



Understanding Our
Energy Distribution Systems:

Gas Infrastructure and Deliverability in New England

Richard Levitan, rl@levitan.com
March 5, 2014

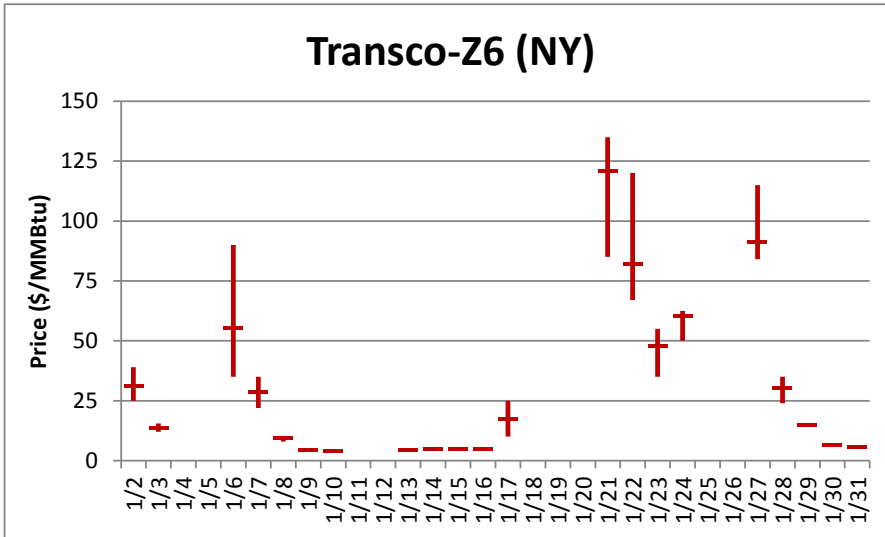
LEVITAN & ASSOCIATES, INC.
MARKET DESIGN, ECONOMICS AND POWER SYSTEMS

Agenda

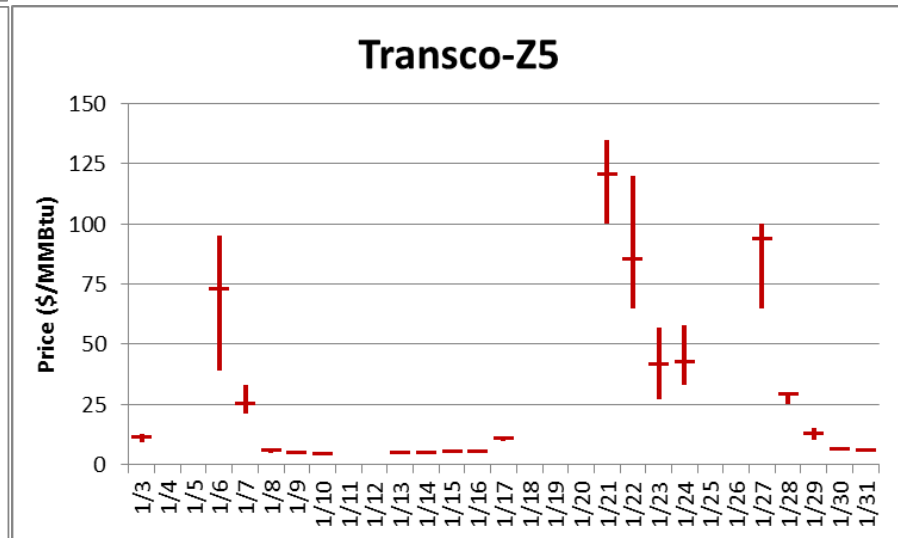
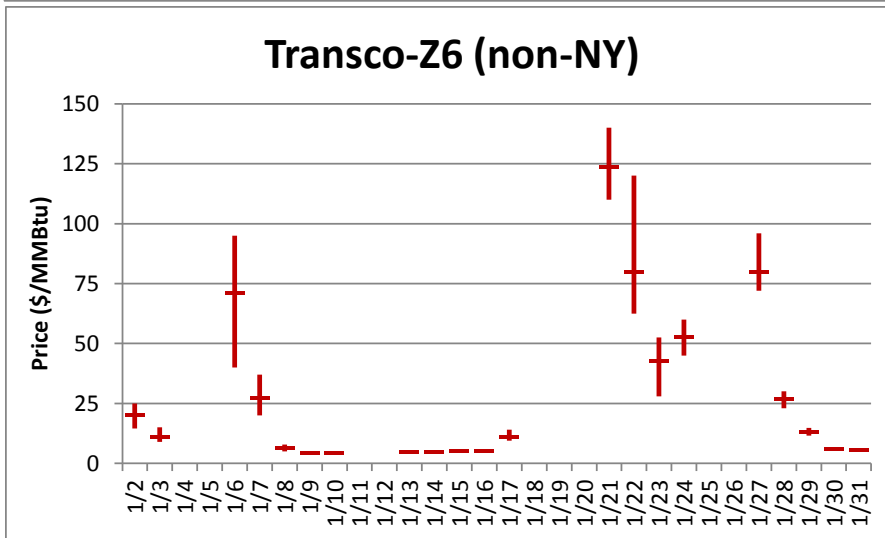
- ◆ Price Discovery During the Polar Vortex
- ◆ New England's P/L Infrastructure
 - Marcellus shale E&P impact on supply / deliverability
 - Decline in gas portfolio diversity -- pipeline economic obsolescence
 - Reduced LNG Imports
 - Potential infrastructure expansion efforts

Next Day Strip Prices, January 2014

(High, Low, Weighted Average)



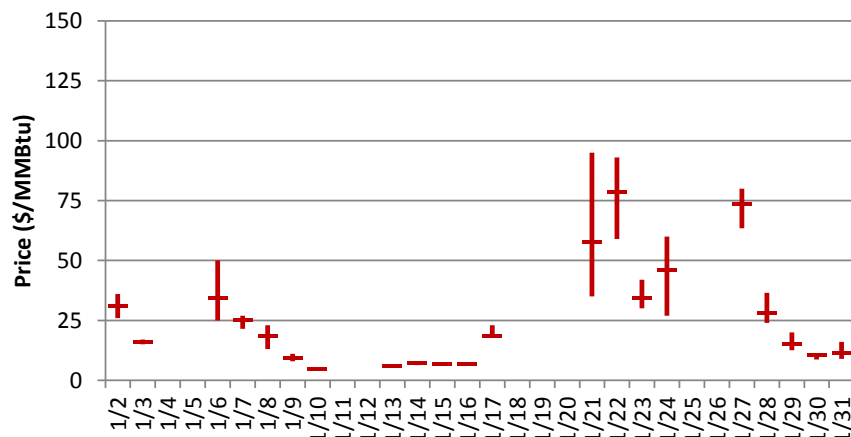
TZ6 (non-NY) is VA/MB border to Linden, NJ
TZ5 is GA/SC to VA/MD border



