Your vision statement suggests our regional electric grid should be clean, affordable and reliable. In order to have a reliable electric grid it requires power mix diversity rather than excessive reliance on a single source. Our power system is currently extremely reliant on natural gas. This is used for most electricity generation as well as a significant portion of heating in the winter. An issue with the pipeline or a lack of sufficient supply could cause a shortage of natural gas in the New England region. Adding only renewables requires energy storage or backup using gas fired simple cycle peaking power plants. These are only about 2/3 as fuel efficient as combined cycle gas fired power plants which can't ramp as quickly and are more like baseload plants like coal fired power plants and nuclear power plants. Another method of matching the intermittent renewable energy sources with electricity demand is energy storage such as pumped hydro like the Northfield Mountain facility. That also has some inefficiency with a round trip efficiency of about 70% and some additional energy losses would be added by transmission lines from the renewable sources to the pumped hydroelectric facilities. Batteries located near the renewable energy systems would improve efficiency because lithium ion batteries can provide more than 90% round trip facilities and co-locating with the intermittent energy sources minimizes transmission losses. Batteries are however still relatively expensive.

Logical planning is needed for an affordable energy grid. Capacity planning should be done carefully with complete data. Quick decisions based on political pressure, public opinion possibly biased by misunderstanding and overly optimistic future cost projections may impact emissions, cost and reliability. Such misunderstanding could be based on an installation in another location with a more favorable resource in the case of PV or in a country with significantly lower labor cost or less safety regulations can lead to unexpected costs. With installation batteries may be much more expensive and may require more frequent replacement than expected depending on the renewable resource and its possible significant mismatch with local electricity demand. Premature closure of non GHG gas emitting nuclear power plants based on overly optimistic renewable energy projections seems like a terrible mistake that has caused increased emissions and reduced our power mix diversity causing our power to be potentially less reliable. Steady nuclear power was the most reliable power source during the recent poser system failure in Texas. Nuclear power is also statistically the safest energy source with careful NRC regulation and its risk is greatly exaggerated. The nuclear waste issue is also exaggerated. Spent fuel is very compact and is safely stored in stainless steel casks with additional shielding using concrete. A spent nuclear fuel reprocessing facility in France recovers unused uranium for reuse and reduces the already very small nuclear waste volume by 80% based on claims from the plant owner.

PV systems in New England only operate at about 13% capacity factor. Nuclear power plants operate at 90% capacity factor. At best offshore wind could operate at 45% capacity factor therefore twice as much wind power capacity is needed to replace the clean energy from the 677 MW Pilgrim nuclear power plant that was prematurely closed in 2019. With some renovation it could have provided as much clean energy as 4.7 GW of PV in New England or 1.35 GW of offshore wind which is more than the output of all the 1.45 GW of PV and 1.48 GW of onshore wind turbines ~30% capacity factor currently in service in New England. The recent premature closure of the 2 GW Indian Point nuclear power plant caused a much worse increase in emissions from gas fired power plants.

https://www.spglobal.com/marketintelligence/en/news-insights/research/new-england-renewable-policies-to-drive-12500-mw-of-renewable-capacity-by-2030

Its premature closure which caused increased emissions from gas fired power plants should have been delayed at least until the Vineyard Wind offshore windfarm needed to replace its clean energy is

completed and operational. Because of such a low capacity factor PV systems in New England are not an efficient use of land and should not waste public green space. They can be installed on buildings and other structures such as parking lots if they are cost effective. Nuclear power could be very helpful for our future clean electric grid providing 40% or more of our electricity reliably without emissions with perhaps 40% from all renewables and 20% from gas fired power plants.

1: Wholesale Market Design: Electric vehicles can serve as dispatchable energy storage and can reduce emissions if the power grid is sufficiently clean. Their chargers could be controlled or timed to operate when electricity supply is high relative to demand thereby reducing strain on the grid and large scale energy storage systems.

2: Transmission System Planning: Added transmission lines would waste land that could be public green space therefore more clean local power plants including nuclear power plants which require far less space than renewables would be more beneficial than importing clean energy from a long distance away such as from Canada. Environmental justice issues include loss of public green space or impacted aesthetic value in places where people enjoy outdoor activities.

3: Public input to ISO New England meetings could be enabled by remote online connections and some in person attendance could also be allowed. Rate payers are stakeholders and should understand power system plans and have methods of providing suggestions and feedback to Iso New England.

Best,

Bill Lynch