Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth



Massachusetts Department of Energy Resources

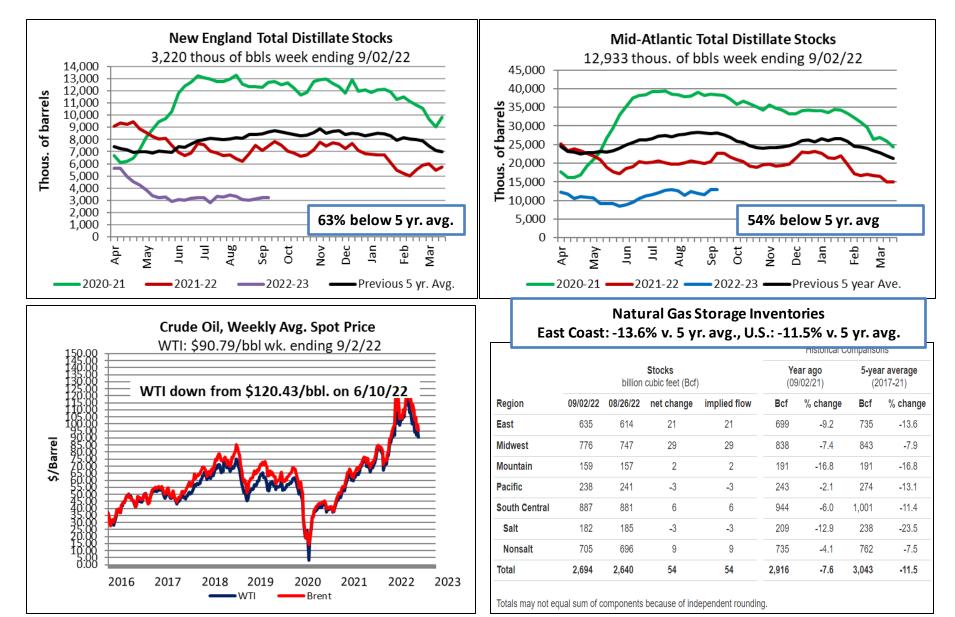
## Designing State Energy Security Plans for Energy Emergency Response Operations

2022-2023 Fuel Reliability Concerns and Response

Tuesday, April 11, 2023

## September 2022

### record low distillate inventories, Crude prices declining, gas storage inventories lagging



## 2022-2023 Fuel Reliability Concerns

### **Details**

- Late summer 2022: New England Governors and Sec. Granholm exchanged letters highlighting concerns with winter fuel reliability and low fuel inventories for peak hurricane season and winter.
- Sec. Granholm asked States to convene with DOE to align in responding to the situation and discuss other potential winter challenges.
- Asked States to consider what immediate steps can be taken to improve preparedness
- DOE called for oil and natural gas industry to address low product inventory, and noted actions it was taking: monitoring, assessing potential impacts, preparedness/mitigation options, and preparing for potential constraints.

### **Background**

- September 2022: U.S. and eastern natural gas storage levels below the 5-yr. avg.; U.S. -11.5% and East region -13.6%
- Distillate inventories are down in 3 of 5 U.S. regions; in PADD 1: Mid-Atlantic -54% and New England -63%
- East coast gasoline stocks -15% in the Mid-Atlantic and -10% in New England (but improving)
- Propane is within the 5-yr avg. range in New England (marine terminals only reporting)

### Potential Actions (Short-term)

### When do we recommend escalating actions?

- Enhance monitoring of fuel stocks (weekly) and conduct outreach to terminals
- Institute weekly calls with terminal operators in MA and potentially require weekly reporting on stocks by fuel type
- Ask terminals to voluntarily build stocks in the coming month
- Coordinate with New England and NY states and DOE on monitoring/preparedness actions



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## Winter 2022-2023 Fuel Reliability Concerns

### Potential Actions (Mid-term)

- Regional voluntary program for fuel terminals to maintain a minimum level of storage
- In coordination with other states, evaluate and be prepared to request a Jones Act Waiver for certain fuels
- Monitor dual-fuel power generators supply of distillate/refill rates and coordinate with ISO-NE to ensure generators have adequate distillate supply as we move into heating season.
- Continue coordinating with New England states on preparedness and mitigation actions in the event of supply issues this winter.
- Explore convening a winter preparedness meeting with stakeholders and State Energy Officials

