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Hon. Costa Constantinides, Chair

**June 24, 2019**

**Oversight – Renewable Energy And The Pathway To A Sustainable Future**

**Int. No. 49:** By Council Members Constantinides, Espinal and Brannan

**Title:** A Local Law to amend the administrative code of the city of New York, in relation to installation of utility-scale battery storage systems on city buildings and conducting a feasibility study on installation of such systems throughout the city

**Administrative Code:**  Adds a new section 4-207.3

**Int. No. 51:** By Council Members Constantinides, Espinal and Perkins

**Title:** A Local Law to amend the administrative code of the city of New York, in relation to the creation of a pilot program for a district-scale geothermal system

**Administrative Code:**  Adds a new section 3-126

**Int. No. 140:** By Council Members Levin, Constantinides, Reynoso, Richards, Rosenthal and Rivera

**Title:** A Local Law in relation to a study and plan relating to community choice aggregation programs

**Int. No. 269:** By Council Members Richards and Brannan

**Title:** A Local Law to amend the administrative code of the city of New York, in relation to a solar power pilot program

**Administrative Code:**  Adds a new section 3-126

**Int. No. 426:** By Council Members Constantinides, Maisel and Kallos

**Title:** A Local Law to amend the administrative code of the city of New York in relation to the installation of solar water heating and thermal energy systems on city-owned buildings

**Administrative Code:**  Adds a new section 4-207.2

**Int. No. 1076:** By Council Members Richards and Holden

**Title:** A Local Law in relation to studying and identifying locations for district-scale geothermal systems and encouraging installation and operation of such systems

**Int. No. 1375:** By Council Members Richards, Rosenthal and Levine

**Title:** A Local Law to amend the administrative code of the city of New York, in relation to requiring creation of a database of subsurface conditions to support better engineering of geothermal heat pumps

**Administrative Code:** Adds a new subdivision to c to section 24-804

**Res. No. 864:** By Council Members Kallos, Constantinides, Lander, Reynoso, Levin, Espinal and Koslowitz

**Title:** Resolution declaring a climate emergency and calling for an immediate emergency mobilization to restore a safe climate

1. **Introduction**

On June 24, 2019, the Committee on Environmental Protection, chaired by Council Member Costa Constantinides, will hold an oversight hearing on renewable energy and pathways to a sustainable future. The Committee will also hear a legislative package on the topic. Int. No. 49 would require the Department of Citywide Administrative Services (“DCAS”) to conduct a feasibility study on the installation of utility-scale battery storage systems on city buildings. Int. No. 51 would require the City to establish and oversee a pilot program for a district-scale geothermal system. Int. No. 140 would require the Department of Environmental Protection (“DEP”) to conduct a feasibility study on the implementation of a community choice aggregation program for energy purchasing. Int. No. 269 would require that OLTPS develop a residential renewable energy pilot that utilizes a solar thermal district heating system along with solar photovoltaic systems to supply all of the energy for heating, hot water production, cooling and electricity for a residential site. Int. No. 426 would require that DCAS conduct a feasibility study of the costs of installing solar water heating and thermal energy systems on city-owned buildings and mandate the installation when identified as cost-effective. Int. No. 1076 would require the DEP to undertake a study designed to ascertain areas most suitable to facilitate construction of geothermal mini grid or district heating. Int. No. 1375 would require the City to create and maintain a database of subsurface conditions to support better engineering of geothermal heat pumps. Res. No. 864 declares a climate emergency and calls for an immediate emergency mobilization to restore a safe climate. The Committee expects to receive testimony from DEP, DCAS, the Mayor’s Office of Sustainability, utility companies, energy experts, environmental and climate justice advocates, and interested members of the public.

1. **Background**
* ***Utility Scale Battery Storage***

The cost of producing energy from wind and solar technologies is now competitive with fossil fuel-based methods, however, the intermittent nature of power generation from these technologies remains an obstacle to wide-scale implementation.[[1]](#footnote-1) Because the grid requires a consistent supply of energy that can be scaled along with demand, utility-scale battery storage is an integral component of ensuring an uninterrupted supply of electricity during periods where wind and solar assets are not producing at peak efficiency.[[2]](#footnote-2)

Prior to the 1990’s, there is no record of any United States experimentation with large-scale battery energy storage.[[3]](#footnote-3) The period from the 1990s to the late 2000s had limited experimentation due to significant financial and technological hurdles, but a combination of technological advances and increased public funding resulted in a marked increase in rollout and implementation during the period from 2009 to 2014.[[4]](#footnote-4) Currently, while lithium ion battery technology is the most widely implemented for utility and grid scale use, relatively high installation costs and short battery lives of currently available models continue to impede further implementation.[[5]](#footnote-5)

* ***Lithium Ion Batteries***

Between 2010 and 2015, lithium ion batteries accounted for 95% of the grid scale battery market.[[6]](#footnote-6) They are energy dense, and costs have come down significantly due to aggressive research and development in related sectors, such as electric car production.[[7]](#footnote-7) They are attractive to consumers because the batteries can be purchased as off–the-shelf units, which can then be scaled together in temperature-regulated storage tanks and easily coupled with controlling units.[[8]](#footnote-8) Unfortunately, they are currently only capable of providing four hours of energy storage, and have a limited cycle life, meaning that their performance degrades with repeated charging and discharging of electricity.[[9]](#footnote-9) There are also concerns regarding the sustainability of the mining practices surrounding necessary components, limited infrastructure and technology in place for the recycling of spent batteries, and the high cost, estimated at $270-$600 per megawatt hour of storage.[[10]](#footnote-10)

