



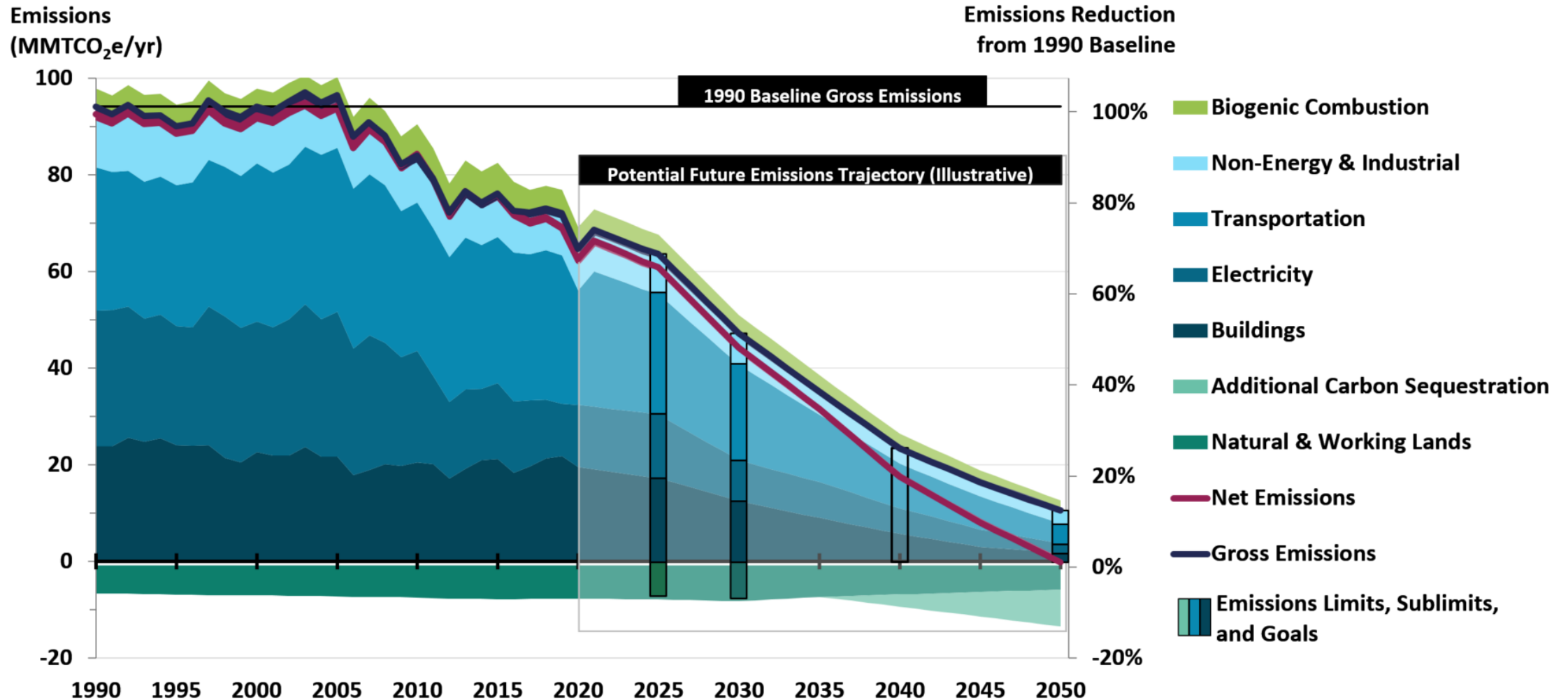
The Role of Solar in Massachusetts' Climate Plan

