



New England Electricity Restructuring Roundtable

*Role(s) of Natural Gas in Decarbonizing New England:
Essential Bridge and/or Fundamental Barrier?*

Preview of Gas in MA 2050 Pathways Analysis

David Ismay

Undersecretary for Climate Change

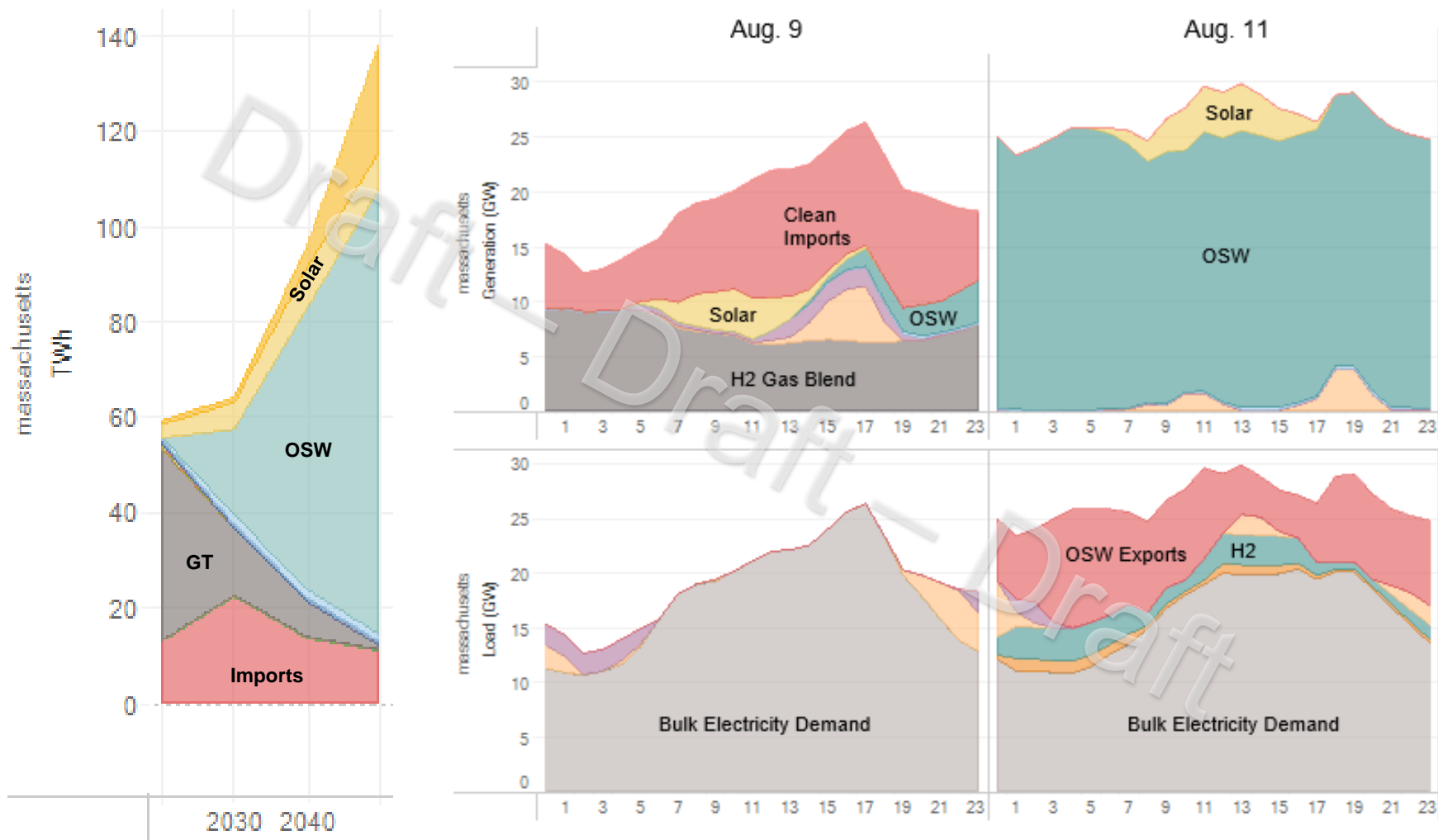
Executive Office of Energy and Environmental Affairs

June 12, 2020

Gas in a 2050-Compliant Electricity System

- Full-region, all-sector, energy & emissions model
- Integrated hourly dispatch (on historical actual weather data) to assess reliability
- > 6 model runs including one modeling the availability of a decarbonized pipeline product

