Using Demand-Side Resources to End a Moratorium on New Customers for a Local Natural Gas Company in Massachusetts

ACEEE 2017 National Conference on Energy Efficiency as a Resource

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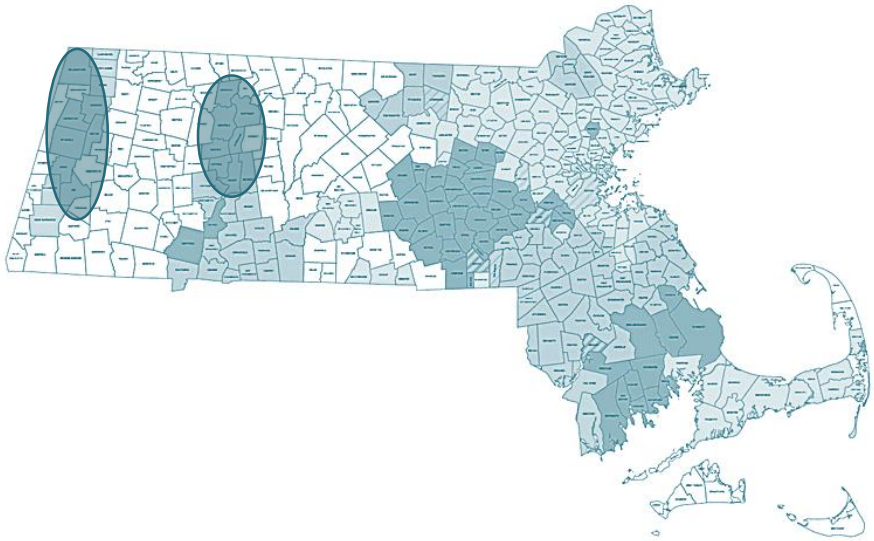
Synapse Energy Economics

- Founded in 1996 by CEO Bruce Biewald
- Leader for public interest and government clients in providing rigorous analysis of the electric power sector
- Staff of 30 includes experts in energy and environmental economics and environmental compliance
- Experts in best practices and appropriate treatment of energy efficiency and demand response resources within the energy sector

