National Grid Distributed Generation MA Webinar

Complex Interconnection Process Review

April 17th, 2025

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The information in this presentation could be affected by future revisions to the Standards for Interconnection of Distributed Generation, M.P.D.U. No. 1579 (Tariff), or by open docket D.P.U. 19-55.

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Note: As used in the following slides, reference to "National Grid" or the "Company" means Massachusetts Electric Company and Nantucket Electric Company, as applicable, when the context is the distribution system and/or distribution interconnection requirements, and shall mean New England Power Company when the context is the transmission system and/or transmission system requirements.

01

Safety Message

Will Kern

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Checking for Ticks

Tickborne diseases are on the rise, particularly in the spring, summer and early fall when ticks are most active, according to the Centers for Disease Control and Prevention.

Steps to protect against ticks. Follow these whether you work outside, enjoy your yard or spend time on a national forest or grassland. You should:

•Avoid areas with high grass and leaf litter and walk in the center of trails when hiking.

•Use repellent that contains 20 percent or more DEET, picaridin, or IR3535 on exposed skin for protection that lasts several hours.

•Use products that contain permethrin to treat clothing and gear, such as boots, pants, socks and tents or look for clothing pre-treated with permethrin.

•Treat dogs for ticks. Dogs are very susceptible to tick bites and to some tickborne diseases. They may also bring ticks into your home. Tick collars, sprays, shampoos, or monthly “top spot” medications help protect against ticks.

•Bathe or shower as soon as possible after coming indoors to wash off and more easily find crawling ticks before they bite you.

•Conduct a full-body tick check using a hand-held or full-length mirror to view all parts of your body upon returning from tick-infested areas. Parents should help children check thoroughly for ticks. Remove any ticks right away.

•Tumble dry clothes in a dryer on high heat for 10 minutes to kill ticks on dry clothing after you come indoors. If the clothes are damp, additional time may be needed.

02

General Communications & FY25 Successes

Will Kern

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General Communications

- **Simplified Interconnection Process Webinar is scheduled to take place July 2025**
- **CEI Open House May 15th 2025**

- **Former Webinars are posted to our *'Stakeholder Meetings Updates Page'***

- **Transfer of Ownership**
  - Outages
  - Reconciliation/Cost Sharing Payouts
  - Record Keeping
  - ***Interconnections Documents Website***

- **Schedule Z / Community Solar**
  - opportunity to make changes increased to 6x per year

- **Apr'24 – Mar'25: Interconnected 13,742 applications totaling to 197.68 MWs**
  - Complex - 1,816 apps totaling 113.25 MWs
    - Solar –
    - Other -
  - Simplified - 11,926 apps totaling 84.43 MWs
    - Solar –
    - Other –

03

Screening Review Process

Jorge Jorge (JJ), Anish Ganta & Claudia Cobani

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Pre - Applications

•Required for all cases 250 kW or greater, optional for cases less than 250 kW (Tariff Section 3.2)

Project Size	Pre-Application Report Fee
< 250 kW	$100
250 kW – 500 kW	$250
> 500 kW	$750

•Pre-application requirements include, but not limited to: Proposed site location, system size, generation type (Solar, Wind, Hydro, CHP, Diesel, Energy Storage, etc.) and an uploaded screenshot using any web mapping platform (Google Maps, Bing Maps, Assessors Maps)

•Pre-application reports are completed by the Company within 10 business days (BD)

•Pre-application report includes, but not limited to: feeder/circuit information, substation name, phase(s), if the area is in a network or non-network area, potential system constraints, application checklist, the connected & pending aggregate distributed generation (DG) on the feeder(s) and if a project will fall in an area that has an ongoing Affected System Operator (ASO) or Group Study

Pre – Application Report

Report is a sample and for illustrative purposes only

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Massachussetts Pre-Application Report	Applicant:	123456 National Grid			
	Pre-Application Request Date:	7/15/2021	Preparation Date:	7/7/202	
	Prepared by:	Jorge Jorge	Revision # (if any):	0	

I. **Executive Summary:**

A. **Interconnection Application:** The Applicant (noted above), has submitted a request for a Pre-Application Report (Report) for the interconnection of a generation system (located at the proposed location(s) noted below) to the National Grid (Company) Electric Power Sy

B. **Pre-Application Process:** The proposed location was reviewed (as per the Standards for Interconnecting Distributed Generation referenced below) to: (1) determine the characteristics of the existing Company EPS near the proposed location(s), (2) identify the aggregate amount o other proposed and existing generation capacity connected to the nearby Company EPS, and (3) identify other potential system constraints critical items that may impact the proposed generation system(s).

C. **Further Inquiries:** All additional questions and comments related to this report should be directed to National Grid's Distributed Generati Services email account: Distributed.Generation@nationalgrid.com.

II. **Proposed Location Information:**

The proposed location information provided in the table below is based on the information provided by the Applicant (i.e. Interconnecting Customer) in the Exhibit B - Pre-Application Report Form, which has been attached to this Report.

Table of Proposed Location Information		Proposed kW(AC):	2,500 kW	Phase	
Proposed Energy Source:	Solar	Existing Account (if applicable):		N/A	
Street Address:	939 Southbridge Street	X- Street:		N/A	
City:	Worcester	State:	MA	Zip Code:	01610
Likely Process:	Standard	GPS (North):	N/A	GPS (West):	N/A

III. **The Company's Electric Power System (EPS):**

A. As required by the Standards for Interconnecting Distributed Generation (referenced below), the Company must identify feeders within ¼ of the proposed interconnection site. Since many locations may not have any adequate feeders within ¼ mile, the Company may elect to provide information for the nearest adequate feeder(s) to the proposed location.

Table of Information for Nearest Feeder					
Feeder Number:	01-HT17		Radial or Network?:		Radial
Hosting Capacity:	Available		Feeder Rating:		264 A
Substation:	Cambridge St.		Voltage at Substation:		23 kV
Substation 3V0:	Not In Service		Substation Transformer Rating:		- MVA
Voltage (near location):	23 kV		Phase (near location):		3 Φ
Distance to three-phase (if not within 1/4 mile of proposed location):					0 ft
Distance to Substation:	4,260 ft		Feeder Peak Load:		- MVA
DG on Feeder:	0 kW	Pending DG:	0 kW	Existing DG:	0 kW
Included in total above:		*Pending PV:*	0 kW	*Existing PV:*	0 kW
		Pending non-PV:	0 kW		
		Non-PV Type:	N/A		

Table of Information for Second Nearest Feeder (if available)					
Feeder Number:	01-8W2		Radial or Network?:		Radial
Hosting Capacity:	Available		Feeder Rating:		527 A
Substation:	Vernon Hill		Voltage at Substation:		13.8 kV
Substation 3V0:	In Service-Cost Sharing Required		Substation Transformer Rating:		40 MVA
Voltage (near location):	13.8 kV		Phase (near location):		3 Φ
Distance to three-phase (if not within 1/4 mile of proposed location):					150 ft
Distance to Substation:	10,230 ft		Feeder Peak Load:		7.9 MVA
DG on Feeder:	2,748 kW	Pending DG:	21 kW	Existing DG:	2,727 kW
Included in total above:		*Pending PV:*	21 kW	*Existing PV:*	2,698 kW
		Pending non-PV:	0 kW		
		Non-PV Type:	N/A		

B. Other Known System Constraints:

1. Recent changes in the Massachusetts net metering rules may have further restrictions regarding the size of a distributed generation system that can be offered Net Metering Services on any one single parcel of land. Refer to the Massachussetts Depart. of Energy & Environmental Affairs / Dept. of Public Utilities (D.P.U.) homepage:
http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/dpu/
Massachussetts Dept. of Energy & Enviromental Affairs / Dept. of Public Utilities (D.P.U.) - Net Metering Homepage:
http://www.mass.gov/eea/energy-utilities-clean-tech/electric-power/net-metering/net-metering.html
Massachussetts Dept. of Public Utilities (D.P.U.) - Net Metering Frequently Asked Questions and Answers:
NOTE: See section VI. Design and Development of Net Metering Facilities / Question #46.:
"What is the maximum capacity of a net metering facility?"
http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/dpu/net-metering-faqs.html

2. A conceptual grade cost estimate of the required system modifications will be determined during the System Impact Study (SIS). The cost for line extensions / re-conductoring of radial feeders can approach or exceed $500,000/mile depending on the level of complexity. State and Federal taxes apply to payments for system modifications, including feeder line extensions. The Point of Interconnection, circuit characteristics, and/or other projects may affect feasibility of installing the proposed generation capacity on this circuit at the proposed location. Also, the available distributed generation capacity is open to other project proponents unless and until a complete application is received.

3. Additional system constraints particular to the proposed location (if applicable):

Thank you for your interest in interconnecting to National Grid's Electric Power System. We look forward to working with you to progress your application through the interconnection process. Please review the following conditions as they may impact your overall processing time and associated costs.

Due to the high volume of existing and proposed DG interconnections, this project's location falls within an area that is currently undergoing study by an Affected System Operator (ASO), which analyzes the potential impacts of a DG project to non-distribution assets. As such, in accordance with MDPU 1320, should this application proceed to impact study, it will immediately be placed on hold pending the results of the ASO study. In addition, because system modifications are anticipated to be in excess of $1 Million; study timeframes will be by mutual agreement in accordance with MDPU 1320.

Ongoing ASO Notes

Prior study of the Barre feeder, which is near the proposed Facility, has shown significant interconnection challenges. Be advised that interconnection in this area may require substantial system modifications, impacting the Customer's desired project schedule and budget. Further National Grid engineering review will be required to determine the most viable method of interconnection.

Challening Interconnection Notes

Barre is 13.8Kv Grd'd Wye/ effectively grounded.

As the proposed Facility is equal to or greater than 5MW please be advised that significant distribution and transmission system upgrades may be required that may result in a longer project schedule and higher costs than a smaller project. In addition to the Distribution System Impact Study (DSIS) being required, a Transmission System Impact Study (TSIS) will be required. This will require that the DSIS be placed on hold at the point that the Distribution System interconnection solution is identified. Once that point is reached in the DSIS; a high level non-binding cost estimate and timeline will be provided to the Interconnecting Customer and they may determine if they wish to proceed or not at that point. Link to the ISO Tariff for Section 1.3.9 https://www.iso-ne.com/participate/rules-procedures/tariff

DSIS/TSIS Notes

Based on the information provided in the Applicant's Exhibit B - Pre-Application Report Form and the other information identified in this report, the Company expects that if an application is submitted at the proposed location, the application will ultimately need to be processed in the Standard process track. If the applicant submits a complete application and elects to proceed directly to the Standard process, the application will proceed directly to the Impact or Group Study process once an initial review is completed. The applicant may still submit an Expedited application, and in which case upon receipt of a completed application the Company will perform a Screening Review (and if necessary Supplemental Review) to determine if an Impact or Group Study is required.

Process Track Notes

Group Study Hold:
Prior to completion of Screening for your Application/Case, the company began the process of performing necessary engineering studies to determine the scope of required modifications to the electric distribution system in this area in order to provide the requested interconnection. In performing such studies, it has been determined that the interconnection will also impact the electric transmission system and will require substantial review and study by the Affected System Operators (including, but not limited to, New England Power Company and ISO-NE) to determine a safe and reliable interconnection solution. Your Case/Application had not completed Screening prior to determination of the scope of this study, and as such, your Application/Case with Massachusetts Electric Company will remain On Hold until the conclusion of the review of the Affected System Operators.