*Western Massachusetts Solar Forum
September 5, 2023*

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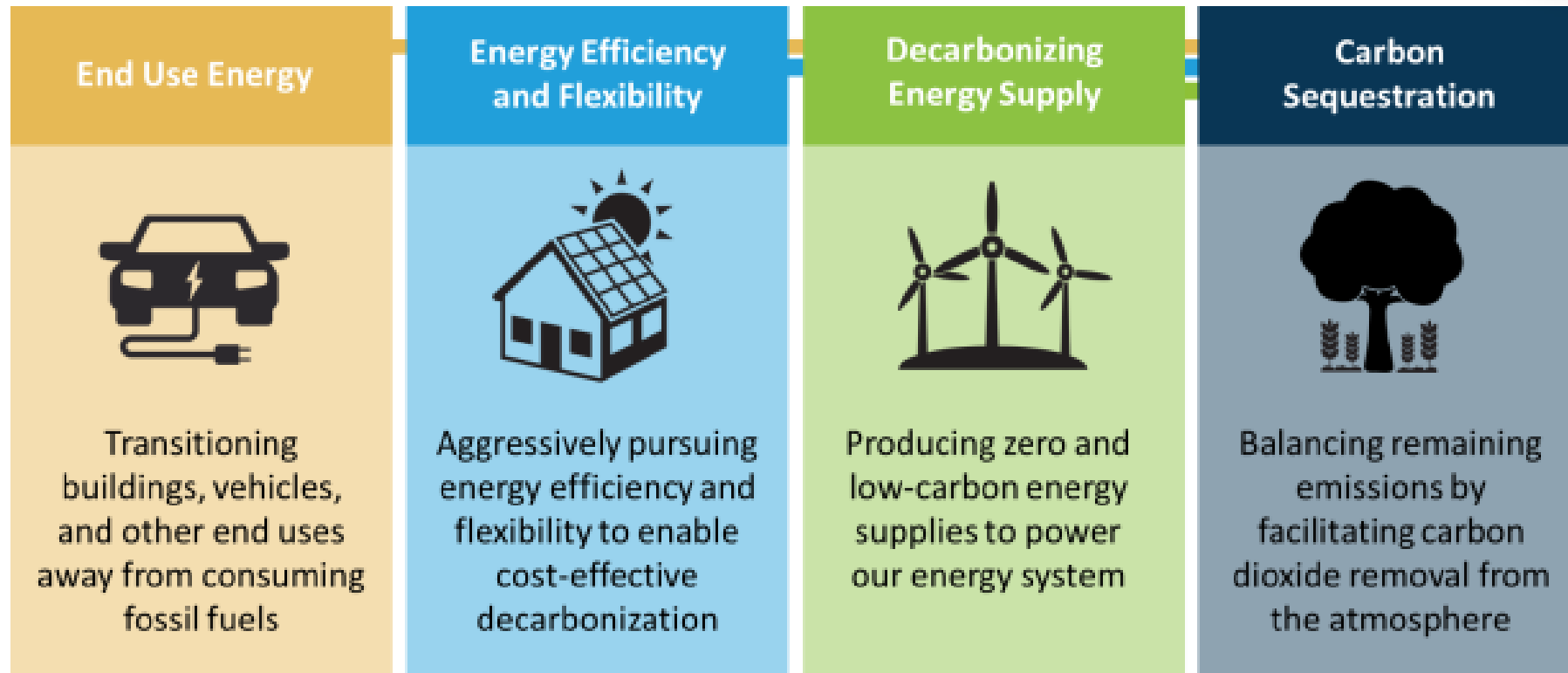


Massachusetts is on A Path to Net Zero



Net Zero: when statewide GHG emissions are equivalent to GHGs removed and $\leq 15\%$ of 1990 emissions

How Are We Going to Get There?



2050 CECP KEY BENCHMARKS

Achievement of the Commonwealth's greenhouse gas emissions limit of at least 85% below the 1990 baseline level and net-zero emissions in 2050

TRANSPORTATION

97%
of light-duty vehicles
(5 million) electrified

93%
of medium- and heavy-duty
vehicles (over 350,000)
electrified or non-emitting



NON-ENERGY AND INDUSTRIAL

52%
of industrial energy use electrified

90%
reduction in solid waste disposal



BUILDINGS

80%
of homes (over 2.8 million)
heated and cooled by electric
heat pumps (including those with
on-site fuel backups)

