

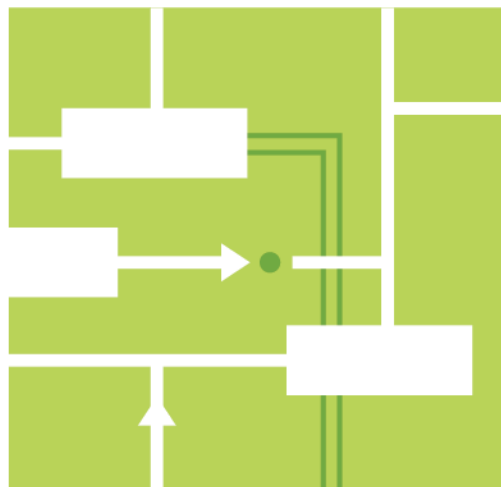
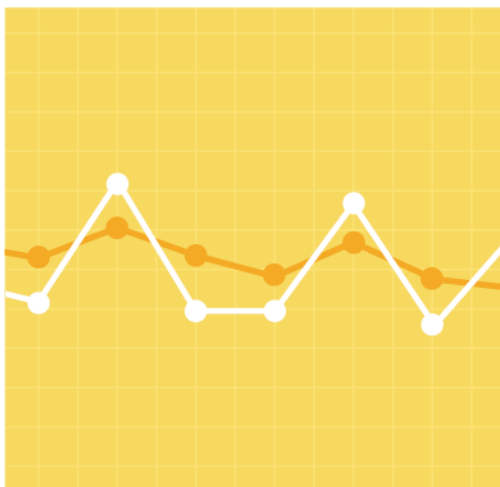


Monthly Regional Network Load Cost Report December 2017

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Market Analysis and Settlements

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Section 1

Introduction

Created in 1997, ISO New England Inc. (ISO) is the not-for-profit regional transmission organization (RTO) responsible for the day-to-day reliable operation of the electric power generation and transmission system within the New England area, oversight and administration of the region's wholesale electricity markets and regional transmission service, and management of a comprehensive regional power system planning process.

The ISO operates under the *ISO New England Transmission, Markets, and Services Tariff* (the tariff), approved by the Federal Energy Regulatory Commission (FERC).¹ The tariff contains the detailed rules governing the provision of wholesale electric energy, capacity, transmission, reliability, and ancillary and other services, including the allocation of costs and billing for these services. The totality of these costs to load may be termed "total wholesale load costs." The larger portion of these costs, which include energy, capacity, and ancillary market charges are estimated and analyzed in \$/megawatt-hour (MWh) of electric load and reported elsewhere on the ISO website.²

The smaller portion of "total wholesale load costs," reported here, are associated with providing *regional network service* (RNS) and other services to transmission customers that collectively provide for the use of transmission facilities, reliability, and certain administrative services.³ The *Open Access Transmission Tariff* (OATT) (Section II of the ISO tariff) governs the allocation of these costs, which are billed according to a transmission customer's *regional network load* (RNL).⁴ The RNL is the customer's hourly load at the time of the peak load of its local transmission network. The aggregate of these costs generally is referred to as "OATT costs" or "RNL costs," which are charged and reported by \$/MW-Month.⁵

In response to requests from various New England stakeholders to increase transparency and facilitate their understanding of all the costs of serving load in New England, particularly those associated with transmission, the ISO has already published the [Historical Regional Network Load Cost Report](#) (Historical NLCR), which provided a comprehensive study of RNL costs for 2012 to 2016.⁶ The Historical NLCR provides a deeper background and discussion on the majority of concepts discussed in this report, and we recommend the reader reference the historical report for additional information.

¹ The *ISO New England Transmission, Markets, and Services Tariff* (2009), includes the *Open Access Transmission Tariff* (OATT) (Section II) and the *Self-Funding Tariff* (SFT) (Section IV). The OATT provides the terms and conditions for nondiscriminatory, open-access transmission services over the New England transmission system and comparable, nondiscriminatory treatment of all transmission owners (TOs), transmission providers, and transmission customers taking transmission services under the OATT. The SFT, Schedule 1, provides the terms and conditions for cost recovery associated with the scheduling, dispatch, and control service using RNL as an allocator, and the SFT Schedules 2 and 3 provide for cost recovery of other aspects of ISO operations allocated through non-RNL mechanisms. These documents are available [here](#).

² These costs are reported in the *Wholesale Load Cost Report*, available [here](#).

³ Total wholesale load costs include those reported here as well as those reported in the Monthly Wholesale Load Cost Report.

⁴ The OATT defines *network load* as a network customer's hourly load coincident with the aggregate load of all network customers served in each local network in the hour in which the respective local network's aggregate load is at its maximum for the month (i.e., the monthly peak).

⁵ To convert \$/MW-Month to \$/kW-month, divide \$/MW-Month by 1,000.

⁶ The *2012-2016 Historical Network Load Cost Report* provides the historical basis for this *monthly* report and is available [here](#).

RNL costs are categorized as follows, according to provisions in the OATT:⁷

- **Infrastructure** cost category—recovers the following costs associated with the use of pool transmission facilities (PTFs):⁸
 - Pre-1997 transmission infrastructure costs
 - Post-1996 transmission infrastructure costs
- **Reliability** cost category—recovers the costs associated with maintaining the following power system reliability services:
 - Resources retained for reliability (RFR) in the Forward Capacity Market (FCM)
 - Voltage support⁹
 - High-voltage control
 - System restoration¹⁰
 - Load-response program
- **Administrative** cost category —recovers the costs associated with the administration of power system reliability and consists of the following:
 - PTO dispatch and control¹¹
 - ISO dispatch and control
 - New England States Committee on Electricity (NESCOE) budget¹²

This *Monthly Regional Network Load Cost Report* (Monthly NLCR) summarizes RNL costs over the most recent thirteen months. This report is produced on a one-month lag to account for the many OATT settlement processes that lag behind other, non-OATT settlement processes by one month.

⁷ The full definitions and processes associated with the listed terms and concepts are included in the tariff and the ISO's operating procedures, available at http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_i.pdf and <http://www.iso-ne.com/participate/rules-procedures/operating-procedures>.

⁸ PTFs are certain transmission lines (69 kilovolts [kV] or greater), associated equipment, and facilities over which ISO New England has operational control. These facilities are owned and maintained by a group of approximately 17 participating transmission owners. PTFs do not include those lines and facilities that serve local load only or are generator leads (i.e., radial transmission from a generator bus to the nearest point on the PTF). The ISO reviews the status of transmission lines and related facilities at least once per year. A current listing of PTFs is available [here](#). See the ISO tariff, Section II. H. II. 49 for a more detailed description of PTFs.

⁹ Voltage control is when reactive power is used to maintain transmission voltages for meeting the operating requirements of the New England transmission system.

¹⁰ System restoration ("black-start") services enable the ISO to designate specific generators to start without an outside electrical supply following the partial or full shutdown of the transmission system.

¹¹ PTOs are participant companies that own or support the PTFs in the New England Balancing Authority Area and are eligible to submit revenue requirements to recover their costs. Of the PTOs that supported a portion of the PTFs during 2007 to 2011, approximately 20 both owned and operated facilities in the local networks. An even smaller group of currently eight PTOs are recognized as having local network RNS rates, as discussed throughout the report. According to the North American Electric Reliability Corporation (NERC), which is the organization responsible for ensuring the reliability of the bulk power system in North America, a balancing authority area is a group of generation, transmission, and loads within the metered boundaries of the entity (balancing authority) that maintains the load-resource balance within the area. Balancing authority areas were formerly referred to as control areas. Further information is available in the NERC glossary found [here](#).

¹² NESCOE is the FERC-approved regional-state committee for advising the ISO on the development of the Regional System Plan. The ISO serves as the vehicle for recovering funds from transmission customers to cover NESCOE's budgeted operating expenses. More information is available at www.nescocoe.com.

