

Market Design Through a Period of Transition

Raab Roundtable

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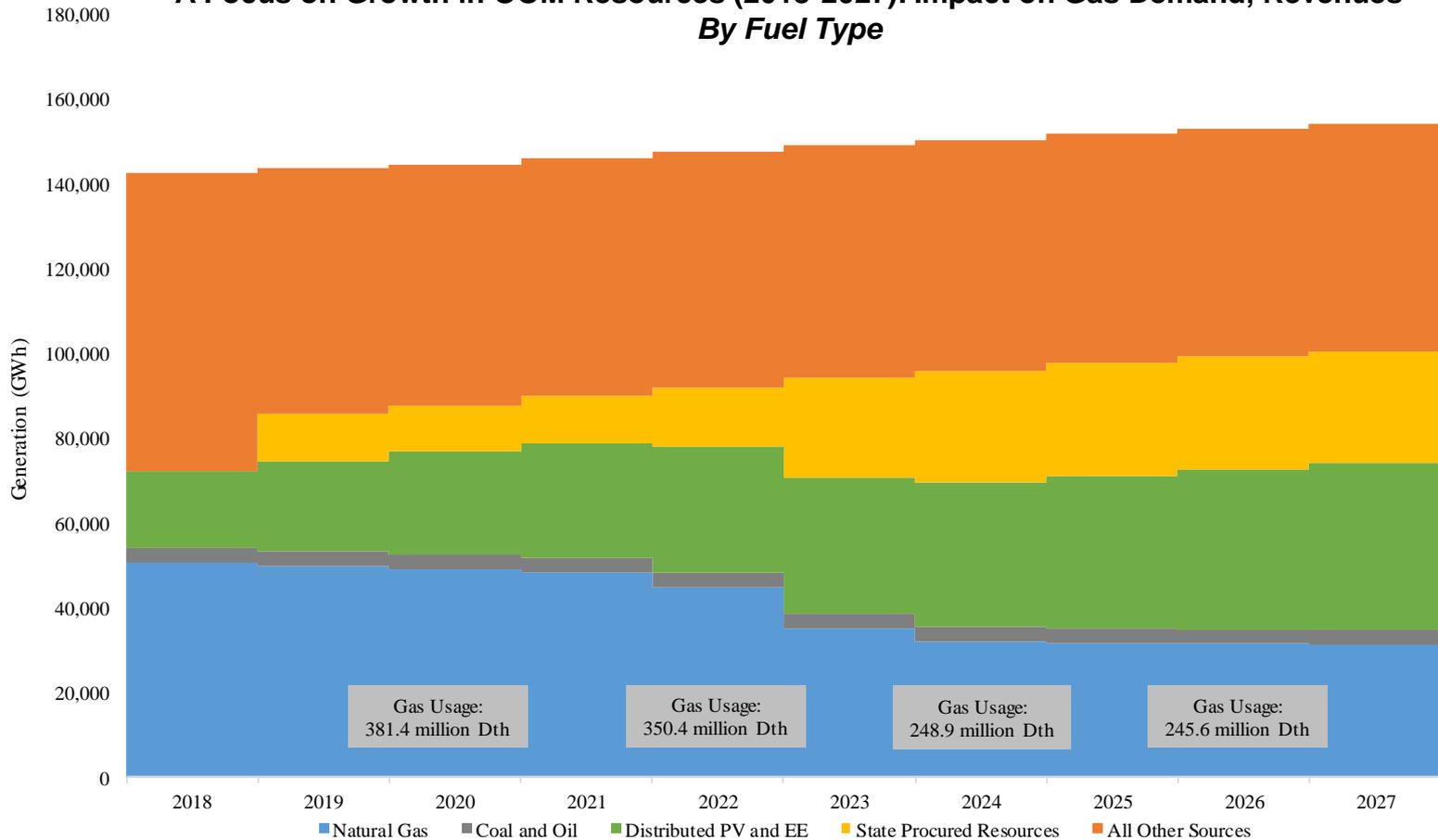
Outline

- Markets reflect their surroundings
- What does the future look like?
 - Wholesale market focus
 - Natural gas – a lone competitor in a period of transition?
- Implications
- A few thoughts going forward

Markets for What?

