



Vision in Action



ISO NEW ENGLAND'S
STRATEGIC PLAN

From the President and CEO



Gordon van Welie
President and Chief Executive Officer

Twenty-five years after the ISO's inception, we stand at an inflection point in New England's energy history. The future clean grid is on the horizon, but the road we take to get there will involve a sea change in how the region generates, transmits, and consumes electricity.

Tomorrow's bulk power system will be powered primarily by renewable resources and will rely upon four interconnected pillars: significant amounts of clean energy, balancing resources, energy adequacy, and transmission investment. ISO New England's focus is on ensuring the strength of these four critical pillars, but it will take a collaborative effort by all industry and government stakeholders to ensure we reach our clean energy goals; everyone has a role to play.

Our corporate strategy, as outlined in this report, provides our stakeholders with insight into how we intend to fulfill our three critical roles of power grid operation, market administration, and power system

planning as the industry and the region transition to a cleaner power system. This corporate strategy is the result of an iterative process, informed by larger trends affecting the industry and our society, especially as extreme weather becomes more commonplace and we emerge from the pandemic with new global challenges, a changing workforce, and a sharper focus on the needs for a successful energy transition.

The initiatives highlighted in this report do not capture all of the critical work the talented people at the ISO are doing each day to serve New England consumers. This year's strategy builds on the many past projects that have enabled the participation of renewable

resources, batteries, and demand-side measures; established a reliable transmission backbone; and prepared the system for the future.

I welcome the opportunity to share this update with you. At ISO New England, we are united in our commitment to facilitate the decarbonization of our region's economy, and strive to support that vision with actions that move the region forward. We are proud to serve as New England's regional transmission organization, and ready for the challenge of making our power grid one that is clean and reliable – for all of us today, and for future generations.

A handwritten signature in black ink, reading "G van Welie". The signature is written in a cursive style with a long vertical line extending downwards from the end.

New England's Energy System is Undergoing a Dramatic Change

New England is on a path to achieve a clean energy future over the next several decades. Decarbonization will become a way of life during the transition, as New England states seek to combat climate change. Over the next three decades, New England's grid will nearly double in size as the "electrification of everything" continues apace, transforming how we power our electric grid and our lives.

ISO New England, the six New England states, and the New England Power Pool (NEPOOL) have been preparing for this greener future, working together to study every aspect of the future power system. Calling upon the results of several key studies, as well as 25 years' experience planning the region's power system, the ISO has identified **four pillars** critical to supporting the region's clean energy transition:

1

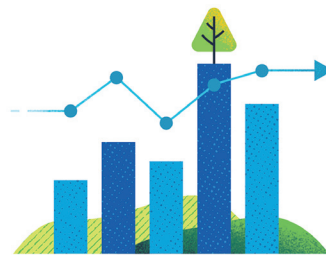
Clean Energy



Significant amounts of clean energy to power the economy with a greener grid

2

Balancing Resources



Balancing resources that keep electricity supply and demand in equilibrium

3

Energy Adequacy



Energy adequacy – a dependable energy supply chain and/or a robust energy reserve to manage through extended periods of severe weather or energy supply constraints

4

Transmission Development



Robust transmission to integrate renewable resources and move clean electricity to consumers across New England

Fortifying these pillars, and thus, the region's readiness for tomorrow's clean energy electric system, is a shared responsibility requiring increasingly close coordination among all stakeholders. As part of the ISO's strategic planning process, we assess trends inside and outside the industry that could impact the execution of our Mission and Vision, and the strength of the four pillars. This report examines these trends and articulates the ISO's vision for how the pillars, when operating optimally, can provide what the region needs – rapid growth of renewable energy resources and wholesale markets designed to attract and retain the resources needed – with the necessary infrastructure to support a safe and reliable transition.

While the challenges ahead and desired outcomes are clear, how we will achieve them is not. ISO New England and the region stand together at an inflection point: The needs of the future power system are well defined, but decisions and action on several fronts are needed now to achieve them.

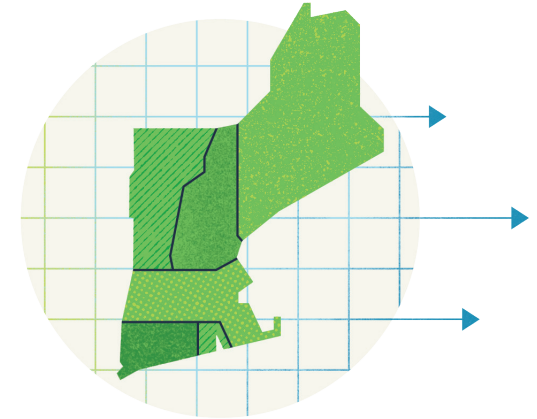
Specifically, the urgent need for regional solutions to shore up energy adequacy, as well as a clear process on transmission planning and procurement, including cost allocation, cannot be overstated. Given the region's dependency on a volatile liquefied natural gas (LNG) supply chain, there is a clear connection between the two pillars, because transmission investments offer a way to both reduce the region's dependency on natural gas, through integration of renewables, and strengthen energy adequacy, by tapping into energy reserves in neighboring regions.

In addition, reaching stakeholder consensus on a market structure that will support clean energy and reliability throughout the transition is crucial. These inputs are critical to achieving the ISO's Vision. The ISO is eager to continue working through the complex challenges we face in reaching and maintaining the clean energy future, but also recognizes that responsibility for certain key decisions, and infrastructure investments, lies beyond the scope of our role.

The ISO's Board of Directors, senior management, and staff are focused on fulfilling our Vision. We believe the clean energy future is within reach, but it will require all industry stakeholders – the ISO, policymakers, market participants, and consumers – to be realistic about what it will take to get there, and to work collaboratively to make it happen.

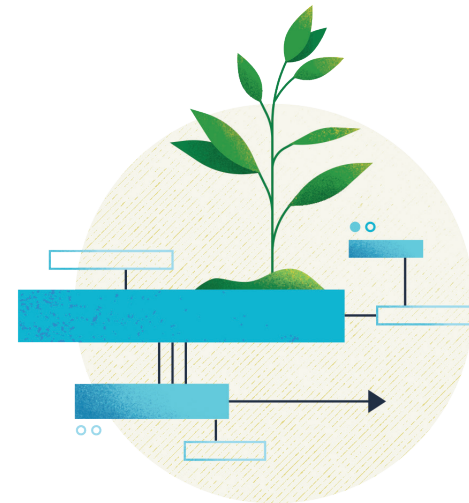
MISSION

Through collaboration and innovation, ISO New England plans the transmission system, administers the region's wholesale markets, and operates the power system to ensure reliable and competitively priced wholesale electricity.



VISION

To harness the power of competition and advanced technologies to reliably plan and operate the grid as the region transitions to clean energy.