87%
of commercial space is
heated by either electricity
or alternative fuels

NATURAL AND WORKING LANDS

40%
of lands and waters in MA
permanently conserved

64,400 acres
of new riparian and urban
tree cover



ELECTRIC POWER

2.5-fold
increase in electric load
compared to 2020

97%
of electricity consumed is from
clean and renewable sources



JOB AND HEALTH BENEFITS

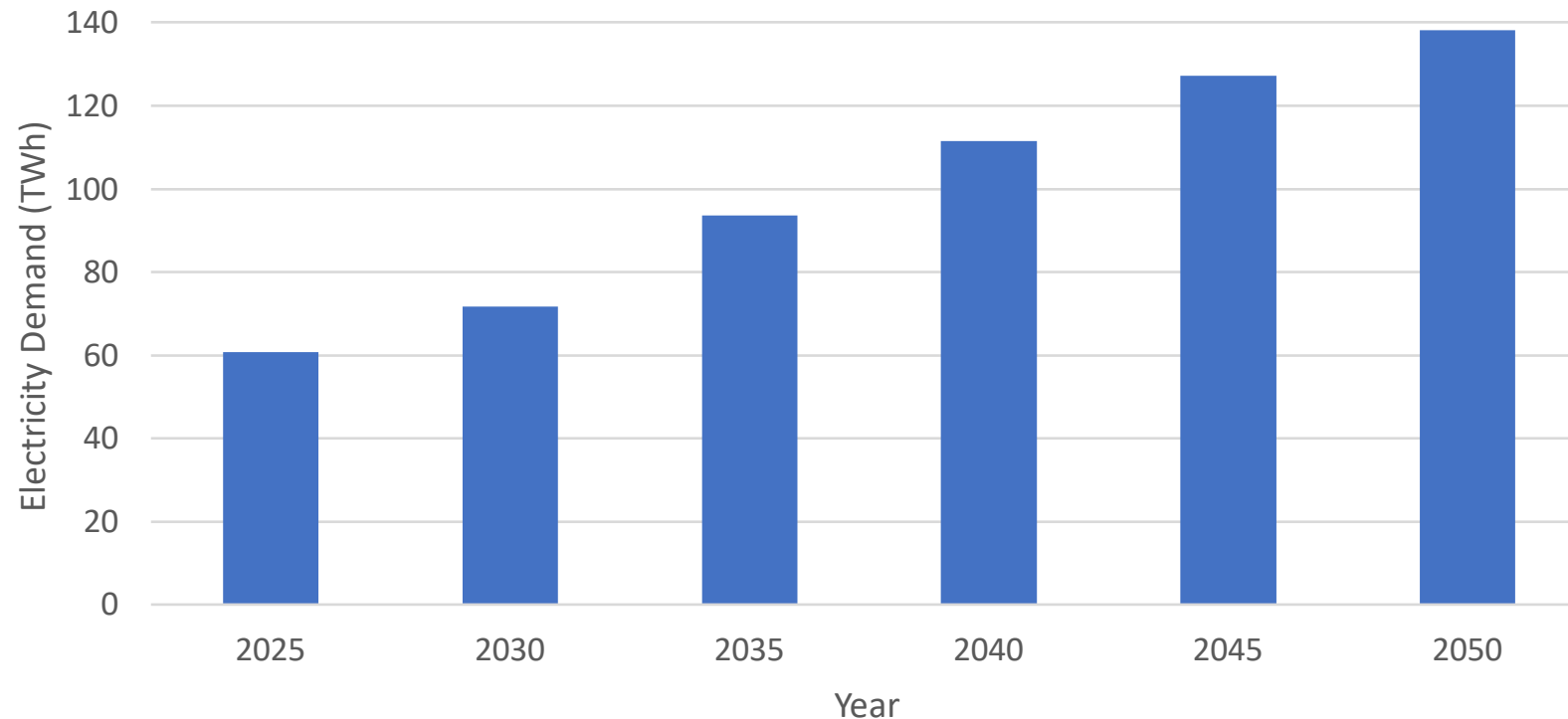
65,000
additional full-time jobs created
from the clean energy transition

Up to **\$4.7 billion**
in health benefits



Electrification is a Core Strategy, and Requires Significant Planning

MA Projected Electricity Demand (TWh)



Where We're Going

- ~2.5-fold increase in electric demand
- Met with far more renewables
- With adequate transmission/distribution
- With costs and benefits spread equitably

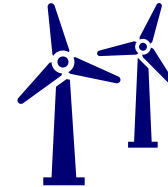
Note: values taken from the "Phased" scenario in the modeling underlying the 2025/2030 and 2050 CECPs. Values exclude transmission exports.



