

2015 ISO/RTO Metrics Report Summary

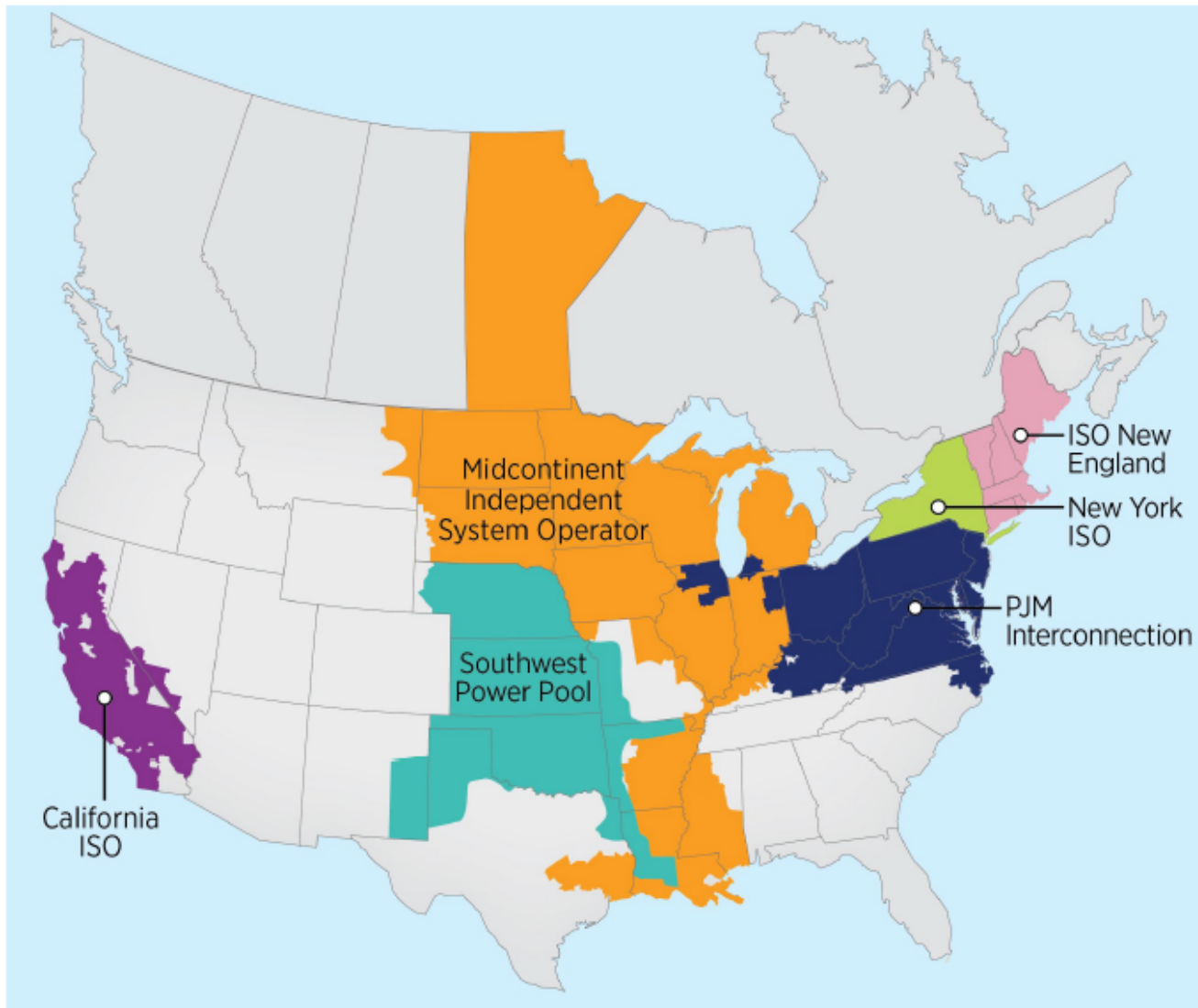
November 2015

ISO/RTO Metrics Report – Background

- Independent system operators (ISOs) and regional transmission organizations (RTOs) that are regulated by the Federal Energy Regulatory Commission (FERC) prepare the ISO/RTO Metrics Report.
- At FERC’s direction, the report provides information on various data points common to each of the system operators.
 - *Further history:* The ISO/RTO Metrics Report originated in 2008 with a review by the U.S. Government Accountability Office (GAO) at the request of the U.S. Senate Committee on Homeland Security and Governmental Affairs. The GAO recommended that the FERC work with ISOs/RTOs and others to standardize measures that track the performance of ISO/RTO operations and markets, and to report the performance results to Congress and the public.
- The ISOs and RTOs submitted the report in response to the FERC's "*Request for Information on Common Performance Metrics for RTOs and ISOs and Utilities Outside RTO and ISO Regions*" (August 17, 2015).
- This Report includes the 30 Common Metrics and "Other Metrics Specific to ISO and RTO Performance" identified in the Commission Staff "Common Metrics Report" issued on August 26, 2014.

**The ISO/RTO Metrics Report presents RTO information serially, not comparatively.
NESCOE prepared these with RTO data to provide a comparative look at some of the issues.**

ISO/RTO Overview



ISO/RTO Background Information

ISO/RTO	Installed Generation (MW)	Miles of Transmission Lines	Population (millions)
CAISO	57,124	26,000	30
ISO-NE	31,000	8,600	14
MISO	180,006	65,800	48
NYISO	39,039	11,086	20
PJM	183,604	62,556	61
SPP	58,982	50,575	15

