



**QUARTERLY REPORT ON THE ELECTRICITY GENERATOR  
EMISSIONS LIMITS PROGRAM (310 CMR 7.74):  
FOURTH QUARTER 2024**

**Prepared for:**

**Massachusetts Department of Environmental Protection on behalf of the  
Commonwealth of Massachusetts**

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## A. INTRODUCTION AND SUMMARY

The Massachusetts Department of Environmental Protection (“MassDEP”) implemented its program to limit CO<sub>2</sub> emissions from electricity generators in January 2018. This report provides background on key aspects of the program, a summary of market activity through the compliance deadline for 2024, an overview of emissions and allowance holdings patterns, and discussion of the results of our market power screens.

- *CO<sub>2</sub> Emissions versus Annual Caps*: Emissions have fallen since the program’s annual caps were established, resulting in a large number of banked allowances after each annual compliance deadline.
  - ✓ In 2022, the cap was 8.06 million allowances compared to 6.43 million metric tons of emissions. The cap is not scheduled to fall below this level until 2030.
  - ✓ In 2023, the cap was 7.84 million allowances compared to 5.62 million metric tons of emissions. The cap is not scheduled to fall below this level until 2034.
  - ✓ In 2024, the cap was 7.61 million allowances compared to 6.28 million metric tons of emissions. The cap is not scheduled to fall below this level until 2030.
- *Load, Generation, and Emissions Trends*: Emissions from covered generation have fallen compared to 2018. 2024 emissions were higher than 2023 but lower than 2022.
  - ✓ Generation from covered units increased by 11 percent in 2024 from the previous year. The year to year fluctuations in emissions are inversely correlated with emission allowance prices for the program, reflecting that higher emission prices provide incentives for reduced production from fossil fuel generators.
- *CO<sub>2</sub> Allowance Prices and Trading Activity*: Trading activity was limited in 2024 and early 2025 as regulated entities relied on banked allowances and auctions to satisfy most or all of projected compliance obligations for 2024.
  - ✓ The vast majority of allowance purchases were made through auctions rather than the secondary market. The eight auctions for 2024 vintage allowances cleared:
    - 380,590 allowances for \$6.03/metric ton in Auction 2023-1 in December 2022,
    - 380,590 allowances for \$5.85/metric ton in Auction 2023-2 in March 2023,
    - 380,590 allowances for \$6.53/metric ton in Auction 2023-3 in June 2023,
    - 380,590 allowances for \$3.00/metric ton in Auction 2023-4 in September 2023,
    - 761,180 allowances for \$2.25/metric ton in Auction 2024-1 in December 2023,
    - 761,180 allowances for \$2.25/metric ton in Auction 2024-2 in March 2024,

- 1,178,160 allowances for \$1.25/metric ton in Auction 2024-3 in June 2024, and
- 1,178,159 allowances for \$5.65/metric ton in Auction 2024-4 in September 2024.
- ✓ The six offerings of 2025 vintage allowances cleared:
  - 369,396 allowances for \$1.75/metric ton in Auction 2024-1 in December 2023,
  - 369,396 allowances for \$1.75/metric ton in Auction 2024-2 in March 2024,
  - 369,396 allowances for \$1.25/metric ton in Auction 2024-3 in June 2024,
  - 369,396 allowances for \$5.50/metric ton in Auction 2024-4 in September 2024,
  - 738,792 allowances for \$6.06/metric ton in Auction 2025-1 in December 2024, and
  - 738,792 allowances for \$9.30/metric ton in Auction 2025-2 in March 2025.
- ✓ Prices increased significantly following the June 2024 auction and after the MassDEP posted a discussion document in July 2024 stating that it was considering an increase in the auction reserve price from \$0.50 to \$9.00 per allowance.
- ✓ The spread between 2024 vintage and 2025 vintage clearing prices was small (ranging from \$0 to \$0.50/metric ton) in the four auctions where both vintages were sold. This is expected when there is a substantial surplus of current vintage allowances that can be banked and used in subsequent years.