For illustrative purposes, this report provides summaries of the RNL costs at several levels, including the balancing authority area (or pool), reliability region, state, and local network levels.¹³ The New England Balancing Authority Area is divided into eight reliability regions that have local networks with RNS rates. Table 1-1 lists these regions and the eight local networks and participating transmission owners operating in each one that had local RNS rates during the past few years.

**Table 1-1
Local Network to Reliability Region Mapping**

Reliability Region	Local Network ^(a)
Connecticut (CT)	Local network of the Northeast Utilities service companies (NU) ^(b) Local network of United Illuminating (UI)
Maine (ME)	Local network of Emera Maine Bangor Hydro Division (EM-BHE) Local network of Central Maine Power (CMP) Local network of NU
New Hampshire (NH)	Local network of the National Grid USA companies (NGRID) Local network of NU Local network of the New Hampshire Transmission, LLC (NHT)
Northeastern Massachusetts (NEMA)	Local network of NGRID Local network of NSTAR
Rhode Island (RI)	Local network of NGRID
Southeastern Massachusetts (SEMA)	Local network of NGRID Local network of NSTAR
Vermont (VT)	Local network of VT Transco LLC and Vermont Electric Power (VT Transco/ VELCO)
Western/Central Massachusetts (WCMA)	Local network of Fitchburg Gas and Electric Light (FGE) Local network of NGRID Local network of NU

(a) Several of the local networks reside in more than one reliability region or state jurisdiction.

(b) The NU local network falls under responsibility of Eversource.

New England state level summarizations are shown in Section 8 of the report. Each New England state is comprised of its respective reliability region of the same name, except for the state of Massachusetts (MA), which is comprised of the NEMA, SEMA, and WCMA reliability regions.

Each PTO with a local network RNS rate is responsible for determining the peak RNL value on its local network in a given month and for identifying the share of RNL to be assigned to each of the network load assets in its local network. The [Historical Regional Network Load Cost Report](#) contains additional information about the local networks with local network RNS rates in New England.

¹³ *Reliability regions* are regions of the New England Balancing Authority Area that reflect the operational characteristics of the transmission system and therefore form the basis for allocating costs of certain wholesale market products and services. For example, costs for high-voltage control are allocated to RNL customers who benefit from that particular ancillary service within their specific reliability region. A *local network* is a portion of the PTF owned or operated by a PTO and serving RNL and “through or out service.” This report removes the effect of through-or-out transactions on costs. “*Through-or-out service*,” is the delivery of electricity over the PTFs through or from New England to another balancing authority area. This report does not provide summaries of the costs associated with the provision of Schedule 21–Local Service; Schedule 18, *Merchant Transmission Facility (MTF) Service*, or Schedule 21, *Other Transmission Facilities (OTF) Service*, under the OATT.

Section 2

Summary of Regional Network Load (RNL) Costs, December 2017

This section summarizes data on RNL and RNL costs for December 2017:

- **New England RNL**— Pool-aggregate RNL during December was 20,164 MW-Month, reflecting an increase of 3,403 MW-Month from the prior month and an increase of 3.6% from December of the prior year.
- **New England Average RNL Costs**
 - December RNL costs were approximately 15.5% of total wholesale load costs.¹⁴
 - In December, the average RNL cost for New England was \$9,859/MW-Month, an increase of \$29/MW-Month, or 0.3%, from the November values, and an increase of 7.4% from the prior year.
- **New England Average RNL Costs by Major Category**—Average RNL costs varied across all RNL cost categories:
 - **Infrastructure** costs¹⁵, for which underlying rates change on June 1 of each year, averaged \$9,330/MW-Month during December, unchanged from the November values, and an increase of 7.5% from the prior year. Infrastructure costs were approximately 95% of overall RNL costs.
 - Post-96 infrastructure costs averaged \$7,888/MW-Month, unchanged from November, and an increase of 8.9% from the prior year.
 - Pre-96 infrastructure costs averaged \$1,441/MW-Month, unchanged from November, and an increase of 0.7% from the prior year.
 - **Reliability** costs averaged \$181/MW-Month in December, reflecting an increase of \$29/MW-Month, or 18.8%, from the November values, and an increase of 12.6% from the prior year. Reliability costs were approximately 2% of overall RNL costs.
 - Voltage support (regional) costs averaged \$82.29/MW-Month, a decrease of \$10.30/MW-Month from the prior month.
 - System Restoration costs averaged \$49.92/MW-Month, a decrease of \$10.14/MW-Month from the prior month.
 - High Voltage control costs averaged \$49.15/MW-Month, up from \$0.00/MW-Month the prior month.
 - **Administrative** costs averaged \$348/MW-Month in December, unchanged from the November values, and an increase of 0.8% from the prior year.¹⁶ Administrative costs were approximately 4% of overall RNL costs.

¹⁴ Total wholesale load costs include those reported here as well as those reported in the [Monthly Wholesale Load Cost Report](#).

¹⁵ The RNS rate may change during the annual period as it is subject to regulatory proceedings and resettlement.

¹⁶ See Section 6 for discussion of factors that affect year-over-year changes in administrative component costs.

- Reliability Region Average RNL Costs**— RNL costs were slightly higher in the Northeastern Massachusetts (NEMA) reliability region, averaging \$10,061/MW-Month, compared with \$9,810/MW-Month in the remaining reliability regions, due to the High Voltage Control charge for that region.

Table 2-1 provides a summary of New England average RNL costs for the current month for each cost component discussed in this report.

**Table 2-1
New England Average RNL Costs**

Month	Major Cost Category	Cost Concept	Cost Rate (\$/MW-Mo.)	Delta from Prior Month (\$/MW-Mo.)	Delta from Prior Month (%)
Dec-17	Infrastructure	Post-96 Infrastructure	\$7,888.34	\$0.00	
		Pre-1997 Infrastructure	\$1,441.49	\$0.00	
		Infrastructure subtotal	\$9,329.83	\$0.00	0.00%
	Reliability	FCM PDFR	\$0.00	\$0.00	
		FCM RFR	\$0.00	\$0.00	
		High Voltage Control	\$49.15	\$49.15	
		System Restoration	\$49.92	(\$10.14)	
		Voltage Support	\$82.29	(\$10.30)	
		Reliability Subtotal	\$181.36	\$28.71	18.81%
	Administrative	ISO Dispatch & Control	\$190.93	\$0.00	
		NESCOE Budget	\$6.78	\$0.00	
		PTO Dispatch & Control	\$150.59	\$0.00	
		Administrative subtotal	\$348.30	\$0.00	0.00%
		Total RNL Costs	\$9,859.49	\$28.71	0.29%

Section 3

New England Total and Average RNL Costs

Total wholesale load costs include RNL costs, reported here, as well as various other costs, which include energy and capacity and are reported elsewhere on the ISO Website. RNL costs are the smaller portion of total wholesale load costs. Table 3-1 displays RNL costs as a percentage of the cost of serving load in New England over the last 13 months. Please note that the values in this table reflect **total** pool-wide costs developed on an hourly basis, and will therefore differ somewhat from the **average** values reported in the Wholesale Load Cost Report found [here](#).¹⁷

Table 3-1
RNL as percent of Total Wholesale Load Costs

Month	Total RNL Costs (\$)	Wholesale Load Costs (\$)	Total Wholesale Load Costs (\$)	RNL as % of Total
Dec-16	\$178,633,679	\$686,659,429	\$865,293,109	20.6%
Jan-17	\$176,648,352	\$480,984,045	\$657,632,398	26.9%
Feb-17	\$165,361,192	\$348,229,794	\$513,590,985	32.2%
Mar-17	\$159,787,640	\$443,951,452	\$603,739,092	26.5%
Apr-17	\$143,605,821	\$353,440,616	\$497,046,437	28.9%
May-17	\$180,989,615	\$360,813,746	\$541,803,361	33.4%
Jun-17	\$229,397,231	\$417,698,530	\$647,095,761	35.5%
Jul-17	\$226,419,366	\$481,240,633	\$707,659,998	32.0%
Aug-17	\$217,919,604	\$430,404,736	\$648,324,339	33.6%
Sep-17	\$203,092,432	\$449,840,034	\$652,932,466	31.1%
Oct-17	\$165,793,702	\$448,091,646	\$613,885,348	27.0%
Nov-17	\$164,768,910	\$488,366,400	\$653,135,310	25.2%
Dec-17	\$198,804,851	\$1,085,094,823	\$1,283,899,675	15.5%

Figure 3-1 and Table 3-2 display New England-wide average RNL costs by major category over the past 13 months.