Please review the information on this link to determine the potential impact of a group study on this project
https://ngus.force.com/servlet/servlet.FileDownload?file=0156T00000FLq3i

Group Study Notes

Application Checklist

Requirement	MVPU 1320 / RPUC 2100 ESB 756C / ESB 756D	250kW - 500kW	500kW and Above	CHP	Template Comments
Portal front page requirements					
Has the Application Fee been processed?	MVPU 1320 Section 3.0 RPUC 2100 Section 3.0	Required	Required	Required	
Does the Total AC Rating and value for the Assets match?		Required	Required	Required	CHP needs KW/KVA at PF with curve
Technical Details Section					
If the project includes AC or DC coupled storage has the Total Energy Storage Energy, AC [kW] been populated with the correct value?		Required	Required	Required	
Confirm that the Feeder & line has the feeder listed in the pre-application if one exists. If no feeder is written, add the nearest 3-phase feeder to the site using GIS		Required	Required	Required	
The address and system size must be consistent with the remainder of the application.		Required	Required	Required	
Application					
Signature		Required	Required	Required	
The system size		Required	Required	Required	
Does the address of Facility match what is found on the one-line and		Required	Required	Required	
Generating unit type information must be clearly shown, showing all relevant AC ratings that match information shown on the spec sheet. Include fuel type for rotating		Required	Required	Required	Synchronous, Induction, Turbine, Inverter, Fuel Cell, Hydro or Wind
One-line					
Electrical P.E. Stamp and stamp date	MVPU 1320 Exhibit C RPUC 2100 Exhibit C ESB756 1.7.2.1	Required	Required	Required	
Does the address match the portal and the application?		Required	Required	Required	
Aggregate AC kW/kVA Nameplate Rating of Generators should be shown	ESB756C Exhibit 4 ESB756D Exhibit 4 Figure 2	Required	Required	Required	Generator and Prime Mover
Generator Type, Manufacturer, Model Number(s) must be shown	ESB756C Exhibit 4 ESB756D Exhibit 4 Figure 2	Required	Required	Required	
Rotating Machines: Nameplate rating of the generator (as opposed to the nameplate rating of generator set) should be shown including generator reactance	ESB756C 7.0 ESB756D 7.0 ESB756C Exhibit 4 ESB756D Exhibit 4 Figure 2	N/A	N/A	Required	Need impedances from the cut sheet for modeling purposes
Inverter: Nameplate rating of the inverter and relay settings should be shown. DG above 500kW to have redundant relay or NG PTR settings for 27,59,81 O/U settings. DG above 1000kW to have NG PTR.	ESB756C 7.0 ESB756D 7.0 ESB756C 7.6.3 ESB756D 7.6.3 ESB756C Exhibit 4 ESB756D Exhibit 4 Figure 2	Required	Required	Required if inverter based CHP	Some rotating machines are behind an inverter. All requirements would apply if they are looking to omit some of our requirements. Otherwise they are subject to screening that is considered "non-listed"
Interconnecting Transformer -Winding Configuration (N/A if utility owned) -X/R Ratio & Impedance (N/A if utility owned) -Ratings: kVA, primary voltage, secondary voltage -The core structure of the interface transformer for grounding requirements to be shown	ESB756C 7.6.2 ESB756D 7.6.2 ESB756C Exhibit 4 ESB756D Exhibit 4	Required	Required	Required	
Effective Grounding [not required <500kW] Effective grounding may be accomplished with the following configurations: 1.A wye-grounded to wye-grounded transformer with a grounded generator source. 2. A wye-grounded connected primary winding with a fully insulated neutral and the secondary winding to have a delta connection. The insulated neutral is to establish provisions for the addition of a grounding reactor or grounding resistor in the event the generator's contribution to faults on the Company's EPS results in undesirable fault current values. 3. A wye-grounded to wye-grounded transformer with an associated grounding transformer. 4. A delta primary winding with a primary side grounding transformer and neutral any secondary configuration. 5. A wye-grounded primary with wye-ungrounded secondary with a primary side grounding transformer. 6. A wye-ungrounded primary with wye-grounded or wye-ungrounded secondary with a primary side grounding transformer.	ESB756C 7.6.2.1 ESB756D 7.6.2.1 ESB756C Exhibit 4 ESB756D Exhibit 4	N/A	Required	Required	This is critical for rotating machines: If the customer is proposing a grounding transformer, the kVA rating, X/R ratio, Z% and winding configuration needs to be shown. If a neutral grounding reactor is used, the proposed size (in ohms) needs to be indicated.
Service entrance rating is shown	ESB756C 7.2.1 ESB756D 7.2.1	Required	Required	Required	
The PCC line of demarcation (customer vs. utility equipment)	ESB756C Exhibit 4 ESB756D Exhibit 4 Figure 4	Required	Required	Required	
Interrupting Device (recloser, breaker, fuse, etc.) shall be shown, including make, model, voltage and current rating	ESB756C 7.3 ESB756D 7.3	Required	Required	Required	
Element 86 should be shown if customer has AC Coupled IBDS and would like to limit the output		Required for Storage	Required for Storage	Required for Storage	
Relaying for Interrupting Device (including Make and Model, voltage and current rating of device) should be shown (Also > 500kW can opt to use NG PTR and fuses instead of redundant relay) -Relay Elements and settings shown (27,59,81O/U,etc)	ESB756C 7.6.0 - 7.6.12 ESB756C Table 7.6.11.1-1 ESB756D 7.6.0 - 7.6.12 ESB756D Table 7.6.11.1-1	N/A	Required	Required	Rotating will most likely include 51, 51G OR 51N settings on their relays. A narrative on how they will operate in times of an outage helps us determine how the interlocks will work. Will they island them selves away from utility if so trip the main. If they do not then trip the generator breaker. Rotating machines without an inverter will require a sync check relay(25) in their relay protection scheme and any device that can open in between the utility and the generator. If rotating determines they will not export(different type of study) what is their minimum import they will need to watch when tripping(51 relay setting)
Neither 3 wire ungrounded EPS - Delta High-Side Customer-Owned Transformer: Customer 3rd relay & instrument transformers	ESB756C 7.1.3 ESB756D 7.1.3	N/A	Required	Required	
VT & CT configurations: rating/ratio, accuracy, burden class, 3 PTRs wye-wye	ESB756C 7.6.4 ESB756D 7.6.4	N/A	Required	Required	
DC Power Supply for Relaying (including fail-safe controls) should be shown including utility restoration settings Also needs a note saying battery is rated to last for >8 hours	ESB756C 7.5.2 ESB756D 7.5.2	N/A	Required	Required	
Main Service Breaker or Fused Disconnect (if behind customer load) should be shown	ESB756C Exhibit 4 ESB756D Exhibit 4	N/A	Required	Required	
Customer-owned Manual Generator Disconnecting Means: [gang operated, visible break when opened, utility lockable in open position, accessible 24/7 to the utility] should be shown They must include the Voltage/Current/Make/Model of the switch unless it is custom made	ESB756C 7.4 ESB756D 7.4 ESB756C Exhibit 4 ESB756D Exhibit 4	N/A	Required	Required	
Utility Revenue Meter should be shown	ESB756C 7.2 ESB756D 7.2 ESB756C Exhibit 4 ESB756D Exhibit 4	Required	Required	Required	
Utility Recloser shown (P> 1000kW) should be shown or > 500kW if customer opts for NG PTR in place of customer redundant relay	ESB756C 7.6.12.3 ESB756D 7.6.12.3 ESB756C Exhibit 4 & 6 ESB756D Exhibit 4 & 6	N/A	Required	Required	If project>1MW
Utility Disconnect Means shown	ESB756C Exhibit 4 & 6 ESB756D Exhibit 4 & 6	Required	Required	Required	
Internal DG Protective Device Settings: [Both Primary and Secondary/Redundant Relay Settings]	ESB756C 7.6 ESB756D 7.6 ESB756C Figure 4&2 ESB756D Figure 4&2	Required	Required	Required if inverter based CHP	Only if the rotating engine is behind an inverter is this needed. Generally there will be a redundant protective device over 500 kW
Site plan					
Does the site address match the portal and the application? (i.e. in NG footprint)		Required	Required	Required	
Are the property lines shown? Any easement issues 40 kV, Rail road, waterway, pull land etc	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Cardinal direction 'north' shown	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Site plan to scale with scale bar	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Are all streets near the project site shown and labeled?		Required	Required	Required	
All meters (utility- and customer-owned) shown	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Interfacing Transformer(s)	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Interrupting Device(s)	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Isolation device(s) (e.g. generator disconnect) [24/7 accessible, lockable]	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Point of Common Coupling (PCC)	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Company pole number nearest to the proposed PCC	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Existing and proposed access road(s) including, at a minimum, road material, and dimensions at least 20' to confirm Company personnel and equipment access requirements are met (The access road must be adjacent to company equipment, equipment for new service must be located on private property [e.g. cannot have recloser/load break/meter along a street])	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Restricted access, fences, gates, and access controls	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Generator location	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	
Existing services	ESB756C 7.1.1.3 ESB756D 7.1.1.3	Required	Required	Required	

Standard Interconnection Application

Interconnection Application

- Required for all projects
- Requires all items on application review checklist to be filled out and submitted
- Application reviews are completed within 10BD

Application Requirements

- All submissions require a completed application form, application fee, Billing account number, system size, equipment assets, account location, site plan, line diagram, site control documentation tech sheet(s) and legal information document

- Larger projects could require additional forms such as: De-Rating Letters, Anti Islanding Forms, UL 1741SB Certificate, Load Rejection Overvoltage Letter. Projects with storage also require the Energy Storage Narrative and Energy Storage Checklist

- All required documents are detailed in the app review checklist

Commonly Missed Items Leading To Application Review Holds

- Document Discrepancies
- Billing Account Number
- Construction Work Request Number
- UL 1741SB Certificate
- Anti-Islanding Forms
- De-Rating Letter

Line Diagram Omissions:

- Inverter & interrupting device nameplate rating, relay settings, make, model, voltage and current rating
- Internal DG protective settings with redundant relay settings for inverters (Table 7.6.11.1-1, ESB 756)
- Missing Electrical Engineering PE Stamp
- Aggregate AC KW/KVA Ratings of entire proposed system

Site Plan Omissions:

- Point of Common Coupling (PCC)
- Company pole number nearest to the proposed PCC
- Access road notes that include road material, and dimensions of at least 20’ wide for necessary clearance requirements
- All equipment will be required to be grouped and will need to be approved by National Grid metering department before installation.

Application Review Guidelines

•Electric Service Bulletin (ESB) 756D

•National Grid will not provide transformers larger than 300kVA or when primary metering is least cost to serve option

•All commercial meters and disconnects need to be grouped together

•Existing metering located on a pad mounted transformer will be required to be relocated when applying for new stand-alone DG systems

•New MA SMART meter installations require disconnecting means on both the line and load side of the meter

•MA SMART systems over 500KW must be co-located with an energy storage system (ESS) that meets the requirements for an energy storage adder pursuant to 225CMR 20.06(1)(e). AC coupled projects require individual meters for the solar, ESS & a utility meter ahead of the entire system

•All final metering locations will be determined by the metering department and will be based upon existing service configuration

•All Expedited cases that need further study will need all the documentation required for Standard projects

• Final disconnect and meter locations should not be installed until National Grid has approved the location on site with the electrician

Screening

- Screening is **required** for Expedited and Standard projects
- Expedited projects require a screening review to be completed within 25 BD
- Standard projects require an initial review to be completed within 20 BD

Screening Checkpoints:

- Is the proposed PCC on a radial/Network System?
- Is the facility using UL1741 SB Listed equipment?
- Is the service configuration screen met?
- Substation back-feed screen met?
- If any of the screening checkpoints fail, National Grid may require further study before providing an Interconnection Service Agreement (ISA)
- Most proposed projects larger than 25KW on a 4KV Feeder and any projects on a network or non-effectively grounded system will require further study

Potential System Constraints That Lead To Further Study

- Ongoing Area Studies or Group Studies
- Challenging Feeders
- Hosting Capacity
- Feeder Reconfiguration
- Ungrounded Feeders, Non-Effectively Grounded Feeders and HT Lines
- Planned Substation Work
- Feeder Saturation

Screening Memo

Report is a sample and for illustrative purposes only

Screening Memo
Prepared by: Jorge Jorge

Revision Number: 0.0
Preparation Date: 10/17/2022

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Interconnecting Customer:	National Grid	Application(s):	Const. WR(s):
1000.00	kW(AC) Proposed Inverter Based Interconnection Project	Case:XXXXXX	XXXXXXXX
250.00	kW(AC) Proposed Battery Based Interconnection Project		
0.00	kW(DC) Proposed Battery Based Interconnection Project		
0.00	kW(AC) Existing Inverter Based Interconnection Project		
1250.00	Aggregate kW(AC) of Proposed and Existing Inverter Based Interconnection Projects		
Project Address:	939 Southbridge Street, Worcester MA, 01610		

Project & Site Information

I. Executive Summary:

A. The Interconnecting Customer has submitted an application for the interconnection of the generating system described herein to the National Grid (Company) Electric Power System (EPS). Reviewed as outlined in:

M.D.P.U. 1468 & National Grid's Electric Service Bulletin (ESB) 756 Appendix C

The application | requires | further study based on the results of this review.

Due to the complexity of your application, a study fee estimate will be established by our engineering team. This cost must be paid in full before National Grid initiates the impact study. The study agreement must be signed and returned within 15 business days of its issuance to the Interconnecting Customer. The impact study will be completed in 55 business days. An additional 5 business day maybe required if substantial modifications are required. The Company will inform the Interconnecting Customer about incremental study time after the Company commences the impact study.

Study Required Or Not Required

DSIS Cost Estimate If Progressing To Impact Study

II. The Company's Electric Power System (EPS):

A. Table of Information for Nearest Feeder

Feeder Number:	01-8W2	Radial or Network?	Radial
Feeder Rating (A):	527	Feeder Voltage at Substation (kV):	13.8 kV
Substation Name:	Vernon Hill	Distance to Substation (Circuit Feet):	~10,230'
Substation Transformer Number:	T2	Peak Feeder Load (estimated for past 12 months):	7.9
Substation Transformer Rating (MVA)	40		
Feeder Phase & Voltage at/near Site of Proposed DG:			
Voltage (kV):	13.8 kV	Feeder extension or upgrade required to serve the site?	No
Phase:	3Φ		

B. Is the existing service equipment compatible with the proposed generating system? Yes

Metering Type: Primary

C. Interconneted and In-Process DG

The following describes the interconnected and in-process DG on the subject feeder, as of the time of this report. Note that the following values are provided for informational purposes, based on the current status of the feeder and available information at the time of writing of this report, and are not binding.

