

Respondents:

New Hampshire Department of Energy, Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), and Until Energy Systems, Inc. (UES)

Docket No. DE 22-060

Date Request Received: June 21, 2023

Date of Response: July 19, 2023

Data Request No. RR-001

Page 1 of 1

Request from: New Hampshire Public Utilities Commission

Request:

Please provide the default service rates for

	Eversource		Liberty		UES		Composite
	Average Annual Residential Default Service Price (\$/kWh)	Load Served (kW)	Average Annual Residential Default Service Price (\$/kWh)	Load Served (kW)	Average Annual Residential Default Service Price (\$/kWh)	Load Served (kW)	Load-Weighted Residential Default Service Price (\$/kWh)
2018							
2019							
2020							
2021							
2022							
2023							

Response:

Joint Utilities Response

Please see Attachment RR-001 for the information requested.

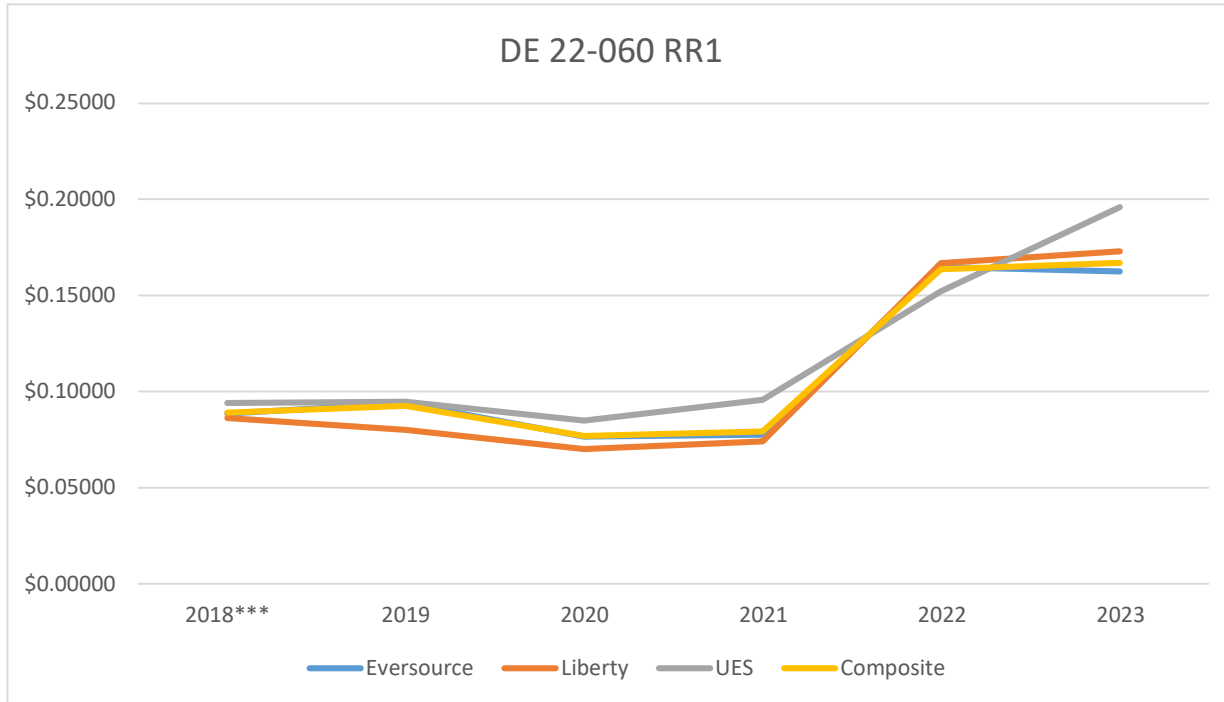
Year*	Eversource		Liberty		UES		Composite
	Average Annual Small Customer** Default Service Price (\$/kWh) (a)	Load Served (kWh) (b)	Average Annual Small Customer Default Service Price (\$/kWh) (a)	Load Served (kWh)	Average Annual Small Customer Default Service Price (\$/kWh) (a)	Load Served (kWh)	
2018***	\$0.08858	2,595,572,654	\$0.08615	448,964,601	\$0.09412	463,083,617	\$0.08900
2019	\$0.09391	3,177,080,471	\$0.08005	438,530,685	\$0.09475	451,590,805	\$0.09251
2020	\$0.07668	3,431,044,185	\$0.07009	445,634,131	\$0.08489	483,997,589	\$0.07692
2021	\$0.07761	3,569,546,463	\$0.07411	455,346,583	\$0.09570	488,415,748	\$0.07922
2022	\$0.16485	3,561,241,074	\$0.16674	452,844,231	\$0.15219	486,514,143	\$0.16367
2023	\$0.16247	3,415,339,228	\$0.17310	450,588,191	\$0.19591	454,834,260	\$0.16710

