

INTERCONNECTION  
GUIDE FOR **LARGE  
COMBINED HEAT AND  
POWER (CHP)**  
PROJECTS 5-20 MW

*October 2016*



**LEGAL DISCLAIMER:** This guide is for informational purposes only and does not constitute legal advice. This does not substitute for any applicable laws, rules or regulations, tariffs, and/or specifications. Further, any information is subject to change without notice. To the extent there is any conflict between this guide and any applicable laws, rules, regulations, tariffs, and/or specifications, the applicable laws, rules, regulations, tariffs, and/or specifications control. Consolidated Edison Company of New York shall not be held liable for indirect, special, incidental, punitive, or consequential damages of any kind, including loss of profits, arising under or in connection with this guide.

**COMPANY REVIEW:** The Company's shall review the Customer's design at various stages of the design as well as during construction. The Company's review is for general arrangement and conformity with the Company's interconnection requirements only and does not indicate safe or faultless design. Company review of the final plans or drawings, indicates that the design is compatible with Company equipment and service. Responsibility for proper design, operation, maintenance and safety of the Customer's installation rests solely with the Customer. In addition, all work and equipment must conform to municipal and all other applicable codes and requirements, including applicable provisions of the National Electrical Code (NEC), the National Electrical Safety Code (NESC) and OSHA in effect at the time of construction.

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## Welcome

Congratulations on your decision to consider installing Distributed Generation (DG).

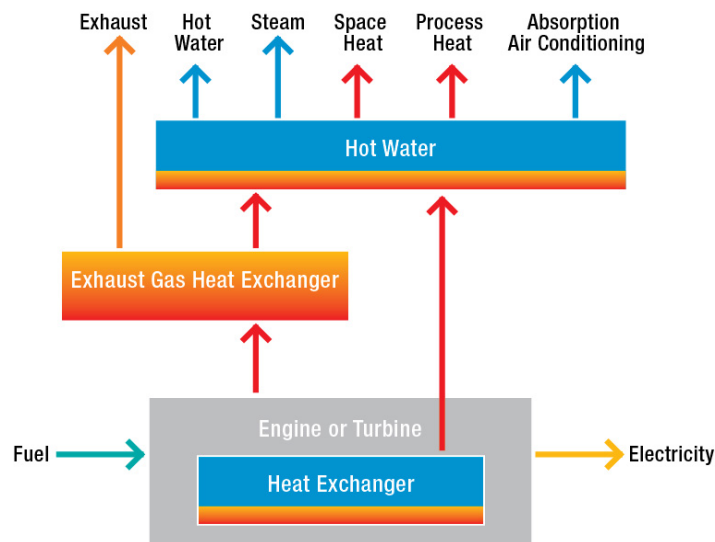
This guide is for Con Edison Customers who are either installing or upgrading natural gas-supplied DG systems generating greater than 5 MW up to 20 MW<sup>1</sup> that are or will be connected to Con Edison's electric distribution system.

This guide provides details of the electric, gas, and steam interconnection process, typical schedule, and challenges associated with DG projects. This guide is not a design or technical specification<sup>2</sup>.

This guide will be posted on the Con Edison DG website and updated annually or as needed. In addition, Con Edison will post a redacted report on the [Con Edison DG website](#) in July and January of each year on compliance with the timelines outlined in this document.

## What Is Cogeneration?

Cogeneration, or Combined Heat and Power (CHP), is a system that uses the waste heat output from a typical electric generator, such as using the waste heat to supplement heat or hot water. Systems range in size from smaller (1-10 kW) to larger (up to 20 MW). This guide covers the complex interconnection processes associated with larger CHP projects above 5 MW.



<sup>1</sup> This guide does not apply to generating equipment that will never operate in parallel with the Con Edison distribution system, such as most generators used solely for emergency service, nor does it apply to Distributed Generation up to 5 MW. For these, please refer to the [New York State Standardized Interconnection Requirements \(SIR\)](#) and the [Con Edison Distributed Generation website](#).

<sup>2</sup> For detailed technical requirements, please see [EO-2115 Handbook of General Requirements for Electrical Service to Dispersed Generation Customers](#), the Con Edison DG website, [conEd.com/dg](#), and the [PSC's DG website](#).

## **Technical Support**

Con Edison recommends Customers work with a Professional Engineer (PE) who is both licensed by New York State and experienced in CHP systems to evaluate their property and choose or design an appropriate system. Projects greater than 5 MW require a PE of record. A PE can also help guide Customers through the interconnection process and help secure project permits from the agencies involved.

## **Key Scheduling Considerations**

The Company's experience has been that the process of installation for large DGs is complex and must be carefully planned. Each project poses its own unique set of challenges. A large DG project typically takes one to three years to progress from initial concept through commissioning, depending on the engineering expertise and the complexity of the Customer's design. Early project submission to the Company and close coordination are critical to meeting the Customer's expected service date. There are several scheduling considerations beyond design review timelines that Customers should factor in to their project timelines. The City of New York places an embargo on non-emergency street excavations during the winter holiday period to minimize traffic disruptions. For DG installations on a new service feeder outages will need to be scheduled. The Company does not typically perform non-emergency work on primary feeders between May 15 and September 15, which is an important consideration if DG will be installed on a new service. Customer property-line manholes need to be completed before the ducts can be built for the extension of primary feeders to the Customer. The Customer must plan to ensure completion of construction of property-line manholes in time to allow Company to build the necessary ducts before the embargo periods.

In addition to these calendar limitations on street construction, the Company must provide safe and adequate service to all of its Customers. Occasionally, weather events must necessarily limit the Company's ability to address Customer-specific projects, like a DG installation.

