



Fuel Cell Guide

Version 5 / July 2022



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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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Consolidated Edison Company of New York: Guide to Fuel Cell Interconnection

Welcome

Congratulations on your decision to consider installing Distributed Energy Resources (DER) in Fuel Cell.

This guide is for Con Edison's customers who are either installing or upgrading Fuel Cell DER systems that are or will be connected to Con Edison's electric distribution system **and are primarily dedicated to supporting customer load**¹.

Interconnection of Distributed Energy Resource technology, such as Fuel Cell, less than 5 MW are subject to the New York State [Standardized Interconnection Requirements \(SIR\)](#). All developers and applicants should read the SIR as the SIR will take precedence. This document is aligned to the May 2022 version of the SIR, and later revisions of the SIR will be integrated as expediently as possible. Applicants will need to register with Power Clerk prior to application submission. Projects with interconnection requests less than or equal to 50kW-AC should be submitted through the [Small DG portal](#). The [Large DG portal](#) should be used for interconnection requests greater than 50kW-AC up to 5MW-AC. The SIR only applies for projects up to 5MW-AC. Projects above 5MW-AC are separate from the SIR and will still be processed through Power Clerk. For questions on projects above 5 MW, please contact dgexpert@coned.com.

This guide provides a high-level overview of the process, typical schedule, and challenges associated with electrical and gas connections for Fuel Cells. This guide is not a design or technical specification².

More information may be found at the links listed below:

- Con Edison Distributed Generation Website: [Using Private Generation Energy Sources | Con Edison](#)
- [Con Edison Gas Yellow Book](#)
- [Public Service Commission Standard Interconnection Requirements \(SIR\)](#):
- National Grid: www2.nationalgridus.com
- To learn more about demand response programs such as the Distribution Load Relief Program (DLRP) and the Critical Peak Rebate Program (CPRP), visit [Smart Usage Rewards | Con Edison](#)

What is a Fuel Cell?

A Fuel Cell is an electrochemical cell that generates electricity through an electrochemical reaction that occurs from the fuel provided to the cell.

¹ This guide does not apply to generating equipment that will never operate in parallel with the Con Edison distribution system.

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



Technical Support

Con Edison recommends customers hire a registered professional engineer who is both licensed by New York State and experienced in Fuel Cell systems to evaluate their property and choose or design an appropriate system. Projects greater than 5MW-AC require a professional engineer of record. A professional engineer can also help guide customers through the interconnection process and help secure project permits from the agencies involved.

Project Communication

Fuel Cell installation requires involvement from various groups within Con Edison. Con Edison will appoint an Energy Services Customer Project Manager (CPM) to act as a liaison and serve as a central point of contact throughout your project. CPM contact information will be provided once a project is submitted.

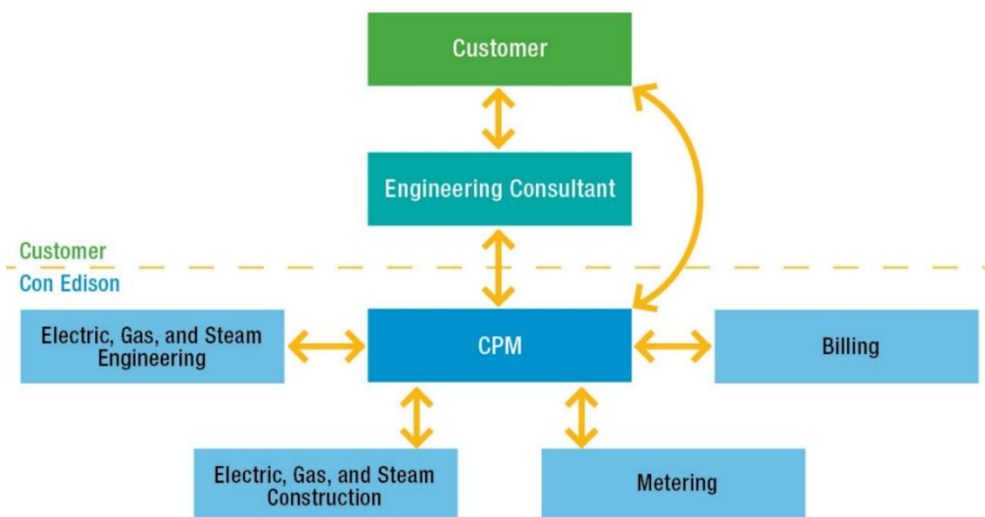


Figure 1. Project Communication Diagram

The Process

Electric and Gas Considerations

Interconnecting a Fuel Cell system may require modifications to the interconnecting customer's gas and/or electric service. Generally speaking, the gas service request should precede the DER interconnection request. Gas service to a Fuel Cell system often requires new gas mains or service laterals to be installed at the building – in many cases not at the same location as the existing electric or gas

service. In the event a Fuel Cell electric interconnection request is submitted prior to receiving a Con Edison ruling that adequate gas service exists or can be established at the premises, the interconnection request will be put on hold pending the final service determination of the gas service case.

Gas Considerations

For Fuel Cell systems with gas installation, before submitting a formal DER electrical interconnection application, customers should submit a gas inquiry to their gas supplier (Con Edison or National Grid). This determines if their current gas service is sufficient to supply the proposed additional load and if there will be costs associated with any required upgrades. Gas service requests are processed through the Company's Project Center portal. The [Con Edison Customer Guide to Natural Gas Service Installation](#) (a.k.a. the Yellow Book) and [Con Edison Gas Operation Standard G- 2040-9](#) outline the overall gas service process and requirements for the installation of gas boosters and other protective devices. These should be reviewed by the Customer prior to making your gas service request on Project Center. Other steps to be taken include reading Gas [Rider H](#) and [Rider J](#), which are the Commercial and Residential distributed generation tariffs, respectively, and registering with [Project Center](#). The Project Service is where gas service inquiries can be submitted.

