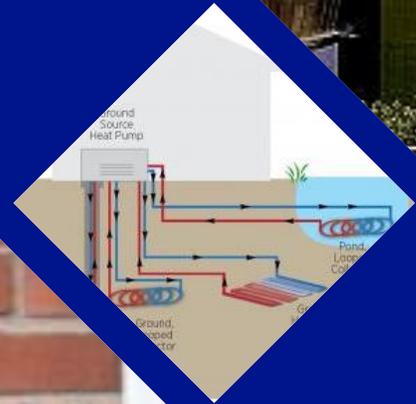


# Heat Decarbonization in the Northeast

Restructuring Roundtable  
21 June 2019

Mackay Miller  
Director, US Strategy  
National Grid

**nationalgrid**



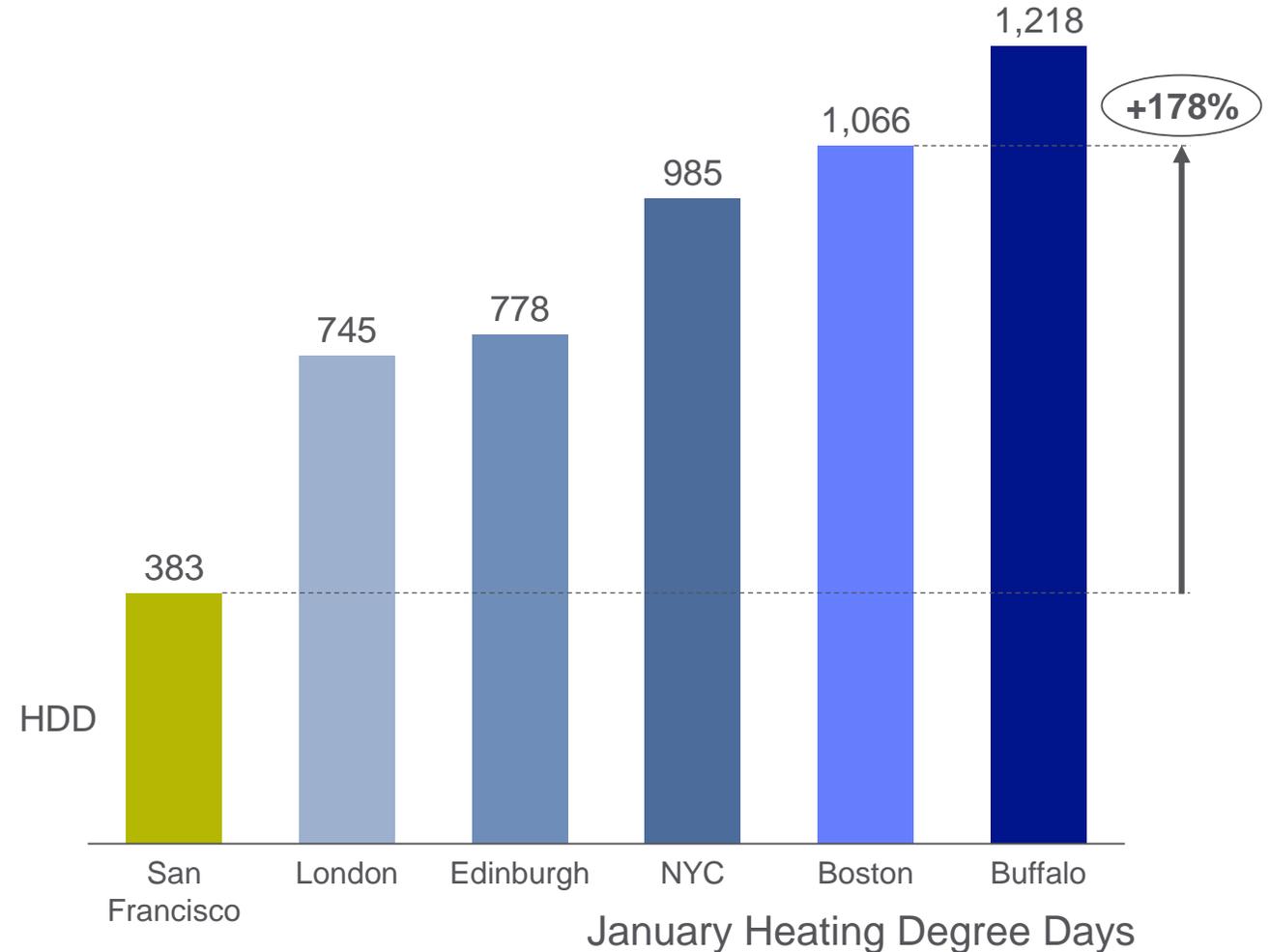
# The Northeast climate warrants tailored solutions