For any concerns about how your job is being handled—including missed timeframes—please call the DG Ombudsperson (contact info on p. 19) or use 'escalation process' detailed at: [conEd.com/es/Escalation\\_Process\\_for\\_Energy\\_Services.pdf](http://conEd.com/es/Escalation_Process_for_Energy_Services.pdf).

## **Electric, Gas, and Steam Rate Considerations**

Customers are responsible for researching the rate impacts of the DG gas, electric, and steam tariffs. Please refer to the more detailed section on rates at the end of this guide (p. 17).

## **Gas Considerations**

Customers must submit a gas inquiry to their gas supplier (Con Edison or National Grid) to determine if their current gas service is sufficient to supply any proposed additional gas load, and whether there will be costs associated with any required upgrades. Con Edison's low-pressure gas system supplies a minimum pressure of 4 inches water column and a maximum pressure of 12 inches water column; its high pressure gas system supplies a minimum pressure of 15 psi. Generally the low-pressure gas system is more widely distributed<sup>3</sup>; however, the proximity of low- or high-pressure gas can be discussed during the Exploratory Meeting, as discussed below. The Con Edison Gas Operation Standard (G-2040-9) laying out the

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<sup>3</sup> Con Edison gas engineering shows locations where gas expansions are planned at: [conEd.com/gasconversions/area-growth.asp](http://conEd.com/gasconversions/area-growth.asp)

requirements for the installation of gas boosters, microturbines, and other protective devices should also be reviewed by the Customer<sup>4</sup>.

### **Other Approvals**

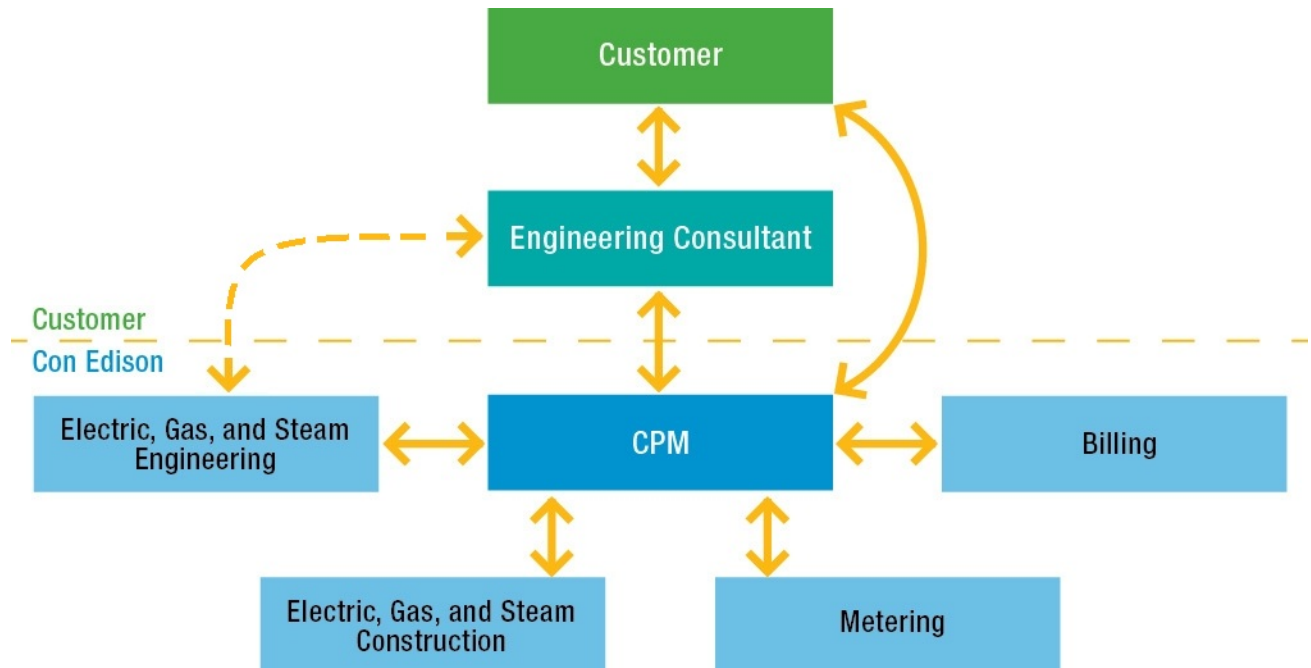
New York City Department of Buildings (DOB) approval for the internal gas piping is required before Con Edison (or National Grid) can turn on the gas supply. Con Edison advises discussion with the DOB, or the appropriate municipality, at the earliest possible stages of planning to avoid delays. The DOB approval process can be complex and time-consuming. Air permits may also be required through New York City's Department of Environmental Protection (DEP) or through New York State's Department of Environmental Conservation (DEC). Review and approval by the Electric Advisory Review Board may also be required for non-standard electrical interconnections. Depending on the scope of work Con Edison or the Customer may be responsible for obtaining Department of Transportation (DOT) permits.

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<sup>4</sup> <http://coned.com/es/specs/gas/G-2040-9.pdf>

## Project Communication Hierarchy

DG installation requires involvement from various departments of Con Edison. Con Edison will appoint an Energy Services CPM to act as a single point of contact liaison throughout your project. CPM contact information is available at [conEd.com/es/contact\\_us.asp](http://conEd.com/es/contact_us.asp). Con Edison emphasizes the importance of the Customer's consistent coordination with the CPM. Con Edison will communicate directly with the Customer, and not just the designated consulting engineer.