Notes: *Year = February through January; **Small Customer, not just residential; ***After generation divesture, initial Eversource RFP was 4 months

Sources:

- a. Small Customers (Rate R, G, & OL) Weighted Average Energy Service Rate Calculation filings
- b. Small Customer Volume from Migration Summary for Default Service

Docket DE 22-060
Record Request 1
Attachment RR-001



Respondents:

New Hampshire Department of Energy, Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), and Unitil Energy Systems, Inc. (UES)

Docket No. DE 22-060

Date Request Received: June 21, 2023

Date of Response: July 19, 2023

Data Request No. RR-002

Page 1 of 4

Request from: New Hampshire Public Utilities Commission

Request:

2a. Please develop a moving average of the composite prices generated from Record Request 1, brought to 2024 dollars.

2b. Using that [data], please re-run the avoided costs reflected in the Addendum to the New Hampshire Value of Distributed Energy Resources.

Please state any further assumptions and provide any additional description of the required steps necessary for the Commission to understand the derived results.

Response:

2a: NH Electric Utilities:

The Joint Utilities converted the composite rates from Record Request 1 to 2023 dollars (and not 2024 dollars) because the Consumer Price Index for All Urban Consumers: All Items in U.S. City Average—the index used to convert nominal dollars to real dollars—only has data through May of 2023. 2024 data is not yet available.

Then, the Joint Utilities created a “moving average” by starting with the 2018 composite rate from Record Request 1 (converted to 2023 dollars) and then averaged in each successive year to the “moving average.” See Attachment RR-001a. For an example of the moving average calculation, the \$0.10818/kWh under the Moving Average (in 2023 dollars) column for 2019 is the average of the 2018 and 2019 composite rates and the \$0.10204/kWh under the Moving Average (in 2023 dollars) column for 2020 is the average of the 2018, 2019, and 2020 composite rates, and so on through 2023.

2a: NH Department of Energy comment:

Based on data received from Liberty, Eversource, and UES (the Utilities), the historical composite rates and 3-year moving average values in Attachment RR-002.b were derived over the 2018-2023 period (all expressed in 2023 dollars). The moving average values in Attachment RR-002.b differ slightly from those shown by the utilities in Attachment RR-002.a. This is because the Attachment RR-002.b moving average values use a 3-year moving average, starting

Respondents:

New Hampshire Department of Energy, Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), and Until Energy Systems, Inc. (UES)

Docket No. DE 22-060

Date Request Received: June 21, 2023

Date of Response: July 19, 2023

Data Request No. RR-002

Page 2 of 4

in 2020 and looking back three years, as opposed to the approach by the utilities that averaged all preceding years, as described in 2a.

2b: NH Department of Energy:

The Department provides Attachment RR-002.b in response to this request. However, it notes that the results produced are likely unreliable, and not beneficial, as the request calls for an analysis that incorporates changes to the basic underlying avoided cost criteria of the Value of Distributed Energy Resources (VDER) study. These were developed after a lengthy stakeholder process as directed by Order No. 26,029, issued June 23, 2017, in Docket No. 16-576 within the scope directed by that Order and approved by the Commission in Order No. 26,316, issued December 18, 2019, in the same docket.¹ Page six of Order No. 26,316 lists the 17 avoided cost criteria that were approved by the Commission for analysis in the study - including energy costs, transmission capacity, distribution grid support services, etc. - along with descriptions of recommended or approved methodology for analyzing each individual avoided cost criteria's estimated impact on total avoided costs over a 15-year period. The Commission also specifically noted in Order No. 26,316 that, although most parties objected to inclusion of at least one of the avoided cost criteria in the study, "we are not persuaded that the scope of the study should be modified to exclude any criteria that were recommended by Staff following the stakeholder working group's collaborative consultation process." See p. 24 of Order No. 26,316.

