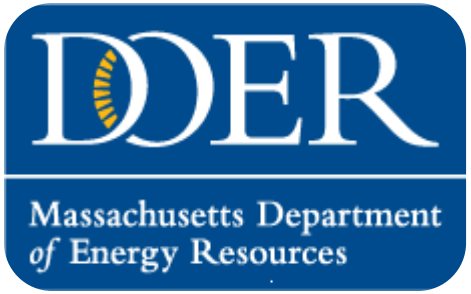
Creating A Clean, Affordable, and Resilient Energy Future For the Commonwealth



COMMONWEALTH OF MASSACHUSETTS
Charles D. Baker, Governor
Karyn E. Polito, Lt. Governor
Matthew A. Beaton, Secretary
Judith Judson, Commissioner

CPS Straw Proposal Presentation

Boston, MA

April 2, 2019

Clean Peak Standard Straw Proposal

DRAFT

Overview

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Background: Clean Peak Standard

- The Clean Peak Energy Standard (CPS) was part of *An Act to Advance Clean Energy*, which was signed into law in August 2018
- Clean Peak Resources include new Class I Renewable Energy Resources, Existing Class I / Class II resources that are paired with an Energy Storage System, Energy Storage Systems, and Demand Response Resources
- Any eligible resource that generates, dispatches or discharges energy to the electric grid during a Seasonal Peak Period will generate Clean Peak Certificates
- Clean Peak Certificates can be sold to retail electricity suppliers, which are required to purchase a certain amount each year
- DOER is responsible for:
  - Establishing the eligibility criteria to qualify;
  - Establishing the four Seasonal Peak Periods in which resources must operate;
  - Setting an Alternative Compliance Payment rate and procurement processes to establish Clean Peak Certificate values;
  - Establishing annual compliance requirements;

Background: DOER Objectives

- Implement a clean peak program that aligns clean energy generation and zero emission demand resources with periods of peak electricity demand in the most cost-effective manner for Massachusetts customers possible while reducing emissions
- Encourage co-location and/or co-operation of energy storage and clean generation
- Incentivize and enable continued deployment of renewable generation by flattening the net electric load curve

Background: Program Design Details

- Portfolio Standard Structure
  - Qualified Clean Peak Resources eligible to generate Clean Peak Certificates (CPCs) during Seasonal Peak Periods
    - Potential for multipliers to align CPC generation with highest value periods
  - Minimum standard obligation applied to all retail electricity suppliers and is set as a percentage of total retail sales
    - Annual obligation on suppliers must increase by at least 0.25% per year
  - Retail load served under contracts executed prior to 1/1/19 is exempt from obligation
  - Alternative Compliance Payment rate creates cost cap and helps establish market value for CPCs

Eligible Resources: Project Eligibility Criteria

- Four types of eligible resources:
  1. **New RPS Class I** eligible resources in operation on or after 1/1/19
  2. **Existing RPS Class I / Class II resources that are paired with a Qualified Energy Storage System**
  3. **Qualified Energy Storage Systems** (includes standalone systems and incremental pumped storage capacity)
  4. **Demand Response Resources**
- Distribution connected resources must be interconnected to the Commonwealth of Massachusetts electric power system
- Transmission connected resources must be connected in the ISO-NE control area

Eligible Resources: New RPS Class I

- New RPS Class I in operation after 1/1/2019 are eligible to qualify and participate
- Upon qualifying a new RPS Class I, all electricity delivered by the resource during Seasonal Peak Periods will be eligible to generate CPCs

Eligible Resources: Existing Class I/II Renewables Paired with Storage

- RPS Class I/II resources in operation prior to 1/1/2019 are eligible to qualify and participate **if** they pair new energy storage facilities with their resource
  - DOER proposes that the energy storage facility paired with the resource must be at least:
    - 25% of the nameplate power of the facility; and
    - Have a minimum 4 hour duration of storage
- Upon qualifying an existing RPS Class I/II resource, all electricity delivered by the resource during Seasonal Peak Periods will be eligible to generate CPCs

Eligible Resources: Qualified Energy Storage Systems

- "Energy storage system", as defined in section 1 of chapter 164 of Massachusetts General Law
- Commenced commercial operation or provided incremental new capacity at an existing storage system after 1/1/2019
- Operates primarily to store and discharge "renewable energy", as defined in section 1 of chapter 164 of Massachusetts General Law

Eligible Resources: Demand Response Resource

- Demand Response Resource
  - Must be able to measure and verify the reduction in load or energy delivered to a load or the grid for CPC generation
  - May be an aggregate of multiple technologies and multiple locations
  - Must be connected to the Distribution System in Massachusetts
  - Could potentially include energy storage, electric vehicle charging infrastructure, and all other responsive electric loads for which the response can be measured and verified

