

# Electric Resilience & Reliability: **A Natural Gas Pipeline Perspective**

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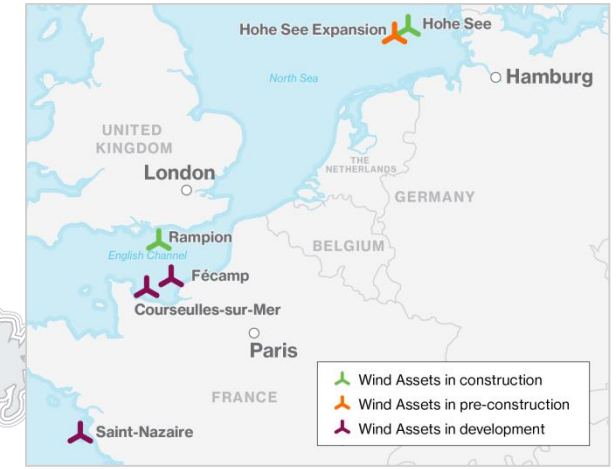
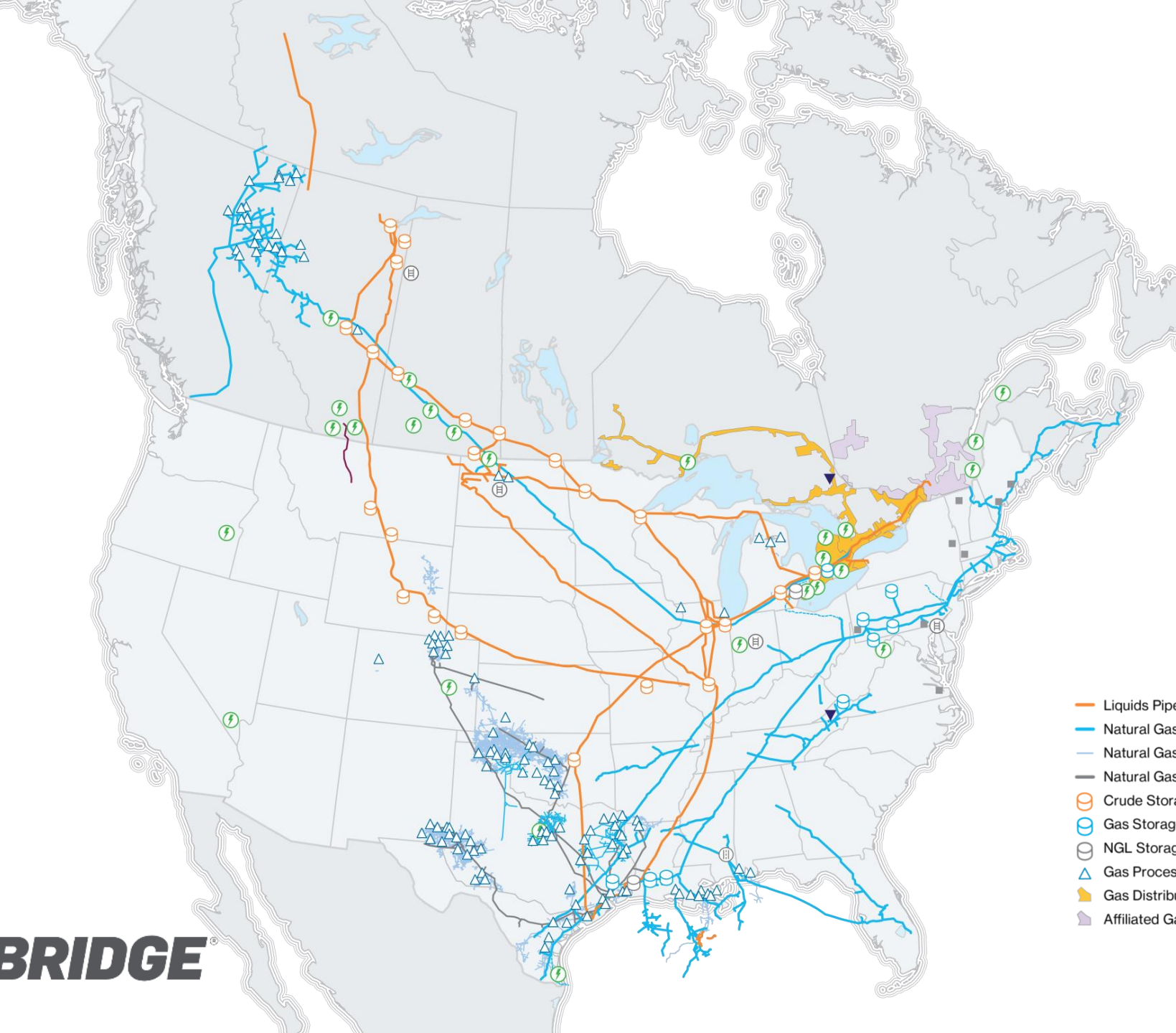
Energy Policy Roundtable in the PJM Footprint