We evaluate information on the holdings and demand for allowances to identify firms that may have acquired a position that raises competitive concerns. In the current study period, we find no evidence of anti-competitive conduct in the secondary market for allowances, and we find that firms have generally sought to acquire or sell allowances consistent with their expected needs for 2024 and 2025.

## B. BACKGROUND

Regulation 310 CMR 7.74 created a cap-and-trade program to reduce carbon dioxide emissions from electricity generating facilities located in Massachusetts beginning in 2018.<sup>1</sup> Cap-and-trade programs work by setting an aggregate emissions limit for a particular class of emitters and requiring them to acquire a number of allowances sufficient to cover their emissions. Firms that hold allowances can decide whether it is more profitable to use them to cover their emissions or to sell them to an emitter that can use them more efficiently.

Covered compliance entities and emissions are consistent with the Regional Greenhouse Gas Initiative (RGGI) regulation, implemented as 310 CMR 7.70 in Massachusetts. Under 310 CMR 7.74, compliance periods are annual. The Massachusetts Carbon Allowance Registry (“Registry”) is used to track the ownership of allowances. Once an allowance is allocated or purchased in the auction, it can be resold in the secondary market. Participation in the market for allowances is limited to regulated electricity generating facilities.

The secondary market is important for several reasons. First, it gives firms the ability to obtain allowances at any time, while the auctions are relatively infrequent. Second, it provides firms a way to protect themselves against unexpected swings in future prices. Third, it provides price signals that assist firms in deciding how much electricity to produce and in making investment decisions that are affected by the costs of compliance.

The market for Massachusetts allowances has several key elements, which are discussed in this section: the emissions cap, allocations, auctions, banking, program participation, and compliance.

### *Annual Emissions Cap*

The program’s annual emissions cap was set at 9,149,979 metric tons for 2018, which was the first year of program implementation. The annual cap fell to 8,731,175 metric tons in 2019, 8,507,299 metric tons in 2020, and it declines by 223,876 metric tons in each subsequent year,

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<sup>1</sup> <https://www.mass.gov/guides/electricity-generator-emissions-limits-310-cmr-774>

eventually reaching 1,791,019 metric tons in 2050.<sup>2</sup> The 2024 cap is 7,611,795, and the 2025 cap is 7,387,919.

### *Allowance Allocations*

One hundred percent of the 2018 vintage allowances were allocated to individual generators, including new facilities. Starting with the 2019 compliance year, the MassDEP began to transition from allocating allowances directly to using auctions as the primary mechanism for distributing allowances.<sup>3</sup> For the 2019 and 2020 compliance years, the MassDEP distributed a number of allowances equal to 75 and 50 percent of the cap through direct allocation. As of the 2021 compliance year, all allowances are distributed by auction, subject to the banking adjustment described below.

### *Banking of Allowances*

In August 2018, the MassDEP adopted changes to the provisions for banked allowances (i.e., allowances held by covered entities after the compliance deadline for a given year). Under the new provisions, if the number of banked allowances after a particular year exceeds 223,875, the number of allowances distributed in the subsequent year will be adjusted downward by the difference between the number of banked allowances and 223,875. As the cap declines by 223,876 metric tons each year, this approach ensures that each year's emissions are less than the previous year's cap.

For instance, after 2022 compliance obligations were satisfied, 1,853,109 allowances were held in facility accounts on April 1st, 2023. Thus, the number of allowances to be distributed for the 2023 compliance year was adjusted down by 1,629,234 (which equals the 1,853,109 allowances held after 2022 minus the limit of 223,875 allowances). Consequently, the adjusted emissions

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<sup>2</sup> 310 CMR 7.74(5)(a)

<sup>3</sup> In this report, the term "allowance" refers to allowances that can be used to comply with 310 CMR 7.74 only. These allowances cannot be used to comply with requirements of the Regional Greenhouse Gas Initiative, which is implemented in Massachusetts pursuant to a different regulation, 310 CMR 7.70.

cap for the 2023 compliance year was 8,059,546 metric tons (including 1,853,109 banked allowances and 6,206,437 vintage 2023 allowances sold in auctions 2022-3 through 2023-4).