Changing How the Region Generates and Uses Electricity

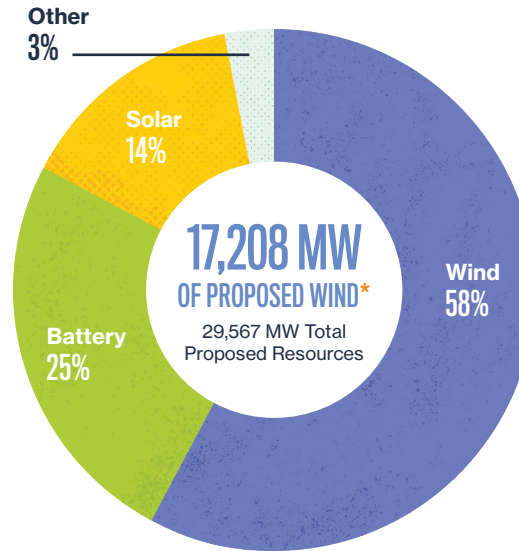
The shift toward renewable resources to power our electric grid has been underway for years. Driven in large part by the New England states' policies seeking to reduce carbon emissions from the electric, heating, and transportation sectors, regional decarbonization goals will increase renewable energy resources and reduce greenhouse gas emissions to nearly zero by 2050.

A near net-zero carbon emission grid will be powered primarily by renewable resources, displacing carbon-emitting resources most but not all of the time. Eventually, renewables will become the new baseline resource, meeting most consumer demand, with other resources such as energy storage and efficient natural gas generation filling the gaps.

When competitive markets were first introduced in New England, private developers proposed natural gas-fired generators to meet demand. Natural gas has been the region's prevailing fuel source for electricity for the past 20 years, but proposals for wind power and battery storage now dominate the ISO's Interconnection Queue. However, "proposed" is not "built." Retirements of older, more traditional generation with onsite fuel continue on schedule, while planned large-scale renewable projects have been canceled or delayed.

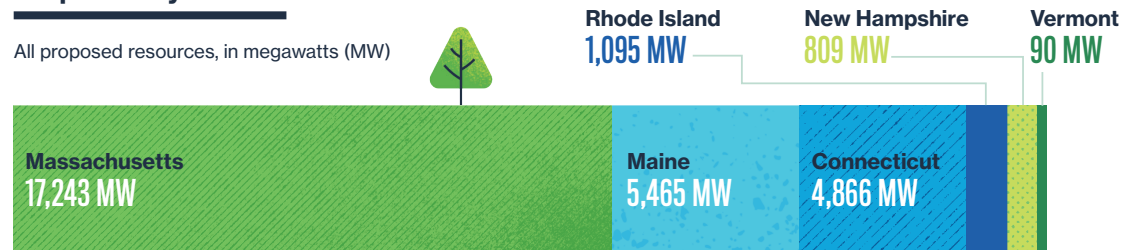
For over a decade, the ISO has been laying the groundwork to prepare for a grid powered primarily by renewable energy and serving significantly increased load.

Wind Power Comprises Two-Thirds of New Resource Proposals in the ISO Interconnection Queue



Proposals by State**

All proposed resources, in megawatts (MW)



*Source: ISO Generator Interconnection Queue (September, 2022); FERC and Non-FERC Jurisdictional Proposals; Nameplate Capacity Ratings. Note: Some natural gas proposals include dual-fuel units (with oil backup). Some natural gas, wind, and solar proposals include battery storage. Other proposals include hydro, biomass, fuel cells, and nuclear uprate.

**Source: ISO Generator Interconnection Queue (September, 2022); FERC and Non-FERC Jurisdictional Proposals

ISO New England was an early adopter of market rules compensating demand response, implementing programs for active demand resources in 2003. The full participation of both active and passive demand resources was integral to the ISO's design and implementation of the Forward Capacity Market (FCM) in 2010. The launch of a new price-responsive demand (PRD) structure in 2018, meanwhile, made ISO New England the first U.S. grid operator to deploy its active demand resources as part of the energy dispatch and reserve-designation process along with generating resources.

Other innovations address how the proliferation of distributed energy resources, together with the shift from conventional generation to renewable energy, will increase the complexity of maintaining power system reliability. As more weather-dependent resources connect to the grid, accurate forecasting of both weather and demand become more critical to keeping the system in balance.

Responding to that trend, ISO New England was the first grid operator to develop multi-state, 10-year forecasts of energy efficiency and behind-the-meter solar. Over the last several years, the ISO has bolstered its forecasting capabilities for solar and wind, hired an on-staff meteorologist, and partnered with the Electric Power Research Institute (EPRI) to model energy security risks associated with extreme weather events.

Running parallel to the significant changes in how the region supplies energy are state policies driving changes in how the region uses electricity, with broad shifts in patterns of seasonal demand. To account and prepare for these changes, the ISO develops electrification forecasts to project how the region's adoption of electric vehicles (EVs) and air-source heat pumps (ASHPs) will drive increases in electricity demand.

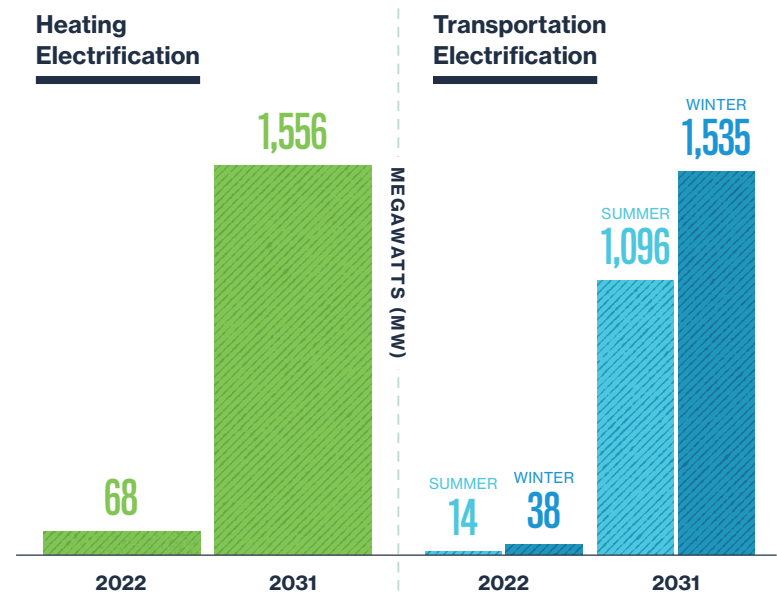
As state policies to decarbonize the economy continue to drive sea changes in how electricity is generated and used, ISO New England will support them through its three roles as the region's independent system operator: operating the power grid, administering the wholesale electricity markets, and planning the high-voltage transmission system. Together, the ISO and region's stakeholders can take action now to ensure our future electric system is as reliable as it is clean.

ISO's Electrification Forecast Shows Demand Growth

The ISO began including forecasted impacts of heating and transportation electrification on state and regional electric energy and demand in the 2020 CELT report.