November 28, 2017



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**Richard J. Kruse**  
Vice President, Texas Eastern



- Liquids Pipeline
- Natural Gas Transmission Pipeline
- Natural Gas Gathering Pipeline
- Natural Gas Liquids Pipeline
- Crude Storage and Terminal
- Gas Storage Facility
- NGL Storage
- △ Gas Processing Plant
- Gas Distribution Service Territory
- Affiliated Gas Distribution Territory
- ▼ LNG Facility
- Rail
- Trucking Facility
- Propane Terminal
- Power Transmission
- ⚡ Renewable Energy

- ⚡ Wind Assets in construction
- ⚡ Wind Assets in pre-construction
- ⚡ Wind Assets in development

# What we do

We help fuel quality of life of millions of people everyday



## Our liquids business

- 16,500 miles of pipelines
- 3 million bpd capacity
- More than 100 unique commodity types



## Our natural gas business

- 34,410 miles of natural gas pipelines
- Moving 15% - 20% of North America's gas needs



## Our renewables business

- 23 renewable facilities: wind, solar, geothermal and waste heat recovery
- 2,800 megawatts generating capacity




## Our gas distribution business

- 3.5 million customers across Ontario
- Servicing more than 500 communities

- Pipeline Design Capability is determined by contract
  - Pipelines rarely built for non-firm service
- Two physical components
  - Pipelines are buried and generally tested from 120% to 150% or more of Maximum Allowable Operating Pressure
  - Compressor Stations
- U.S. DOT - PHMSA
  - Pipeline Safety Standards
    - Construction
    - Operation
    - Maintenance