### **Additional Considerations**

- Stocks provide some buffer against this risk
- Market volatility and uncertainty continue. Prices for all fuels continue to be elevated versus this time last year
- Market and supply chain continue to respond to Ukraine-Russia war; fears of a global economic recession; weather-related demand influence (heatwaves; summer storms); continued global demand concerns (COVID-19 lockdowns in China again drawing market attention/ concern)
- Current East Coast refineries (7) are at 100% capacity and Gulf Coast refineries are at 94% capacity. Most refinery capacity is now in the Gulf Coast (9.8 MM bbl c/d) or Midwest (4.2 MM bbl c/d). For context: 7 East Coast refineries total capacity ~.817 MM bbl c/d.
- A tropical storm/hurricane impacting refineries would have a significant impact on national supply.
- Natural gas inventories typically build over summer/early-fall and draw down over winter. There is some concern natural gas storage deficits may not be overcome as we move into winter

### What are the appropriate actions if the situation changes?



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## September 2022 Actions

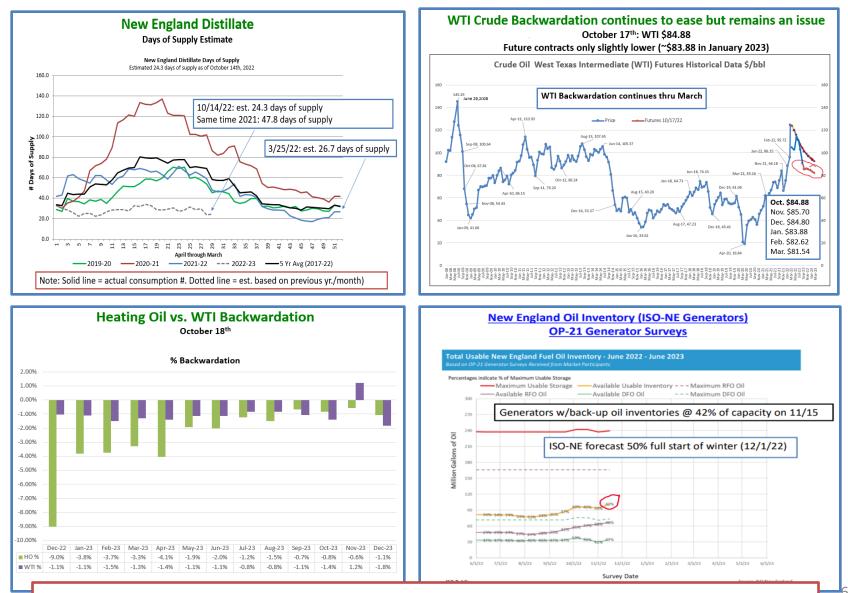
- We increased monitoring, stepped up regional coordination calls, provided situational awareness and decisionsupport to leadership, drafted media and public communications strategies, etc.
- Limited tools in the quiver (examples):
  - Encouraged contracts for non-firm customers (like dual-fuel generators)
  - Encouraged state/local government entities to order fuel early and contract for supply for winter
  - Media outreach to inform the public and instill confidence in the fuel delivery system
  - Continue to monitor and express concern to various stakeholders
- Prepare to increase response if needed

- State Energy Security Plans have a number of tools for liquid fuel disruption events
- Aimed at increasing supply, decreasing demand, or manage/allocate available supply. Examples:
  - Industry actions: terminal swaps, sales, exchanges; heating oil or motor fuel allocation; customer education
  - State Actions: Hours of service waivers; Request strategic reserve release, voluntary reductions in use, close state offices, priority user programs, environmental waivers, minimum/maximum purchases

Actions largely designed to respond to an event with supply or transportation impacts (hurricane, polar vortex, etc.) vs. market issue

## October 2022

low distillate inventories and days of supply, persistent market backwardation, dual-fuel generators slow to refill...and industry tightly managing inventories



A markets issue with the potential for real-world impacts if supply chain disrupted.