Elements of the Project

- Hyper local issues
- Very political
- Climate policies
- Energy regulation



Utility solutions

- Proposed pipeline

- Gas moratorium

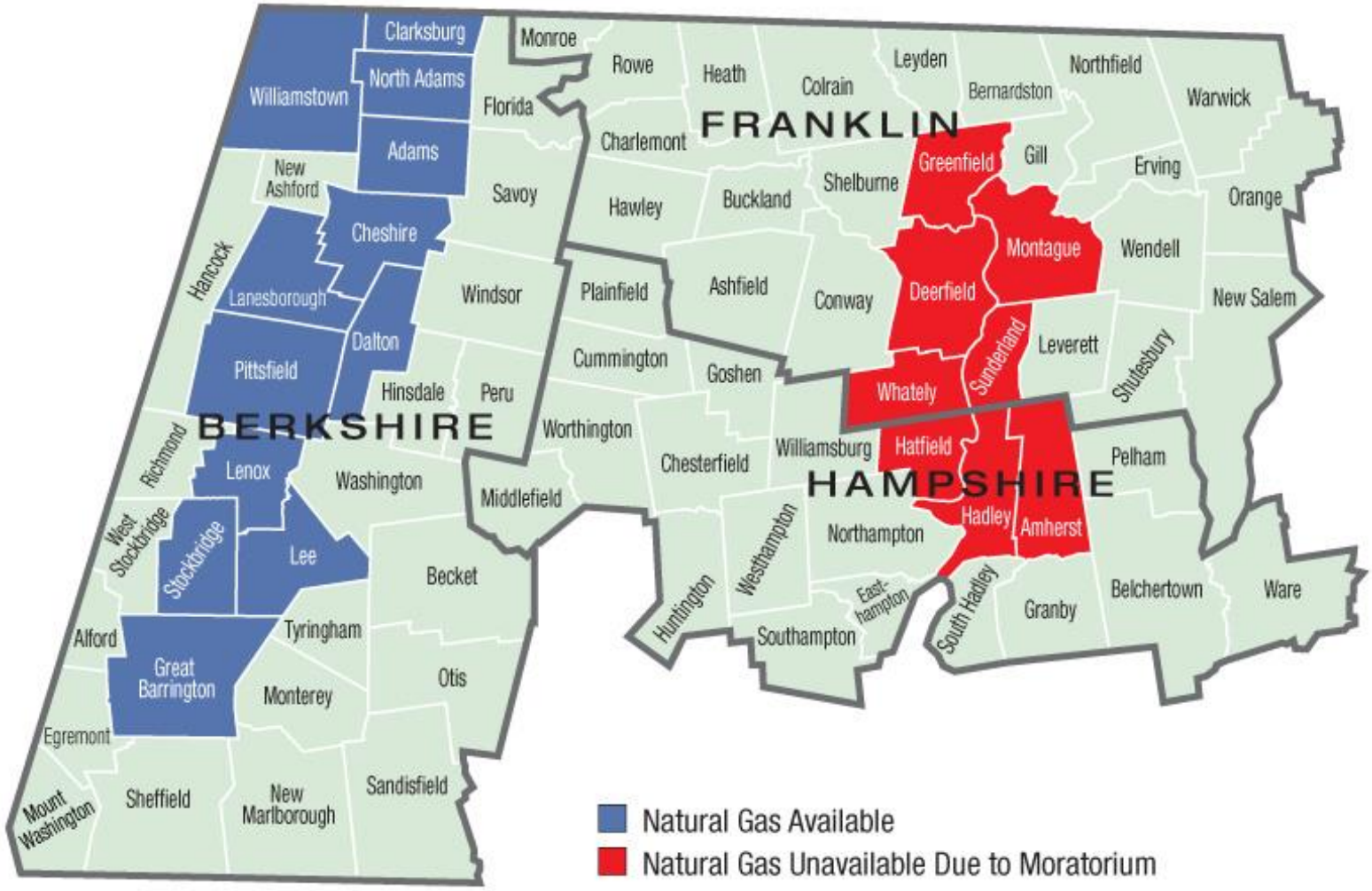
DSM solutions

- Heat pumps
  Electrification

- Energy efficiency
  Demand response

Berkshire Gas Proposal: Build, Build, or Build

Berkshire Gas Service Territory



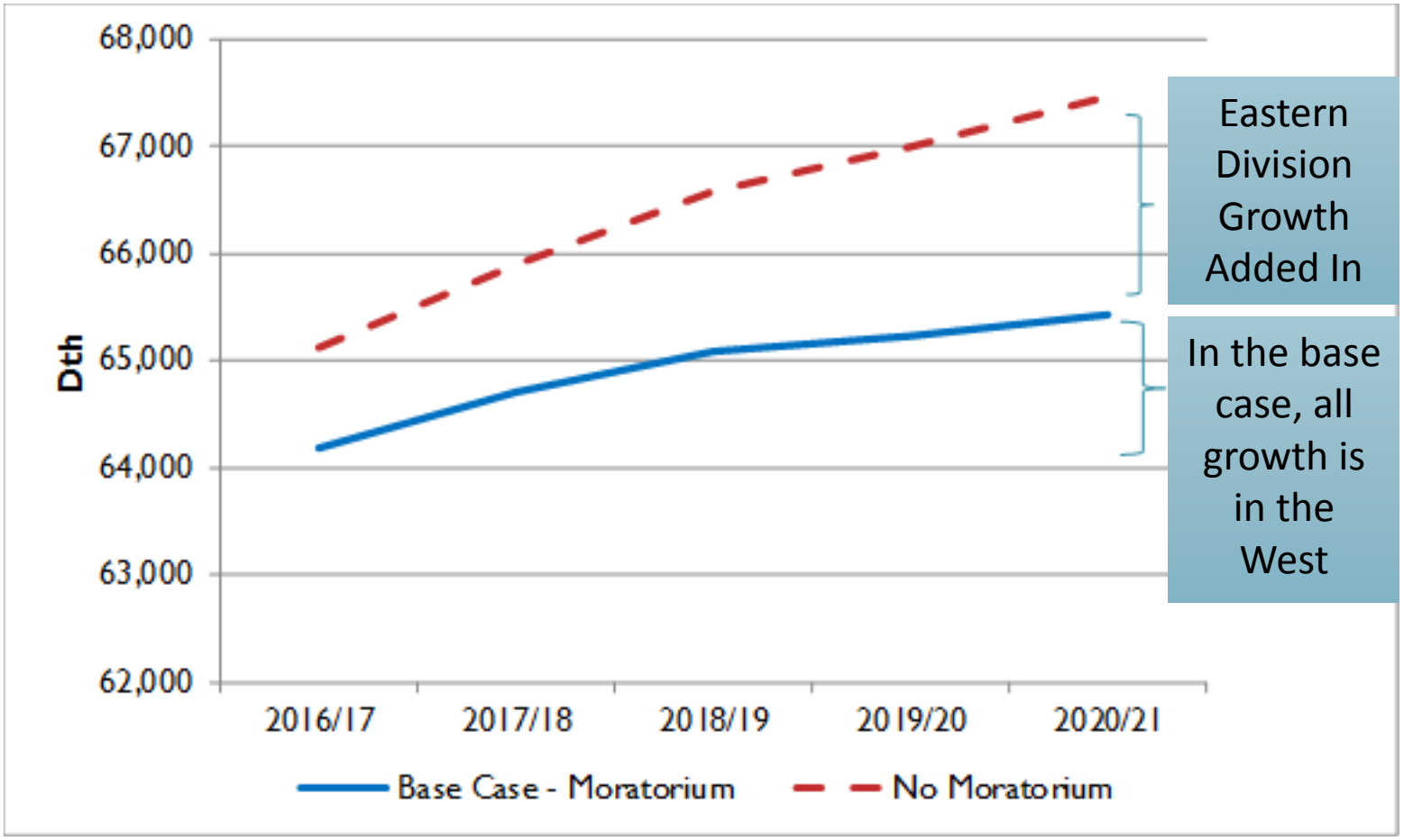
Berkshire Gas Proposal

- Lift the moratorium as soon as possible
- Build massive supply-side resources
- Analyzed 11 different options
- Two recommended options are:

A distribution system enhancement providing a new main between the TGP mainline and the Eastern Division	A new, larger liquefied natural gas facility in the northern portion of the Eastern Division
• 10,000–18,000 Dth/day • $58M	• 10,000–18,000 Dth/day • ~$120M (including $21M for distribution looping)

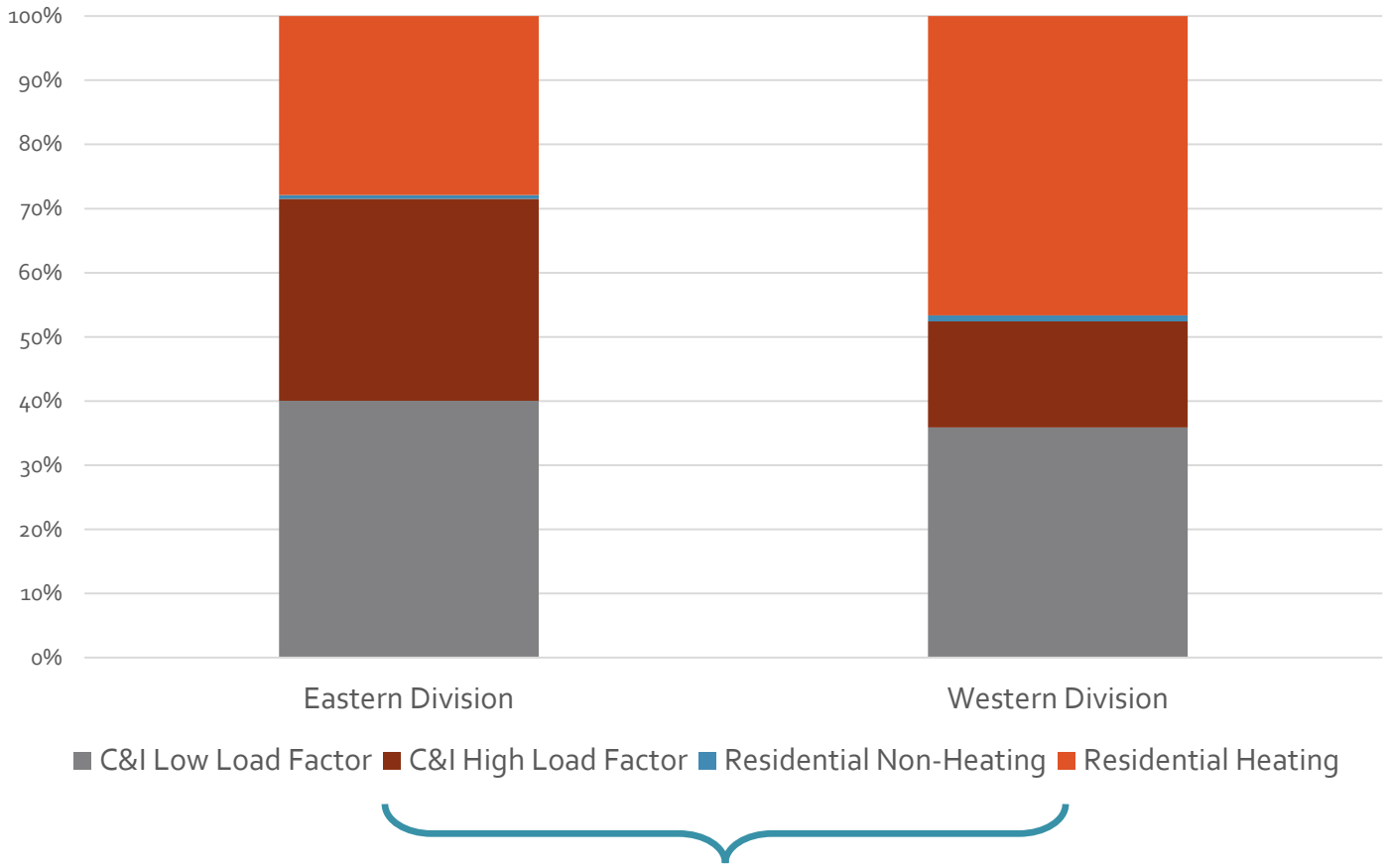
A Closer Look at an Overly Loaded Forecast