In Order No. 26,029, issued June 23, 2017, in Docket No. 16-576, the Commission provided an initial study scope as guidance for the parties to use when further developing the VDER study scope, including the use of methodology consistent with energy efficiency analysis. The Commission stated that, "[t]he methodology for conducting the value of DER study should be generally consistent with that used to evaluate energy efficiency resource standard program investments." See p. 61 of Order No. 26,029. In their December 18, 2019, Order approving the final study scope, the Commission reaffirmed that, "consistency with energy efficiency benefit-cost analysis, where appropriate, is an underlying priority of the VDER Study." See p. 25 of Order No. 26,316. As the use of default service rates as avoided cost criteria does not align with AESC and energy efficiency methodologies, default service rates were not included as an avoided cost criteria in the VDER study.

¹ See Order 26,029, pp. 59-62 for the Commission's first directive outlining the VDER study scope.

Respondents:

New Hampshire Department of Energy, Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), and Unitil Energy Systems, Inc. (UES)

Docket No. DE 22-060

Date Request Received: June 21, 2023

Date of Response: July 19, 2023

Data Request No. RR-002

Page 3 of 4

The Commission also stated that the study should be a 15-year forward looking study using forward projections.² The Commission considered and rejected a request by Eversource to carry forward historical trends in certain avoided cost criteria, many of which may be included in default services rates - such as energy, capacity, ancillary services, and renewable portfolio standard costs. The Commission did note that historical data could have relevance and approved the use of three to five years of historical data when possible to verify and validate forward projections, and such approach was used in the NH VDER study. See p. 26 of Order No. 26,316. The use of historical data was not to replace or supplant the use of proven forward-looking price projections, for example energy market forecasts.

Further, the Commission's intent appears to be to use historical data where relevant in analyzing each specific avoided cost criteria - therefore, using historical default service rate data that combines several avoided cost criteria into one input cannot appropriately verify and validate the VDER forward-looking projections. In addition, using historical data, that is fluctuating and influenced by current world events, which are predicted to be short-term, is not an appropriate methodology for forecasting future avoided costs.

The Commission also noted that the study should provide detailed avoided cost information at specific times, which Dunsy Energy and Climate Advisors (Dunsy) used in designing the study and accompanying model.³ As described in more detail in the attached, annual default service rate averages do not fit with the study design and scope. Additionally, the data provided from the utilities in the record request response does not include the recently-approved decreases in default service rates.

The VDER study and model were designed using the approved scope and methodology from Order No. 26,029 and Order No. 26,316, and thus were not designed to use annual default service rate inputs in a way that produces verifiably reliable data. Thus, while the Department provides the requested information, it notes that the data are in conflict with the approved scope of the VDER study and required the use of Dunsy's time, which is limited per contract. As

² See p. 59 of Order No. 26,029, issued June 23, 2017, in Docket No. 16-576. See also pp. 1-2 of Order No. 26,316, issued December 18, 2019, in Docket No. 16-576 for a summary of the approved study design.

³ See p. 4, para. 2 of Order No. 26,316. See also Table 1, Section 2 of the Value of Distributed Energy Resources Scope and Timeline Report, submitted by Commission Staff on May 8, 2018, after a working group and stakeholder process. The scope outlined in this report was approved, with some modifications, by the Commission in Order No. 26,316. [16-576 2018-05-09 STAFF VDER STUDY SCOPE TIMELINE RPT.PDF \(nh.gov\)](#).

Respondents:

New Hampshire Department of Energy, Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), and Unutil Energy Systems, Inc. (UES)

Docket No. DE 22-060

Date Request Received: June 21, 2023

Date of Response: July 19, 2023

Data Request No. RR-002

Page 4 of 4

discussed in detail in Attachment RR-2.b, the results are likely unreliable, and the Department does not recommend they be relied on in deciding any issues in this matter. Accordingly, the Department does not intend to offer this analysis as an exhibit and does not intend to offer a witness to sponsor the results for use in this docket.