¹⁷ On the left hand side of the page, select “Wholesale Load Cost Analysis Reports” from the document type filter and “PDF” from the file type.

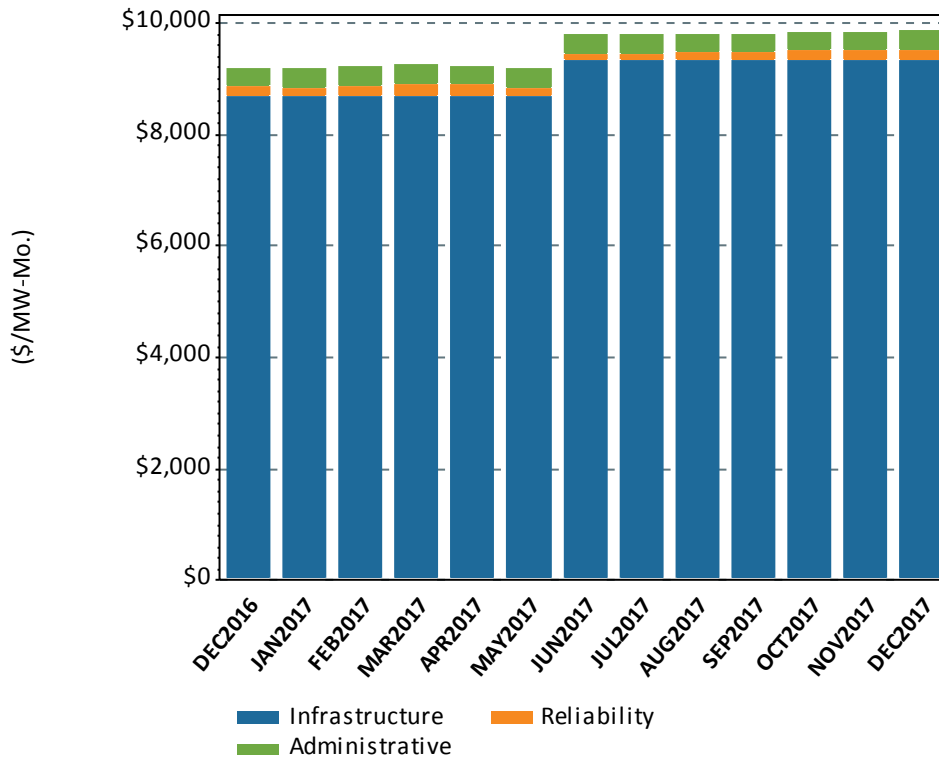


Figure 3-1. New England-level RNL costs by major category, 13 months.

Table 3-2
New England-level RNL Costs by Major Category, 13 Months (\$/MW-Month)

Month	Infrastructure	Reliability	Administrative	Total
Dec-16	\$8,675	\$161	\$345	\$9,182
Jan-17	\$8,675	\$141	\$347	\$9,163
Feb-17	\$8,675	\$190	\$347	\$9,213
Mar-17	\$8,675	\$206	\$347	\$9,229
Apr-17	\$8,675	\$194	\$347	\$9,216
May-17	\$8,675	\$137	\$347	\$9,160
Jun-17	\$9,330	\$111	\$348	\$9,789
Jul-17	\$9,330	\$110	\$348	\$9,788
Aug-17	\$9,330	\$114	\$348	\$9,792
Sep-17	\$9,330	\$123	\$348	\$9,802
Oct-17	\$9,330	\$153	\$348	\$9,831
Nov-17	\$9,330	\$153	\$348	\$9,831
Dec-17	\$9,330	\$181	\$348	\$9,859

Section 4

Infrastructure Costs

The infrastructure category of RNL costs reflects the rates charged through the tariff for the transmission owners' recovery of their infrastructure investments in the PTFs that provide regional transmission service to transmission customers. These investments serve to maintain or expand the PTFs, maintain or improve reliability, and improve the economic performance of the entire New England transmission system. Transmission rates, which are first developed by the PTOs, are currently based on PTF revenue requirements of the prior and current years, as well as the previous year's average of all monthly network load peaks for each local network.¹⁸

As part of industry restructuring, and in response to FERC directives to provide a "nonpancaked," or a single transmission rate, NEPOOL undertook an 11-year transition period from 1997 to March 2008 that revised the rate structure. The result was the convergence of individual local network rates that recovered costs associated with the PTFs (and, therefore, the overall pool transmission rate) into a single rate.¹⁹ Reflecting the transition process, the RNS rate, which is regulated by and filed with the FERC, includes the following two components:

- **Pre-1997 transmission infrastructure costs (Schedule 9 Pre-'97 RNS):**²⁰ This component is associated with PTFs and PTF upgrades placed in service or made before 1997. The pre-1997 values shown throughout the report reflect the FERC-filed rate for each local network. Pre-1997 values are also shown for each reliability region (i.e., at the pool level) for illustration purposes, as applicable. From 1997 to March 2008, each local network had a different rate.
- **Post-1996 transmission infrastructure costs (Schedule 9 Post-'96 RNS):** This component is associated with PTFs and PTF upgrades placed in service or made after 1996. The value shown in the report for each year reflects the FERC-filed rate, which has been homogenous across all local networks since 1997.

The RNS rate, which includes the pre-'97 and post-'96 components, is determined annually²¹ and is effective June 1 through May 31 of the following year.

PTOs typically make a multiple-year forecast of PTF additions (investments), PTO revenue requirements, and RNS rates.²² Such forecasts are meant to be indicative, are subject to change, and are not included here.

The [Historical Regional Network Load Cost Report](#) on the ISO website provides a more detailed description of each of these components and how RNS rates are developed.

¹⁸ See both Section 2.2 and the Appendix of the [Historical Regional Network Load Cost Report](#).

¹⁹ See FERC Order 888 regarding FERC directives to provide nonpancaked rates found [here](#).

²⁰ Schedule 9 of the ISO OATT is available [here](#).

²¹ The RNS rate may change during the annual period as it is subject to regulatory proceedings and resettlement.

²² PTOs publically post this information at the ISO's Transmission Committee website found [here](#).

Figure 4-1 and Table 4-1 show the average monthly infrastructure costs for both the pre-'97 and post-'96 components for the last 13 months.