Berkshire Gas Load Forecast



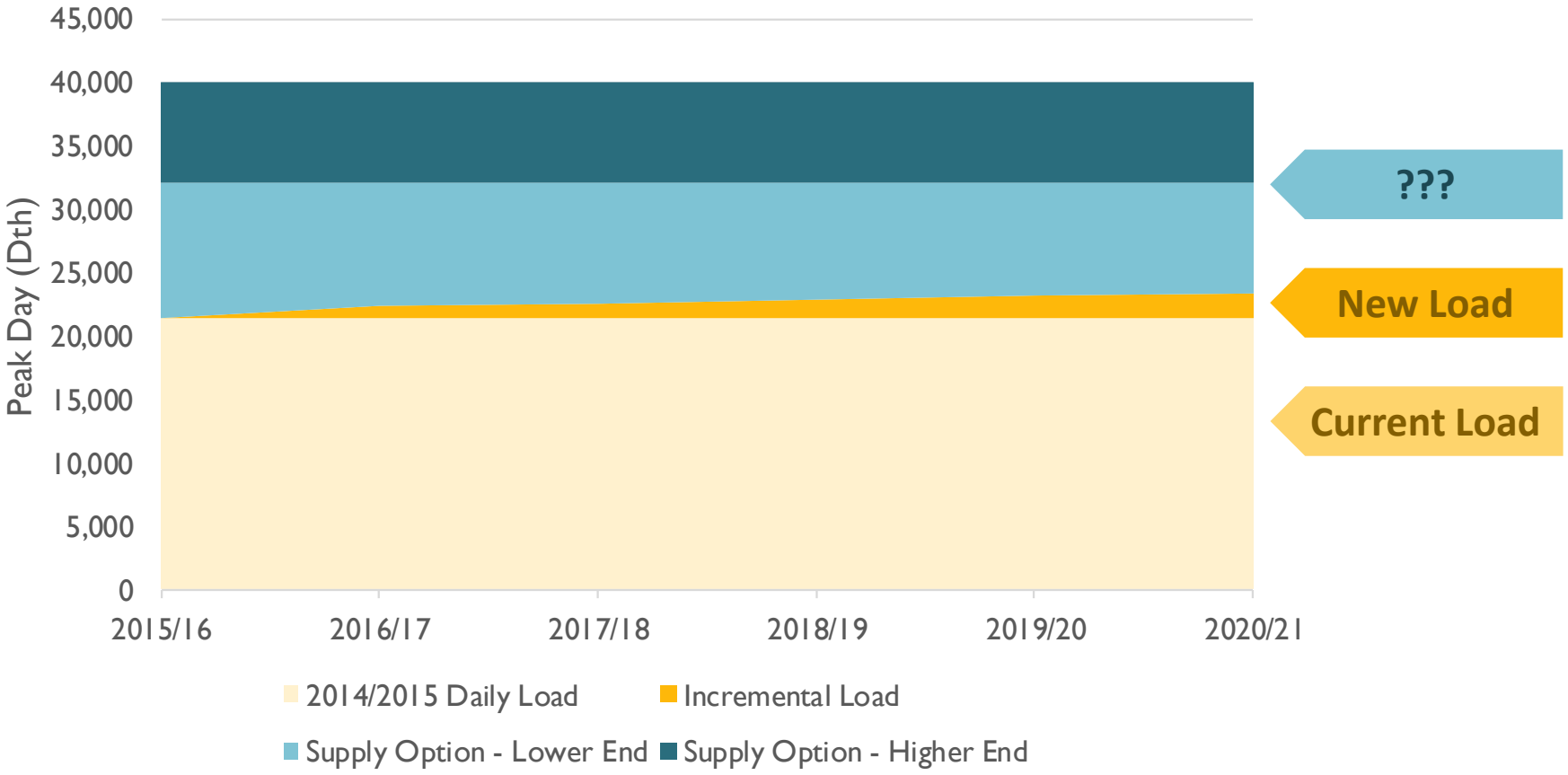
All Divisions Are Not Created Equal

Share of Annual Firm Sales in 2015 by Division

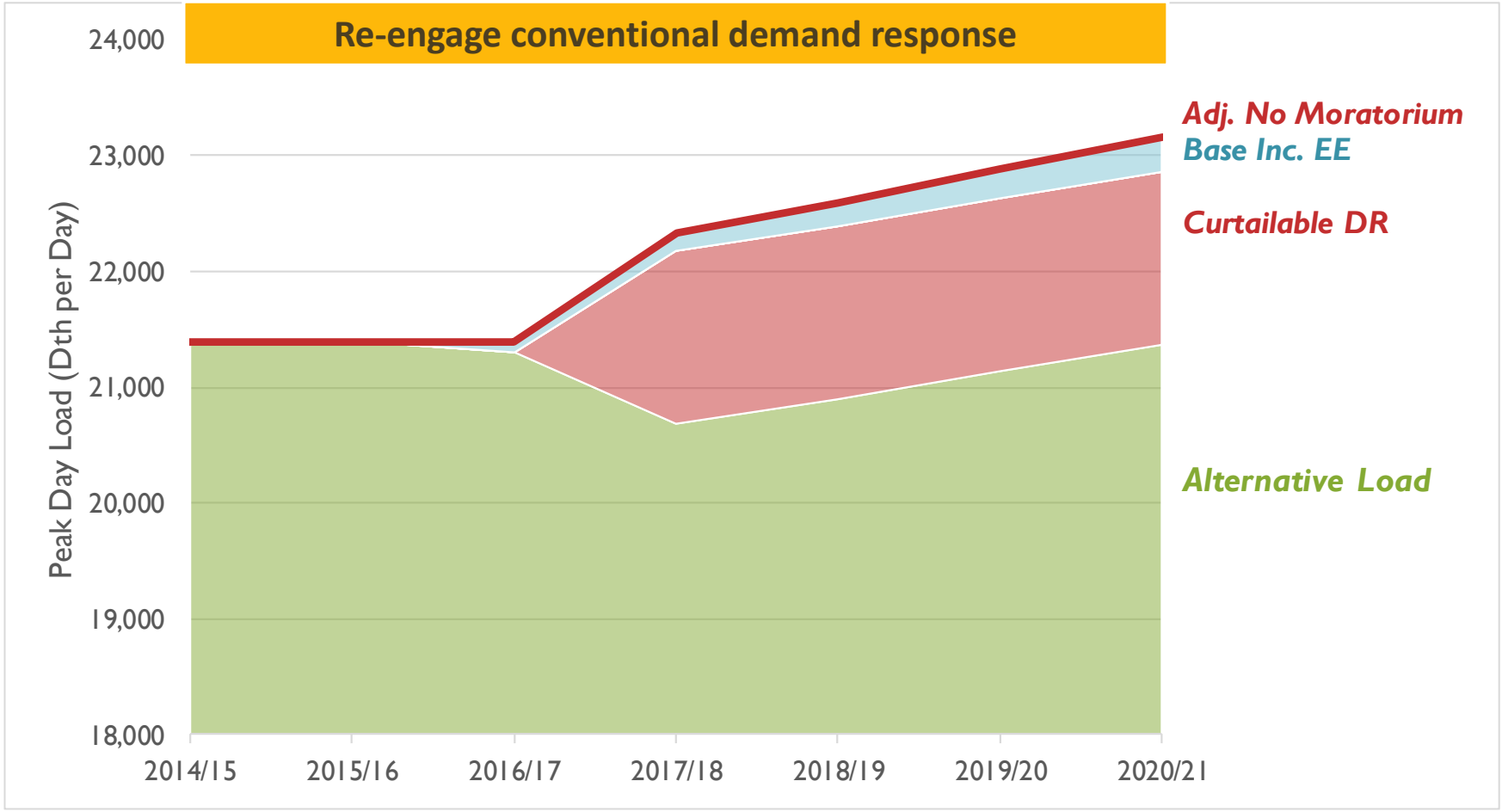


Berkshire Gas lumped these together for its load forecast.