## **Regional Winter Fuels Coordination Calls**

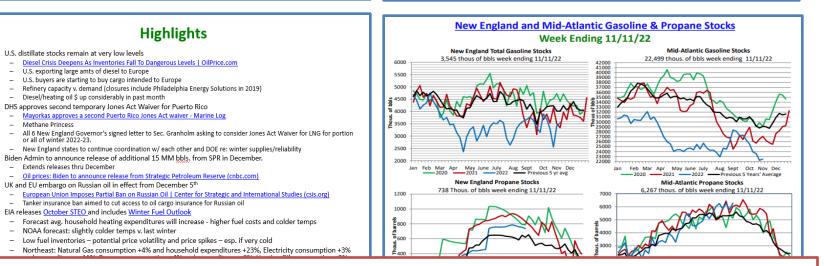


#### **Purpose of these Regional Coordination Calls**

- Increase regional communications across all sectors concerning delivered fuels in New England and New York. A significant benefit of these calls is getting to know our counterparts across industry and government before a significant emergency
- Share information about potential or actual energy supply or delivery issues and coordinate response/mitigation actions across industries and government to resolve or mitigate problems.
- Allow for a "one-stop shop" for biweekly updates on energy situations affecting the region and individual states. The region shares energy supplies and infrastructure – and a problem in one energy sector or geographic area can have a cascading effect - causing problems for other fuels.

-2020-21 -2021-22 -2022-23 -5 year Ave

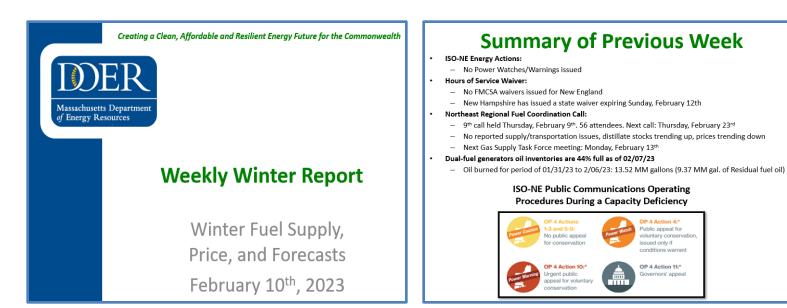
- Calls open to invited guests
- Ask that you observe Chatham House Rules for these calls. Feel Free to use information but please do not quote or ID participants/affiliations



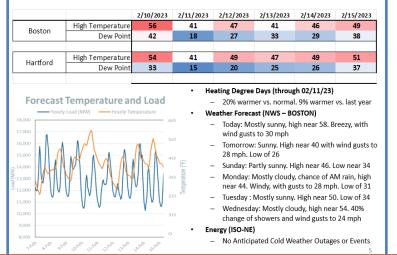
- 2020-21 - 2021-22 - 2022-23 - Previous 5 year Avg

We do information sharing and coordination across states and sectors in the region fairly well.

## **Energy Briefings with Internal Stakeholders**



### **Forecasts for Next Week**



## ISO-NE Winter Outlook and OP-21

OP 4 Action 4:\*

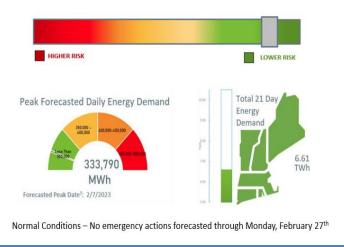
Public appeal for

conditions warrant

OP 4 Action 11:\*

Governors' appeal

oluntary conservatio issued only if



Inform/update leadership across the Secretariat, provide decision support, set tempo for winter

## Weekly Energy Briefings with Internal Stakeholders

Fuel

Heating Oi

(\$/gallon

ropane (\$/gallor

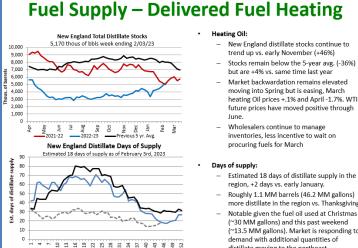
Gasoline (\$/gallor

Diesel Oil (\$/gallor

WTI Crude Oil -

spot (\$/barrel

/MI



April through March = -- 2022-23 5 Yr Avg (2017-22)