Heat demand in Boston exceeds that of San Francisco by **178%**

California heat decarbonization policy will not be our template for Northeast



**The Northeast will need to develop its own policy and technical approach to heat decarbonization.**



Fahrenheit-based 5-year-average (2013 to 2017) heating degree days for January (base 65F).  
Source: [www.degreedays.net](http://www.degreedays.net) (using temperature data from [www.wunderground.com](http://www.wunderground.com))

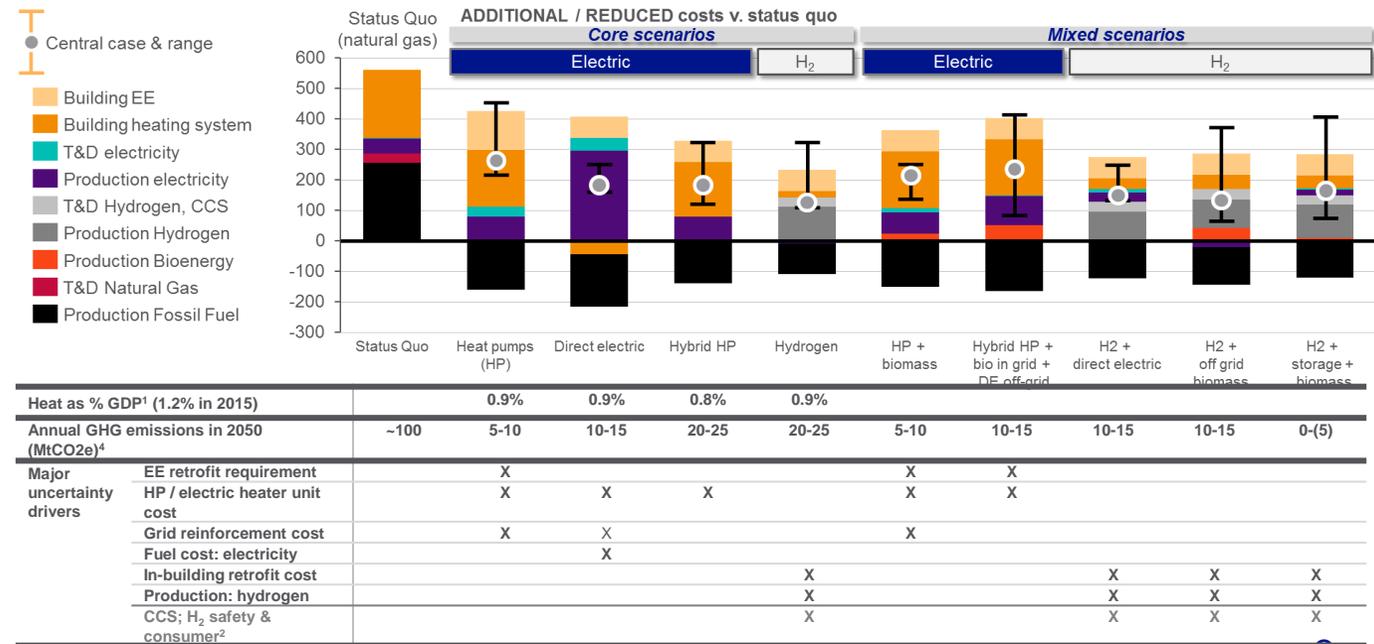
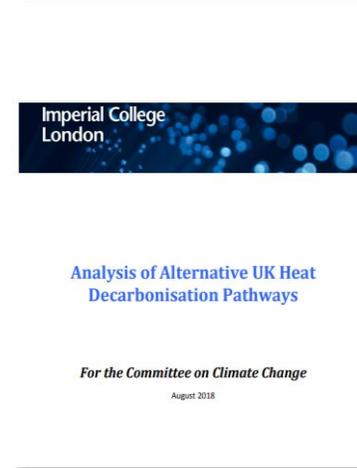
# The UK is leading the way in rigorous analysis of heat decarbonization