# Reliability and Resilience Defined by Contracting

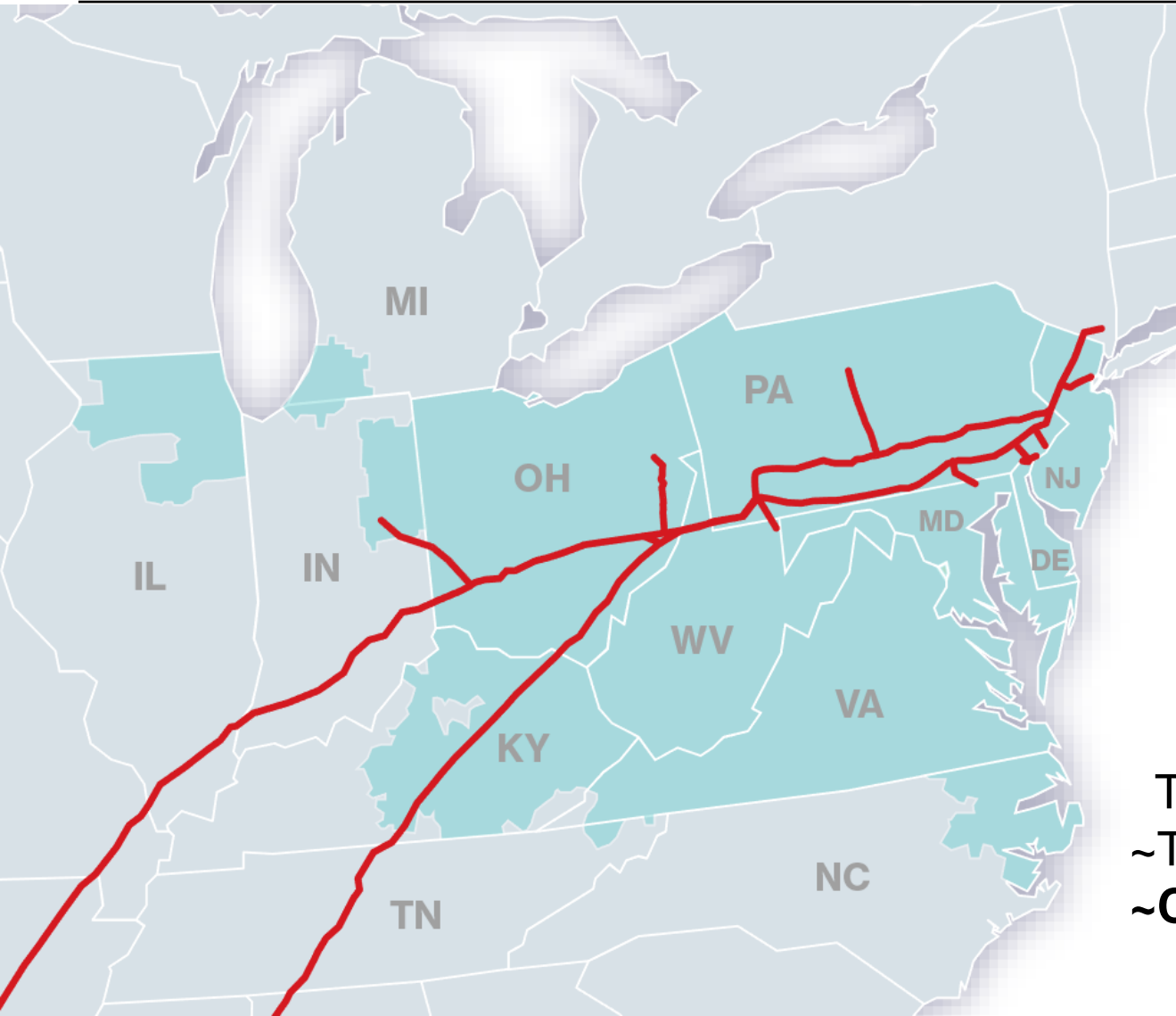
## The Type of Contract being Scheduled Determines the Priority of Service



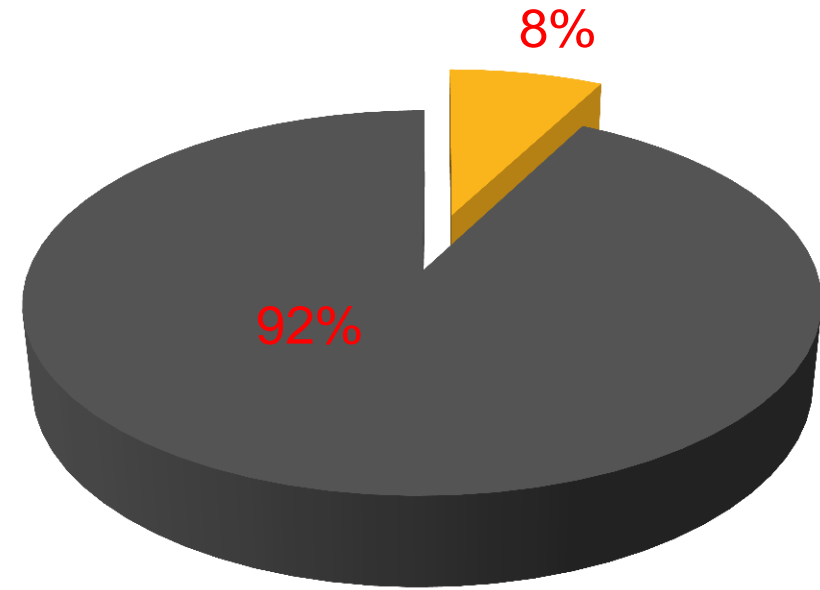
<b>Most Reliable</b>	<b>Primary Firm: Primary Receipt to Primary Delivery</b>		
	Secondary	Within Path	to Primary Delivery Point
	Secondary	Within Path	not to a Primary Delivery Point
	Secondary	Out of Path	with Entitlements at Point of Constraint
	Secondary	Out of Path	without Entitlements
<b>Least Reliable</b>	Interruptible Transportation		