2021-22

- New England distillate stocks continue to trend up vs. early November (+46%)
- Stocks remain below the 5-year avg. (-36%) but are +4% vs. same time last year
- Market backwardation remains elevated moving into Spring but is easing. March heating Oil prices +.1% and April -1.7%. WTI future prices have moved positive through
- Wholesalers continue to manage inventories, less incentive to wait on procuring fuels for March
- Estimated 18 days of distillate supply in the region, +2 days vs. early January.
- Roughly 1.1 MM barrels (46.2 MM gallons) more distillate in the region vs. Thanksgiving
- (~30 MM gallons) and this past weekend (~13.5 MM gallons). Market is responding to demand with additional quantities of distillate moving to the northeast

#### **New England Fuel Prices** Delivered Fuels: from Las

Voar

17%

-4%

-2%

32%

-12%

Avg. Last Week

\$4.70 傘 \$3.87

\$3,44 4

\$5.09

Algonquin Citygate v. Henry Hub Natural Gas

Daily Avg. \$/MMBtu

Algonquin \$2.86/MMBtu and Henry Hub \$2.35 on 2/08/23

Weel

\$4.52

\$3.63

\$3.41

\$5.06

2/3/2023

\$76.51 4 \$80.33 ast Yr. Wk. Avg

\$3.77

\$3.46

\$3.84

Last Yr

\$89.60

- Heating oil prices have declined 55 cents/gal since Thanksgiving
- WTI Crude has declined ~\$3.80/bbl. in the last 2 weeks and over \$12/bbl. since Veterans Day

#### Northeast natural gas prices spiked over the weekend with severe cold impacting the region:

- Algonquin Citygate prices fell \$9.64 from \$12.16/MMBtu last Wednesday to \$2.52/MMBtu this Wednesday
- Last Thursday, February 2nd, Algonquin prices spiked to \$71.42/MMBtu, reaching the highest daily price since \$79.98/MMBtu back on January 4th, 2018
- Temps in New England fell rapidly last Thursday through Saturday. In Boston, temps fell from an avg, 31°F on Thursday, which is 1°F above normal, to 4°F on Saturday, 26°F below normal
- Total natural gas consumption in the Northeast averaged 33.8 Bcf/day between Feb. 2nd and 4th, 38% higher vs. the avg. daily consumption of 24.4 Bcf/day over the rest of the week

#### February 3<sup>rd</sup> to February 5<sup>th</sup> extreme cold event in New England oil-fired plants and last coal plant in region called on to help meet demand

- Over 3 days of extreme cold, hourly electricity demand in ISO-New England peaked at 19,487 megawatthours (MWh) at 7:00 p.m. on Friday, February 3.
- . Demand approached that level again the evening of Saturday, February 4, when it reached 19.287 MWh.
- Hourly electricity demand in ISO-NE remained above 16.000 MWh for 32 consecutive hours during the arctic blast, from February 3 to February 4.
- On a typical winter day, hourly electricity demand in ISO-NE peaks around 16,000 MWh and falls below 14,000 MWh at night, when electricity demand is usually lower.
- To help meet demand, ISO-NE called on power plants that aren't typically used, including more than 5,000 megawatts (MW) of oil-fired power plants as well as the region's last remaining coal-fired power plant. These plants ran during the entire cold weather event. Generation at these plants was phased out on Sunday, February 5, once temperatures warmed.
- The mix of electricity sources used to meet electricity demand over the weekend was similar to the mix used during Winter Storm Elliott in December 2022. In both cases, oil-fired power plants met the heightened electricity demand and compensated for the decline in output from natural gas-fired plants.
- Output from natural gas-fired plants declined because the region's limited natural gas pipeline capacity was increasingly used to supply natural gas to residential and commercial