Total Interconnected DG on the Subject Feeder:	7114	kVA
Total In-Process DG on the Subject Feeder:	369	kVA
Total Interconnected and In-Process DG on the Subject Substation Transformer:	13013	kVA

Total DG Exceeds Substation Transformer Rating: No

The combined interconnected and in-process DG, including this application, does not exceed the rating of the substation transformer. As a result, it is not expected at this time that a substation transformer replacement will be required.

Proposed Feeder & Substation Information

Screening Memo

Report is a sample and for illustrative purposes only

Screening Memo
Prepared by: Jorge Jorge

Revision Number: 0.0
Preparation Date: 10/17/2022

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D. Additional Interconnection Details

The Interconnecting Customer (IC) has proposed to install a 3Φ generating Facility.
Customer has proposed to interconnect onto customer owned pad mounted transformer with (See below)kVA rating.
-Actual point of interconnection to be determined.
*Please, refer to NGRID EPS diagram for the location of the nearest three-phase feeder.
*Final interconnection determination to be made during the Study.
- System modifications may be required.

Project Configuration Notes:
New MA SMART Stand Alone PV System that is proposing 3PH 13.8KV Primary Interconnection.

Site configuration includes interconnection behind new proposed utility loadbreak, recloser and primary meter. System equipment proposal includes: New system disconnect loadbreak, pad mounted recloser, one 1500 KVA 13.8KV To 600V Transformer and Four Yaskawa PV Inverters.

Utility & Site Equipment Layout Notes

*** Interconnecting customer must ensure that all service equipment will be suitable for the existing service characteristics and confirm equipment locations are approved before any installations.**
***All PV Meters and disconnects are required to be grouped with any existing metering. NGrid Metering department will approve of any taps or tap boxes and final location of all equipment.**

General Site Requirement Notes

*** Please note if your project intends to be over 1 MW, a PSCAD model and PSCAD Model Review payment will be required. Additionally, if you project intends to be 5 MW or above, a PSSE model and PSSE Model Review payment will be required ***
For further detail; Please refer to the 'Updated Model Requirements & ASO Initiation Timeline' document provided here: https://gridforce.my.salesforce.com/servlet/servlet.FileDownload?file=0156T00000GJcFN.

Additional Information For Possible Requirements Moving Forward

Screening Notes:
This application will be diverted to the Group Study process as project is proposing interconnection in an area with an open group study window. Group Study will encompass multiple applications and study the surrounding infrastructure and will determine:
- System Grounding Requirements (if required)
- System Relaying Requirements (if required)
- System Modifications (if required)

- Feeder 01-8W2 has hosting capacity
- Vernon Hill Substation 3V0 Is In Service
- This interconnection application has failed the risk of islanding screen
- This interconnection application has passed the substation feedback screen
- Any required construction costs will be developed during the conclusion of the Study Review

*This application is proposing to interconnect in the Worcester Study Area where there is an ongoing group study. This project will be placed on hold until the conclusion of the Group Study, where it could possibly be included in a new pending group study that will commence once the current group study concludes.

Screening Review Notes

Screening Memo

Report is a sample and for illustrative purposes only

Screening Memo
Prepared by: Jorge Jorge

Revision Number: 0.0
Preparation Date: 10/17/2022

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III. The Description of Interconnecting Customer's Facility:

The proposed design of the generating Facility described herein is subject to change based on the requirements identified by National Grid prior to the execution of the Interconnection Service Agreement.

A. Description of Generating Facility

The proposed 1250kW system consists of:

			UL1741 certified equipment		
Quantity	Manufacturer	Model	Generator Type	kWAC Nameplate	Phase/VAC
4	Yaskawa	Solectria XGI 1500-250-600	PV Inverter	250 KW/KVA	3PH/600V

Proposed Generating Equipment

Refer to the attached line diagram for system configuration and protection equipment details.

NOTE: UL 1741 SA certified equipment is required for interconnection/ during Commissioning - listing TBD.
*IC must ensure that the max. output power of the proposed system is limited to 1250kW AC PV - as proposed (1000kW AC PV + 0kWh DC coupled + 250kW AC coupled Battery Storage System)
*The system design capacity of the proposed system MUST not exceed nameplate rating as proposed.
*Note: "The Company reserves the right to disconnect the Facility if the output exceeds the nameplate rating".

B. Point of Common Coupling (PCC)

The point of common coupling (PCC) for this interconnection application will be the

Point where the customer-owned primary conductors connect to the company-owned conductors on the 'load' side of the primary metering. This interconnection project will be capable of exporting power beyond the PCC onto the Company's Electric Power System (EPS)

C. Corrections to Proposed Design

The proposed design documentation does not require corrections before the next step in the process.
Refer to the attached Customer Documentation Checklist for comments on the proposed design documentation.
Further design changes may be identified during the study (if applicable).

IV. Requirements:

A. General Requirements

1. In addition to any specific requirements identified herein, the Interconnecting Customer is required to comply with all applicable requirements described in the Interconnection Tariff & National Grid's Electric Service Bulletin 750 Series.
2. The Customer shall provide documentation from the inverter manufacturer for the islanding detection method to be used by the inverter(s). The documentation shall be sufficient to determine whether the islanding detection method is active (perturbing the utility system and looking for a response), or passive (monitoring grid parameters without perturbing the system), and describe how the islanding detection method functions, including what parameters (i.e. phase, frequency, VARs,) are perturbed and monitored.
3. The Company recommends installing surge arrestors on the Customer side of the Point of Common Coupling for the protection of Customer-owned equipment during possible overvoltage conditions.
4. The information provided herein is a non-binding report of existing National Grid electrical facilities in the area of your proposed project. This report shall not be used to infer the ability to interconnect any project to any of the existing National Grid facilities. That determination can only be made following National Grid completing the applicable review process as outlined in the Tariff.

Screening Memo

Report is a sample and for illustrative purposes only

Screening Memo
Prepared by: Jorge Jorge

Revision Number: 0.0
Preparation Date: 10/17/2022

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B. Specific Requirements

Other Requirements

The Interconnection Customer is responsible for all financial obligations related to the system modifications associated with the customer-applied new service/ upgrade under the Work Request Number: XXXXXXXX

V. References:

National Grid's Massachusetts Distributed Generation Website:
https://ngus.force.com/s/
National Grid's Electrical Specifications & Standards Website:
https://www.nationalgridus.com/ProNet/Technical-Resources/Electric-Specifications
National Grid's Stakeholder Information Website:
https://ngus.force.com/s/article/MA-DG-Stakeholder-Meeting-Information

Additional guidance documents and information can be found on the National Grid Distributed Generation Website.

Reference Links

VI. Attachments:

A. Interconnecting Customer's proposed design diagram(s) at the time of the review
B. Customer Documentation Checklist (if corrections have been identified)

--- End of main document - Refer to any attachments on the following pages ---

04

Standard/Complex

Jess Kosinski

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Interconnection Process Steps

- Pre-Application
- Application
  - Standard
- Engineering Review
  - Distribution System Impact Study/Detailed Study/Group Study
    - ASO Study by Affected System Operator (If Applicable)
- Interconnection Service Agreement (includes interconnection terms and conditions, including System Modifications and associated costs)
- Design
- Pre-Construction Requirements
- National Grid Construction
- Witness Test and Completion Documents/Photos
- Meter Installation
- Register Assets
- Authorization to Interconnect

https://ngus.force.com/s/article/MA-Complex-Standard-Application-Process

Standard Review Path for Independent Application

(non Group Study)

	Standard
Eligible Facilities	Any DG
Acknowledge Receipt of Application	3 business days
Review Application for Completeness	10 business days
Complete Standard Process Initial Review	20 business days
Send Impact Study Agreement / Invoice	5 business days
Study Agreement Execution and Payment	15 business days
Complete Impact Study	55 – 60 business days, or by mutual agreement depending on complexity
Complete Detailed Study (if needed)	30 – 60 business days, or by mutual agreement depending on complexity
Send Executable Agreement (ISA)	15 business days
Total Maximum Days	135 business days, 160 business days (if began as Expedited), 200 business days or more (if Standard Complex)
Construction Schedule	Varied
Witness Test	10 business days from the National Grid's approval of test procedures or by mutual agreement

Group Study Timeline

Timing*	Step Description
up to 40BD	Group Window
20BD	Scoping Meeting
10BD	Group members notify the Company as to whether they wish to proceed; non-response=withdrawal
2BD	Company provides notice to remaining Group members for opt-in to Extended Group Study
5BD	Group to provide Extended Group Study Consent Form with unanimous consent; non-response=no Extended Group Study
15BD	Company issues Group Study Agreements
15BD	Group members to each execute Group Study agreement and submit payment of fees. Group Study will not commence until full payment received from all members
100BD	**100BD:** Group study timeframe if the area contains equal to or less than 3 applications with an aggregate Nameplate Capacity of equal to or less than 10 MW and estimated aggregate System Modifications less than $1.5M. Study timeframe may be longer if the Group elects the Extended Group Study.
OR *125BD*	**125BD:** Group study timeframe if the area contains equal to or less than 5 applications with an aggregate Nameplate Capacity of equal to or less than 25 MW and estimated aggregate System Modifications less than $1.5M. Study timeframe may be longer if the Group elects the Extended Group Study.
OR *160BD*	**160BD:** Group Study timeframe if the area contains over 5 applications, over 25 MW of cumulative Nameplate Capacity, or any Group Study with estimated aggregate System Modifications $1.5M or more. Study timeframe may be longer if the Group elects the Extended Group Study.

**Denotes time after previous step completed, and is exclusive of any holds or ASO study requirements*

Timeline Cont..

Timing	Step Description
*~ 40-60BD***	Preliminary Assessment: high level Impact and associated thresholds
***	Group study potential hold pending developer decision and/or change submission
*ASO Study Assessment – **Study Hold** – ISO-NE Determines if ASO Study Required*	
Balance Distribution Analysis – DSIS reports delivered inclusive of document revisions required to proceed to ISA	
15BD	Customers to identify intent to proceed to ISA and address document deficiencies
*15BD – 35BD****	ISA draft/delivery
20BD	Customers to sign and return ISA
Timelines follow those in the Interconnection Tariff M.D.P.U. 1468	

*** Not a tariff requirement.* This is approximate timing of when Company expects to identify high level impacts and associated thresholds. This milestone could vary based on study duration.

**** Please refer to change process in the Group study provisions, without limitation Tariff Section 3.4.1.j).*

***** In accordance with Group Study timeframes in Tariff Section 3.4.1.i).*

Group Study Summary

Group Study Language: Link to DPU File Room

- Each Group member is encouraged to review the Group Study provisions (Tariff Section 3.4.1.) to understand the full scope of the process and requirements for the Group Study process.
- National Grid will provide visibility and communication in accordance with the Tariff
- Group members are responsible to understand individual responsibilities and process tasks that require Group consensus

Common Study Area

"…discrete portion of the Company EPS where [DG] Facilities may have cumulative impacts…"

Group

"…proposed Facilities…in a Common Study Area."

Group Study

"…single study that may be performed at the same time for a Group…"

Common System Modifications

- *"…System Modifications required for more than one Interconnecting Customer's Facility…"*

The summaries in this slide deck are not all inclusive of every tariff requirement applicable to a Group Study.

Group Study
References

- Group Study Website Link was updated: https://gridforce.my.site.com/s/article/MA-Distribution-Group-Study-Documents
- Monthly Group Study Status Report can be found on our MA Distribution Group Study Documents website
  - The purpose of this report is to provide status updates for each on-going Group Study, inclusive of ASO Study statuses and more visibility of expected timelines for certain milestones.
  - You can also find Group Study Forms, past meetings, resources, links, and CIP schedules within the Group Study Website
- A Group Study Status Map can be found here: https://systemdataportal.nationalgrid.com/MA/

ESS Timelines

- The Screening Memo will indicate that a distribution system Impact Study (DSIS) is required. If the ESS will be charging from the grid, the customers will be asked in the Screening Memo if they want to be studied in scheduled AND unscheduled operating modes under a mutually agreed upon timeframe of 95BD. If the study is to be performed based on a single mode of operation then the study will follow the typical 55BD tariff path
- For projects reviewed under the 95BD timeframe, a preliminary assessment will be provided around the 35BD
  - The preliminary assessment will provide information regarding available system capacity and estimated distribution System Modifications that are required under multiple operating scenarios for ESS projects
- Following the delivery of the preliminary assessment the project will be placed on a 10BD hold awaiting a response on how the customer wishes to proceed
  - Any design updates submitted by the customer beyond those necessary to reflect alignment with the decided path forward will be subject to the National Grid's policy on significant and moderate changes
  - Any design updates submitted beyond the 10BD time frame will be subject to National Grid's policy on significant and moderate changes
  - If no response is received, the project will progress as unscheduled at full nameplate
  - If document revisions are required, they will be requested at this point in the process as well
- DSIS proceeds in accordance with normal planning processes and engineering analyses, based on confirmed or updated operating methodology provided by the customer in the above step

Common Errors at Study/ISA Stage	
1	Legal Information Document needs to be completely filled out with all required information
2	The One Line diagram is required to have an electrical engineer PE Stamp
3	If a project includes ESS, ensure application reflects this equipment
4	Make sure storage charging/discharging capability is noted on the One Line
5	When case status is "Conditional Approval - Delivered - Pending Customer Decision", don't hit the "finalize submission" button unless you have uploaded the signed ISA.