**Electric, Gas, and Steam Engineering** will determine if the Customer's current service is adequate for the proposed DG installation. If additional equipment upgrades are required, Engineering will:

1. Determine what system-impact studies need to be performed and estimate the costs associated with any necessary corrective actions that need to be made to the Con Edison distribution system to ensure safety and reliability.
2. Develop the design requirements and cost estimates for any needed upgrades to the Con Edison system.

**Electric, Gas, and/or Steam Construction** will specify, and in some cases install, Con Edison-owned ducts, vaults, and any needed electric, gas, and steam line extensions.

**Electric and Gas Metering and Steam Engineering** will determine any needed upgrades to the existing metering, and costs associated with such upgrades.

**Billing/Customer Operations and Steam Business Development** will determine applicable rates, and process gas, electric, and steam bills.

## Electric, Gas, and Steam Interconnection Process Details

### Design Review

#### Exploratory Meeting

The Customer or Customer's authorized representative can start the process by emailing [DGExpert@coned.com](mailto:DGExpert@coned.com), or if familiar with our requirements, submit an application electronically through Project Center ([conEd.com/es](http://conEd.com/es)).

The Customer's Customer Project Manager (CPM) will arrange the Exploratory Meeting to discuss—generally—the scope of the project, schedule, rates, and billing. The interconnection and gas construction processes will be reviewed, including common concerns, potential scheduling issues, and likely costs. For a more in-depth understanding of the process the Customer/contractor should bring a draft project schedule, expected gas load, expected generator size, type, and operating mode. Con Edison will provide and review the Customer's existing service connection and discuss generator options. Con Edison will provide the Customer with the Con Edison engineering specifications appropriate to the CHP job following this meeting.

**Gas:** If Con Edison is the Customer's gas supplier and additional gas service is needed for your DG project, Con Edison's gas department will generate a preliminary **order-of-magnitude** cost calculation **within 15 business days** after receiving a completed Gas Load Letter. The Gas Load Letter must include the detail of connected gas load, a plot plan, and the requested point of entry (POE) for the new gas service. The preliminary order-of-magnitude will include an estimate of any required reinforcement and/or extension, the gas operating pressure that will be supplying the new service, and Customer costs and payment options.

**Steam:** If applicable, the Company will review the steam distribution system map and determine if an extension or reinforcement of the Company's main is required to serve the Customer's premises.

#### Formal Application

The Customer will submit formal Electric Interconnection and Gas Load Letter applications to Con Edison, either electronically (preferred) through the Project Center portal on the Con Edison website ([conEd.com/es](http://conEd.com/es)) or by hard copy. Customers will be notified of whether the application is complete or if additional information is needed within **20 business days of receipt**. For steam service application, load letter, and POE requirements please go to the Steam website: [conEd.com/steam/steam\\_service.asp](http://conEd.com/steam/steam_service.asp).

A complete DG application includes the following:

- *Authorization Letter\**—authorizing contractor to represent Customer for purposes of the interconnection.
- *Description of Operation*
- *Equipment Detail Application Form\**
- *Addendum to Application for Service* – to determine Customer's DG electric rate
- *Rider H Gas Application, Gas Load Letter\*, and Gas POE (if applicable)*
- *Steam Application and Load Letter (if applicable)*



- *One Line Diagram\**—electrical interconnection detail (conceptual ok for initial review)
- *Equipment Manufacturer Data Sheets*
- *Planned DG Operating Mode\**
- *Equipment and Commissioning Test Procedures*
- *Application Fee\** (\$100 + \$2/kW based on Aggregated Generator Nameplate kW)
- *Project Schedule* (including dates for the milestones listed in the typical schedule on page 14)

All of the above (except the application fee) can be filled out or uploaded electronically, however, initial discussions regarding the project can proceed upon receipt of the asterisked items above with a conceptual one-line diagram.

**The One-Line Diagram will be revised throughout the process as project design detail is developed.** The drawing(s) shall show existing and proposed facilities at the Customer's location. This will include the Con Edison service details. For the initial submittals a distinction shall be made between existing facilities, modifications to existing facilities and new equipment. The finalized drawing(s) shall show at a minimum, the items indicated below, and all submittals should be stamped by the customers' PE of record. A separate one-line diagram is required for each location. "Typical" drawings or manufacturers' catalog cuts are not acceptable for a one-line diagram. Drawing content on the initial submittal should include as much of the following information as possible, and all buses, cables, breakers, fuses, transformers, etc. must be uniquely identified and show equipment ratings for:

Generator nameplate data including:

- Capacity
- Voltage
- Power factor
- Type (synchronous, induction)
- Manufacturer
- Winding connection (Delta, Wye)
- Grounding equipment ratings
- Subtransient reactance

Bus Work

- Voltage
- Ampacity
- Manufacturer/model

Circuit Breakers

- Continuous current ratings
- Short circuit interrupting ratings
- Close and latch current ratings
- Manufacturer/model

Fuses

- Current ratings
- Manufacturer/model
- Indicate if current limiting

Disconnect/Ground Switches

- Current ratings
- Indicate if lockable
- Manufacturer/model

Transformer nameplate data including:

- Capacity ratings
- Cooling/temperature ratings
- Voltage ratings
- Voltage taps
- Impedance
- BIL
- Winding connection
- Grounding facilities and rating

Protective Relaying & Metering

- ANSI relay designation
- Current transformer and protection transformer ratios and accuracy class
- Relay breaker tripping
- Relay function description
- Relay manufacturer & model
- Relay set points

Generator Leads

- Impedance
- Type and number of circuits

### **Electric Engineering Study Requirements**

**Within 30 business days after the complete DG application** is submitted, the Con Edison CPM will inform the Customer whether the proposed interconnection is viable. If viable, Con Edison will provide a list of **engineering studies** that customer must perform to assess technical impacts of the interconnection.

