

Planning for the Future of Gas

2021 NECPUC Symposium

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NGUSA Net Zero Commitment

National Grid US is committed to reach net zero by 2050:

- Goal is inclusive of indirect emissions from our gas and electric customer sales (scope 3 emissions).
- Our GHG emission targets are SBTi verified.
- We are currently focusing on this critical decade and the next 9 years leading up to 2030, aligning with our states' (MA, NY, and RI) 2030 targets.

We will be providing annual progress updates:

- Our inaugural update will be released in November 2021, including a microsite, focusing on:
 - Reporting our emissions;
 - Plans and progress; and
 - Ensuring a fair transition.
- The report will contain specific targets and achievements to-date for each of the 10 main emission categories identified in our October 2020 announcement.



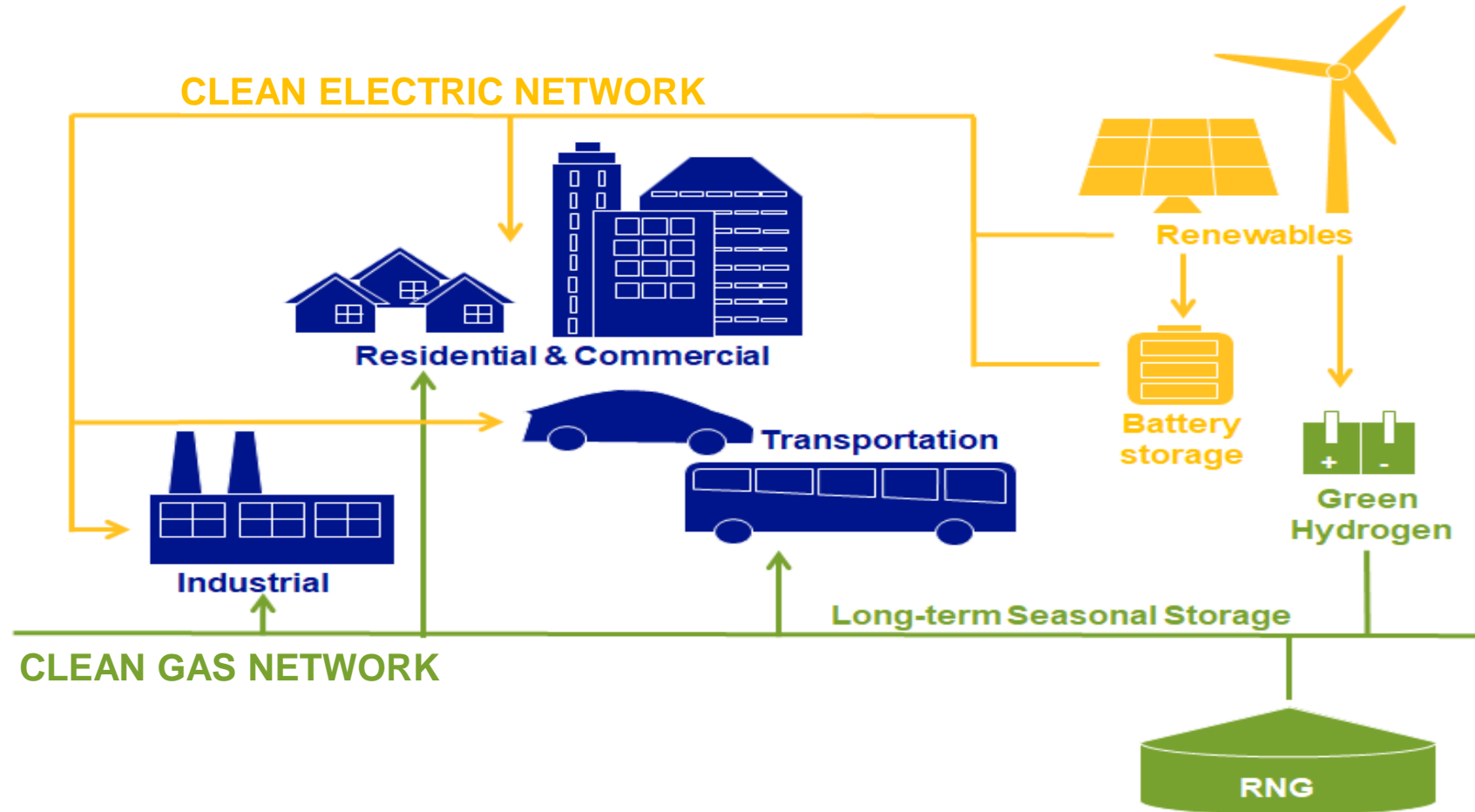
Newtown Creek Wastewater Treatment Plant | New York City
Department of Environmental Protection

Our Future of Heat activities are key to meeting our net zero targets:

- The largest segment of our direct (scope 1) emissions are from our gas network leaks,
- The largest segment of our indirect (scope 3) emissions are from customer use of our gas sales.
- We are working to bring both segments to net zero by:
 - Reducing methane emissions;
 - Decarbonizing the gas network with the integration of low carbon fuels; and
 - Supporting efficient electric and hybrid-electric heating options.

Our Vision for a Net Zero Energy System

A decarbonized gas network that is integrated with, and complementary to, a decarbonized electric system.



What is a 'Net Zero' Strategy for Heat?