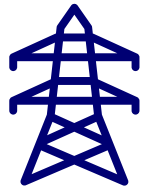
Meeting Growing Electric Demand With Decarbonized Generation Requires Multiple Steps



Procure clean energy at scale



Support renewable development, particularly offshore wind and solar



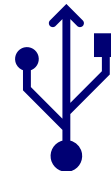
Reform transmission planning to accommodate renewables



Center environmental justice in energy siting, access and electric planning



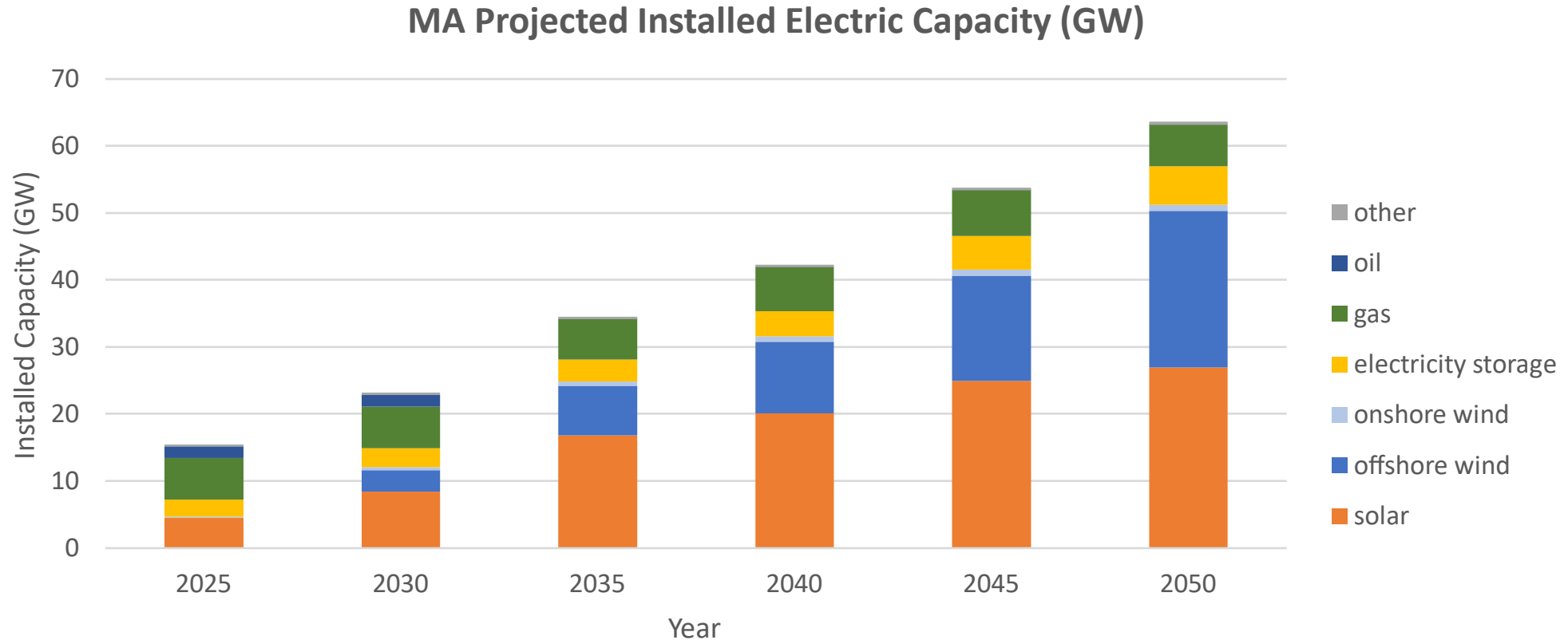
Modernize distribution system to manage flexible load