The engineering studies determine how the Customer's project will impact the Con Edison system, detailing, for example, relay coordination, fault current contribution, voltage regulation, and potentially others depending on site specific interconnection. The studies will also propose corrective actions. The Customer is responsible for all costs associated with these studies. Con Edison will perform any necessary load flow studies. Con Edison will review and respond **within 60** days of receipt of the Customer's PE-stamped engineering studies detailing:

1. Utility system impacts
2. Notification of whether the proposed system meets utility system requirements, and
3. If applicable, a description of where the proposed system is not in compliance with these requirements
4. A good faith, detailed estimate of the total cost of the interconnection of the proposed system, administration, design review, metering, and on-site verification testing

### **Steam Engineering Study Requirements**

Con Edison's Steam Business Unit will inform the Customer of steam interconnection requirements **within 30 days** after receipt of PE-stamped detailed Load Letter and POE form (for new steam service requests). The load letter must provide a detailed breakdown of the winter and summer steam load requirements for the building as it relates to the installation of the steam generating equipment. The load letter should clearly show a breakdown of the peak winter and summer steam load requirements for the building when the Customer's DG is in service and not in service. All uses (heat, domestic hot water, air conditioning, etc.) for the hot water and/or steam produced by the Customer's DG must be clearly defined in the load letter. The steam equivalent in pounds per hour for the hot water load of the Customer's DG must be submitted. The load letter must include the planned operating hours of the Customer's DG.

- The Company shall review the steam distribution system map and determine if an extension or reinforcement of the Company's main is required to serve the Customer's premises. The Company will notify the Customer if a Rider A (Prepayment for Extension or Reinforcement of Mains) payment is required. If the payment is required, it must be paid before the Company begins any work.
- The Company shall also determine the estimated cost for furnishing, installing and connecting a new steam service line and the furnishing of Company owned and maintained metering equipment. If the estimated cost exceeds an amount equal to two-years of estimated revenue from the Customer, the Customer must pay the Rider B (Prepayment for Installation of Service Line and Furnishing of Service Equipment) payment before the Company begins any work.

### **Gas Construction Cost**

Con Edison will provide a detailed gas construction cost **within 20 business** days of the final Gas Load Letter submission. If the proposed DG project requires new or additional gas supply, and if the Customer agrees to pay these detailed costs, Con Edison **reserves the gas capacity for the Customer for six months**. After six months, if there is no documented commitment from the Customer including payments for any associated costs, Gas Engineering may re-

evaluate this detailed cost and re-evaluate the current gas capacity in lieu of previously reserved gas capacity. If high-pressure gas is being supplied, the permitting process may be more complex. The Customer is strongly advised to submit an application for a gas permit to the DOB or appropriate municipal authority early in the interconnection process.

**Gas:** The Customer will provide any design documentation Con Edison requires for the gas construction work behind their property line 20 days prior to detail design and construction.

The CPM will provide written information regarding all metering equipment, regulatory requirements and all applicable design specifications.

**Steam:** All of the following Company requirements, as defined in Specification S-11965<sup>5</sup>, shall be satisfied before a steam interconnection is permitted:

1. The PE-stamped load letter is submitted to the Company
2. The Customer drawings, design and shop, must be reviewed and accepted by Steam Distribution Engineering (SDE). The design drawings must include piping schematics for all piping to/from the CHP/steam generating equipment (i.e., hot water supply/return piping system and steam piping system). The drawings must clearly show how the CHP/steam generating equipment interconnects with the steam piping system supplied by the Company. Schedules and equipment specifications for all CHP/steam generating equipment (steam generators, heat exchangers, pumps, pressure reducing valves, condensate return system, etc.) must also be submitted to the Company for review.
3. A stress analysis must be reviewed and accepted by SDE.
4. If no street service valve exists, one shall be installed by the Company at the Customer's expense. The street service valve shall be installed prior to the time steam service is required by the Customer.
5. The steam meter station must be constructed or modified in accordance to current Company specifications.
6. The Customer's steam plant design and installation must have the necessary protection and design features to prevent:
  - Over-pressurization (operating at steam pressures that exceed the 200 psi) of the 200-psi steam piping system
  - Over-pressurization (operating at steam pressures that exceed the design pressure of the Customer's steam generating equipment) of the Customer's steam generating equipment and associated steam piping system
  - Backflowing steam that is generated by the Customer's plant through the steam meter station and into Con Edison street steam distribution system.
7. The proper DOB Certificate of Inspection (TR1 Technical Report) must be received by the Company.
8. **For new Customers.** A signed Application for Steam Service must be received by the Company.

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<sup>5</sup>Steam Specifications are at: [conEd.com/steam/engspecs.asp](http://conEd.com/steam/engspecs.asp).

## **Electric Interconnection Agreement, Engineering Specifications, and Payment**

When the Customer is ready to begin construction, the Company will develop project specific Engineering Specifications based upon EO-2115, EO-2022, EO-4133, and potentially others will draft an Interconnection Agreement, with all specifications as attachments, which will be signed by both parties. The Engineering Specifications and Interconnection Agreement address issues such as scope, operation and maintenance of the unit, disconnection of the unit (including emergency and non-emergency disconnection), access, dispute resolution, and liability. The Customer must submit a final set of design drawings, specifications, and descriptions of all protection devices and auxiliary equipment to be installed.

Con Edison will give the Customer a draft Interconnection Agreement **within 60 days** of Company's receipt of a complete interconnection application. The Interconnection Agreement must be finalized before a DG installation may be interconnected with the Con Edison electric distribution system.

