DG Winter Installer Workshop

December 12th, 2018
Con Edison
Agenda

• Overview of progress to date
• Con Edison Grid
• Con Edison Interconnection Process
• How to navigate the DG website
• Value Stack
• Open Discussion
Interconnection “Trailer”

https://bcove.video/2yzYBbr
2018 Overview
Interconnection Customer Adoption

- Added 4,862 new DG installations
- Solar accounted for 98% of installs
- Uptick in RNM and CDG applications

DG Installations (as of 11/30/18)

<table>
<thead>
<tr>
<th>Units: # of installs</th>
<th>Con Ed Territory</th>
<th>NYC Only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017 only</td>
<td>Total</td>
</tr>
<tr>
<td>Battery Storage</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Fuel Cells</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>CHP</td>
<td>281</td>
<td>301</td>
</tr>
<tr>
<td>Solar</td>
<td>17,779</td>
<td>23,204</td>
</tr>
<tr>
<td>TOTAL</td>
<td>18,114</td>
<td>23,572</td>
</tr>
</tbody>
</table>
Interconnection
DG Capacity Additions

- Added 50 MW new capacity
- Solar accounted for 50% of capacity
- Solar capacity is coming in on forecast – 2019 projected to reach 267 MW capacity

DG Capacity Installed (as of 11/30/18)

<table>
<thead>
<tr>
<th>Units: MW</th>
<th>Con Ed Territory</th>
<th>NYC Only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017 only</td>
<td>Total</td>
</tr>
<tr>
<td>Battery Storage</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>Fuel Cells</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>CHP</td>
<td>176</td>
<td>181</td>
</tr>
<tr>
<td>Solar</td>
<td>178</td>
<td>223</td>
</tr>
<tr>
<td>TOTAL</td>
<td>370</td>
<td>420</td>
</tr>
</tbody>
</table>
Hosting Capacity
Stage 2 Hosting Capacity delivered

How to view the Maps:

1) Register here

2) E-mail dgexpert@coned.com for access

3) Log in here
Hosting Capacity – Secondary Network Layer delivered

- Released with 2018 DSIP
- Con Edison specific design
Additional Value Layers

LSRV Opportunities

NWS Layers
Distribution System Data

- Established online data portal and used Hosting Capacity maps
- Worked with the Joint Utilities to establish a central portal for utility system data.
- Continued discussions with stakeholders to identify the range of system data currently available and to better understand their needs.
Non-Wires Solutions
Non-Wires Solutions

- Stakeholder collaboration provided suitability criteria
- NYS Benefit Cost Analysis (BCA) handbook describes BCA methodology
- Con Edison has identified and put out RFP for 7 projects in addition to BQDM and BQDM extension
## Procuring Non-Wires: Con Edison

<table>
<thead>
<tr>
<th>Project Name/Description</th>
<th>Required Load Relief</th>
<th>Need Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glendale</td>
<td>55</td>
<td>NA</td>
<td>Continuing BQDM</td>
</tr>
<tr>
<td>Columbus Circle</td>
<td>4</td>
<td>2021</td>
<td>RFP Closed. Evaluating</td>
</tr>
<tr>
<td>Hudson</td>
<td>7.1</td>
<td>2021</td>
<td>RFP Closed. No viable portfolio</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>2.5</td>
<td>2020</td>
<td>RFP Closed. Evaluating</td>
</tr>
<tr>
<td>Plymouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water St</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing Crossing</td>
<td>7.3</td>
<td>2019</td>
<td>RFP Closed. No viable portfolio</td>
</tr>
<tr>
<td>W42nd St Load Transfer</td>
<td>42</td>
<td>2021-2027</td>
<td>RFP Closed. Evaluating</td>
</tr>
<tr>
<td>Chelsea Network Feeder relief</td>
<td>3.2</td>
<td>2021</td>
<td>RFP being developed</td>
</tr>
<tr>
<td>Parkchester No. 1 Cooling</td>
<td>15</td>
<td>2021-2027</td>
<td>RFP being developed</td>
</tr>
<tr>
<td>Newtown Transformer Installation</td>
<td>24</td>
<td>2022-2027</td>
<td>RFP closed 8/31/18</td>
</tr>
</tbody>
</table>

[www.coned.com/nonwires](http://www.coned.com/nonwires)
Integrating DERs into the Underground Network System
Purpose of network protectors: Fault Isolation

Area
Substation

Substation
Breakers

Network
Transformer

NWP

120/208 Volt Grid

13 kV Feeder

A
B
C
D
E
Purpose of network protectors:
Fault Isolation

Area
Substation

120/208 Volt Grid

13 kV Feeder

Substation Breakers

Network Transformer

NWP
Purpose of network protectors:
Fault Isolation
Purpose of network protectors:
Fault Isolation