Coordinate joint planning among electric and gas utilities



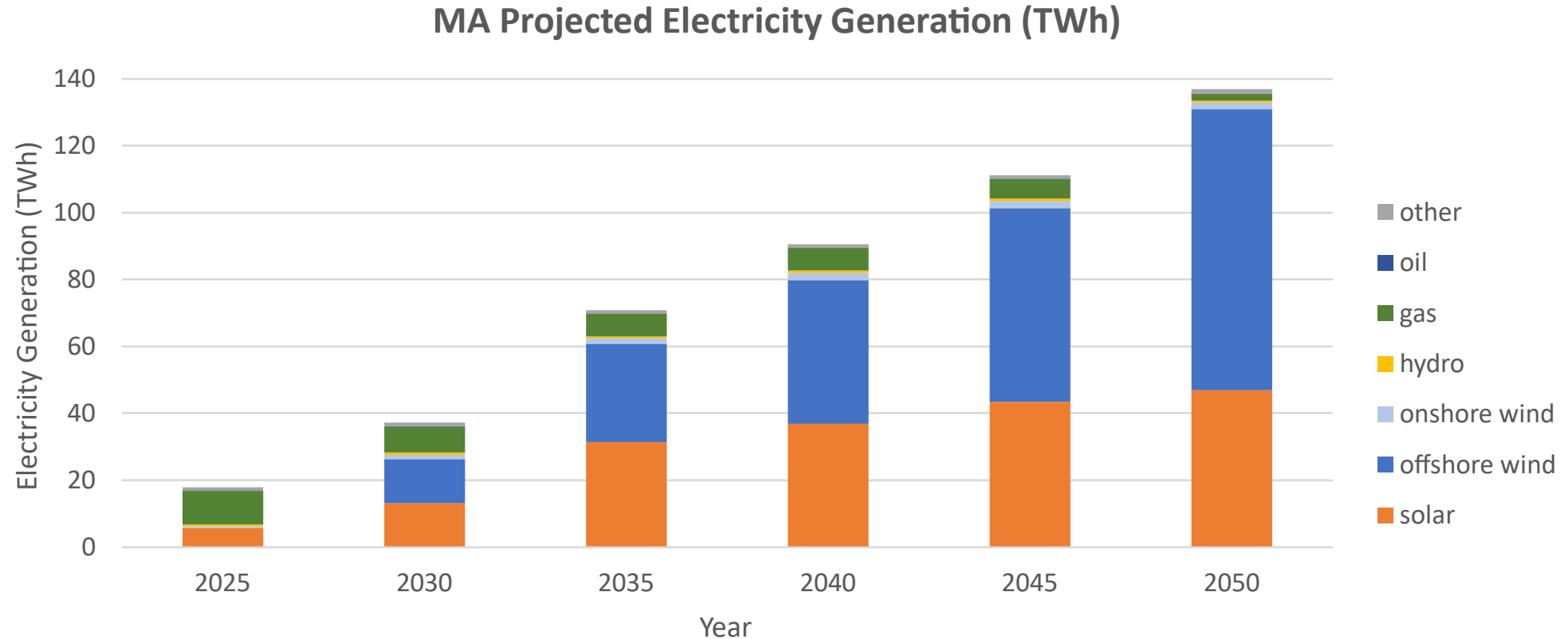
We Project a Need for a 6-Fold Buildout in Solar Capacity between 2025 and 2050



Note: values taken from the "Phased" scenario in the modeling underlying the 2025/2030 and 2050 CECPs.



...And Significant Growth in Generation



Note: values taken from the "Phased" scenario in the modeling underlying the 2025/2030 and 2050 CECPs. Values exclude transmission imports, and generation is used to serve demand throughout the region, so totals do not match overall projected demand.



Natural and Working Lands (NWL) Are An Essential Asset in Getting to Net Zero

- Massachusetts' NWL are a “net greenhouse gas sink,” absorbing ~10% of statewide emissions in 2020
- Massachusetts' four-part approach to NWL:



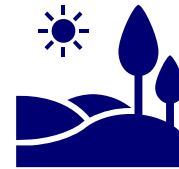
PROTECT

Protect NWL from degradation and conversion to non-NWL uses. Conserve 30% of Massachusetts by 2030, and 40% by 2050



MANAGE

Manage NWL to sustainably sequester carbon and enhance ecosystem resilience to future carbon losses



RESTORE

Restore NWL to reduce GHG emissions and recover lost carbon storage capacity on degraded NWL