In New England by the early part of the next decade, the ISO forecasts that there will be:

- > 1.1 million air-source heat pumps
- > 1.5 million electric vehicles



Source: ISO New England 2022-2031 Forecast Report of Capacity, Energy, Loads, and Transmission (2022 CELT Report); Heating Electrification Forecast 2022; Transportation Electrification Forecast 2022

Changing Weather and Winter Challenges

Managing a system as complex as the bulk power grid is challenging any day of the year.

The challenges—and the stakes—can increase amid the short days of a New England winter, and concerns about the year's coldest months will grow as climate change makes weather more volatile and harder to predict, all while driving more severe weather. With the grid expected to shift from a summer-peaking to a winter-peaking system in the decades ahead, the region must find ways to mitigate specific risks to reliability that arise during cold weather. ISO New England has observed how other power systems have been forced to step backwards in their environmental goals in response to reliability risks, and we would like to avoid that outcome.

Natural gas pipeline constraints lead the region to rely more heavily on electricity generation from stored fuels, primarily imported liquefied natural gas (LNG) and oil, during cold weather. This leaves New England vulnerable to fuel supply shortages, as generators rely on the delivery of global fuel supplies to produce electricity, and must compete in global markets for a commodity that may fetch a higher price oceans away. The ongoing war in Ukraine, meanwhile, has led buyers in Europe and Asia to lock in LNG supplies through long-term contracts, further limiting the availability of shipments to New England.

For two decades, the ISO has raised concerns about the impact of fuel supply constraints on electricity supplies during periods of extreme cold. Despite actions taken over the years by the New England states, the Federal Energy Regulatory Commission (FERC), and the ISO to attempt to address our region's energy adequacy risks, these vulnerabilities remain.

Our most acute concerns involve prolonged cold snaps – especially as the electrification of the heating and transportation sectors begins to shift peak demand to the winter months. In New England, widespread loss of electricity in the winter can present a health and safety crisis just as easily as it did in Texas in February 2021.



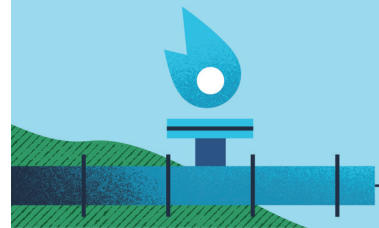
Cold weather also brings implications beyond reliability. New England's fuel supply issues ripple through the economy and environment, with colder-than-average weather driving up wholesale electricity prices and, in turn, retail rates. Meanwhile, regional greenhouse gas emissions spike when oil-fired generators – which produce more carbon dioxide (CO₂) per megawatt-hour of electricity generated than any other fuel used in the region – are typically cheaper to run than natural gas units, as the energy markets select the lowest-priced resources needed to produce electricity.

The region's winter reliability issues, price volatility, and potential for spikes in emissions require systemic solutions, not short-term patches. To bolster the pillar of energy adequacy – so the grid can withstand wind and solar “droughts,” also known as the winter doldrums, as well as long-duration severe weather events – New England will need a sustainable solution by the end of this decade to reinforce the energy supply chain and ensure sufficient stored energy. While battery storage will help, current technologies are too short in duration to support the system's balancing needs during expected periods of low renewable energy output. The ISO is closely following evolving battery and hydrogen technologies, but for now, the region will remain reliant on flexible natural-gas resources. The years ahead will require diligent work with the states and stakeholders to identify a preferred course of action to support energy adequacy – whether the states and FERC support a market solution or an approach that would share costs across the region, similar to transmission.

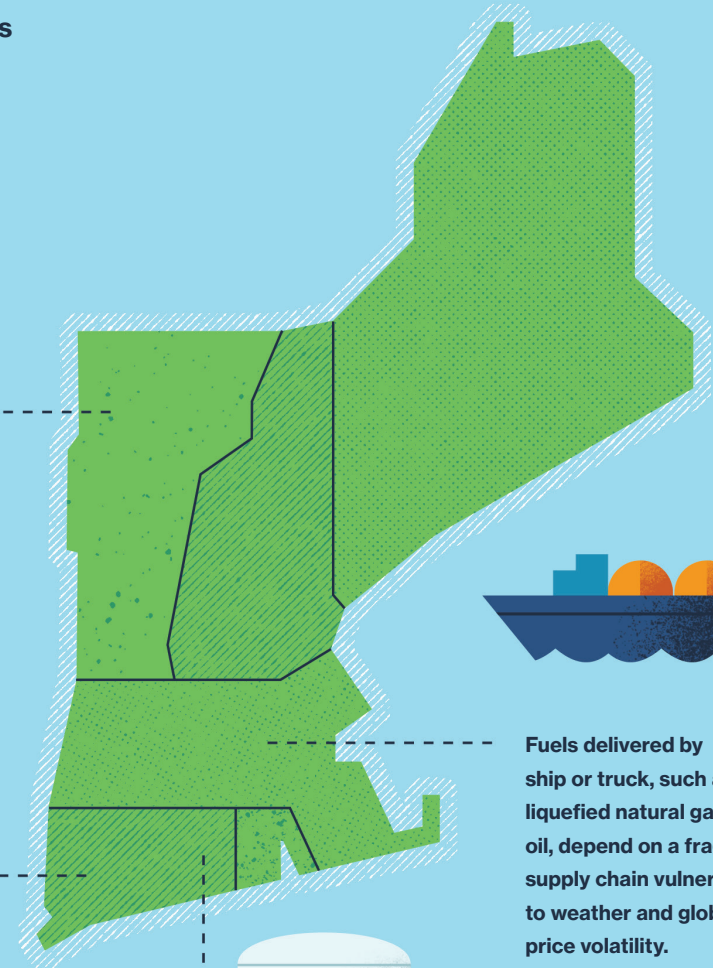
Our System Currently Has Built-in Vulnerabilities



When New England is facing adverse weather, our neighbors typically are as well, limiting our ability to count on increased electricity imports.



New England has limited pipeline capacity for natural gas. Pipeline constraints are magnified in the winter, as heating customers are served before power plants.

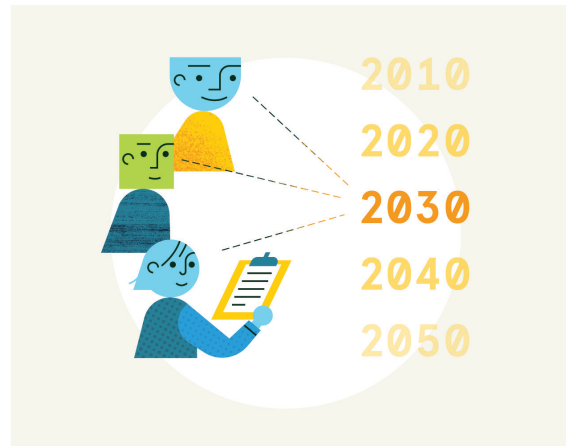


Fuels delivered by ship or truck, such as liquefied natural gas and oil, depend on a fragile supply chain vulnerable to weather and global price volatility.