Area Substation

Substation Breakers

120/208 Volt Grid

13 kV Feeder

Network Transformer

NWP
Purpose of network protectors:
Fault Isolation

Area
Substation

Substation
Breakers

120/208 Volt Grid

13 kV Feeder

Network
Transformer

NWP
Network protector considerations:
Solar export with Low Network Load

[Diagram with labels: Substation, Breakers, 120/208 Volt Grid, 13 kV Feeder, Area Substation, NWP, PV Customer, DG Customer]
Network protector considerations:
Solar export with Low Network Load

Area Substation

Substation Breakers

120/208 Volt Grid

13 kV Feeder
Network protector considerations:
Spot or Isolated Networks

Area Substation

Substation Breakers

120/208 Volt Grid

13 kV Feeder

Network Transformer

NWP

PV Customer

DG Customer
Network protector considerations: Spot or Isolated Networks
Network protector considerations:

Spot or Isolated Networks

120/208 Volt Grid
13 kV Feeder

Area Substation
Substation Breakers
Network protector considerations:
Spot or Isolated Networks

Area Substation

Substation Breakers

120/208 Volt Grid

13 kV Feeder

Network Transformer

NWP

PV Customer

DG Customer

A

B

C

D

E
DG Implications

Network Grid Service

- Export capability dependent upon multiple factors
  - PV size vs service capacity
  - Network loading
  - Nearby transformer loading
  - Network Protector operations

- Upgrades to service may require street work
  - Localized underground
  - Increased customer cost & timeline
DG Export Solutions for Network System

• Adaptive Trip (AT) or Insensitive (I):
  – Application: Network grid service
  – Description: Modifications to nearby network protectors to make operation more conducive to reverse power flow from solar export
  – Typical Cost: Up to $5-15K

• Communications Aided Tripping (CAT):
  – Application: Isolated/Spot Network
  – Description: Modifications to impacted network protectors and communication to customer inverters.
  – Typical Cost: $70-100K
Grid Innovation
Grid Innovation & DSP

We are investing in grid innovation and Distributed System Platform functionality to support continued integration of DER, enhanced customer engagement, expanded data sharing, and market enablement.

- Pursuing a series of investments that will advance state policy goals and realize the vision laid out in our DSIP.
- Foundational investments will be core to achieving the long-term vision.
Grid Innovation efforts can be grouped into three focus areas:

- **Reliability & Resiliency**: To meet and exceed customer expectations in an era of increasingly diverse resources.
- **Safety & Security**: To protect people, data, and infrastructure in an ever-changing environment.
- **Clean Energy & Flexibility**: To enable customer choice—including clean, reliable, affordable energy.
Grid Innovation

• Builds on smart meter investment and existing distribution SCADA to enhance and expand upon current capabilities

• Investments are part of a long-term strategy that phases investment to develop, then build upon foundational capabilities in the areas of:
  • Distribution automation
  • Grid-edge sensing
  • Tools & analytics
  • Flexible resources
  • Market enablement

• Long-term plan is highlighted and discussed in greater depth in the Company’s DSIP Filing

• Energy storage and electric vehicle investments were discussed during our clean energy meeting, and are tied in here as well
Foundational Investment: GIS

• Consolidates five core mapping applications, 32 ancillary applications, and 16+ legacy applications into a single enterprise system over five years

• Supports DSP enablement & grid innovation
  • Needed for more accurate DER forecasting, allowing enhanced interconnection processes and expanded hosting capacity analysis
  • Pre-requisite for DER Management System
  • Complements smart meter roll out
  • Allows for more accurate expedited damage assessment (including drones)

• Integration with work management and other systems will enhance operational efficiency
Foundational Investment: Communications Infrastructure

- Builds on smart meter roll out to facilitate the deployment of smart sensors and other smart grid communicating technologies
  - Sensors include manhole monitoring and methane detectors
- Provides resiliency by creating a diversity of communications channels
- Incorporates cybersecurity protections into system design
Additional Investments

Modernizing Network Protector Relays & SCADA

- Facilitates two-way power flow on the underground network system – key to enabling solar and other DER to export onto the system
- Increased remote monitoring and control of network protectors

Volt-Var Optimization

- Allows less power to be flowed over the system by optimizing voltage and reactive power needs to the grid edge
- Hardware installations at 4 kV unit substations will be complete by 2019 – proposing to extend this work to area substations beginning in 2020
ConnectDER
Description

- DER meter collar for easy interconnection of all residential scale DER (<15kW)
- Integrated circuit breaker can be customized to each location – eliminates need for separate 89L
- No line side tap, no penetration into home, no panel inspection.

