

19 Remove Barriers to Solar Energy

I. Summary

Issue:

Onsite solar power can keep buildings habitable during blackouts, but technical, regulatory, and economic barriers inhibit its use.

Recommendation:

Con Edison, NYSERDA, and other government agencies should continue working together to streamline permitting processes, reduce barriers in project schedules, and increase the allowable roof area for solar power.

II. Proposed Legislation, Rule or Study

Facilitate DOB Permitting:

The issues addressed here do not require changes in building code, but can be rectified by improvements in the way permits for photovoltaic (PV) system installations are processed.

1. The Department of Buildings should prepare a manual that clearly identifies all requirements for PV installations. Examples of topics include: when an engineering study is required to prove the structural integrity of the roof, and when a simple statement of conditions will be acceptable instead of the study; when a licensed asbestos inspection is required as opposed to a visual inspection reported by the contractor; and what procedures are acceptable for sealing envelope penetrations. Con Edison's manual for Distributed Generation provides an example of the recommended coverage and depth. (www.coned.com/dg/process_guide/processGuide.asp).
2. The Department should train inspectors in the characteristics and requirements of PV systems, reducing the likelihood of unnecessary inspections or the requirement of unneeded construction measures due to uncertainty as to what is safe and reliable.

Con Edison & NYSERDA Policies:

1. Con Edison should work with NYSERDA to coordinate approvals, so that funding can be based on clear knowledge of project progress, and not be rigorously tied to meter installation, which can be delayed for internal reasons at Con Edison.

2. The future development of photovoltaic (PV) power in New York City will be limited by the ability of Con Edison's grid to accept distributed power. Con Edison should develop a long-term plan to strengthen and diversify the grid so that a substantial fraction of the system's energy can be supplied by distributed sources by 2025.

Amendments to the New York City Fire Code:

1. Amend Section 504.4.1, 504.4.2 and add a new section 504.4.5 to read as follows:

504.4.1 Rooftop access. [Access] Except as otherwise provided in Section 504.4.5, access to building rooftops shall be provided as follows:

1. For each 12 linear feet (3658 mm) of building perimeter accessible from the frontage space of the building and from any other exposure accessible to fire apparatus, a minimum clearance of 6 feet (1829 mm) in width and 6 feet (1829 mm) in depth from any obstruction shall be provided at the parapet wall or other perimeter of the rooftop. Where such building perimeter is 24 linear feet (7315 mm) or greater, but less than 36 linear feet (10 973 mm), the required clearance openings shall be separated by a distance of not less than 12 linear feet (3658 mm). Where such building perimeter is 36 linear feet (10 973 mm) or greater, the required clearance openings may be contiguous, provided, however, that such contiguous openings shall not exceed 12 linear feet (3658 mm) and shall be separated from other required clearance openings by a distance of not less than 12 linear feet (3658 mm). Each exposure accessible by fire apparatus may be treated separately for purposes of locating clearance openings and otherwise complying with the requirements of this provision.
2. A minimum clearance of 6 feet (1829 mm) in all directions shall be provided from each door opening onto a rooftop from a dwelling unit, stairway, bulkhead, or other occupied space or means of egress, as measured from the door hinge.
3. A minimum clearance of 3 feet (914 mm) in all directions shall be provided from any fire escape or rooftop access ladder, as measured from each side of the ladder or landing.

504.4.2 Rooftop obstructions. [Unobstructed] Except as otherwise provided in Section 504.4.5, unobstructed space shall be provided on rooftops sufficient to allow firefighting operations, as follows:

1. A clear path of not less than 6 feet (1829 mm) horizontal width and 9 feet (2743 mm) in height shall be provided from the front of the building to the rear of the building and from one side of the building to the other, except that a conduit or pipe in compliance with the requirements of this section may cross such path. Such clear path shall be accessible from each point of the rooftop access from which clearance is required pursuant to Section 504.4.1.
2. To the maximum extent practicable, conduits, including cable trays, and piping, shall be installed on the rooftop side of the parapet wall. If such installation is not

practicable, conduits and piping shall be installed along the periphery of the rooftop, in order to minimize rooftop obstructions. Steps or ramps constructed of non-combustible material and equipped with railings shall be provided in the clear paths for any conduits or piping installations that exceed 1 foot (305 mm) in height above the rooftop. All conduits and piping installations shall be color-coded with continuous, durable and weatherproof reflective or luminescent markings as follows:

- 2.1. High voltage wiring – Red.
- 2.2. Low voltage wiring – Orange.
- 2.3. Natural gas piping – Yellow.
- 2.4. Other compressed gas piping – Yellow, labeled at regular intervals with the type of gas.
- 2.5. Fuel oil piping – Yellow with black stripes.