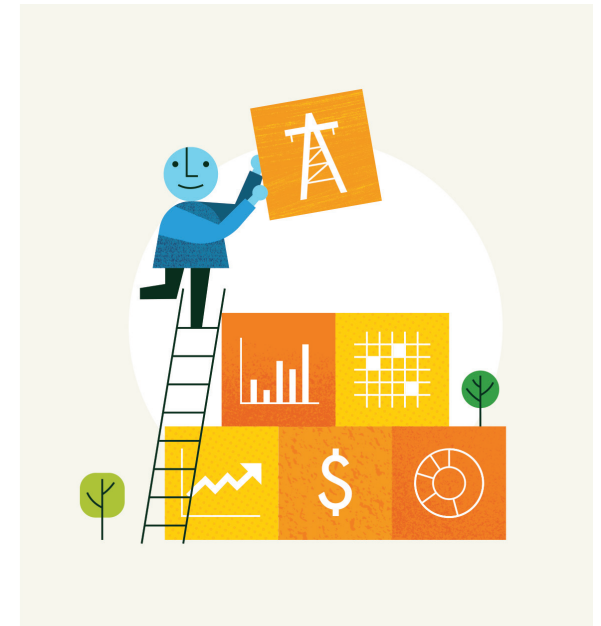
A Changing Workforce Environment

ISO New England operates within a contained six-state region, but competes for resources on both the national and global stages. As the threat of climate change grows, and steps are taken across the globe to combat it, many are following the same path we are on in New England – aggressively decarbonizing economies by turning to renewable energy to meet increasing electricity demand. Whatever is needed for a clean energy transition – natural elements for batteries, turbine blades for wind power, fuel for balancing the system when needed – is going to be in high demand for decades. This includes the most important resource we have: People.



To effectively support the objectives of the four pillars, as well as to maintain its ongoing responsibilities, ISO New England expects to add approximately 52 full-time positions between 2023 and 2024, most of which will support development of wholesale markets and transmission planning initiatives. At the same time, the day-to-day progress of the clean energy transition requires a high level of responsiveness to state and stakeholder requests and FERC orders, which have increased the overall workload for the organization. Competition for people to fill the highly specialized roles is stiff, and can be made more challenging by the limitations of ISO New England's not-for-profit status. In addition, job seekers are increasingly prioritizing the importance of work with purpose, and the ISO offers an opportunity for work that has real impact.

The ISO is committed to fostering an open, collaborative environment, where employees can be their full selves and do their best work. The challenges of the clean energy transition are considerable, and require the kind of creativity that diverse teams, with their blend of backgrounds and perspectives, consistently offer. Inclusion – the feeling employees have that they are valued and respected, and that their ideas will be heard – is a critical partner to diversity. Supporting both is integral to the ISO's strategic efforts to attract and retain top talent as its workforce evolves along with the region's electric power system.



A Changing Economy— At Home and Around the World

Reaching a future in which the rapid adoption of renewable energy and new grid technologies occurs in harmony with the alignment of system reliability and competitive wholesale electricity markets will require significant capital and infrastructure investment.

The clean energy transition is underway at a singular moment. From the COVID-19 pandemic, to Russia's invasion of Ukraine, to inflation and rising interest rates, the last few years have been a time of significant economic uncertainty. These trends carry implications for the ISO and the power industry at large, and underscore how our regional path to a decarbonized grid is inextricably linked to the global economy.

Rising prices and costs, for example, could pose new risks and challenges for developers of renewable energy projects, as well as the balancing resources needed to ensure reliability. This is especially true for large projects such as offshore wind, which could see financing delays and escalating development costs.

Higher global fuel and energy costs will continue to drive up New England power prices, ultimately increasing costs for consumers already facing tighter budgets. Rising electricity prices will, in turn, challenge the pace of the region's electrification of

transportation and home heating. Current economic outlooks, though, suggest this price pressure may moderate – relative to 2022's historical highs – over the next five years.

Other uncertainties include the actual pace of innovation. How soon will new energy technologies emerge, at the scale needed to meet future demand? And how quickly will the costs of those technologies align with the markets needed to support them in practice? For example, long-duration batteries could reshape the future grid, but they are still on the cusp of becoming commercially viable and will take time to reach the required scale of deployment.

Meanwhile, inflation – and associated interest rate hikes designed to rein in rising prices – increases the ISO's operating costs, from cybersecurity product fees and maintenance, to enterprise computer products, to insurance, dues, staffing, and consultants.

Taken together, these forces are creating greater economic uncertainty for the energy sector, and beyond, than we have seen in the recent past. The trends and potential challenges described here are far from a sure thing, and it is unclear how strong any economic headwinds will prove to be – particularly as they relate to the four pillars of clean energy resources, balancing resources, energy adequacy, and transmission investment.