- State carbon policy: nuclear, hydro, renewables
- RMRs or bust: coal, oil
- What's left, other than natural gas as a competitive residual reliability resource?
- What does that look like going forward, with forces pushing in different directions?
 - Some shifts move away from gas and markets (state resources, RMRs, distributed resources)
 - Others highlight a pervasive need for economic gas-fired generation (retirements, electrification (heating, transportation))
- What does this mean for markets?

A Focus on Growth in OOM Resources (2018-2027): Impact on Gas Demand, Revenues By Fuel Type



Note:

[1] Generation by all other sources includes nuclear, wind, solar, hydro, landfill gas, methane, refuse, steam, wood, and imports.

Sources:

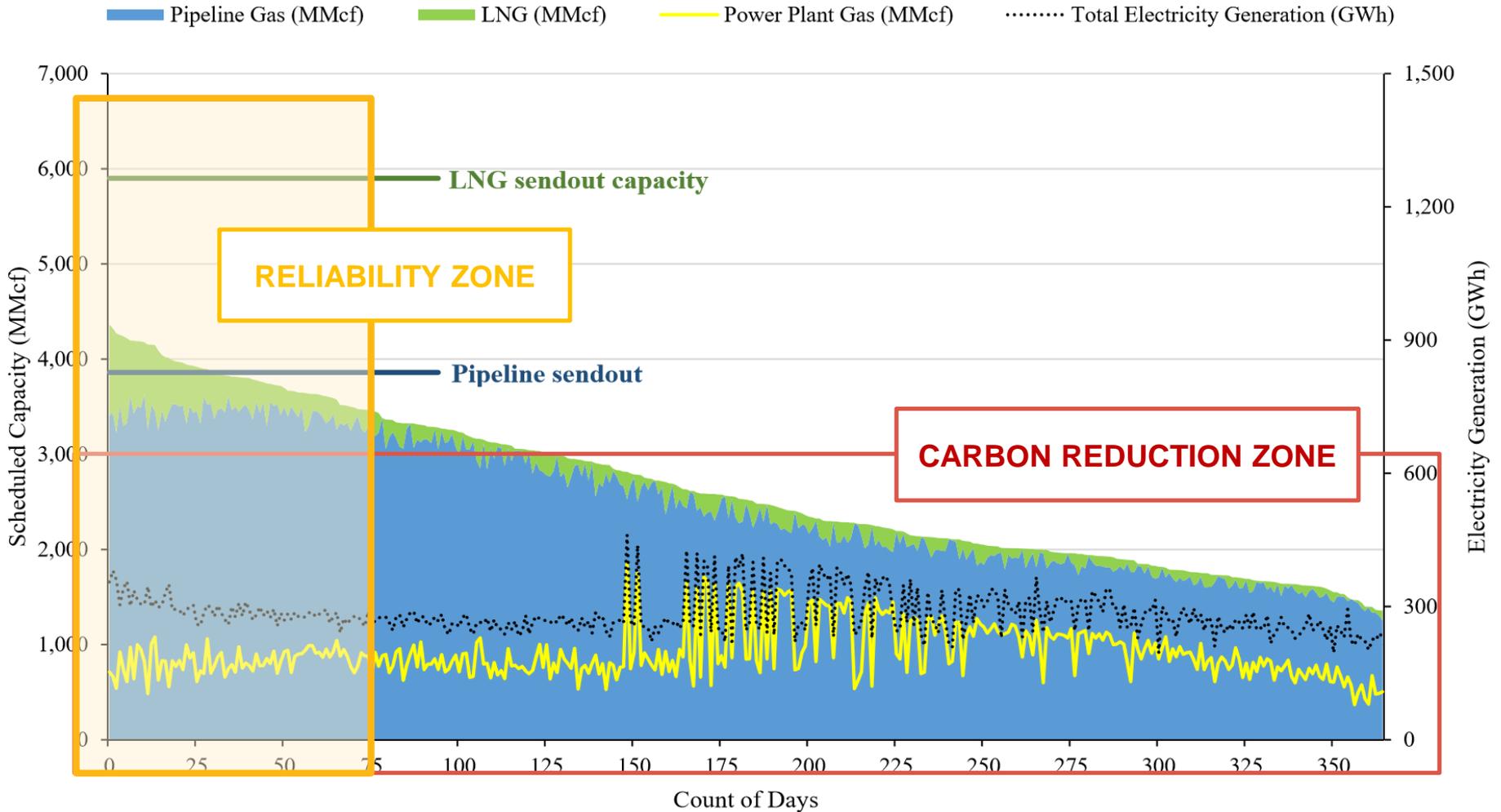
[1] ISO-NE, 2018 Forecast Data (CELT Report 2018-2017).