Gas Construction and Payment

Con Edison will provide a detailed gas construction cost within 20 business days of Load Letter submission. If Con Edison is the gas supplier, and the proposed DER project requires new or additional gas supply, customers must select a payment method (lump sum or surcharge). Then sign a Payment Agreement with Con Edison. Once the Payment Agreement is signed, the customer will install a gas sleeve at the point of entry (POE). Con Edison will inspect the POE, order gas meters, construct the gas line to the head-of-service (HOS) valve, and order gas regulators. After payment, Con Edison reserves gas capacity for the customer for six months. After six months, if there is no commitment from the customer, Gas Engineering may re-evaluate this detailed cost.

NOTE: At this point the customer is strongly advised to submit an application for a Gas Permit to the NYC DOB (or appropriate municipal authority).

Approval

Approval is required before the gas can be turned on. Con Edison advises discussion with the New York City Department of Buildings (DOB), or the appropriate municipality, in the earliest stages possible to avoid delay. 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).

Applying for Gas Service

Gas service will be requested electronically through the [Project Center portal](#). Customers will be notified of application problems or omissions.

Taking the following steps prior to and during the application submission will help speed up the review:

- Include accurate account (14 digit) and meter (7 digit) numbers
- Include accurate customer email address
- Include the Con Edison service (electric and gas) information in all drawings
- Include additional existing on-site Distributed Energy Resources (DER) in the application to provide details in the scope of work and note other DER location on drawings

- Enter the rating per inverter and number of inverters
- Ensure consistency in all forms and documents

The gas service application will progress through the following high level process steps:



Figure 2. High Level Process of a Gas Service Request

A gas service request can be initially discussed with a Con Edison CPM through an exploratory meeting. Within 15 days of the exploratory meeting, an order of magnitude cost estimate will be provided, for customer decision making. When a gas service application is ready for formal submission, the following documents must be collected and attached to the application in the [Project Center](#):

- Detailed load letter
- Any applicable easements, rights-of-way, permits (excepting street permits), consents and certificates necessary to give the Company or its representatives access to the installation and equipment or to enable service pipe connection
- Any required service engineering diagrams

The gas process then follows the workflow depicted below:

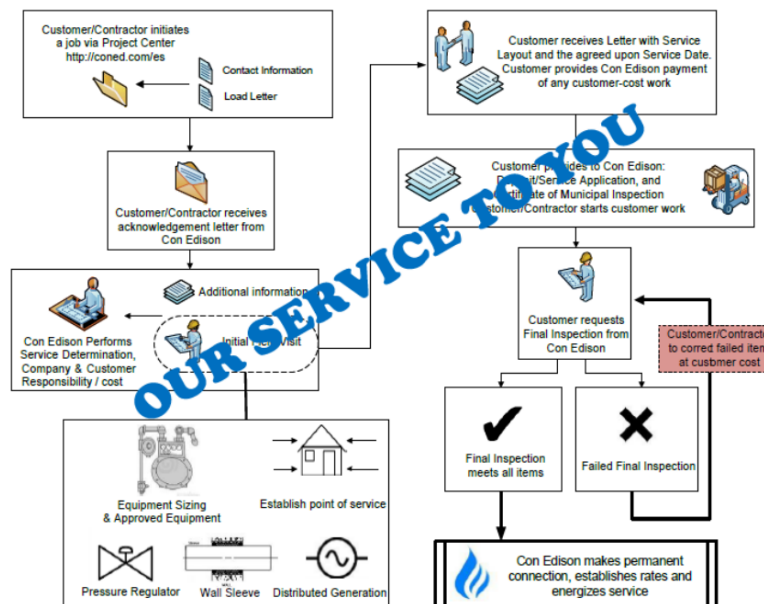


Figure 3. Gas Work Request Flow Process

Once the Service Determination is complete, a service date will be determined. CPMS will automatically calculate the estimated time required to provide service. Any jobs where service is adequate should typically take 60 calendar days or less. Jobs requiring construction should take no longer than 120 calendar days. This service date is highly dependent on the customer's readiness for service. If the customer's requested service date is prior to the CPMS estimated service date, the CPM will consult with the customer

and attempt to determine a mutually acceptable service date. If necessary and where appropriate, the CPM will consult with the appropriate Gas Operation Departments and coordinate to meet the customer's requested service date. If the customer's service date cannot be met, the customer and the Energy Services Manager will be notified and it will be determined if any required action is necessary. If the Company cannot meet the customer's date due to weather, emergency, construction dates, etc. the customer should be notified in writing and a new date should be negotiated with the customer. A letter or email to the customer must be attached to the case.

Gas Construction Timeline

1. Gas availability inquiry
2. Con Edison Gas generates order-of-magnitude cost (15 business days)
3. Customer submits gas load letter
4. Con Edison gives detailed estimate of gas construction costs (20 business days)
5. Customer submits payment for gas service upgrade
6. Customer prepares site for gas connection
7. Con Edison inspects "Point of Entry" (POE)
8. Con Edison orders gas meter, constructs gas line to head-of-service valve, and order gas regulators
9. Con Edison performs final gas inspection
10. Customer installs gas meter
11. Con Edison performs gas integrity test