Metric Interpretation - Comparability

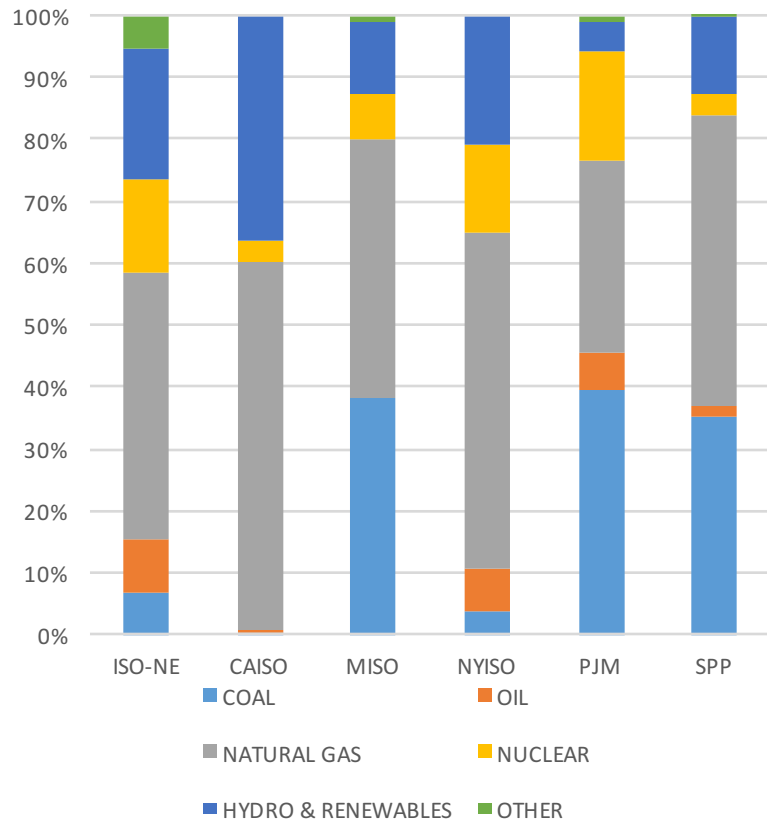
Information must be assessed in the proper context – a number of factors influence the data and could result in variations among the ISOs/RTOs:

- Geographic diversity of the control area
- Different reliability planning standards
- Tariff requirements, e.g., interconnection studies
- Regional resource mixes – natural resource availability, and associated political, economic, and environmental factors
- Prevailing weather patterns, demographic trends, and economic conditions

Fuel Diversity

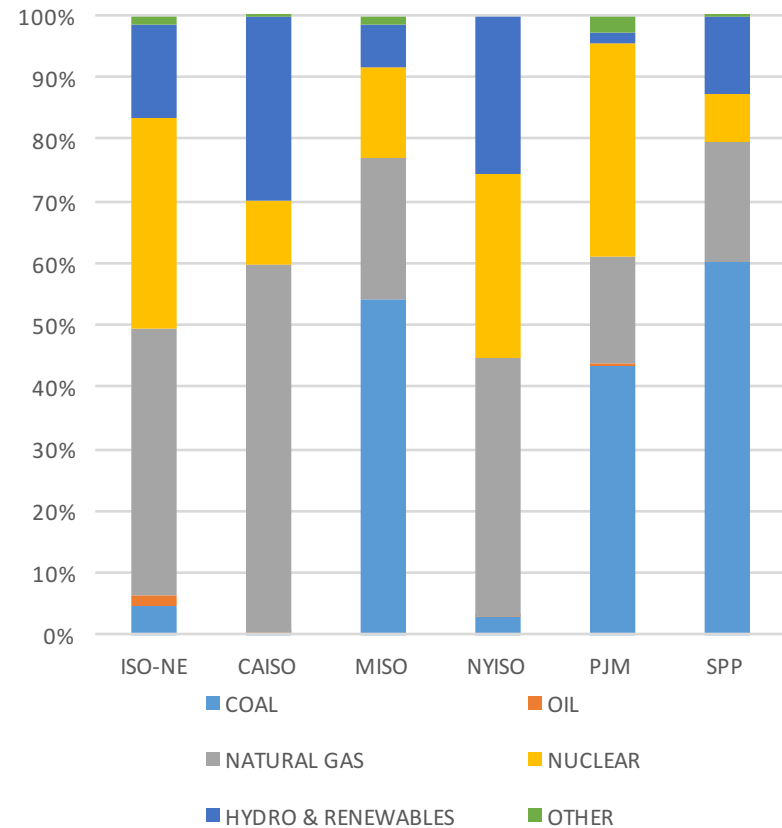
Capacity

2014 Summer Capacity



Energy

2014 Generation Output



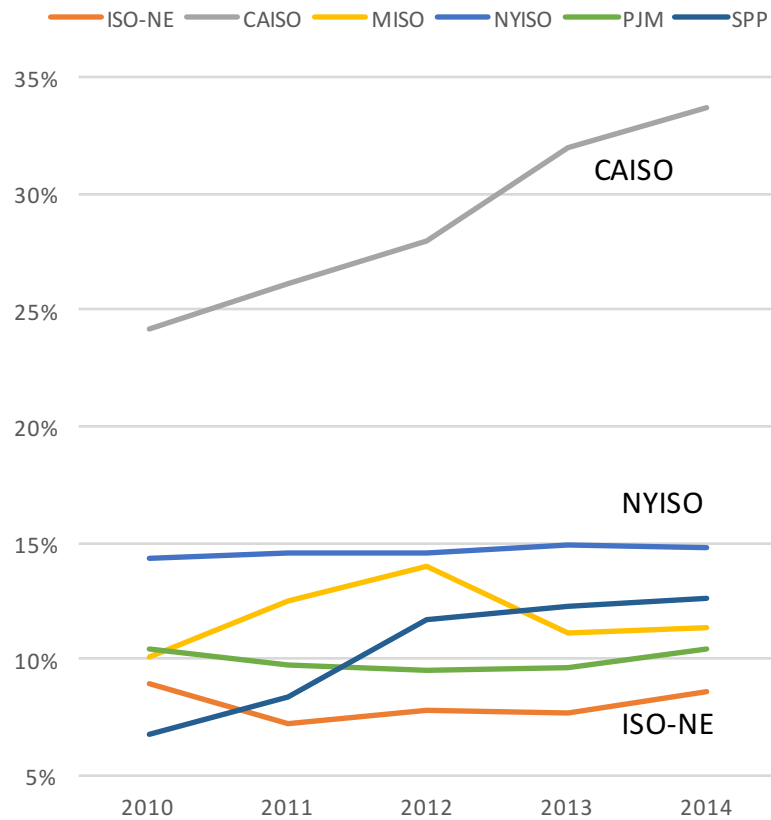
Figures shown represent generation *within* the RTO systems.