The same calculation was used to determine the adjusted emissions cap for 2025 and the number of 2025 allowances to be sold in Auctions 2025-3 and 2025-4. In April 2025, the amount of vintage 2024 and before allowances held after compliance was 1,554,739, so the number of allowances to be auctioned for the 2025 compliance year was adjusted down by 1,330,864. Because a total of 2,955,168 vintage 2025 allowances were auctioned through 2025-2, the number of 2025 allowances remaining to be distributed is 3,101,887.

### *Auctions*

Twenty percent of the 2025 vintage allowances were auctioned in Auctions 2024-1 to 2024-4. The MassDEP plans to distribute the rest of allowances for the 2025 compliance year in four quarterly auctions:

- On December 11, 2024: 10 percent of the 2025 unadjusted emissions limit was offered (738,792 allowances).
- On March 19, 2025: 10 percent of the 2025 unadjusted emissions limit was offered (738,792 allowances).
- In June 2025: 50 percent of the allowances remaining after the 2024 banking adjustment was performed (1,550,944 allowances).
- In September 2025: All remaining 2025 allowances will be offered for sale (1,550,943 allowances).

In addition to 2025 vintage allowances, 5 percent of the 2026 annual cap (which equals 358,202 allowances for the 2026 vintage) will be offered in each of the four auctions listed above.

### *Participants in the Program*

Participation in the program, including auctions, is restricted to the owners and operators of covered facilities. The term “Regulated Entity” is used in the Registry to refer to the highest level of facility ownership, and in the case of shared ownership groups together several

facilities.<sup>4</sup> A list of facilities and associated regulated entities is available to the public at <https://macar.apx.com/> (select “Reports”).

### *Compliance*

On March 1<sup>st</sup> of each year, every generating facility’s Registry account is required to hold sufficient allowances to satisfy obligations from the prior calendar year. Facilities that do not hold sufficient allowances may qualify for “emergency deferred compliance.” Under emergency deferred compliance, the compliance obligations from emissions that occurred during a MLCCP#2 designated period can be deferred to the following year.<sup>5</sup> However, those emissions are required to be offset on a two for one basis in that following year.<sup>6</sup> For example, if a facility deferred 1,000 allowances for 2019 compliance, they are required to hold a number of allowances for 2020 compliance equal to their 2020 emissions plus 2,000 additional allowances for their deferred compliance from the previous year. This provision is intended to provide generators with additional flexibility when they may be needed for system reliability, while still discouraging generators from exceeding the cap in a given year. Thus, it is unlikely that facilities will use this option under normal circumstances.

By April 1<sup>st</sup>, the Department will deduct allowances from each generating facility’s registry account; first to address any deferred obligations, then to meet the facility’s obligations from the previous calendar year. For 2024, allowance deductions were carried out successfully and all facilities met their obligations without the use of emergency deferred compliance. The Registry tracks current holdings, allowance transfers, and allocations, as well as ownership and representation of each facility or regulated entity.

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<sup>4</sup> For example, Medway Station and Mystic receive allocations separately, but they are both owned by Exelon, so for tracking and market monitoring purposes their demand is aggregated.