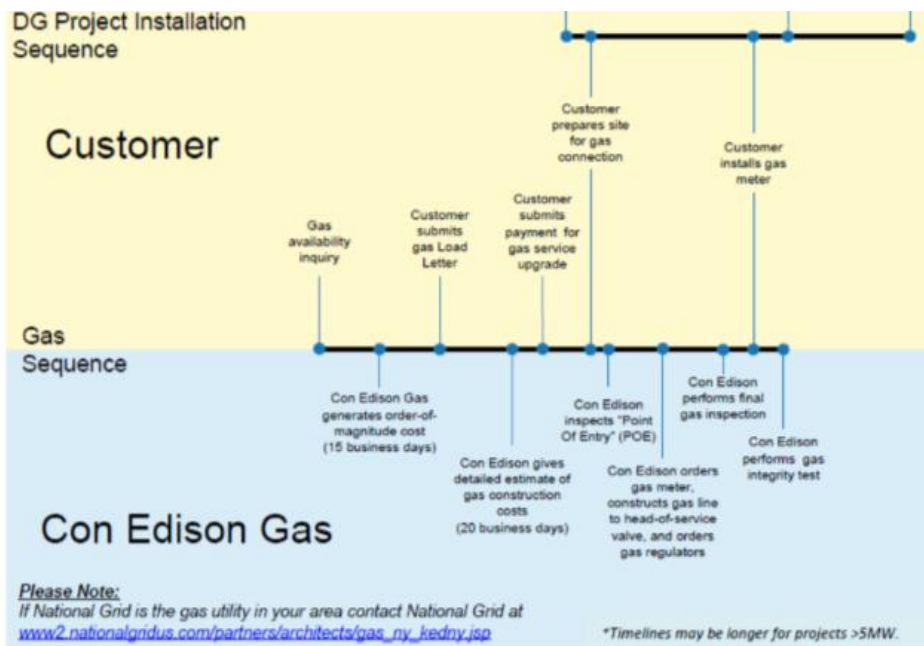
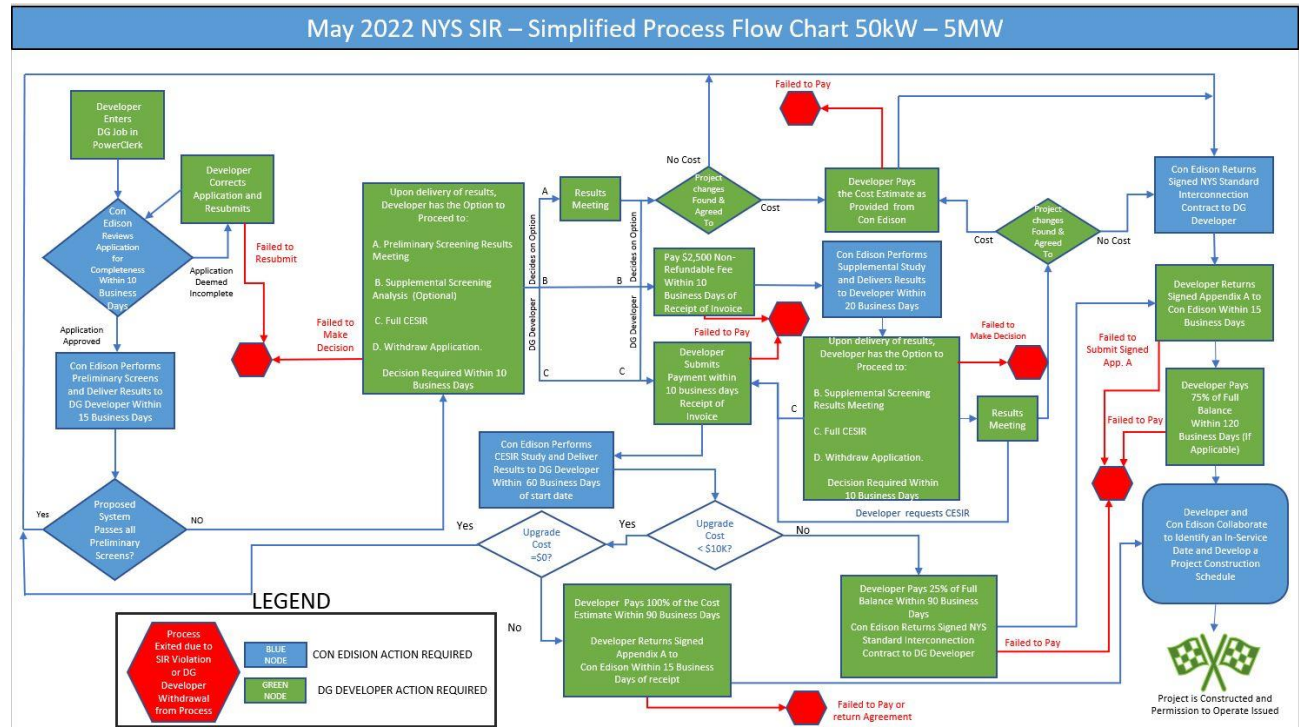


Figure 4. Gas Construction Timeline

To provide additional guidance in preparing for gas service inspections, Con Edison has prepared checklists for the interim and final inspections:

- [Interim Gas Inspection Checklist](#)
- [Final Gas Inspection Checklist](#)

Interconnection Process



1. Exploratory Meeting

The customer or contractor can start the process by emailing dgexpert@coned.com, or if familiar with our requirements, submit an application electronically through Power Clerk. The customer will be assigned a Customer Project Manager (CPM), who will set up a meeting to discuss the scope of the project, schedule, rate impacts, and billing. The interconnection and gas construction processes will be explained, including common concerns, potential scheduling issues, and potential costs. The customer or contractor must bring a high-level draft of the project schedule plus information about the expected gas load, expected generator size and type, voltage, and customer connection mode. Con Edison will supply appropriate documentation such as a process outline, standardized contract or site-specific Interconnection Agreement, technical requirements, and listings of qualified type-tested equipment.

If Con Edison is your gas supplier and additional gas service is needed for your Fuel Cell project, Con Edison's gas department will generate an order-of-magnitude cost calculation after the Exploratory Meeting. After receiving this cost calculation, and if the customer chooses to proceed, the customer then submits a more detailed Load Letter to Con Edison. 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.

2. Formal Application

Con Edison follows the New York State SIR to review and approve all solar projects under 5 MW. Prior to application submittal, please read the SIR thoroughly to familiarize yourself with application process and timelines, technical and operating requirements, and required contracts and forms. In advance of application submission please review Rider R, which is the Net Metering and Value Stack tariff for Con Edison and register with Power Clerk. The [Small DG portal](#) should be used for Interconnection requests less than or equal to 50kW. The [Large DG portal](#) should be used for Interconnection requests greater than 50kW. The SIR only applies for projects up to 5MW. For projects seeking interconnection to the distribution system not under the SIR jurisdiction, please contact dgexpert@coned.com for more guidance.