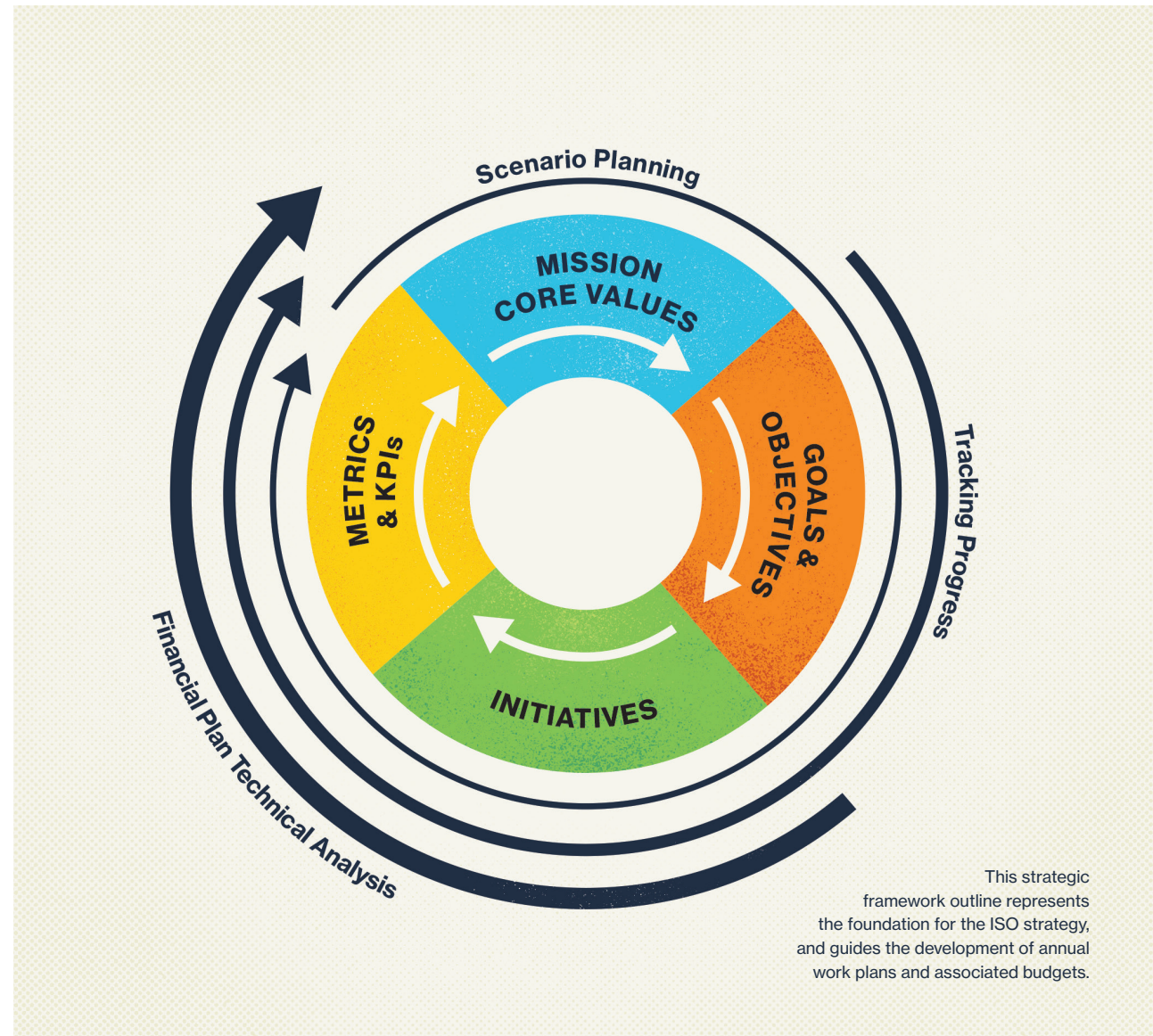


ISO New England's Strategy

Goals, Objectives, and Initiatives

As part of its 2022 strategy assessment, and as re-examined annually, ISO senior management and the ISO Board of Directors identify central challenges and strategic opportunities that form the cornerstone of the ISO's Strategic Goals. These goals represent the priorities the company has identified as necessary to making progress toward its Vision, upholding its Mission, and addressing regional and organizational needs over a three-to-five-year period. Throughout the year, management and the board continually assess external trends, business performance, and stakeholder and policymaker initiatives to better identify signposts and potential trigger events that could influence strategy. If needed, we respond with reformulated Strategic Goals that continue to effectively support the company's Vision and provide value to stakeholders. These goals and initiatives discussed in this report build on notable projects completed in 2022 that further the clean energy transition, including eliminating the Minimum Offer Price Rule from the Forward Capacity Market, establishing rules to enable increased participation from distributed energy resources under FERC's Order No. 2222, and establishing a process for longer-term transmission planning.

The ISO Strategy reveals our aspirations as a company and as a team of people working together toward a greater purpose for the region.



ISO New England's Strategic Goals

Responsive Market Designs: Improve the current market structure and continue to evolve and reposition the market design to reflect the states' objectives and the transition to high levels of renewables and distributed resources. Maintain a robust fleet of balancing resources and preserve the ability of the market to attract new entry.

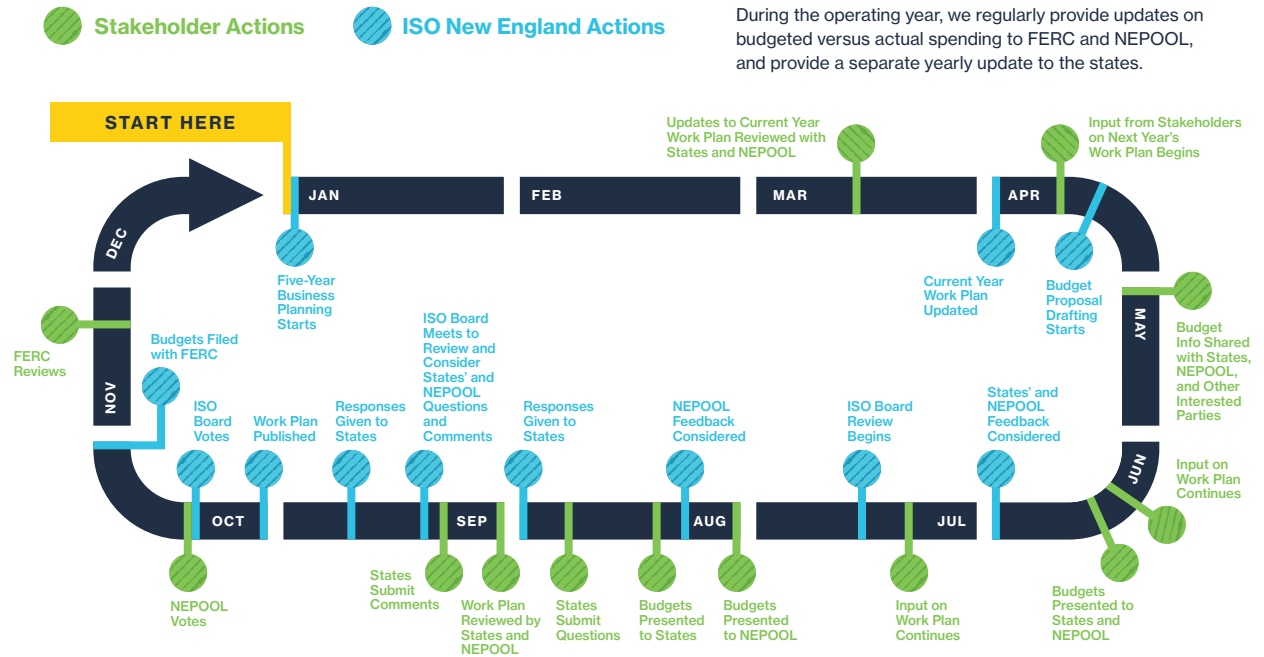
Progress and Innovation: Evolve capabilities to support the grid as the region transitions to clean energy, including improved power system and market modeling. Support investments in transmission infrastructure to enable renewable energy. Facilitate the integration of distributed energy resources. Provide data and information-based services.

Operational Excellence: Continuously improve operations and processes, with a focus on efficiency and effectiveness, business results, and continuity of reliable operations.

Stakeholder Engagement: Collaboratively understand and anticipate needs, demonstrate thought leadership through high-quality analysis and communication, and nurture productive relationships with FERC, the states, and market participants.

Attract, Develop, and Retain Talent: Develop a sense of community around our Core Values, Mission, Vision, and Goals; prepare the workforce; recognize and reward employees' success and innovation; and honor diversity and promote inclusion.

ISO New England Actively Engages Stakeholders Throughout its Annual Budget Cycle



Stakeholder engagement occurs throughout the annual budget cycle, which relies on input from various stakeholders in its annual approval process.

To make meaningful progress toward its goals, the ISO integrates its budget and business planning with the organizational strategy. This connects our broader strategy to annual resource commitment and day-to-day execution. The work plan identifies the strategic objectives and initiatives to help the ISO make progress toward its Vision, in concert with its defined Mission; aligns business goals and financial targets with decisions and execution across the enterprise; gives context to individuals about their role in the organizational work-effort; and leads to improved decision-making.