Gas in a 2050-Compliant Electricity System



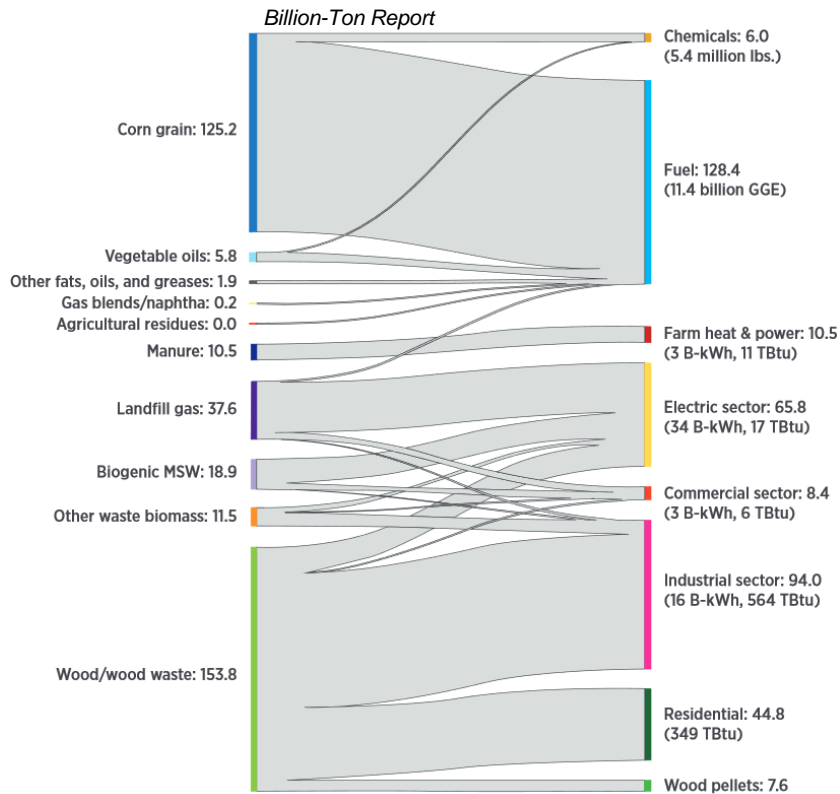
Gas in a 2050-Compliant Electricity System

- Potential for valuable, cost-effective use of existing GT generation assets through 2050
- Very low capacity factor “30-hour Reliability Units”
 - Requires H2 blended fuel (2-5% or more)
 - Not primarily an intra-daily “ramping” asset, or to “balance” hourly variability
- Not “necessary” – could be satisfied (at higher cost & risk) by new +30-hour wholesale bulk storage
 - Distinct from both “flexible load storage” (V2G, distribution-side) and “seasonal storage” (here satisfied more cost-effectively by transmission)
- Availability of decarbonized pipeline gas supply does not materially change the model dynamics

Gas in a 2050-Compliant Building Sector

- Sensitive to assumptions re: availability, cost, and use – across economy – of carbon-neutral combustion fuels (liquid and gaseous), especially biomass-based
 - Using DOE *Billion-Ton Report* (2016)
 - Moving together with neighbors in the Northeast, which affects reasonably anticipated demand across the economy
- Tied to electric sector modeling, especially re: annual load shape and peak critical

Gas in a 2050-Compliant Building Sector



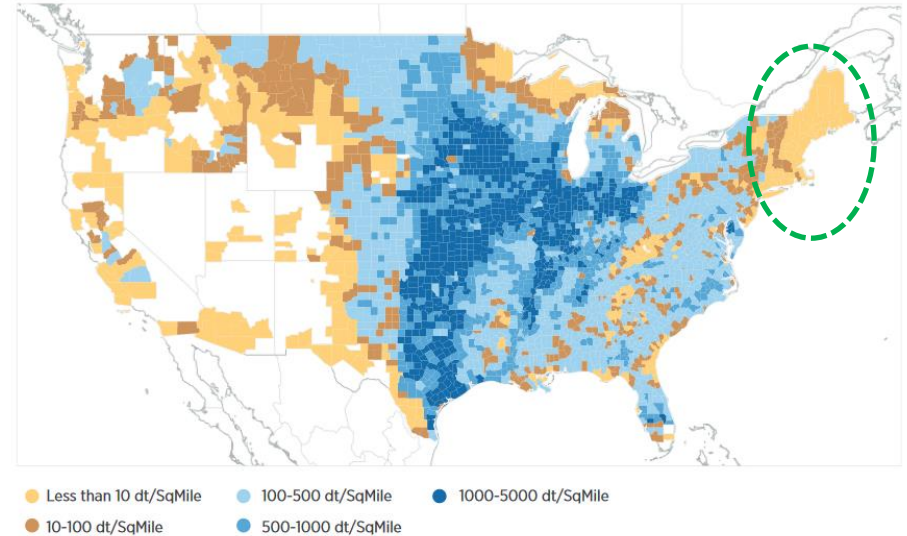
* 2019 Biomass Use: 5 quads

* 2019 U.S. Methane 32 quads

Petroleum 37 quads

69 quads

Billion-Ton Report
Production of residues and energy crops at an offered farmgate price of ≤\$60 in 2040 under a high-yield (3%) scenario



**Full Production Potential:
 10 - 15 quads**

**2040 Additional U.S. Biomass
 ~ 10 quads at max production**

* Lawrence Livermore Nat. Lab.

Gas in a 2050-Compliant Building Sector

- Across all examined scenarios electricity dominates (on cost) over combustion for building heat/services
- Near-term (through 2035) demand-side savings in Decarb. Gas scenario overwhelmed by higher fuel costs long-term
 - One of higher net total cost 2050 scenarios
- Decarbonized gas at scale:
 - Greater dependence on expensive, imported fuel delivered by “maxed-out” national biofuel supply market; *or*
 - Requires local synthesis that dramatically increases required new clean generation

Thank You

2050 Roadmap Website: <https://www.mass.gov/info-details/mass-decarbonization-roadmap>

Contact: David Ismay, Undersecretary for Climate Change
david.ismay@mass.gov

(617) 626-1144