A complete DER Application contains everything included in [Appendix F of the SIR](#), including the following:

- Authorization Letter– authorizing contractor to represent customer for purposes of the interconnection
- Equipment Detail Application Form
- Addendum to Application for Service – to determine customer’s DER electric rate
- New York State Standardized Contract (for systems up to 5 MW) – this agreement between Con Edison and the customer (not the contractor or installer) takes effect once the project has received design approval to build
- Three Line Diagram – electrical interconnection detail
- Manufacturer Data Sheets
- Operation and Verification Test Procedures
- \$750 Application Fee
- Load Letter & Preferred Point-of Entry (POE) Construction Information – new or additional service is required

Examples of some of the features that should be called out on the three-line diagram are shown below:

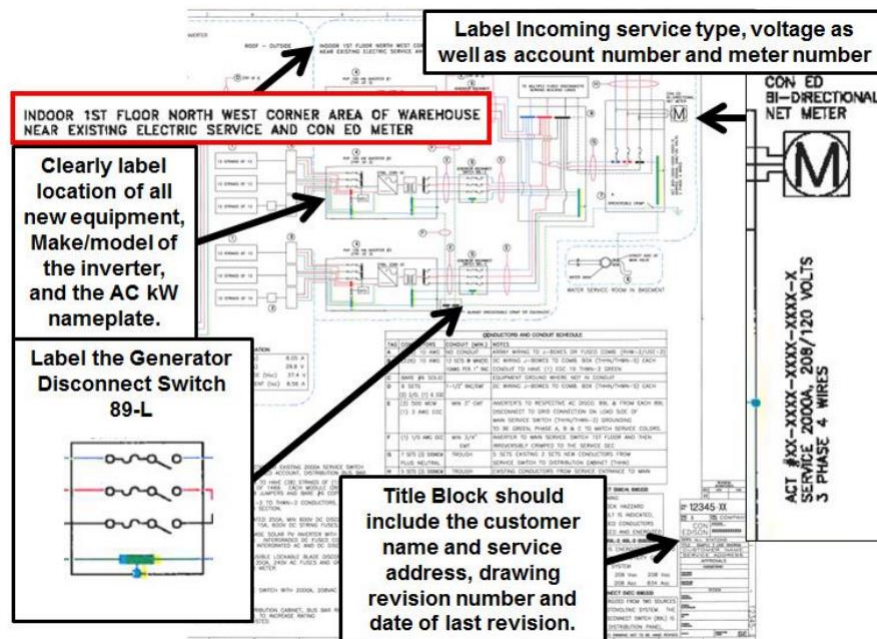


Figure 5. Required Elements of an Acceptable Drawing

3. Preliminary Determination and Cost Estimate

After the formal Fuel Cell application is submitted, Con Edison will inform the customer whether the proposed interconnection is viable. Con Edison will also provide a cost estimate for performing the Coordinated Electric System Interconnection Review (CESIR), an engineering study usually required for larger projects. The CESIR determines how the customer's project will affect the Con Edison system, details any adverse impacts (e.g., relay coordination, fault current, or voltage regulation problems), identifies necessary corrective actions, and estimates any costs associated with mitigating these issues. The customer pays for all costs associated with the CESIR. The customer can either authorize Con Edison to conduct the study. After receiving a CESIR determination and cost estimate, the customer will decide whether to authorize the study and move forward with the project.

4. CESIR (Coordinated Electric System Interconnection Review)

The customer will provide any design documentation Con Edison requires for the CESIR, along with payment. Within 60 days of commitment, Con Edison will complete the CESIR and provide the customer with the results of the study and a cost estimate. The estimate will cover the interconnection of the customer's DER for operation in parallel with the distribution system.

NOTE: The information provided by the CESIR gives the customer another opportunity to decide whether to proceed.

5. Interconnection Agreement

For Fuel Cell systems between 50kW-AC and 5MW-AC, the customer will sign a site-specific Interconnection Agreement. The agreement is a contract that addresses issues such as rates, termination, scope, installation, operation and maintenance of the unit, disconnection of the unit (including emergency and non-emergency disconnection), access, dispute resolution, and liability. (For these larger DER projects, at this point Con Edison begins development of the site-specific design and operating specifications that the customer will ultimately co-sign.) For all Fuel Cell systems, the customer will pay Con Edison for the estimated interconnection costs. This payment from the customer is placed into an escrow account. The customer will also be required to submit a final set of design drawings, specifications, and descriptions of all protection devices and auxiliary equipment to be installed. The costs will be reconciled at the end of the project. Receipt of the signed Interconnection Agreement and Con Edison approval of the final documents are required before a DER project may operate in parallel.

6. Project Installation

While the Fuel Cell facility is being installed in accordance with the approved designs, the customer's design will be formally submitted to Con Edison for design review. The customer's design team should meet with the Con Edison design review engineer to discuss interconnection details and requirements as they pertain to the specific project. In addition, the CPM and the customer or contractor should arrange site meetings to perform electric, gas, and steam inspections, as applicable, to ensure that the system is being installed according to the approved design documents and drawings. During the course of the installation, the project schedule should be reviewed periodically to ensure that key milestones are being met. Outage and embargo schedule impacts should also be discussed regularly, and schedule adjustments should be made as necessary. During installation, Con Edison will make any necessary electrical system or metering changes to accommodate the customer's DER. If new or additional gas service is required, Con Edison or the appropriate gas supplier will schedule construction and perform interim inspections. Once the customer has an approved gas permit (Blue Card) from the NYC DOB (or relevant municipal authority),

the gas supplier will perform a final inspection (including a gas booster compliance inspection, if necessary) and install the meter.

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

7. Gas Integrity Test

Before the gas can be turned on, for those projects where Con Edison upgraded gas service, the CPM will perform an integrity test on the additional gas piping. The integrity test consists of a series of pressure tests along the different sections of the line.