Please see Attachment RR-002.b prepared by Dunskey, which provides the requested analysis.

2b. Joint Utilities' Comment:

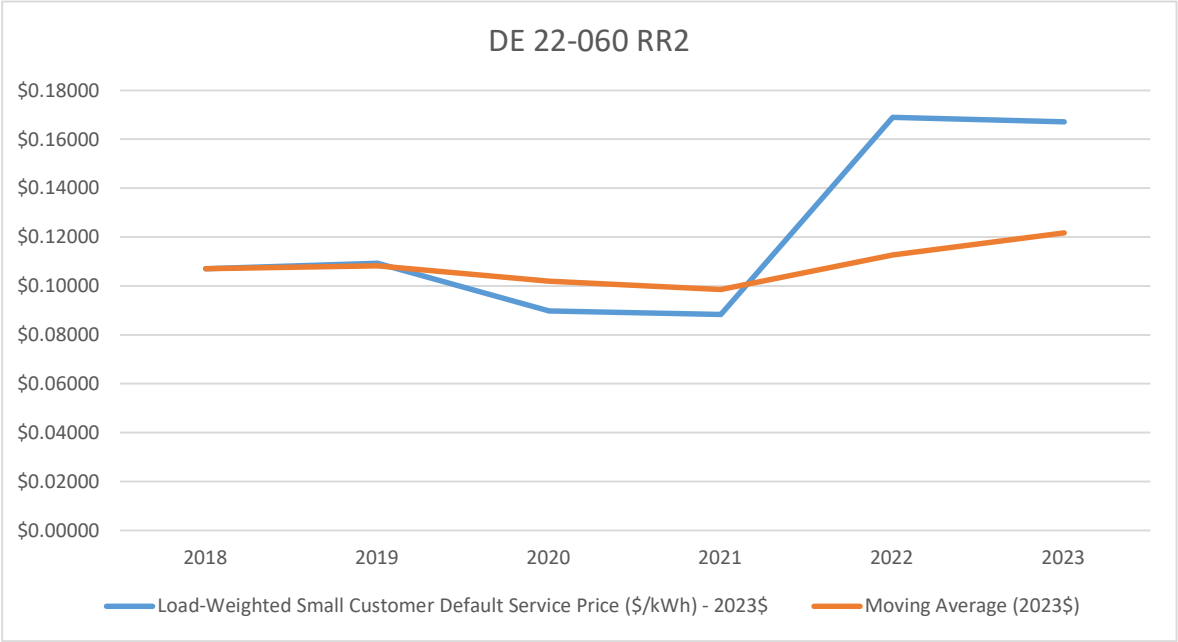
To the extent that the DOE finds the substance of this response to be unreliable, the Joint Utilities concur with the Department's recommendation for treatment of this information.

**Docket DE 22-060
Record Request 2
Attachment RR-002a**

	Composite	
Year	Load-Weighted Small Customer Default Service Price (\$/kWh) - 2023\$	Moving Average (2023\$)
2018	\$0.10705	\$0.10705
2019	\$0.10930	\$0.10818
2020	\$0.08975	\$0.10204
2021	\$0.08830	\$0.09860
2022	\$0.16894	\$0.11267
2023	\$0.16710	\$0.12174

Sources: Load-Weighted Small Customer Default Service Price (\$/kWh) from Record Request #1 brought to 2023 dollars using the Consumer Price Index for All Urban Consumers

Docket DE 22-060
Record Request 2
Attachment RR-002a



To: New Hampshire Department of Energy

From: Alex Hill, Anirudh Kshemendranath (Dunsky Energy + Climate Advisors)

Date: 2023-07-10

Re: NH -DOE Response to Procedural Order Re: Record Request #2

1. Context

The New Hampshire Public Utilities Commission issued a procedural Order Re: Record Requests as part of the Docket DE 22-060. The Order requests that the New Hampshire Department of Energy collaborate with the New Hampshire Regulated Utilities to provide a coordinated response to the record requests as follows:

- Record Request 1 asks that the utilities provide default service rates for the years 2018 to 2023. Additionally, they were tasked with developing a composite Load Weighted Residential Default Service Price in (\$/kWh).
- Record Request 2 asks that the avoided costs in Addendum to the New Hampshire Value of Distributed Energy Resources study be re-run using the moving composite rates.