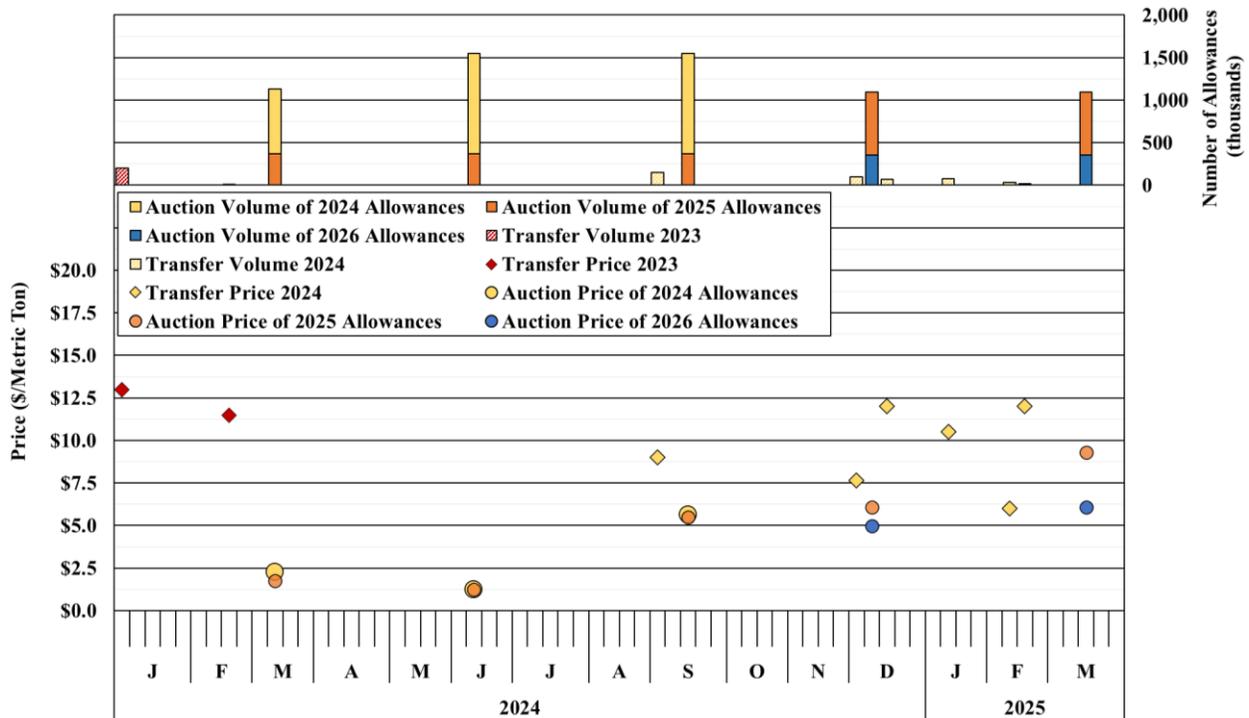
<sup>5</sup> These are periods when ISO New England has triggered “Master Local Control Center Procedure No.2”

<sup>6</sup> 310 CMR 7.74(6)(d)

C. SUMMARY OF PRICES AND TRADED VOLUMES

This section evaluates the available information regarding the purchase of allowances in the auctions and transfers in the secondary market for allowances. Figure 1 displays the weekly volumes of allowance transfers and weighted average prices as well as auction results.

Figure 1: Allowance Prices and Volumes<sup>7 8</sup>



For allowances usable for 2024 compliance, there were seven priced transfers between unaffiliated regulated entities in 2024 and three in the first quarter of 2025 before the March 1 compliance deadline. Most of the transfers were for small volumes with three of the transfers

<sup>7</sup> Figure 1 shows transfers reported to the registry through April 5, 2025, but since there is no prompt reporting requirement, other transactions may have occurred that have not yet been reported. Trades are reported by transaction date if one is provided that differs from the date it is reported to the Registry.

<sup>8</sup> “2024 Allowances” indicates allowances usable for 2024 compliance, which includes previous vintages.

accounting for 69 percent of the total volume. For these ten transactions, the average transfer price was \$10.48 for 653,118 allowances.

Figure 1 exhibits relatively illiquid conditions in the secondary market as transaction prices fluctuated over the period and a small number of allowances were traded. Prices of allowances usable for 2024 compliance ranged between \$5 and \$12.50 from the second half of 2024 through the first quarter of 2025. Prior to the compliance deadline, three transactions were recorded at prices significantly higher than the auction clearing prices. However, these transfers involved relatively low volumes, and the pricing may have been determined well before the transactions were recorded.

The auction clearing price increased significantly from June to September in 2024, reflecting expectations of a future increase in the minimum auction reserve price. In July 2024, MassDEP released a discussion document proposing an increase in the reserve price from \$0.50 to \$9.00 per allowance, which prompted substantial feedback from market participants.<sup>9</sup> Although the reserve price remained unchanged in the September 2024 auction (2024-4), the December 2024 auction (2025-1) used for the first time a reserve price of \$5.00 for current vintage allowances, while the reserve price for the future vintage remained at \$0.50.