Since 2012, the UK government has commissioned a sustained analytical program around low-carbon heat.

Major studies in 2018 (commissioned by the *Committee on Climate Change* and the *National Infrastructure Commission*) tested total system costs of full electrification vs. hybrid vs. hydrogen pathways.



**Even in the warmer UK climate, the lowest cost pathway is uncertain as of yet**



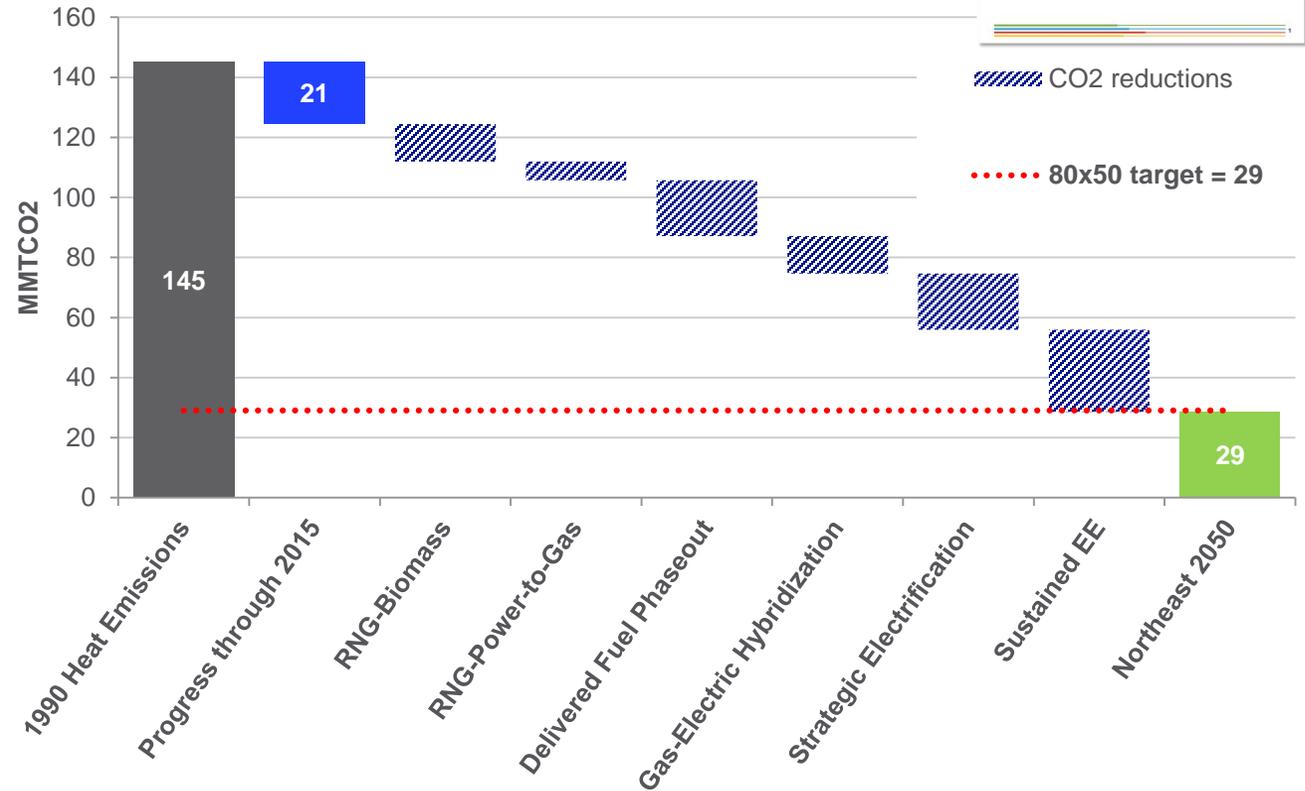
# Toward a robust Northeast heat decarbonization strategy

Heat pumps, hybrid homes, biomass, and hydrogen from electrolysis will all play a part.

