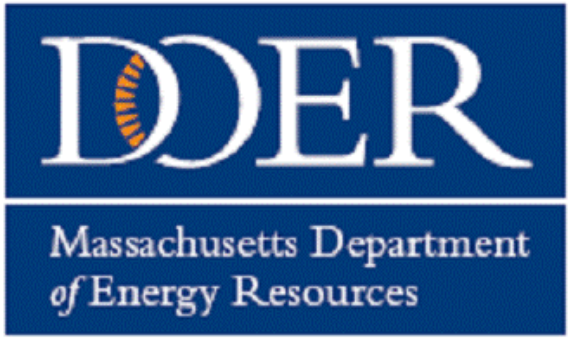


Massachusetts' Energy Future

DOER Commissioner Judith Judson

Massachusetts Energy Approach

1. Reduce and **stabilize the rising cost** of energy for consumers

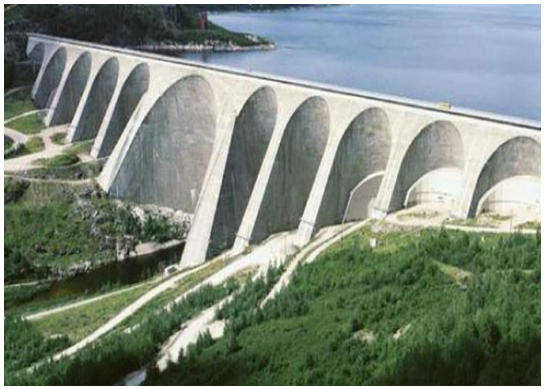
2. Continue the Commonwealth's commitment to a **clean energy future**
   - GWSA GHG reductions: 25% by 2020 and 80% by 2050 (1990 baseline)

3. Ensure that we have a **safe, reliable, and resilient** energy infrastructure

Clean Energy Legislation

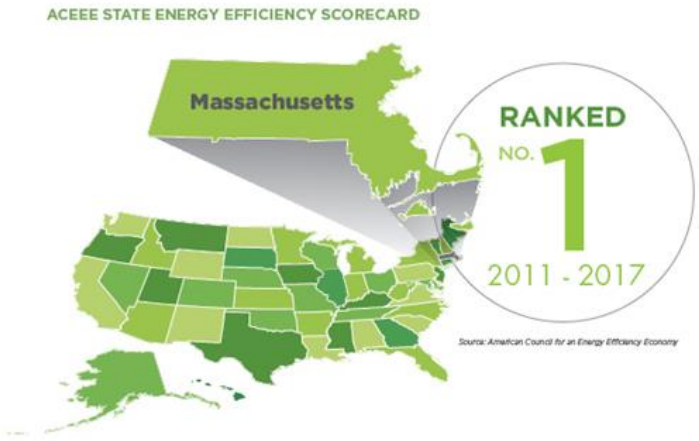
"An Act Relative to Energy Diversity"

- **Governor Baker signed bi-partisan, comprehensive energy diversification legislation on August 8, 2016:**
  - Requires utilities to competitively solicit and contract for:
    - approximately 9,450,000 megawatts hours (MWh) of clean energy generation;
      - Solicitations due by July 27, 2017
      - Contracts by December 31, 2022
    - And approximately 1,600MW of offshore wind generation;
      - Solicit by June 30, 2017 and June 30, 2019
      - Contract by June 30, 2027
  - Establishes a commercial Property Assessed Clean Energy (PACE) program;
  - And directs DOER to determine if an energy storage procurement target is prudent and, if so deemed, to set a target;



Massachusetts is a National Energy Efficiency Leader

- Ranked #1 by ACEEE for seven straight years (2011-2017) for our energy efficiency programs and policies.
- 2016-2018 Plans have the most aggressive energy efficiency goals in U.S.
  - Will deliver $8 billion in economic, environmental and energy benefits
- 52,000 jobs and growing
- Energy Efficiency Program Administrators (PAs) demonstrating peak demand projects



Peak Demand Reduction

Energy Efficiency Programs

- Peak Demand Reduction was one of 3 key priorities negotiated by DOER in the 2016—2018 Three Year Plan
- All four electric utility partners have submitted proposals to the DPU to pilot peak demand reduction offerings
- Goal to include at scale demand reduction programs as part of next three year plan 2019 – 2021