Common Errors in Completion Documents

1	**Commissioning Test should consist of at least the following:** • Two (2) second shutdown when disconnect open test. • Five (5) minutes before restart when disconnect is closed test. • Confirm system matches As-built (include most recent revision date of as built provided). • List the inverter relay frequency • There are separate commissioning memos for SA vs SB rated inverters
2	**Pictures:** • Meter picture should show permanent plaque (visible at eye level) that includes a warning about generator installed. • If the AC utility disconnect switch is not grouped with and adjacent to the utility revenue meter, then a permanent plaque (visible at eye level) that clearly identifies the location of the AC utility disconnect is required.
3	**Qualifying Facility Documents:** • Schedule A (P-Rate) required for all QF projects. • W9 (Only for projects >60kW) • ACH (Only for projects >60kW) • Supplier Enrollment Form (Only for projects >60kW) • Asset Registration (Only for projects >60kW)
4	**As Built:** • Must be PE stamped (Electrical) and signed/ dated by person that performed the commissioning test.
5	**Evidence of Insurance:** • This is required for Expedited and Standard projects except for eligible Class I Net Metering facilities (see Tariff 11.1 (a) (iv) and (b)). Refer to the ISA and Tariff for insurance requirements

Standard Review Path Reminders

- DSIS, Detailed Study (if required), and Group Study (if required) will determine the electrical impact on the National Grid's distribution electric power system (EPS) with the required system modifications and associated cost.
- All projects greater than 1 MW will require ISO-NE I.3.9 Submission for ISO-NE approval regardless of whether an ASO Study is required. This submission will take place within the DSIS. Once submitted, the DSIS will be placed on an ASO hold until the ISO-NE provides approval and/or the ASO study (if required) is complete.
- If substation modifications are required, National Grid has 60BD for study. If estimated construction cost are greater than $1M, study timeline could be by mutual agreement. Notified at 20BD review.
- ISA will have the estimated construction timeline and is provided after study is complete. If Detailed Study is required, the customer may request an early ISA, which will not have a construction timeline.
- Under the Tariff, 1st ISA payment (sometimes referred to as CIAC) is due within 60BD and CIACs do not have a cure period. Failure to make timely payments will result in application withdrawal.
- Design begins after 1st CIAC payment.
- Easements, permitting, Right of Way (R.O.W.), etc. begin after design and are required to move into construction.

Metering Reminder

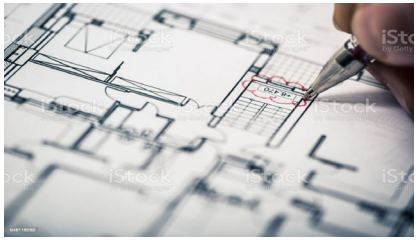
- No equipment (adapters) between the meter and the socket or in a meter socket
- Meter sockets are not allowed to be used as junction boxes
- Projects greater than 60 kW in MA require interval metering (wireless or phone line)
- Make sure test meter is removed from generation meter socket
- A 4G wireless signal test on a Verizon network is required in order to provide wireless metering
- Phone lines must be dedicated and terminated at the meter location. Line must be 100% copper. Fiber lines will not communicate properly.
- These meters are long lead time items and prep time can be 10-12 weeks, so it is important to work through this with your job owner well in advance of when you intend to seek Authority to Interconnect.
- Wireless test form: https://ngus.force.com/s/article/MA-Interconnection-Documents

Witness Test & Completion Document Reminders

- Most recent checklists on nCAP: https://ngus.force.com/s/article/MA-Interconnection-Documents
- Documents can be approved in advance, but all must be provided before review can begin.
- For any specific questions, please reach out to your account manager.
- Witness Test Checklist
  - Include pictures of nameplates.
  - All checklist requirements must be approved and both National Grid and customer construction (including municipal approval) must be completed prior to scheduling a Witness Test.
- Compliance Document Checklist
  - Asset registration is required as part of compliance documents.
  - National Grid applies for asset registration on behalf of the customer; typically takes 5-10 BD.
  - All incentive projects (e.g., Qualifying Facility / Net Metering) >60kW require asset registration with ISO before ATI is granted because we cannot backdate payments.
  - Behind-the-meter Class II/III Net Metering and Demand Response systems are exempt from being registered as a Settlement Only Generator with ISO.
  - If AC ESS Standalone system is generating power to the EPS, it needs to be registered separately with ISO.

Document Revision & Restudy Reminders

- A Change Request form will need to be completed and submitted in addition to any documents supporting the change (one lines, site plan, etc.). Form can be found on the Interconnections Documents website https://gridforce.my.site.com/s/article/MA-Interconnection-Documents
- Whenever new one lines or site plans are submitted, all changes (including text changes) should be clouded, and the revision block (including the rev # and dates) should be updated
- One lines and site plans need to have the PE stamp, as per ESB 756.
- If making changes after study has been finalized, the customer needs to inform National Grid of changes via Change Request button on the portal & provide revised documents to determine if restudy would be necessary. Restudy will have associated study costs and timelines.
- Restudies can cause impacts to project costs & timelines, even if the scope of work doesn't change. Please refer to the moderate/significant change guidance prior to submitting your change. https://ngus.force.com/servlet/servlet.FileDownload?file=0156T00000FLhJr
- If an ISA has already been executed, National Grid's design/construction process may be put on hold (as determined by the Company) for the duration of the restudy and until an ISA amendment has been fully executed. Re-evaluation of the construction schedule may be necessary and will be determined during the restudy.



Important Target Dates for Interconnecting Customer Requesting EOY Interconnection

By October 1st	**Submit the following documentation:** • Witness Testing Documents - (including but not limited to) proposed Witness Procedure, Energization Plan, all other applicable witness test documentation as outlined in the Witness Test Checklist that can be found here: https://gridforce.my.site.com/s/article/MA-Interconnection-Documents • Witness Test Checklist updated as of 08/12/2024 • Wireless Meter Test form OR Meter Phone Number (as applicable)
By November 15th	**1. Complete distributed generation facility construction** **2. Submit all outstanding documentation** • All Completion Documentation must be submitted prior to National Grid for review

Meeting these target dates does not guarantee EOY interconnection for your facility, however it does give National Grid a better opportunity to meet your request. These target dates have been established based on the Company's experience with delays to EOY processing including:

- Necessary engineering review of initial plans and documentation as well as multiple subsequent reviews and communications with Interconnecting Customer as necessary to achieve the Interconnecting Customer's compliance with the requirements
- Queueing and resource allocation for both witness testing scheduling and meter installations
- Fewer processing days due to state holidays and weather conditions (when they result in force majeure)
- Required registration with the ISO-NE that must be processed prior to ATI and Interconnecting Customer delay in starting the registration process in a timely manner.

The Interconnecting Customer's planning and cooperation is essential to this process. Please keep in mind that Authorization to Interconnect will not be issued until the Interconnecting Customer has satisfied all interconnection requirements (including, without limitation, the wiring inspection, all Compliance Documentation, the Witness Test, and ISO-NE Registration) and the required meter is installed.

Additional information and resources to assist you in this process can be found at https://ngus.force.com/s/article/Submitting-Witness-Test-Documents. If you have any questions, please contact the CEI job owner assigned to your project.

05

Fulfillment of ISO-NE's I.3.9 Requirements

(Includes ASO Study Process)

Jess Kosinski

nationalgrid

Overview

PSCAD / PSSE Model Requirement:

To assist the Company in complying with ISO-NE modeling requirements; PSCAD models and model review payment are required for all systems over 1 MW, and PSSE models and model review payment are required for all systems 5 MW and above, regardless of ASO Study requirements.

ISO-NE I.3.9 Approval Requirement:

All proposed projects > 1MW are required to receive ISO-NE I.3.9 approval of either a Generator Notification Form (GNF), or a Proposed Plan Application (PPA). An ASO Study may be needed prior to meeting this requirement.

Process for Providing Approved PSCAD/PSSE Models

1. Initial Model Request:

- Model and Model Review Fee will be formally requested from the Customer when their Interconnection Application's screening is complete. Customers will be invoiced in full for the model review. Models will not be reviewed until payment has been received.
  - Costs cover 3 attempts for each discrete model submission. Fundamental design or equipment changes, including inverter changes, would be considered a new model, and thus charged accordingly**. If there are still model deficiencies identified after the third review, the Customer will need to submit additional payment for further model review.**

2. Initial Model & Payment Submission:

- Required Models and Model Review Payment are *expected* to be initially submitted **within 30 BD of the initial request**. It is very unlikely a model will be considered working/approved after an initial submission, so submitting the required models and payment as soon as possible will ensure there is enough time for multiple rounds of revised model submissions and additional engineering reviews before the **Model Approval Due Date**.

3. Model Approval Due Date:

- The Model Approval due date will be determined upon the start of the Impact Study or Group Study. *Please note this is the date the model must be approved, not submitted for the first time.* The Model Approval due date also aligns with when the individual project or Group Study is expected to go on hold for ASO Determination because ASO Determination cannot be made without the required approved models.
  - **Failure to provide an approved model by the Model Approval Due Date will result in the project being subject to withdrawal from the interconnection queue and must reapply if they wish to proceed**.

Process for Receiving ISO-NE I.3.9 Approval

- **All proposed projects > 1MW are required to receive ISO-NE I.3.9 approval of either a Generator Notification Form (GNF), or a Proposed Plan Application (PPA).**
- **Prior to receiving that approval, ISO-NE must determine if any proposed project that is greater than 1 MW, but less than 5 MW requires an ASO Study. All projects 5 MW or greater automatically require a Comprehensive ASO Study.**
- **In the event an ASO Study is required, the ASO Study must complete prior to receiving ISO-NE I.3.9 approval. ISO-NE ASO Study Determinations are made on a monthly basis.**

When to Request ISO-NE's ASO Study Determination

In order to receive ISO-NE's ASO Study Determination, a project or Group Study must have confirmed transmission injection points, and all required models must be approved. A project's DSIS will be placed on hold for ASO purposes when transmission injection points are identified via engineering.

Study Type	Targeted ASO Study Determination Timeline (& Targeted Model Approval Due Date)
100 BD Group Study	**65 BD**
125 BD Group Study	**80 BD**
160 BD Group Study	**105 BD**
55 BD Individual System Impact Study	**35 BD**

Customers with models outstanding or models that are not fully approved by the date transmission injection points are identified will be subject to withdrawal from the interconnection queue and must reapply if they wish to proceed.

Process for Receiving ISO-NE I.3.9 Approval
(continued)

Once ISO-NE's ASO Study Determination has been made for a project, the Customer will be notified via the Company of that determination and next steps.

ISO-NE Determines an ASO Study is *NOT* Required

If ISO-NE determines that no ASO Study is required, the project will be presented, as a Generator Notification Form (GNF), at the next monthly NEPOOL RC meeting for I.3.9 approval. About 1-3 weeks following the meeting, a formal ISO-NE i.3.9 approval letter is received by the Company.

If the project is not part of a Distribution Group Study, the DSIS can resume once the ISO-NE I.3.9 approval letter has been received by the Company.

If the project is part of a Distribution Group Study, the Distribution Group Study will remain on hold until the Company has received a formal ISO-NE I.3.9 approval letter for ALL >1MW applications in the Group Study.

Process for Receiving ISO-NE I.3.9 Approval
(continued)

ISO-NE Determines an ASO Study *is* Required

If ISO-NE determines a project requires an ASO Study, then an ASO Study will be required prior to the project receiving ISO-NE I.3.9 Approval. The Customer will be informed of this determination and next steps.

Remember; projects that are 5 MW or greater *automatically* require a Comprehensive ASO Study.

Pre-ASO Study Commencement

Prior to an ASO Study being able to commence, all other ongoing ASO Studies and/or FERC Studies within the same electrical area must be complete. Once there are no ongoing ASO Studies or FERC Studies taking place within the same electrical area, ASO Study commencement preparation can begin. These pre-commencement steps typically take about 30-60 BD. This includes:

1. Finalizing ASO Group (if more than one >1MW project within the same electrical area)
2. Finalizing Scope with ISO-NE
3. Finalizing ASO study costs
4. ASO Study Invoicing (15 BD to make payment from invoicing date)

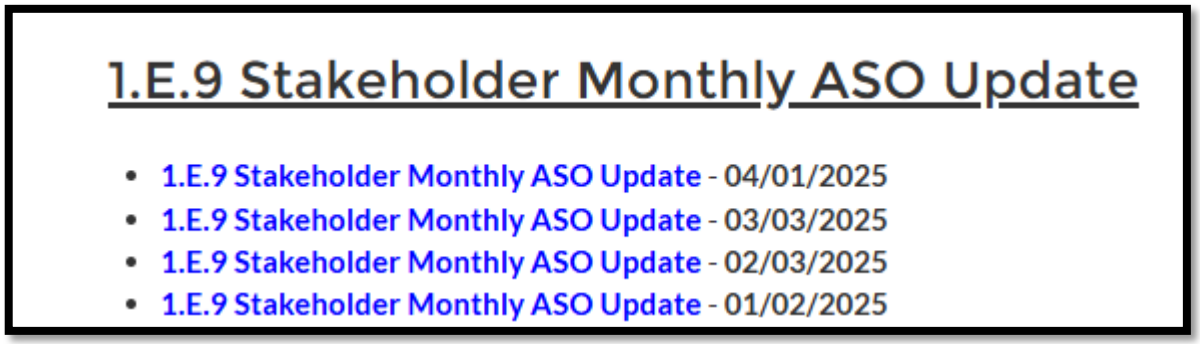
Once all ASO Study payments have been received, then the ASO Study can officially commence.