8. Verification Test

Once installation is complete and all gas requirements have been met, the customer should schedule an electric verification test of all protective devices (including relay test sheets and trip checks) with Con Edison within two weeks.

9. Interconnection and Operation

Upon satisfactory completion of the gas integrity (if necessary) and verification tests, installation of the appropriate metering, and receipt of completed documentation, the customer's system is allowed to operate in parallel with Con Edison's system. At this point the CPM will place the customer accounts on the applicable gas, electric, and steam rates.

10. Final Acceptance and Cost Reconciliation

Con Edison will review results of the verification test and issue a list of deficiencies or a formal letter of acceptance for interconnection within 10 days. 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.

11. Final Meeting

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

Note on Fuel Cell projects that will require an outage to interconnect their project:

If you cannot connect your Fuel Cell system's electrical interconnection point to an existing breaker and have to connect directly to a live bus, please work with your CPM to coordinate disconnecting electric service to the building, commonly referred to as an "outage." Please note: no electrical connections or customer current transformers (CT's) are permitted within Con Edison's revenue metering cabinet, also known as the CT Cabinet. Please coordinate where connections can be made to existing customer switchgear with your CPM prior to finalizing the outage request.

If your project requires that your site have an outage in order to interconnect, please work with our CPM to coordinate that. It is important to note that Con Edison crews will be available at no charge during regular business hours: Monday-Friday, 7:00am – 3:00pm excluding holidays. However, if you request an outage outside of these normal working hours, or if the outage extends beyond 3:00pm, you will be responsible for full payment of the cost for time spent outside working hours, including overtime etc.

Spot or Isolated Networks

For customers on dedicated spot or isolated networks, the opening of a network protector would result in a loss of power to the customer. Con Edison's traditional approach to maintain reliability for customers wanting to install Fuel Cells on a spot or isolated network would require a reverse power relay that would prevent export. As forward thinking, Con Edison has begun offering solutions to enable export across network protector relays through pilot programs, making it the only utility in the nation to allow export on network service. This solution is called "Communications Aided Tripping" (CAT) and it involves the following:

- 1.) Reducing sensitivity on local network protector relays – Reprogramming network protector relays to an "insensitive" mode that allows back-feed of up to 50% of the transformer rating.
- 2.) Supervisory Control and Data Acquisition (SCADA) and anti-islanding – Installing equipment to monitor the performance of the Fuel Cell generator and the network protectors and allow for remote tripping in the event of system contingencies and/or outage risk to the customer.

The solutions offered will be tailored to the specific service configurations. Costs for CAT will be project specific and determined by your CPM but very generally can be in the range of \$100,000³. The reduced sensitivity solution on local network protector relays is more suitable for interconnections to the low voltage grid, whereas the communication-aided tripping is more suitable for isolated or spot networks.

SCADA Equipment Details

The following list of equipment may be required (and installed as needed) for Con Edison DER projects, particularly those using the CAT solution. The exact requirements and specifications of the equipment will be determined during the engineering review and site visits.

The customer is responsible for the cost of procuring and installing this equipment, regardless of whether the customer or Con Edison is installing it.

- **Supervisory Control and Data Acquisition (SCADA):** This equipment collects data from the customer's inverters and Con Edison's network protectors. In addition to providing communications, SCADA also allows for remote operations and controls of the network protectors.
- **Anti-islanding device:** This equipment is sometimes required, based on a case-by-case assessment of the system size and the type of service to the customer. The purpose of this device is to ensure that power export does not cause a customer outage if one or more feeders go out of service.
- **DNP3 Data Concentrator for data link communication:** DNP3 communication protocol is required to ensure reliable, and consistent communication between customer's inverters and Con Edison. This can be achieved by customer installing DNP3 compliant Data Concentrator for Con Edison to adequately monitor customer equipment and issue controls. A DNP3 converter card will be

³ This is an estimate only. Project costs can be higher or lower depending on project specifics. Customers should not rely on this number before they receive actual costs and written design approval from Con Edison.

required if the customer Control System is MODBUS. The customer is responsible for ensuring availability of a DNP3 protocol in their Control System.

- **Network protector micro-processor relay and associated cabling:** A device to remotely monitor the operations of the network protector. This is required to enable two-way communications. Con Edison network protectors are typically installed with a standard non-communicating relay and must be upgraded for participation in this program. Con Edison will install the relays and connect any required cables within Con Edison's jurisdiction.
- **Conduits & Cables:** Cables and conduits will be run between the communications and protective equipment. The customer will be required to provide their own communications cable which is specified by Con Edison engineering design. The customer will make the connections and bring the cable to Con Edison's jurisdiction, who will then connect the DER to the relays to complete the installation. New conduits may be required, depending on existing site conditions.

Common Concerns, Scheduling, and Cost Considerations

The following issues have been known to cause delays or cost overruns:

- **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 DER project. If the site has insufficient gas availability, the proposed DER project could require redesign or incur significant costs and/or delays.
- **Gas Pressure:** If the proposed equipment uses elevated gas pressure, additional DOB and FDNY permits might be necessary. These permit applications may be complex and time-consuming, so 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 [DTT], anti-islanding devices, telemetry, fault current limitation devices, etc.), metering, and any safety provisions. These costs should be determined and communicated after the CESIR is completed.
- **Fault Current Limitations:** In certain areas, DER 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 CESIR review, described in step 3 above.
- **Outage and Embargo Scheduling:** Scheduling of Con Edison feeder outages and NYC-imposed street work embargoes may delay and add costs to DER projects. Close coordination with Con Edison and relevant NYC agencies will help mitigate these delays.
- **Rates and Billing Changes:** Customers may wish to design systems to take advantage of various billing options, which are outlined below. Upon request, the CPM will set up meetings with relevant billing specialists early in the process.
- **NYC Department of Buildings (DOB):** The customer should seek approval from the NYC Department of Buildings early in the process, as **neither Con Edison nor any other gas utility will turn on the gas without DOB approval**. For additional information please refer to the [DOB CHP Handbook](#).