## **Project Review**

### **Payment Agreements**

**Electric:** The Customer will pay Con Edison for the estimated interconnection costs. Payment is placed into an escrow account. Costs will be reconciled at the end of the project.

**Gas:** Con Edison gas Customers requiring upgrades must select a payment method (lump sum or monthly surcharge), sign a Payment Agreement with Con Edison, and, if the payment method selected was a lump-sum payment, provide Con Edison with an advance payment for Con Edison's estimated costs. Once the Payment Agreement is signed and when the lump sum payment is received in the cases when the payment method selected was a lump-sum payment in lieu of a monthly surcharge, the Customer will install a gas sleeve at the point of entry (POE). Con Edison will inspect the POE, and once DOB or Westchester EQ issue the Blue Card, Con Edison will order gas meters, construct the gas line to the head-of-service (HOS) valve and order regulators. If the application for the DOB (or relevant municipal authority) permit has not yet been submitted, the Customer is advised to apply for the permit at this time to avoid potentially significant delays.

**Steam:** The Customer shall pay to the Company any applicable charges, fees and payments required for interconnection.

### **Project Construction – Electric Design Reviews**

The Customer will be required to develop the design to meet the Company's interconnection requirements as identified by the preliminary One-Line, the site-specific design specification and associated Company's general DG interconnection specification EO-2115. The Customer must submit the design documents when the design is approximately 30% complete and again when the design is approximately 60% complete. Experience has shown that such periodic review ensures that the Customer is incorporating the necessary requirements and greatly reduces the need for changes and the consequential delays in the project.

The first full design submittal for review is at approximately 30% completion of the design. At this stage Con Edison expects to see the general equipment layout. At the end of this review construction of switchgear equipment, ducts and associated work will typically proceed, and major items such as generation equipment, gas boosters, and transformers are ordered. This submittal shall, at a minimum, include the following drawings:

- One-line diagram with latest revision
- A short circuit study (see EO-2115 for study detail requirements)
- AC three-line diagram
- Floor plan (including room layouts)
- Grounding plan
- Switchgear arrangements (both service and utilization voltage)
- Transformer design
- AC and DC circuit breaker control schematics (both service and utilization voltage)
- DC control battery one-line diagram detailing the battery and charger types, distribution panels, transfer switches, relaying and alarms, and associated calculations
- Emergency generator details and arrangements (if applicable)

The Company shall issue comments subsequent to this review. The Customer should meet with the Company to discuss the design. The Customer will be expected to address the comments issued by modifying these drawings as appropriate and re-submitting revised drawings for Company review and acceptance.

The second design submittal, at approximately 60% completion will add detail to the items submitted in the 30% review. At this stage we expect to see protection calculations, vendor drawings of major equipment already ordered (but not yet delivered), cable terminations etc. This submittal will include the following:

- Bill of materials—including all generation equipment, relays, voltage and current transformers (showing ratios and connections), fuses, and interrupting and grounding devices
- A relay coordination study and proposed protective relay settings – detail of study requirements and settings format can be found in EO-2115.
- Termination compartment equipment showing the arrangement of the cable terminations, neon indicators and ground studs
- Metering compartment equipment showing the physical layout and clearances, barriers, and phasing facilities
- Bus, cables and terminations (manufacturer's specifications)
- Ground and test devices or ground switches—manufacturer, detailed description of operation, equipment drawings, specifications, and interlocks
- Vendor drawings and specifications
- Emergency generator—interlocking procedures, load to be supplied, and testing schedule

The Customer shall subsequently submit the manufacturer's design drawings for the following equipment:

- Generation and auxiliaries equipment
- High tension switchgear (both service and utilization voltage)
- Ground and test device arrangement drawings
- Service/isolation transformer nameplate and arrangement drawings
- Remote control monitoring panel drawings
- The Customer's bill of materials

The Customer must also prepare and submit for Company review:

- Coordination study
- Description of Operation
- Stability Studies
- Voltage Regulation Studies
- Grounding Study

## **Electric Testing and Inspections**

Prior to final inspection and testing, the Customer shall submit final design documents for review.

These include:

- Signed copies of site-specific service and O&M specs and interconnection agreement
- Generator startup and test procedures
- Equipment test reports
- Certified protective relay test reports
- Relay settings test sheets
- Confirmation of DOB sign off

Pre-Operational Testing [4-8 weeks] — This includes such activities as relay testing, switchgear inspection and operational tests, cable tests, completing meter installations, interlocks, etc. The Customer will prepare a step-by-step testing procedure to be submitted to the Company for review. It is recommended that all job-specific documentation be completed prior to scheduling the witness test.

Feeder Energization & Customer Documentation — Prior to energization the Customer shall resubmit to Energy Services their final submittal package, corrected and marked final and stamped by the PE of record for Company record. Con Edison will prepare a job-specific checklist of documentation that will be needed.

Outage Scheduling [1 week per feeder] — Once all testing is completed and the required documentation is in place, the CPM will schedule the outages and initiate the splicing of the Customer's cable to Company cable in the Customer property-line manhole. As noted above, this is not typically done during the summer (May 15 to September 15) as this is the period of peak electricity demand. The project schedule should ensure that this point is arrived at outside these months.

## **Gas and Steam Testing**

**Gas:** Before permitting gas interconnection from Con Edison for those projects where Con Edison has upgraded the gas service, the CPM will witness an integrity test on the additional gas piping. The integrity test consists of a series of pressure tests along different sections of the line. The CPM will ensure that the contractor has complied with the requirements of the local authority having jurisdiction and Con Edison's specifications related to integrity tests. The Customer must arrange for testing per the DOB or relevant municipal authority and issue a Blue Card or affidavit for work prior to the CPM releasing the meter installation change request. The

Customer may elect to be placed on the Rider H gas rate once gas service is in place.