The fuel diversity implications of RTOs' imports and exports are not reflected in this graphic.

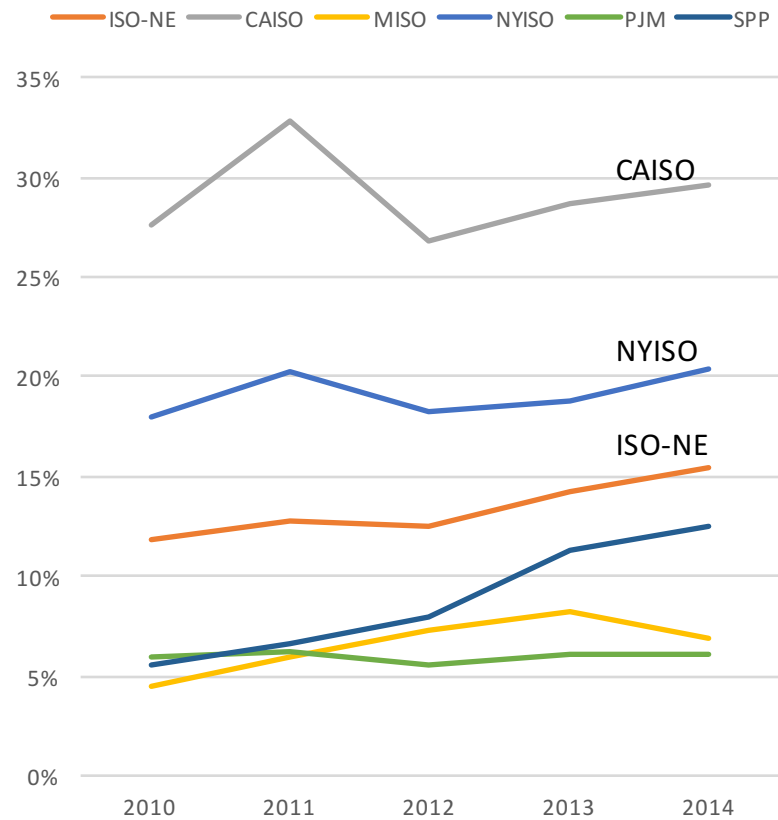
An example of this in the ISO-NE region is hydropower imports from Canada.

Renewable and Hydro Resources

Renewable and Hydro Resources
As a Percent of Total Capacity, 2010-2014



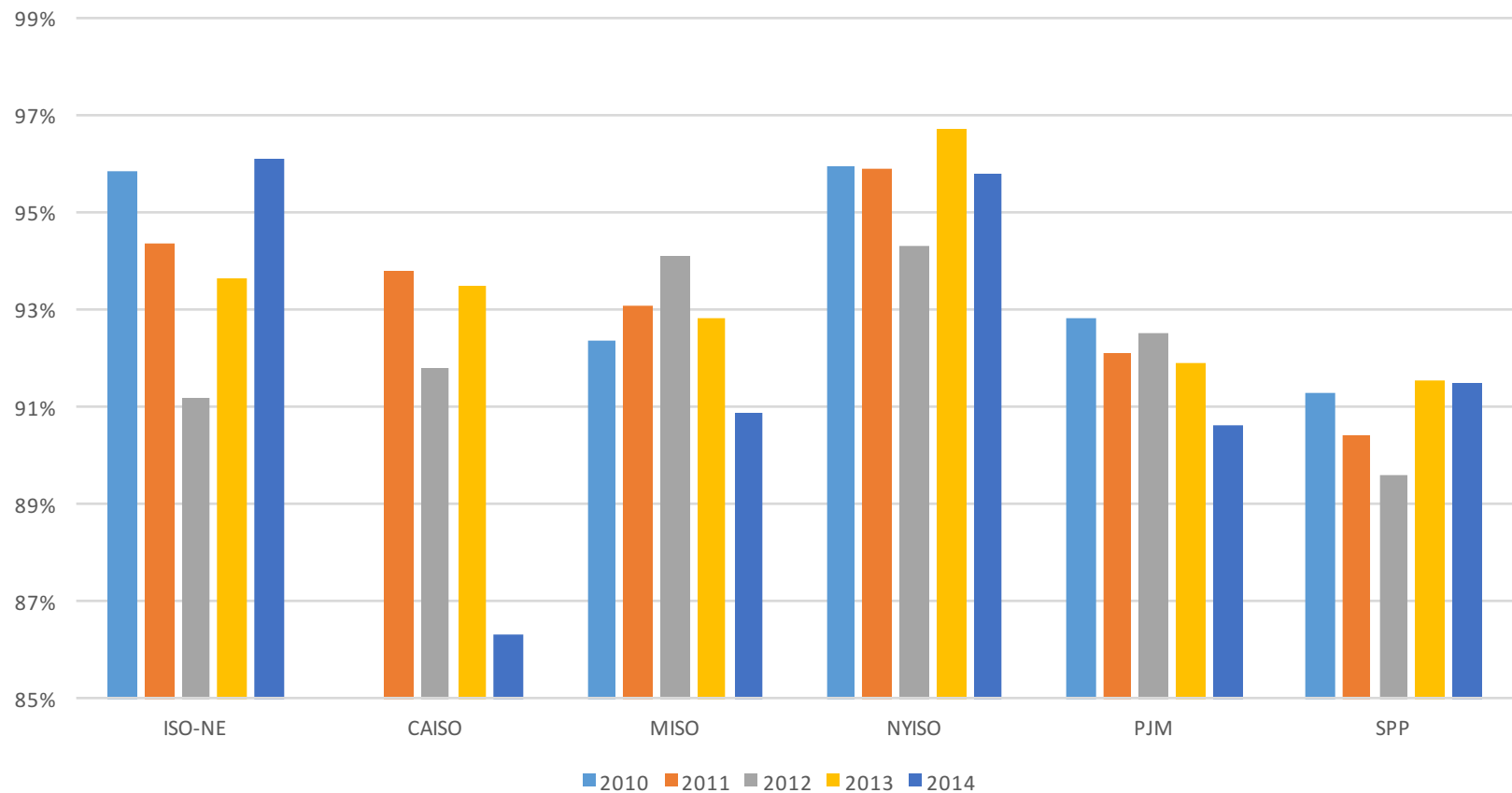
Renewable and Hydro Resources
As a Percent of Total Energy, 2010-2014