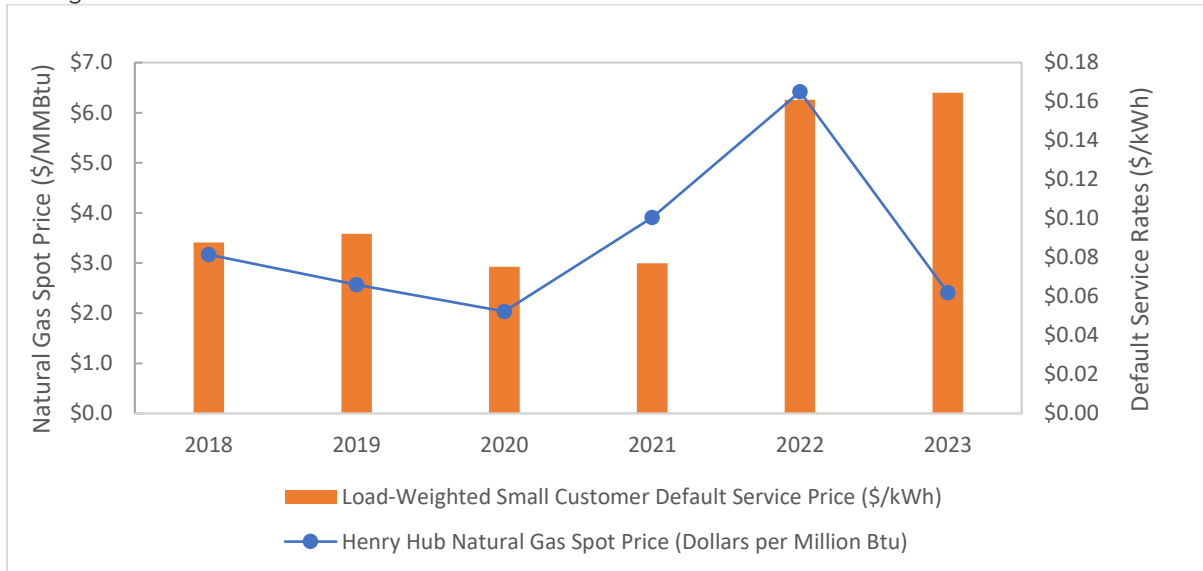
2. Response to Record Request 2

Dunsky Climate + Energy Advisors, who prepared the New Hampshire Value of Distributed Energy Resources (VDER) study offers the following considerations in responding to the NH PUC requests. Overall, three potential pitfalls are noted when comparing the avoided costs in the VDER analysis to the composite rates derived from the utility data:

1. **Lack of clarity over which avoided cost values are accounted for (partially or wholly) within the utility default service rates:** The VDER analysis applied a set of 17 value streams to develop technology-agnostic avoided costs. If a customer doesn't participate in the competitive retail electricity market, they will automatically receive the default energy service from one of the regulated distribution utilities, which is reflective of a subset of the overall VDER avoided costs. The utility default service rates are determined through a competitive solicitation process and generally reflect wholesale market prices. As a result, these rates include various VDER avoided cost components such as energy, capacity, DRIPE, line losses, and RPS. Since the other cost streams identified in the VDER study relate to either transmission or distribution components and are applied to all customers irrespective of their choice of energy supplier, they are not included in the default service rate. Furthermore, utilities generally include administrative and general expenses related to procuring energy services for their customers in their default energy service rates. These administrative costs were not developed as a part of the VDER study. Therefore, it is not fully clear to what degree each avoided cost stream can be accounted for within the default service rates, which may lead to a risk of double counting or omitting avoided cost streams if the composite rate is applied for VDER analysis.