**NOTE: NYC Department of Buildings (or relevant municipal authority) approval is required before the gas can be turned on.**

**Steam:** The Customer must install a control system that is designed to prevent the steam produced by Customer's steam generating equipment from back flowing through the steam meter station and into Con Edison's street steam distribution system. Con Edison shall witness the testing of the backflow prevention control system. Completed municipality inspection (TR1 in New York City) and all protection and design features of the backflow prevention system must be demonstrated to function as designed before Con Edison shall permit steam interconnection.

### **DG Verification Test**

Typically a Customer completes a High Tension service interconnection prior to completing a DG installation. Once the DG installation is complete and all gas requirements have been met, the Customer's pre-synchronization "Testing Period" can take as long as the Customer requires. Prior to any parallel operation with Con Edison the Customer must provide documentation of protective device testing including certified relay test reports. Customer will then schedule a Con Edison will witness verification test within **two weeks** of Customer request. Witness testing will include trip checks, synchronization checks, point-to-point telemetry data checks, and any other commissioning testing required prior to permanent parallel operation as detailed in EO-2115.

### **Final Acceptance, Cost Reconciliation, and DG Rates**

Con Edison will review results of the verification test and issue a formal letter of acceptance for interconnection within 10 business days of a complete verification test. The CPM will place the Customer accounts on the applicable gas, electric, and steam rates.

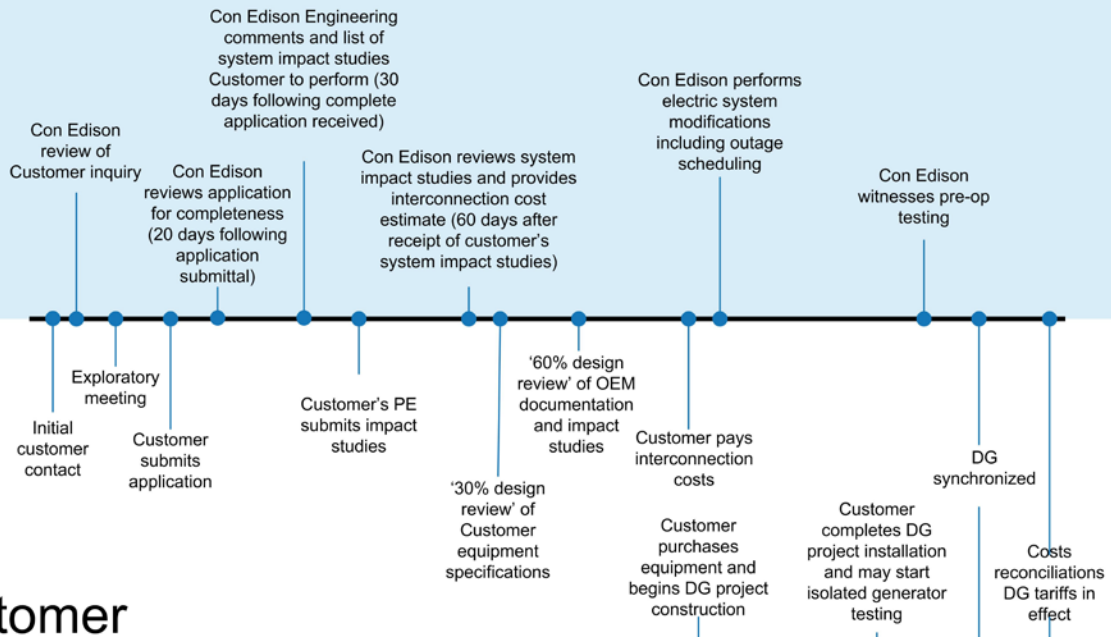
- The Customer will be permitted 60 days for testing prior to being placed on the electric standby rate.
- The steam standby rate goes into effect upon completion of the NYC DOB TR1 Technical Report.
- The Rider H gas rate can be in effect upon receipt of a Gas Card (i.e. Blue Card) or equivalent for Westchester.

The Customer will receive either a bill for the balance due or reimbursement for the difference between its application fee and advance payments and actual interconnection costs.

### **Final Meeting**

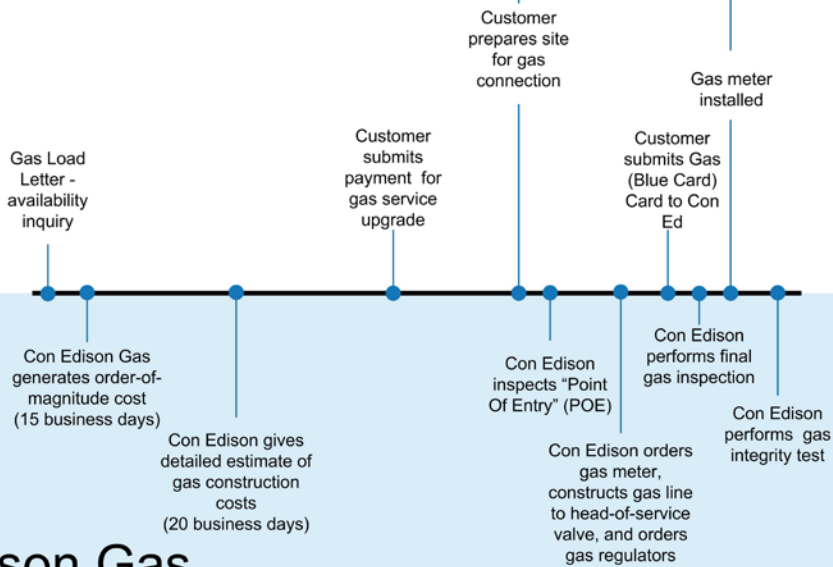
The CPM will schedule a meeting to discuss any outstanding issues and to review any changes to the gas, electric, and steam bills.