ISO-NE has relatively low renewable and hydro capacity, but receives a growing portion of its energy from these resources.

Generator Performance

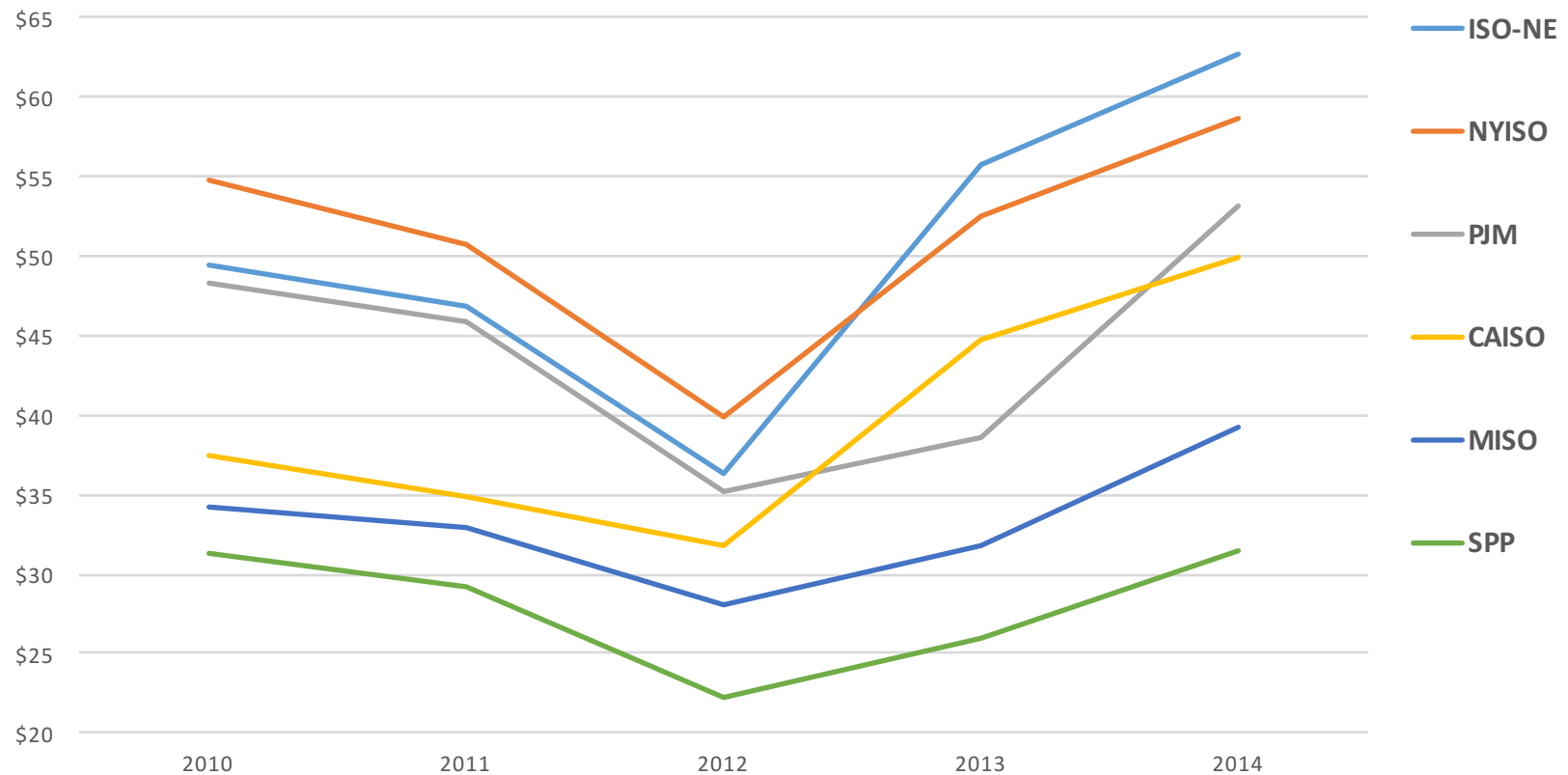
Annual Generator Availability (1-eFORd), 2010-2014



In New England, generator performance has improved over the last few years, possibly due to market reforms and out-of-market fuel assurance programs.