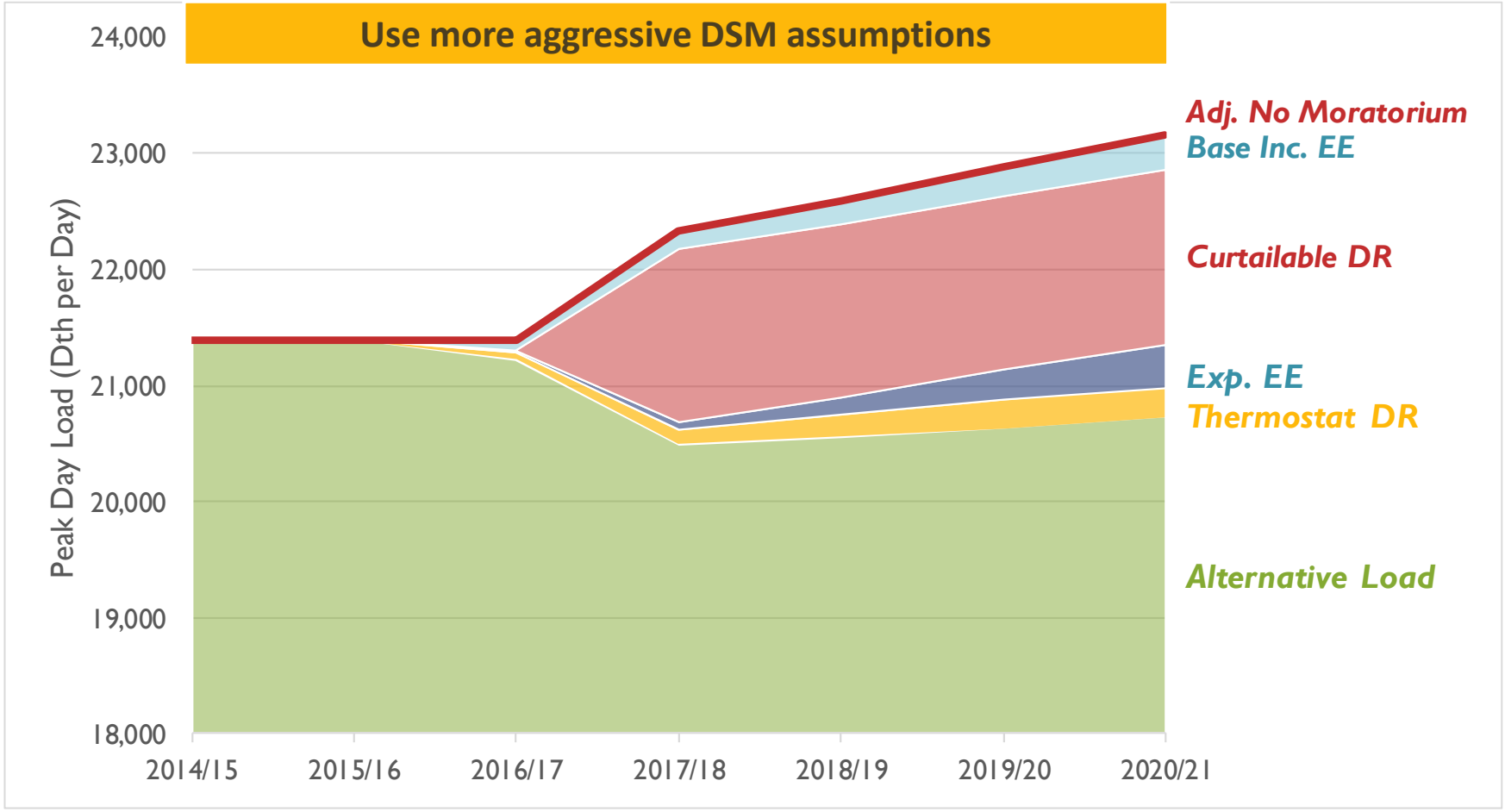
The Eastern Division: Investing in Over-Supply