[2] Solar and wind capacity factors from Lawrence Berkeley Laboratory, Utility-Scale Solar 2018 and US DOE, Wind Technologies Market Report 2017.

[3] State power procurements based on reports in SNL Financial as well as MA, CT, and RI press releases.

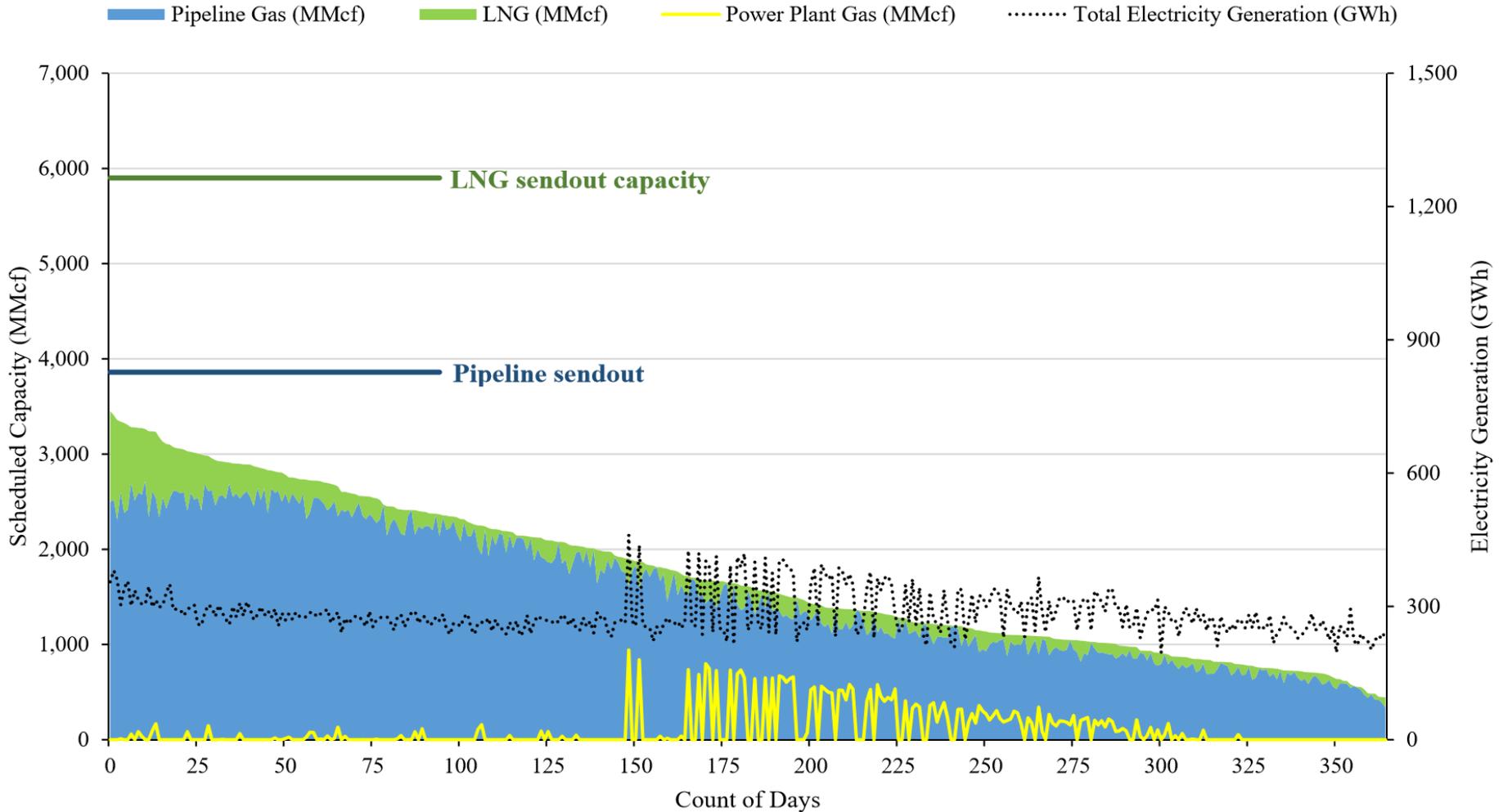
New England Natural Gas Demand by Source (2018)