The ISO publishes its work plan in the fall and updates it and incorporates feedback in the spring, outlining its objectives and initiatives supporting its Strategic Goals. The work plan incorporates stakeholder input by sharing information with the NEPOOL Participants Committee and representatives of the New England states through the New England Conference of Public Utilities Commissioners (NECPUC) and New England States Committee on Electricity (NESCOE). Although the work plan specifies priorities and activities, the ISO necessarily maintains some flexibility to take on additional assignments or reprioritize previously identified initiatives.

Metrics

After articulating the organization's initiatives and objectives, management establishes metrics for measuring progress and interpreting risk for the upcoming year. The ISO uses several different frameworks when determining what metrics to use to measure our effectiveness in fulfilling our responsibilities. For metrics to be a useful evaluation tool, they must either: (1) measure performance against achieving our Strategic Goals; (2) measure risk tolerance for identified risks in light of available resources; or (3) measure compliance with various regulatory requirements. The ISO uses a "balanced scorecard framework" to translate its Strategic Goals into performance metrics using four different perspectives to measure performance: (1) financial; (2) customer satisfaction; (3) internal business processes; and (4) learning and growth.

2023 Goals and Objectives

RESPONSIVE MARKET DESIGNS

Promote New and Enhanced Market Designs for Non-Emitting Resources

– Initiatives that focus on the ISO's work supporting market constructs for and participation of non-emitting resources.

Support Reliability Through Competitive Market Mechanisms

– Initiatives that help the ISO ensure system reliability via enhanced market incentives.

PROGRESS AND INNOVATION

Implement New Technologies to Address Increased Power System Complexity

– Initiatives that increase the ISO's ability to model and forecast for a grid with a growing number of assets and more complex market features.

Improve Weather Forecasting Capabilities -

Improving weather forecasting as a means of better forecasting for the increasing number of weather-dependent resources on the grid and modeling extreme weather impacts.

OPERATIONAL EXCELLENCE

Maintain IT Reliability – Maintaining secured and reliable IT systems is central to the Mission of ensuring reliability for New England.

Support Increased Workload and Complexity

– As grid technologies become more advanced and increase in quantity while the region transitions to clean energy, the workload and process complexity to address them increases concurrently.

Assess FERC Orders and Stakeholder Requests

– The ISO is dedicated to responding to the needs of the region as market rule changes and system operations evolve.

STAKEHOLDER ENGAGEMENT

Facilitate Input into Annual Work Plan

– Initiatives that promote active stakeholder engagement and prioritize requests to ISO for assessment of issues and resolution of concerns.

Inform on Power System and Wholesale Markets Performance and Needs

– Informing stakeholders about challenges to the grid and ensuring they are apprised of concerns around daily operations and system planning challenges.

Administer Transmission Planning to Enable the Clean Energy Transition

– The clean energy transition will be dependent on a substantial investment in transmission and the ISO is engaged in initiatives to address this pillar.

ATTRACT, DEVELOP, AND RETAIN TALENT

Maintain Competitiveness in Labor Market

– Initiatives for recruiting, providing competitive salaries, and administering benefits across the organization.

Support the Professional Development of the ISO Workforce

– Supporting employee trainings, ISO policies, and diversity among a hybrid workforce, as well as championing the ISO's strategy to address the clean energy transition.

Selected 2023 Initiatives

Listed below is a subset of 2023 initiatives that represent major capital investment, respond to stakeholder requests, and/or directly address pressing priorities of the Four Pillars and Strategic Goals.

RESPONSIVE MARKET DESIGNS

Preferred Pathway to the Future Grid

Assessment – The ISO, states, and stakeholders have been working to define a preferred market pathway for facilitating the evolution of New England's power grid that reflects state energy policies (forward clean energy market, net carbon pricing, or hybrid). In 2023, this will require a threshold determination of jurisdiction and governance frameworks for the path, which will largely involve policymakers and regulators, as well as identifying details needed to develop the market design.

Alternative FCM Commitment Horizons (Prompt/ Seasonal) – In 2023, the ISO plans to begin evaluating possible market design changes to the Forward Capacity Market (FCM) commitment horizon that would replace the Forward Capacity Auction (FCA) with a “prompt” capacity auction, and would structure capacity as a seasonal product. Stakeholder discussions would take place in 2024.

Resource Capacity Accreditation (RCA) in the FCM

– This effort, already underway, seeks to implement new methodologies to quantify/accredit resources' capacity contributions to regional resource adequacy, which will be critical to reliability and market efficiency as the resource mix transforms. In 2023, the ISO and stakeholders will discuss the detailed framework design; the ISO plans to file with FERC by Q4 2023 and implement changes for FCA 19.

Day-Ahead Ancillary Services Initiative (DASI) –

This initiative seeks to develop market constructs for procuring and transparently pricing ancillary service capabilities needed for a reliable, next-day operating plan with an evolving resource mix. Market mitigation and other conforming rule changes will be addressed, including elimination of the Forward Reserve Market. In Q4 2022 and throughout 2023, the ISO and stakeholders will discuss the detailed designs; the ISO plans to file with FERC by the end of 2023.

- Energy Imbalance Reserve would cover the “gap” when the day-ahead market's physical energy supply awards are below the ISO's forecast real-time load.
- Day-Ahead Flexible Response Services would procure day-ahead 10- and 30-minute response services to enable the system to recover from sudden source loss contingencies and respond quickly to fluctuations in net load during the operating day.

PROGRESS AND INNOVATION

nGEM Market Clearing Engine – This major initiative replaces the ISO's 20+ year-old Market Management System (MMS) with the next Generation Electricity Management (nGEM) platform that is foundational to supporting a system with a growing number and type of grid assets, new and more complex market features, ever-multiplying security threats, and advancing IT technologies. The ISO has been working on the complex processes for customizing and implementing the day-ahead version of the new market clearing engine (MCE) software and infrastructure, which is expected to be in service in Q2 2023. Once the day-ahead MCE goes in service, the ISO expects to go onto the next phase, which includes real-time MCE.

Operational Impacts of Extreme Weather Events

– The ISO is working with the Electric Power Research Institute (EPRI) to build an innovative framework for conducting a probabilistic energy security study that assesses the operational impact of future extreme weather events.

OPERATIONAL EXCELLENCE

FCM Assessments and Enhancements –

Beginning in Q4 2022 and extending into 2023, the ISO will discuss with stakeholders the ISO's assessment of the proposal, and possible market

rule changes regarding bid flexibly associated with retirement and permanent delist bids, and financial requirements of retired resources returning to service, with a potential FERC filing by end of 2023 targeting FCA 19 implementation.

In 2023, the ISO plans to assess whether and why new capacity resources are clearing in the FCA when they may not be commercial by the associated Capacity Commitment Period and discuss possible reforms with stakeholders, with a potential FERC filing by end of 2023 targeting FCA 18 implementation.

