ELECTRICAL CHANGES & OTHER REQUIREMENTS

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Buildings

presented by



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PRESENTATION DESCRIPTION

To protect the health, safety and welfare of the building occupants and the surrounding neighborhood, the significant changes in the 2022 Building Code Chapter 27 with respect to emergency, standby and voluntary generators are reviewed. This presentation will review the proposed rule 1 RCNY 105-2, which updates the requirements for the approval of a property tax abatement applications for the installation of *electric energy storage equipment*. Relevant New York City Electrical Code (NYCEC) requirements for specified electrical equipment installations will be discussed. Electricity load from electric vehicle supply equipment (EVSE) relevant to Local Law 97 of 2019 will be discussed.



BC CHAPTER 27 *Electrical*





BC 2702.1

 Emergency power systems and standby power systems shall be installed in accordance with the New York City Electrical Code, NFPA 110 and NFPA 111.



Figure **2702.1**-1: Emergency Generator Source: <u>CAT</u>

ANALYSIS:

This section was modified to clarify that when referring to emergency and standby power systems, the 2014 BC word **emergency** was replaced by **emergency power systems**.





Figure **2702.1.1**-2: Natural Gas Generator *Source:* <u>CAT</u> Systems relying on fuel supplies shall have an on-premises fuel supply sufficient for not less than 6-hour full-demand operation of the system. However, natural gas from the public utility street main shall be permitted as the sole fuel supply for (i) emergency power systems serving Group R-2 occupancies, (ii) emergency power systems where permitted by Appendix G of this code, and (iii) standby power systems, provided that an outside gas cut-off valve separate from other gas services is installed in accordance with Section E.6 of Appendix E of the New York City Fuel Gas Code.

ANALYSIS:

This section was modified to allow natural gas as the sole fuel supply for emergency power systems, where permitted by Appendix G of the Building Code.





Figure **2702.1.2**-3: Multiple generators sharing a common room *Source: <u>Cummins</u>*

Multiple generators supplying emergency power system loads only or supplying emergency power system equipment in combination with optional standby power loads as a common system may be located in the same room. Such generators may also share a common room, fuel supply and other common equipment and systems.

ANALYSIS:

Text was added to clarify that multiple generators can share a common room when supplying power systems.



 Automatic transfer devices, emergency generators and emergency or standby power system feeders shall comply with Sections 2702.1.7.1 through 2702.1.7.2.1.

2702.1.7.1 Prohibited location

All automatic transfer devices and power system feeders that serve emergency and required standby power system equipment shall not be located in the same room as the emergency power system equipment or the main or primary electrical service equipment. Where emergency and standby transfer devices are installed in accordance with Articles 700 and 701 of the New York City Electrical Code, automatic transfer devices for optional standby power systems shall not be installed in the same room.

ANALYSIS:

This section has added text to clarify that automatic transfer devices for optional standby system shall not be located within the same room with emergency / standby equipment, including emergency automatic transfer switches.





Figure **2702.1.7.1**-4: Dedicated ATS Room for Emergency and Required Standby Systems Source: <u>WIKIMEDIA</u>





Figure **2702.2.1.1**-5: UPS as an emergency power source for alarm communication system *Source:* <u>OnlinePower</u>

In prior code buildings, where a stationary generator is not otherwise required, the power source for emergency power to the voice/alarm communication system may be served by a gas generator or an uninterruptable power source (UPS) in accordance with the New York City Electrical Code.

ANALYSIS:

In the past UPS was not allowed to be used in lieu of generators for emergency power. However, this new section allows, in this scenario, voice/alarm communication systems to be supplied from a UPS, or from a gas-powered generator for emergency power.





Figure **2702.2.13**-6:Hudson Yards Mall *Source: <u>Hudson Yards New York</u>*

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Emergency power shall be provided for voice/alarm communication systems in covered and open mall buildings in accordance with Section 402.7.4.

ANALYSIS:

This new section requires Emergency Power in both, Open and Covered Malls.

 Standby Power is no longer allowed in Covered Malls.



Standby power for elevators, including elevators provided to accommodate ambulance stretchers pursuant to Section 3002.4, shall be provided as set forth in Section 3003.1.

ANALYSIS:

Eliminates previous 2014 BC text, **Controls, elevator cab lights, ventilation, and associated** equipment required for elevator operation be connected to emergency power.

Requirement for elevator cab lights to be connected to emergency power is now in Section 2702.2.20.1 for Occupancy Groups B, E and R-1.

In addition, per referenced Section 3003.1.4, where standby power is connected to elevators, machine room ventilation / air conditioning shall also be connected to the standby power source.





Standby power systems shall be provided for fans or fan systems being designed in accordance with Section 607.5 of the New York City Mechanical Code and Section 717 of this code.