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504.4.5 Rooftop access on adjoining rooftops. Two or more adjoining rooftops meeting the requirements of Section 504.4.5.1 may be consolidated for purposes of complying with the rooftop access requirements of Sections 504.4.1(1) and rooftop obstruction requirements of Section 504.4.2(1). Where adjoining rooftops are consolidated for these purposes, they may comply with the alternative requirements of Section 504.4.5.2.

504.4.5.1 Eligible rooftops. Rooftops may be consolidated for rooftop access purposes only in connection with the installation of solar panels and only where the rooftops:

1. are on buildings classified as Occupancy Group R-2 or R-3;
2. are at the same height and are physically adjoining, without any gap;
3. have no bulkheads; and
4. individually are not more than 25 feet in width.

504.4.5.2 Alternative rooftop access and obstruction requirements. All rooftops consolidated for purposes of this section may be provided with rooftop access in compliance with the following requirements:

1. The front portion of each adjoining roof shall be unobstructed for the full width of the adjoining roofs to a depth of 6 feet (1829 mm) and height of 9 feet (2743 mm), providing an unobstructed path along the front portion of the adjoining buildings. A similar unobstructed path shall be provided along the front portion of any other building exposure that is fire apparatus accessible (such as on a corner building fronting on two streets).

2. The rear portion of each adjoining roof shall be unobstructed for the full width of all of the adjoining roofs to a depth of 4 feet (1219 mm) and a height of 9 feet (2743 mm), providing an unobstructed path along the rear portion of the adjoining buildings.
3. Access to the rear of the adjoining buildings shall be provided by a clear path 6 feet (1829 mm) in width and 9 feet (2743 mm) in height, complying with the requirements of Section 504.4.1, on not less than every other building.
4. Rooftop obstructions shall not obstruct fire escapes or other means of rooftop access or egress; cover skylights, hatches or scuttles; or otherwise obstruct any building feature required by the Building Code to be operable or accessible.

504.4.5.3 Application. The application for the rooftop solar panel installation submitted to the Department of Buildings shall include a plan identifying the rooftops consolidated for purposes of this section. The application shall be signed or otherwise authorized by the owners of the respective buildings.

504.4.5.4 Notification to department. Notification of a solar panel installation on rooftops consolidated pursuant to this section shall be made to the department in an approved manner.

504.4.5.5. Signage. A durable sign shall be conspicuously posted on each rooftop upon which there is a solar panel installation indicating the location of the inverter shut off switch for the installation by reference to the building address and floor of the building.

504.4.5.6 Discontinuance and restoration of adjoining rooftop access. If, for any reason (including alteration of the rooftop or demolition of the building), the rooftop access required pursuant to Section 504.4.5.2 is no longer available on one or more adjoining rooftops consolidated for purposes of this section, any adjoining rooftop or rooftops lacking the required access from an adjoining building shall be restored or altered to comply with the rooftop access provisions of Section 504.4.1 and the rooftop obstruction provisions of Section 504.4.2.

III. Supporting Information

The details of the three separate components of this proposal are presented here.

Item 1: Facilitate DOB Permitting

Expanded Issue and Benefits:

Certain New York City Department of Buildings (DOB) practices and procedures have the effect of slowing the widespread installation of solar thermal and PV systems on the roofs of New York City buildings. These practices cause delays that are significantly greater than those found on

Long Island or in New Jersey, increasing costs and heightening the sense of risk when considering solar systems. Because these delays are largely independent of the size of the job, they are particularly damaging to the cost effectiveness of smaller projects. Improved procedures would result in more widespread implementation of PV systems throughout the five boroughs, improving air pollution, lowering greenhouse gas emissions, and increasing resilience. Interestingly, these delays do not appear to arise from the construction codes, but instead from the novelty of PV installations, the absence of well-defined procedures, and the consequent inexperience of building inspectors in this area. This inexperience has led, in the opinions of practitioners, to many instances of excessive caution, resulting in requirements for additional, largely unnecessary analyses or structural support.