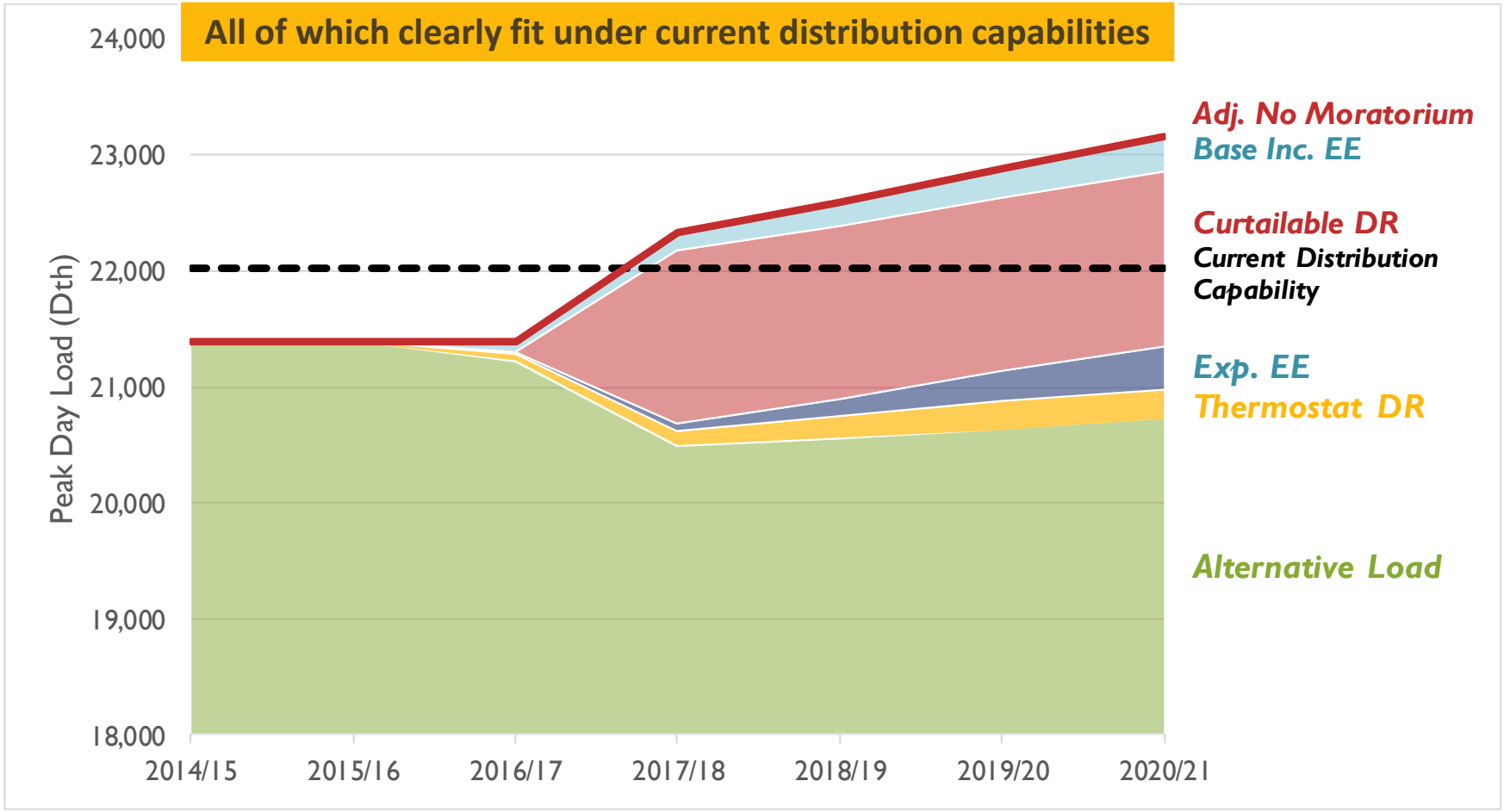
We've Got a Better Load Forecast



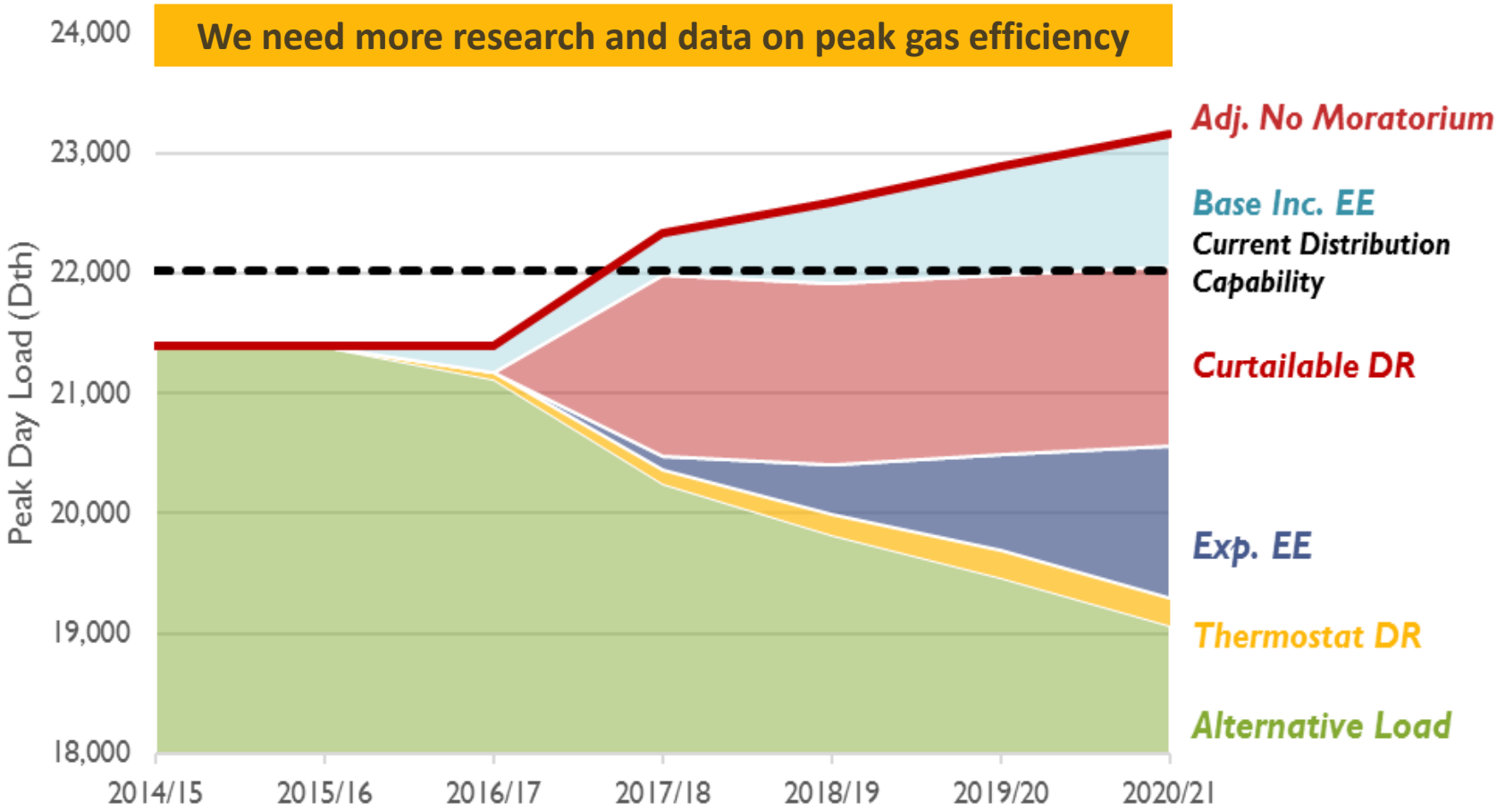
And an Even Better Load Forecast



A Better Load Forecast (cont')