- Continue to **reduce fugitive methane emissions** through infrastructure modernization.
- **Ramp up energy efficiency**, aggressively focusing on building envelope improvements.
- **Scale up renewable natural gas (RNG)** from local and regional sources to displace fossil gas.
- **Blend hydrogen (H₂)** into gas networks (“no regrets” up to at least 20% over time) and lay the groundwork for high-H₂ gas networks in the long run.
- Deploy extensive **dual fuel heating** systems for gas customers – i.e., heat pumps integrated with gas backup for the coldest days in our cold weather climate.
- Build out **geothermal networks**, including “non-pipe alternatives.”



Advancing Geothermal Solutions

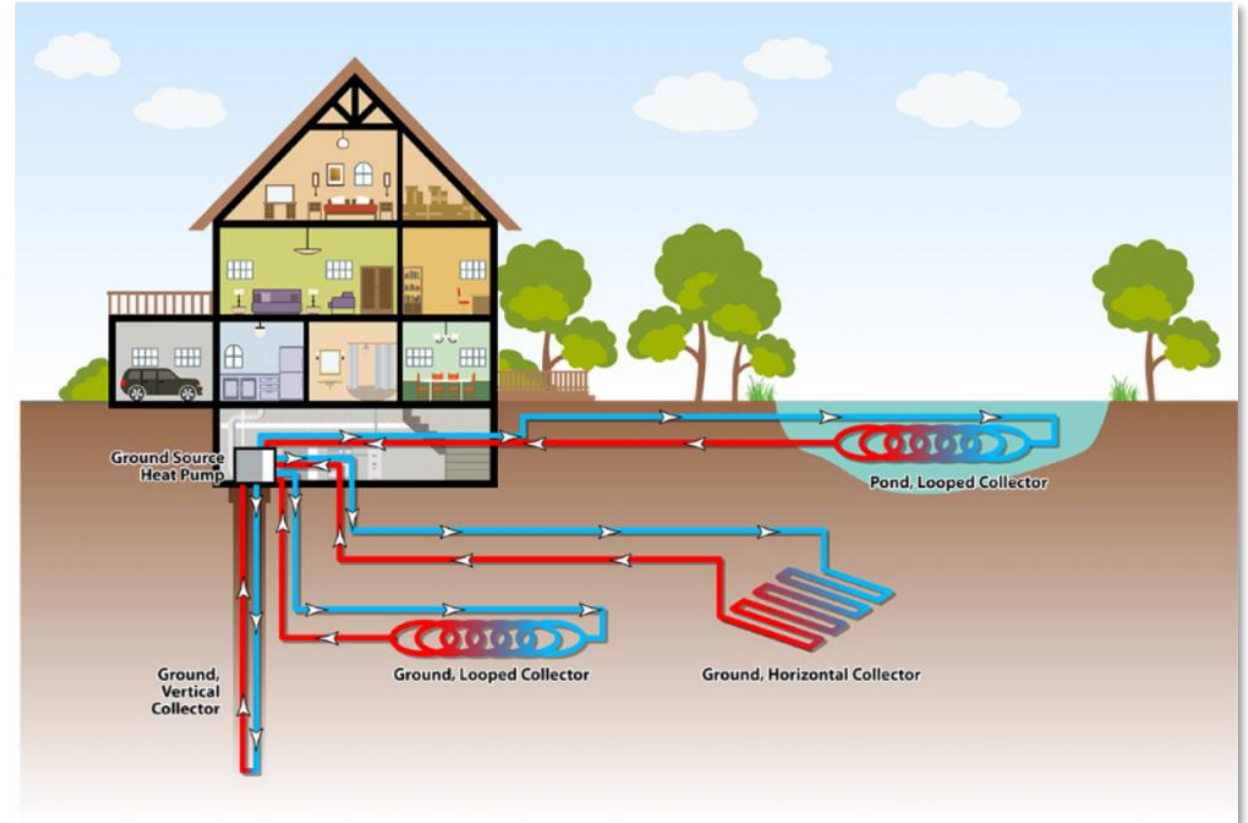
National Grid's geothermal proposals focus on shared loops for ground source heat pumps that provide heating and cooling for multiple customers on the same loop.

KEDLI Gas REV Demo Geothermal Project (Long Island, New York, 2017-Present)

- Shared loop for 10 single-family homes, in a senior living community, and one building served by a single GSHP.

Pending Proposal MA DPU 21-24: Massachusetts Geothermal District Energy Demonstration Program (Anticipated 2022-2026)

- Approx. 4 geothermal shared loop demo projects for 100-200 gas customers to gather data and evaluate the potential of geothermal utility offerings to inform future business models, including customer interest, feasibility and additional transition needs (e.g., customer appliances), with the potential to avoid LPP replacements and reduce/avoid infrastructure and system constraints.



Researching Heating Technologies and Leveraging Partnerships

We are working with a variety of groups to learn from our peers, academia, industry experts, and national partnerships.

- American Gas Association/Northeast Gas Association
- Downstream Initiative
- Gas Technology Institute
- Electric Power Research Institute-Gas Technology Institute Low Carbon Resources Initiative
- U.S. Environmental Protection Agency
- Stanford University
- Massachusetts Institute of Technology



Putting the Pieces in Place

We have an opportunity to build the policy and regulatory frameworks to scale low-carbon fuels to decarbonize the gas network, create opportunities for geothermal investment, expand energy efficiency, and increase customer adoption of decarbonization technologies.

- Renewable Heating Fuel Standard
- Customer tariff options
- Renewable Heating Fuels Statewide Inventory
- Quality standards for injection of RNG and hydrogen into the gas system
- Geothermal solution offerings to customers
- Statewide study of renewable thermal district heating potential
- Expansion of energy efficiency and demand response programs
- Coordination of electric and gas investment planning



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