Peak Demand Reduction Grant

- In June, DOER awarded $4.6 million to 9 projects

Energy Storage Initiative

- **$10 million** initiative launched in 2015
  - *State of Charge* study
  - Demonstration projects
- Robust stakeholder engagement
- Study details:
  - Technology and market landscape
  - Comprehensive modeling of the cost and benefits of deploying storage
  - Economic use cases of specific storage applications
  - Economic development opportunities
  - Policy and program recommendations to grow storage deployment and industry in MA

"Massachusetts will continue to lead the way on clean energy, energy efficiency, and the adoption of innovative technologies such as energy storage."
- Governor Baker, Feb 2016, Accord for a New Energy Future Press Event

"Given the recent advances in energy storage technology and cost-effectiveness, it is hard to imagine a modern electric distribution system that does not include energy storage."
Utility stakeholder perspective

Storage In Commodity Supply Chains

FOOD

Warehouses
Grocery stores
Freezers & refrigerators

WATER

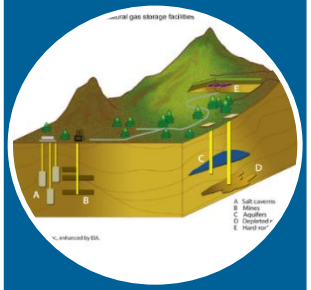
Reservoirs
Above-ground tanks
Water bottles

GASOLINE

Underground tanks
Above-ground tanks
Tank trucks
Portable fuel tanks

OIL

Above-ground tanks
Piping



NATURAL GAS

Depleted fields
Aquifers
Salt caverns
Pipelines
Above-ground tanks

ELECTRICITY

Energy Storage Technologies

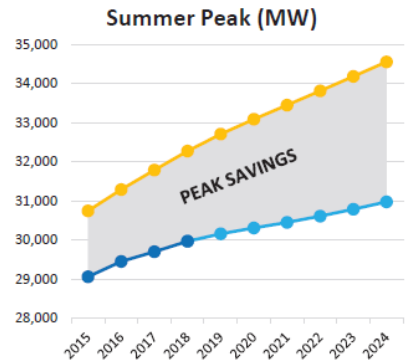
Currently less than 1% of daily electricity consumption for MA

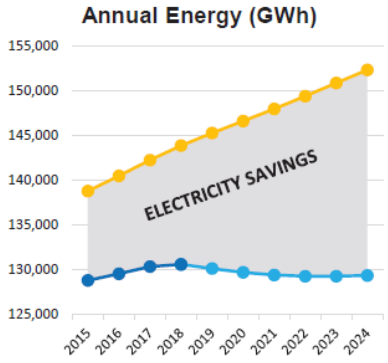
Storage capacity more than 10% of daily consumption

The electricity market has a fast “speed of light” supply chain and the least amount of storage. This lack of storage creates a need for additional infrastructure to maintain market reliability.

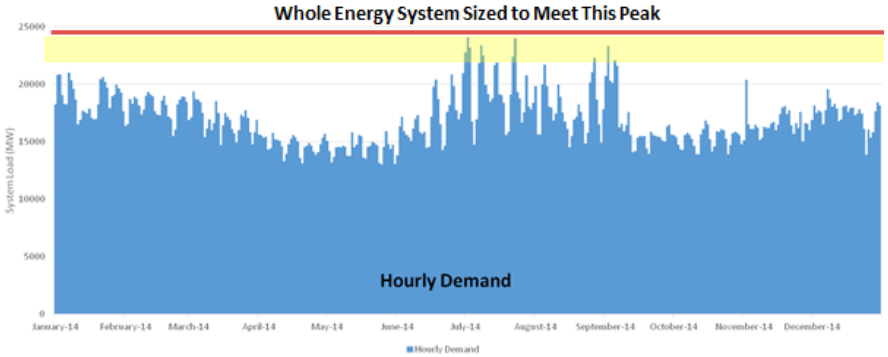
Massachusetts Energy Challenges: Storage is "Game Changer" for Meeting Peak