Secondary and Interruptible services are subject to operational conditions at the time.

# Texas Eastern Transmission Serves PJM Footprint



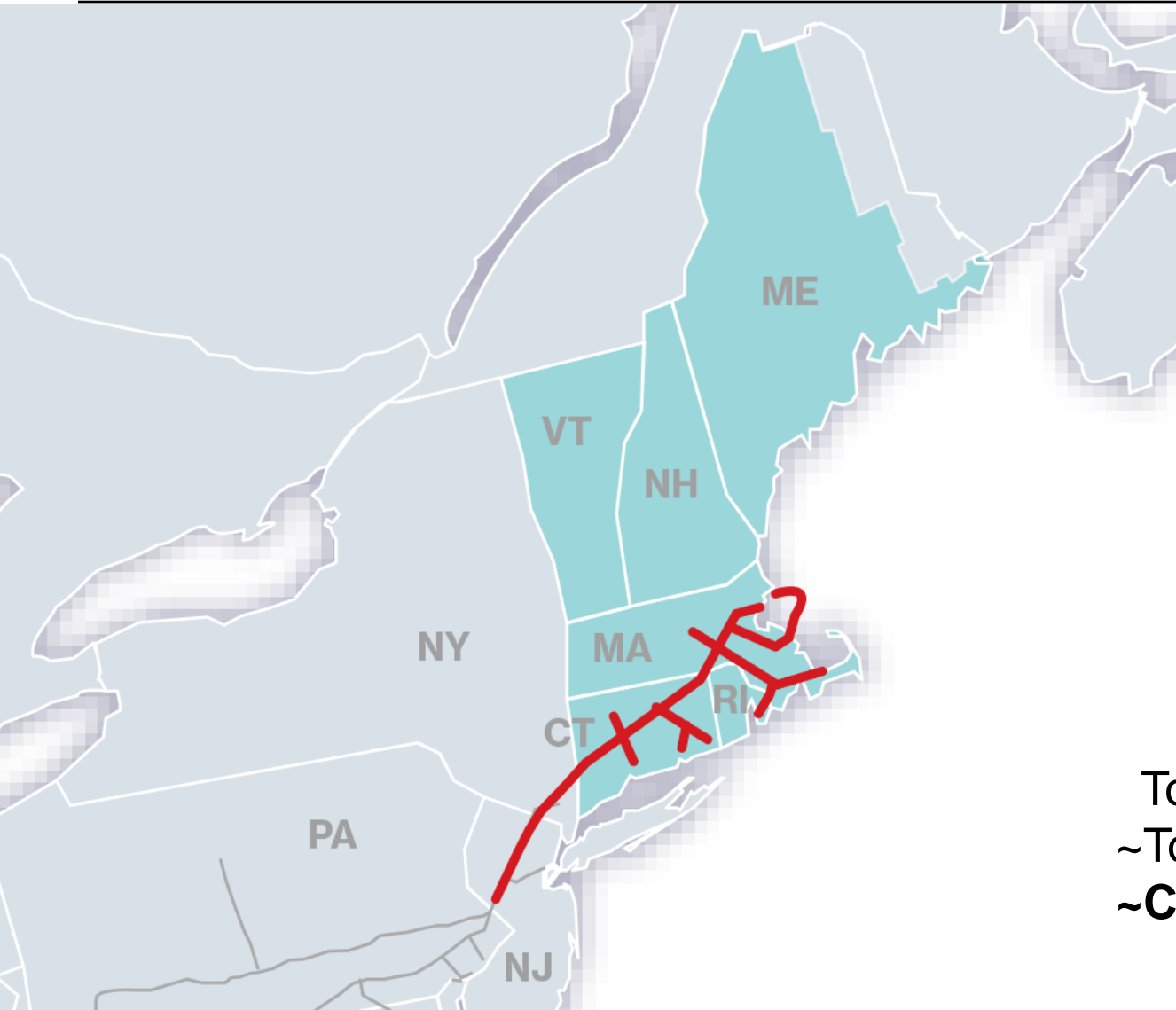
TETLP Directly Connected Power Generation Capacity v Total Firm Mainline Pipeline Capacity Held By Power Generators