2. **Extrapolating default service rates over the VDER study period may fail to account for evolving trends that drive the VDER avoided costs:** The VDER study applied forward-looking projections of avoided costs over the study period (2023-2035). The moving average composite rates effectively capture the recent trend in the default rates, but it is unclear from the PUC’s request how these values should be projected forward over the study period and DER lifetimes. Moreover, extrapolating the historical composite prices suggests that trends and influences on the default service rates over the past six years will continue steadily over the study’s avoided cost window. However, this may not hold for the long-term forecasts applied in the VDER study, which are extended to 2035. According to a previous order¹ from the New Hampshire Public Utilities Commission, the rise in default service rates has been primarily attributed to increased natural gas prices. As seen in Figure 1 below, the volatility in the natural gas prices is closely correlated with the volatility observed in the default service rates. However, the latest Henry Hub forecasts anticipate natural gas prices decreasing and then stabilizing over the next fifteen years², which would ideally lead to an initial decline and further stabilizing in default service rates, as has been applied in the VDER study avoided costs, but would not be captured from extrapolating the historical composite rates.

Figure 1: Correlation between Natural Gas Prices³ and Default Service Rates



3. **Failure to account for time-varying attributes:** Regardless of the extrapolation method applied to the composite rates, the resulting avoided cost would fail to account for time-varying components in the VDER avoided costs stack. The accepted methodology in the VDER study included hourly avoided costs that reflect the time dependence of various value streams. Because many DERs have intermittent impacts on the electricity system, it is critical to apply hourly avoided costs to accurately capture the anticipated value that a given DER delivers over a given period. The annual average composite rates would conflate many avoided cost streams that vary from hour to hour, thereby reducing the accuracy of the underlying VDER assessments.

¹ [Order 26-532 \(Unitil, 2021\)](#)

² <https://www.cmegroup.com/markets/energy/natural-gas/natural-gas.quotes.html>

³ <https://www.eia.gov/dnav/ng/hist/rngwhhdM.htm>

Avoided Cost Comparison

Based on data received from Liberty, Eversource, and UES, the following historical composite rates and 3-year moving average values were derived over the 2018-2023 period (all expressed in 2023 dollars).

Table 1: Historical Electric Utility Composite Default Service Rates (2018-2023)

Year	Composite ⁴	
	Load-Weighted Small Customer Default Service Price (\$/kWh) - 2023\$	3-year Moving Average (2023\$)
2018	\$0.10705	
2019	\$0.10930	
2020	\$0.08975	\$0.10204
2021	\$0.08830	\$0.09578
2022	\$0.16894	\$0.11566
2023	\$0.16710	\$0.14145
Average	\$0.12174	n/a

To apply these composite service rates as avoided costs, and compare them to the avoided costs in the VDER study addendum, we developed an estimate of the default service rates that can be derived from the avoided costs in the VDER study. Recognizing that the default service rates represent a subset of the avoided costs applied in the study, the set of avoided costs that are most likely captured within the utilities' default service rates were identified and summed to provide a VDER study default service rate to facilitate comparison with the historical composite rates. The components that are most likely to be accounted for in the default service rates are:

- **Avoided Energy Costs:** If a customer decides not to opt for energy from the competitive retail market, a utility will purchase power at the prevailing rates determined by the wholesale energy market. These costs were derived using the AESC wholesale energy price forecasts⁵, accounting for the recent natural gas price escalations update. To lower energy supply costs in default service rates, the utility could obtain a long-term energy contract; however, for simplicity, we have assumed the wholesale energy avoided cost as a proxy for the energy supply cost in the default service rate.
- **Avoided Capacity:** Besides energy, the utility must also obtain capacity to ensure that resources can meet the anticipated peak demand from customers who do not choose energy from the competitive retail market. These costs were derived using the AESC wholesale capacity price forecasts and included a 14% reserve margin cost. We have assumed the wholesale capacity avoided cost as a proxy for the capacity cost in the default service rate.