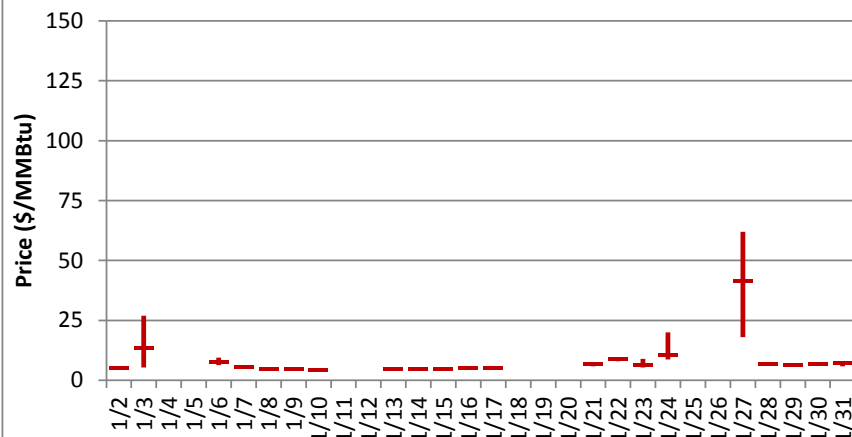
Next Day Strip Prices, January 2014

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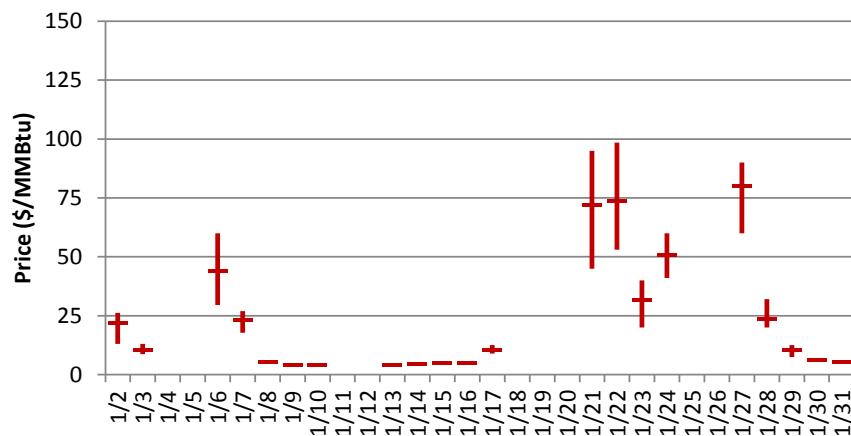
Algonquin Citygates



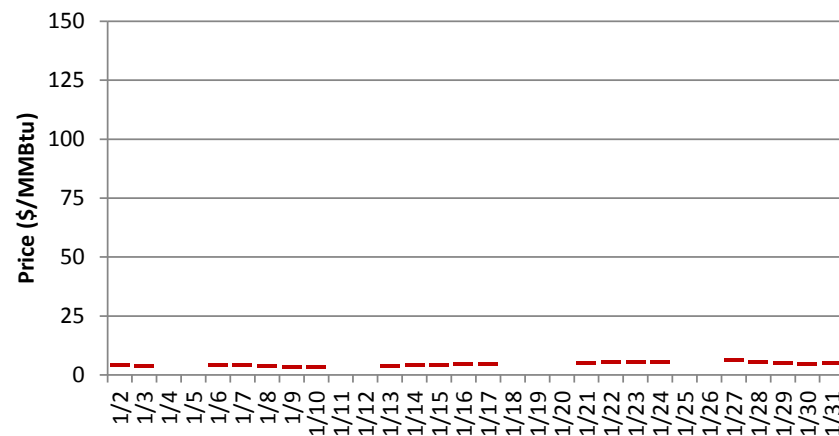
Chicago Citygates



TETCO-M3

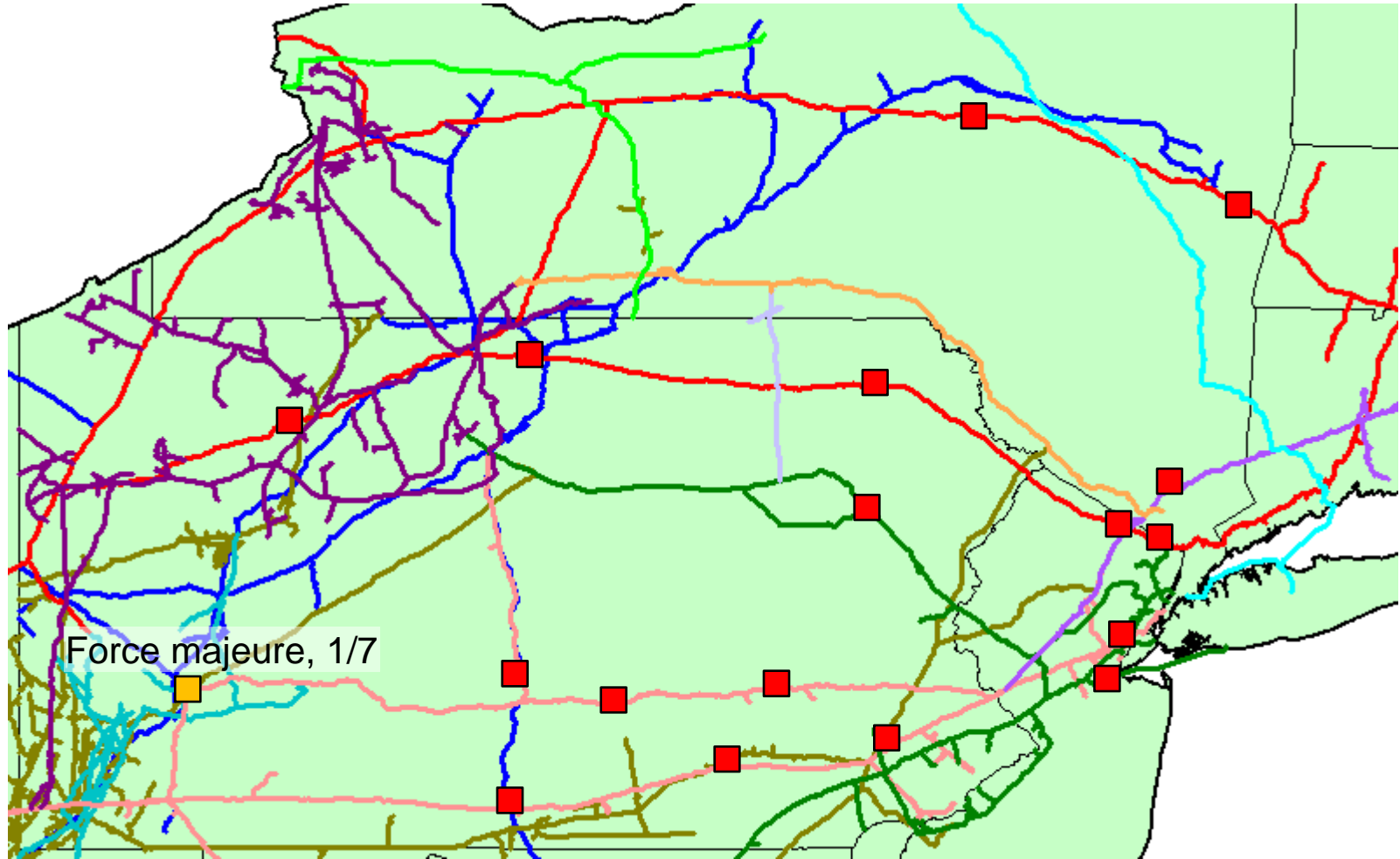


Dominion-South



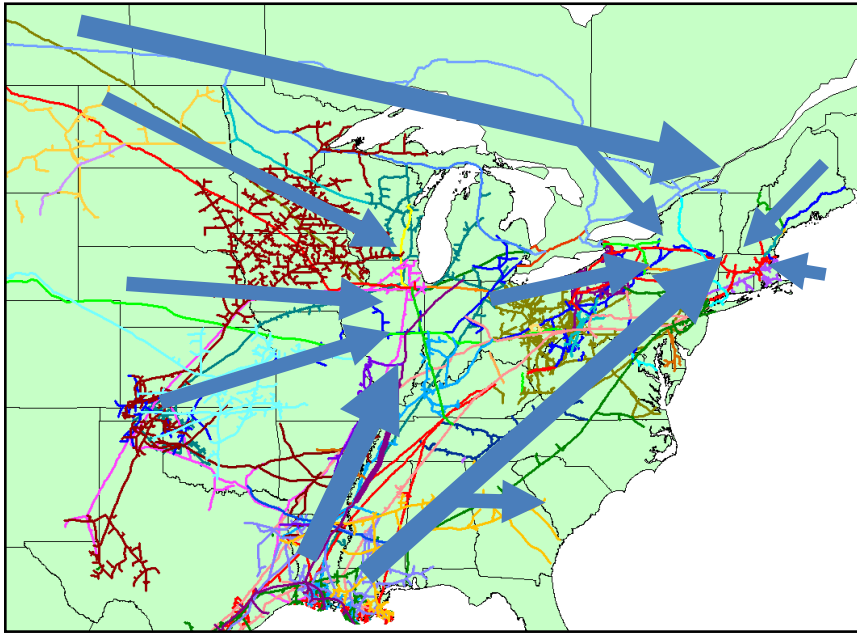
Chokepoints Across the Supply Chain into the NYFS