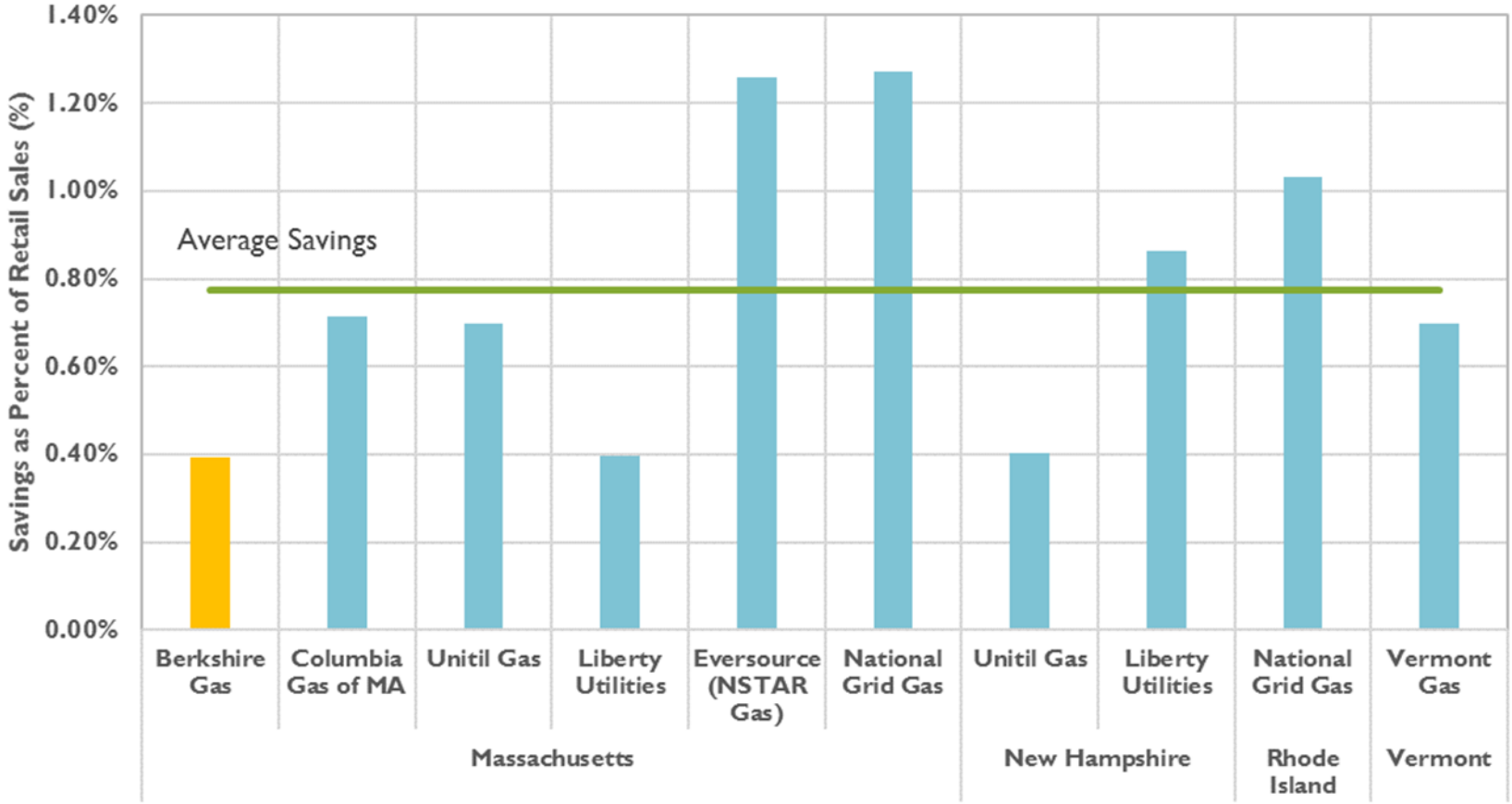


The Great Potential Hidden in Peak Data



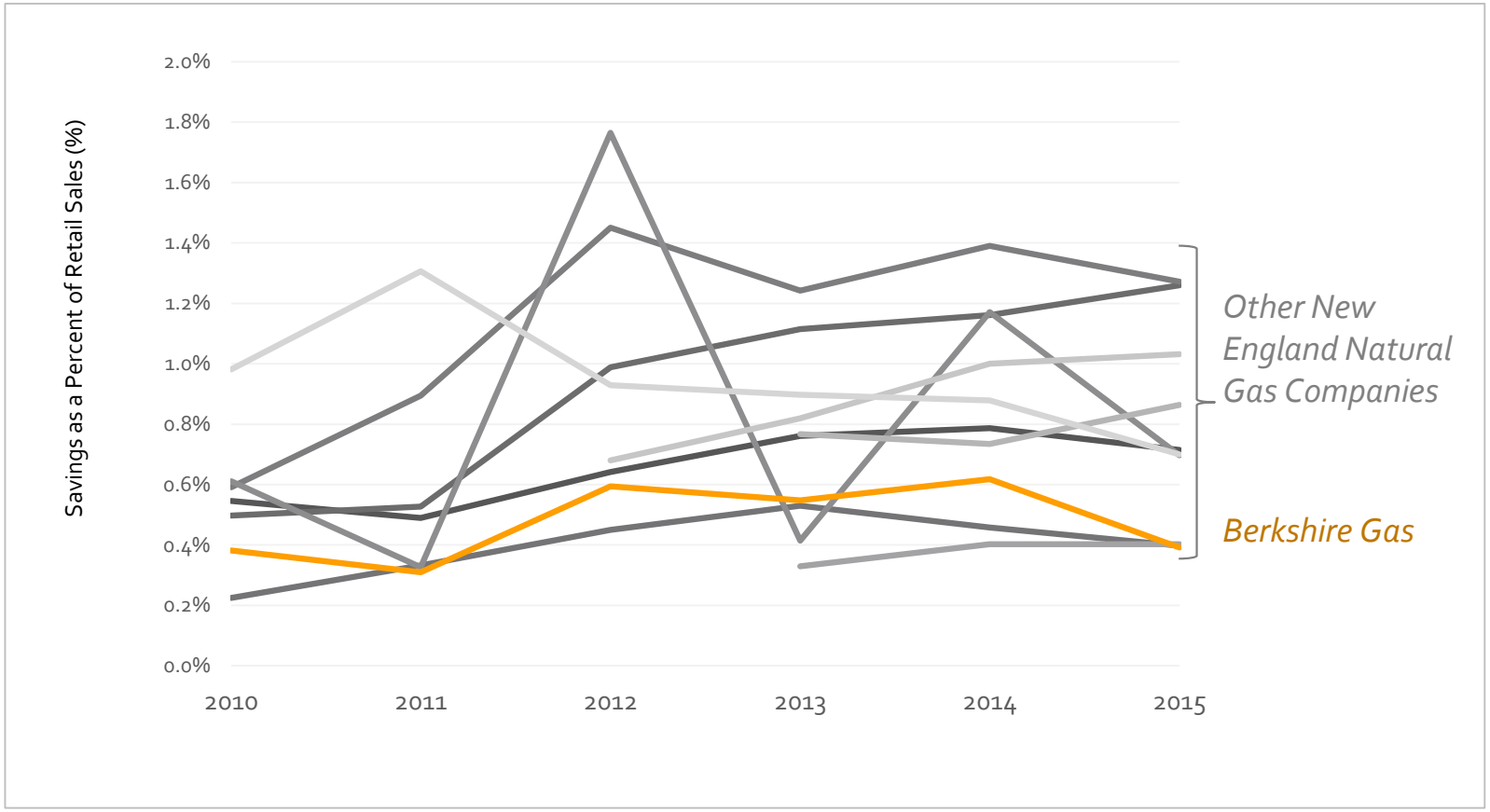
How Is New England Doing on Gas Energy Efficiency?

Historical Energy Efficiency Performance by New England Gas Companies in 2015



Berkshire Gas Consistently Underwhelms

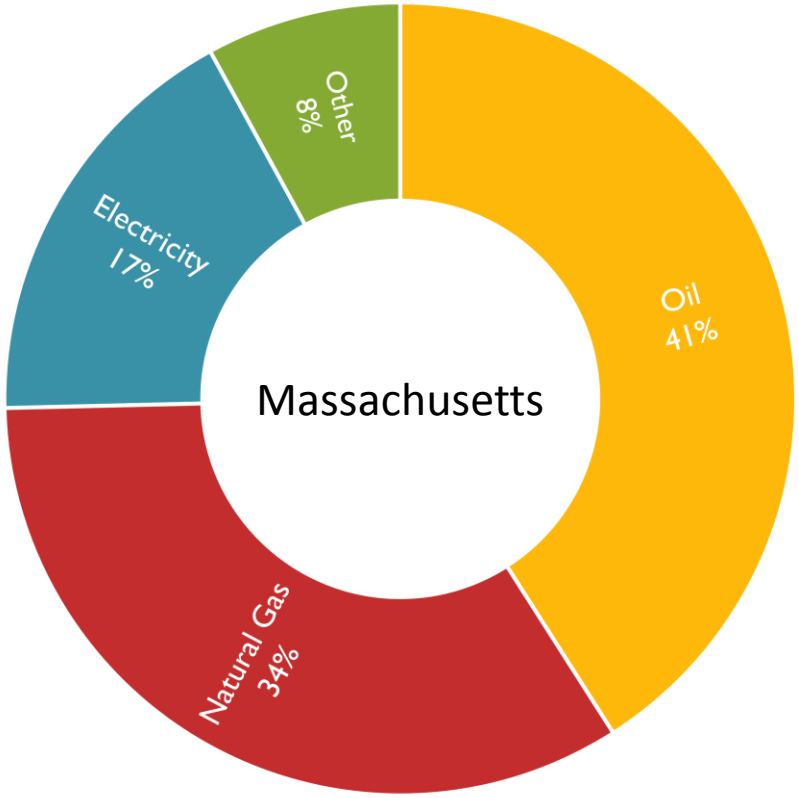
Historical Energy Efficiency Performance by New England Gas Companies from 2010–2015



What Else Is Berkshire Gas Missing?

- Emerging trends: heat pumps and electrification
- The policy context: state clean energy and climate change policies and regulation

Who's Installing Air-Source Heat Pumps?