Market Pricing – Energy

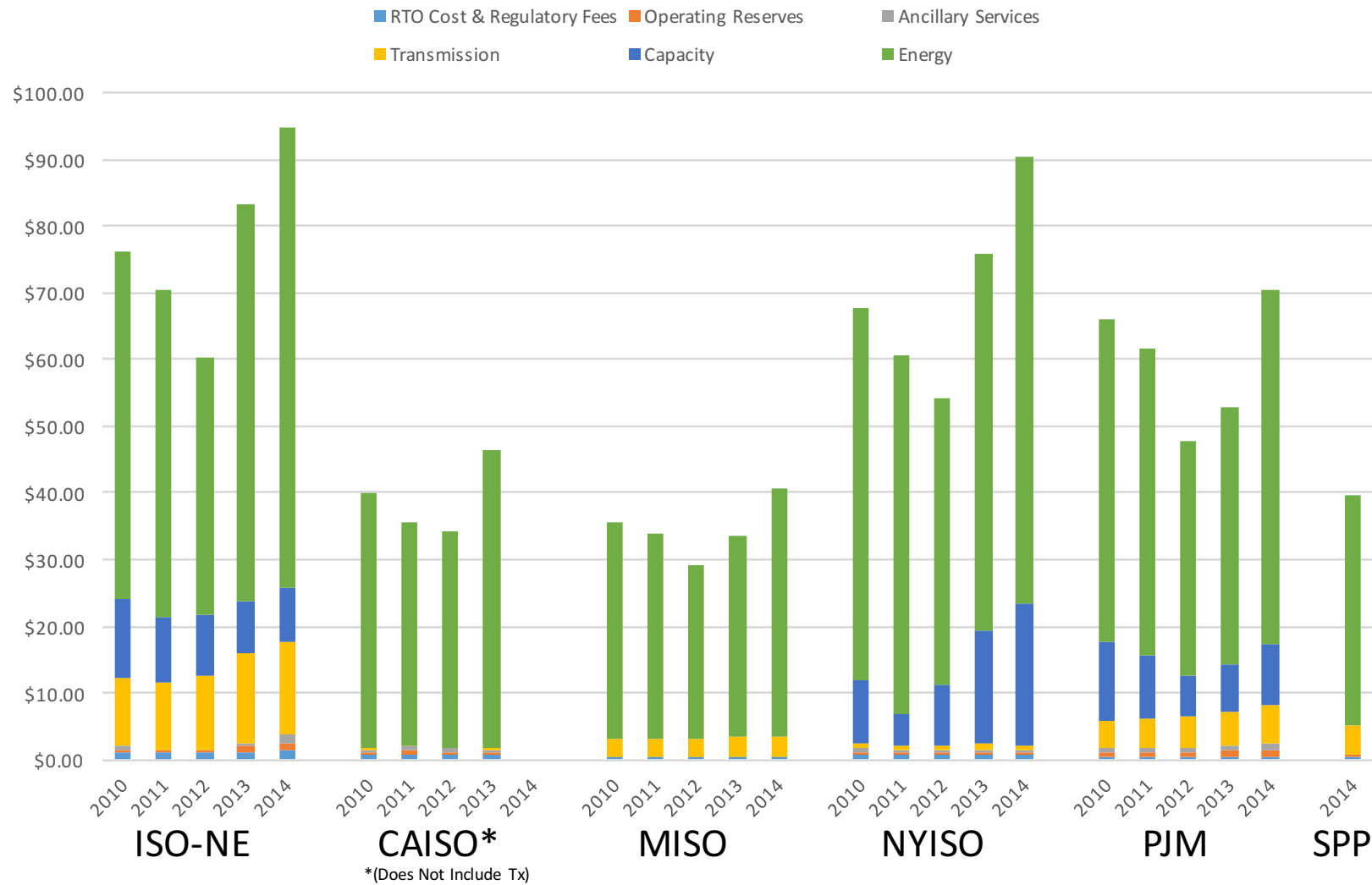
Average Annual Wholesale Energy Prices, 2010-2014



While energy prices have risen nationally over the past few years, New England has some of the highest energy prices of the ISO/RTOs. Various factors may influence regional price differentials (as discussed on slide 5).

Market Pricing – Components

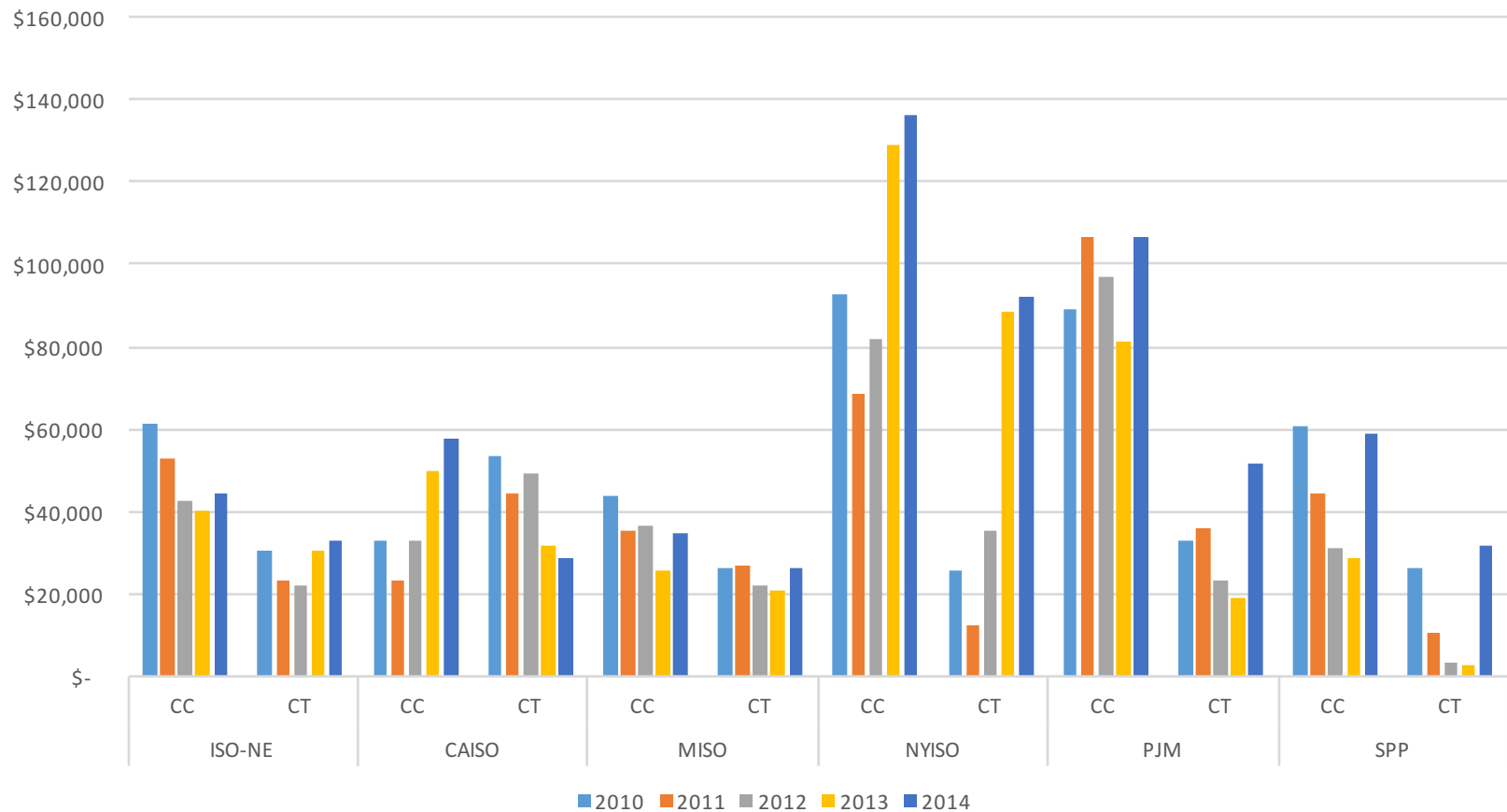
Wholesale Power Cost Breakdown, 2010-2014 (\$/MWh)