January 6-7, January 21-23, 2014

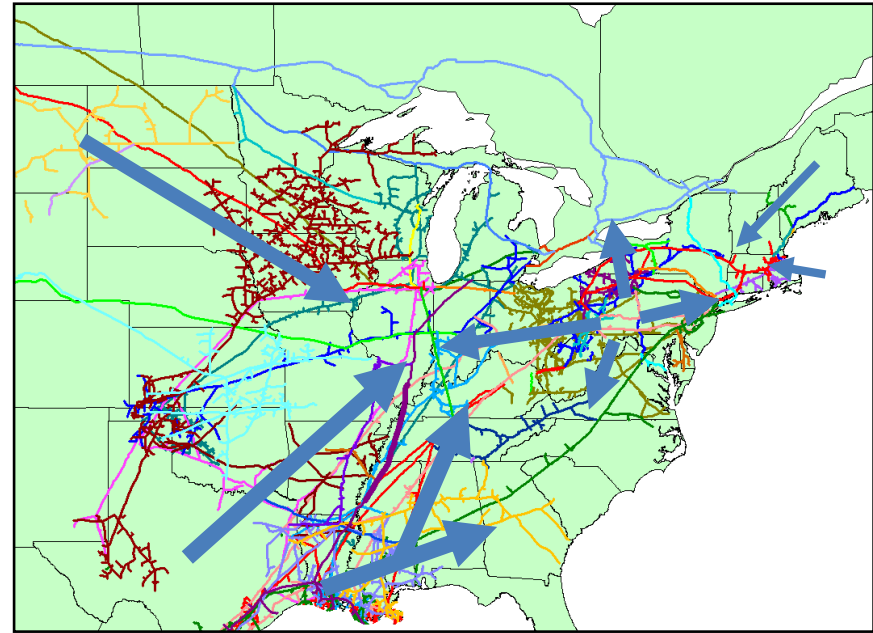


Pre-Shale and Post-Shale Gas Flow Patterns

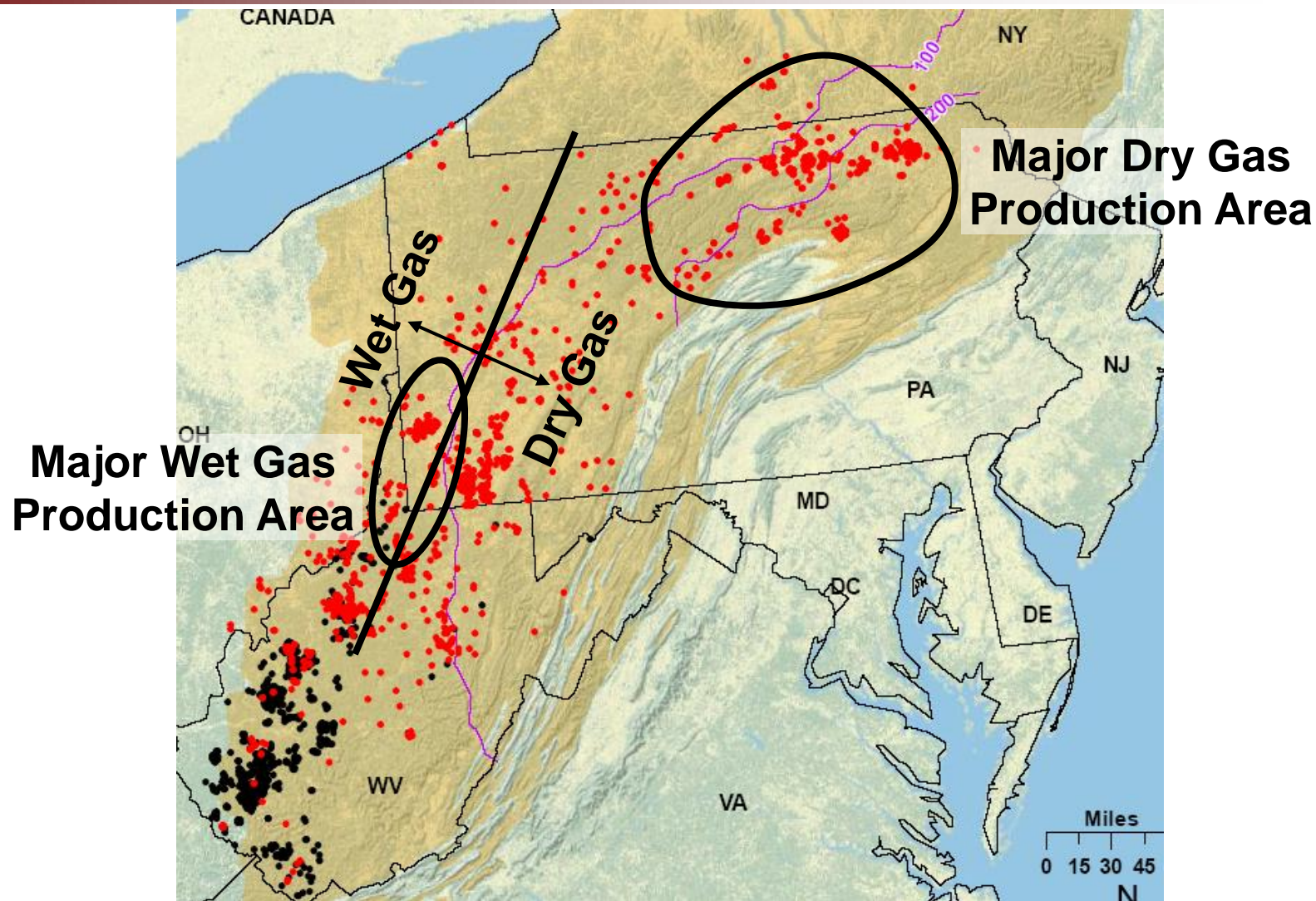
Pre-Shale Flow Patterns



Post-Shale Flow Patterns



Wet and dry shale gas production

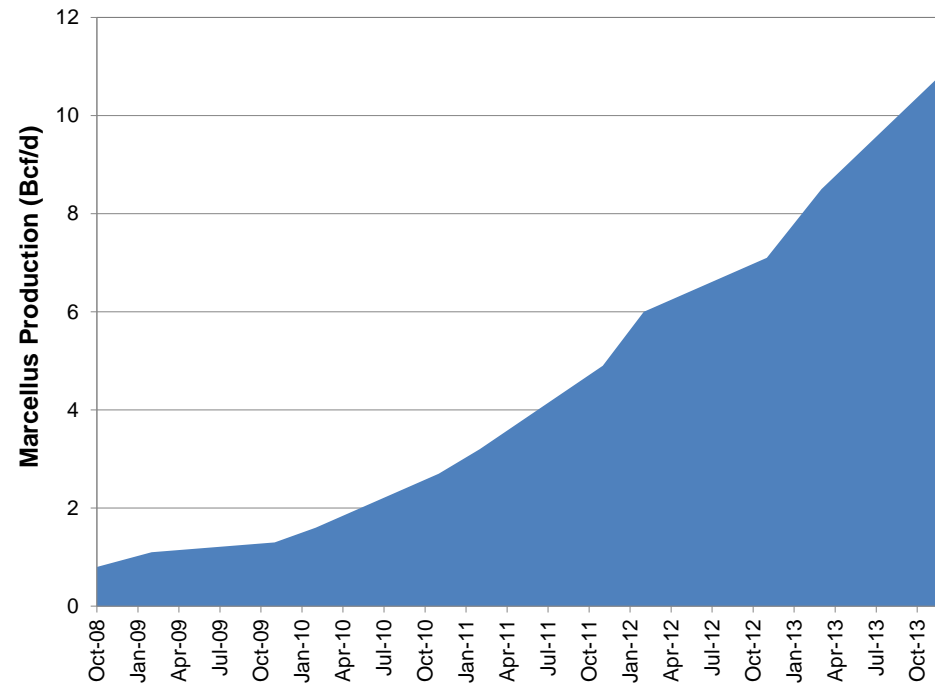


Sources: EIA, Pennsylvania State University Marcellus Center, Dominion Resources, Pennsylvania Department of Conservation and Natural Resources