Process for Receiving ISO-NE I.3.9 Approval
(continued)

ASO Study In-Progress

- Once the ASO Study has officially commenced; expected completion timelines are based on the level of ASO Study being performed.
  - **Non-Comprehensive ASO Study:** 1-4 months to complete
  - **Limited Comprehensive ASO Study:** 4-6 months to complete
  - **Full Comprehensive ASO Study (level III):** 6-12 months to complete

- Comprehensive ASO Study updates are published monthly on the *MA ASO Updates* knowledge page, via the 1.E.9 Stakeholder Monthly ASO Update report.



Process for Receiving ISO-NE I.3.9 Approval
(continued)

Completion of an ASO Study

Upon ASO Study completion, projects included will be presented, as a Proposed Plan Application (PPA) *(for Comprehensive ASO Studies)* or GNF *(for Non-Comprehensive ASO Studies),* at the next monthly NEPOOL RC meeting for I.3.9 approval. About 1-3 weeks following the meeting, a formal ISO-NE I.3.9 approval letter is received by the Company.

If the project is not part of a Distribution Group Study, the DSIS can resume once the ISO-NE I.3.9 approval letter has been received by the Company.

If the project is part of a Distribution Group Study, the Distribution Group Study will remain on hold until the Company has received a formal ISO-NE I.3.9 approval letter for ALL >1MW applications in the Group Study.

Project Changes after ISO-NE I.3.9 Approval Letter is Received

Certain project changes made after an ISO-NE I.3.9 Approval Letter has been received would trigger the following:

Project Change *(not limited to)*	Trigger
Inverter Changes	New PSCAD / PSSE Model (including review costs)
PV / CHP / BESS (including kWh) Size Increases	Revised ISO-NE ASO Study Determination & Revised GNF or PPA Submission
PV / CHP / BESS (including kWh) Size Decreases	Revised GNF or PPA Submission
Addition or Removal of a DC or AC Coupled BESS	Revised ISO-NE ASO Study Determination (only if increasing total max export) & Revised GNF or PPA Submission
Site Address Change	Revised GNF or PPA Submission
Transmission Injection Point Change	Revised ISO-NE ASO Study Determination & Revised GNF or PPA Submission
Withdrawal	Withdrawal of GNF or PPA

ASO References, Reports, Resources

MA ASO Updates Page

- **I.E.4 Stakeholder Bi-Monthly Report**
- **I.E.6/E.7 Notices of Potential ASO Study and Bi-Weekly Update**
- **I.E.9 Stakeholder Monthly ASO Update**

MA Interconnection Documents Page

- **Model Review Requirements & ASO Initiation Timeline**
- **Guidelines: PSCAD and PSSE Models**
- **ASO Impact Screen**

MA Distribution Group Study Documents Page

- **Monthly Group Study Status Report (includes ASO information)**

National Grid – MA System Data Portal

- **Group Study Map (includes ASO information)**

MA Standard DG Process Steps

- **Pre-ISA Process Map:** Flow of a 55BD or 95BD DSIS to ISA delivery and initial payment of system modifications (includes ISO-NE's I.3.9 requirements for >1MW applicants, which may include an ASO Study)

06

Post Connection & Incentive Program Support

Alex Bellavia

nationalgrid

Connected Customer Requests

Who can submit Connected Customer request?

Any party that is a stakeholder (such as billing customer or system owner) can submit a connected customer request. Please note that information or changes to the system will not be honored without proper authorization from the billing customer and/or system owner.

What type of requests should be submitted?

DG Billing Inquiries

- Why haven't I received my bill?
- Why am I getting multiple bills?
- I don’t see my incentive credits

Credit Allocation Inquiries

- How do I change my allocations?
- I don't know my meter number?
- Why haven't the transfers gone out?
- Can I get a transfer history?

Transfer of Ownership

- Follow the steps outlined in the knowledge page

Power Quality / High Voltage

- We are seeing constant spikes in our data
- Our generation is not matching your generation
- Our project is tripping off-line several times a week

Credit Allocation Change Requests

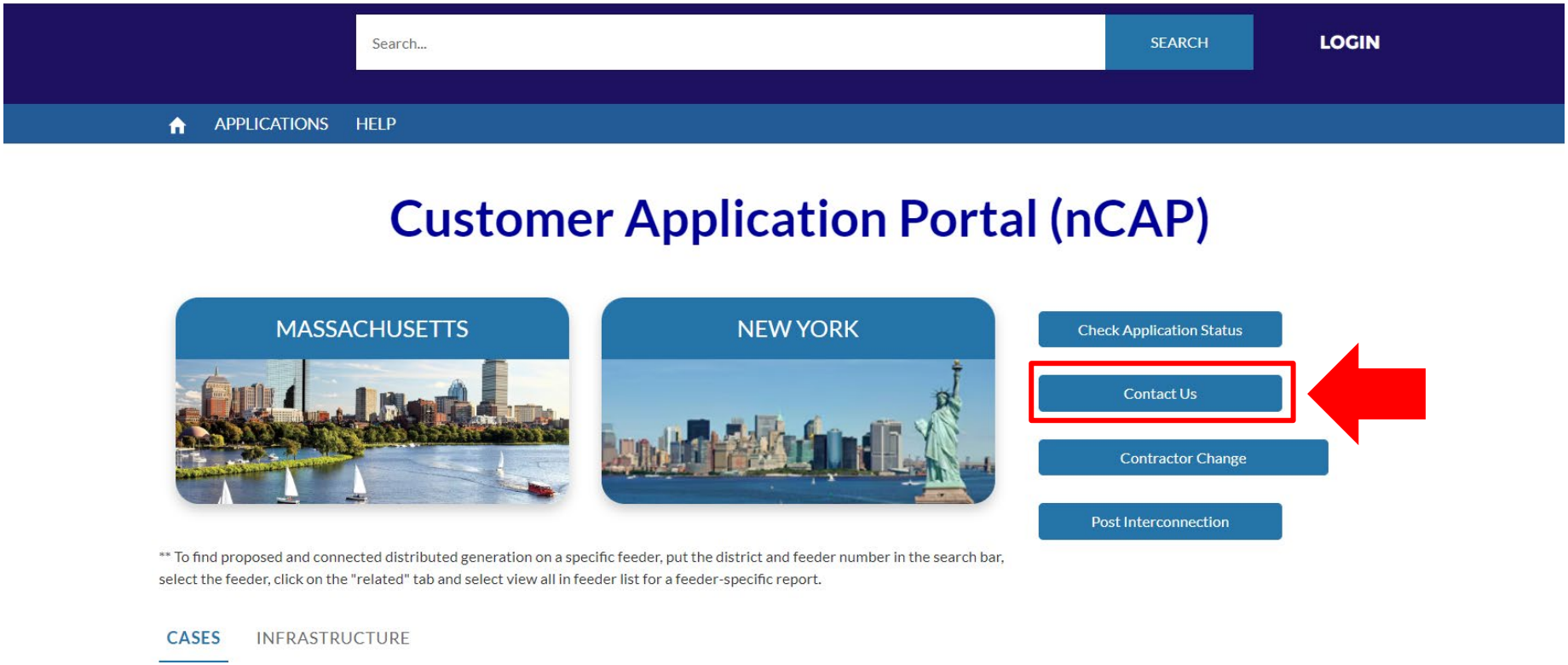
Other Post Interconnection Inquiry

- I need to update my mailing address
- I would like to add this to my billing portal
- I would like to expand my system what are the steps?

System Terminated / Decommissioned

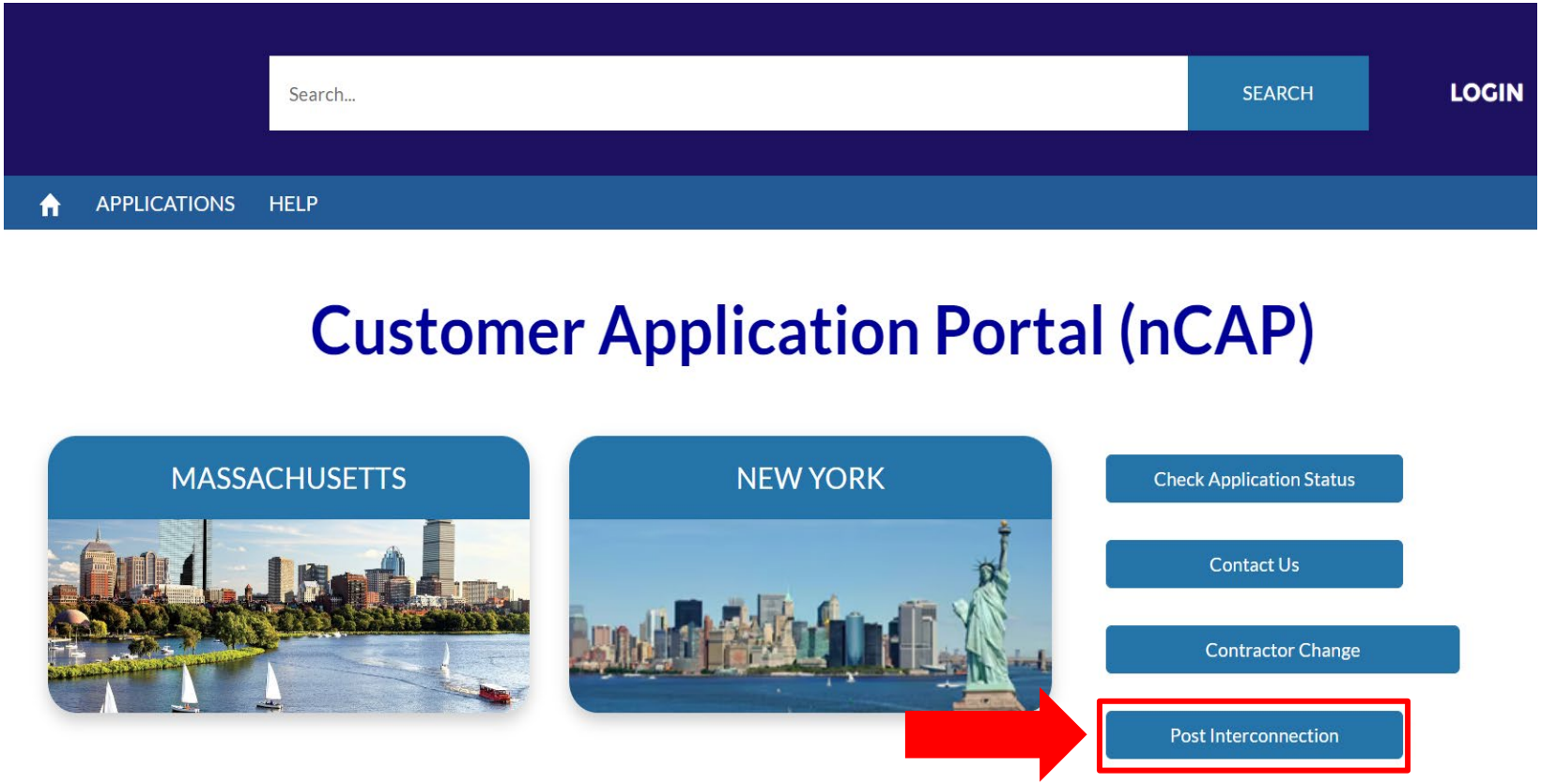
How to submit a DG Inquiry

Go to: https://gridforce.my.site.com/s



Where to find allocation change forms

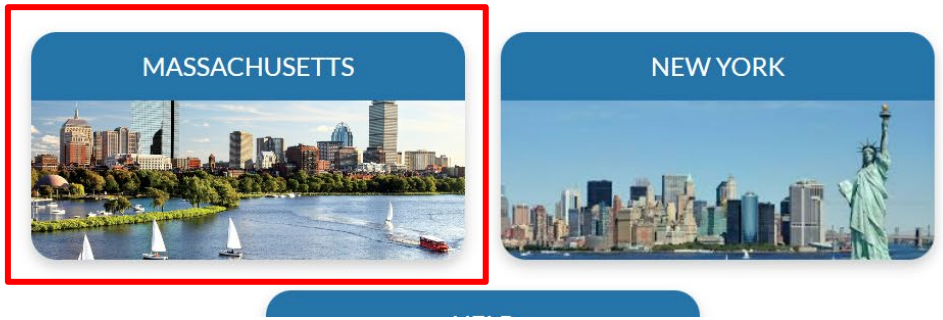
Go to: https://gridforce.my.site.com/s

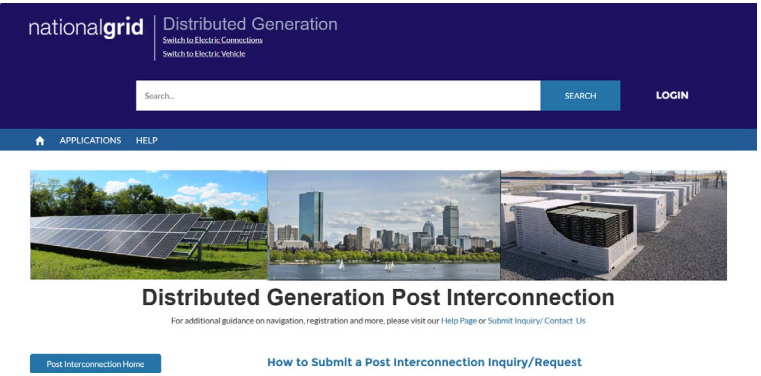


Where to find allocation change forms (pt 2)

Distributed Generation Post Interconnection

For additional guidance on navigation, registration and more, please visit our Help Page or Submit Inquiry/ Contact Us





How to Submit a Post Interconnection Inquiry/Request

Guidance on how to submit a distributed generation post interconnection inquiry or request through the Post Interconnection Inquiry form

Massachusetts DG Billing Inquiry

Knowledge and helpful links for all distributed generation billing inquiries, including meter readings, data analysis, and first bill walk throughs. Billing inquiries will assist in understanding and answering any issue you may have with your distributed generation bill.