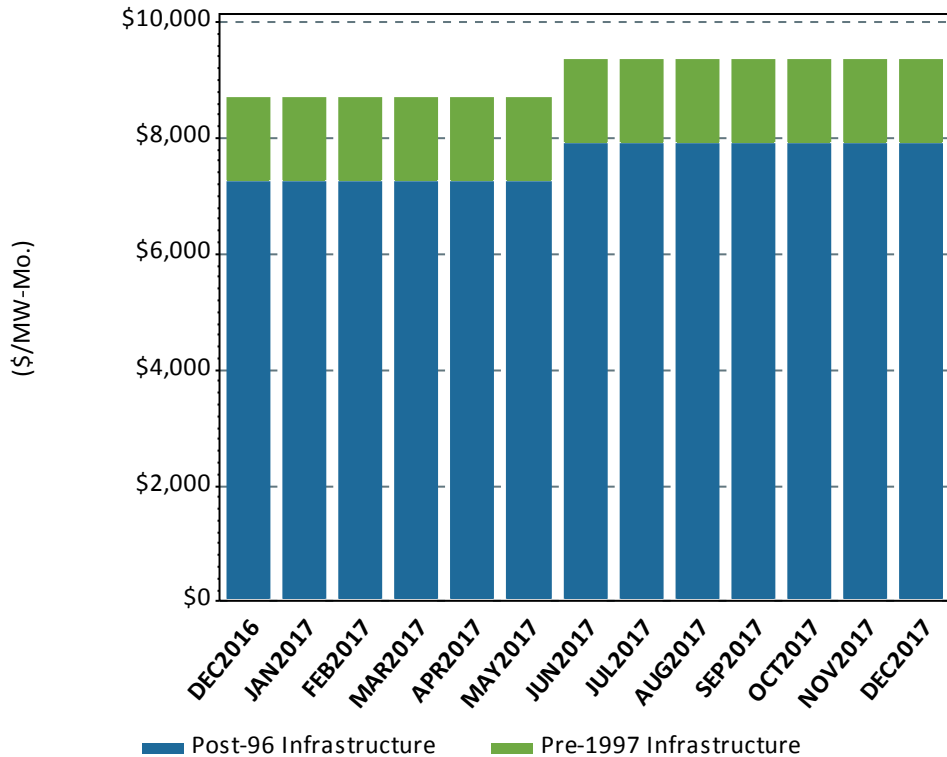


Figure 4-1: Infrastructure costs by type, 13 months.

Table 4-1
Infrastructure Costs by Type, 13 Months (\$/MW-Month)

Month	Post-96 Infrastructure	Pre-97 Infrastructure	Total
Dec-16	\$7,243	\$1,432	\$7,243
Jan-17	\$7,243	\$1,432	\$7,243
Feb-17	\$7,243	\$1,432	\$7,243
Mar-17	\$7,243	\$1,432	\$7,243
Apr-17	\$7,243	\$1,432	\$7,243
May-17	\$7,243	\$1,432	\$7,243
Jun-17	\$7,888	\$1,441	\$7,888
Jul-17	\$7,888	\$1,441	\$7,888
Aug-17	\$7,888	\$1,441	\$7,888
Sep-17	\$7,888	\$1,441	\$7,888
Oct-17	\$7,888	\$1,441	\$7,888
Nov-17	\$7,888	\$1,441	\$7,888
Dec-17	\$7,888	\$1,441	\$7,888

Section 5

Reliability Costs

Reliability services charged through the tariff serve to recover the costs of certain reliability programs and services administered through the OATT.²³ The costs (and rates) in this category are developed by taking total payments for the provided service or program and dividing them by the appropriate value of RNL during the month. The components addressed in this section were listed in the text and footnotes of Section 1 of this report. The [Historical Regional Network Load Cost](#) report provides further background on most of these components and the calculation of their costs.

5.1 Units Retained for Reliability in the Forward Capacity Market

The Forward Capacity Market (FCM), implemented in June 2010, is an auction-based approach to meeting New England’s forecasted capacity requirements for a future year. Resources that clear in the Forward Capacity Auction (FCA) acquire a capacity supply obligation (CSO) and receive payment based on their CSO and the forward-capacity payment rate. Resources that place auction bids to “delist” from the marketplace and have their bid rejected for reliability reasons are considered “retained for reliability” (RFR).²⁴ These RFR resources receive additional reliability credits based on their CSO retained for reliability and the difference between their delist bid price or cost-of-service rate, as approved by FERC, and the FCA clearing price. These reliability credits are allocated to RNL in the reliability region where the resource is located.

In this report, FCM reliability credits in each reliability region were divided by reliability region RNL to derive a \$/MW-Month rate. For illustration and comparison purposes, a systemwide rate also was derived by dividing aggregated FCM reliability credits by aggregated RNL for the entire system.

More information on this subject is available on the ISO website within the [Understanding Your Bill](#) area or in Section III.13.2.5.2.5.1 of [Market Rule 1](#).²⁵

5.2 Reliability Costs by Type, Last 13 Months

Both Figure 5-1 and Table 5-1 show reliability costs by type for the last 13 months. Projects improving the New England electric transmission system that were completed over the past few years have mitigated or eliminated the need for certain reliability programs and services. As a result, reductions in reliability costs have often been evident from year to year.

The benefits of an improved, more efficient transmission system extend beyond the reduced reliability costs reported here. Other benefits include lower transmission congestion costs (reflected in wholesale market prices for electric energy), costs of redispatching the system for providing reserves, and costs paid to less economic generators that provided local-area second-

²³ Not all reliability service costs are recovered through the OATT.

²⁴ Existing capacity resources are required to participate in the FCA and are automatically entered into the capacity auction. However, these resources may indicate a desire to be removed from the FCA by submitting a delist bid before the existing-capacity qualification deadline.

²⁵ Look for the “Forward Capacity Market (FCM) Reliability Credit (& Charge)” line items within the “Invoice and Remittance Advice Item Descriptions” found in the “Understanding Your Bill” portion of the ISO Website.

contingency protection to respect system reliability requirements.²⁶ Transmission investments should continue to play a role in mitigating these costs.

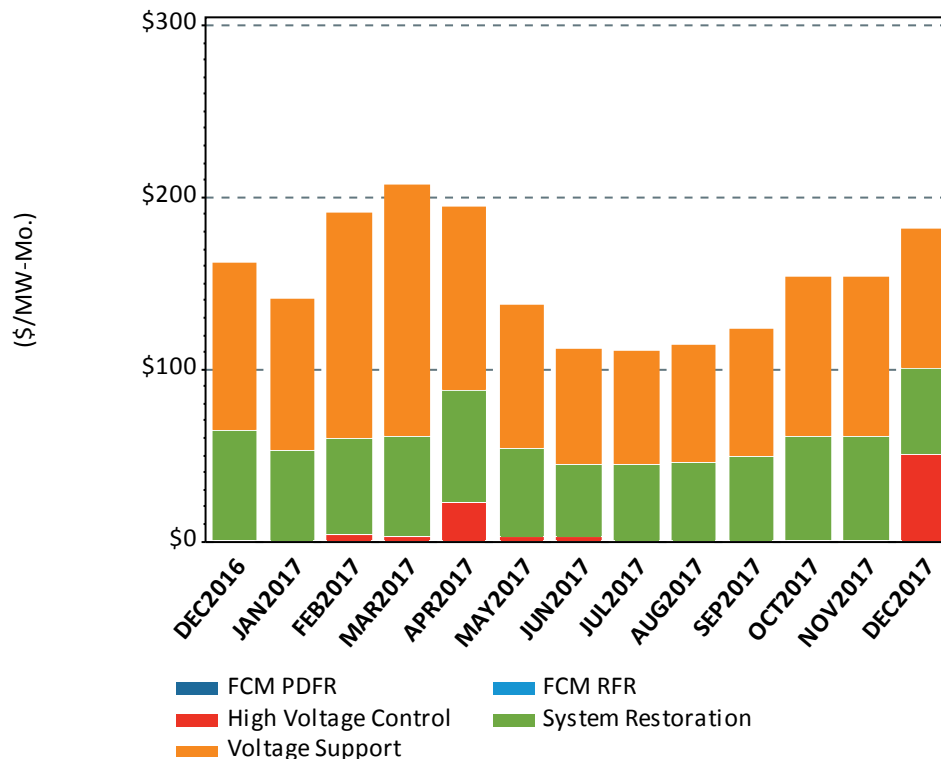


Figure 5-1: Reliability costs by type, 13 months.