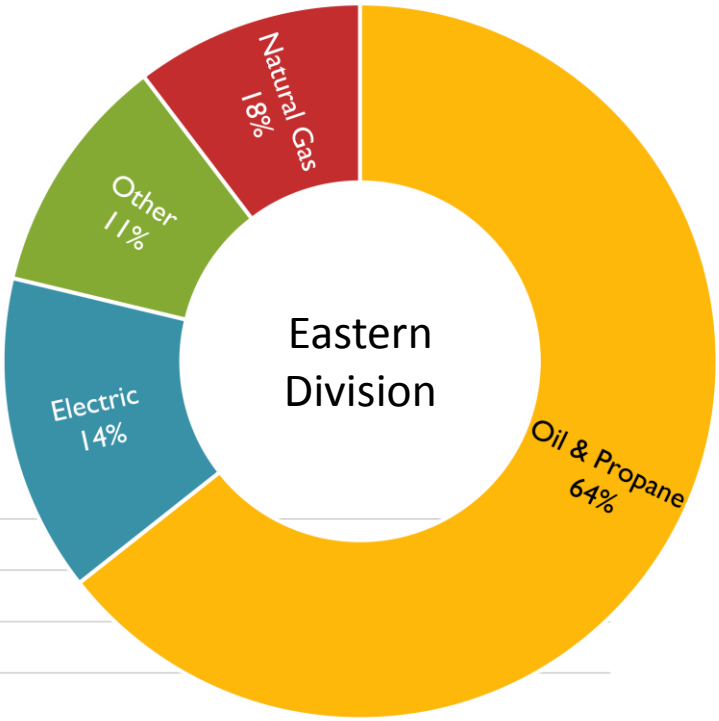


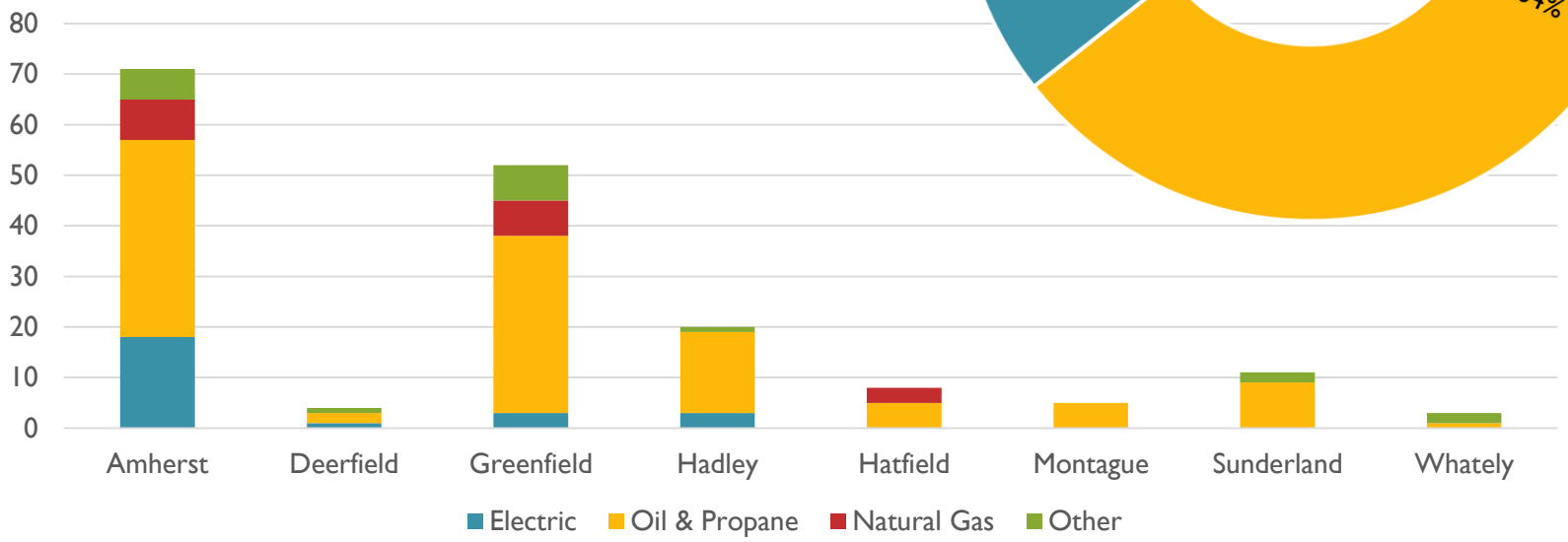
Fuel Source Replaced	2014	2015	2016*	Total
Natural Gas	1	716	584	1301
Oil	4	999	579	1582
Other	5	217	86	308
Electricity	4	410	258	672
Total	14	2342	1507	3863

MassCEC Residential Heat Pump Program units installed from Dec 2014 through August 2016* by fuel

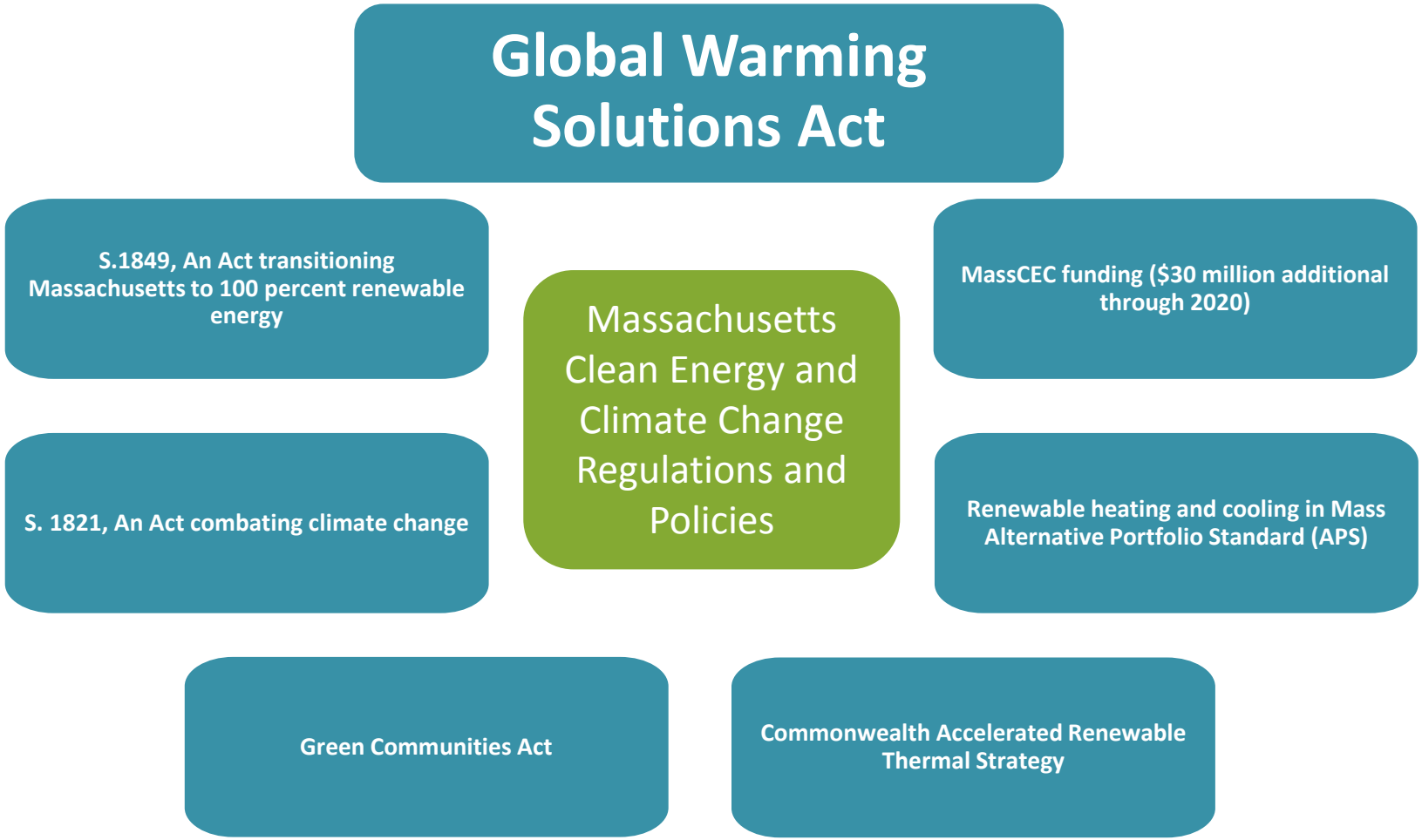
Eastern Division Heat Pumps Replace Gas Along with Oil

MassCEC Heat Pump Program Participants in Berkshire Gas's Eastern Division by Fuel