Clean Peak Windows: Defined Seasons

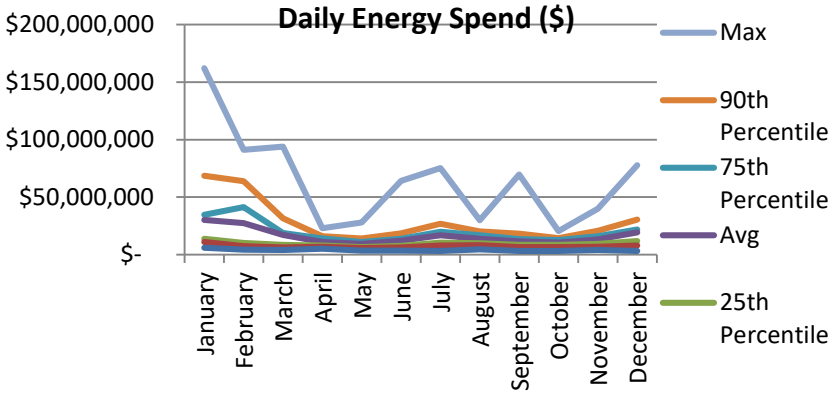
- The statute requires that daily time windows be established for each of the four annual seasons for when net demand of electricity is the highest
- Stakeholders suggested matching seasons with weather and peak demands instead of strictly following the meteorological seasons
- The DOER proposes to establish the CPS seasons as:
  - Spring: March 1 – May 14
  - Summer: May 15 – September 14
  - Fall: September 15 – November 30
  - Winter: December 1 – February 28

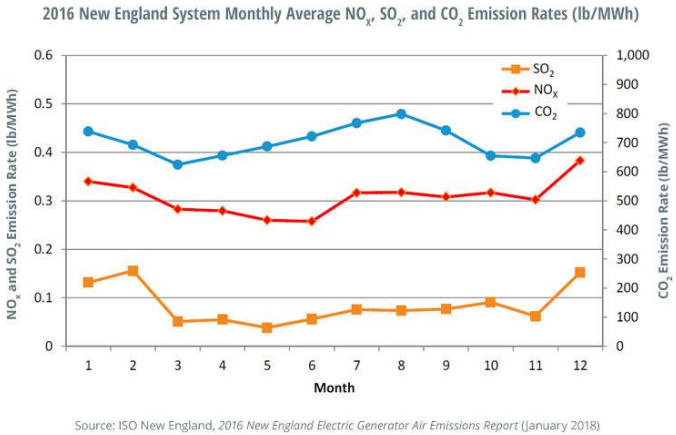
Establishing Clean Peak Windows

- DOER intends to establish the Seasonal Peak Periods in advance of the year in which they will be applied and publish them at same time as establishing the annual minimum standard percentage requirement
- DOER intends to review and potentially revise the seasonal peak periods at least once every three years
- DOER anticipates the Seasonal Peak Periods will be established in Guideline in order to avoid a rulemaking process every time they need to be adjusted
- Clean Peak Windows are required to be at least 1 hour and no more than 4 hours each weekday, excluding holidays and will be set for each of the 4 seasons

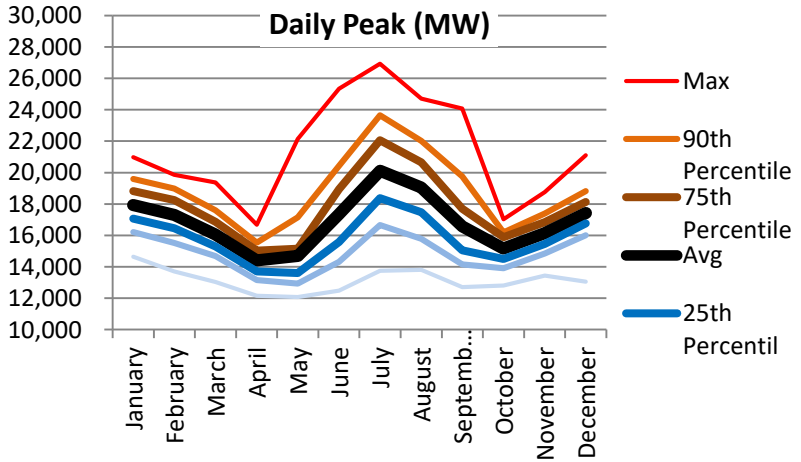
Clean Peak Windows: Valuing the Seasons

- **Summer**
  - Highest daily peaks
    - Drives capacity, transmission and distribution costs
  - Second highest energy spend
  - Second highest emissions generation per MWh
- **Winter**
  - Highest energy spend
  - Highest emissions generated per MWh
- **Spring and Fall**
  - Flatter load curves