* ***New York State Energy Storage Goals***

New York State Public Service Law (PLS) §74 requires the Public Service Commission (“PSC”) to establish a statewide energy storage goal for 2030, and a deployment policy to support that goal.[[11]](#footnote-11) In the 2018 State of the State address, New York Governor Andrew Cuomo announced a target to deploy 1,500 MW of energy storage by 2025, to help achieve the Clean Energy Standard goal of getting 50% of New York’s electricity from renewable sources by 2030.[[12]](#footnote-12)

* In June 2018, the state Department of Public Service, along with New York State Energy Research and Development Authority (“NYSERDA”), filed a roadmap to provide the PSC with a range of recommendations to meet the goals established in PLS §74.[[13]](#footnote-13) On December 13, 2018, the PSC, NYSERDA and the Long Island Power Authority (“LIPA”) issued the resulting *Order Establishing Energy Storage Goal and Deployment Policy* (“the Order”),[[14]](#footnote-14) a comprehensive strategy to enable deployment of 1,500 MW of energy storage by 2025 and expanding to 3,000 MWs by 2030.[[15]](#footnote-15) The Order also adopts a package of energy storage deployment policies, and authorizes bridge incentive funds to be deployed by NYSERDA, bringing total authorized funds to $350 million outside Long Island, and requires NYSERDA to work with LIPA to develop equivalent set of incentives on Long Island.[[16]](#footnote-16) ***Energy Usage and City Owned Buildings***

According to the New York City Open Data portal, city-owned buildings consumed 1,317,725 mmbtu (million British Thermal Units) of energy in fiscal year 2015, excluding heating fuel oil.[[17]](#footnote-17) This translates into roughly 386 gigawatts of annual power consumption.[[18]](#footnote-18) Local Law 107 of 2018 mandates that all city owned buildings be powered by 100% renewable energy by 2050,[[19]](#footnote-19) which will likely necessitate the installation of battery storage in order to ensure reliability of the power supply. Climate control and hot water production account for 57% of citywide energy consumption,[[20]](#footnote-20) and City studies have shown that buildings where hot water production is decoupled from space heating boilers had substantially lower rates of fuel consumption than buildings where these two functions were serviced by the same equipment.[[21]](#footnote-21) Solar water heaters present a potential option for hot water production for city buildings with significantly lower dependence on heating fuel for its production. According to the United States Department of Energy, solar water heaters can cut water heating bills by 50% to 80% in residential applications.[[22]](#footnote-22) Much like geothermal heat exchangers, solar water heaters take advantage of natural heat energy, in this case solar energy, to reduce the energy required to bring water to the desired temperature.[[23]](#footnote-23) While they must be installed in conjunction with a backup heating system,[[24]](#footnote-24) the technology can provide the bulk of the energy required to heat water, and has also been proven reliable for district scale use. For example, in the Drake Landing Solar Community in Ontario, Canada, where solar water heaters were coupled with a borehole thermal storage system, an array of 800 panels is able to collect and store enough heat during the summer months to provide over 90% of both hot water and space heating for 52 homes.[[25]](#footnote-25)

* ***Geothermal Energy***

Geothermal energy systems harness heat energy emanating from the Earth’s core for electrical generation, or in order to assist with heating and cooling in various applications.[[26]](#footnote-26) In areas with high seismic activity, such as along the borders of tectonic plates, hydrothermal reservoirs holding steam, or water in excess of 220 degrees Fahrenheit, can be used to power steam turbines for the production of electricity.[[27]](#footnote-27) In areas where hot water resources exist, but at temperatures below the boiling point, it can be pumped directly to heat fish ponds for aquaponics, greenhouses for agriculture, used for heating buildings, for industrial purposes such as drying lumber, or in binary cycle power plants, which use the naturally heated water to heat fluids that expand when warmed, in order to run turbines.[[28]](#footnote-28) In areas lacking these heat resources, the relatively constant temperature of the ground near the earth’s surface, generally 50 to 60 degrees Fahrenheit in the uppermost 10 feet of soil, geothermal heat pumps can be used to reduce the amount of energy needed for thermal regulation in buildings and homes.[[29]](#footnote-29) In a study cited by the United State Environmental Protection Agency (“EPA”), it was found that geothermal heat pumps are the most energy efficient, environmentally clean, and cost effective space-conditioning systems available, with the lowest carbon dioxide emissions.[[30]](#footnote-30)

A geothermal heat pump system generally consists of a heat pump, ductwork, and a system of underground pipes used for heat exchange.[[31]](#footnote-31) In the winter, the higher ambient temperature of the ground is used to partially warm the air, reducing the energy required to heat spaces to a comfortable temperature.[[32]](#footnote-32) In the summer, the process is reversed, and the pump moves heat from the indoor air into the ground around the heat exchanger, subsequently reducing the energy required to cool the space.[[33]](#footnote-33) According to the United States Department of Energy, geothermal heat pumps can reduce the energy required for thermal regulation by 25 to 50% compared to conventional heating or cooling systems.[[34]](#footnote-34) This translates into a geothermal heat pump using one unit of electricity to move three units of heat from the Earth.[[35]](#footnote-35) According to the EPA, geothermal heat pumps can reduce energy consumption, and corresponding emissions, up to 44% when compared to air-source heat pumps and up to 72% when compared to electric resistance heating with standard air-conditioning equipment.[[36]](#footnote-36)