## Con Edison Electric



## Customer

### Project Installation Sequence



## Con Edison Gas

**Please Note:**

If National Grid is the gas utility in your area contact National Grid at [www2.nationalgridus.com/partners/architects/gas\\_ny\\_kedny.jsp](http://www2.nationalgridus.com/partners/architects/gas_ny_kedny.jsp)

**Note:** This diagram illustrates the sequence of steps for completion of a DG project. This sequence does not include obtaining funding or permits or parts of the process associated with other agencies (e.g. NYC DOB). Project duration will vary according to its complexity and other factors.



## Common Concerns, Scheduling, and Cost Considerations

Based on the Company's experience with large DGs, Customers have not always thoroughly planned for the following necessary elements of DG installation:

- **Outage and Embargo Scheduling:** Scheduling of Con Edison feeder outages and NYC-imposed street work embargoes may delay and add costs to DG projects. Close coordination with Con Edison and relevant NYC agencies will help mitigate these delays.
- **Gas Availability:** Customers should contact their local gas supplier (e.g., Con Edison or National Grid) to determine the availability of gas lines *before* beginning a DG project. If the site has insufficient gas availability, the proposed DG project could require redesign or incur significant costs and/or delays.
- **Gas Pressure:** If the proposed DG equipment uses elevated gas pressure, additional NYC DOB and FDNY permits might be necessary. These permit applications may be complex and time-consuming, so the Customer should begin the application process as early as possible.
- **Customer Cost Responsibility:** The Customer will bear any costs directly incurred as a result of interconnection. These interconnection costs include, but are not limited to, engineering studies, purchase and installation of electric protection devices for Company system protection (such as direct transfer trip, anti-islanding devices, telemetry, fault current limitation devices, etc.), metering, and any safety provisions. Costs for studies and equipment will vary significantly depending on Customer mode of connection, generator size, operating modes and type. For example, the direct transfer trip will generally cost upwards of one million dollars, anti-islanding equipment approximately fifteen thousand dollars, and fault current mitigation equipment will cost approximately two hundred thousand dollars for DG connected to a 4kV bus. Con Edison continues to explore smart grid options for protection and monitoring.
- **O&M:** The Customer is responsible for a monthly 12.1<sup>6</sup>% O&M charge for Con Edison's operation, maintenance and tax obligations on equipment installed on its system to accommodate the DG.
- **Fault Current Limitations:** In certain areas, DG may contribute fault current that will require additional protective devices to preserve the safety and reliability of the Con Edison system. These devices may increase the project's engineering complexity and cost. Fault current limitations will be determined and remedies outlined during the engineering studies' review.
- **Rates and Billing Changes:** Customers must be aware of the terms of the relevant tariff (billing) options and may wish to design systems to take advantage of various billing options, which are outlined below. The CPM will set up meetings with relevant billing specialists early in the process.
- **Interconnection Agreement:** Before any DG project greater than 5 MW can operate, the Customer (not the contractor or installer) must sign a formal Interconnection Agreement with Con Edison. Project specific design and operating specifications will be attached to the Interconnection Agreement.

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<sup>6</sup> Tariff-based and subject to change.

- **Selection of Contract Demand:** The electric standby rate includes a monthly charge, called “Contract Demand,” that should be very carefully selected. If the Contract Demand level selected is too low, there can be significant surcharges.
- **NYC Department of Buildings (NYC DOB):** The Customer should seek approval from the DOB early in the process, as **neither Con Edison nor any other gas utility will turn on the gas without DOB approval, or of the equivalent municipal authority in Westchester.** For additional information please refer to the [DOB CHP Handbook](#).
- **High Tension Service:** Larger Customers—generally with loads greater than 5 MW—may be installing new high tension services at the same time they are adding DG. For an understanding of the engineering, timing, and scheduling of high tension installations, please see the Company’s [High Tension Guide](#). It will likely be necessary to coordinate the two efforts. This additional work will likely add to the project timeline.
- **Steam:** The steam interconnection process can be costly and complex, so it should be addressed early in the project.
- **Type of Service:**

<b>Generator Type</b> <b>Customer Connection Type</b>	<b>Synchronous</b>	<b>Induction</b> <small>(without separate excitation source)</small>	<b>Inverter based</b>
<b>Secondary Voltage, non-network, Radial</b>	Standby & Standby/Stand-Alone	Standby	Standby & Standby/Stand-Alone
<b>Network: Secondary Voltage</b>	Not Available	Standby	Standby & Standby/Stand-Alone
<b>Spot Network</b>	Standby & Standby/Stand-Alone	Standby	Standby & Standby/Stand-Alone
<b>High Tension Primary 4kV-33kV</b>	Standby & Standby/Stand-Alone & Buy Back	Standby & Buy Back	Standby & Standby/Stand-Alone & Buy Back

**Standby:** The Customer supplies some, or all, of their own electric load in parallel with the electric system.

**Standby & Stand-Alone:** The Customer normally operates in Standby mode and is also able to self-supply upon the loss of the utility’s supply.

**Buy-Back:** Customer sells power to the utility at the market wholesale rate.

## Rates<sup>7</sup>

DG Customers may be subject to rates, which are explained generally below. Some of these rates depend upon Customer classification (residential or commercial) and the type and intended operation of the equipment being installed.