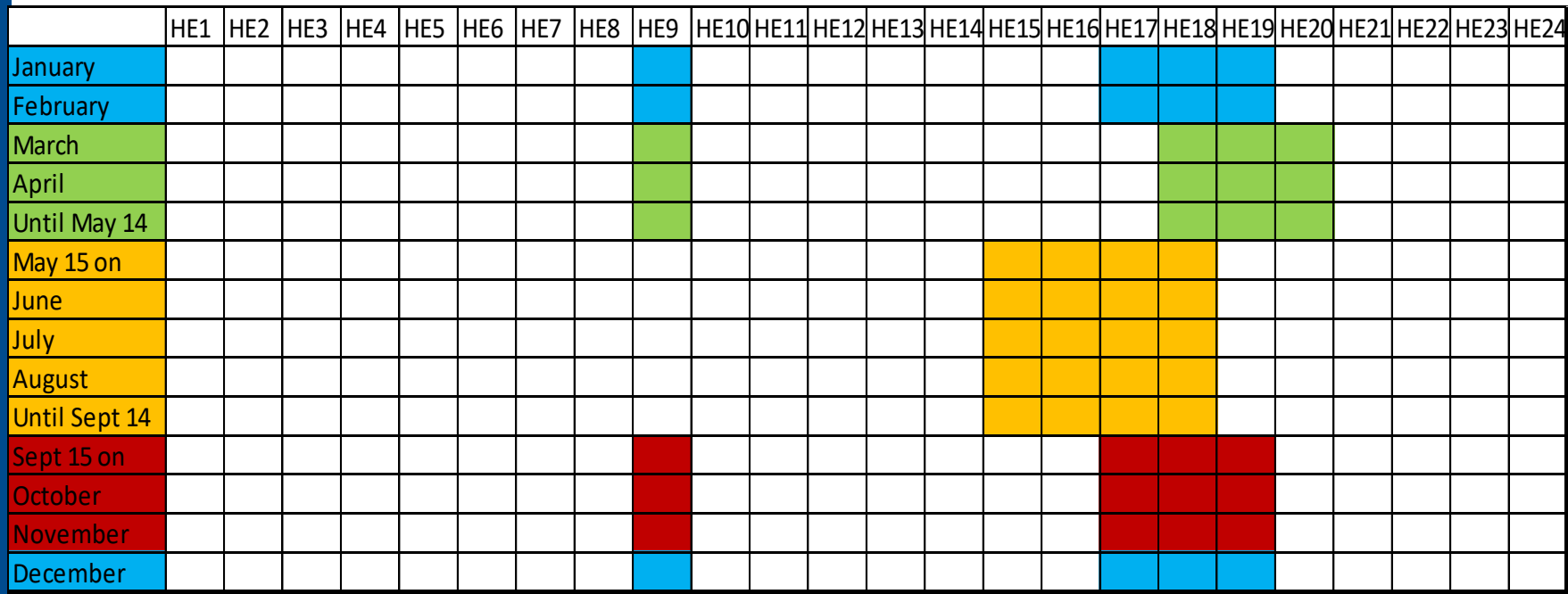


Source: ISO New England, *2016 New England Electric Generator Air Emissions Report* (January 2018)