Geothermal heat exchangers can be roughly categorized into three configurations, open systems with supply and diffusion wells, standing column wells, and closed loop systems.[[37]](#footnote-37) Open systems with separate wells for supply and diffusion can have the lowest installation cost and highest efficiency, but require abundant groundwater close to the surface, high enough flow rates through the aquifer to provide the necessary heat transfer rates, as well as the ability to easily return water to the aquifer without radiant heat from the diffusion side affecting the supply side.[[38]](#footnote-38) Standing column well heat exchangers put the supply and diffusion lines within the same well system, are less dependent on the presence or flow of groundwater, and require less extensive testing of hydrological conditions than open systems with separate supply and diffusion wells.[[39]](#footnote-39) Closed loop systems are best suited for areas where water quality concerns preclude the use of open systems, or where sufficient water is not present for the previous methods.[[40]](#footnote-40) These systems represent the highest up-front installation costs, but are less constrained by on-site hydrology.[[41]](#footnote-41) They can be installed in vertical or horizontal configurations.[[42]](#footnote-42)

* ***Subsurface Conditions and the Efficacy of Geothermal Heat Pumps***

The effectiveness of a geothermal heat pump’s ability to move heat between a structure and the ground is dependent on a variety of factors such as the composition of the soil or rock surrounding the heat exchangers, as well as the moisture content, all of which can affect heat transfer rates.[[43]](#footnote-43) These thermal properties also vary based on the density of the sediment, as well as the type of minerals present in the matrix. Quartz for example, has high thermal conductivity, and is often added to the thermal grout used to line boreholes in order to improve heat transfer between heat exchangers and the surrounding earth.[[44]](#footnote-44)

Subsurface conditions in New York City vary widely, and can range from bedrock, to glacial deposits, to recently created land filled areas (see Figure 1).[[45]](#footnote-45) In Manhattan and the Bronx, bedrock often comprises the land surface, or is very close to the land surface. This bedrock slopes downward towards the southeast, and in some parts of Queens and Brooklyn, the bedrock can be covered in hundreds of feet of glacial till.[[46]](#footnote-46)

When paired with the complex matrix of subsurface utilities in New York City, the great variability of subsurface geological conditions presents a significant impediment to individuals seeking to install geothermal heat pumps.[[47]](#footnote-47) A database of subsurface conditions that includes geological logs of the city’s geothermal bores, locations of existing geothermal energy systems, and the locations of all water wells, including those unused and privately owned, would establish a necessary base of information useful for system selection and initial cost analysis for interested parties seeking to install geothermal heat pumps.[[48]](#footnote-48) This information would likely be useful to communities seeking to collaborate for district scale geothermal or thermal storage applications, as well as for the identification of areas ideal for district scale geothermal or thermal storage type projects.

Figure 1. The NYC Region - Geologic Map of Northern Manhattan and The Bronx[[49]](#footnote-49)



* ***District Scale Renewable Energy***

Approaching renewable energy projects from the district or community level allows individual actors to take advantage of economies of scale, in order to achieve goals that would be difficult at the individual building or home level.[[50]](#footnote-50) Whether individuals are collaborating to purchase energy from renewable sources, as in the community choice aggregation model, or embarking on renewable projects more directly via district scale geothermal, heat storage, or community solar type models, participants may reap the benefits of coordination, allowing them to more efficiently reduce greenhouse gas emissions and incentivize development of renewable energy resources.[[51]](#footnote-51)

 In 2015, the first community choice aggregation program to be created under Governor Cuomo’s Reforming the Energy Vision program was established in Westchester County, NY. The program, which was implemented by a coalition of local governments known as “Sustainable Westchester,” bundled the purchasing power of various municipalities in order to purchase renewable energy at bulk fixed prices for individual homeowners who opted into the program. The electricity is still delivered through the state designated utility, but the bulk purchasing agreement allows participants to choose a percentage of renewable energy, up to 100% to constitute their electrical supply.[[52]](#footnote-52)

 Community solar programs allow individuals and businesses for whom installation of privately owned solar panels is unfeasible to reap the environmental and economic benefits of solar powered electricity generation.[[53]](#footnote-53) Panels can be located on public or jointly owned property, and power output is shared by community subscribers who then receive credit on their electrical bills for their share of power produced.[[54]](#footnote-54) Community solar arrangements are generally categorized into four different models. The “on bill crediting” model involves participants investing in a portion of a local facility, and receiving a credit for their share of power produced.[[55]](#footnote-55) The “special purpose entity” model involves individuals and companies partnering to form a business enterprise that designs, constructs, and owns the solar facility.[[56]](#footnote-56) The benefit of this arrangement is access to incentives and tax credits that may not be offered to utilities.[[57]](#footnote-57) The “utility-sponsored” model involves utilities providing their customers with the option to purchase renewable energy from a shared facility.[[58]](#footnote-58) The “buy a brick” model involves donors contributing to a shared renewable installation owned by a charitable non-profit organization.[[59]](#footnote-59)

 The Drake Landing Solar Community in Ontario, Canada, is just one example of a district scale renewable energy project. Arrays of solar thermal heating panels placed on the community’s garage roofs cycle heat energy to a centralized borehole array that is adjacent to the community.[[60]](#footnote-60) The 800 panels in the array collect enough heat through the summer months to provide over 90% of the community’s annual hot water and space heating needs for 52 homes.[[61]](#footnote-61) Heat energy stored in the borehole array is circulated back into the homes during the winter months via heat exchangers connected to a thermostatically controlled valve that automatically shuts off when the home’s preferred temperature is reached (see Figure 2).[[62]](#footnote-62)

Figure 2: Drake Landing Solar Community Thermal Array and Borehole Storage[[63]](#footnote-63)



1. **Legislation**

**Int. No. 49** would require the Department of Citywide Administrative Services (DCAS) to conduct a feasibility study on the installation of utility-scale battery storage systems on buildings that are owned by the city, or for which the city regularly directly pays all of the annual energy bills, that are more than 10,000 gross square feet, and to coordinate the installation of such systems on city buildings where it is deemed feasible and cost-effective to do so. Additionally, this bill would require a feasibility study that also identifies the environmental and financial benefits relating to the installation of utility-scale battery storage systems on non-city buildings. This local law would take effect immediately.