Table 5-1
Reliability Costs by Type, 13 Months (\$/MW-Month)

Month	FCM RFR	FCM PDFR	High Voltage Control	System Restoration	Voltage Support	Total
Dec-16	\$0.00	\$0.00	\$0.00	\$63.45	\$97.66	\$161.11
Jan-17	\$0.00	\$0.00	\$0.00	\$52.21	\$88.44	\$140.65
Feb-17	\$0.00	\$0.00	\$2.54	\$56.08	\$131.69	\$190.32
Mar-17	\$0.00	\$0.00	\$1.56	\$58.14	\$146.61	\$206.31
Apr-17	\$0.00	\$0.00	\$21.87	\$64.54	\$107.21	\$193.61
May-17	\$0.00	\$0.00	\$1.71	\$50.85	\$84.68	\$137.25
Jun-17	\$0.00	\$0.00	\$1.32	\$42.85	\$66.71	\$110.88
Jul-17	\$0.00	\$0.00	\$0.00	\$43.52	\$66.53	\$110.05

²⁶ A *contingency* is the sudden loss of a generation or transmission resource. A *first contingency* (N-1) is when the first power element (facility) of a system is lost, which has the largest impact on system reliability. A *second contingency* (N-1-1) is the loss of the facility that would have the largest impact on the system after the facility that has the largest impact is lost. See the ISO’s Annual Markets Report for further analysis of these costs over time found [here](#), and on the left hand side of the page, select “Annual Markets Reports” from the document type filter and “PDF” from the file type.

Month	FCM RFR	FCM PDRF	High Voltage Control	System Restoration	Voltage Support	Total
Aug-17	\$0.00	\$0.00	\$0.00	\$45.23	\$68.84	\$114.07
Sep-17	\$0.00	\$0.00	\$0.00	\$48.58	\$74.83	\$123.41
Oct-17	\$0.00	\$0.00	\$0.00	\$59.69	\$93.02	\$152.71
Nov-17	\$0.00	\$0.00	\$0.00	\$60.06	\$92.59	\$152.65
Dec-17	\$0.00	\$0.00	\$49.15	\$49.92	\$82.29	\$181.36

5.3 Reliability Costs by Reliability Region, Last 13 Months

Figure 5-2 shows the aggregated reliability costs of all types by reliability region for the last 13 months. Price separation may be attributable to high voltage control costs or costs of retaining resources for reliability in the FCM.

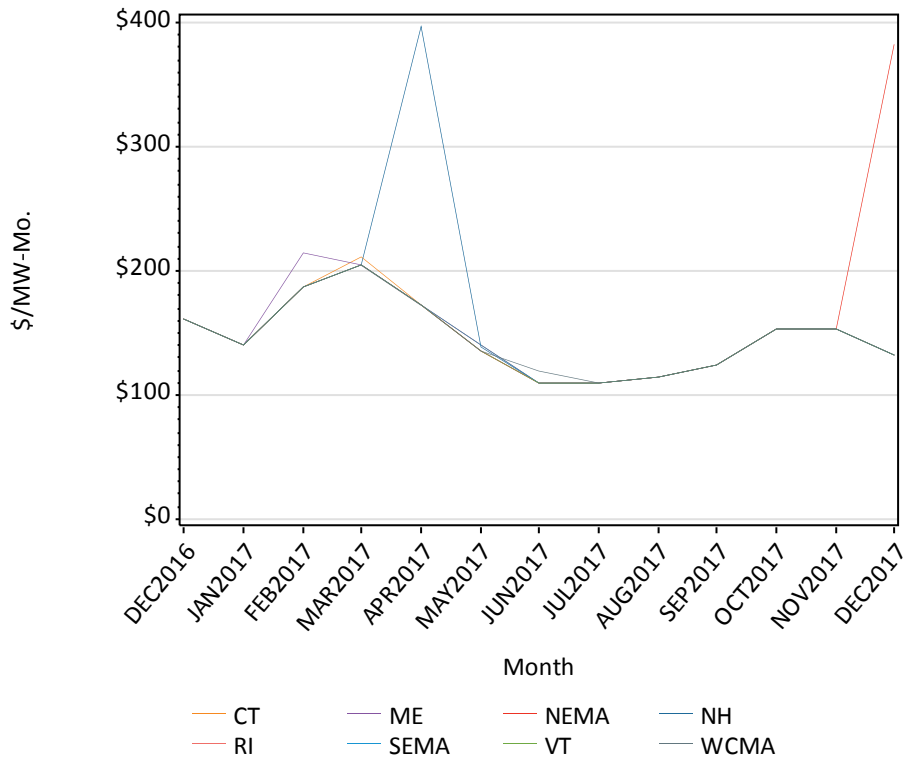


Figure 5-2: Average combined costs for reliability services by reliability region, 13 months.

5.4 FCM-Related Reliability Costs by Reliability Region, Last 13 Months

Table 5-2 shows the FCM RFR costs by reliability region for the last 13 months, while shows the FCM PDRF costs by reliability region for the same period.

Table 5-2
FCM RFR Costs by Reliability Region, 13 Months (\$/MW-Month)

Month	ME	NH	VT	CT	RI	SEMA	WCMA	NEMA
For the period of December 2016 through December 2017, there were no RFR costs in any reliability region.								

Table 5-3
FCM PDFR Costs by Reliability Region, 13 Months (\$/MW-Month)

Month	ME	NH	VT	CT	RI	SEMA	WCMA	NEMA
For the period of December 2016 through December 2017, there were no PDFR costs in any reliability region.								

5.5 Voltage Support Costs, Last 13 Months

Volt ampere reactive (VAR) is a measurement of reactive power used to maintain transmission voltages for meeting the operating requirements of the New England transmission system. Qualifying reactive resources that are compensated for providing VAR service may receive both fixed (capacity cost) payments and variable payments.

Before June 2008, the cost of resources committed to providing reactive power for either low-voltage support or regional high-voltage control was primarily borne by systemwide RNL. Starting in July 2008, the allocation for high-voltage control shifted from systemwide RNL to RNL within the specifically affected reliability region. The allocation for low-voltage-support costs remains at the systemwide level. The fixed payments paid to VAR resources are included in the allocation of low-voltage support to pool RNL.

Figure 5-3 shows voltage-support costs for the last 13 months. Table 5-4 shows the fixed capacity and variable components of voltage-support cost along with total voltage-support cost for the last 13 months. Variability in the fixed-cost portion is attributable to the monthly change in RNL used to allocate the costs.

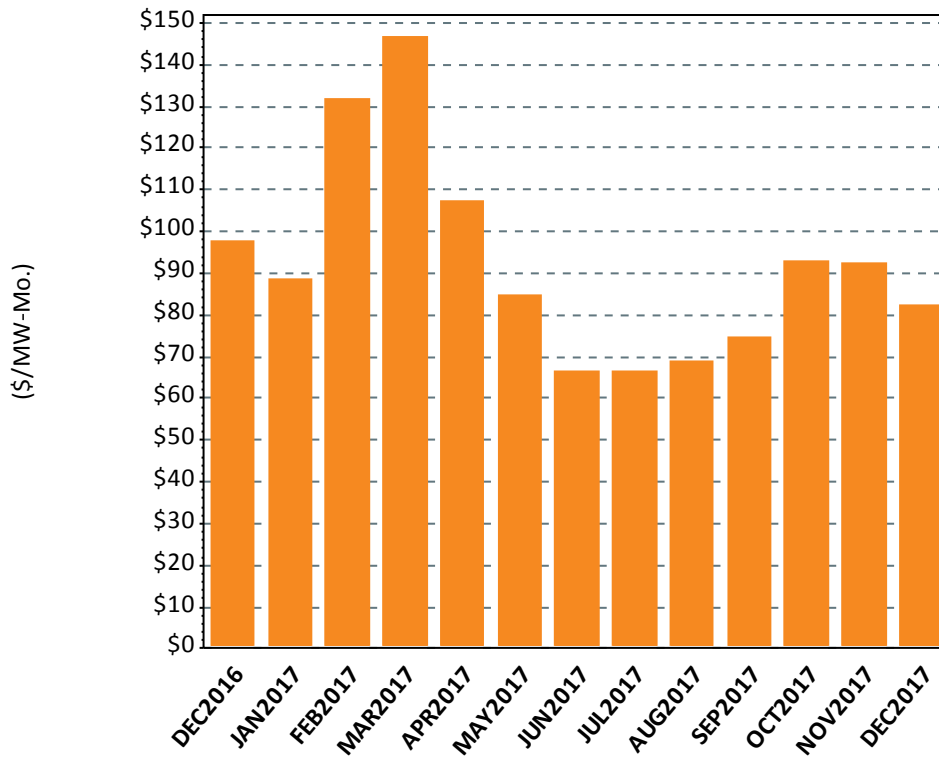


Figure 5-3: Voltage support costs, 13 months.