⁴ Sources: Load-Weighted Small Customer Default Service Price (\$/kWh) from Record Request #1 brought to 2023 dollars using the Consumer Price Index for All Urban Consumers

⁵ AESC 2021 Study, Counterfactual 2

- **Avoided Ancillary Services:** Increasing energy procured through the wholesale market could increase the ancillary service charges and other load obligation charges assessed on New Hampshire’s utilities, thereby increasing default service rates.
- **DRIFE:** Increasing the overall energy and capacity procured through the wholesale energy and capacity market could result in higher market clearing prices and thereby increase the default service rates.
- **Renewable Portfolio Standard:** Consistent with a previous order⁶ by the New Hampshire Public Utilities Commission, the default energy price would include an amount the utility must pay to comply with New Hampshire’s Renewable Portfolio Standard (RPS) requirements under RSA 362:F. The AESC provides RPS avoided cost forecasts by state.
- **Risk Premium:** Typically, the full retail price of electricity for customers is higher than the combined cost of energy, capacity, and ancillary services in the wholesale market. Wholesale suppliers take on market risks when they set prices before delivering the supply, which leads to increased costs. To account for higher risks in fuel supply, near-term wholesale risk premiums were set at around 11%, resulting in increased costs. However, these premiums are expected to fall back to the default assumption of 8% over time.

Table 2 below provides a detailed breakdown of estimated default service rates avoided costs derived from the relevant VDER study avoided cost components from 2024 to 2035.

Table 2: Avoided Cost Comparison between VDER Study and Projections from Historical Composite Rates (\$/kWh)

Annual Average Avoided Costs	2024	2026	2028	2030	2032	2035
Avoided Costs from VDER Study Addendum 1						
Energy	\$ 0.069	\$ 0.065	\$ 0.047	\$ 0.048	\$ 0.048	\$ 0.052
Capacity	\$ 0.005	\$ 0.005	\$ 0.006	\$ 0.007	\$ 0.007	\$ 0.007
RPS	\$ 0.003	\$ 0.003	\$ 0.003	\$ 0.002	\$ 0.002	\$ 0.002
Risk Premium	\$ 0.009	\$ 0.007	\$ 0.005	\$ 0.006	\$ 0.006	\$ 0.006
Ancillary Services	\$ 0.003	\$ 0.003	\$ 0.002	\$ 0.002	\$ 0.002	\$ 0.002
DRIFE	\$ 0.007	\$ 0.006	\$ 0.006	\$ 0.006	\$ 0.007	\$ 0.007
<i>Default Service Rate Avoided Costs derived as a sum of the above values</i>	\$ 0.096	\$ 0.088	\$ 0.068	\$ 0.070	\$ 0.071	\$ 0.075

The Commission requested that new avoided costs be developed based on the moving average of the historical composite rates. However, it is unclear what method the Commission had in mind for projecting these historical rates forward. Three potential options could be:

