebec, April 2018. Maps: Copyright © 2019 S&P Global Market Intelligence.

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The views expressed in this report are based on conversation shared about the discussion topics of this roundtable event and are not necessarily endorsed by each attendee in the audience.

Questions or Comments? Please Reach Out.

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