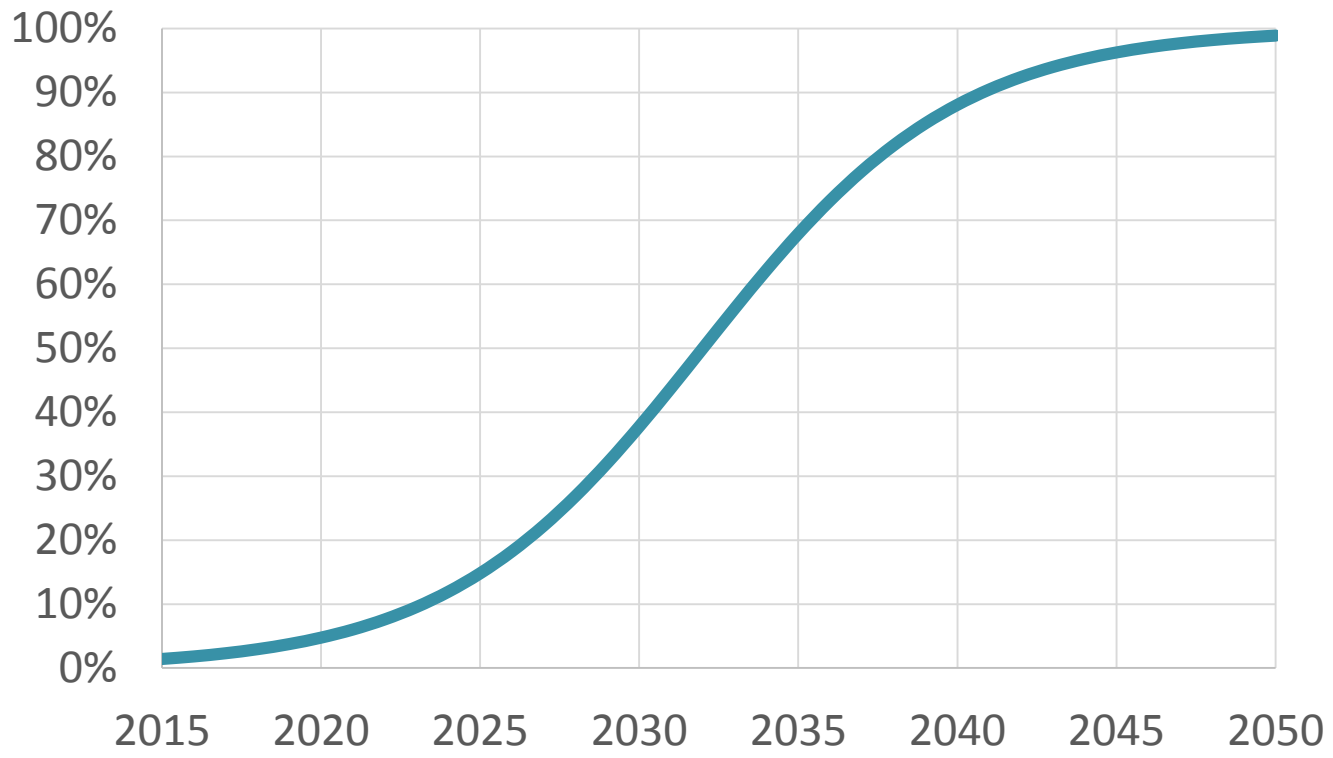
The Bigger (Policy) Picture



Synapse found out that decreased natural gas use from non-electric sector will account for one-quarter of GWSA reduction. This translates into a reduction of 50 trillion Btu by 2030, or an average annual reduction of 0.8 percent.

Heat Pumps Are Critical to Achieving State Goals

Heat pumps as a percent of new heating equipment sales for existing natural gas-heated homes



From the *Northeastern Regional Assessment of Strategic Electrification*, prepared by Synapse for the Northeast Energy Efficiency Partnerships.

Recommendations

Divide and Conquer

- Berkshire Gas should correct its load forecast based on two separate load forecast models for the Eastern and Western Divisions.

Unload the Forecast

- Berkshire Gas should revise its load forecast to properly include:
- energy efficiency savings from the 2016–2018 plan and the next three-year plan;
- additional potential curtailable agreements with large customers;
- impacts from the heat pump market; and
- impacts from existing and anticipated state climate change and clean energy policies.

Get Serious About Demand-Side Management

- Berkshire Gas should submit within six months a more aggressive energy efficiency and demand-response program beyond the level of the current 2016–2018 three-year plan.

Take a Non-Build Approach to Lift Moratorium

- Berkshire should revise its Forecast and Supply Plan and plan to lift the moratorium without any new gas infrastructure.

Thank you!

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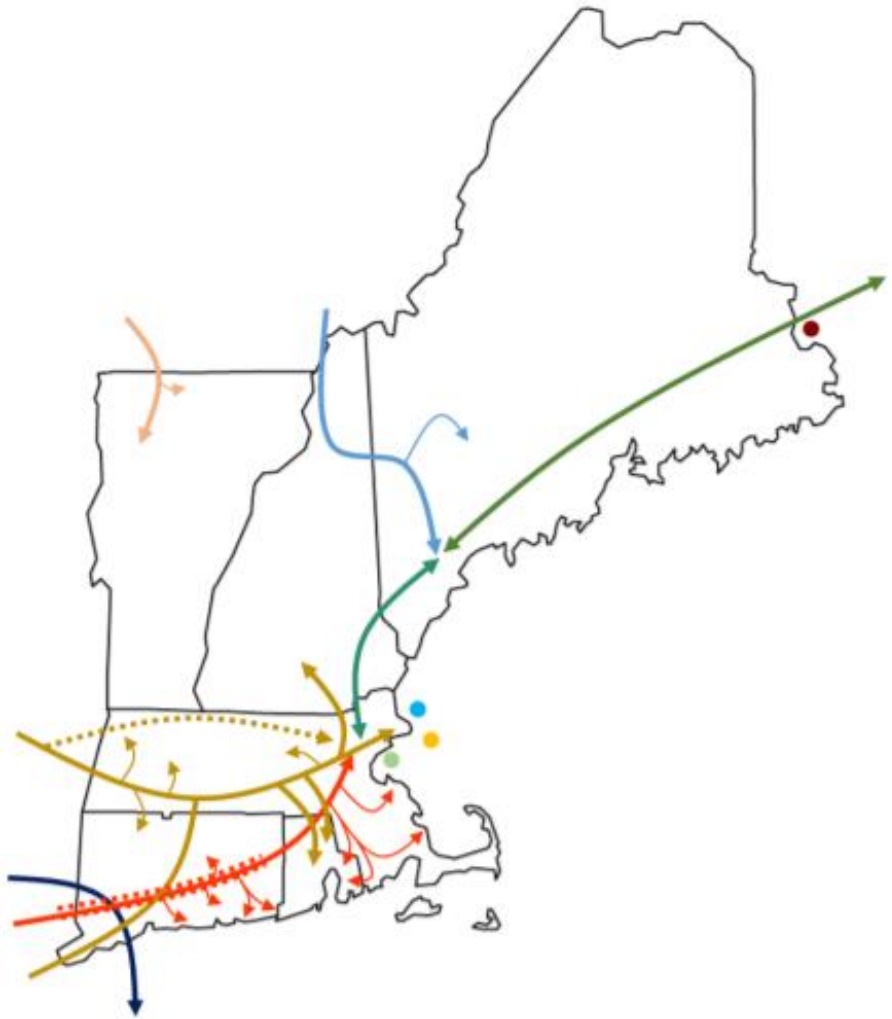
Regional Pipeline Map



Pipelines (—)
Algonquin
(including the proposed ANE Expansion --)
Iroquois
Maritimes & Northeast
Portland Natural Gas
Portland Natural Gas /
Maritimes & Northeast Joint
Tennessee Gas Pipeline
(including the cancelled
NED Expansion --)
Vermont Gas

LNG Terminals (•)
Canaport
Distrigas
Neptune
Northeast Gateway

Synapse Energy Economics, 2017

Terminology

- Annual load vs. design day load
- Design day load is the highest expected load on the coldest day
- Planning load
  - Used for supply resource procurement
  - Planning load includes the load that the Company is required to plan for pursuant to mandatory capacity assignment including firm sales and non-exempt firm transportation.
- Firm sendout
  - Used for local distribution capacity requirement
  - Firm sendout represents firm sales and firm transportation load (and excludes interruptible and special contract load)
- Interruptible and special contract load