Base Case



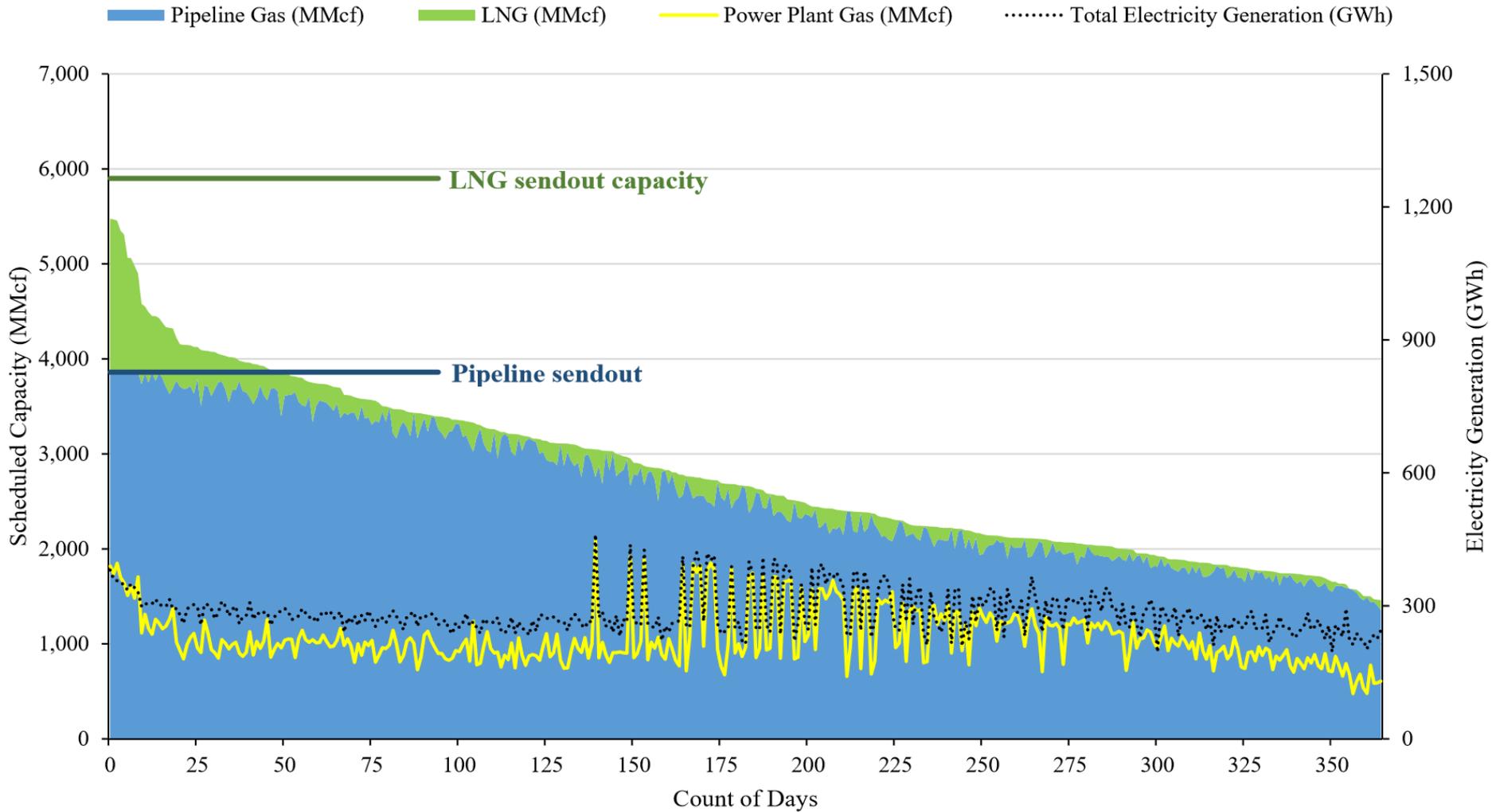
New England Natural Gas Demand by Source (2018)