In addition to high energy prices, ISO-NE appears to have some of the higher transmission rates.

Market Competitiveness

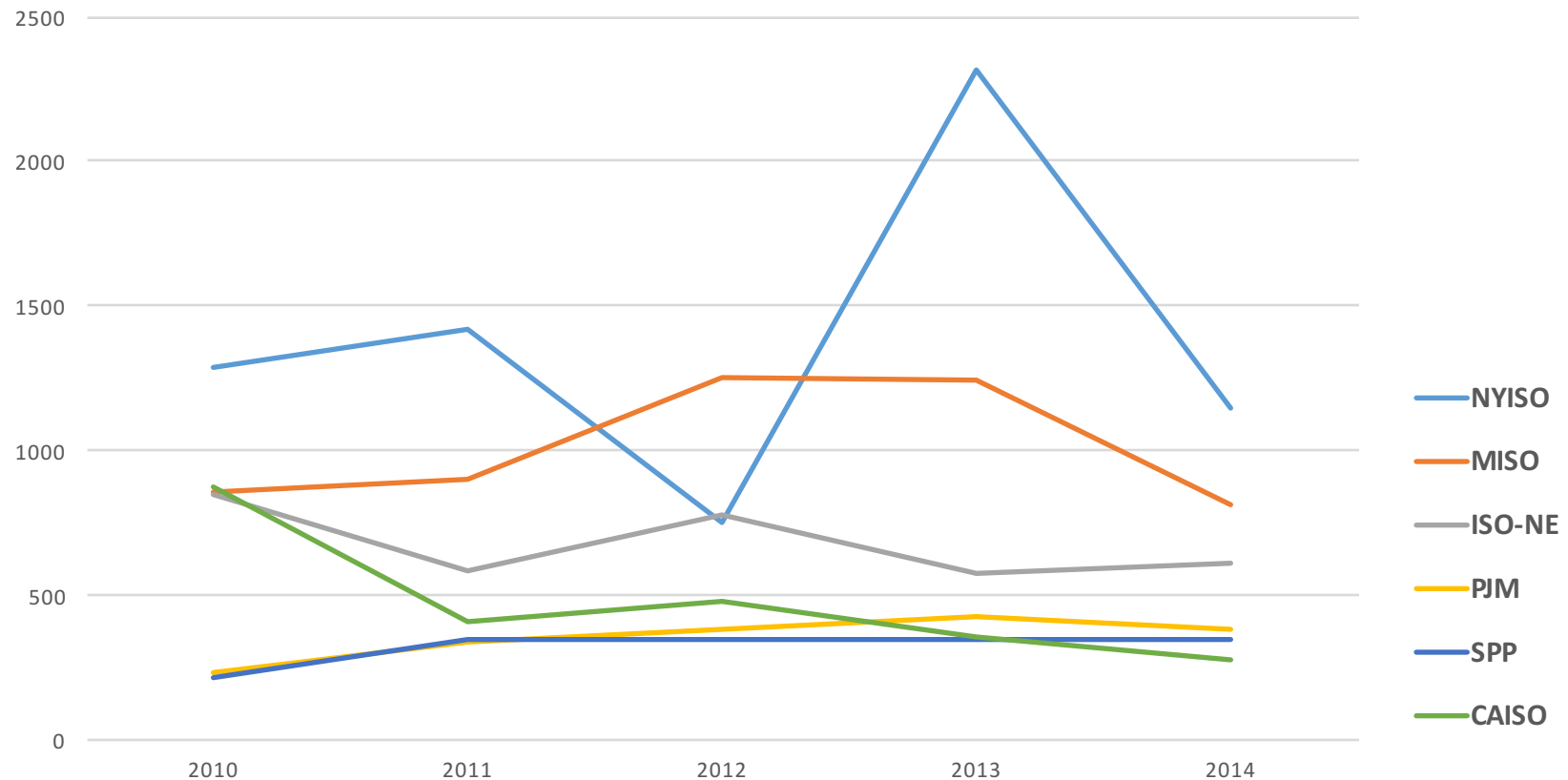
New Entrant Gas-Fired Combined-Cycle (CC) and Combustion Turbine (CT)
Net Generation Revenues (Gross Margin) 2010-2014



Over the past five years, NYISO and PJM provided the most generation revenue (gross margin) for proxy gas-fired resources.