**Int. No. 51** would require the Mayor’s Office of Long-Term Planning and Sustainability, in consultation with the DEP, to establish and oversee a pilot program for a district-scale geothermal system. This project could be developed by a third-party that is selected through a request-for-proposals process. The bill would establish criteria for choosing a site for the pilot district and would require a geothermal system to be constructed and maintained, and require that geothermal energy be provided to participating buildings through power purchase agreements with building owners. These agreements would give ownership of geothermal system infrastructure to building owners at the conclusion of the agreement term, which could not exceed seven years. The bill would also require detailed reporting on various aspects of the pilot program, including recommendations on whether the program should be expanded. This local law would take effect 90 days after it becomes law.

**Int. No. 140** would require the DEP to conduct a feasibility study on the implementation of a community choice aggregation program for energy purchasing by March 1, 2019. If the DEP determines that such a plan would be feasible and is recommended by the department, then the department will be required to submit an implementation plan to the mayor and speaker by March 1, 2020. The city was authorized to conduct such a program by the public service commission in 2016. This local law would take effect immediately.

**Int. No. 269** requires that DCAS develop a residential renewable energy pilot which utilizes a solar thermal district heating system along with solar photovoltaic systems to supply all of the energy for heating, hot water production, cooling and electricity for the proposed development. The homes in the project shall be affordable and remain affordable for the duration of the program. This local law would take effect immediately.

**Int. No. 426** would require that DCAS conduct a feasibility study of the costs of installing solar thermal energy systems on all buildings or structures owned by the city of New York, its agencies or departments, and where they are cost effective mandating the installation of city-owned solar hot water systems or thermal energy generation systems on those city-owned buildings where the feasibility study has found such systems to be cost-effective. The bill would also require DCAS to mail to property owners, together with the first property tax bill sent each year, a flyer that educates property owners as to the benefits of using solar hot water systems, including the financial, tax, and environmental benefits of installing such a system on their property. This local law would take effect immediately.

**Int. No. 1076** would require that an office or agency designated by the mayor undertake a study designed to ascertain areas most suitable to facilitate construction of geothermal mini grid or district heating and cooling applications within New York City. The study must consider areas where properties have similar geology and the individual well drilling might because prohibited; where groups of property owners with a history of working collaboratively such as block associations and civic groups and where the economies of scale can be achieved. Where areas most suitable for the installation of geothermal mini grid or district heating and cooling applications have been identified, the bill requires creation of a plan for facilitating an operating district scale geothermal systems. This local law would take effect immediately.

**Int. No. 1375** would require that the database include a single place for geological logs of the city’s geothermal bores and locations of geothermal energy system installations. The database would also include locations of any and all water wells including unused privately owned wells and shall be updated annually. This local law would take effect immediately.

**Res. No. 864** declares a climate emergency and calls for an immediate emergency mobilization to restore a safe climate.

Int. No. 49

By Council Members Constantinides, Espinal and Brannan

..Title

A Local Law to amend the administrative code of the city of New York, in relation to installation of utility-scale battery storage systems on city buildings and conducting a feasibility study on installation of such systems throughout the city

..Body

Be it enacted by the Council as follows:

Section 1. Chapter 2 of title 4 of the administrative code of the city of New York is amended by adding a new section 4-207.3 to read as follows:

 § 4-207.3 Utility-scale battery storage systems for city buildings. a. Definitions. As used in this chapter, the following terms have the following meanings:

Battery storage system. The term “battery storage system” means a set of methods and technologies utilizing a range of electrochemical storage solutions, including advanced chemistry batteries and capacitors, for the purpose of storing energy.

    City building. The term “city building” has the same meaning as set out in section 28-309.2.

    Commissioner. The term “commissioner” means the commissioner of citywide administrative services.

 Cost effective. The term “cost effective” means that the cumulative savings in energy costs expected to result from the use of a battery storage system, including expected savings will, in 25 years or less, equal or exceed the costs of acquisition, installation, and maintenance of such system, less all federal, state and other non-city governmental assistance and including the social cost of carbon value, as described in paragraphs 3 and 4 of subdivision d of section 3-125. A higher site- or project-specific social cost of carbon value may be developed and used in lieu of the social cost of carbon value.

 Department. The term “department” means the department of citywide administrative services.

b. The department, or any other agency authorized by the commissioner, shall, within two years from the effective date of the local law that added this section, submit to the mayor and the council a feasibility study regarding the use of utility-scale battery storage systems for city buildings. The feasibility study shall include a review of any available federal or state funds or incentives for the acquisition, installation, operation or maintenance of such systems.

c. The department, or any other agency authorized by the commissioner, shall install, or cause to be installed, utility-scale battery storage systems on all city buildings where the feasibility study has found it cost-effective.

d. Not later than December 15 of the year following the submission of the feasibility study, and every second year thereafter, the department shall report to the mayor and the council the following:

1. The city buildings where the installation of a utility-scale battery storage system would be cost effective and the projected annual energy and other cost savings for each such system, both individually and in the aggregate.

2. The city buildings where installation of a utility-scale battery storage system has been commenced by the department or any other agency authorized by the commissioner.