ANALYSIS:

If an air handling system is installed/designed to provide return air under fire condition (i.e., continuous operation), such air handling system must be served by standby power. This new section coordinates with MC 607.5.2.2, Exception 4, which states that in Public Corridors,

"Smoke dampers shall not be required in ducts where the air continues to move and the airhandling system installed is arranged to prevent recirculation of exhaust or return air under fire emergency conditions or loss of normal power by provision of standby power in accordance with Chapter 27 of the New York City Building Code."



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Figure **2702.2.21**-7: Air Handling Unit Source: <u>Douglas Bowker</u>





Figure **2702.2.22**-8: Gas Detection System Source: <u>Sierra Monitor Corp.</u>

Emergency power systems shall be provided for gas detection systems in accordance with Section 918.5.

ANALYSIS:

This new section requires that gas detection system be connected to emergency power systems.





BC 2702.4

- In addition to any other loads, optional standby power systems shall be capable of providing power to the following standby and emergency power loads upon failure of the normal power supply:
 - 1. Emergency lighting
 - 2. Fire alarm systems
 - 3. Elevators as follows:
 - 3.1. For Group R-2 occupancies in buildings greater than 125 feet (38 100 mm) in height, ...; or
 - 3.2. For all other buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access,

Exception: Backup power systems that provide backup power for non-accessory public telecommunications equipment, such as rooftop telecommunications antennas, cooling equipment, routers, etc., need not provide power to the standby and emergency power loads listed in this section.

ANALYSIS:

This above Exception clarifies that "Backup Power Systems", which serves non-accessory public telecommunication equipment, such as rooftop antennas, does not need to power the additional loads that listed in this section, based on intent of previously issued BB 2015-002.



BC 2702.4



Figure **2702.4**-9: Rooftop Antenna Source: <u>Landmark Dividend</u>



BC 2702.4.1



Figure **2702.4.1**-10: Existing Generator Source: <u>Analogue Kid</u>

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Where a functioning emergency power system or required standby power system is in place and provides power to all required emergency or required standby power loads, any additional optional standby power system need not supply power to such emergency or required standby power loads.

ANALYSIS:

Clarifies requirements for optional standby power systems, based on previously issued BB 2015-002 (Section C)



BC 2702.4.2

Where an optional standby power system is required to supply emergency or required standby power loads, such power system shall comply with the UL 2200 listing and NFPA 110.



Figure **2702.4.2**-12: UL Listed Logo *Source: <u>UL</u>*



Figure **2702.4.2**-11: NFPA Logo Source: <u>NFPA</u>

ANALYSIS:

Clarifies requirements for optional standby power systems, based on previously issued **BB 2015-002 (Section D)**



BC 2702.4.3



Figure **2704.4.3**-13: Special Inspection Source: <u>Milrose Consultants</u>

Where an optional standby power system is required to supply emergency or required standby power loads, such power system shall be subject to special inspection in accordance with Section 1704.31 and the rules of the department.

ANALYSIS:

Clarifies requirements for optional standby power systems, based on previously issued **BB 2015-002** (Section E)



PROPOSED AMENDMENTS: 1 RCNY 105-02

The Department of Buildings is amending its property tax abatement rule to:

- Clarify the process for the installation of solar electric generating systems
- Add eligibility for a tax abatement for the installation of electric energy storage equipment
- Delete some obsolete provisions,
- Add language regarding filing of electrical work
- Add language regarding site specific review requirements



PROPOSED AMENDMENTS: 1 RCNY 105-02

The rule establishes the procedure for a property tax abatement application for a solar electric generating system and **electric energy storage equipment** as defined in Title 4-C of Article 4 of the New York State Real Property Tax Law ("<u>Title 4-C</u>").



§ 499-aaaa. Definitions. When used in this title, the following terms shall have the following meanings:

7. "Eligible building" shall mean a class one, class two or class four real property, as defined in subdivision one of section eighteen hundred two of this chapter, located within a city having a population of one million or more persons. No building shall be eligible for more than one tax abatement pursuant to this title.





8. Eligible solar electric generating system expenditures and eligible electric energy storage equipment expenditures shall mean reasonable expenditures for materials, labor costs properly allocable to on-site preparation, assembly and original installation, architectural and engineering services, and designs and plans directly related to the construction or installation of a solar electric generating system or electric energy storage equipment installed in connection with an eligible building. Such eligible expenditures shall not include interest or other finance charges, or any expenditures incurred using a federal, state or local grant.





10. **Solar electric generating system** shall mean a system that uses solar energy to generate electricity. Such system shall not include any equipment connected to a solar electric generating system that is a component of part or parts of a non-solar electric generating system or that uses any sort of recreational facility or equipment as a storage medium.