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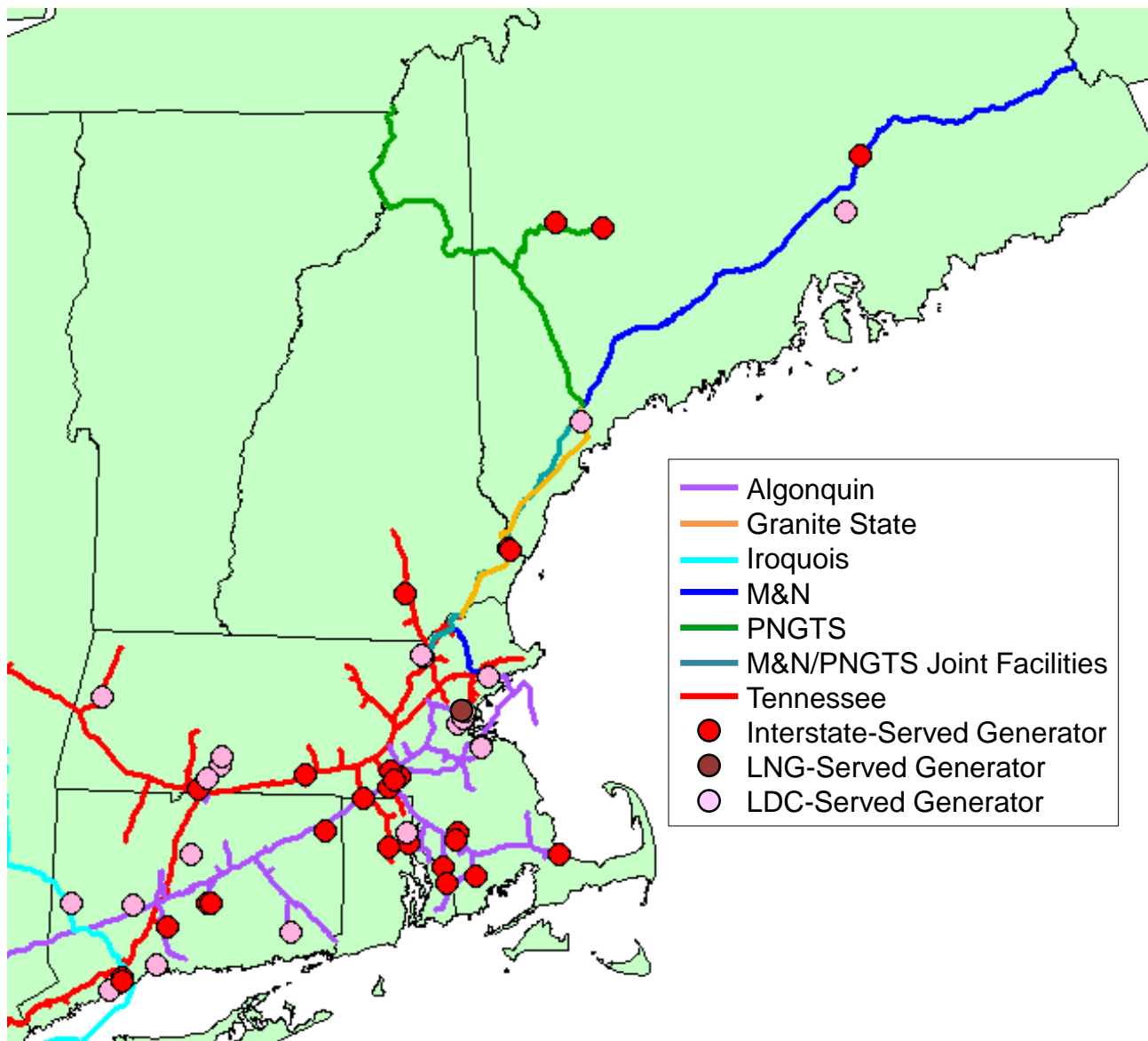
Radical Change in Traditional Flows

- ◆ Shale gas fundamentally altering traditional flows
 - Long haul transportation from WCSB obsolete
 - Marcellus gas supplanting gas from GoM and Canada
 - Declining Sable Island production, uncertainty around Deep Panuke
 - Reversal of flow through New York / Ontario
 - LNG imports limited to contract quantities, periodic arbitrage
 - Flexible cargoes to EU or Asia