Massachusetts Transfer of Ownership

Knowledge of how to submit a transfer of ownership for a distributed generation project. Transfer of ownership payment information should be submitted through this request. Required documentation for specific incentive programs, types of projects, and definitions of roles are explained to provide additional guidance.

Massachusetts Credit Allocation Change Request or Inquiry

Knowledge and helpful links on credit allocation change requests, including access and guidance on which documents need to be submitted based on the project's incentive program.

Massachusetts Other Post Interconnection Inquiry

If your inquiry does not fall into the pre-defined topics, submit your inquiry using Other Post Interconnection Inquiry topic.

Credit Allocation Change Information

- **National Grid allows up to 6 credit allocation change requests per year, in addition to accepting "removal" and "swap" forms (where a single account number is removed or replaced, with no further changes to other allocation accounts or percentages on the form) as needed.**

- **Under both the SMART Provision (MDPU 1574) and Net Metering Provision (MDPU 1578), National Grid will carry forward any remaining credit balance on a customer account, except for Alternative On-bill Credit (AOBC) customers in SMART and Cap Exempt Facilities Serving On-site Load (CEFSOL) customers in Net Metering, who will have the option to cash-out excess balances each fiscal year. Carrying forward of credit balances applies to both host customers and recipients.**

- **If a recipient account closes before bill credits generated during a billing period are allocated to it, the allocated percentage will remain on the host customer's account.**

Credit Allocation Change Forms

Net Metering – Complex and/or MA SMART + Net Metering

Please submit the Schedule Z form and the Schedule Z Excel
Please fill in only blanks on Excel document, do not alter the excel sheet in any way.

Net Metering – Account Removals/Swaps (no change to % of credit allocations)
Please submit the Account Removal form
Please submit the Swap form

If you are closing your account and would like National Grid to apply your balance of bill credits to another account, you may use a One-Time Transfer form. Request must be from the customer (host or recipient) closing account.

- **To transfer to a single account please use the One Time Transfer Form**
- **To transfer to multiple accounts please use the One Time Transfer Form for Multiple Accounts**

***** Credits can only be transferred within the originating accounts load zone.***

******Accumulated credits on a satellite account are only allowed to be transferred when the satellite account is in a final status.***

*******National Grid is otherwise not permitting OTTs for Net Metering customers***

MA SMART – ALTERNATIVE ON-BILL CREDIT

Please submit the AOBC (Alternative On-bill Credit) form

Portal Post-connection & Regulatory Resource Hubs

https://gridforce.my.site.com/s/article/MA-BUSINESS-Net-Metering

https://gridforce.my.site.com/s/article/SMART-Solar-Massachusetts-Renewable-Target-Program#Documents

https://gridforce.my.site.com/s/article/Massachusetts-Incentive-Document

Important Reminders for Interconnected Customers

Outage notifications for DG Facilities require updated emergency contact information. Please be sure to notify National Grid **if** or **as** your emergency contact information changes!

My Business Account is available for commercial customer billing.
Access My Business Account here

Our Solar hub is now live - read about everything solar and view sample bills per project type

Physical Changes to Connected Projects

- **Customers seeking to make changes to Connected Projects should submit a DG Inquiry Case via the Contact Us button in the Portal.**
- **The Case will be reviewed and routed to an Account Manager who will guide you through what is needed based on the changes or upgrades you are requesting.**
- **Management of the ask will take place in the Portal either on the original Case or a new one that will be created by the Account Manager.**
- **Only non-Significant Changes can be handled this way. Significant changes will require a new Application.**
  - Example of a non-Significant Change: inverter updates/replacements at the end of their warranty period or natural life cycle
  - Example of a Significant Change: Adding batteries to a connected solar project
  - If unsure if the change is Significant, submit the DG Inquiry Case and NG will advise
- **Age of projects and nature of the ask will drive cost and timeline**
  - A study or review from engineering may be required
  - A Witness Test may need to be performed

Do not make changes to Connected Projects without informing National Grid. Alterations that invalidate the ISA may force a project to be disconnected until corrections are made.

07

Portal Moment

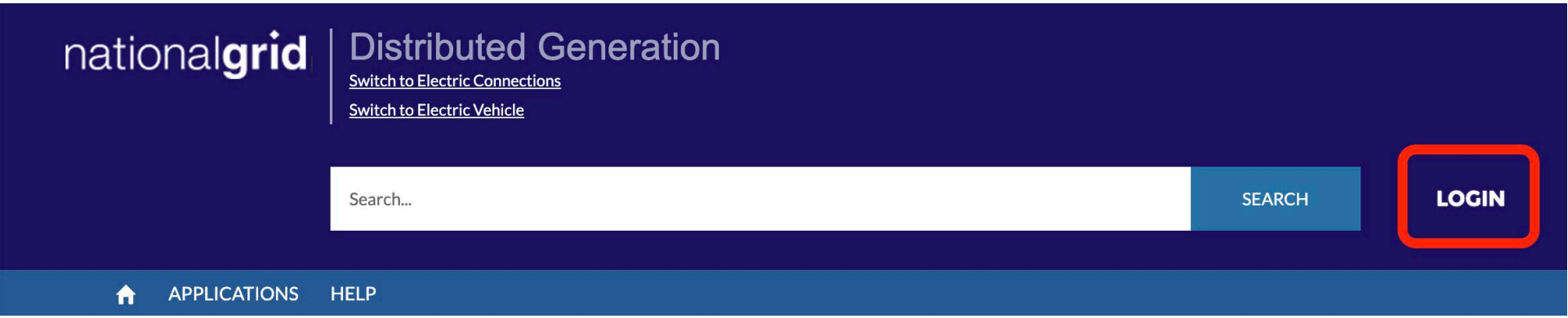
Kara Nail

nationalgrid

Portal Registration

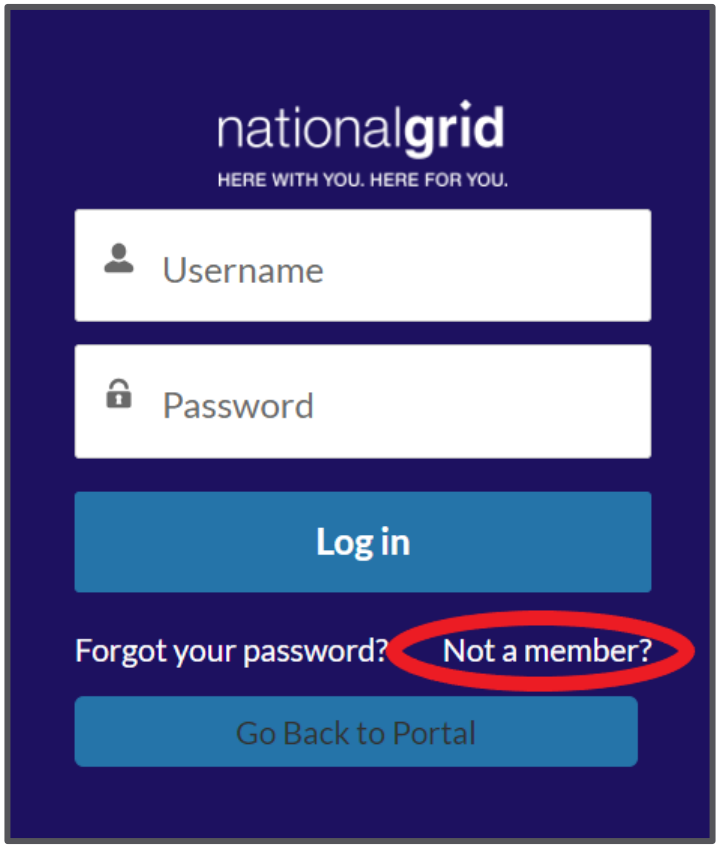
https://gridforce.my.site.com/s/homepage

To start the registration process, click the Login button

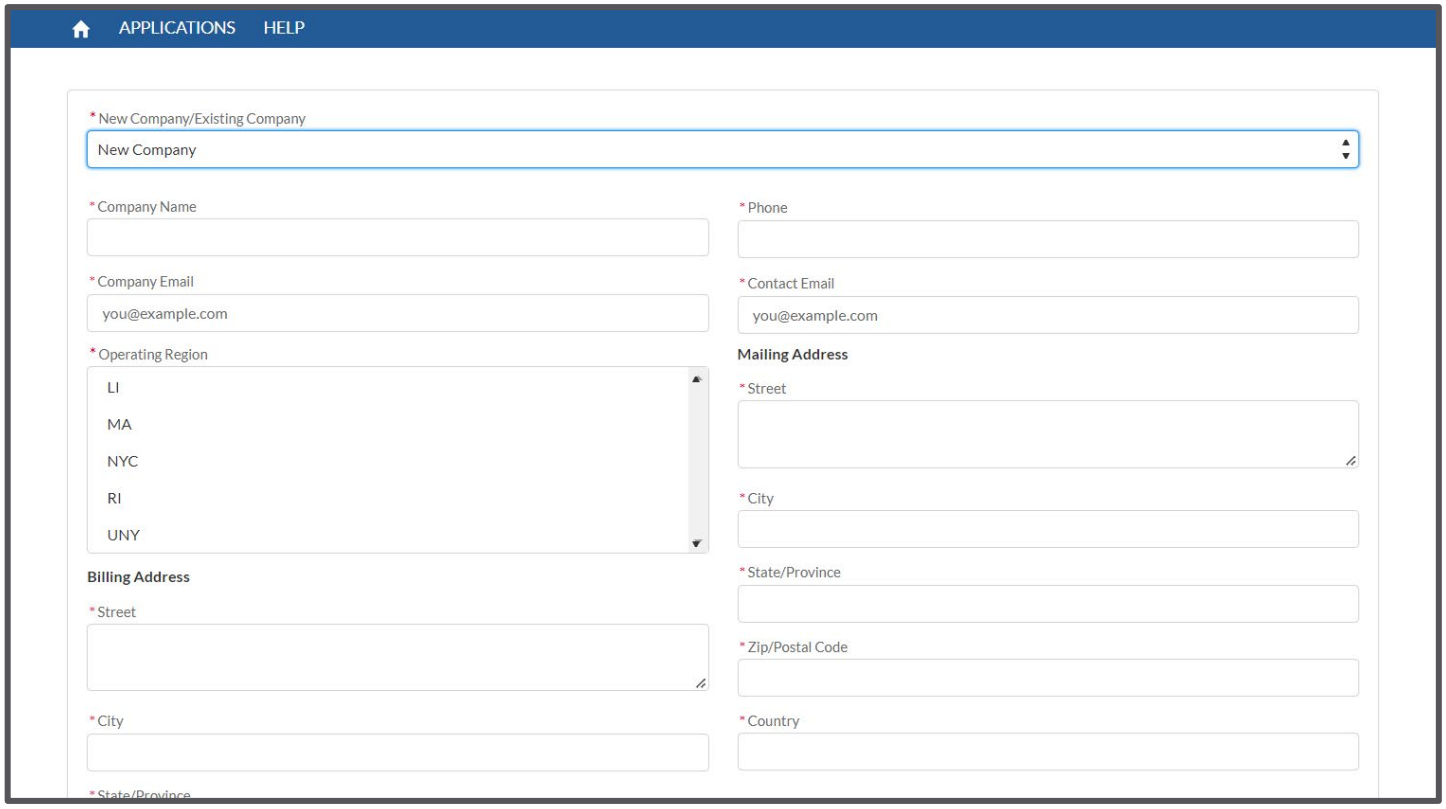


Customer Application Portal (nCAP)