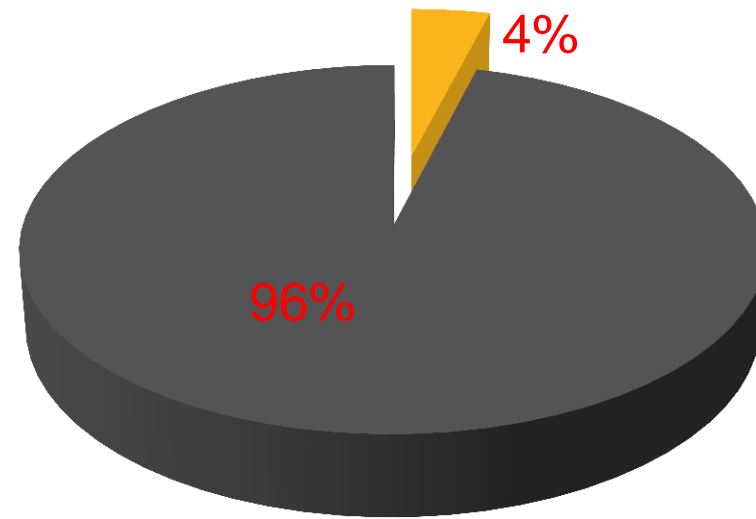
Total Plant MW	3,741 MWs
~Total Plant Capacity	2,748,000 Dths
~ <b>Contracted Firm P/L Capacity</b>	<b>227,000 Dths</b>



# Algonquin Gas Transmission Serves ISO New England Footprint



AGT Directly Connected Power Generation Capability v Total Firm Mainline Pipeline Capacity Held By Generators



Total Plant MW	7,350 MWs
~Total Plant Capability	1,470,000 Dths
<b>~Contracted Firm P/L Capacity</b>	<b>61,000 Dths</b>

## Texas Eastern Enhanced Electric Reliability Project Open Season held August 1 – September 30, 2017

- Project proposed to provide
  - Enhanced non-ratable firm natural gas transportation and storage service for electric generators, LDCs, and other delivery points within the PJM region
  - New Energy Reliability Service (“ERS”) that provided for:
    - Reserved No Notice Transportation with option for non-ratable hourly flexibility
    - “Quick-start” No Notice service enabling shippers to begin deliveries 2 hours prior to commensurate supply being nominated
    - Enhanced Maximum Hourly Quantity for assured non-ratable gas deliveries
    - Park and Loan No Notice Service
- Open Season results
  - Limited interest from power generators
  - Respondents were from LDCs or already existing power plants



**Root Question:**

**If additional Firm Capacity is needed, why are Generators not signing up?**