Sustained building energy efficiency investment is foundational.

The Northeast decarbonization strategy will find a balanced mix of strategic electrification, decarbonized gas, and energy efficiency

Illustrative Pathway to Heat Decarbonization (New York + New England)



# The Role of Renewable Natural Gas

Significant activity around North America to decarbonize gas supply.

Utilities and third-party ecosystems are developing new business models.

Blend targets, carbon pricing and low-carbon fuel standards are a common denominator in major markets.

**A robust policy foundation drives utility engagement and business model innovation**



2017: BP acquires Clean Energy Fuels for \$155 million to become the prime national supplier of RNG.

Senate Bill No. 154-Senator Cancela

CHAPTER.....

AN ACT relating to natural gas; requiring the Public Utilities Commission of Nevada to adopt regulations authorizing a public utility which purchases natural gas for resale to engage in renewable natural gas activities and to recover the reasonable and prudent costs of such activities; requiring such a public utility to attempt to incorporate renewable natural gas into its gas supply portfolio; and providing other matters properly relating thereto.

**Legislative Counsel's Digest:**  
This bill requires the Public Utilities Commission of Nevada to adopt regulations authorizing a public utility which purchases natural gas for resale to engage in renewable energy activities and to recover all reasonable and prudent costs associated with the public utility's participation in a renewable natural gas activity which provides certain environmental benefits and has been approved by the Commission. This bill also requires a public utility which purchases natural gas for resale to attempt to meet certain goals for incorporating renewable natural gas into its gas supply portfolio.

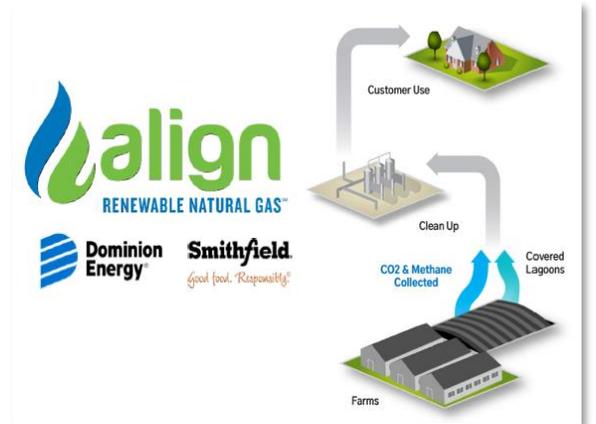
EXPLANATION - Name is added and/or a new name between brackets [inserted name] is material to be enacted.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

**Section 1.** Chapter 704 of NRS is hereby amended by adding thereto the provisions set forth as sections 2 to 8, inclusive, of this act.

**Sec. 2.** As used in sections 2 to 8, inclusive, of this act, unless the context otherwise requires, the words and terms defined in sections 3 to 7, inclusive, of this act have the meanings ascribed to them in those sections.

2018-19: RNG targets established or proposed in CA, NV, OR, CT



2019: \$250 million JV launched between Dominion and Smithfield food – the largest RNG partnership in history.

## **Conclusion:** Focusing on What Matters in Heat Decarbonization

**Technical:** Ensuring reliability at each home and across the system

**Social:** Equity and affordability to ensure political support

**Financial:** Understanding public policy costs and integrating with carbon pricing

**Innovation:** Unique opportunity for Northeast to 'stand out' in the innovation landscape

**Policy:** Meaningful (i.e. larger than rooftop PV) incentives will be required across a variety of sectors

**Regulation:** Performance-based regulation should be leveraged to incentivize utilities to pursue decarbonization

**Leveraging our leadership nationally:** How can the Northeast region propel national action well before 2030?