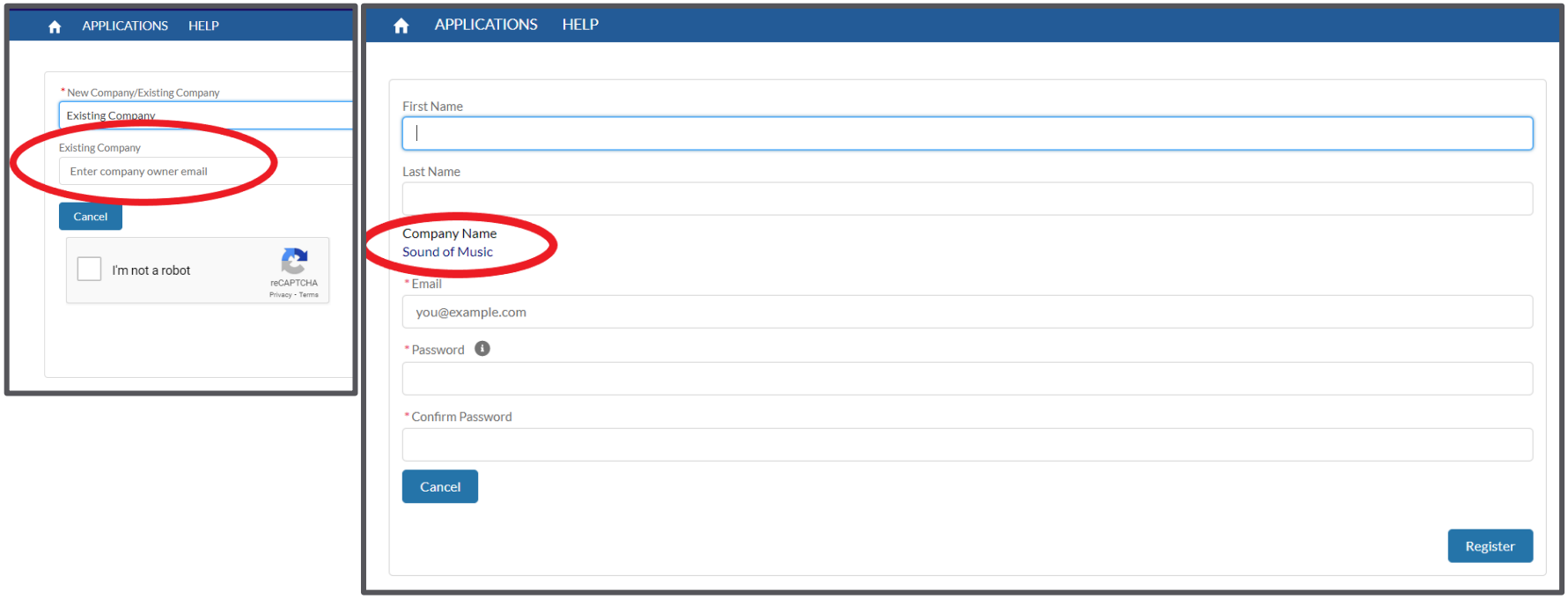
Portal Registration



Portal Registration – New Company



Portal Registration – Existing Company



Company Admin Responsibilities

Customer Application Portal (nCAP)

New Application

Check Application Status

Manage Contacts

Contact Us

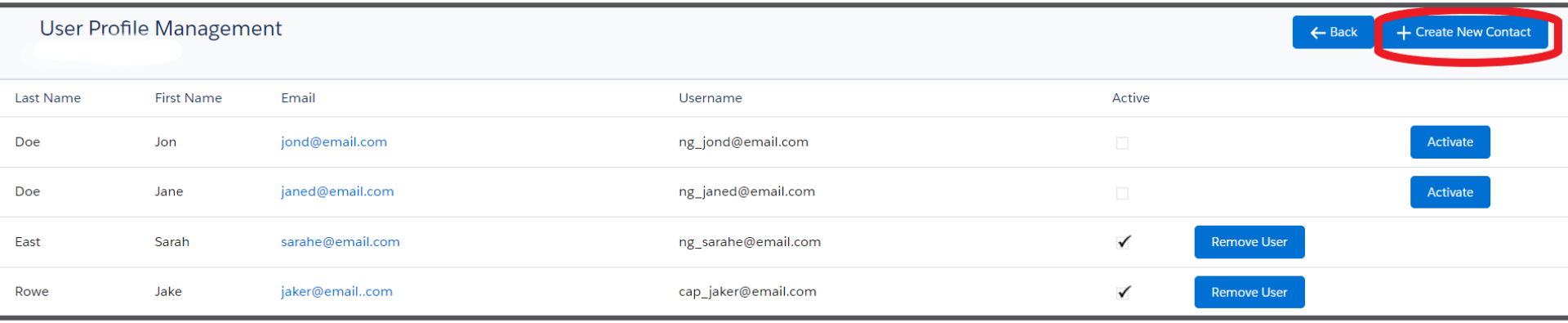
Contractor Change

Post Interconnection

** To find proposed and connected distributed generation on a specific feeder, put the district and feeder number in the search bar, select the feeder, click on the "related" tab and select view all in feeder list for a feeder-specific report.

Invite a new Portal user

To add a user, click the upper right-side button “Create New Contact”

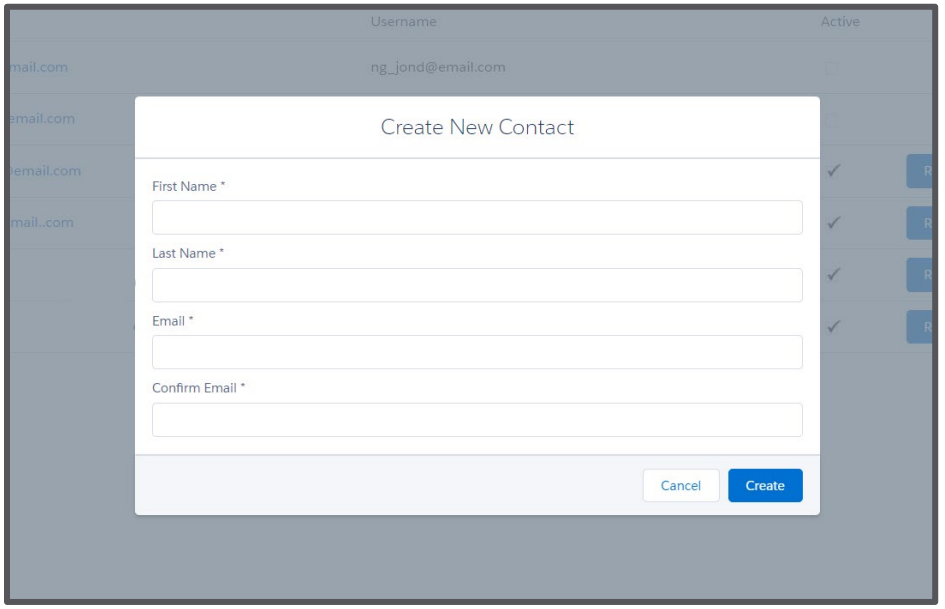


Invite a new Portal user

A new screen will pop up, allowing user to place the information of the new user in the appropriate places:

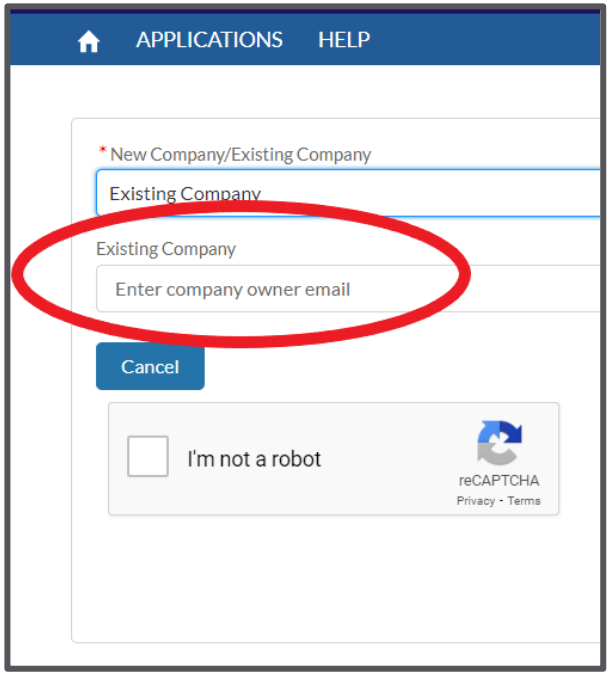
Once that has been completed, click “Create”.

The invitee will receive an invite to complete the Portal registration.

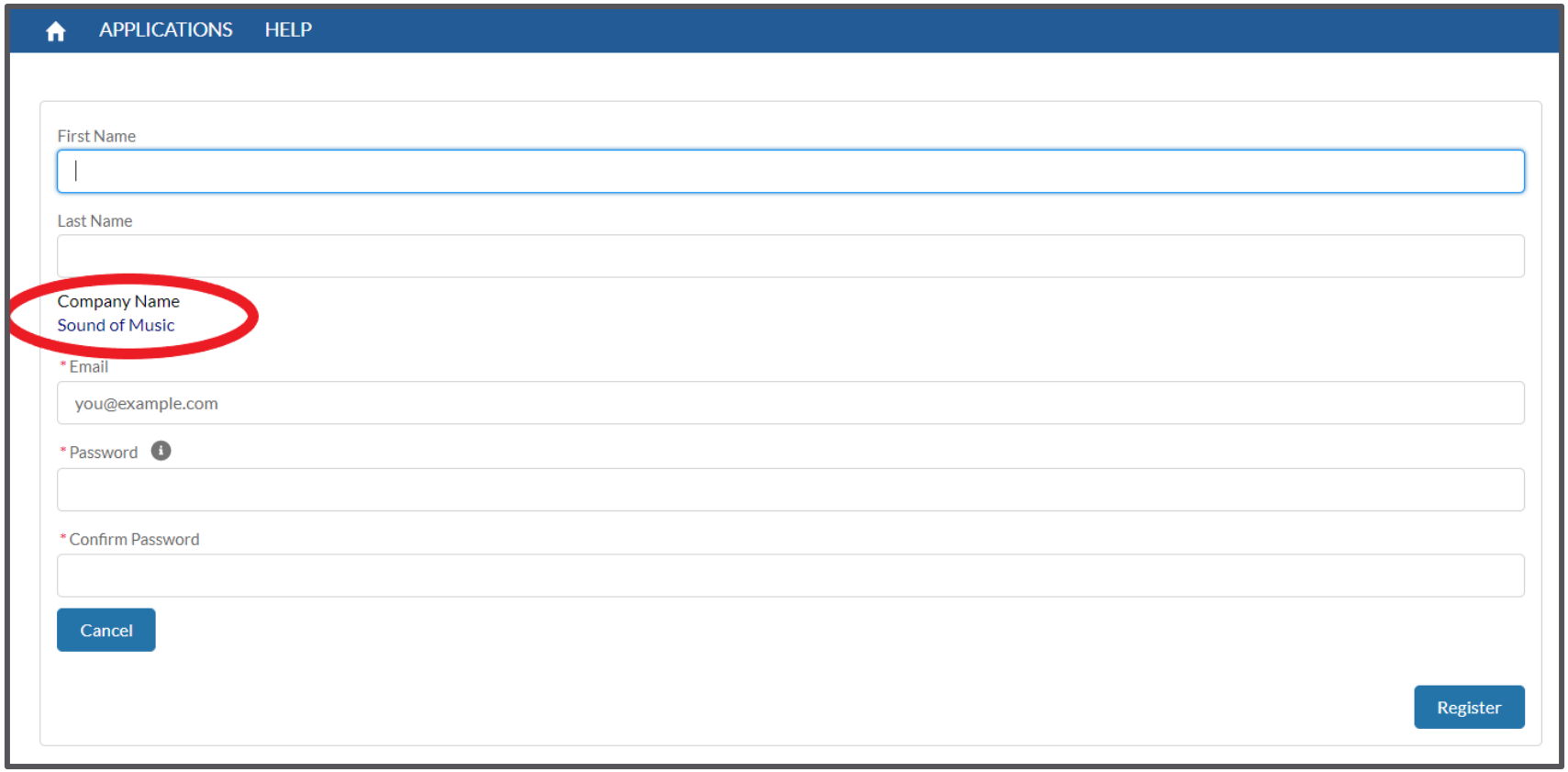


Portal Registration – Existing Company

New users with an Existing Company can also register without having an invite.