Addition of Renewables (10 GW)



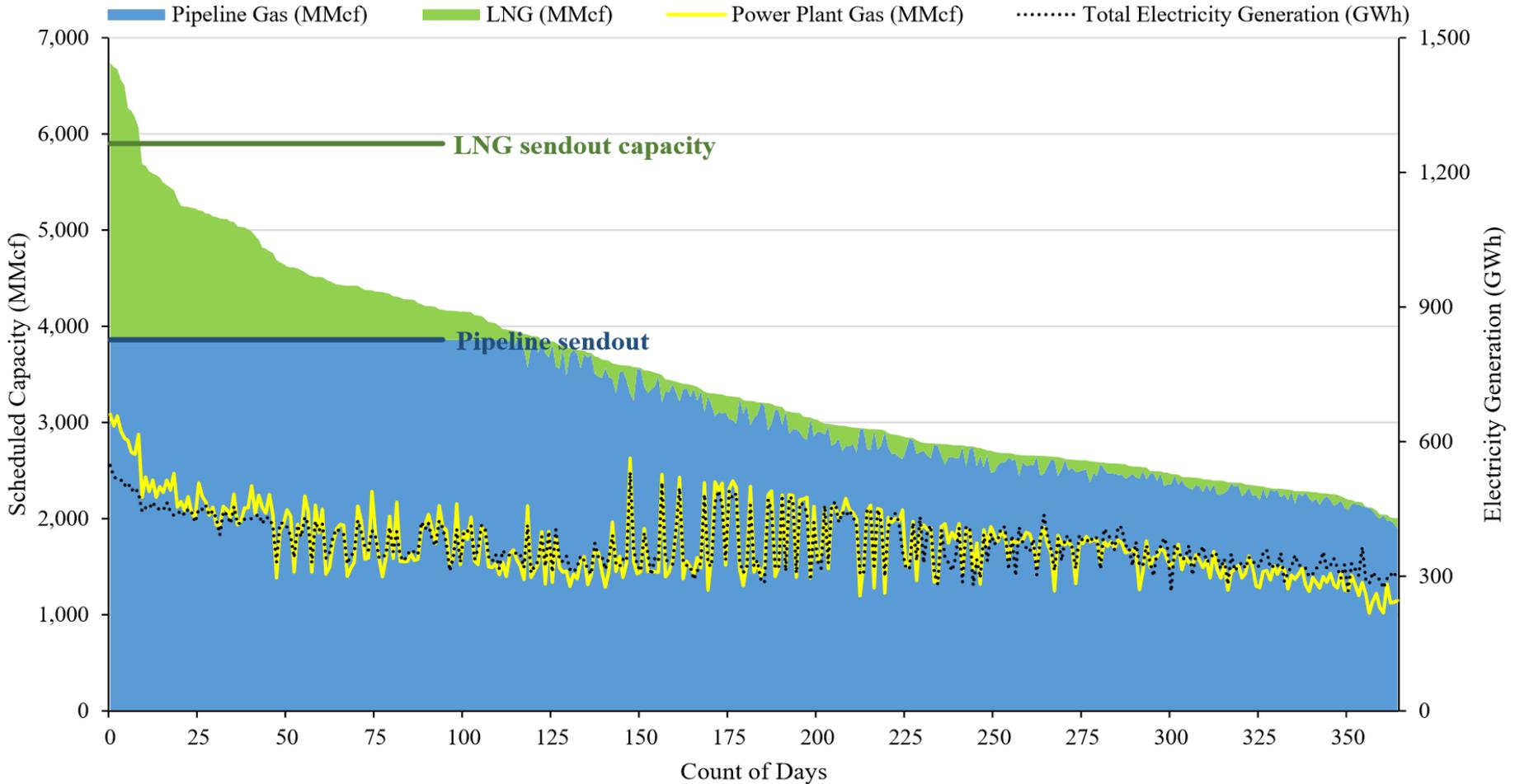
New England Natural Gas Demand by Source (2018)