11. Electric energy storage equipment means a set of technologies capable of storing electric energy and releasing that energy as electric power at a later time. Electric energy storage technologies may store energy as potential, kinetic, chemical or thermal energy that can be released as electric power, and include, but are not limited to, various types of batteries, flywheels, electrochemical capacitors, compressed air storage and thermal storage devices.





PROPOSED AMENDMENTS: 1 RCNY 105-02

(a) **Purpose and applicability**. This section establishes the procedure for a property tax abatement application for a solar electric generating system <u>and electric energy storage</u> <u>equipment</u> as defined in Title 4-C of Article 4 of the New York State Real Property Tax Law ("Title 4-C").

- (1) No solar electric generating system expenditures shall be eligible for a tax abatement pursuant to Title 4-C if such expenditures were: (1) incurred before August 5, 2008; or (2) incurred in connection with a solar electric generating system placed in service before August 5, 2008.
- (2) No electric storage equipment expenditures shall be eligible for a tax abatement pursuant to Title 4-C if such expenditures were: (1) incurred before January 1, 2019 or after January 1, 2024; or (2) incurred in connection with electric storage equipment placed in service before January 1, 2019 or after January 1, 2024.





1 RCNY 105-02





SOLAR ELECTRIC GENERATING SYSTEM

- REVISED Procedures for the installation of a solar electric generating system for the purpose of tax abatement
 - File alteration application
 - The applicant of record indicates that the alteration application will be the subject of a property tax abatement application
 - Submit required documents and information*
 - File for Electrical Plan Review (if applicable)





SOLAR ELECTRIC GENERATING SYSTEM

- REVISED Procedures for the installation of a solar electric generating system for the purpose of tax abatement
 - Obtain Construction work permit
 - Obtain Electrical work permit
 - Perform the work
 - Perform Inspections
 - Request Sign-offs



ELECTRIC ENERGY STORAGE EQUIPMENT

- NEW Procedures for the installation of electric energy storage equipment for the purpose of tax abatement
 - File alteration application
 - The applicant of record indicates that the alteration application will be the subject of a property tax abatement application
 - Submit required documents and information*
 - File for Electrical Plan Review (if applicable)
 - File for site-specific review (OTCR)

*Documentation required includes: zoning analysis, plot plan, site plan, foundation and/or anchorage of the electric energy storage equipment, and roof plan amongst other documentation.





ELECTRIC ENERGY STORAGE EQUIPMENT

NEW Procedures for the installation of electric energy storage equipment for the purpose of tax abatement

- Obtain Construction work permit
- Obtain Electrical work permit
- Perform the work
- Perform Inspections
- Request Job Sign-offs



ELECTRICAL PLAN REVIEW: WHEN IS AN ELECTRICAL PLAN REVIEW REQUIRED?

- An electrical plan review is required if any of following conditions are met:
 - A new electrical installation or revised installation above 600 volts, irrespective of KVA rating
 - A new electrical installation of equipment totaling 1000 KVA or higher

- Any change in an electrical installation with a rating of 1000 KVA or higher, up to and including the second level overcurrent protection, unless it was fully described and approved as "future" on the original approved plan
- Any addition to an existing electrical installation which would bring the total to 1000 KVA or higher
- The addition of any equipment in a room, which would affect clearances around the equipment of a 1000 KVA electrical installation.



OTCR REVIEW: WHEN IS AN OTCR REVIEW REQUIRED?

- Electrical equipment not specifically addressed in the NYCEC technical standard, for example:
 - Low Voltage Lighting Systems (if not listed)
 - Energy Storage System
- Electrical equipment not bearing the label of approval of an electrical testing laboratory acceptable to the Commissioner.
 - Foreign decorative luminaires
 - Waterless toilets



BB 2021-020 ELECTRICAL INSTALLATIONS FILING

The purpose of <u>Buildings Bulletin 2021-020</u> is to clarify the types of electrical installations of different equipment that are subject to plan examination.



ELECTRICAL INSTALLATIONS

Examples of equipment include but are not limited to:

- Service equipment
- Transformers
- UPS systems
- Generators
- Electrical wiring of assembled photovoltaic arrays
- Generator paralleling equipment



Source: Cat Gen.



Source: Maddox Trans.



Source: UPS System



ELECTRICAL INSTALLATIONS

(continued)

Other sources including but not limited to:

- Energy storage systems
- Fuel Cells
- Photovoltaic Systems
- DC or AC micro grids
- Co-generation plants
- Stationary batteries









Source: Energy.gov, PV



ELECTRICAL INSTALLATIONS

(continued)



Source: Convergent,

Tops Markets

Technology Under Construction PV and Lithium-Ion Application Interconnection Voltage Community Solar-Plus-Storage 13.2 kV

5 MW / 15 MWh (storage); 7.7 MW / 5 MWh (solar)

Solution

Size

Status

The solar-plus-storage projects developed by Convergent provide Tops and upstate New Yorkers access to solar energy whether or not the sun is shining and reduce the state's reliance on power plants during peak demand hours.