Before beginning installation, Customers should thoroughly review the details of rate alternatives set forth in the tariffs. In addition, after receiving initial bills, Customers should schedule a meeting with Con Edison to discuss them.

## Electric

**Standby Service General Rule 20:** Standby delivery service must be taken by large interconnected DG Customers to supplement the energy generated by a generating facility on Customer premises. Con Edison ensures the appropriate infrastructure is in place to meet the Customer's maximum connected load whether or not the generator is operating. Contract demand charges cover the cost of the equipment that is in place to provide standby service to the Customer, and the daily as-used demand charges recover the costs of the upstream delivery system based on the Customer's actual usage. *Please note that there can be substantial surcharges if the Customer sets the contract demand level inaccurately.* Other charges include daily as-used demand charges, Customer and metering charges, and associated Monthly Adjustment Clauses (MACs). There is an O&M charge for additional equipment installed on the Con Edison system to accommodate the generator.

**Offset/Campus Standby Tariff General Rule 20.2.1(B)(7) & (8):** Standby service is available to Customers who choose to export generation to the Company's High Tension service in order to supply the same Customer's existing services within the Customer's premises. Each importing service will be assigned a contract demand and each will be allocated a proportional amount of the generator's output to determine the as-used daily demand. As with other Standby Customers, Customer, metering, associated MACs, and O&M charges will apply. Customers on this tariff may not be able to operate in Stand Alone mode.

**Buy-Back Service—SC-11:** A Customer that would like to sell energy to Con Edison may take service under SC-11, Buy-Back Service. The payment rate for energy will be based on the applicable wholesale rate, which is based on the Locational Based Marginal Price (LBMP) set by the New York Independent System Operator (NYISO). Customers delivering energy at the secondary distribution level will have the LBMP increased by a factor of adjustment of 1.066 to account for avoided line losses. Under this service agreement, the Customer will pay a Customer charge and a contract demand charge based on the facilities in place to deliver energy.

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<sup>7</sup>Rates are subject to change— please see [conEd.com/rates](http://conEd.com/rates) for the latest.

## Gas

**Rider H—Non-Residential DG Gas Rate:** Non-residential DG Customers have the option to utilize Rider H gas rates. To be eligible for Rider H, a Customer must maintain a 50 percent annual load factor, which means that usage must be greater than or equal to half of the maximum winter period gas load. A separate meter is required to meter and bill this service. Only electricity-producing DG equipment may be placed on the Rider H meter.

## Steam

**Back-Up/Supplementary Service—SC-4:** Steam standby service is supplied to Customers that use steam from the Con Edison steam system for any purpose and employ another energy source for the same purpose between the months of November and April. The Customer will be subject to several charges, including Customer charge, usage charge, contract demand charge, interconnection charge, and all other charges described in the general information sections of the steam tariff. The contract demand charge is based on the maximum potential demand between the months of November and April that is specified in the Customer's request for service. The specific rates vary by the Service Classification (Rate I or II of SC Nos. 2 or 3) the Customer would otherwise be billed under. Please refer to "Service Classification No. 4 Back-up/Supplementary Service" of PSC No. 4.

**Rider A- Prepayment for Steam Main Extension or Reinforcement:** Customer will pay for any steam main extension when the two-years' estimated revenue from the Customer connected to a new main is insufficient to justify the expenditure. During the first 10 years starting from the date when service is first supplied, the prepayment will be repaid to the Customer.

**Rider B- Prepayment for Steam Service Line and Service Equipment:** Customer will pay for any steam main extension when the two-years' estimated revenue from the Customer connected to a new main is insufficient to justify the expenditure. During the first 10 years starting from the date when service is first supplied, the prepayment will be repaid to the Customer.

## **Contacts for Questions and Concerns**

Always call your CPM first. To escalate a concern about a job, please contact the DG Ombudsperson by emailing [DGExpert@coned.com](mailto:DGExpert@coned.com), or follow the Energy Services Escalation Process at: [conEd.com/es/Escalation\\_Process\\_for\\_Energy\\_Services.pdf](http://conEd.com/es/Escalation_Process_for_Energy_Services.pdf). This link can also be found on the Con Edison Energy Service website [conEd.com/es](http://conEd.com/es).

## **Additional resources**

- General specification for High Tension Service EO-2022: [conEd.com/dg/specs\\_tariffs/EO-2022.pdf](http://conEd.com/dg/specs_tariffs/EO-2022.pdf)
- Technical DG Interconnection Specification EO-2115: [conEd.com/dg/specs\\_tariffs/EO-2115.pdf](http://conEd.com/dg/specs_tariffs/EO-2115.pdf)
- Con Edison Distributed Generation Website: [conEd.com/dg](http://conEd.com/dg)
- Department of Buildings CHP Handbook: [nyc.gov/html/dob/downloads/pdf/combined\\_heat\\_and\\_power\\_systems.pdf](http://nyc.gov/html/dob/downloads/pdf/combined_heat_and_power_systems.pdf)
- National Grid: [www2.nationalgridus.com](http://www2.nationalgridus.com)
- NYSERDA: [NYSERDA.ny.gov/All-Programs/Programs/Combined-Heat-and-Power-Program](http://NYSERDA.ny.gov/All-Programs/Programs/Combined-Heat-and-Power-Program)
- To learn more about demand response programs such as the Distribution Load Relief Program (DLRP) and the Commercial System Relief Program (CSR), visit [conEd.com/dr](http://conEd.com/dr)
- Con Edison High Tension Handbook: [conEd.com/dg/specs\\_tariffs/specsTariffs.asp](http://conEd.com/dg/specs_tariffs/specsTariffs.asp)