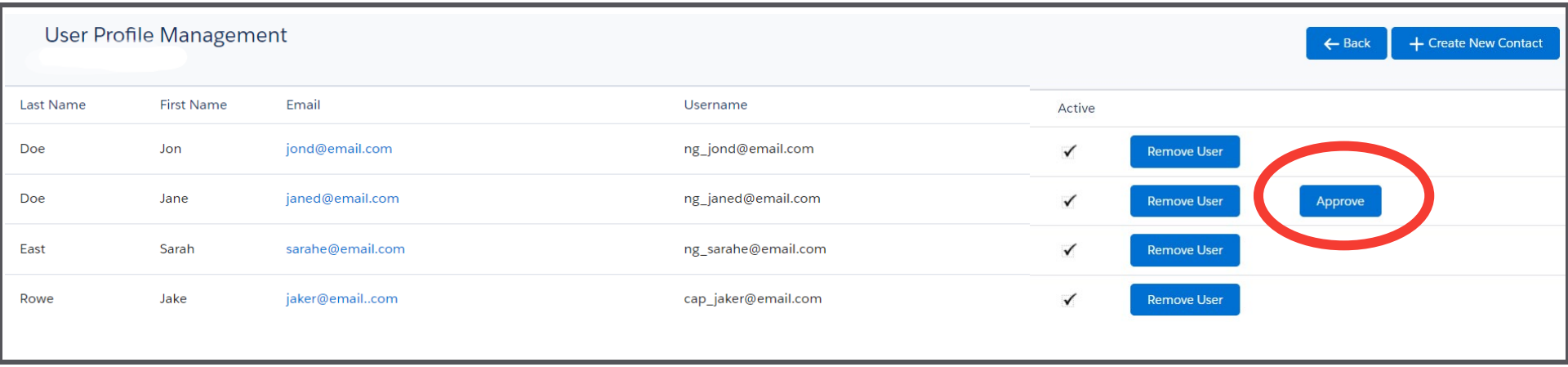


Portal Registration – Existing Company



Approve a new Portal user

When a new Portal user registers without an invite, the Company Admin will need to click the Approve button.



Remove a Portal user

To remove/deactivate a user, locate that user on the User Profile Management Page and click “Remove User”

Activate a new Portal user

To reactivate a user, locate that user on the User Profile Management Page and click “Activate”

Standard DG Process Steps: Click Here

Standard DG Process Steps

This knowledge page is to provide resources and guidance specifically for MA Standard DG applicants in the queue that have submitted an application and will follow the Independent Distribution System Impact Study (DSIS) path.

Apr 10, 2025 DG Documentation

ARTICLE BODY

MA Standard DG Process Steps

from Application to Interconnection

The process documents below will provide guidance on action items for each nCap Portal (Salesforce) case status from the point that a customer application is submitted up to when the project interconnects.
*Please note: If your project is following the Distribution Group Study process path, please refer to the **MA Distribution Group Study Process Steps page** (coming soon) for step by step documents and process map .*

Process Maps

1. Pre-ISA Process Map **(PDF):** Flow of a 55BD or 95BD DSIS to ISA delivery and initial payment of system modifications (includes ISO-NE's I.3.9 requirements for >1MW applicants, which may include an ASO Study)
2. Post-ISA Process Map **(PDF):** Flow of process steps from once Design is initiated to when the project interconnects *(coming soon)*

Process Step Documents per Case Status

1. Application - Draft / Submitted / In Review **(Webpage):** Customer Application submitted

2. Screening - Complete - Pending Customer Decision **(PDF):** NE Complex Customer Decision Form and initial PSCD/PSSE Model request for >1MW projects

3. Study - Draft [*Includes* Study - Submitted] **(PDF):** DSIS Agreement and Invoice [*Includes* Customer Signature and Payment]

4. Study - In Progress - Start Study **(PDF):** DSIS Commencement

5. Study - In Progress - Initial Review **(PDF):** Initial Review updates provided. (may include status **'Study - Hold - Study Hold'** if document revisions are requested)

6. Study - Hold - ASO Hold: Only needed if max export of proposed system or proposed aggregate system is > 1 MW, because ISO-NE I.3.9 approval is required and an ASO Study may be required prior to receiving that approval. Once the ASO Hold is lifted, the application case status will be placed back into the status **Study - In Progress - Initial Review,** and the DSIS will resume.

7. Study - In Progress - QC and Review: Draft DSIS Under Internal Review (5 BD). No PDF needed since there is no Customer action items at this status.

8. Study - In Progress - Draft Ready **(PDF):** Draft DSIS Report Provided. (may include status **'Study - Hold - Study Hold'** if document revisions are requested)

9. Study - Complete - Sent to Customer **(PDF):** Final DSIS Report Provided

Other Potential Case Statuses:

1. Study - Hold - Study Hold: For holds not related to the Initial Review / Preliminary Assessment, or when the Draft DSIS Report is provided.
2. Pending Withdraw: A project can be placed in this status for various reasons; such as customer non-compliance or customer initiated withdrawal.
3. Study - Restudy: When a project that has already completed it's initial Distribution System Impact Study, but is now undergoing a Re-Study due to project changes.

Resource Links:

- MA Interconnection Documents
- ASO Study Updates
- MA DG Stakeholder Meeting Information
- Massachusetts Typical System Modifications and Estimated Costs for DG Interconnection
- MA Distribution Group Studies

08

Flexible Connections Programs

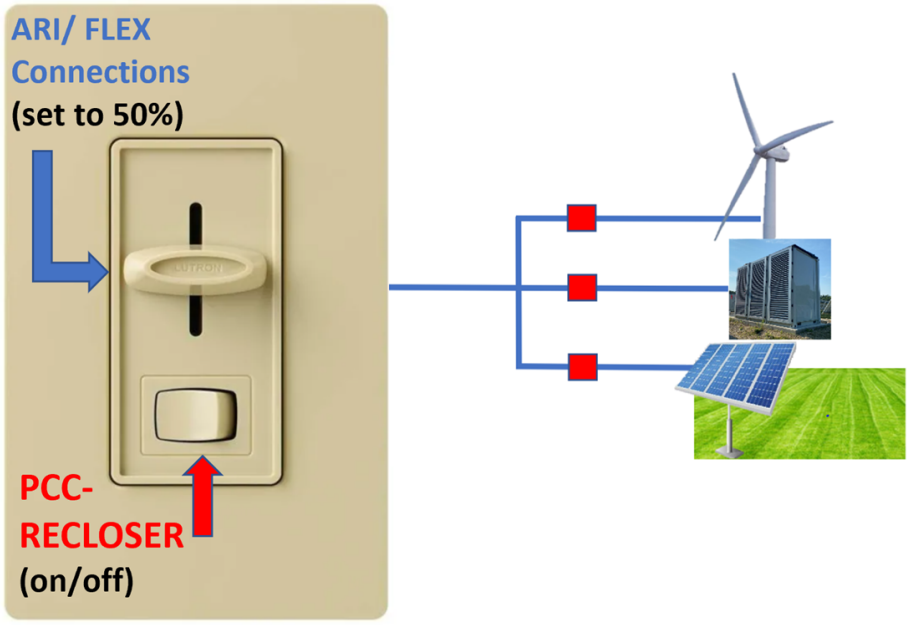
Arnaldo Arnal

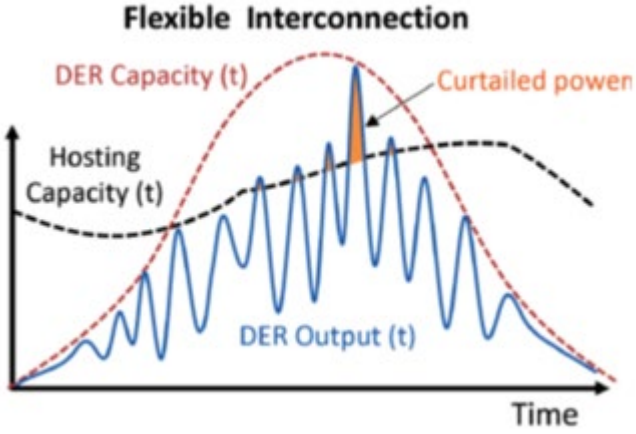
nationalgrid

Flexible Connections - Introduction

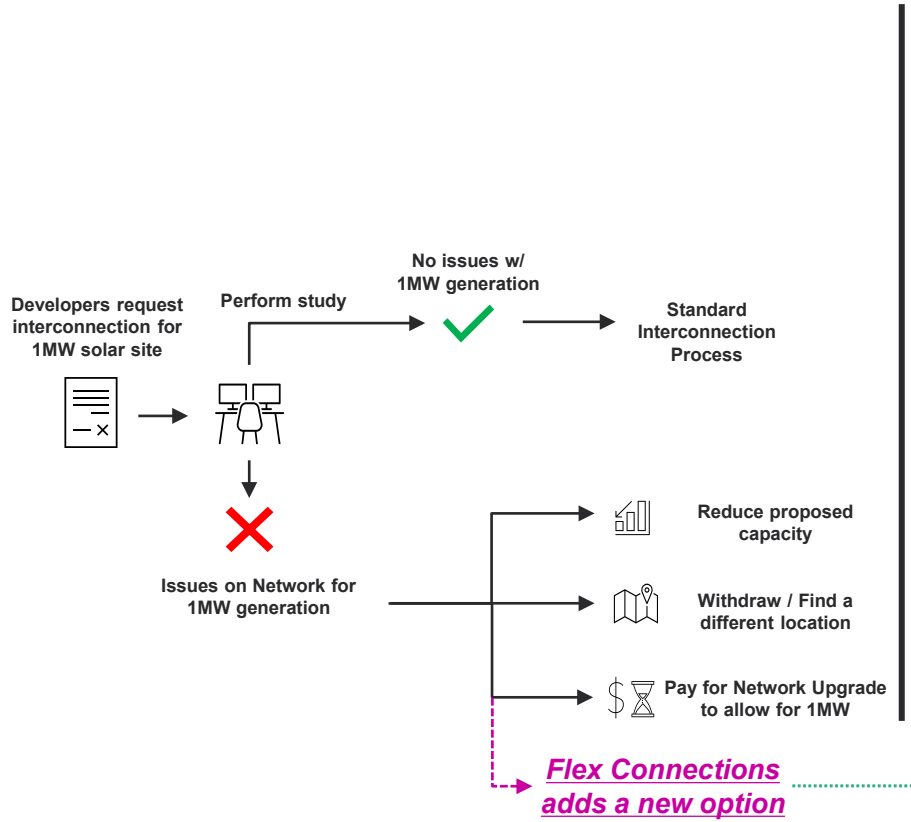
Through a Flexible Connection, customers can interconnect quicker and reduce expensive system upgrades

Flexible Connections: is the addition of a dispatch control function to DER assets on our system. The ability to curtail a DER site gives flexibility to leverage during system constraints.





Flex Connect Interconnection Solutions



Local Power Controller (LPC)

Solution for projects with new Load & new Generation and Non-Export (remain net importer).

Ideally residential and C&I customers in the ~250 kW range.

- Behind-the-Meter (BTM)
- **100kW to 500kW**
- Solar or Solar + Storage
- Power Control System
- Application of customer-owned technology/equipment
- No side contracts & no major changes to the Interconnection Service Agreement (ISA)

Generation curtailment based upon Network conditions.

Allows developers to potentially lower interconnection costs & timelines.

- Front-of-the-Meter (FTM) / Behind-the-Meter (BTM)
- **1MW to 5MW**
- Solar, Solar + Storage, and Standalone Storage
- Utility-owned Grid Edge Technology – "Gateway"
- Real-time data, thermal constraints, and dynamic monitoring

Active Resource Integration (ARI)

Value Proposition for Flex Connect

Benefits	Flex C. Customer	The Commonwealth	The Electric Power System
Faster Interconnection times	☑		
Lower System upgrade Costs	☑		
Increased Network utilization		☑	☑
Increase overall grid visibility and control		☑	☑
Facilitated renewable generation growth	☑	☑	☑
Improve Customer experience for developers	☑		
Increase energy realization toward the Commonwealth's clean energy goals	☑	☑	☑

Note: Currently the queue for the Flex Connect Pilot is filled, we are planning to have a full offering by Q1 2026

09 Questions?

Please submit questions using the Q&A link provided in the Microsoft Teams meeting chat.

We will do our best to address your question during this time. Q&A's will also be formally documented and uploaded to our website.

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Appendix: Summary of Resources, Documents & Links

Distributed Generation Website: https://ngus.force.com/s/ma-home

Interconnection Process Resources: https://ngus.force.com/s/ma-process

MA Dist. Group Studies: https://gridforce.my.site.com/s/article/MA-Distribution-Group-Study-Documents

ISO – NE's Interconnection Process: https://www.iso-ne.com/static-assets/documents/rules_proceds/isone_plan/pp05_1/pp5_1.pdf

National Grid's list of active and pending FERC feeders: https://ngus.force.com/s/?tabset-651ee=2&Infrastructure__c-filterId=00B0W000006uAI3UAM

MA DG Stakeholder Meeting Information: https://ngus.force.com/s/article/MA-DG-Stakeholder-Meeting-Information

ASO Updates: https://ngus.force.com/s/article/MA-ASO-Updates

Hosting Capacity Maps: https://systemdataportal.nationalgrid.com/MA/

Storage Assistance - https://ngus.force.com/s/article/Storage-Assistance

DPU Interim Guidance for ESS -

https://ngus.force.com/s/article/How-to-Add-Energy-Storage-to-an-In-Progress-Application-in-Massachusetts

Sample One Line Diagrams SMART Program-

https://ngus.force.com/servlet/servlet.FileDownload?file=0150W00000ET8dj

Interconnection Documents- https://ngus.force.com/s/article/MA-Interconnection-Documents

Typical System Modifications and Estimated Costs for DG Interconnection- https://ngus.force.com/s/article/System-Modifications-for-DG-Interconnection

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