Example of a **<u>5MW/15MWH</u>** electric energy storage equipment - outdoor installation requiring electrical plan review



<u>**1 RCNY §4000-01(b)</u>** sets forth the filing requirements* for electrical work subject to electrical plan review:</u>

Request a Job Number by emailing <u>ElecJobNo@buildings.nyc.gov</u>

* Filing requirements for electrical installations can be found under DOB's Project Guideline Requirements for Design Professionals: Electrical Systems on DOB's website at, https://www1.nyc.gov/site/buildings/industry/project-requirements-design-professional-electrical.page





<u>1 RCNY §4000-01(b)</u> sets forth the filing requirements* for electrical work subject to electrical plan review:

- Submit an application with the following documentation:
 - One line diagram
 - Plan view / service equipment room layout
 - Statement confirming coordination of overcurrent protection devices.
- Submission must be made, by a New York State Licensed and Registered Professional Engineer, New York State Licensed and Registered Architect, licensed filing representative or an individual with comparable qualifications from an outside jurisdiction.

* Filing requirements for electrical installations can be found under DOB's Project Guideline Requirements for Design Professionals: Electrical Systems on DOB's website at, https://www1.nyc.gov/site/buildings/industry/project-requirements-design-professional-electrical.page





- Pay required fees in person at 280 Broadway, 1st Floor
- <u>Submit Electrical Plan Examination</u> <u>Request Form</u>

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Electrical Equipment Room Layout



Buildings

One-Line Diagram





- Coordination Statement
 - A statement confirming that all fuses and/or circuit breakers have been coordinated for selective short circuit overcurrent protection must be on the drawing.
- DEP Asbestos Statement





BB 2021-019: GREENHOUSE GAS EMISSIONS ACCOUNTING FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)

New York City has aggressive climate goals, including reaching net zero emissions by 2050 across the building, transportation, and waste sectors. Local Law 97 of 2019 (LL 97/2019), effective November 15, 2019, amends Title 28 of the New York City 2014 Administrative Code to require reductions in greenhouse gas emissions from certain buildings beginning in 2024. The purpose of <u>Building Bulletin 2021-019</u> is to clarify that energy used to charge vehicles will not be required to be included in emissions from buildings.





ELECTRIC VEHICLE CHARGING SYSTEM INSTALLATION



Source: <u>Chargepoint</u>



ELECTRIC VEHICLE CHARGING SYSTEM INSTALLATION



PHOTO SOURCE: M Simon DOT



BB 2021-019

Important terminology:

 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) refers to the conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.



BB 2021-019

 PLUG-IN ELECTRIC VEHICLES (PEV) refers to plug-in hybrid electric vehicles (PHEVs) and all-electric vehicles (EVs) that can plug in to an EVSE that is connected to a building's electrical system.



BB 2021-019

*COVERED BUILDING. The term "covered building" means, as it appears in the records of the department of finance, (i) a building that exceeds 25,000 gross square feet (2322.5 m²) or (ii) two or more buildings on the same tax lot that together exceed 50,000 gross square feet (4645 m²), or (iii) two or more buildings held in the condominium form of ownership that are governed by the same board of managers and that together exceed 50,000 gross square feet (4645 m²).



ELIGIBILITY

- Covered Buildings must report emissions associated with electric energy sent from the building to Plug-in Electric Vehicles (PEV) via EVSE.
- For the purposes of reporting building emissions in accordance with Section AC 28-320.3.7, an owner may exclude electricity attributable to unidirectional electric vehicle charging systems used exclusively for charging PEV.
 - Systems that charge other types of storage devices (including but not limited to portable storage batteries and stationary batteries) are not eligible for this deduction.



ELIGIBILITY

(continued)

- The EVSE installation must meet at least one of the following in order to deduct the electricity from the building's total annual consumption.
 - must be separately metered by the utility; or,
 - must be separately metered or submetered by the owner in a manner that produces auditable data aligned with the reporting year; or
 - must be capable of and configured to produce data that records the electricity supplied to vehicles over the course of the reporting year by means of hardware and software integrated with the equipment.



TRANSPORTATION ENERGY USE

The submetered energy use will be considered Transportation Energy Use, as per the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories, which can be deducted from the building energy consumption for determining compliance with the building's emissions limit*.

*There will be no change to the calculation methodology for building emissions intensity.





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