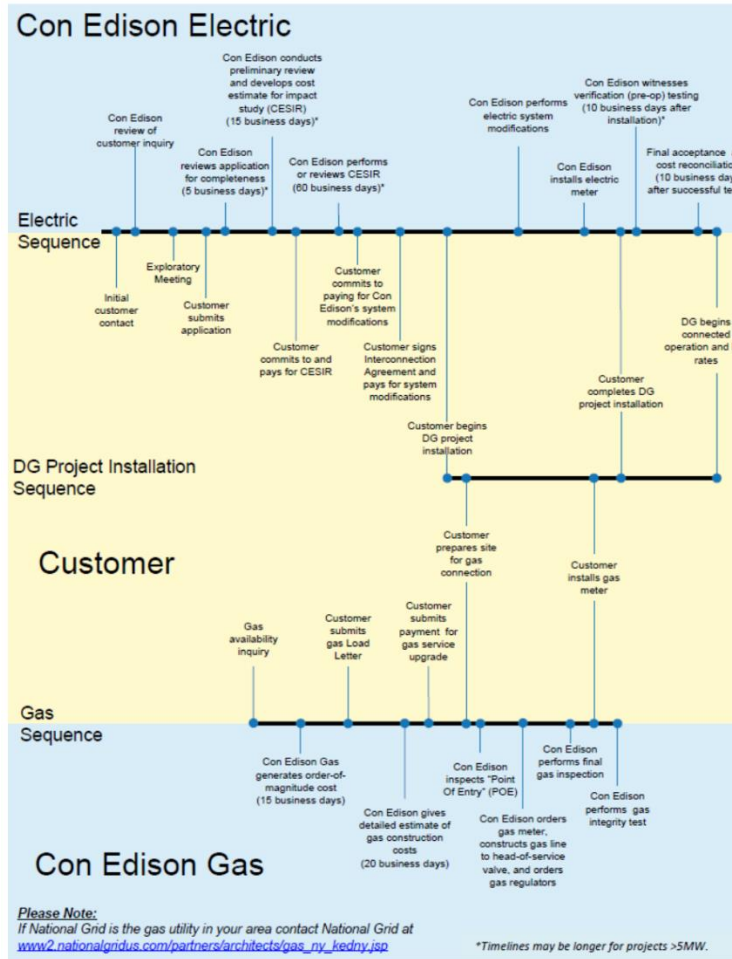


Figure 6: This diagram illustrates the sequence of steps for completion of a DER project. This sequence does not include obtaining funding or permits or parts of the process associated with other agencies (e.g. NYC Department of Buildings). Project duration will vary according to its complexity and other factors.

Rates and Service Classifications

DER customers may be subject to certain 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. Rates are subject to change without notice; please see [Rates & Tariffs | Con Edison](#) for most updated tariffs.

Typical Gas Rates

Rider H

Non-Residential DER Gas Rate - Non-residential DER 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.

Rider J

Residential DER Gas Rate - Residential DER customers have the option to utilize [Rider J](#) gas rates. Customers with five or more dwelling units must meet a 50 percent annual load factor to be eligible for Rider J and will require separate metering. Small residential customers with fewer than five dwelling units have no annual load factor requirement and do not require separate metering, so a small residential customer's entire gas usage bill will be at residential DER gas rates.

Typical Electric Service Classifications

The electric service classifications for customers typically installing Fuel Cell generation include the following. Con Edison assigns the service class based on the customer characteristics.

Mass Market

Service Class 1 (SC1) – Residential/Religious

This rate is for residential customers. It is volumetric billing based on energy usage (kWh). SC 1 customers have no demand charge.

Service Class 2 (SC2) – General – Small

This rate is for small commercial customers with demand less than 10kW. It is also volumetric billing based on energy usage (kWh). SC-2 customers have no demand charge.

Large Onsite

Service Class 8 (SC8) – Multiple Dwellings

This rate is for master-metered residential customers. It includes energy usage (kwh) billing with a variable demand charge (kW), adjusted monthly based on the highest 30 minutes of demand

Service Class 9 (SC9) – General Large

- A. This rate is for large commercial customers with demand 10kW or larger. It is energy usage (kwh) billing with a variable demand charge (kW), adjusted monthly based on the highest 30 minutes of demand Figure 7. List of Con Edison Compatible Meters

In addition to the electric service class, [Rider R](#) of the electric tariff also applies to customers with Fuel Cell generators for Value Stack tariff. As a rider to the customer's base Service Classification, Rider R allows for Net Metering and Value Stack credits to Fuel Cell generators without any change to the underlying rates of the individual service classification. In addition, Rider R lays out the applicability requirements for technologies on certain types of service classifications, details how net export of power for the billing cycle is treated, and specifies which technologies can participate in Remote Net Metering (RNM), Remote Crediting (RC), or Community Distributed Generation (CDG) programs as well as the credit reconciliation process for these programs.

In conjunction with Rider R, these service classification distinctions will determine how the Net Metering and Value Stack credits are applied.

Value of Distributed Energy Resource (VDER)

On March 9, 2017 the New York State Public Service Commission (PSC) released an order to transition away from net energy metering (NEM) to value of distributed energy resource (VDER).

Grandfathered NEM

If you have a Fuel Cell system for which an interconnection application was completed by July 17, 2017, all excess kilowatt hours of energy sent to the grid are "cashed out" after every billing cycle. We do this by multiplying the excess kilowatt hours by the avoided cost of energy. The avoided cost of energy is determined by the average wholesale price of energy for the year, increased by 6.6 percent. The resulting dollar value is applied to your account as a credit and your kilowatt-hour bank is reset to zero.

Existing NEM customers may opt into Value Stack rates.