Table 5-4
Fixed Capacity, Variable, and Total Voltage Support Costs, 13 Months (\$/MW-Month)

Month	Fixed (Capacity Charge) Voltage Support Cost	Variable Voltage Support Cost	Total Low Voltage Support Cost
Dec-16	\$88.09	\$9.57	\$97.66
Jan-17	\$86.41	\$2.03	\$88.44
Feb-17	\$92.29	\$39.40	\$131.69
Mar-17	\$94.03	\$52.58	\$146.61
Apr-17	\$105.41	\$1.80	\$107.21
May-17	\$82.80	\$1.88	\$84.68
Jun-17	\$65.85	\$0.86	\$66.71
Jul-17	\$66.53	\$0.00	\$66.53
Aug-17	\$68.84	\$0.00	\$68.84
Sep-17	\$74.15	\$0.68	\$74.83
Oct-17	\$92.59	\$0.43	\$93.02
Nov-17	\$92.37	\$0.22	\$92.59
Dec-17	\$79.28	\$3.01	\$82.29

5.6 High-Voltage Control Costs by Reliability Region, Last 13 Months

In 2008, the tariff was changed to allocate the costs of high-voltage control to the reliability region and not regionwide. Figure 5-4 shows high-voltage control costs by reliability region for the last 13 months. Table 5-5 shows high-voltage control costs by reliability region, total voltage-support costs, and total voltage costs for the last 13 months.

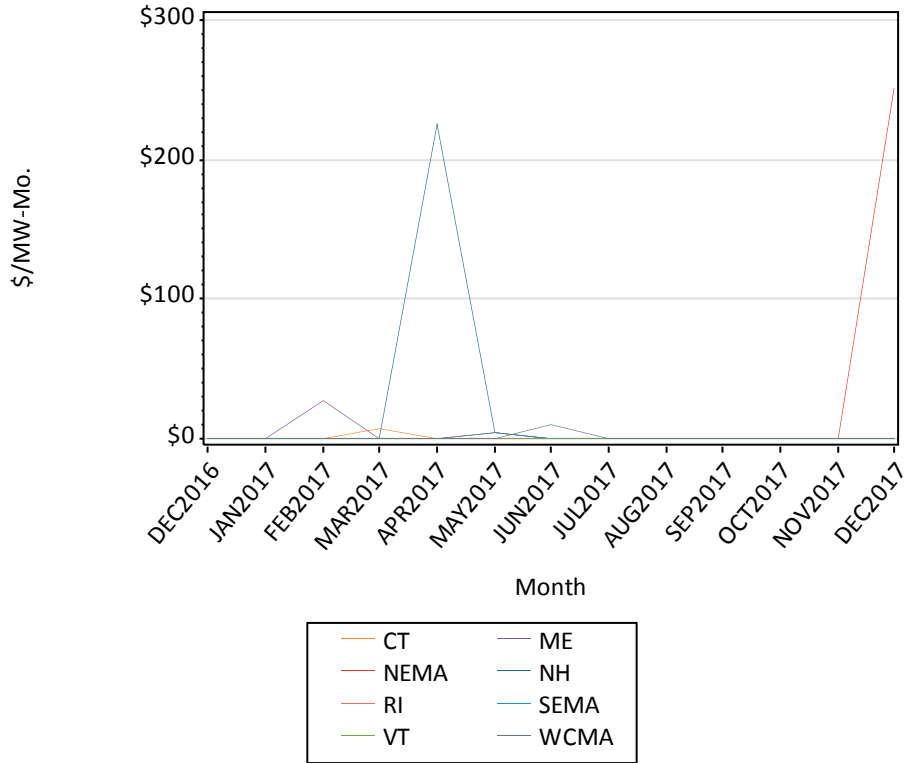


Figure 5-4: High-voltage control costs by reliability region, 13 months.

Table 5-5
Voltage Control, Voltage Support, and Total VAR Costs, 13 Months (\$/MW-Month)

Month	High Voltage Control									Voltage Support	New England Total Voltage Cost
	ME	NH	VT	CT	RI	SEMA	WCMA	NEMA	New England		
Dec-16	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$97.66	\$97.66
Jan-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$88.44	\$88.44
Feb-17	\$26.71	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2.54	\$131.69	\$134.24
Mar-17	\$0.00	\$0.00	\$0.00	\$6.31	\$0.00	\$0.00	\$0.00	\$0.00	\$1.56	\$146.61	\$148.17
Apr-17	\$0.00	\$225.70	\$0.00	\$0.00	\$0.00	\$0.24	\$0.00	\$0.24	\$21.87	\$107.21	\$129.08
May-17	\$0.00	\$3.44	\$0.00	\$0.00	\$0.00	\$4.16	\$0.00	\$4.16	\$1.71	\$84.68	\$86.39
Jun-17	\$0.00	\$0.00	\$0.00	\$0.21	\$0.00	\$0.00	\$9.76	\$0.00	\$1.32	\$66.71	\$68.03
Jul-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$66.53	\$66.53
Aug-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$68.84	\$68.84
Sep-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$74.83	\$74.83

Month	High Voltage Control									Voltage Support	New England Total Voltage Cost
	ME	NH	VT	CT	RI	SEMA	WCMA	NEMA	New England		
Oct-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$93.02	\$93.02
Nov-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$92.59	\$92.59
Dec-17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$250.55	\$49.15	\$82.29	\$131.44

Section 6

Administrative Service Costs

Administrative cost components reflect costs incurred by both the ISO and the PTOs for scheduling, system control, and dispatch service of the transmission system and to bill and collect for NESCOE’s operating budget. Administrative costs are based on regulated, revenue requirements of the ISO, local control centers (LCCs) (operated by PTOs), and NESCOE. ISO dispatch and control costs reflect only Schedule 1 (and not Schedules 2 and 3) of the ISO Self-Funding Tariff.²⁷ Year-over-year volatility in individual administrative component costs may not be driven solely by changes in underlying revenue requirements, but may reflect true-ups (for over-collections or under-collections) of annual revenues and annual movements in underlying loads, both of which are influential in the rate determination process. ISO-NE’s calculation for the 2017 NESCOE budget is \$0.00678 per kW-month and reflects the true-up for funds recovered and unspent from prior years. The [Historical Regional Network Load Cost](#) report provides further background on each of these components and the calculation of their costs.²⁸

Figure 6-1 and Table 6-1 show administrative costs by type for the last 13 months.