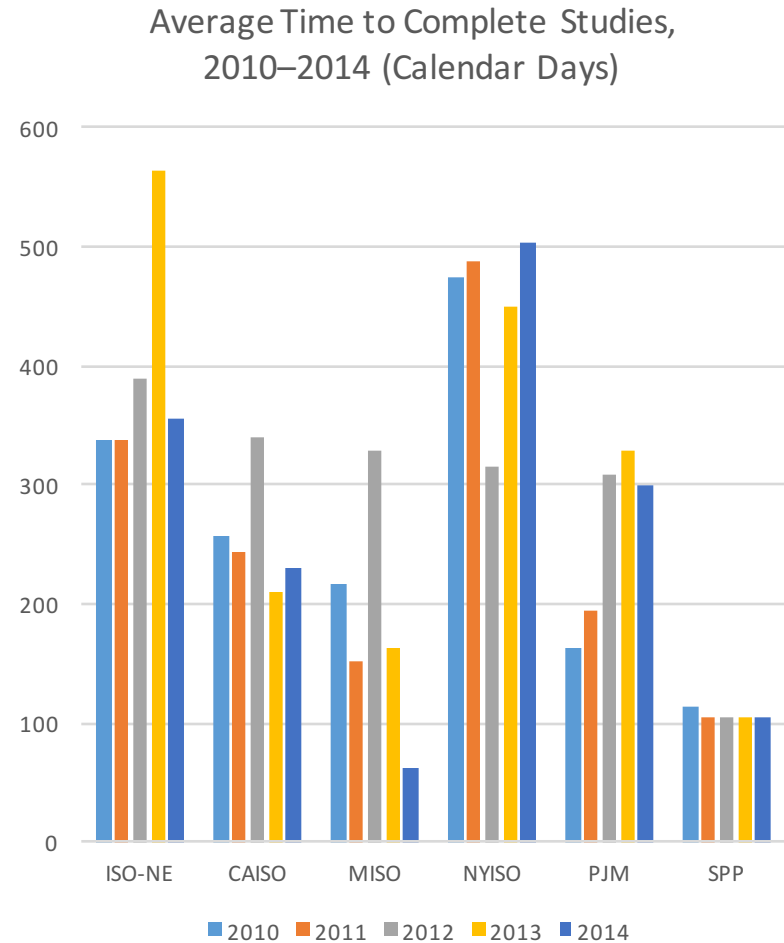
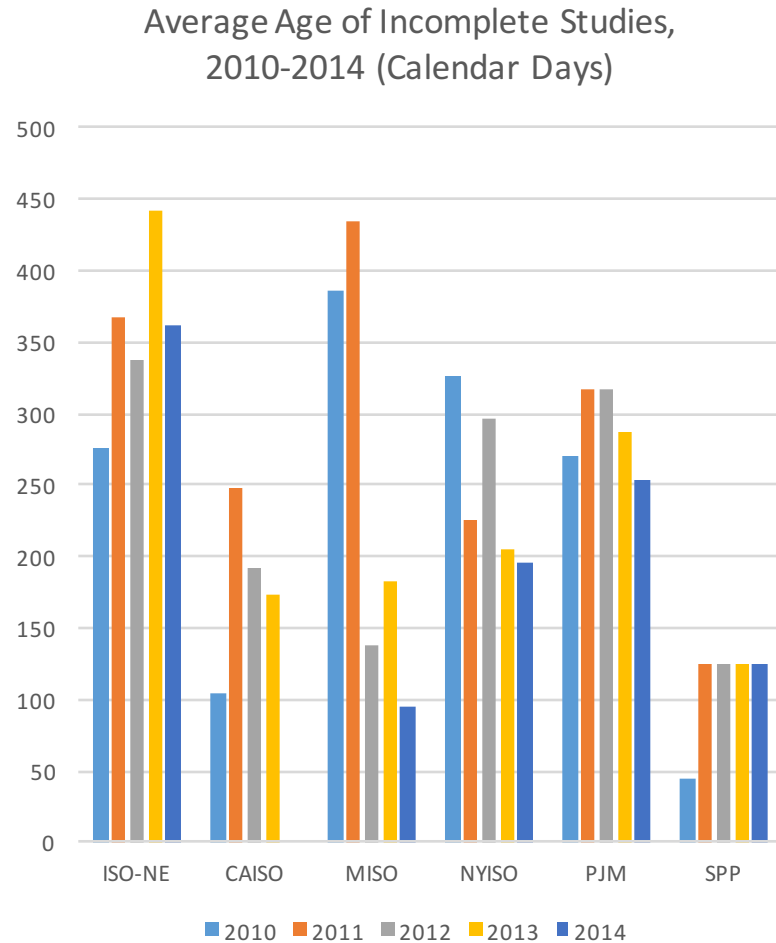
Generator Interconnection - Time

Average Generation Interconnection Request Processing Time,
2010-2014 (Calendar Days)



ISO-NE has neither the longest nor shortest average time for completing the generator interconnection process.