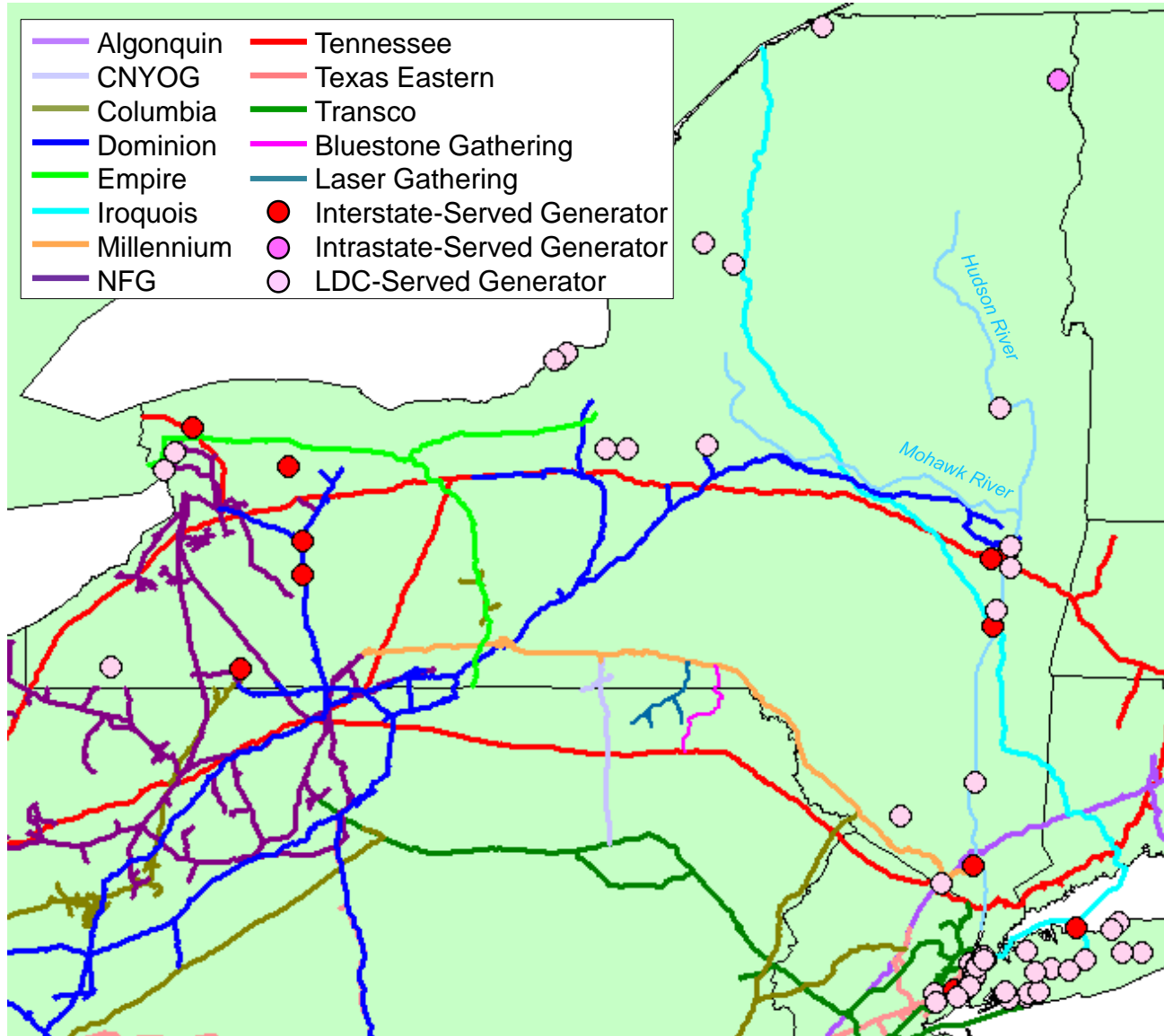


Source: Bentek Energy

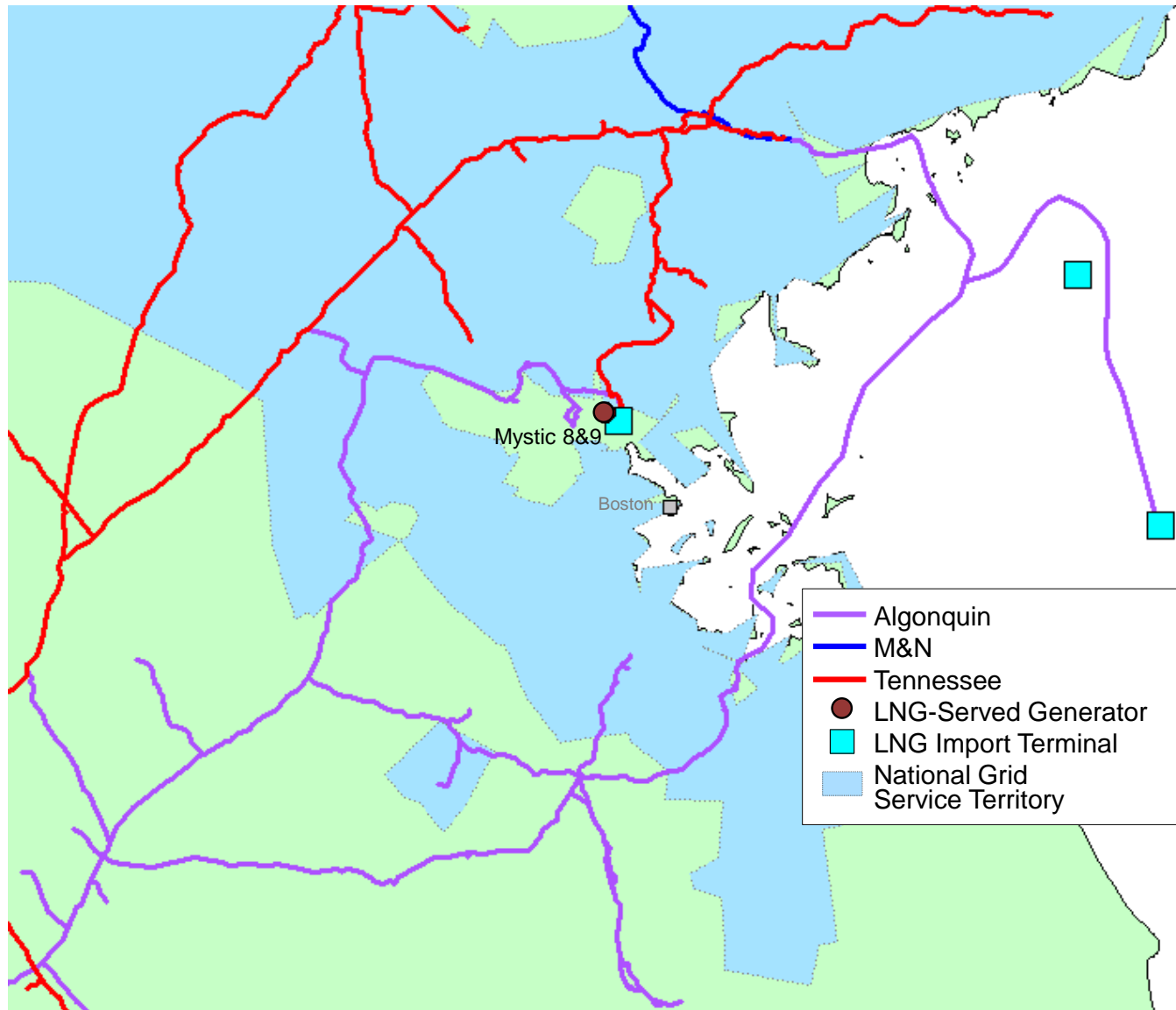
Interstate Pipelines Operating in New England



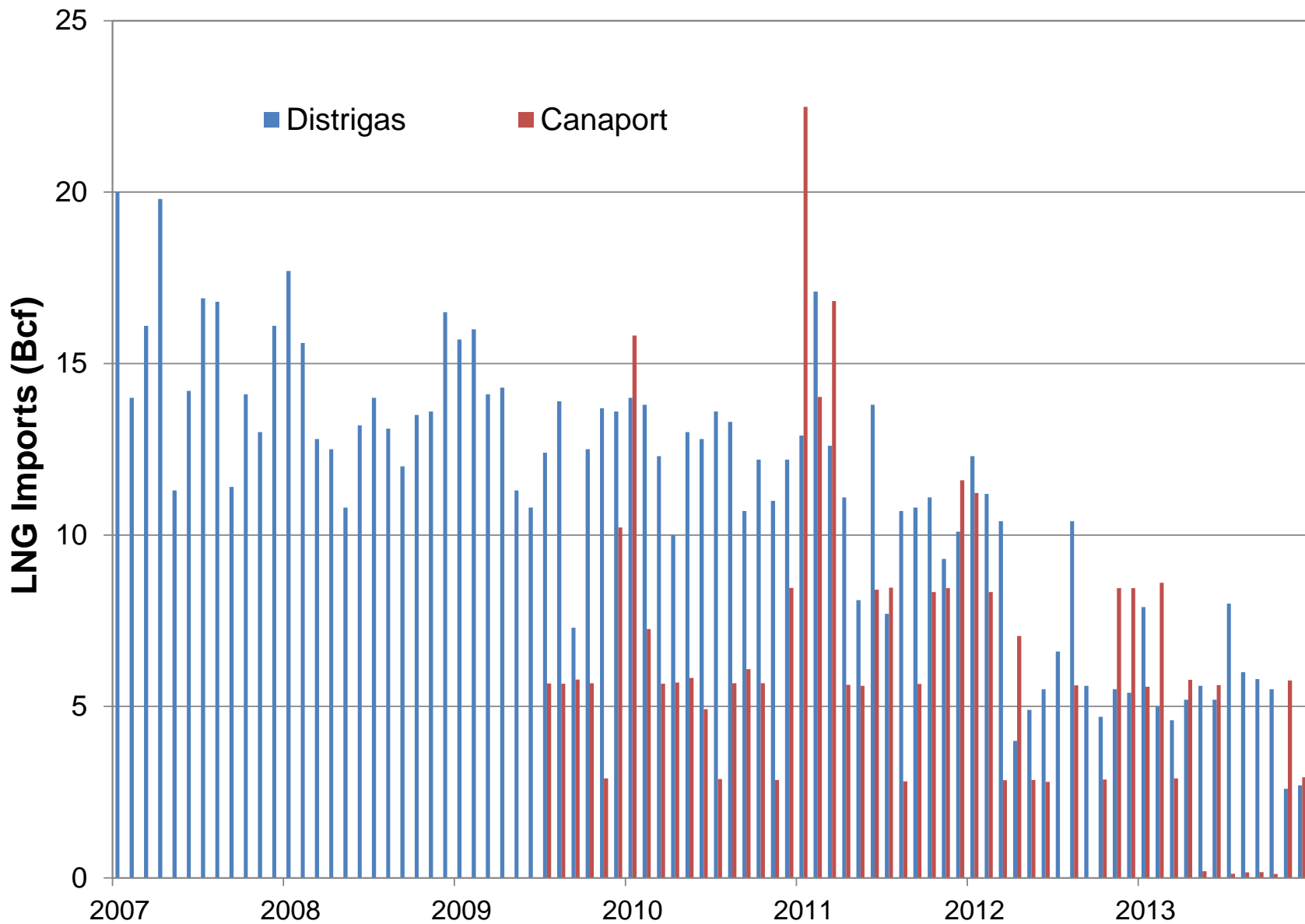
Interstate Pipelines Operating in New York