3. The city buildings where the installation of a utility-scale battery storage system has been completed by the department or any other agency authorized by the commissioner, and the annual energy and other cost savings associated with the installation of such battery storage systems.

§ 2. Report on feasibility of installation of utility-scale battery storage systems in non-city buildings. Not later than 2 years after the enactment of this local law, one or more offices or agencies designated by the mayor shall submit to the mayor and council, and make available to the public, a report on the feasibility of installing utility-scale battery storage systems throughout the city, not including city buildings as defined in section 28-309.2 of the administrative code of the city of New York. Such report shall also include, but need not be limited to, recommendations on where installation of utility-scale battery storage systems would be appropriate and identification of any financial or environmental benefits to the public that are associated with the installation of such systems.

 § 3. This local law takes effect immediately.

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Int. No. 51

By Council Members Constantinides, Espinal and Perkins

..Title

A Local Law to amend the administrative code of the city of New York, in relation to the creation of a pilot program for a district-scale geothermal system

..Body

Be it enacted by the Council as follows:

Section 1. Subchapter 2 of chapter 1 of title 3 of the administrative code of the city of New York is amended by adding a new section 3-126 to read as follows:

§ 3-126 District-scale geothermal system. a. Definitions. For purposes of this section, the following terms have the following meanings:

Building. The term “building” means a building as defined in section 28-101.5.

Geothermal energy. The term “geothermal energy” means energy stored in the form of heat beneath the surface of the earth.

Geothermal system. The term “geothermal system” means a system used to exchange geothermal energy between the earth and one or more buildings for the purpose of powering building systems, which may include, but need not be limited to, heating and cooling buildings, heating water and generating electricity.

Pilot district. The term “pilot district” means a portion of the city that includes two or more buildings and is designated for participation in the pilot program.

Pilot program. The term “pilot program” means a pilot program established pursuant to this section for the creation and administration of a district-scale geothermal system.

Power purchase agreement. The term “power purchase agreement” means a contract in which one party generates geothermal energy and another party purchases such energy or another form of energy, such as heat or electricity, that is developed using geothermal energy.

Third-party developer. The term “third-party developer” means a renewable energy developer that may be selected through competitive bidding to undertake project development for the pilot program, including site assessment and system configuration, installation, financing, operation and maintenance.

b. Development of pilot program. The director of long-term planning and sustainability, in consultation with the commissioner of environmental protection, shall establish and oversee a pilot program for the creation of a district-scale geothermal system in accordance with this section.

c. Request for proposals; third-party developer. The director of long-term planning and sustainability may comply with subdivision b of this section by issuing a request for proposals from renewable energy developers for the development of a geothermal system for the pilot district, including site assessment and the configuration, installation, financing, operation and maintenance of a geothermal system. Any such request for proposals may include terms in which a third-party developer selected for the pilot program owns the geothermal system and sells the geothermal energy produced by such system to building owners under power purchase agreements.

d. Siting of pilot district. 1. The director of long-term planning and sustainability, in consultation with the commissioner of environmental protection and any third-party developer selected pursuant to subdivision c of this section, shall identify potential sites for the pilot district in consideration of all relevant factors, which shall include, but need not be limited to:

(a) The site’s geologic and hydrologic profile;

(b) The availability, suitability and accessibility of land for geothermal wells within a suitable distance of the site;

(c) Whether the city has the property rights necessary to develop geothermal energy at the site and, if not, the cost of obtaining such rights, including the cost of paying fair market value to property owners;

(d) The level of interest of property owners in the area in participating in a geothermal system;

(e) The energy demand profile of buildings in the area that may participate in the geothermal system;

(f) The capacity of a geothermal system to meet the demand projected for the proposed pilot district;

(g) Projected fuel cost savings for participating buildings;

(h) Projected carbon emissions savings measured in terms of the social cost of carbon as provided in paragraphs 3 and 4 of subdivision d of section 3-125, except that a site- or project-specific social-cost-of-carbon value may be developed and used in place of the social-cost-of-carbon value from section 3-125 if such site- or project-specific social cost of carbon is higher than the value provided in such section; and

(i) Projected costs to build, operate and maintain a geothermal system, including costs to the city, to any contracted private entities including any third-party developer selected pursuant to subdivision c of this section, and to property owners and tenants.

2. The site for the pilot district and geothermal system shall be selected from among such potential sites in compliance with sections 197-c and 197-d of the charter.

e. Construction of geothermal system. The director of long-term planning and sustainability, in consultation with the commissioner of environmental protection and any third-party developer selected pursuant to subdivision c of this section, shall build, install and maintain:

1. A geothermal system for the pilot district, including equipment in and around buildings selected for the pilot program; and

2. Other facilities and equipment necessary for the operation of such geothermal system.

f. Power purchase agreement. 1. Each power purchase agreement entered into pursuant to this section between a property owner and the city or a third-party developer selected pursuant to subdivision c of this section shall provide that title to all geothermal system infrastructure located on such an owner’s property shall vest in that owner at the conclusion of the term of such agreement.

2. The duration of a power purchase agreement executed pursuant to this section shall not exceed seven years.

g. Provision of service. 1. Charges for geothermal energy service in the pilot district and procedures for the application for, termination of and reconnection of such service shall be administered in accordance with rules promulgated by the director of long-term planning and sustainability. In promulgating those rules, such director shall select from the following models the model that will be least costly to the average consumer of the geothermal energy being produced:

(a) A consumption model, in which consumers are charged in proportion to the amount of geothermal energy they consume; or

(b) An access model, in which consumers are charged a fixed amount for access to energy from the geothermal system, which charge does not vary based on the amount of energy consumed. If the director of long-term planning and sustainability selects the access model, such director may set a maximum amount of energy that each consumer may consume.