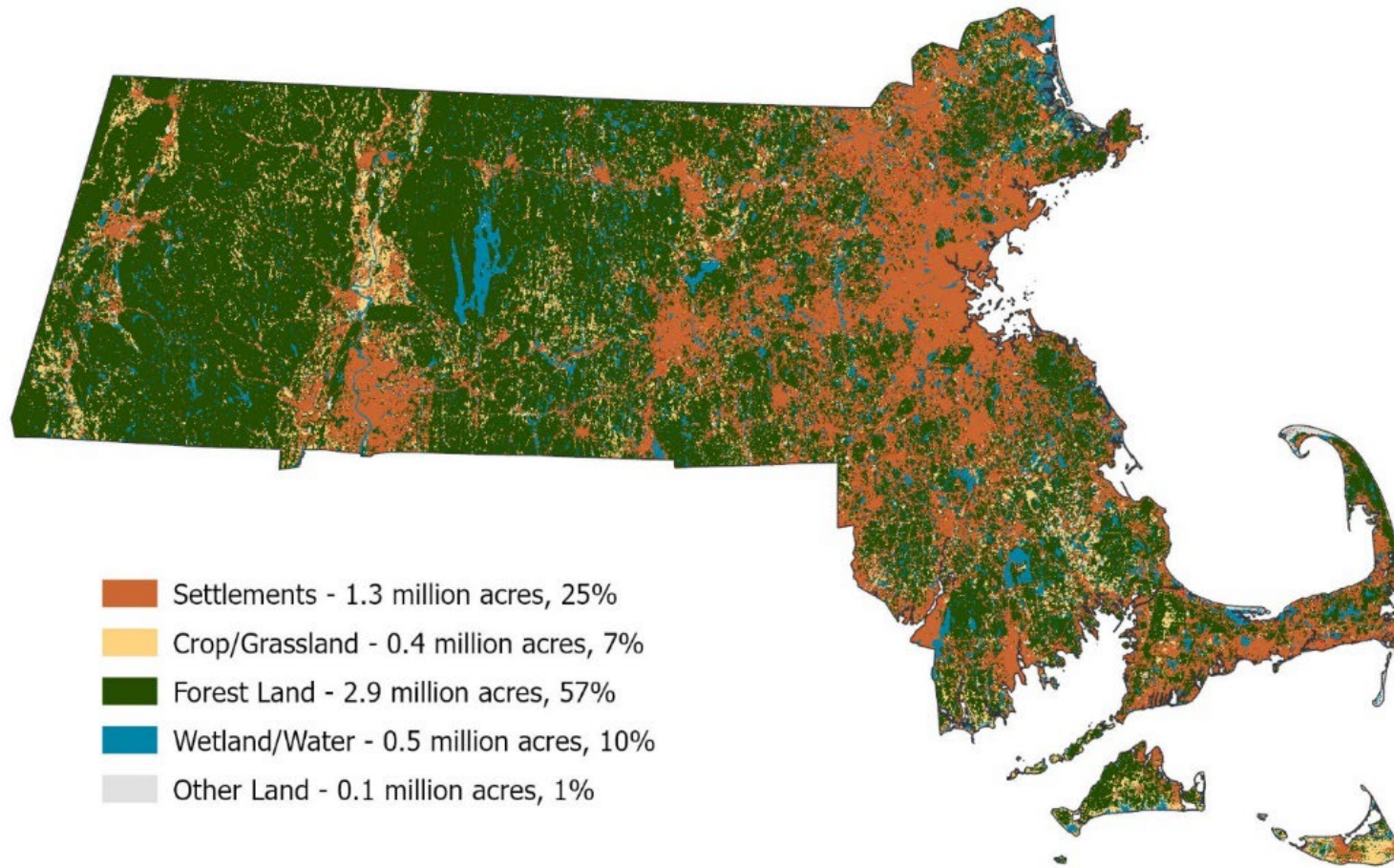


UTILIZE

Sustainably utilize NWL products to extend carbon storage and support local NWL-based economy



Balancing Energy & Land-Use Tradeoffs



Deforestation is the largest, controllable threat to the ability of our lands to remain a carbon sink

Choosing where to site our energy infrastructure, particularly solar, is therefore essential

- Prioritize solar installation on developed land, e.g. rooftop solar, solar canopies, dual-use solar projects
- Improve design of dual-use solar installations on cropland or pasture to carefully balance electricity, food production, and NWL carbon sequestration on qualified farmland



Massachusetts' Technical Potential of Solar

The rate of solar installation and the amount installed need to increase dramatically.

Geospatial analysis estimates the statewide technical potential for solar.