In auctions where both 2024 and 2025 vintage allowances were sold, there was only a modest premium on the 2024 vintage over the future vintage. This reflects the presence of substantial banked allowances, which likely reduced the urgency to purchase current-year allowances at a significant premium.

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<sup>9</sup> See <https://www.mass.gov/doc/questions-and-answers-on-minimum-reserve-price/download> with a link to the July 2024 issuance.

**D. EMISSIONS AND ALLOWANCE HOLDINGS**

In this section we review patterns of emissions and allowance holdings to assess the fundamentals of supply and demand. Table 1 and Figure 2 evaluate emissions and electricity supply over the last three years, while Figures 3 compares allowance holdings to emissions by regulated entity.

Table 1 summarizes electricity supply and emissions through 2024 compared to 2022 and 2023. Data is provided for regulated facilities by type: combined cycle units running on liquified natural gas (“LNG”), all other combined cycle units (“CC”), gas/oil-fired steam turbines (“ST”), and combustion turbine peaking units (“CT”). The table shows the supply of electricity from other non-regulated sources, including: nuclear generation, other non-program units such as renewables and waste burners, and net generation from the commercial and industrial sectors (“C&I”).

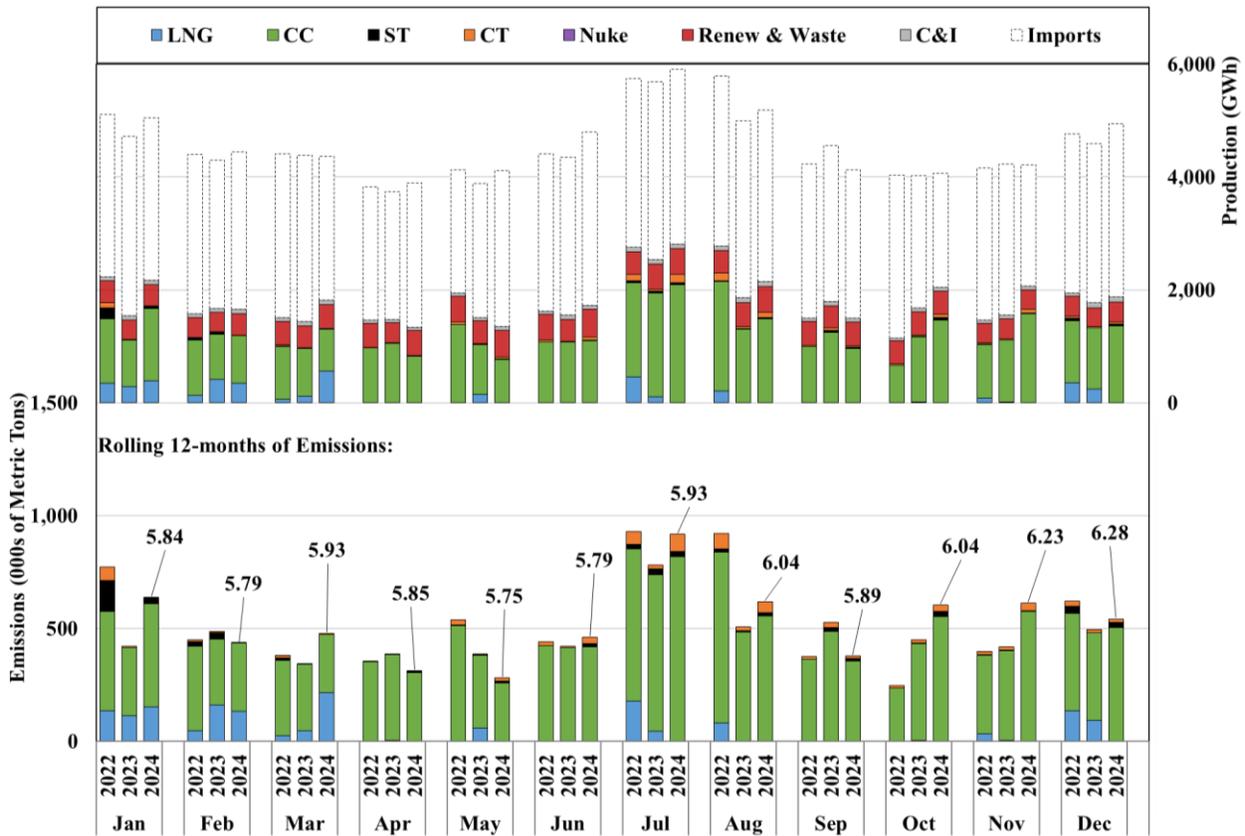
**Table 1: Electricity Supply<sup>10</sup> and Emissions**