2. Charges for geothermal energy service in the pilot district shall not exceed the sum of the reasonable cost of system design, installation and maintenance over a 50-year period and a reasonable return on investment for any third-party developer selected pursuant to subdivision c of this section.

h. Rulemaking. The director of long-term planning and sustainability, in consultation with the commissioner of environmental protection, shall promulgate such rules as are necessary to effectuate this section.

i. Reporting. 1. Except as provided in paragraph 2 of this subdivision, no later than February 1 of each year the director of long-term planning and sustainability, in consultation with the commissioner of environmental protection and any third-party developer selected pursuant to subdivision c of this section, shall report to the mayor and the council a detailed assessment of the impacts of the pilot program. Such assessment shall include, but need not be limited to:

(a) Recommendations for improving the pilot program, including the specification of any beneficial new technology for the geothermal system;

(b) Recommendations on whether or not to make the pilot program permanent;

(c) Recommendations on whether or not to add similar permanent or pilot programs at other sites and the locations of any such potential sites;

(d) The costs incurred by the city, by contracted private companies including any third-party developer selected pursuant to subdivision c of this section, and by property owners and their tenants in implementing the pilot program up to the date of the report and anticipated future costs per year;

(e) Recommendations regarding the efficient and equitable allocation of geothermal energy among interested parties in the pilot district; and

(f) Recommendations regarding the administration of the pilot program, including, but not limited to, whether the pilot program should be administered directly by a city agency, by a third-party developer, by a public-private partnership, or under a private ownership model with title to the system transferred to property owners after a set term.

2. The director of long-term planning and sustainability may discontinue reporting to the mayor and the council after issuing five annual reports as required by paragraph 1 of this subdivision.

§ 2. This local law takes effect 90 days after it becomes law.

WCJ/MAJ

LS #4617/Int No. 1229-2016

LS 126

12/19/17

Int. No. 140

By Council Members Levin, Constantinides, Reynoso, Richards, Rosenthal and Rivera

..Title

A Local Law in relation to a study and plan relating to community choice aggregation programs

..Body

Be it enacted by the Council as follows:

 Section 1. a. By March 1, 2019, the department of environmental protection, in consultation with any other relevant agencies or offices, shall conduct, submit electronically to the mayor and the speaker of the council and make publicly available online a study determining the feasibility of implementing in the city one or more community choice aggregation opt-out programs, as described in the order issued by the New York state public service commission on April 20, 2016, relating to such programs. Such study shall include, at a minimum, analyses of potential economic and environmental impacts of implementing one or more such programs in the city and regulatory barriers thereto and shall indicate whether such department recommends implementing such programs.

b. If such department determines that implementing one or more such programs would be feasible and such department recommends implementing such programs, then such department, in consultation with any other relevant agencies or offices, shall, by March 1, 2020, develop, electronically submit to the mayor and the speaker of the council and make publicly available online a plan for implementing one or more such programs in a manner consistent with the findings of such study.

§ 2. This local law takes effect immediately.

MG/ARP

LS 9783/Int. 1820-2017

LS 767

1/4/18 11:48PM

Int. No. 269

By Council Members Richards and Brannan

..Title

A Local Law to amend the administrative code of the city of New York, in relation to a solar power pilot program

..Body

Be it enacted by the Council as follows:

Section 1. Subchapter 2 of chapter 1 of title 3 of the administrative code of the city of New York is amended by adding a new section 3-126 to read as follows:

§ 3-126 Solar powered pilot program. a. Definitions.

Covered building. The term “covered building” means a building that contains one or more dwelling units.

Designated agency. The term “designated agency” means the office of long-term planning and sustainability or another agency or office designated by the mayor to administer the provisions of this section.

Dwelling unit. The term “dwelling unit” shall have the meaning ascribed to such term in the housing maintenance code.

b. The designated agency shall develop and conduct a pilot program in which a district-scale solar thermal heating system is used in conjunction with solar photovoltaic systems to provide all of the heating, hot water, cooling and electricity needs for covered buildings participating in such program.

c. The designated agency shall consider utilizing underground borehole thermal energy storage to store solar energy generated in connection with such program. If the designated agency determines that the use of such storage means is not practicable or is otherwise undesirable, such agency shall set forth the reasons therefor in the findings required by subdivision e of this section.

d. The designated agency shall establish a procedure for selecting a suitable site which is the recipient of sufficient solar radiation for the covered buildings to successfully participate in such program.

e. The purchaser of a residential building that is part of the pilot program must enter into a regulatory agreement with the department of housing preservation and development requiring that the building and each dwelling unit offered for rent in such building be made and remain affordable to the occupant or subsequent purchaser thereof for the duration of such program, in a manner determined by such department.

f. In July of each year, the designated agency shall submit to the mayor and the speaker of the council, and make publicly available online, a report on the findings of such pilot.

§ 2. This local law takes effect immediately.

SS/JJD

LS #4503/Int. 1715-2017

LS 204

1/5/2018

Int. No. 426

By Council Member Constantinides

..Title

A Local Law to amend the administrative code of the city of New York in relation to the installation of solar water heating and thermal energy systems on city-owned buildings

..Body

Be it enacted by the Council as follows:

Section 1. Chapter 2 of title 4 of the administrative code of the city of New York is amended by adding a new section 4-207.2 to read as follows:

§ 4-207.2 Solar water heating and thermal energy systems for city-owned buildings. a. As used in this section:

City building. The term “city building” shall have the meaning ascribed to such term in section 28-309.2 of the code.