Massachusetts' technical potential for solar is 15 to 18 times greater than the amount required by the Clean Energy and Climate Plan.

Massachusetts Technical Potential of Solar

DER
Massachusetts Department of Energy Resources

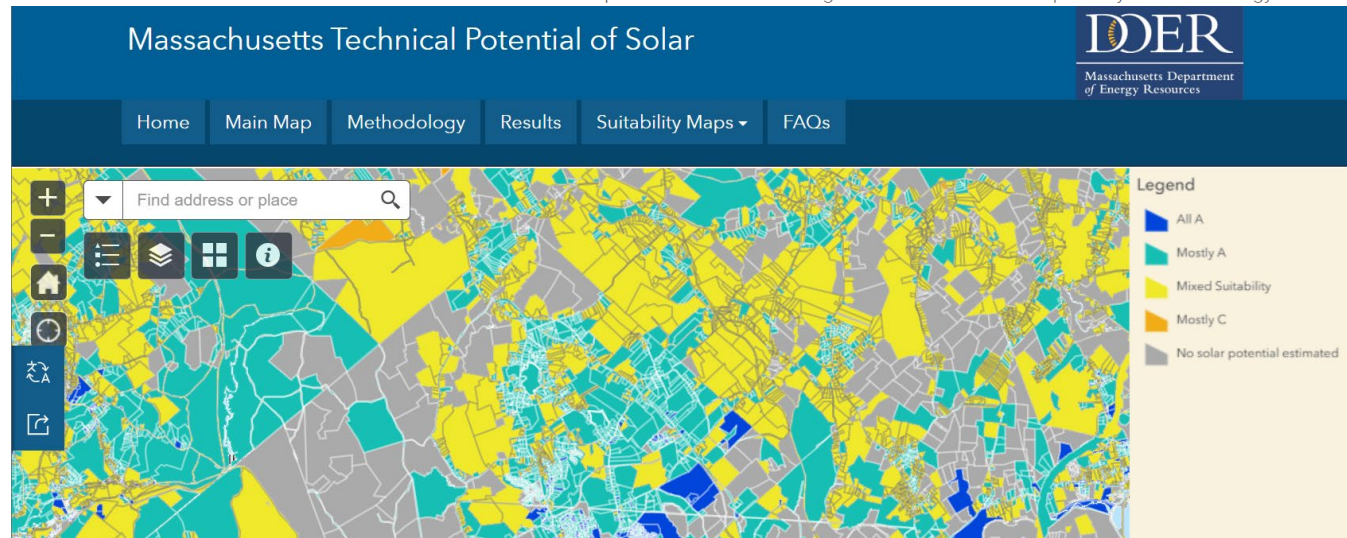
Home Main Map Methodology Results Suitability Maps ▾ FAQs

Results

High-level results for the Massachusetts Solar Siting Analysis are presented here. For more detailed spatial analysis results, information on the stakeholder survey process, conclusions and more, please refer to the final report located [here](#).

Statewide Suitability Results

This analysis finds that Massachusetts has the potential to site 506 GW_{AC} of solar. Synapse estimated that Massachusetts' technical solar potential is 15 to 18 times greater than the amount required by the Clean Energy and Climate Plan (27 to 34 GW_{AC}). This potential is primarily in the form of large ground-mounted solar arrays, with a total area of approximately 1.78 million square meters or nearly 1.78





Initiatives Underway To Meet Land Conservation & Solar Capacity Goals

1. **Technical Potential of Solar Study:** a recently released interactive tool that estimates the total technical potential for solar energy development in the state, used to inform users about the relative impacts and tradeoffs of solar development throughout the Commonwealth.
2. **Forest Carbon Study:** a forthcoming simulation of statewide forest carbon through 2100 to assess opportunities and risks from land use change, ecological disturbances, and forest management. Includes analysis of the carbon implications of alternative scenarios of future solar development, informed by recent trends and other reports.
3. **Holistic climate land use strategy:** a forthcoming statewide comprehensive plan to help balance needs for energy infrastructure, land conservation, housing, transportation, and resilience in the context of climate change.
4. **Agrivoltaic Commission:** a forthcoming Commission set up to investigate and recommend ways to facilitate the installation of agrivoltaic projects in MA “with due consideration given to land use impacts and categorizations, water quality, soil health and food production.”

Thank You!