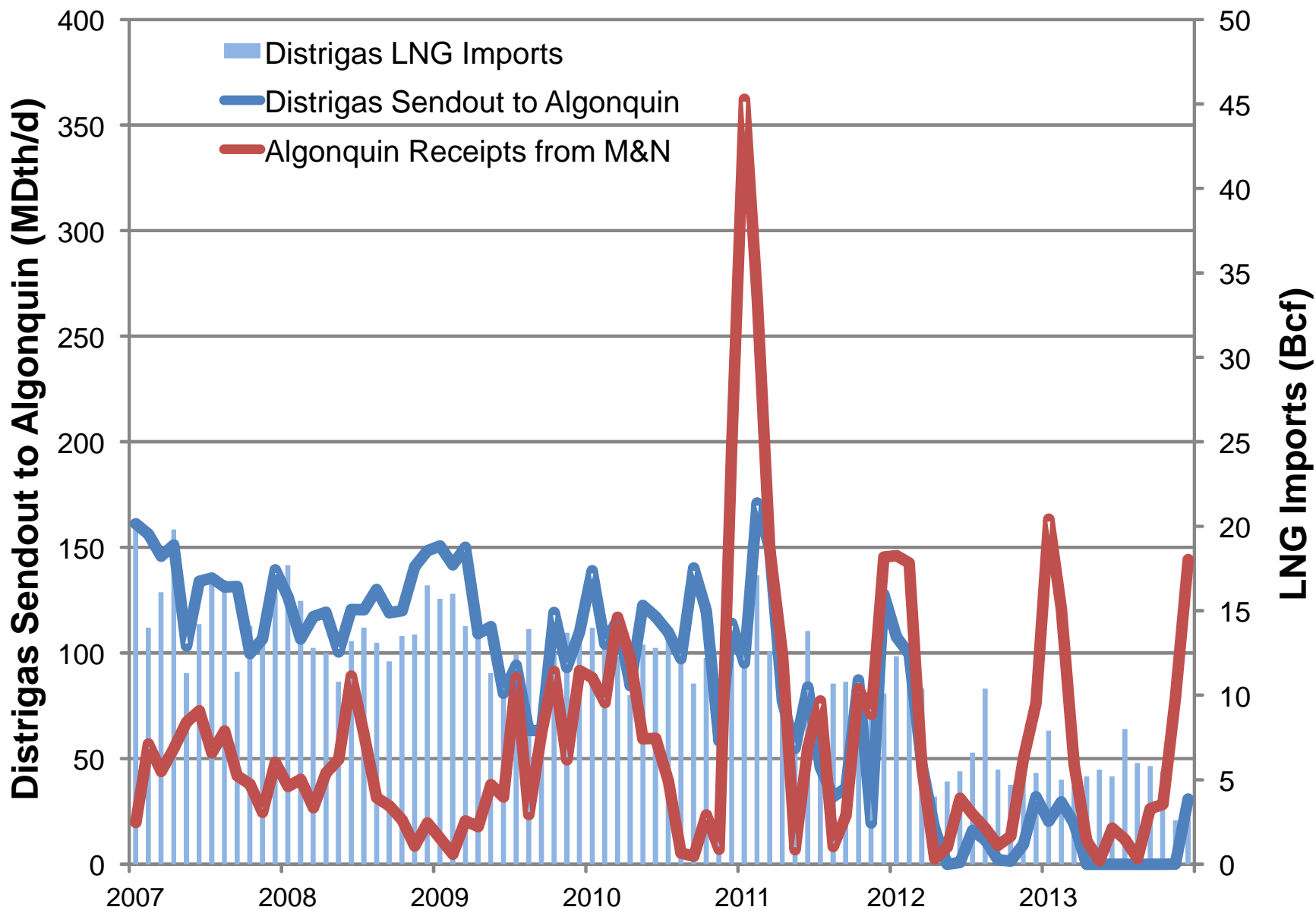
LNG Import Terminals in New England



Northeast LNG Imports

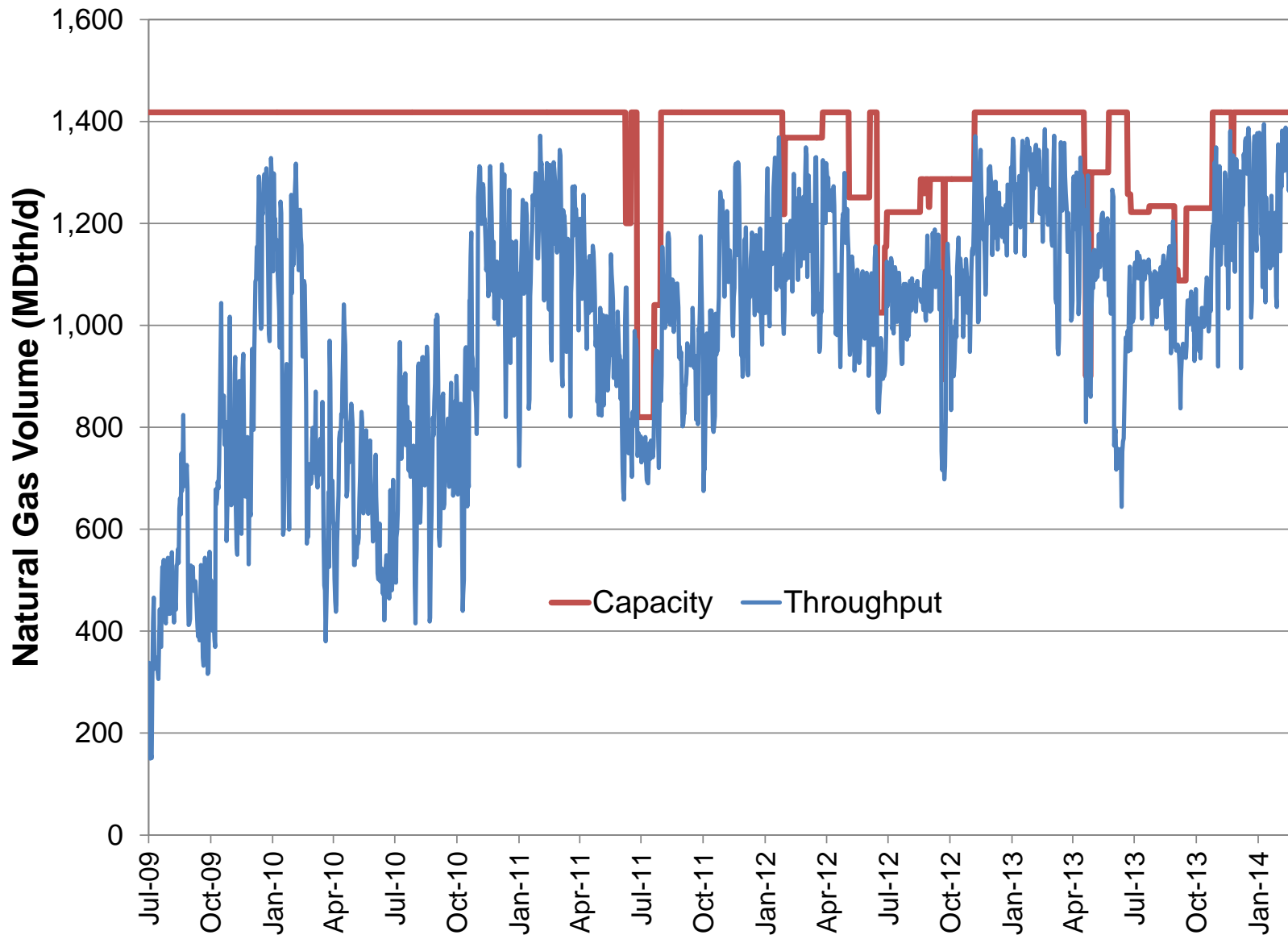


Decline in East-End Supplies



Constraints on West-End Supplies

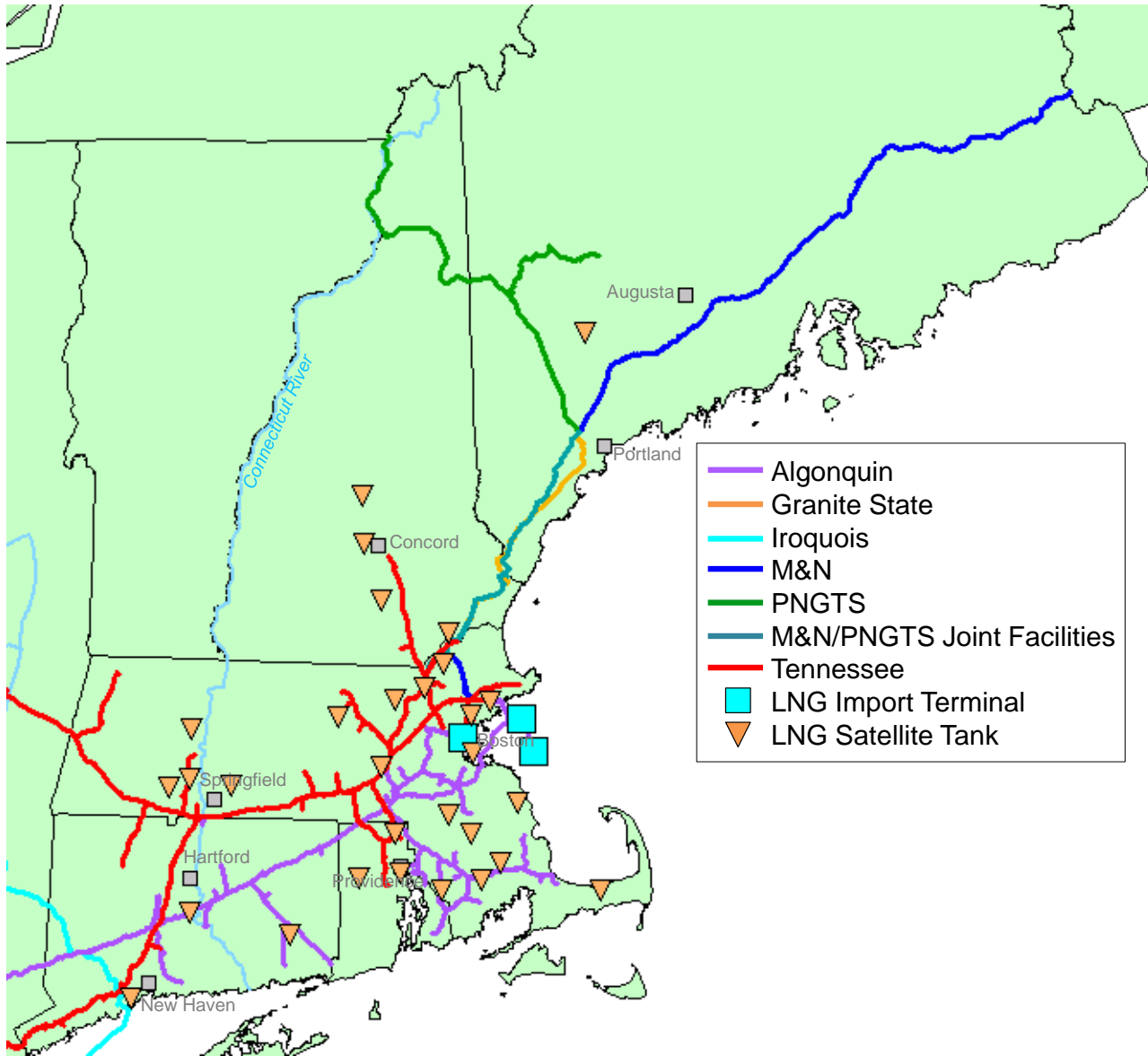
Algonquin Southeast Compressor Station (NY/CT Border)