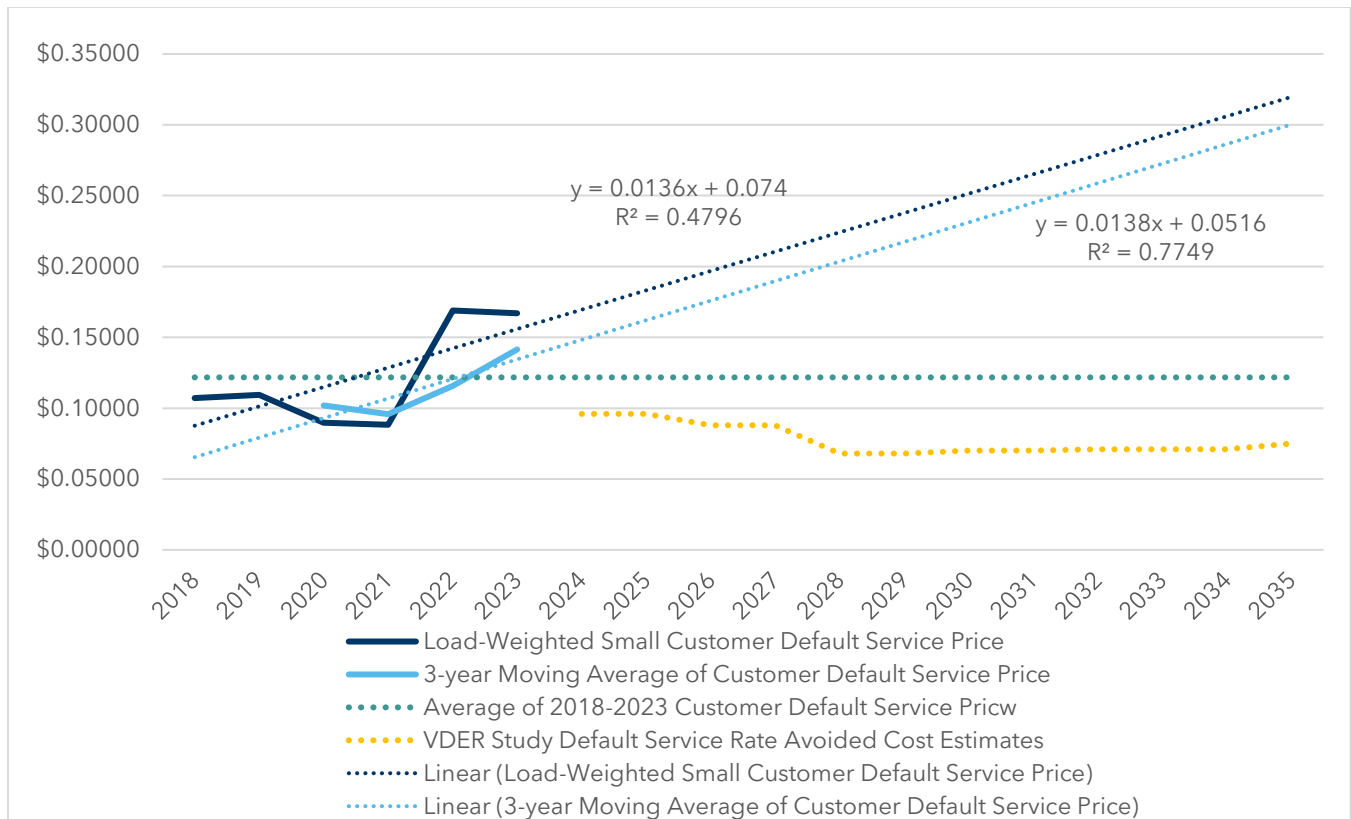
- 1) Extrapolate a trendline based on the 3-year moving average values.
- 2) Extrapolate based on the series of annual composite rates (2018-2023) or
- 3) Hold the 2018-2023 period average value constant over the entire study period (to 2035).

Figure 2 below provides the trend lines for the extrapolation approaches listed above, including the average composite rate for the full 6-year period as presented in Table 1 above. For comparison, it also includes the default service rate avoided costs derived from the VDER study addendum values

⁶ [ORDER_26491 \(Eversource, 2021\)](#)

to provide a comparison of the avoided costs resulting from each approach, as presented in Table 2 above.

Figure 2: Historical Composite Rates and Associated Trend Lines⁷ (all values in 2023\$)



Note: The blue dotted lines in Figure 2 represent linear regression fits to the annual and 3-year moving average data.

Overall, the avoided costs resulting from extrapolating the composite rates are consistently higher than avoided costs applied in the VDER study under all methods, as demonstrated by the default service rate comparison presented in Table 2 above. Moreover, the above comparison shows the exaggerated impact of the extrapolation method selection on the resulting avoided costs values. This calls into question the validity of this approach for developing avoided costs for VDER analysis.

Key Conclusions

- Projected utility composite rates are notably higher than VDER study avoided costs:** Applying historical composite default rates to predict future avoided cost may over-estimate avoided cost values moving forward, as the avoided cost values derived from the moving average and trend lines of composite rates are consistently higher than the detailed avoided costs estimates applied in the VDER study.
- The composite rate projections are likely too heavily influenced by recent upward forces on default service rates:** The various projections of composite rates appear to be

⁷ The trendlines in the figures apply annual values sequentially, wherein for 2018, x=1, and for 2023, x = 6 in the trendline equations.

highly influenced by recent increases in natural gas prices, and extrapolation of past trends from a relatively short period of six years is likely insufficient to provide a valid data set from which to extrapolate default service rate avoided cost over the coming twelve year period (2024-2035).

- **The composite rates extrapolation only offers average annual avoided costs, which cannot capture the impact of DER intermittency.** The composite rates were derived from values that are updated by the utilities every 6-12 months, and therefore do not capture the hourly variations in avoided costs, as is presented in the VDER study addendum values and the VDER model. Applying these would therefore fail to account for the time varying value of DERs on the NH electricity system.