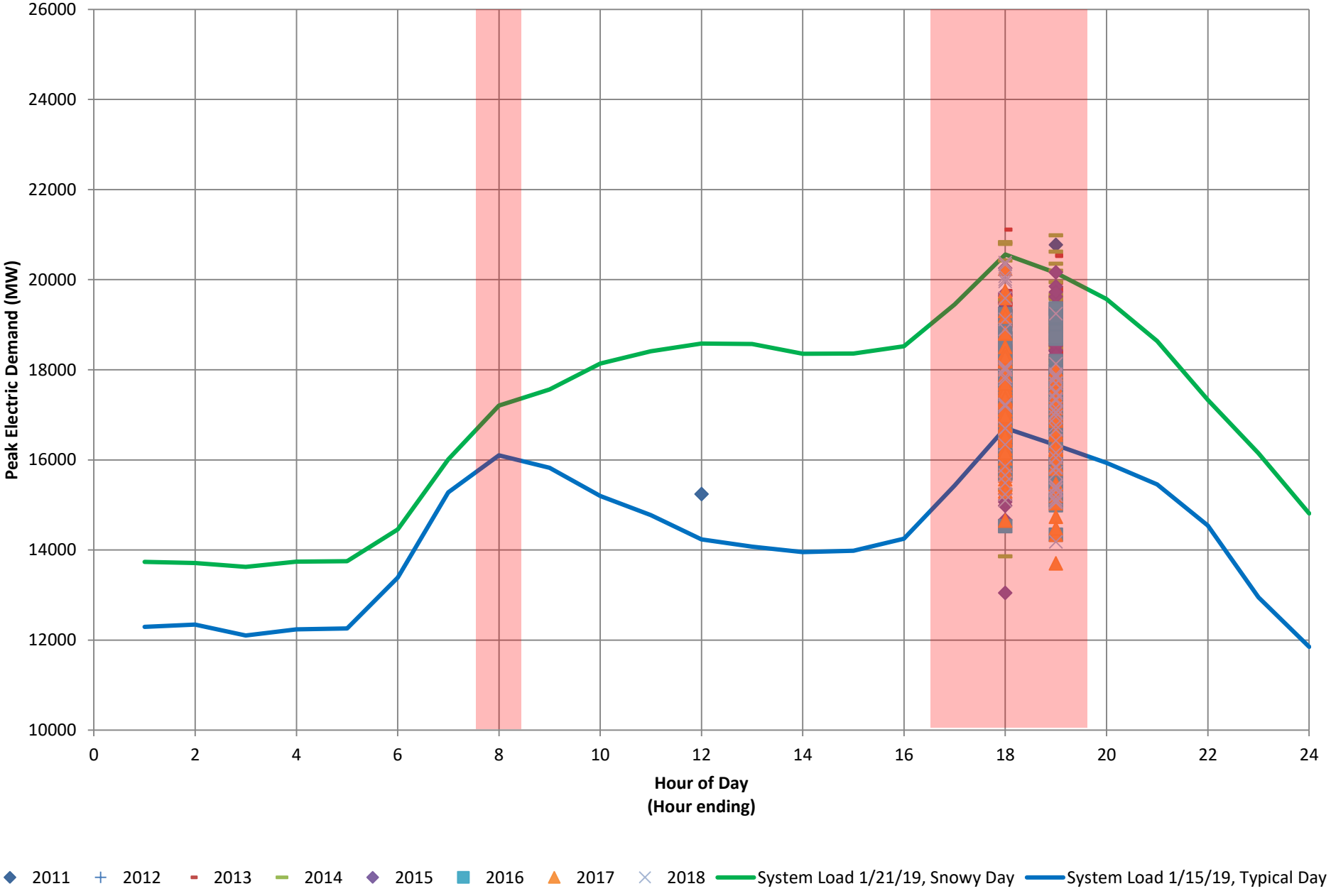


Clean Peak Windows: Initial Seasonal Peak Periods

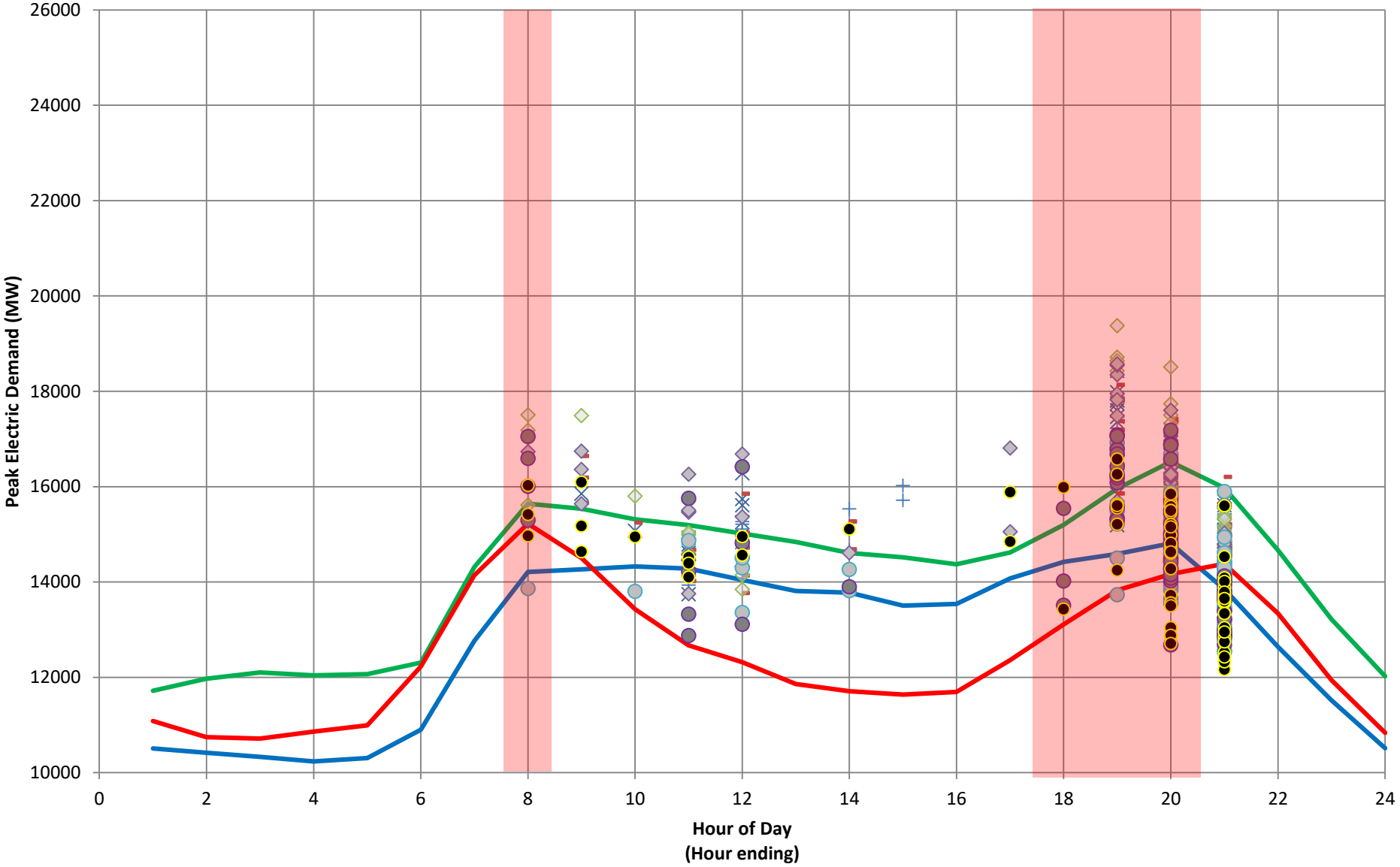
- The DOER proposes the following initial Seasonal Peak Periods, with each totaling 4 hours:
  - Winter: 8am – 9am; 4pm – 7pm
  - Spring: 8am – 9am; 5pm – 8pm
  - Summer: 2pm – 6pm
  - Fall: 8am – 9am; 4pm – 7pm