Cloud Computing – Reliably operating a modern system comprised of renewable and storage resources requires the processing, transfer, and storing of vast amounts of data. In multiple phases, the ISO will implement cloud computing infrastructure and virtualization technology to reduce reliance on energy-heavy data centers and enable more dynamic expansion of computing capability while maintaining reliability.

STAKEHOLDER ENGAGEMENT

Energy Adequacy Considerations & Actions

– The ISO will consider solutions to the long-prevalent concerns about energy security during the winter months. The solution space will build on the results of the EPRI extreme weather study discussed above, and is dependent on ongoing conversations within the region and with FERC. Upcoming work with stakeholders is expected to confirm actions for the next three

winters and ultimately lead to a defined list of potential options for the post-2025 period. The spring 2023 update to the ISO's Annual Work Plan will reflect energy adequacy plans.

Extended-Term/Longer-Term Transmission Planning Phase 2 – In 2022, FERC approved a first phase of changes to Attachment K of the OATT (Open-Access Transmission Tariff), creating a process that allows the New England states to request ISO analyses that may extend beyond the 10-year planning horizon, to provide visibility into the transmission investment needed to further state energy policy objectives. A second phase of changes would provide the process for the states to move public policy-related transmission investments forward along with the associated cost-allocation method; the process should permit conversion of longer-term transmission studies into developable projects. Stakeholder discussions on Phase 2 begin in late 2022/early 2023, with a potential FERC filing in Q3 2023; ongoing processes at FERC may further inform this effort.

2050 Transmission Study – Under the extended planning horizon, the ISO is conducting a transmission study of possible transmission infrastructure and associated cost estimates needed to reliably serve peak loads in 2035, 2040, and 2050 using scenarios/assumptions that reflect state decarbonization policies. The ISO presented study results in spring and summer 2022 and began developing possible transmission solutions; further development of solutions and associated cost estimates will extend into 2023.



Three-Year Roadmap of Key ISO Initiatives

RESPONSIVE MARKET DESIGNS	2022	2023	2024	2025
Storage as a Transmission-Only Asset	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
IEP Updates for Winters 2023/24; 2024/25	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Energy Shortage Pricing Assessment	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Alternative FCM Commitment Horizons Assessment	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Day-Ahead Ancillary Services Initiative	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Pathways & Development of Preferred Path	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Storage Modeling Market Enhancements	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Resource Capacity Accreditation	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
FCM Parameters for FCA21	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
DA and RT Replacement Reserves	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Order 2222 Implementation	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Reserve Zone Reforms	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
PROGRESS AND INNOVATION				
Operational Impacts of Extreme Weather Events	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Expanded Weather Analytics	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Load, Solar, Wind Forecast Improvements	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Models & Simulators to Support Future Grid	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
nGEM Market Clearing Engine	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
OPERATIONAL EXCELLENCE				
FCM Three-Year Capacity Time Out	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Cloud Computing	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
FCM Assessments & Enhancements	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Cybersecurity Initiatives	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
EMS Modeling Enhancements	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Intertemporal Pricing and Optimization	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
STAKEHOLDER ENGAGEMENT				
Extended-Term Transmission Planning Phase 2	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
2050 Transmission Study	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
FGRS Phase 2 & Completion	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Energy Adequacy Considerations & Actions	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■

How Our Work Supports the Four Pillars

1

Clean Energy

Pathways and Development of Preferred Path

Storage Modeling Market Enhancements

Storage as Transmission-Only Asset Implementation

FCM Parameters for FCA21

Alternative FCM Commitment Horizons Assessment (Prompt/Seasonal)

Order 2222/Distributed Resource Qualification & Integration

Load, Solar, Wind Forecast Improvements

nGEM Market Clearing Engine

Models & Simulators to Support Future Grid



Operational Impacts of Extreme Weather Events

Expanded Weather Analytics for 21-Day to Intra-Day Load-Forecasting

FCM Assessments and Enhancements

FCM Three Year Capacity Time Out

Intertemporal Pricing and Optimization

EMS Modeling Enhancements

FGRS Phase 2, and Completion

2

Balancing Resources

DA Ancillary Services Initiative

Pathways and Development of Preferred Path

Resource Capacity Accreditation

Energy Shortage Pricing Assessment

Updates to Inventoried Energy Program (IEP) for Winters 2023/24 and 2024/25

Alternative FCM Commitment Horizons Assessment (Prompt/Seasonal)

DA and RT Replacement Reserves

Reserve Zone Reforms

Operational Impacts of Extreme Weather Events

FGRS Phase 2, and Completion



3

Energy Adequacy

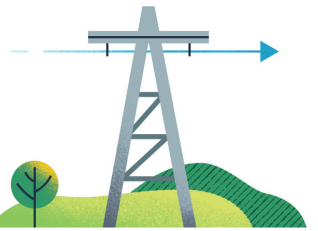
Updates to Inventoried Energy Program (IEP) for Winters 2023/24 and 2024/25

Alternative FCM Commitment Horizons Assessment (Prompt/Seasonal)