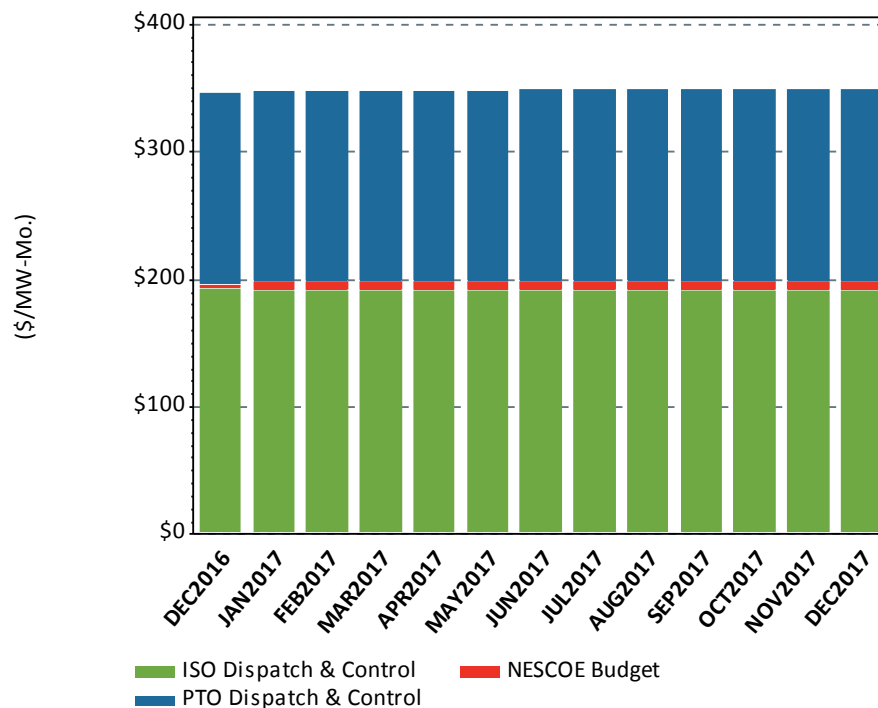


Figure 6-1: Administrative costs by type, 13 months.

²⁷ PTO dispatch and control costs stem from the OATT Schedule 1, Scheduling, Dispatch and Control Service, and are recovered through the OATT using RNL as an allocator. As the billing and collection agent for NESCOE, the ISO collects ISO Schedule 5 NESCOE payments and distributes them to NESCOE. Charges are based on the RNL for any transmission customer using RNS.

²⁸ The reader may also reference the annual ISO Administrative Budget filing, typically filed with the FERC in October of each year and searchable within the [ISO New England Filings](#) section of the ISO website.

**Table 6-1
Administrative Costs by Type, 13 Months (\$/MW-Month)**

Month	ISO Dispatch Control	NESCOE Budget	PTO Dispatch Control	Total
Dec-16	\$192.75	\$2.96	\$149.66	\$345.37
Jan-17	\$190.93	\$6.78	\$149.66	\$347.37
Feb-17	\$190.93	\$6.78	\$149.66	\$347.37
Mar-17	\$190.93	\$6.78	\$149.66	\$347.37
Apr-17	\$190.93	\$6.78	\$149.66	\$347.37
May-17	\$190.93	\$6.78	\$149.66	\$347.37
Jun-17	\$190.93	\$6.78	\$150.59	\$348.30
Jul-17	\$190.93	\$6.78	\$150.59	\$348.30
Aug-17	\$190.93	\$6.78	\$150.59	\$348.30
Sep-17	\$190.93	\$6.78	\$150.59	\$348.30
Oct-17	\$190.93	\$6.78	\$150.59	\$348.30
Nov-17	\$190.93	\$6.78	\$150.59	\$348.30
Dec-17	\$190.93	\$6.78	\$150.59	\$348.30

Section 7

Regional Network Load, Last 13 Months

As defined in the OATT, a transmission customer's monthly RNL is based on monthly peak demand and determines the customer's use of RNS. A transmission customer's monthly RNL value (i.e., monthly network load) is the customer's hourly load at the time of the hourly peak load of the local transmission network to which the customer's load is connected.

Each PTO in New England that has a local network RNS rate calculates monthly RNL values, which it submits to the ISO. The ISO uses these values in the RNS-related settlement processes. Customers with RNL may or may not participate in the wholesale electric energy markets, depending on the way in which they do business in New England.

A *RNL customer* is a transmission customer that a PTO has identified as the billable entity for one or more of the RNL "assets" in its local network. These assets reflect one or more actual physical load facilities and are modeled in the ISO's RNS settlement process for calculating RNS settlements. The RNL cost components discussed in this report (and listed in Section 1) reflect the services for which these customers are charged for their assigned share of RNL. Among the eight local networks, approximately 80 RNL customers own approximately 130 network load assets. These assets are separate from the assets identified in other wholesale market settlements, such as for energy.

7.1 Average Regional Network Load by Month, Last 13 Months

Figure 7-1 shows average monthly regional network load by year for the entire New England Balancing Authority Area for the last 13 months.

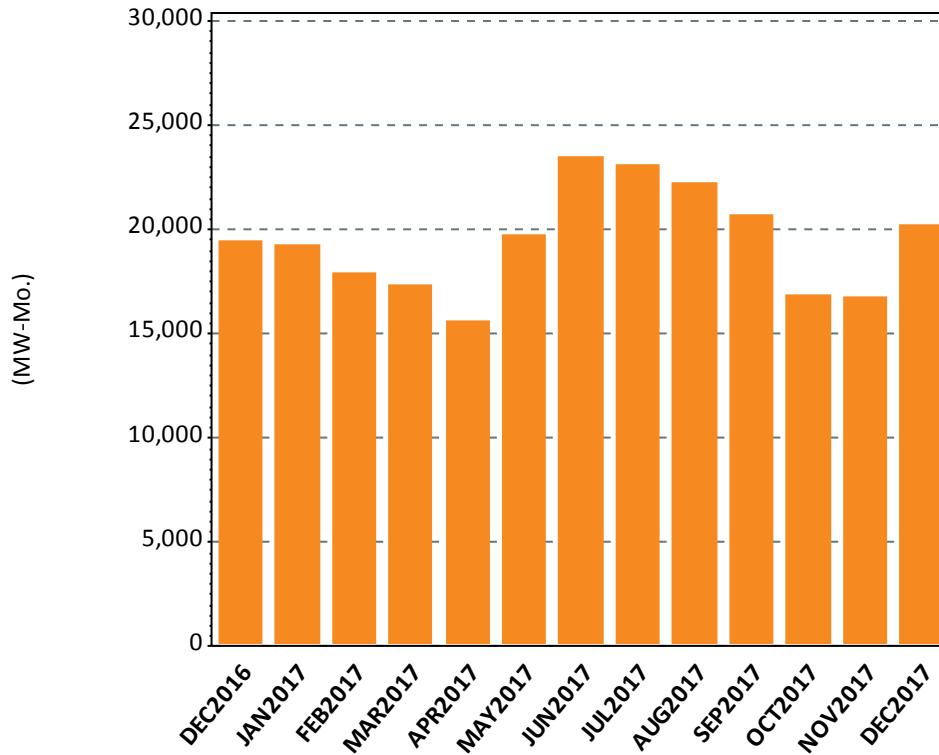


Figure 7-1: Average monthly regional network load, 13 months.

Since RNL reflects peak monthly demand usage, monthly aggregations of RNL appear more volatile during the highest demand months of the year, typically during the summer months, and within local networks or reliability regions serving a larger customer load base.

7.2 Monthly Regional Network Load by Reliability Region, Last 13 Months

Figure 7-2 shows monthly network load aggregated by reliability region for the last 13 months.