Commissioner. The term “commissioner” means the commissioner of citywide administrative services.

Cost-effective. The term “cost effective” means,   with respect to the installation of a solar water heating or thermal energy system, that the cumulative savings expected to result from such installation, including expected savings in energy costs, will in 25 years or less, equal or exceed the expected costs of such installation, less all federal, state and other non-city governmental assistance available to offset the cost of such installation and including the social cost of carbon value, as described in paragraphs 3 and 4 of subdivision d of section 3-125 of the code; provided, however, that a higher  site- or project-specific social cost of carbon value may be developed and used in lieu of the social cost of carbon value described in such paragraphs. Department. The term “department” means the department of citywide administrative services.

b. The department, or any other agency authorized by the commissioner, shall, within one year from the effective date of the law that added this section, submit to the mayor and the council a feasibility study of all city-owned buildings identifying where solar water heating and thermal energy systems would be cost-effective.  The feasibility study shall describe any federal or state funds or incentives that would be available to defray costs related to the installation, operation or maintenance of such systems.

c. A solar water heating system shall be installed on all city-owned buildings where the feasibility study has found such system to be cost-effective, provided that the procurement and installation of such system conforms with all other applicable laws.  The department may prioritize the installation of solar water heating systems based on the expected useful life of the currently installed water heating system, the expected cost savings of such solar water heating system, and by any other criteria determined by the commissioner.

 d. Not later than December 15 of the year following the submission of the feasibility study, and every second year thereafter, the department shall report to the mayor and the council the following:

1. The number of city-owned buildings where the installation of a solar water heating or thermal energy system would be cost effective, and the projected annual energy and other cost savings for each such system, both individually and in the aggregate.

2. The number of city-owned buildings that have commenced installation of a solar water heating or thermal energy system.

3. The number of city-owned buildings that have completed the installation of a solar water heating or thermal energy system.

4. The annual energy and other cost savings, and any other environmental benefits associated with the systems of completed systems.

5. New or updated information regarding technological, pricing, or socio-economic issues pertaining to solar water heating and thermal energy systems.

§ 2.  Subchapter 4 of chapter 3 of title 24 of the administrative code of the city of New York is amended by adding a new section 24-367 to read as follows:

§ 24-367 Solar water heating system outreach. The department shall mail to property owners, with the first water bill sent each year, a notice describing the benefits of a solar water heating system, including the financial, tax, and environmental benefits of installing such system.

§ 3. This local law takes effect immediately.

SS/JJD

LS 1545/Int. 1159-2016

LS 124

1/10/2018

Int. No. 1076

By Council Members Richards and Holden

..Title

A Local Law in relation to studying and identifying locations for district-scale geothermal systems and encouraging installation and operation of such systems

..Body

Be it enacted by the Council as follows:

Section 1. By no later than two years after the effective date of this local law, an office or agency designated by the mayor shall submit to the mayor and council, and make publicly available online:

a. A report describing, for each type of geothermal system, as such term is defined by section 3-125 of the administrative code of the city of New York, locations within the city where it would be feasible to install and operate district-scale geothermal systems of such type; provided that in determining such locations, such designated office shall take into account areas where property owners have a history of working collaboratively with one another through block associations, civic groups or otherwise and such designated office shall seek the cooperation of property owners and organizations representing property owners in identifying such areas; and

b. A plan for encouraging and facilitating the installation and operation of district-scale geothermal systems in such locations; provided that such plan shall include, at a minimum, (i) an identification of obstacles to such installation and operation, including regulatory obstacles, and recommendations for overcoming such obstacles and (ii) recommendations for providing information and financial and technical assistance to property owners at such locations or organizations representing property owners in such locations to encourage and facilitate such installation and operation.

§ 2. This local law takes effect immediately.

LS# 2194 SS

1/21/16 2:48PM

Int. No. 1375

By Council Members Richards, Rosenthal and Levine

..Title

A Local Law to amend the administrative code of the city of New York, in relation to requiring creation of a database of subsurface conditions to support better engineering of geothermal heat pumps.

..Body

Be it enacted by the Council as follows:

Section 1. Chapter 24 of the administrative code of the city of New York is amended by adding a new subdivision to c to section 24-804 read as follows:

 c. Database of Subsurface Conditions. 1. The department, in conjunction with the department of design and construction and the department of planning, shall develop and maintain a database of subsurface conditions by December 31, 2019 to offer resources to support the engineering and design of geothermal heat pump systems.

2. Such database shall be updated annually and shall include:

(a) A repository for geological logs of the city’s geothermal bores;

(b) The locations of existing geothermal energy systems; and

(c) The locations of all water wells, including any unused privately owned water wells.

§2. This local law shall take effect immediately.

LS# 2196

SS

10/17/18

Res. No. 864

..Title

Resolution declaring a climate emergency and calling for an immediate emergency mobilization to restore a safe climate.