Phase One NEM

Mass Market customers with Fuel Cell systems installed after March 9, 2017 as well as Large On-Site customers with Fuel Cell systems that have a rated capacity of 750 kW AC or lower and installed on/after June 1, 2019 receive Phase One NEM compensation unless they choose to opt into Value Stack rates. Phase One NEM is similar to Grandfathered NEM with the following differences:

- Credits carry over month-to-month and year-to-year; there is no annual cash-out

Value Stack

- Unlike traditional NEM, VDER Value Stack compensation is not based only on volumetric metering; the energy produced and exported to the grid will not be credited on the customer's utility bill at the same kWh rate at which energy is consumed. Instead, the Value Stack consists of six potential components and converts energy production into monetary credits that can vary by location and time.
- Value Stack credits are based on export into the utility grid. Fuel Cell generation that instantaneously reduces customer load will reduce the customer bill; generation that exceeds a

customer's load behind the meter is exported to the grid and credited according to the Value Stack rates.

- For more information about VDER, including a description of all of the components of the Value Stack, please visit our [Private Generation Tariffs webpage](#).


		Customer Name	[REDACTED]	
Your account number: [REDACTED]		Account Number	[REDACTED]	
Service delivered to: [REDACTED]		Billing Period State Date	11/17/2017	
Your electric rate: EL9 General Large		Billing Period End Date	12/20/2017	
Next billing date: Wednesday, March 20, 2018		Billed consumption	kWh	1602
Your billing summary as of Feb 20, 2018		Total injections from DER	kWh	-1485.5
Remaining balance	None	Value Stack Components		
Your new charges - details start on page 2		Energy Component	\$/kWh	\$ 0.09
Billing period: Nov 17, 2017 to Dec 20, 2017		Capacity Component	\$/kWh	\$ 0.01
Electricity charges - for 33 days		Environmental Component	\$/kWh	\$ 0.02
	\$475.04	Subtotal Credit per kWh	\$/kWh	\$ 0.07
Adjustments	-\$365.37	Demand Reduction Value	\$/kW-month	(\$168.33)
Total new charges	\$109.67	(monthly lump sum)		
Total amount due \$109.67		Locational System Relief Value	\$/kW-month	\$ -
Payment is due upon receipt of this bill. To avoid a late payment charge of 1.5%, please pay the total amount due by Mar 13, 2018.		(LSRV) (monthly lump sum)		
		Total credit per-kWh elements		(\$197.04)
		Total credit from DRV + LSRV		(\$168.33)
		Total Dollar Credit from DER this Billing Period		(\$365.37)
		Credit Applied to Customer Bill		
		Total Delivery Charges		320.77
		Total Supply Charges		115.55
		Total Miscellaneous Charges		38.72
		Total Charges	\$	475.04
		DER Credit		(\$365.37)
		Remit to Utility	\$	109.67
		Dollar Credits Carried Over from Previous Billing Period (If any)	\$	-
		Excess Dollar Credits Carrying Over to Next Billing Period	\$	-

Figure 8. Example Demand Customer Value Stack bill

- **Community DG**

Community Distributed Generation (CDG) describes the configuration when Value Stack Net Metering credits from one Fuel Cell system (the host) are distributed to multiple different customers (the satellites). For a customer to be eligible for CDG, several conditions must be met:

- The host account must be non-residential
- Host and satellite accounts can be in different NYISO zones within Con Edison service territory
- At least 10 satellite customers unless all are located at the same premise as the host
- Each customer must have at least 1,000 kWh annual usage
- Satellite customers above 25 kW can take up no greater allocation than 40% of the Net Metering credits
- Potential service upgrades required to accommodate export
- Use [Community DG Procedural Document](#) for application, which requires self-certification of creditworthiness, cyber security, NYISO load zone, and any other obligations

Remote Net Metering

The general process and application of Remote Net Metering is described below. The rates will be governed by the tariff and specific questions can be directed to your project manager or the DG ombudsman.

Remote Net Metering describes the configuration when Value Stack credits produced by one Fuel Cell system (the host) are distributed to the same customer's multiple accounts on different locations (the satellite(s)). For a customer to be eligible for Remote Net Metering, several conditions must be met:

- Only available to existing remote net metered Grandfathered Net Metering and Phase One NEM customers, their successor accounts, as well as new and existing net metered wind customers
- The host account must be non-residential
- The host account and satellite account must be different and shall be established in the same customer's name and located on property owned or leased by the customer
 - Satellite accounts can have more than one host account
- Host and satellite accounts must be located within the same NYISO zone within Con Edison service territory
- Starting September 1, 2021, all existing RNM projects interconnected prior to this date, who received Value Stack credits were transitioned to the Remote Crediting program and will continue to receive Value Stack credits. Value Stack RNM is no longer available for non-wind customers.
- Other requirements specified in Rider R, Section A Applicability (e.g., system size)

Remote Crediting

Remote Crediting describes the configuration when Value Stack credits produced by one Fuel Cell system (the host) are distributed to multiple different customers (the satellite(s)). For a customer to be eligible for remote crediting, several conditions must be met:

- Taking Value Stack service
- The host account must be non-residential or residential with Farm Operations
- Host and satellite accounts can be located in different NYISO zones within Con Edison service territory
- Form G must be used for the application
- Host account must submit an allocation form

Net Crediting Program

A voluntary program offered by the Company to CDG Hosts. The Net Crediting Program authorizes the Company to remit payments to the CDG Host on behalf of CDG Satellites, resulting in a net credit on the CDG Satellite's Electric Bill.

Click the following link for more information on how to enroll in the [net crediting program](#).

Important Net Metering Considerations

When evaluating your Net Metering options, there are several concepts that apply that you should be familiar with: level billing, time of use, net meter vs. Fuel Cell production meters, and demand customers.

Avoided Cost vs. Retail Cost

A critical distinction with how Net Metering credits are applied for Fuel Cells relative to solar PV and wind systems is that Fuel Cells receive the wholesale avoided cost rate for excess generation, whereas solar PV and wind systems receive the full retail rate.