To minimize these issues, the DOB should streamline procedures for PV system installations by creating a standard set of guidelines and training inspectors who are specialized to facilitate these projects.

Cost:

Turner Construction Company did not perform cost estimation for this proposal. The following analysis was provided by the authors of this proposal:

Although there would be some modest cost to the DOB, streamlining PV applications will trim the time spent by DOB in review and the overall benefits of increased adoption of PV systems will greatly outweigh these startup costs. Currently an expeditor costs \$5,000 for a residential project, increasing overall cost by about 20%, and by a larger percentage for smaller projects. One practitioner estimates that he spends \$3.50 per watt for parts and labor on a small residential system, and \$2.50 per watt on permits and expediting. Another reported expense is spending \$750 for an engineer's statement that a roof capable of holding New York City snow loads can also hold a much lighter PV system.

Implementation:

These changes will be carried out within the DOB.

Sources:

Interviews with customers and practitioners.

Item 2: Con Edison & NYSEERDA Policies:

Expanded Issue and Benefits:

Currently, NYSEERDA provides incentives that cover a significant portion of the cost of a PV system. NYSEERDA's payment schedule is tied to the installation of Con Edison meters, and delays in installation of these meters are reported to impede the advancement and funding of projects. Con Edison, NYSEERDA, and interested PV installers should collaborate to clarify the details of this issue and develop a communication protocol to minimize delays or complications.

New York City faces a future in which a much greater portion of our power must come from carbon-free sources. Planning for greatly increased distributed PV production throughout the city should be a major component of Con Edison's long-term planning.

Cost:

Turner Construction Company did not perform cost estimation for this proposal. The following analysis was provided by the authors of this proposal:

Implementing these proposals is likely to decrease the cost of PV installations, since time spent on scoping studies would be reduced, construction periods shortened, and a greatly increased scale of PV installation made possible.

Implementation:

There are no clear barriers to implementing this proposal.

Sources:

Interviews with practitioners and customers; review of Con Edison materials.

Item 3: Amendments to the NYC Fire Code

Expanded Issue and Benefits:

One of the barriers to installing larger solar systems is the amount of rooftop space that must be allocated for unobstructed paths for firefighters. The Fire Code (Section 504.4.1) requires that the rooftop of every building have a 6 foot clear path running from the front to the back of the building, and another 6-foot clear path running from side to side. This requirement is the same for every building, so for smaller buildings the paths can preclude use of a substantial portion of the roof. (On a row house with a roof that is 20 feet wide and 40 feet deep, the required clear path would require 324 square feet, 40% of the rooftop area.) Other required clear areas, such as around rooftop ladders, add to the problem. Because solar energy systems include fixed costs that do not vary based on the size of the system, removing unnecessary barriers that constrain the size of rooftop solar systems will improve their cost-effectiveness.

There are situations in which the FDNY has allowed limited exceptions to their clear path requirements. Where a clear path running continuously from across the rooftops of multiple buildings, only one of those buildings must have a front to back clear path. This decreases the area that must be dedicated to fire lanes. Currently, the FDNY requires that these paths be established through an easement agreement between the building owners, which can be difficult to negotiate.

This proposal recommends an approach that would address the FDNY's needs while making it easier to obtain the consolidated roof exception. Under the proposal, owners of adjoining properties need only sign an application, rather than create an easement agreement. Consolidation would be available to adjoining residential buildings of the same height and without bulkheads. The front 6 feet and back 4 feet of the buildings must remain unobstructed, and only one rooftop must maintain a 6-foot wide clear path from front to back.

Cost:

Turner Construction Company did not perform cost estimation for this proposal. The following analysis was provided by the authors of this proposal:

This proposal will lower the cost of installing PV systems, dramatically in the case of smaller buildings.

Implementation

There are no significant barriers to implementing this approach, assuming the Fire Department makes the recommended rule changes.

Sources:

Current New York City Fire Code and informal discussion with Department representatives, who have provided information but have not supported or opposed this proposal.