### **Takeaways**

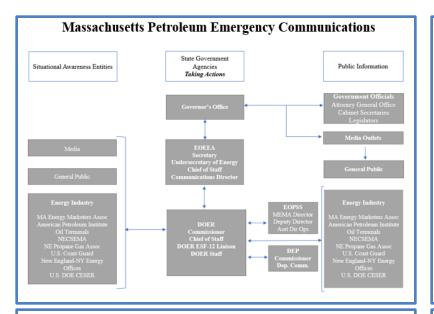
- Temperatures expected to remain mild through next week. Forecast is for above normal temps through late-February. Winter temperatures continue to be significantly warmer vs. normal
- Fuel prices remain declined slightly after holding steady for the past three weeks. Increased global demand and easing of Chinese COVID restrictions may lead to higher demand and potentially higher prices as we move into late-winter and early spring
- Distillate stocks continue to trend up after falling over the Christmas holiday. While still 36% below the 5-year average range, distillate stocks are up 46% vs. early-fall
- Dual-fuel generator inventories 44% full as of 2/07/23 after burning over 13 MM gallons this ٠ past week
- Dutch TTF LNG prices continue to decline and are at \$17.41/MMBtu this week on warmer European weather and storage levels above 5-year averages
- ٠ Heating oil backwardation in PADD 1 is easing for balance of winter. March prices are .1% higher vs. February
- EU embargo on finished Russian petroleum products started on February 5, monitoring for potential impacts to global supply
- ISO-NE reports bulk electric system healthy with normal conditions through late-February

### We do a good amount of analysis across the liquid fuels, natural gas, and electric

Tues

sectors

## **SESP Communications, Tracking, and Assessment**



#### Assessing the Severity of an Energy Emergency

Normal Conditions Level 1	<ul> <li>No discernable shortage.</li> </ul>			
Monitor and Alert	Possible shortages elsewhere.			
Shortage Level 2 Mild Shortage	<ul> <li>5-10% reductions in petroleum supply for a week or more, estimated by the days a port or terminal is closed or the number of substitutions of truck deliveries instead of normal pipeline supply.</li> <li>5-10% reduction in natural gas nominations on interstate pipelines or pipelines on allocation for up to 2 weeks</li> <li>Localized storm damage causing short-term electric transmission/distribution loss.</li> </ul>			
Shortage Level 3 Moderate Shortage	<ul> <li>10-15% reductions in petroleum products for three weeks or more.</li> <li>10 to 15% reduction in natural gas supply nominations on interstate pipelines plus inside City Gate (the point at which gas moves from the pipeline to local distribution lines).</li> <li>Curtailments by local gas distribution companies for two weeks or more.</li> </ul>			

Energy Supply Disruption Track	ing Process and Assignments
Responsible Agency: Department of Energy Resources	
Supply:	Demand:
<ul> <li>Production of crude oil in U.S.</li> <li>Amounts of U.S. imports of crude oil</li> </ul>	<ul> <li>U.S. petroleum products and propane supplied from refineries</li> </ul>
Source countries of foreign crude oil	<ul> <li>Petroleum products and propane supplied into MA and New England</li> </ul>
<ul> <li>Refinery production by petroleum products</li> <li>Movements of crude oil, petroleum products</li> </ul>	Historical fuel usage by MA and New England's major sectors
and propane among Petroleum Administration for Defense Districts (PADDs)	Net changes in petroleum product inventories
<ul> <li>Stocks of crude oil</li> </ul>	<ul> <li>Vehicle miles traveled in Massachusetts</li> </ul>
<ul> <li>Stocks of petroleum products (U.S, New England, MA)</li> </ul>	<ul> <li>Number of households heating with oil and propane</li> </ul>
<ul> <li>Imports of petroleum products (U.S., New England, MA)</li> </ul>	
<ul> <li>Anticipated deliveries of petroleum products into Massachusetts</li> </ul>	
Price:	Physical Infrastructure:
<ul> <li>International, national crude oil prices – posted, spot market, futures market</li> </ul>	U.S. refineries' locations and capacity     Petroleum product pipelines
Massachusetts wholesale petroleum prices	Storage terminals and capacity in
<ul> <li>Massachusetts retail petroleum prices</li> <li>Federal and state taxes on petroleum products</li> </ul>	Massachusetts and New England

### Massachusetts EDC Event Classification Level

LEVEL	EVENT CHARACTERISTICS	ESTIMATED % OF CUSTOMERS W/O SERVICE	TYPICAL DURATION (HRS)
I	Smail Impact	<2%	<12
П	Moderate Impact	2% to 5%	12 - 24
ш	Serious Impact	5% to 9%	24 - 48

We needed an assessment tool to evaluate severity and guide actions and asked DOE for technical support

## **Regional Liquid Fuels Supply Shortage Coordination**

### Process for liquid fuel shortage events

### New England and Mid-Atlantic Regional Liquid Fuels Supply Shortage Coordination

Straw Proposal for a Regional Coordination Process During Liquid Fuels Supply Shortage Events