Year	Generation By Type, January-December (TWh)							
	LNG	CC	ST	CT	Renew & Waste	C&I	Imports	Total
2022	1.7	13.8	0.34	0.56	4.8	0.74	33.1	55.0
2023	1.3	13.2	0.14	0.23	4.6	0.88	33.1	53.5
2024	1.3	14.5	0.24	0.53	5.0	0.92	32.6	55.1
Carbon Dioxide Emissions, January-December (Million Metric Tons)								
2022	0.6	5.2	0.24	0.31	-	-	-	6.43
2023	0.5	4.9	0.09	0.12	-	-	-	5.62
2024	0.5	5.4	0.15	0.27	-	-	-	6.28

Figure 2 summarizes the same categories of information as Table 1 but on a monthly basis. The figure also reports emissions for entities subject to the cap under 310 CMR 7.74.

<sup>10</sup> Generation is based on EIA Form 923 data and Real-Time Load from the ISO-NE website. Form 923 data for 2024 is not final, so values for 2024 may change in future reports.

Figure 2: Monthly Electricity Supply and Emissions, 2022-2024

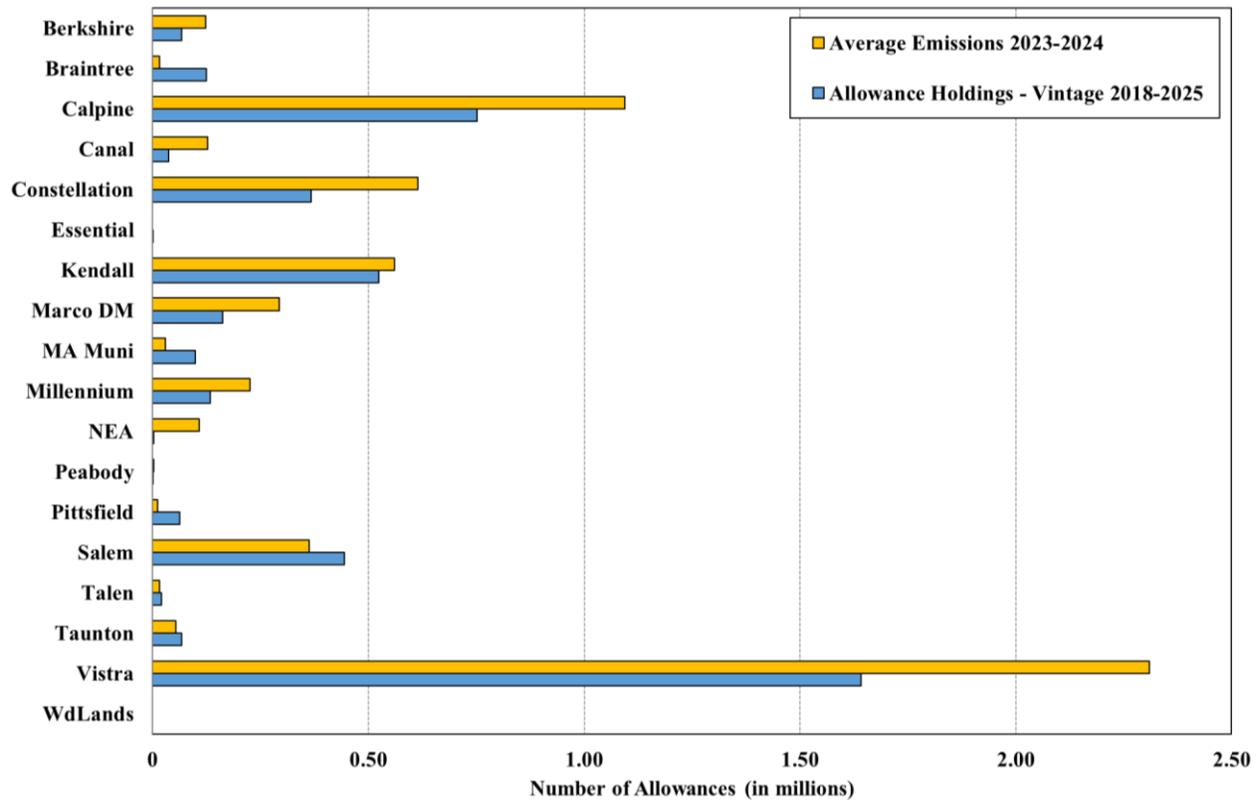


In 2024, emissions totaled 6.28 million metric tons, an increase from 5.62 million metric tons in 2023. This increase in emissions resulted primarily from an increase in load levels of 3 percent (or 1.6 TWh). Emissions from combined cycle units (including ones that rely on LNG imports) increased by 0.5 million metric tons (1.3 TWh) from 2023 to 2024, and emissions from combustion turbines and steam turbines increased by a combined 0.21 million metric tons (0.4 TWh).

Figure 3 shows, for each regulated entity, the average annual emissions over 2023 and 2024 compared to its estimated holdings of allowances that are usable for 2025 compliance, including

allowances purchased in the December 2024 and March 2025 auctions.<sup>11</sup> This is composed of the sum of allowances banked from previous years and its vintage 2025 allowance holdings.

**Figure 3: Allowance Holdings for 2025 and Average Annual Emissions by Regulated Entity**



The figure indicates that certain regulated entities already possess a sufficient quantity of allowances to fulfill their compliance obligations, assuming that 2025 emissions are consistent with the average annual emissions observed in 2023 and 2024. It is important to note that several generating units, including the Mystic units and the West Springfield unit, were retired in 2024. These retirements are expected to reduce the future emissions of the Regulated Entities that owned them, which will tend to reduce emission modestly. Other regulated entities whose historic annual emissions exceed the number of allowances currently held for 2025 are expected