Pilgrim Retires, Remaining Oil + Coal Retires



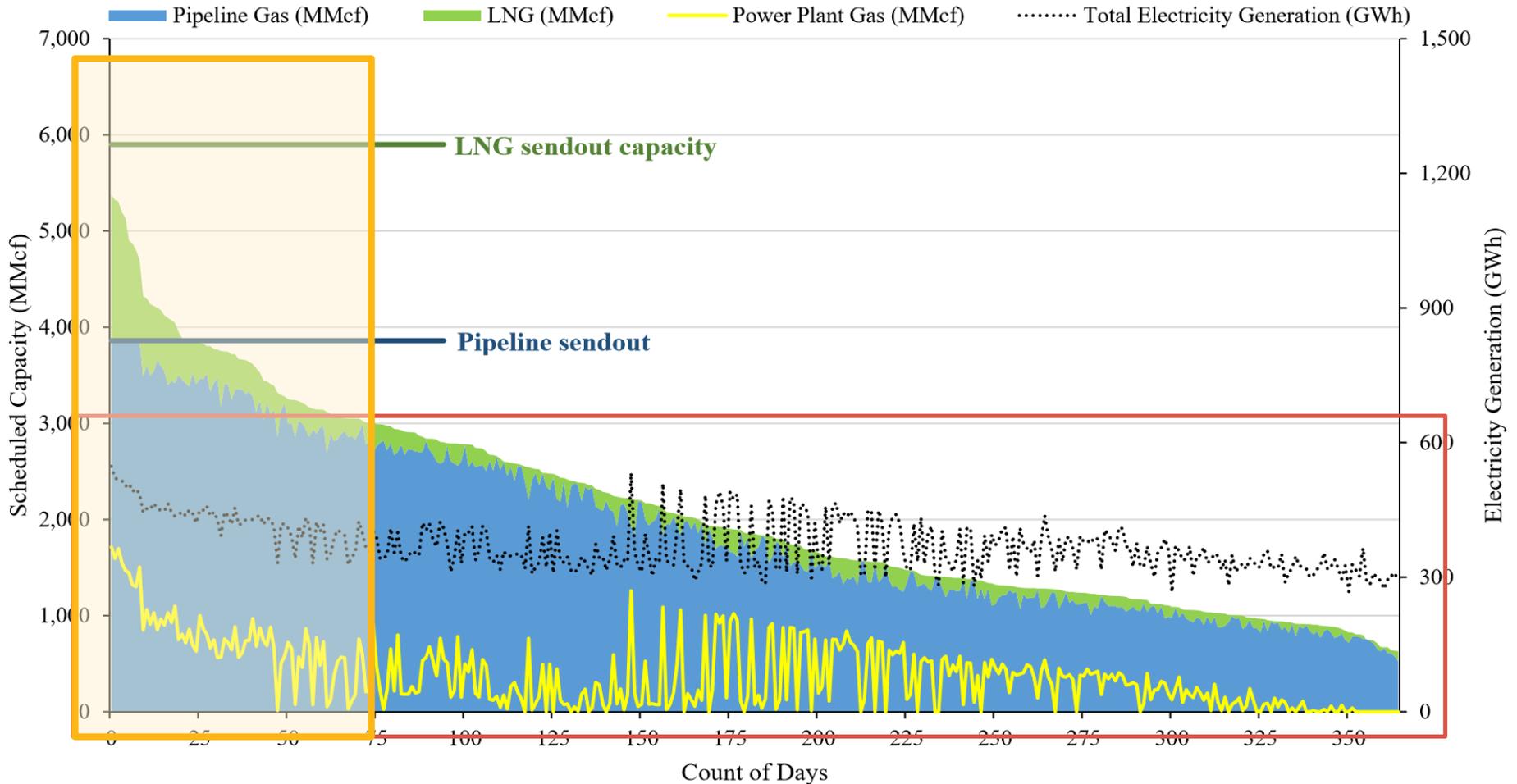
New England Natural Gas Demand by Source (2018)