March 22<sup>nd</sup>, 2023 Update

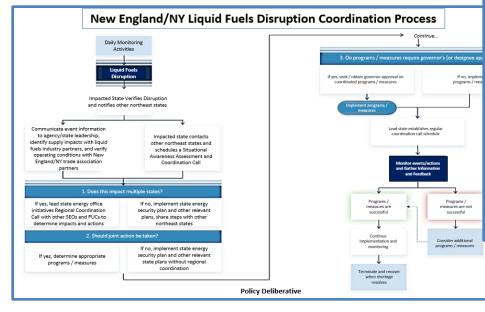
#### **REGIONAL PETROLEUM SHORTAGE RESPONSE**

## COLLABORATIVE DEVELOPMENT GUIDE

#### September 30, 2021







#### Proposed Framework

#### Normal (blue sky)

2 Phases:

- Quarterly coordination calls (March, June, September and December)
- · States rotate hosting duties annually. Host states set agenda, facilitate meeting, and maintain state contact lists
- Coordination calls may transition to monthly as conditions warrant or if states determine a need for increased frequency
- · In the event of a regional liquid fuels disruption event, host state will facilitate regional coordination calls

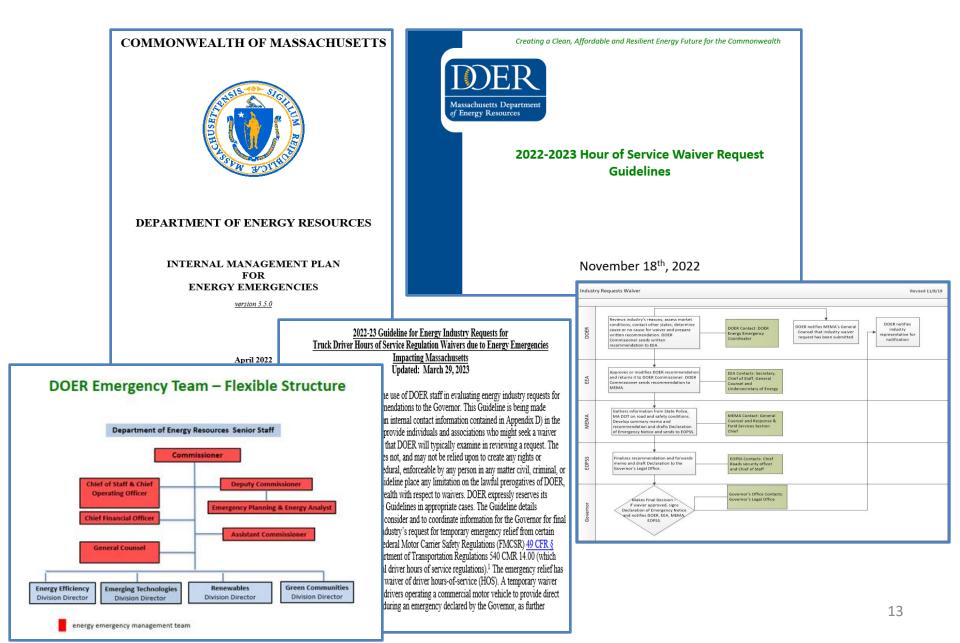
#### Supply Disruption Events

- · Any state can activate the plan and initiate the regional coordination process
- The initiating state will conduct a situational assessment briefing and detail what, if any, actions have been implemented
- If the situational assessment briefing determines a need for additional coordination, the host state will initiate and schedule regional coordination calls for the incident lifespan, including setting agenda and facilitating the meeting
- A menu of liquid fuel shortage response actions will be included in the plan. Response actions are intended to serve as a "menu" of options and not prescriptive. States will voluntarily coordinate implementation of response actions based on the situation and review these actions as the incident evolves
- A voluntary process states may implement none, some, or all recommended actions
- · States responsible for internal coordination, legal authorities for implementing actions, and Governor approval