Level Billing

Level billing is an option offered by Con Edison which allows a customer to spread their total expected annual energy costs over twelve equal monthly payments throughout the year. After installing a solar system, your total expected annual energy costs will be reduced by the solar output. It will take some time for your level payment plan to adjust to this lower energy use, and in the interim you will be putting more money toward your total expected annual energy costs than would actually be required. For this reason, upon completing your solar project you should call Con Edison (1-800-75-CONED) to be removed from the level billing plan. After a year off the program, you will have established your new lower total expected annual energy cost and can call us to re-join the level billing plan. Additional information on level billing can be found on Con Edison's website under [payment plans and assistance](#).

Time of Use Rates

Electric [Time of Use Rates](#) generally do not apply to Fuel Cell only customers as the steady, flat output does not lend itself well to ramping up or down to take advantage of the varying electric rates. For Fuel Cell installations that plan to have a significant amount of exported power during low load times (typically off-peak), time of use rates may not be beneficial either as the excess generation off-peak is held in an off-peak "bucket" and cannot be transferred to defer on-peak usage. Customers combining Fuel Cells with battery energy storage, however, may find value in storing excess production during off-peak hours to be discharged during peak hours.

Net Meters vs. Production Meters

Net Metering billing is based on the excess energy sent back through the net meter, not the Fuel Cell system production meter. The production meters that are typically provided by developers do not account for the energy drawn from the grid or the overall consumption of the premises.

Fuel Cells Paired with Other Technologies

Fuel Cells paired with Value Stack eligible technologies

As discussed earlier, monthly Fuel Cell excess generation is credited at Value Stack rates. Therefore, Fuel Cells can be paired with any other Value Stack eligible technology (such as solar PV). When applying for such systems, a single Hybrid application should be submitted for both technologies by using the Online Interconnection Application Portal ([PowerClerk](#)). You can start this application by choosing "New SIR Application >50kW (including Hybrid)" from the PowerClerk home screen. Even if all technologies are being installed by separate developers, a single combined system diagram may be required to enable engineering evaluation. For Hybrid systems which pair battery energy storage systems (BESS) with Fuel Cells, you will be asked to enter all information related to the BESS in order to complete SIR Appendix K "Energy Storage System (ESS) Application Requirements / System Operating Characteristics / Market Participation."

Value Stack considerations with CHP plants

Fuel Cells paired with a non-eligible Value Stack technology (such as CHP) can be accommodated behind separate Con Edison meters or behind the same Con Edison meter provided that reverse power relaying is provided.

For CHP specifically, the more prudent approach to putting Fuel Cells and CHP behind the same meter might be to configure the relay to make the CHP technology trip offline or curtail power output when power nears export levels. Unfortunately, experience has shown that while CHP is better at curtailing power or stopping and restarting than Fuel Cells, the CHP's overall efficiency is greatly affected by repeated curtailment or stop/restart cycles. Installers should be aware that some state or federal funding programs, as well as some Con Edison electric tariff requirements, are driven by the overall efficiency of the CHP, which may make this option impractical over the long run.

Contacts for Further Questions

If you have questions about your specific project application, please contact your Energy Services Customer Project Manager (CPM). You will receive their contact information when you submit your application in Power Clerk.

For general questions regarding DER interconnection, please contact the Distributed Generation group at dgexpert@coned.com.

For residential billing questions, please contact netmetering@coned.com or 212-780-6600. For large/commercial customers please e-mail dl-CCGNet-metering@coned.com

In addition, New York State Department of Public Service and the New York State Energy Research and Development Authority have dedicated "DG Ombudsmen" who can help answer questions. Their contact information is available at the [Department of Public Service, Interconnection Ombudsmen Effort](#).

Definitions and Acronyms

Definitions

Distributed Generation: (Now referred to as Distributed Energy Resource (DER))

An electric production facility that is dedicated to the support of nearby associated load.

Inverter

A machine, device, or system that changes direct current (DC) power to alternating current (AC) power. Inverters that are self-commutating can be configured for stand-alone service. Inverters that are line-commutated cannot be configured for stand-alone service.

Spot Network

Depending on your DER site's location and the size of your generation, you may be served by a spot network, which can be either at 265/460 Volts or 120/208 volts. This is the standard low-tension service for larger customer loads throughout the Con Edison service area. Spot Networks are served by three or more feeders (depending on size of load and contingency design level) through dedicated transformers. A common bus connected to the secondary side of the transformers directly supplies the distribution service. Standby customers can connect induction or inverter-based generators at this level, but they can

only connect synchronous generation without fault current mitigation, following a successful evaluation of their impact during system fault conditions.

Area Network

Depending on your DER site's location and the size of your generation, you may be connected to network supply. This is the standard of service in Manhattan, most areas of all the other boroughs, and Westchester County. Area Networks are large distribution voltage grids fed by multiple high-tension primary feeders. The distribution service voltage is 120/208 volts. Standby customers can connect induction or inverter-based generators at this level, but are not allowed to connect synchronous generation, due to their impact during system fault conditions and anti-islanding concerns.

Radial Overhead

Depending on your DER site's location and the size of your generation, you may be connected to a non-network, or radial supply. This is typical in Westchester, Staten Island, and parts of Brooklyn, Queens, and the Bronx. The available distribution service voltages will vary by area but will either be 120/208 volt, 120/240 volt, 265/460V or 277/480 volt configurations.

High Tension

High-tension (HT) equipment includes all transformers, cables, wires, buses, instrument transformers, and other equipment operating at 600 volts or higher.

Fault Current

Fault current, also called "short-circuit current" (I_{sc}), is the current that flows through the circuit in the event of a fault (short circuit). This current passes through all components in the affected circuit and is generally significantly larger than normal loading conditions.

Acronym	Definition
SIR	Standardized Interconnection Requirements
SCADA	Supervisory Control and Data Acquisition
DNP3	Distributed Network Protocol
RNM	Remote Net Metering
CDG	Community Distributed Generation
DG	Distributed Generation (Now referred to as DER)
DER	Distributed Energy Resources
CESIR	Coordinated Electric System Interconnection Review
VDER	Value of Distributed Energy Resources

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