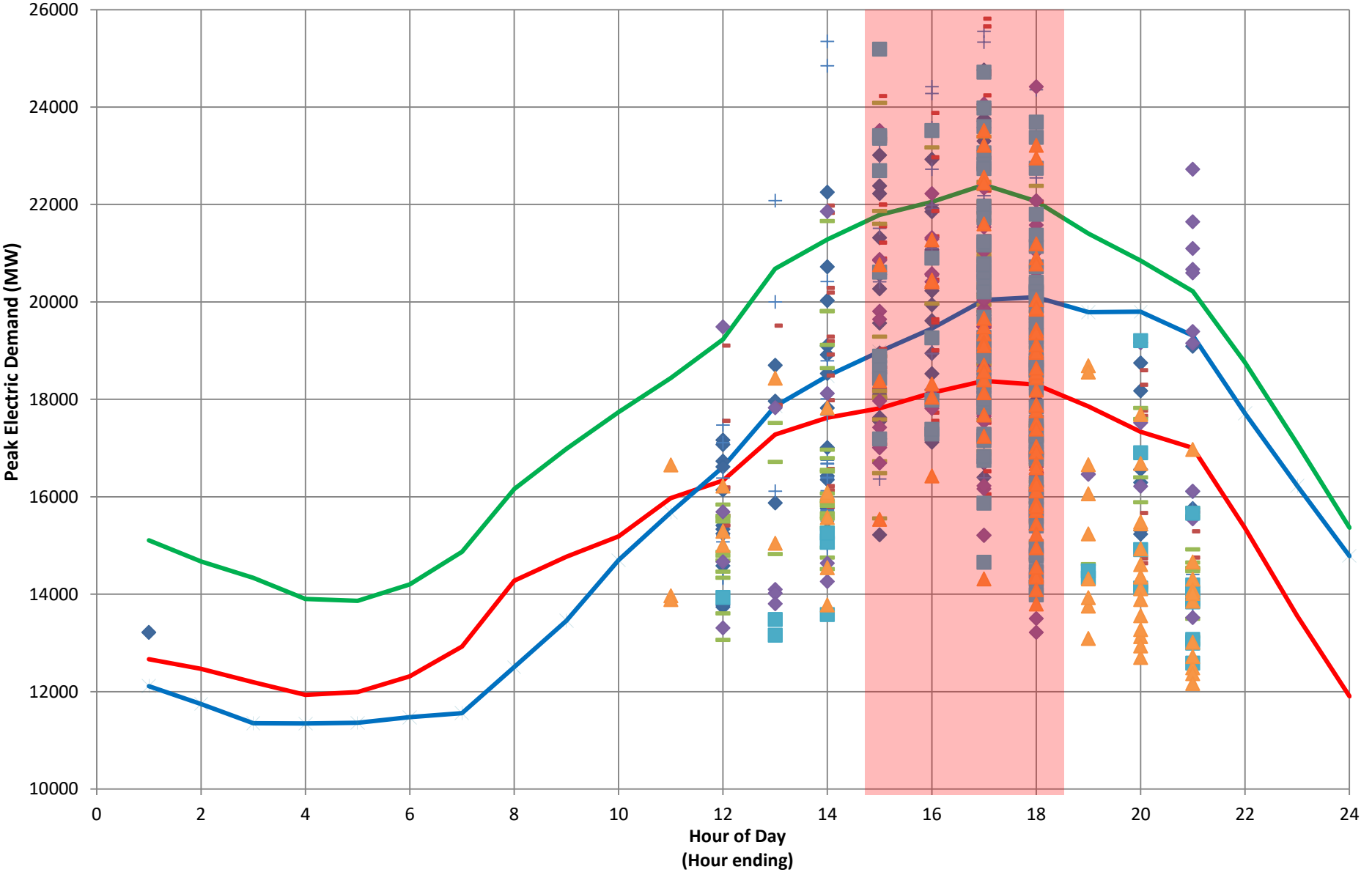
Winter (Dec 1 to Feb 28) Daily Peak Demand