## **Petroleum Response Checklist/Aids Continue to Evolve**

	and fuel stocks report issued				
Weekly winter energy brief	<ul> <li>Bi-weekly pricing, weather and fuel stocks report issued</li> <li>Bi-weekly winter fuels coordination calls with industry and government stakeholders</li> <li>Weekly winter energy briefings/updates with DOER/DPU/DEP/EEA</li> <li>Monitor trusted media outlets for energy supply/demand/transportation issues</li> </ul>		ot Applicable		
Public Messaging   • Coordinate on public comm	nunication process and messaging	with other states and • No	ot Applicable		
d Fuels Shortage Normal Conditions Level	Assessment and Verification	Mild Shortage	Moderate Shortage	Severe Shortage	
■ No unusual energy-related activities or events	<ul> <li>Early warning phase, potential challenge to energy markets identified and are being tracked</li> <li>Assessment of the situation and nature, extent, and duration of potential or impending liquid fuels shortage event</li> </ul>	<ul> <li>5-10% reduction in liquid fuel supply for 1 week or more, estimated by days ports/terminals are closed or number of substitutions of truck deliveries v. normal supply delivery</li> <li>or less than 14 days of distillate day of supply</li> </ul>	<ul> <li>10-15% reductions in liquid fuel products for 3 weeks or more</li> <li>or less than 10 days of distillate days of supply</li> <li>or ISO-NE declared Energy Alert (forecasted shortfall within 6 to 21 days of the assessment)</li> </ul>	<ul> <li>&gt;15% reduction in available liquid fuel products for more than 2 weeks</li> <li>or less than 7 days of distillate days of supply</li> <li>or ISO-NE declared Energy Emergency (forecasted energy shortfall in days one to five of the assessment)</li> </ul>	Shortage Event
Image: Second	<ul> <li>Increase liquid fuels supply and demand monitoring and analysis activities</li> <li>Prepare to implement shortage response actions and public messaging programs</li> <li>Coordinate with state agencies to prepare to implement state government conservation programs</li> <li>Notify DOE, NASEO, and other states of potential shortage event</li> <li>Implement regularly scheduled coordination calls with industry, state and federal stakeholders to discuss potential shortage issues and actions</li> </ul>	<ul> <li>Continue previous monitoring and alert actions</li> <li>Notify DOE, NASEO and other states of mild shortage condition</li> <li>Increase frequency of inventory reports and winter fuel coordination calls with industry and government</li> <li>Convene industry and government fuel stakeholders to review the situation, recommend potential shortage response actions, and support implementation</li> <li>Implement regular New England/NY state energy office coordination calls to share information and coordinate actions</li> </ul>	<ul> <li>Continue previous monitoring and alert actions</li> <li>Notify DOE, NASEO and other states of moderate shortage condition</li> <li>Increase frequency of inventory reports and winter fuels coordination calls</li> <li>Continue convening industry and government stakeholders to review situation, recommend shortage response actions, and support implementation</li> <li>Prepare to support ESF-12 activities</li> <li>Continue regularly scheduled New England/NY state energy office coordination calls to share information and coordinate moderate shortage actions</li> </ul>	<ul> <li>Continue previous monitoring and alert actions</li> <li>Continue enhanced frequency of inventory reporting and regional fuel coordination call rhythm</li> <li>Continue convening industry and government stakeholders to review situation, make recommendations for severe fuel shortage response actions, and support implementation</li> <li>Support State EDC (SEOC) activation and ESF-12 actions</li> <li>Continue New England/NY state energy office coordinate severe shortage actions</li> </ul>	patterns and anomali gy facts and issues. onservation ories on lowering AV), Massachusetts ate information , and DOE as needed. ation and compliance
	calls during heating months	calls during heating months federal stakeholders to (November to March) discuss potential shortage issues and actions	calls during heating months federal stakeholders to office coordination calls to (November to March) discuss potential shortage share information and issues and actions coordinate actions	calls during heating months federal stakeholders to office coordination calls to New England/NY state energy (November to March) discuss potential shortage share information and office coordinate information and issues and actions coordinate actions share information and coordinate moderate shortage actions	calls during heating months     federal stakeholders to     office coordination calls to     New England/NY state energy     coordination calls to       (November to March)     discuss potential shortage issues and actions     share information and     office coordination calls to     coordinate severe shortage       coordinate actions     coordinate actions     share information and     actions

## **State Plans and Guidance**



# Thank you

## **Paul Holloway**

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