Pilgrim Retires, Remaining Oil + Coal Retires, Electrification of Heating (25%), Electrification of Transportation (25%)



New England Natural Gas Demand by Source (2018)

Pilgrim Retires, Remaining Oil + Coal Retires, Electrification of Heating (25%), Electrification of Transportation (25%), Addition of Renewables (10 GW)



Natural Gas-Fired Power Generators

Key Question

- Generators have options
 - Retire
 - Absorb performance risks; take the chance
 - That gas will be available, at a price
 - That in any event, ISO will act to eliminate the risk (e.g., posture oil units)
 - Pay (and collect in the FCM) cost of mitigating the risk
- Firm mitigation alternatives
 - Dual fuel capability
 - Firm transportation
 - LNG forward contracts
- Will the next phase of market rule changes help?

If at First You Don't Succeed...

- Risk Assessment (2010+)
- Generator fuel responsibility (2013)
- Energy-gas market timing (2013+)
- Reserve levels and prices (2012+)
- Generating unit posturing (past and ongoing)
- Pay for Performance (2015)
- Winter Reliability Program (2014-2018)
- CASPR (2018)
- Fuel Security Reliability Assessment, Mystic (2018, ongoing)
- Opportunity costs (ongoing)
- Interim Compensation (?)
- Market-based fuel security designs...

Implications

What happens with gas-fired generation is the question

- The march of carbon policy will not abate
- The absurd
 - Rationalize carbon policy through pricing CO₂ in all energy markets is the easiest (administratively), and (b) can peacefully coexist with markets
 - ...And is the least likely outcome
- Reality – without a sufficient carbon price, state policies and technological change will be continuously disruptive
 - Retail rate design
 - Reliable system operations
 - Wholesale markets
- Wholesale markets focus
 - Consider “reliability zone,” design support for existing infrastructure
 - Changing nature of gas-fired generation (flexible, smaller, more dispersed)
 - Rapid evolution of infrastructure – need for better integration of planning with wholesale markets?