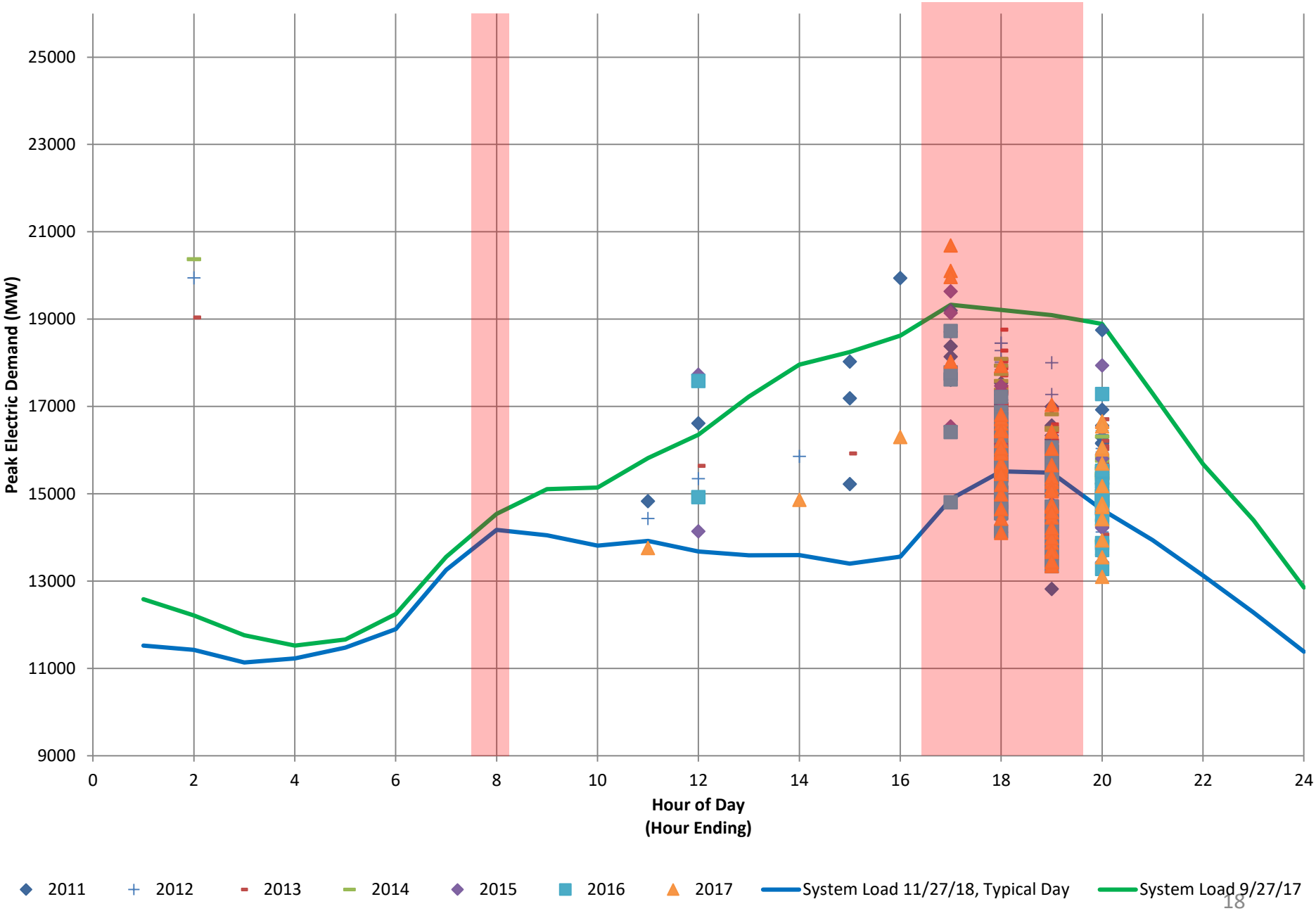
Spring (Mar 1 to May 14) Daily Peak Demand



Summer (May 15 to Sept 14) Daily Peak Demand



Fall (Sept 15 to Nov 30) Daily Peak Demand



Clean Peak Windows: Analysis Used to Establish Seasonal Peak Periods

- Analyzed the time of each daily peak demand in ISO-NE for the past 7 years
  - Winter; very predictable and very consistent time of daily peak electricity demand
  - Summer; fairly predictable with a broad time window of when peak occurs
  - Spring; least predictable and lowest peaks
  - Fall; low peaks
- Established windows that:
  - Capture majority of historic peaks
  - Focus on capturing higher demand peaks over lower demand daily peaks
  - Give recent data more weight than older years as load profiles have shifted

Clean Peak Windows: CPC Generation

- A qualified Clean Peak Resources will generate Clean Peak Certificates (CPCs) according to the average output of the clean peak resource over the duration of the Seasonal Peak Period on a particular day
- On a day which has the regional peak demand, the performance of the resource in the actual hour of peak demand is used to calculate the number of additional CPCs (all other multipliers remain in effect)
- All CPCs are minted following the receipt and verification of the performance of qualified participating facilities for the month

CPC Multipliers

- DOER intends to leverage multipliers to further align generation of CPCs with periods of highest value
- Similar to the SREC Factors in the SREC II Program, multipliers would be set in a Guideline and could increase or decrease over time and with advance notice
- DOER is not currently anticipating multipliers by qualified technology type, however, this may change following further analysis
- **Core Design Elements:**
  - Seasonal Multiplier
  - Actual Monthly System Peak Multiplier
- **Considered Policy Enhancements:**
  - Resilience Multiplier
  - Minimum Load Negative Multiplier
  - Distribution Circuit Multiplier

CPC Multipliers: Core Design – Seasonal Multiplier

- Adjusts the number of CPCs generated by season, where Summer/Winter receive the highest multiplier and Spring/Fall receive a lower multiplier
- Summer electricity demand is the highest peak of the year and drives infrastructure costs for Generation, Transmission, and Distribution
  - As such, Summer Peaks have the highest multiplier
  - DOER considering multiplier of **3x**
- Winter electricity demand incurs the highest energy costs and the highest emissions rate plants
  - As such, Winter Peaks have the highest multiplier
  - DOER considering multiplier of **3x**
- Spring and Fall peaks cause ramping requirements, but otherwise are relatively inconsequential
  - Spring and Fall Peaks have the lowest multiplier
  - DOER considering multiplier of **1x**