..Body

By Council Members Kallos, Constantinides, Lander, Reynoso, Levin, Espinal and Koslowitz

Whereas, On April 22, 2016, world leaders from 174 countries and the European Union recognized the threat of climate change and the urgent need to combat it by signing the Paris Agreement, agreeing to keep warming well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C; and

Whereas, On October 8, 2018, the United Nations International Panel on Climate Change (“IPCC”) released a special report, which projected that limiting warming to the 1.5°C target this century will require an unprecedented transformation of every sector of the global economy over the next 12 years; and

Whereas, On November 23, 2018, the United States Fourth National Climate Assessment (“NCA4”) was released and details the massive threat that climate change poses to the American economy, our environment and climate stability, and underscores the need for immediate climate emergency action at all levels of government; and

Whereas, According to the National Aeronautics and Space Administration (NASA)’s Goddard Institute for Space Studies (GISS), global temperatures in 2018 were .83°C (1.5°F) warmer than the 1951 to 1980 mean, and the past five years are collectively the warmest in modern history; and

The death and destruction already wrought by climate change demonstrates that the Earth is already too hot for safety, as attested by increased and intensifying wildfires, floods, rising seas, diseases, droughts and extreme weather; and

Whereas, World Wildlife Fund’s 2018 Living Planet report finds that there has been 60% decline in global wildlife populations between 1970 and 2014, with causes including overfishing, pollution and climate change;

Whereas, According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, human activity has already severely altered 40% of the marine environment, 50% of inland waterways, and 75% of the planet’s land, and it is projected that half-to-one million species are threatened with extinction, many within the next few decades; and

Whereas, The United States of America has disproportionately contributed to the climate and extinction emergencies and has repeatedly obstructed global efforts to transition toward a green economy, and thus bears an extraordinary responsibility to rapidly address these existential threats; and

Whereas, Restoring a safe and stable climate requires transformative societal and economic change on a scale not seen since World War II to reach net zero greenhouse gas emissions across all sectors, to rapidly and safely drawdown or remove all the excess carbon from the atmosphere, to end the 6th mass extinction of species, and to implement measures to protect all people and species from the increasingly severe consequences of climate change; and

Whereas, A sweeping overhaul of the economy that centers on equity and justice in its solutions is vital to our future and must include the following goals: dramatically expand existing renewable power sources and deploy new production capacity with the goal of meeting 100% of national power demand through renewable sources; build a national, energy-efficient, “smart” grid; upgrade every residential and industrial building for state-of-the-art energy efficiency, comfort and safety; eliminate greenhouse gas emissions from  manufacturing, agricultural and other industries, including by investing in local-scale agriculture in communities across the country; repair and improve transportation and other infrastructure, and upgrade water infrastructure to ensure universal access to clean water; fund massive investment in the drawdown of greenhouse gases; make “green” technology, industry, expertise, products and services a major export of the United States, with the aim of becoming the international leader in helping other countries become greenhouse gas neutral economies and bringing about a global transition; and

Whereas, Marginalized populations in New York City and worldwide, including people of color, immigrants, indigenous communities, low-income individuals, people with disabilities, and the unhoused are already disproportionately affected by climate change, and will continue to bear an excess burden as temperatures increase, oceans rise, and disasters worsen; and

Whereas, Addressing climate change fairly requires a “Just Transition” from fossil fuels to clean, renewable energy that is ecologically sustainable and equitable for all people, especially those most impacted by climate change already and those who will be most impacted in the future; and

Whereas, Core to a Just Transition is equity, self-determination, culture, tradition, deep democracy, and the belief that people around the world have a fundamental human right to clean, healthy and adequate air, water, land, food, education, healthcare, and shelter; and

Whereas, Just Transition strategies were first forged by a “blue-green” alliance of labor unions and environmental justice groups who saw the need to phase out the industries that were harming workers, community health, and the planet, while also providing just pathways for workers into new livelihoods; and

Whereas, Just Transition initiatives shift the economy from dirty energy that benefits fossil fuel companies to energy democracy that benefits our people, environment and a clean, renewable energy economy, from funding new highways to expanding public transit, from incinerators and landfills to zero waste products, from industrial food systems to food sovereignty, from car-dependent sprawl and destructive unbridled growth to smart urban development without displacement, and from destructive over-development to habitat and ecosystem restoration; and

Whereas, Building a society that is resilient to the current, expected, and potential effects of climate change will protect health, lives, ecosystems, and economies, and such resilience efforts will have the greatest positive impact if the most dramatic potential consequences of climate change are taken into account; and

Whereas, Climate justice calls for climate resilience planning that addresses the specific experiences, vulnerabilities, and needs of marginalized communities within our jurisdiction, who must be included and supported in actively engaging in climate resilience planning, policy, and actions; and

Whereas, Actions to eliminate greenhouse gas emissions and/or drawdown greenhouse gases may be taken in ways that also improve resilience to the effects of climate change, and vice versa; and

Whereas, Climate justice requires that frontline communities, which have historically borne the brunt of the extractive fossil-fuel economy, participate actively in the planning and implementation of this mobilization effort at all levels of government and that they benefit first from the transition to a renewable energy economy; and

Whereas, Fairness demands the protection and expansion of workers’ right to organize as well as a guarantee of high-paying, high-quality jobs with comprehensive benefits for all as the mobilization to restore a safe climate is launched; and

Whereas, Common sense demands that this unprecedented mobilization effort address the full suite of existential ecological threats facing humanity in a comprehensive, integrated and timely fashion; and

Whereas, Nearly 400 cities, districts and counties across the world representing over 34 million people collectively have recently declared or officially acknowledged the existence of a global climate emergency, including Hoboken, Berkeley, Los Angeles, Montgomery County, Oakland, Richmond, and Santa Cruz in the United States, Bristol and London in the United Kingdom and many cities in Australia, Canada, and Switzerland; and

Whereas, New York City, as the largest city in the United States, can act as a global leader by both converting to an ecologically, socially, and economically regenerative economy at emergency speed, and by rapidly organizing a regional just transition and climate emergency mobilization effort; now, therefore, be it

Resolved, The City Council declares a climate emergency and calls for an immediate emergency mobilization to restore a safe climate.

NPJ

LS# 10483

5/3/19

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