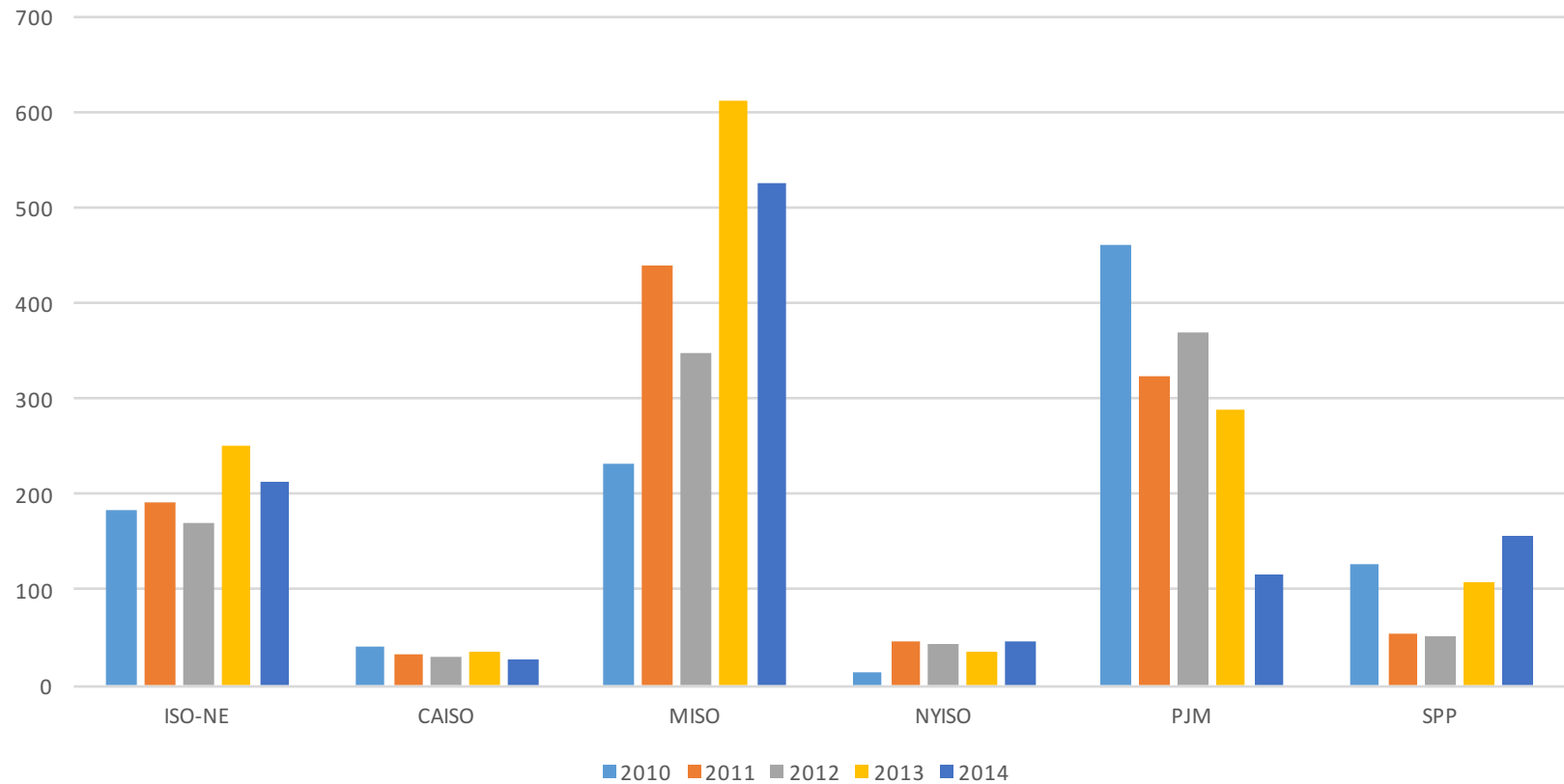
Generator Interconnection -Studies



The time associated with interconnection studies varies widely from year to year.

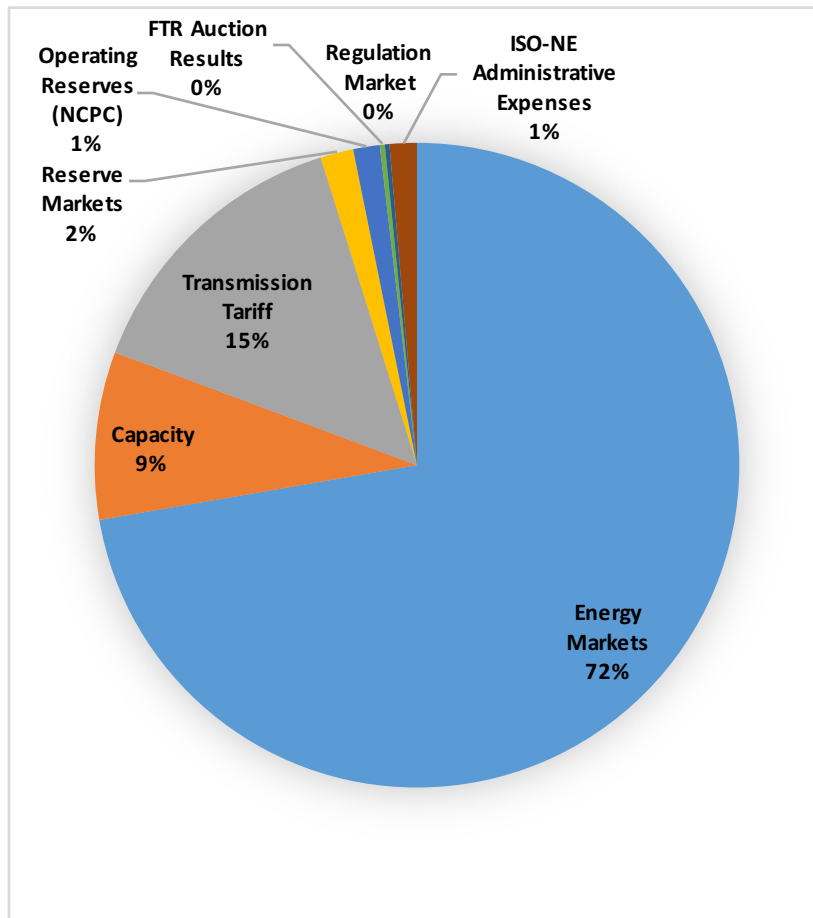
Transmission for Reliability

Number of Transmission Projects Approved for Construction for Reliability Purposes, 2010-2014



ISO/RTOs continue to develop transmission to address reliability issues.

ISO New England in Detail



Wholesale Charge	2014 Dollars Billed	% of 2014 Dollars Billed
Energy Markets	\$9,079,097,261	72.3%
Capacity	\$1,055,946,354	8.4%
Transmission Tariff	\$1,819,430,854	14.5%
Reserve Markets	\$207,495,782	1.7%
Operating Reserves (NCP)	\$167,265,424	1.3%
FTR Auction Results	\$31,616,804	0.3%
Regulation Market	\$28,796,963	0.2%
ISO-NE Administrative Expenses	\$171,241,950	1.4%
Total	\$12,560,891,392	100.0%