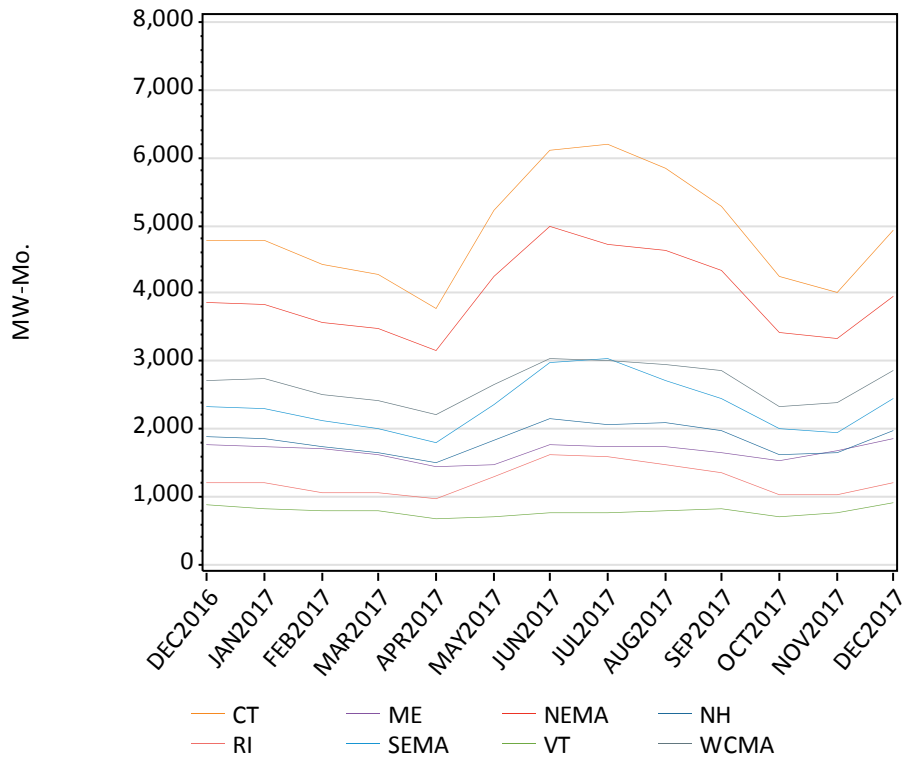


Figure 7-2: Monthly network load by reliability region, 13 months.

7.3 Monthly Regional Network Load by Local Regional Network, Last 13 Months

Figure 7-3 shows monthly network load by local network, as reported by PTOs for the last 13 months.

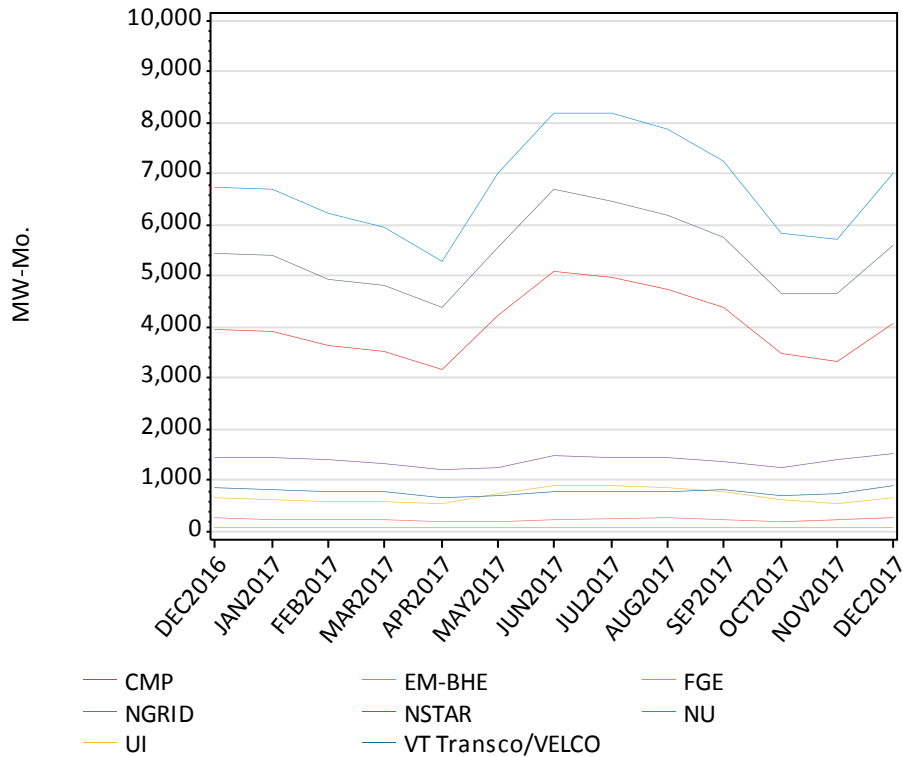


Figure 7-3: Monthly network load by local network, 13 months.

7.4 Monthly Regional Network Load by State, Last 13 Months

Table 7-1 shows monthly network load aggregated by state for the last 13 months.

Table 7-1
Average RNL aggregated by State and in Total, 13 Months (MW-Month)

Month	CT	MA	ME	NH	RI	VT	New England Average
Dec-16	4,796	8,925	1,756	1,893	1,216	870	19,456
Jan-17	4,785	8,858	1,727	1,872	1,208	829	19,278
Feb-17	4,428	8,205	1,710	1,738	1,071	798	17,949
Mar-17	4,285	7,935	1,615	1,641	1,052	786	17,314
Apr-17	3,781	7,186	1,456	1,505	970	684	15,582
May-17	5,217	9,255	1,472	1,831	1,285	699	19,759
Jun-17	6,122	11,010	1,768	2,151	1,619	765	23,434
Jul-17	6,210	10,737	1,744	2,068	1,606	766	23,132
Aug-17	5,846	10,306	1,751	2,090	1,465	797	22,254
Sep-17	5,273	9,637	1,657	1,969	1,367	818	20,720
Oct-17	4,240	7,767	1,521	1,616	1,023	698	16,865
Nov-17	4,015	7,641	1,673	1,653	1,020	759	16,761
Dec-17	4,941	9,264	1,849	1,981	1,213	916	20,164

Section 8

Average RNL Costs by State

This section shows state level summarizations. The correlation among states, reliability regions, and their underlying local area networks were mentioned in Section 1 of the report. The next table shows average RNL costs by New England state for the past 13 months.

Separation in RNL costs among the New England states may occur due to: high voltage control costs, FCM RFR costs, and prior to June 1, 2010, reliability agreement costs. Improvements to the transmission system have and should continue to minimize these costs over time.

Table 8-1
Average RNL Costs by State and in Total, 13 Months (\$/MW-Month)

Month	CT	MA	ME	NH	RI	VT	New England Average
Dec-16	\$9,182	\$9,182	\$9,182	\$9,182	\$9,182	\$9,182	\$9,182
Jan-17	\$9,163	\$9,163	\$9,163	\$9,163	\$9,163	\$9,163	\$9,163
Feb-17	\$9,210	\$9,210	\$9,237	\$9,210	\$9,210	\$9,210	\$9,213
Mar-17	\$9,233	\$9,227	\$9,227	\$9,227	\$9,227	\$9,227	\$9,229
Apr-17	\$9,194	\$9,194	\$9,194	\$9,420	\$9,194	\$9,194	\$9,216
May-17	\$9,158	\$9,161	\$9,158	\$9,161	\$9,158	\$9,158	\$9,160
Jun-17	\$9,788	\$9,790	\$9,788	\$9,788	\$9,788	\$9,788	\$9,789
Jul-17	\$9,788	\$9,788	\$9,788	\$9,788	\$9,788	\$9,788	\$9,788
Aug-17	\$9,792	\$9,792	\$9,792	\$9,792	\$9,792	\$9,792	\$9,792
Sep-17	\$9,802	\$9,802	\$9,802	\$9,802	\$9,802	\$9,802	\$9,802
Oct-17	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831
Nov-17	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831	\$9,831
Dec-17	\$9,810	\$9,917	\$9,810	\$9,810	\$9,810	\$9,810	\$9,859

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