Operational Impacts of Extreme Weather Events

Energy Adequacy Work

FGRS Phase 2, and Completion



4

Transmission Development

Reserve Zone Reforms

Operational Impacts of Extreme Weather Events

2050 Transmission Study

Extended-Term Transmission Planning Phase 2

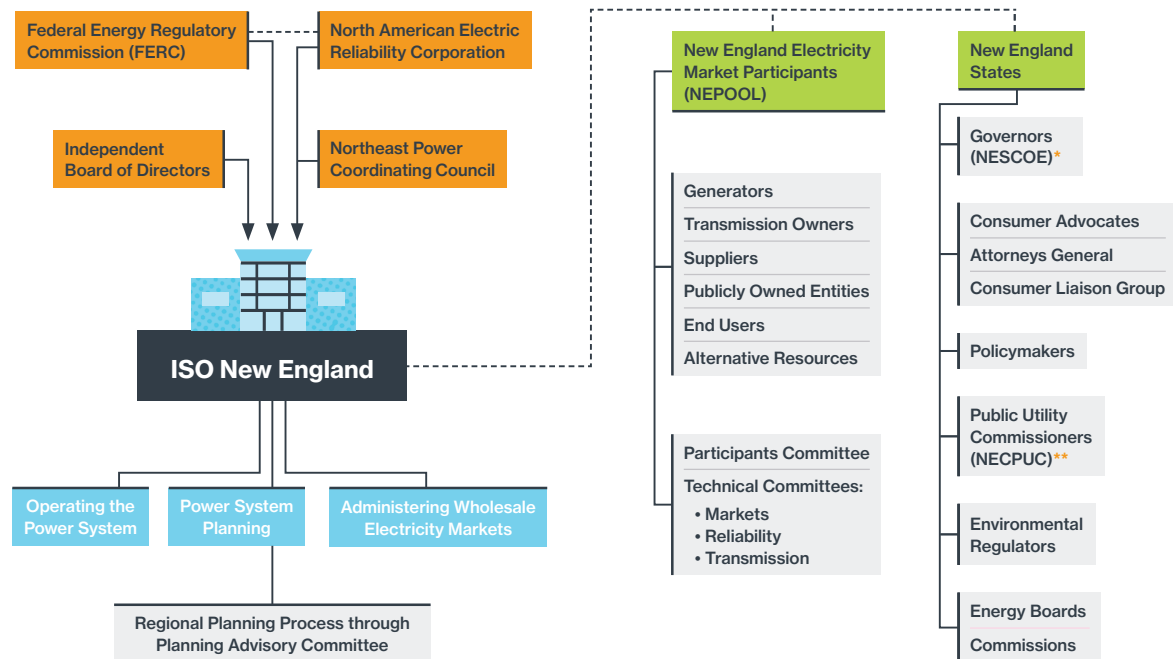
FGRS Phase 2, and Completion

Other Entities Play an Important Role in Supporting the Pillars

The four pillars are the foundation for a clean and reliable energy system for New England – and the ISO is committed to doing its part. The projects discussed in this report are key elements providing support for each pillar, but more will be needed. The energy industry is undergoing dramatic changes – and while the ISO is a pivotal player, other entities play important roles in achieving the region's goals.

The collective actions of the ISO, New England policymakers, energy and environmental regulators, utilities, market participants, consumer and environmental advocates, and the public will affect how successful the region is in its transition to a reliable, clean energy grid. In particular, the New England states play a crucial role with regard to the transition. Issues within the ISO's strategic plan, such as long-term transmission planning, solutions for energy adequacy, and the future design of the wholesale markets, will require input and guidance from the states. State and federal policymakers have been active in passing legislation to provide incentives for new infrastructure, but the siting, permitting, and interconnection of new resources and transmission lines are all required steps that take time. While ISO New England has a role

New England's Industry Structure



* NESCOE: New England States Committee on Electricity

** NECPUC: New England Conference of Public Utilities Commissioners

Like New England's power grid, its industry is also interconnected.

in the interconnection process, decisions on siting and permitting are the purview of state and federal agencies. Therefore, it will be imperative for the states to work together to address siting and cost-allocation issues. In addition, several factors can affect both the pace of the transition and the

options available to support the pillars, including the level of consumer cost impacts, the need to address environmental and community concerns, and the rate of technological advancement and adoption. Solving the energy adequacy pillar in particular will likely require actions outside of the ISO's jurisdiction.

On the Horizon

New England is well along the path to a clean energy future, and we have a clear understanding of what is needed to reach it: clean energy resources, balancing resources, energy adequacy, and transmission investment. Over the next three decades, ISO New England will continue to support the strength of these pillars, understanding that all four will be needed to

support tomorrow's substantially changed grid – one powered primarily by renewable resources – and throughout the transition.

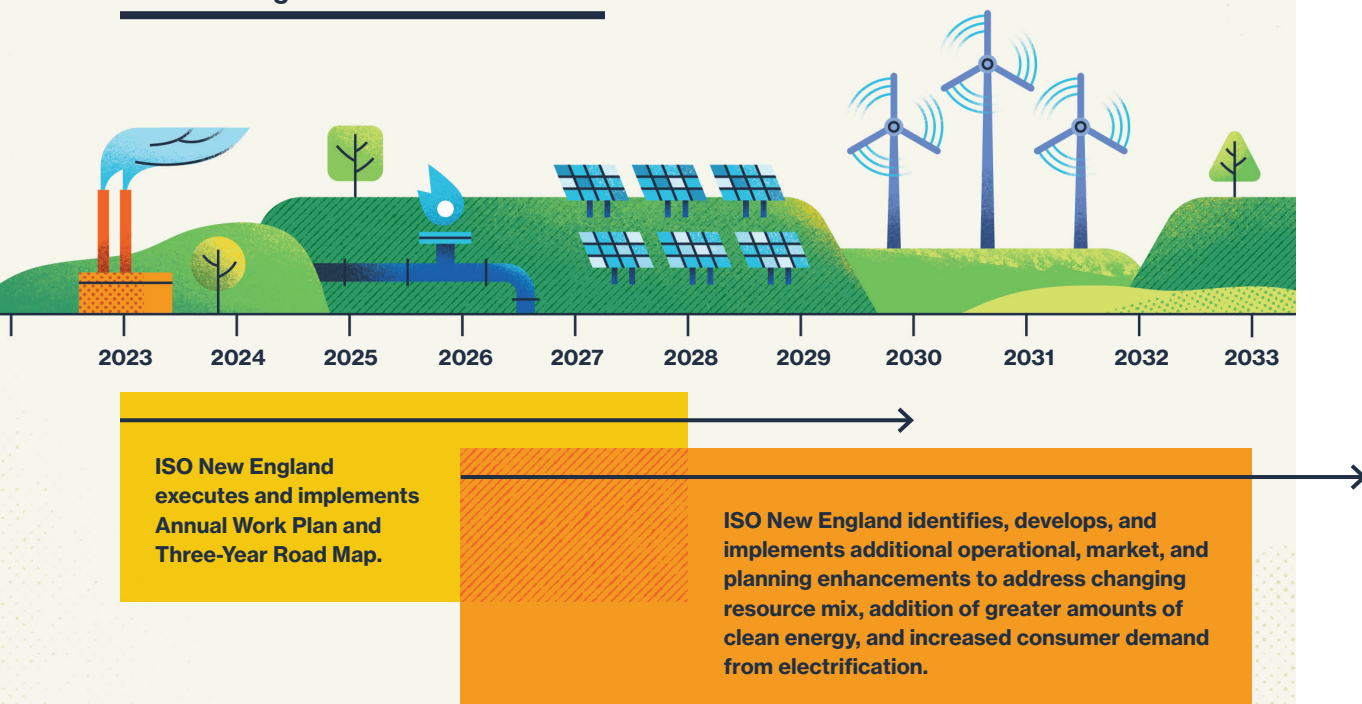
The ISO has been laying the groundwork to support these pillars since its inception, collaborating with government officials and industry stakeholders for the past 25 years to

integrate clean energy resources into the region's competitive markets and system operations. Today, as New England grapples with two key realities on the energy front – the societal impacts of climate change caused by fossil fuel use, and the need for a reliable power system throughout the clean energy transition – public and stakeholder focus on making progress toward tomorrow's greener grid has increased sharply.

Increased focus and urgency are warranted. In the past two years, four out of seven ISOs and RTOs in the U.S. have resorted to controlled outages because extreme weather led to limited energy supplies. In that time, through press outreach, release of detailed studies, and forward-looking reports like this one, ISO New England has made a concerted effort to raise public awareness about the potential for a similar situation to happen here. The reason for doing so is simple: As the entity responsible for the region's power system reliability, the ISO is committed to raising serious concerns when they exist, and working to mitigate them where its role allows.

Going forward, ISO New England remains committed to meeting its responsibilities to the region's clean energy transition, and to working with industry stakeholders and government decision-makers to accelerate progress toward tomorrow's greener grid.

ISO New England and the Future Grid





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