<sup>11</sup> Holdings and allocations are shown as of April 5, 2025.

to require approximately 1.4 million additional allowances. These entities will be able to satisfy their compliance obligations through some combination of:

- Allowance purchases in the remaining two auctions for 2025 vintage allowances (in which 3,101,887 allowances will be offered),
- Allowance purchases in the secondary market – However, secondary market activity has been relatively limited, so this accounted for a small share of allowance acquisitions before 2025.
- Reducing emissions –There is relatively little transmission congestion into Massachusetts from neighboring states, which could allow additional electricity imports if fossil-fuel generators in Massachusetts reduce generation further.

Thus, it appears that regulated entities will have options for satisfying their 2025 compliance obligations.

### **E. DISCUSSION OF MARKET MONITORING**

As the Massachusetts Carbon Allowance Program Market Monitor, we monitor trading and holdings amongst regulated entities in order to identify anticompetitive conduct. This section discusses two types of anti-competitive conduct for which we monitor in the secondary market. In the current period we find no evidence of anti-competitive conduct.

In any commodity market, one potential concern is that a firm could hoard a substantial share of the supply of a commodity to influence prices or to prevent a competitor from obtaining production inputs. Hence, we screen information on the holdings of CO<sub>2</sub> allowances and the demand for allowances to identify firms that might acquire a position that raises competitive concerns.

Another potential concern is that a firm expecting to purchase CO<sub>2</sub> allowances in the auction might sell a large number of allowances below the competitive level. Such a firm might profit from buying a larger number of CO<sub>2</sub> allowances in the auction at a discount if the bidding in the auction were influenced by the depressed transfer price. For this to be a profitable strategy, the firm would need to be able to substantially depress the current price with a relatively small amount of sales—an amount smaller than the amount of CO<sub>2</sub> allowances it planned to buy in the auction. Firms that are looking for an opportunity to sell excess allowances or to purchase CO<sub>2</sub> allowances for their future compliance needs to limit the effectiveness of a strategy to depress prices below the competitive level.