ANESI
Gas Heat Pumps

Better Comfort.
Better Efficiency.
Better Planet.

Public Comments from Stone Mountain Technologies

(6-September-2023)

State of New Jersey, Docket No. GO23020099 – In the Matter of the Implementation of Executive Order 317 Requiring the Development of Natural Gas Utility Plans

Introduction

Docket GO23020099 requires the New Jersey BPU to "engage with stakeholders concerning development of natural gas utility plans that reduce emissions from the natural gas sector to levels that are consistent with achieving the State's 50 percent reduction in greenhouse gas emissions below 2006 levels by 2030". The challenge of providing energy for winter heating loads is one of the largest and most vexing within any discussions on reducing GHGs.

Anesi Gas Heat Pumps offer an economically rational, sustainable, and potentially faster transition to decarbonized heating loads compared to traditional gas heating appliances and electric heat pumps. By offering a lower cost of delivered heat, immediate and significant GHG reductions, and a future-ready pathway to zero-carbon heating, BPU staff would do well to consider GHP technology as an important "tool to add to the tool-belt".

US-company Manufacturers a Compelling New Approach to Cold-climate Building Heat

Stone Mountain Technologies, Inc ("SMTI", and branded as "Anesi Gas Heat Pumps"), based near Johnson City, Tennessee, has been developing Gas Absorption Heat Pumps (GAHPs) since 2010 when it won its first of four grants from the US Department of Energy. Founded by HVAC industry veteran Michael Garrabrant, SMTI's goal has been to reengineer the age-old, single-effect gas absorption heat pump cycle into a modern, low-cost solution for heating buildings in cool/cold climates. The initial gas heat pump product, planned for release in Fall 2023, has a third-party verified Average Fuel Utilization Efficiency (AFUE) rating of 140% and requires no backup appliance, even if the outside ambient temperature reaches ***minus*** 40 degrees. With $35 million raised to date in research and development grants from numerous stakeholders, SMTI's technology development process is now complete. The most recent investment from Energy Impact Partners funded the initial production plant – a 160,000 square foot manufacturing facility in northeastern Tennessee. SMTI is the most commercially advanced company working on this type of technology.

GAHPs can serve a variety of residential and commercial building applications. The initial product will replace furnaces and water-heaters (both in combination) within single-family homes. Those homeowners

heating with gas will immediately realize energy savings and reduce their heating costs by 30-50%, especially impactful for low-income families. Homeowners will also immediately see similar levels of reduction in their carbon footprint without any sacrifice in comfort costly upgrades to the home infrastructure. These latter points are important for efficient market adoption at mass scale to drive major GHG reductions, which is something that EHPs struggle with in cool and cold climates such as New Jersey. SMTI is positioned to demonstrate substantial and cost-effective wins towards decarbonizing building heat loads with the release of Anesi's "furnace combi" application and the development of future residential and commercial building products and applications. The future is bright when this technology is combined with the accelerating development of greener molecules within the gas industry pipes. GAHPs are poised to "change the game" regarding the most effective means to decarbonize building heat loads.

What is a Gas Absorption Heat Pump and What Are Its Benefits?

Like their electric heat pump (EHP) cousins, GAHPs provide space and water heating at efficiencies much higher than conventional gas appliance heating technologies by "pumping heat" out of the surrounding environment (typically from the air, but they can also be ground-sourced). Functionally, the gas absorption cycle used in GAHPs for cool/cold climate heating has several key advantages compared to the vapor compression cycle used in EHP. Specifically, Gas Absorption (and unlike Vapor Compression):

- Uses a thermal (heat) input, not electricity, to drive the cycle. Thus, they can accept many primary energy sources, which presently include natural gas and propane. As the gas industry develops low- and zero-carbon molecules into its pipelines (bio-fuels, hydrogen, RNG, etc.), GAHPs will easily adapt, quickly reducing the net carbon footprint towards zero.
- Provides ample comfort even operating in extreme outside (ambient) temperatures without any backup. The Anesi GAHP will operate in temperatures as low as minus 40°F.
- Perform a lot more effectively than EHPs as outside temperatures drop, GAHP performance curves are more robust (both in capacity and efficiency) than EHPs, which rapidly lose their energy efficiency (and in many, but not all, cases capacity).
- Provides the same level of comfort and warmth that gas-heating customers are used to. This is an important factor when considering how to motivate customers to pick technologies with environmental benefit. Discomfort does not motivate behavior change.
- Reduces the end-user's operating cost to heat their home/building – again raising the question of how to motivate consumers (particularly low-income) to pick environmentally-friendly technologies.
- Has immediate and significant GHG-reducing benefits (30-50%) if replacing legacy gas heating appliances. It is also as good as or better than EHPs on the GHG-reduction topic.
- Requires no major/costly infrastructure changes to the building if changing from traditional gas appliances.
- Similarly, when deployed at mass scale, GAHPs will avoid a key challenge faced by mass deployment of EHPs (grid resiliency). GAHPs at scale will utilize existing energy delivery infrastructures without adding any major cost to society.

It should be noted that SMTI is not "anti-EHP". In mild climates with short winters, mild heating loads, and corresponding large cooling loads, there are clear advantages offered by using EHPs for both heating and cooling duties. However, for cool/climate heating – such as that of New Jersey, – where electrifying

building heating could require doubling or tripling on the electric grid, GAHPs have clear advantages and deserve the opportunity to prove themselves in the marketplace on equal footing.

Stone Mountain Technologies will begin selling and installing its Anesi Gas Heat Pumps in select markets throughout North America during the Fall of 2023, with a broader rollout planned for 2024.. Sales channels have already been developed with some of the HVAC industry's top-notch manufacturers' representatives. HVAC contractors and distributors have provided positive response and anticipate the value this product will bring to their customers.

SMTI welcomes additional discussion with interested parties on any of the data and research that back its claims. We recognize that this perspective may challenge a fast-developing orthodoxy that gaseous fuels simply need to be phased out. New Jersey, like many states and Canadian provinces, is faced with a profound and long-term policy conundrum. Transitioning energy is an uncertain and complex challenge without a single or fast solution. Nonetheless, GAHPs "are here now – in the market" – and have the potential to positively change the discussion and technology pathway in ways that few have anticipated.

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