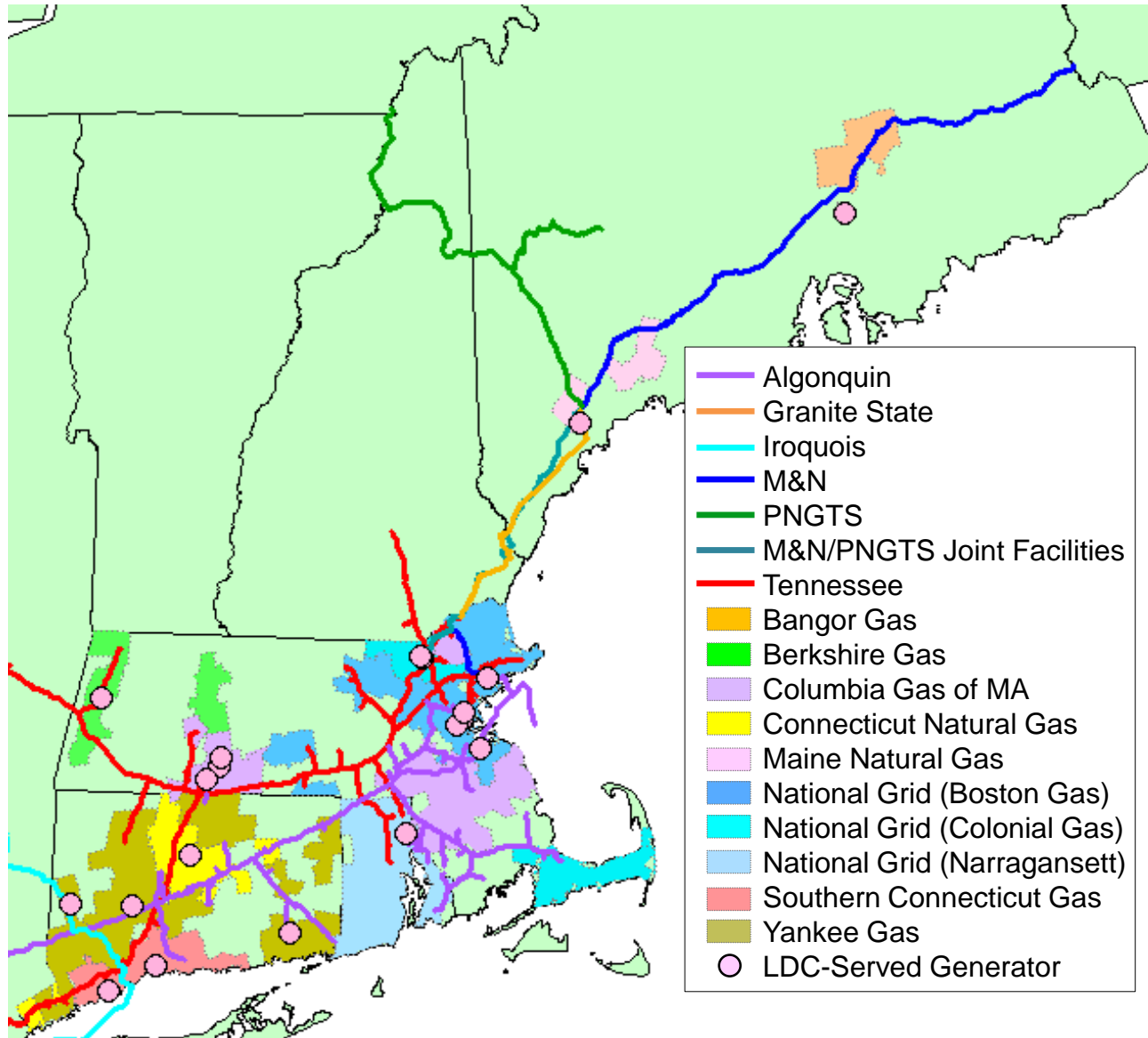
Source: Spectra Energy

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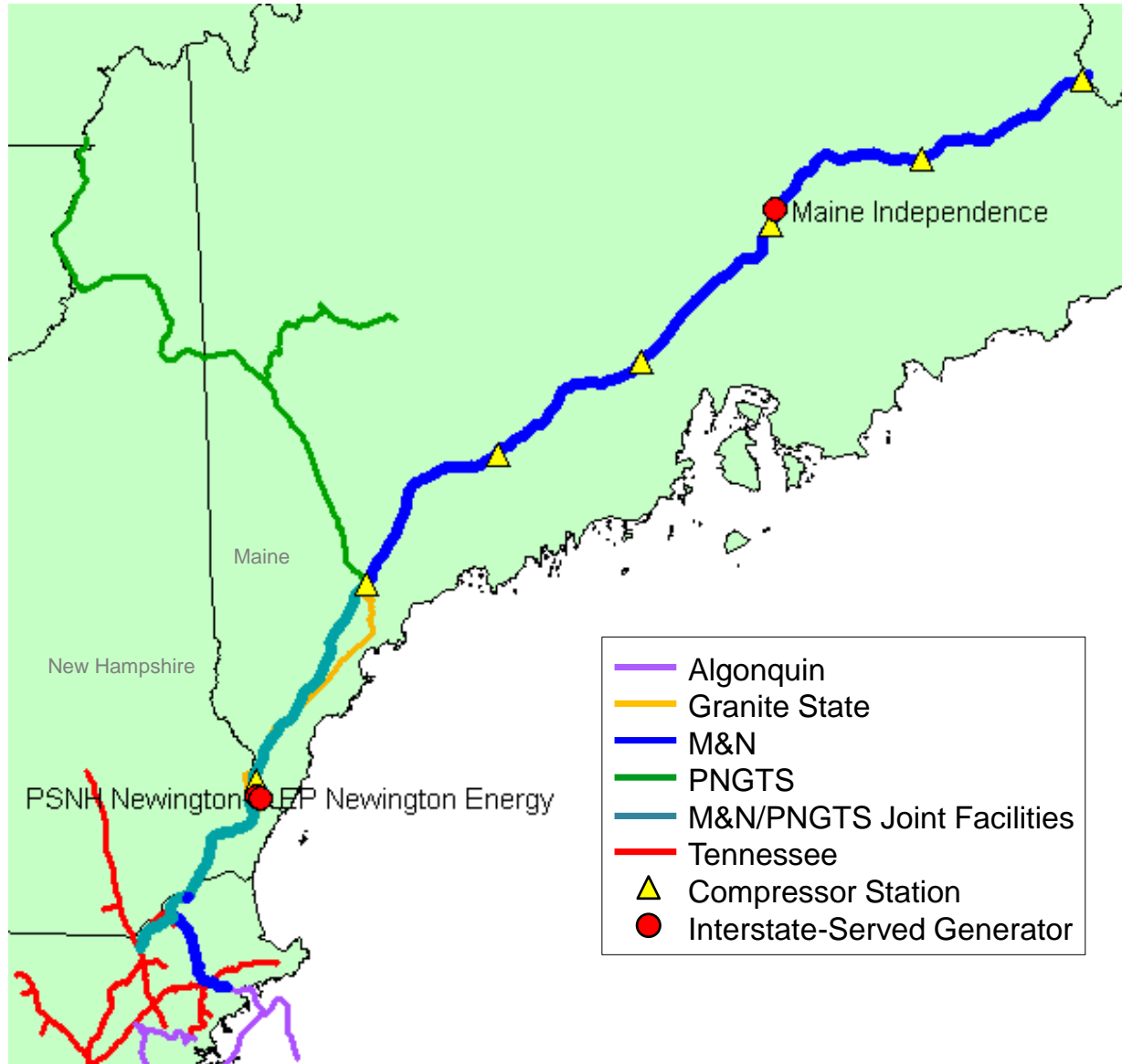
LNG Facilities in New England



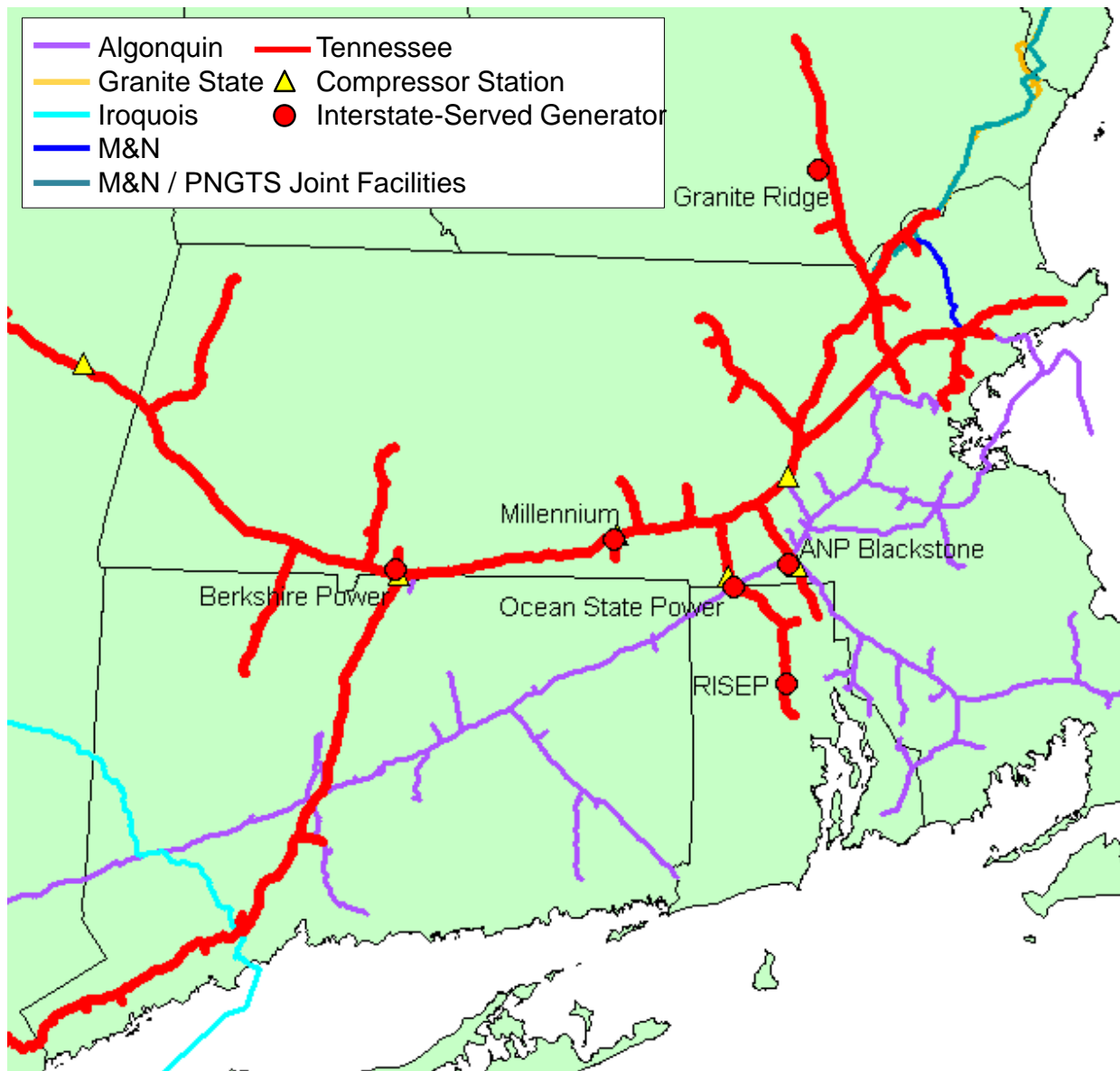
LDCs Serving New England Generators



M&N Pipeline Facilities



Tennessee Pipeline Facilities in New England



Concluding Thoughts

- ◆ Loss of New England's P/L portfolio diversity heightens economic and operational risks
- ◆ High basis and volatile gas prices likely here to stay until pipeline enhancements alleviate congestion along traditional pathways into the region
- ◆ Existing ISO wholesale market design does not induce genco commitments for firm transportation
- ◆ Bulk power security during the winter is derived largely from oil
 - Many oil generation plants at the local level are at-risk for retirement
 - Combined cycle, gas turbine, and steam turbine generators on oil cannot sustain the provision of ancillary services