ISO-NE *State of the Grid 2016 and* System Annual Hourly and Weekly Demand

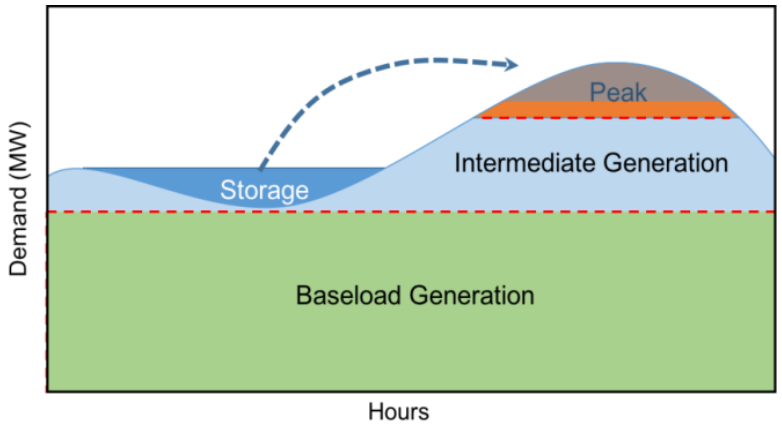




The need to size grid infrastructure to the highest peak usage results in system inefficiencies, underutilization of assets, and high cost



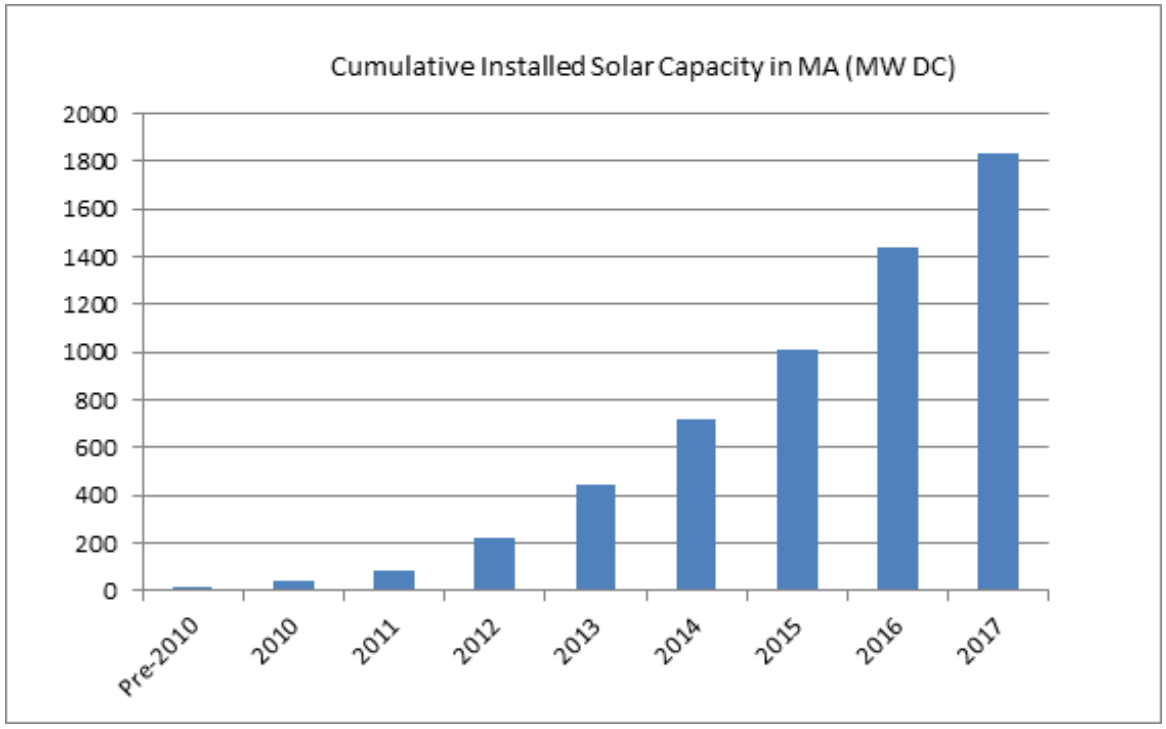
Top 1% of Hours accounts for 8% of MA Spend on Electricity
Top 10% of Hours accounts for 40% of Electricity Spend



Energy storage is the only technology that can use energy generated during low cost off-peak periods to serve load during expensive peak.

Massachusetts is a National Leader in Solar

- 75,500 Solar Projects = 1,850 MW of Solar operating
  - Another 450MW in planning and construction
- New solar incentive program SMART includes storage



THANK YOU