NY GEOTHERMAL ENERGY ORGANIZATION

VIA E-MAIL

Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223

July 19, 2019

Re: – Reply Comments from NY-GEO on Case 18-M-0084 – *New Efficiency, New York* - Per the May 1, 2019 Notice Seeking Comments Regarding Utility Energy Efficiency Proposal

Dear Secretary Burgess:

Please accept for filing NY-GEO's Reply Comments regarding Case 18-M-0084 – *New Efficiency, New York*, as well as 2 supporting attachments.

Sincerely,

Bill Nowak

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The New York Geothermal Energy Organization (NY-GEO**)** is a non-profit trade association representing geothermal heat pump (GHP) installers, manufacturers, distributors, drillers, consultants and industry stakeholders from throughout New York State and beyond.

NY-GEO's reply comments will focus on the first topic listed in the Commission's May 1st Notice Seeking Comments - *Energy Efficiency Targets and Budgets*. Our comments will be in the following 2 areas:

- **Revised Energy Savings Calculations**
- **Peak Load Assumptions**

Revised Energy Savings Calculations

In our July 1st comments we raised objections to the revised full load hour and energy savings numbers submitted in NYSERDA's Update on May 16th, offered evidence that the revisions are inaccurate, and expressed hope that more accurate data would be adopted in this proceeding.

We subsequently met in a conference call with the Joint Utility TRM committee on July 9th. In that call, there was a good exchange on data and methodology and a recognition that there are a number of areas where more data might lead to revisions in full load hour and energy savings calculations. There was a commitment to further exchange information and data. However, there was also a sense conveyed that the train is leaving the station and the revised NYSERDA numbers will continue to be used in the interim, both for revising the TRM and, for the utility heat pump programs under this proceeding.

NY-GEO must object. The revised heat load and energy savings numbers do not correspond with our member's experience in the field. We offer the following comments and request that appropriate adjustments are made.

Heat Load:
In examining NYSERDA's May Update, we believe a substantial error was expressed on page 6: "It was recognized that the maximum heating capacity a heat pump can deliver is less than its nominal capacity. NYSERDA's heat pump analysis uses full load hour and load factor values that express the correlation between nominal heat pump size and annual load (FLH-nom); thus, the above EFLH-MJ values need to be adjusted. A modification of 30% was applied to reflect this effect for ground source heat pumps…"

NYSERDA proceeded to divide the Equivalent Full Load Hours (EFLH) in Table 2.1 by 130% resulting in substantially lower EFLH numbers in Table 2.2

In fact, a lesser capacity would increase full load hours – a machine with 30% less capacity would require 30% more hours to meet the same heating load. The numbers in table 2.1 should have been multiplied rather than divided. I

in practice, for a nominal 48,000 Btuh or 4 ton heat pump, the heating capacity is typically 40,000 Btuh. Thus a 20% adjustment factor is more appropriate than 30%. The Table below shows the result of applying the adjustment to the Table 2-1 ELFH numbers:

	NYSEDA Updated EFLH from Table 2-1	EFKLH with GSHP 20% Capacity Adjustment
Albany	1748	2098
Binghamton	1994	2393
Buffalo	1840	2208
Massena	1910	2292
New York (LGA)	1588	1906
Poughkeepsie	1755	2106
Syracuse	1835	2202

Multiplying the EFLH numbers by the typical 4 ton heat pump heating capacity of 40,000 Btu per hour, we show the following annual heat loads:

	NYSEDA Updated EFLH from Table 2-1	EFKLH with GSHP 20% Capacity Adjustment	GSHP Capacity Btu.Hr	Annual Heat Load
Albany	1,748	2,098	40,000	83,904,000
Binghamton	1,994	2,393	40,000	95,712,000
Buffalo	1,840	2,208	40,000	88,320,000
Massena	1,910	2,292	40,000	91,680,000
New York (LGA)	1,588	1,906	40,000	76,224,000
Poughkeepsie	1,755	2,106	40,000	84,240,000
Syracuse	1,835	2,202	40,000	88,080,000

These heat load numbers are far closer to what installers are seeing in the field and far closer to NYERDAs January heat load calculations. When applied, they will result in more accurate energy savings numbers, essentially congruent with NYSERDA's January report.

Peak Load Assumptions

NY-GEO would also like to comment on the peak savings calculations first published in NYSERDA's January report and revised in the May update.

The NYSERDA reports significantly undervalue the peak shaving potential of modern geothermal systems.

Geothermal systems reject the heat into the relatively cold ground, and their cooling performance during the summer peak A/C hours is independent from the outside temperature, in contrast to air source A/C and ASHPs.

In case PSC CASE 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, the February 26th, 2015 PSC REV Order stated:

"Increasing the responsiveness of demand will reduce price volatility in the near term and price inefficiency in the long term. If, for example, the 100 hours of greatest peak demand were flattened, long term avoided capacity and energy savings would range between $1.2 billion and $1.7 billion per year."

The DPS staff analysis revealed that the gross benefits were associated with:

- Avoided installed generation capacity requirements
- Avoided transmission and distribution investments
- Avoided energy payments, including transmission line losses

In NYS, between 2009 – 2016, demand peaked above 33 GW in 3 out of 8 years.
In 6 out of 8 years cutting the peak <28 GW would have eliminated the top 100 peak hours; the average peak over the eight years was 32.2 GW.

Thus approximately 4 GW would have removed the peak 100 hours. A modern GSHP system shaves an average of 1.75 kW off peak demand in Western NY (see attached monitoring results).

PSEG Long Island calculates their GSHP rebate based on a 2 kW peak demand per system. Attached is also the field study from Western Farmers Electric CO-OP, which tested 22 retrofit installations in OK and NM (climate Zone 4, same as NYC). They reported 2.2 KW peak shaving per GSHP system installed (Attachment 1 - 2014).

At 2 kW peak shaving per system, 2 million GSHPs would shave peak capacity cost of roughly $1.5 billion annually, or $750 per system. This is significantly more than the calculations in the May NYSERDA update, which gives the LIFETIME peak shaving value of between $235 (Upstate/Western NY) and $2,090 (NYC).

It is our understanding that the NYSERDA report incorrectly uses Seasonal Energy Efficiency Ratio (SEER) values for the counterfactual conventional A/C units, and instantaneous Energy Efficiency Ratio (EER) rating for the GSHP systems.

As an example, the SEER rating is based on a 80F outdoor and 78F dry bulb indoor temperature, a temperature differential of only 2F. However, during summer peak, the real-world outdoor temperature is between 95F and 100F, and the indoor setting is around 75F, resulting in a peak differential of over 20F. Using the appropriate EER for a GSHP during the summer peak hours results in a more appropriate peak shaving value of $750 annually, with some adjustments for different grid regions in NYS.

Corrected data should lead to a significantly larger peak grid value for GSHP installations and this means significant savings for all ratepayers. Savings for ratepayers, along with “missing money” calculations, are key factors in the consideration of incentive levels. NY-GEO asks the Commission to ensure these points relative to peak are taken into account in a timely fashion.

CO2 Equivalent Evaluated Through Climate Leadership & Community Protection Act
In addition, as we asserted in our July 1st comments, greenhouse gas emission provisions in the Climate Leadership and Community Protection Act, will significantly increase the Carbon Dioxide Equivalent (CO_2e) impact of heating with fossil fuels in New York State. We project

that, when properly calculated, the combined peak reduction value and carbon value of a GSHP installation are significantly larger than any contemplated by current incentives.