CPC Multipliers: Core Design – Actual System Peak Multiplier

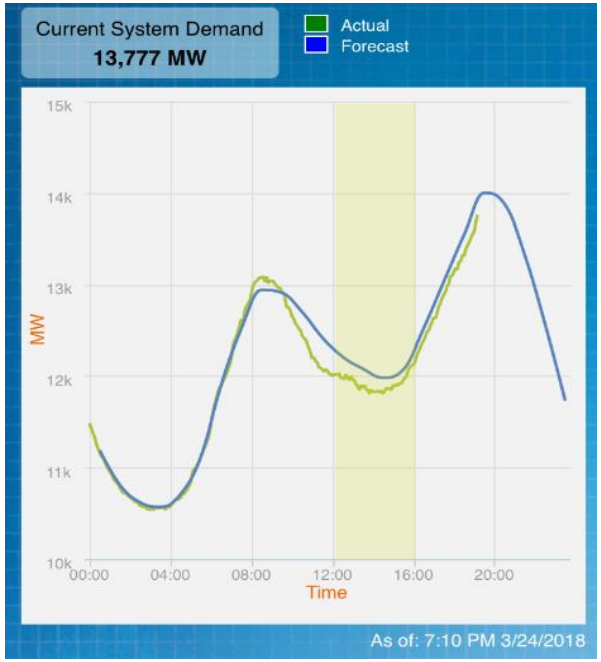
- Increases the number of CPCs generated coincident with actual monthly regional peak, a time which incurs substantial cost and generally speaking, emissions
- The actual hour of system peak is what infrastructure needs to be sized to
- DOER considering a retrospective multiplier for performance coincident with the preceding month's actual peak hour
- Essentially a 'pay for performance' component to Clean Peak
- DOER currently considering an actual system peak multiplier of **15x**
- Retroactive application of the multiplier will incent project owners to 'chase the peak' and will increase likelihood that resources operate at times where they can provide the highest value

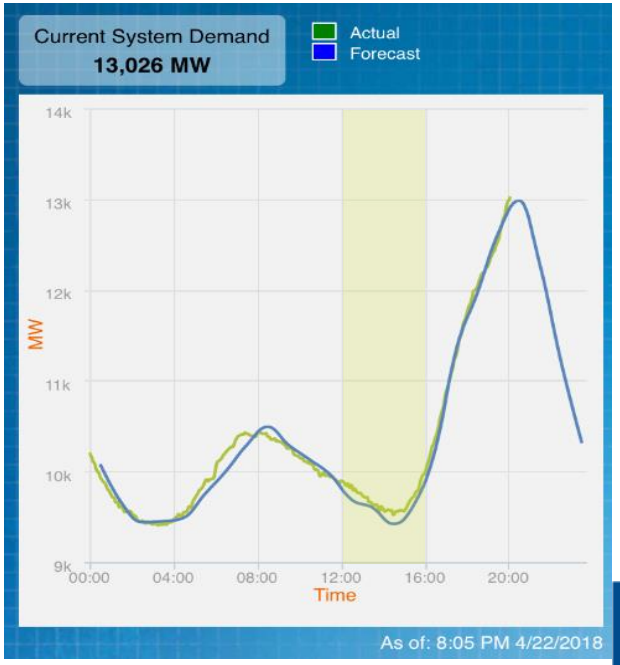
CPC Multipliers: Policy Enhancement – Resilience Multiplier

- Increases the number of CPCs generated by a facility which also provides a resilience benefit by providing power to a load through external outage conditions
- DOER seeks to improve the energy resilience of the Commonwealth, and some peak demand reduction technologies can enable resilient provision of electricity
- Participating facilities which can demonstrate the added ability to provide electricity to load during an external outage will receive a resilience multiplier on all eligible CPC generation
- DOER still considering what value a Resilience multiplier would have

CPC Multipliers: Policy Enhancement – Minimum Load Negative Multiplier

- Negative multiplier for production of CPCs during periods where clean energy generation may cause hosting capacity concerns coincident with minimum-daytime loads
- As renewable penetration increases, there are periods where renewable energy injection into the grid can be detrimental or limit the ability of the grid to host additional resources
- Raising daytime minimum loads during periods of high renewable generation increases the hosting capacity of the distribution system for continued renewable development.
- DOER is considering negative clean peak generation coincident with these periods of low demand; initially only occur Spring weekends and Spring Holidays 12pm – 4pm (HE13-HE17)





CPC Multipliers: Policy Enhancement – Distribution Circuit

- Utility established circuit specific multiplier to account for distribution specific locational values
- Each Distribution Circuit has a unique load profile and particular needs which may enable capital investment deferral or mitigation
- DOER does not intend to include any Distribution Circuit multipliers at program outset, but to work with the Distribution Companies to determine whether and where appropriate multipliers may reflect locational values in the future
- DOER still considering what value a Distribution Circuit multiplier would have

EXAMPLE CPC GENERATION

- Seasonal Peak Period for a week-day in January is 8am – 9am & 4pm – 7pm
  - The day does NOT end up being the month's peak (no Actual Peak multiplier applied)
  - And the resource peak window coincident performance (in kWh) is:

	8-9am	4-5pm	5-6pm	6-7pm
Resource Average Output	75 kW	83 kW	100 kW	75 kW
AVERAGE				83.3 kW

  - The average over the peak window is 83.3 kW
- All applicable multipliers are applied to the 83.3 kW to determine the number of CPCs generated that day
- $CPCs = Average\ kW\ x\ Seasonal\ Multiplier\ x\ Number\ of\ Hours\ of\ Peak\ Window$
- $83.3kW\ x\ 3\ \ x\ 4\ hours$ = 1000 kWh =

  1 CPC generated by the resource that day

EXAMPLE CPC GENERATION
On Day which is Peak Load of Month

- Seasonal Peak Period for a week-day in January is 8am – 9am & 4pm – 7pm
  - The day does DOES end up being the month's peak (Actual Peak multiplier applied)
    - Monthly peak occurs HE18 (5-6pm window)
  - And the resource peak window coincident performance (in kWh) is:

	8-9am	4-5pm	5-6pm	6-7pm
Resource Average Output	75 kW	83 kW	100 kW	75 kW
AVERAGE				83.3 kW

  - The average over the peak window is 83.3 kW and the actual peak is 100 kW
- All applicable multipliers are applied to the 83.3 kW to determine the number of CPCs generated that day, and added to those generated by performance during the actual peak
- $CPCs = (Average\ MW\ x\ Seasonal\ Multiplier\ x\ Number\ of\ Hours\ of\ Window) + (kW\ in\ Actual\ Monthly\ peak\ hour\ x\ Seasonal\ Multiplier\ x\ Actual\ Peak\ Multiplier\ x\ 1\ hour)$
- $(83.3\ kW\ x\ 3\ x\ 4\ hours) + (100\ kW\ x\ \ 3\ x\ 15\ x\ 1\ hour)$ = (1000 kWh) + (4500 kWh) = 5,500 kWh =

5.5 CPCs generated that day

CPC Procurement

- The statute enables DOER to require procurements for CPCs:
  - (c) The department shall promulgate regulations to implement this section, including… the methodology by which clean peak certificate values shall be established, which may include a process by which electric distribution companies competitively procure clean peak certificates from clean peak resources and enter into long-term contracts, subject to the approval of the department of public utilities;
- The DOER proposes to require a procurement process for EDCs:
  - Preference would be to establish compensation via a tariff based mechanism if deemed feasible (e.g. SMART), however, could require standard form contracts to be signed with each selected project (e.g. CT LREC/ZREC programs)
- The intent of the procurement would be to provide long term revenue certainty, enabling reduced cost financing and increased technology deployment at lower program cost
- Procurement should focus on facility types that may not have other sources of long-term financing available to them (e.g. most energy storage facilities, small non-solar renewable facilities such as AD or biomass, etc.)

Program Metrics: Reporting Requirements

- Each qualified Clean Peak Resource must provide hourly interval data for the entire preceding month
- The hourly interval data must by submitted monthly to the entity designated by DOER as the independent verifier of all metered data
- DOER is working on metering requirements
  - DOER may establish different metering requirements depending on: Project size, Project Technology, etc.
- DOER may contract with a sole metering and data verification provider

Program Metrics: Tracking and Verification Process

- DOER anticipates selecting a sole entity to track and verify all metered data
- The vendor shall receive hourly interval performance from each qualified Clean Peak Resource
- The vendor shall validate the number of CPCs each qualified Clean Peak Resource can generate
- The vendor shall report monthly on the preceding month's total CPC production and hour of actual monthly peak
- DOER is considering whether it should seek the services of a single or multiple entities to track and verify metered data, mint certificates, and develop a trading platform for certificates
- DOER has had some preliminary conversations with MassCEC about their willingness and ability to act in this capacity
  - MassCEC currently acts as the independent verifier for almost 90,000 SREC projects and collects and reviews individual meter readings from each facility
  - MassCEC is overhauling its Production Tracking System and could layer the requirements of tracking Clean Peak Resources into its redesign

Program Metrics: CPC Alternative Compliance Payment Rates

- Initial ACP Price designed to meet market needs
- DOER anticipates keeping the ACP rate level for the first 10 years, and then declining the ACP annually to control ratepayer costs, reflect declining technology costs, and reflect potentially diminishing value of further reductions in peak demand
- DOER anticipates structuring a declining ACP rate to manage overall program costs and to account for continuing technology cost declines
- Proposal also leads to gradual phase out of the program by 2051, which is the end date for the program provided in statute

Proposed Program Targets, Minimum Standard Requirements, and Estimated Ratepayer Impact

- In order to properly size the Clean Peak Standard obligation with balanced costs and benefits, DOER is analyzing relevant resource impacts to design the most cost-effective program possible
- Sustainable Energy Advantage and Customized Energy Solutions, our technical consultant team, is supporting DOER analysis of the:
  - Average daily reduction target
  - Estimated compliance obligation
  - Estimated minimum standard requirement
  - Estimated ratepayer benefits
  - Estimated ratepayer costs
- Exact values will be based on % of annual peak reduction and align with the most cost-effective scenario from the Comprehensive Energy Plan
- The CPS will have a minimum annual increase in obligation of 0.25%
- DOER aims to keep ratepayer costs at under $0.005/kWh

Anticipated Implementation Schedule

- Q1 2019
  - DOER engages with stakeholders to build consensus around program design
  - DOER contracts with CPS consulting team
  - DOER releases straw proposal
- Q2 2019
  - DOER receives public comment on straw proposal
  - Final consultant report released
  - DOER releases draft regulation for public comment with updated straw proposal incorporating CPC analyzed values and program impact
- Q3 2019
  - Public hearings on draft regulation; written comments due
  - DOER sends amended regulations to Joint Committee on Telecommunications, Utilities, and Energy (TUE) for review and comment
- Q4 2019 / Q1 2020
  - Final regulations promulgated

Next Steps

- Slides to be posted on DOER CPS webpage
  - https://www.mass.gov/service-details/clean-peak-energy-standard
- Stakeholder feedback on Straw Proposal
  - Sent to DOER.CPS@mass.gov
  - Due by Friday, April 12, 2019

Questions?