Benefits

- Reduces DER installation time & lowers balance of system cost for Customers
- Applicable to residential scale (<15kW) DER, removes risk from Installers
- Utility gains data from PV production for planning/operations/billing needs
- Potential to address new use cases (adding ESS to PV without panel work)
ConnectDER Roadmap

• Con Edison Pilot in Staten Island
  – 32 units installed by two pilot Installers
  – Installed first AMI meters in territory
  – Customers saved $500 on average
  – Allowed installers to reach new customers

• NYISO Pilot Expansion
  – Install on 200 additional homes on SI
  – Started June 2018 - 69 installations so far
  – No cost to installer/customer to participate
  – Testing residential solar effect at NYISO

• ConnectDER Innovation Initiative
  – Continue to provide units at no cost
  – Procurement of 500 units for all boroughs
  – Working on procurement for 2019+
  – Looking to expand to non-PV locations

• Looking forward…
  – 2019 – Integrate process into PowerClerk
  – Q1/2 2019 – Rollout units across territory
  – End Q2 – end the NYISO Pilot installs
  – Incorporate data into grid planning
ConnectDER will help us understand SI duck curves

101 Units installed as of 11/15/18
Break
Interconnection Process
Prior to First Interconnection Request

• **Read the New York State Standard Interconnection Requirements (SIR)**
  – Application Process and Timelines
  – Technical and Operating Requirements
  – Required Contracts and Forms

• **Read Rider R**
  – Net Metering and Value Stack Tariff

• Register with Power Clerk
  – How you submit applications

• Contact us with any questions – dgexpert@coned.com
What You Need to Submit

1. Appendix F of NYS Standardized Interconnection Requirements:
   i. Covers all interconnection documents (customer authorization, site control forms, drawings, project information, specifications, verification test procedures, et cetera)
   ii. Refer to our website for documentation checklist

2. Rate Forms:
   i. Completed Application Form G (net metering, remote net metering
      
      OR
   
   ii. CDG Procedural Requirements Appendices A and B (Community DG)

3. New Appendix K for ESS applications
How You Submit: PowerClerk

Register for Small DG and/or Large DG program(s)

Projects up to 50 kW
conedsmalldg.powerclerk.com

Projects 50 kW to 5 MW
conedlargedg.powerclerk.com
Beginning Your Application

![Image of conEdison website interface]

- **New Interconnection Application >50kW**
  - **Old SIR Cases**
  - **CESIR In Progress**
  - **Unsubmitted**
  - **Completed**
  - **High Level Feasibility Review**

<table>
<thead>
<tr>
<th>Master Case Number</th>
<th>Current Status</th>
<th>Current Status Timestamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsubmitted</td>
<td>12/04/2018</td>
<td></td>
</tr>
<tr>
<td>Unsubmitted</td>
<td>12/04/2018</td>
<td></td>
</tr>
</tbody>
</table>

[No Assignee]
Requirements for Your Application

SIR determines the info and documents required

Changes to the SIR will be reflected in PowerClerk

* Indicates required field

? Indicates help, e.g. a link to a template
Interconnection Process

Energy Storage
## Process for Energy Storage Projects

<table>
<thead>
<tr>
<th>Technology</th>
<th>Power Clerk</th>
<th>Project Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV + Storage as Back-up (not grid parallel)</td>
<td>Solar application **</td>
<td>Emergency Back-up generator application</td>
</tr>
<tr>
<td>Storage in Parallel with Grid</td>
<td>Battery Energy Storage application</td>
<td>None</td>
</tr>
<tr>
<td>DG + New Storage</td>
<td>1 Hybrid Application combining DG and Energy Storage</td>
<td>None</td>
</tr>
<tr>
<td>New Storage + Existing DG</td>
<td>Battery Energy Storage application</td>
<td>None</td>
</tr>
<tr>
<td>New DG + Existing Storage</td>
<td>DG application</td>
<td>None</td>
</tr>
<tr>
<td>DG + DG</td>
<td>2 separate DG applications</td>
<td>None</td>
</tr>
</tbody>
</table>

Hybrid systems parallel with grid
Remote Net Metering
and Community DG
## RNM and Community DG Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Remote Net Metered (RNM)</th>
<th>Community Distributed Generation (CDG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Host Rules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Type / Service Class</td>
<td>Any except residential (SC1)</td>
<td></td>
</tr>
<tr>
<td>DER Technology</td>
<td>Farm waste, PV, wind, micro-hydro, fuel cell</td>
<td>All Tier 1-eligible technologies</td>
</tr>
<tr>
<td><strong>Satellite Rules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Type / Service Class</td>
<td>Any</td>
<td>Larger satellites, ≥25 kW demand, can only take ≤ 40% of output (unless SC8)</td>
</tr>
<tr>
<td>Account Ownership</td>
<td>Accounts owned in the same name as Host</td>
<td>N/A</td>
</tr>
<tr>
<td>Geographic and NYISO zone</td>
<td>Any NYISO zone served by the same utility as the Host</td>
<td></td>
</tr>
<tr>
<td>Minimum number of satellites</td>
<td>1</td>
<td>10 (unless all on same premise or SC8)</td>
</tr>
<tr>
<td>Minimum yearly offtake</td>
<td>N/A</td>
<td>1,000 kWh per satellite</td>
</tr>
<tr>
<td>Can a satellite also be a host?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Can a satellite have multiple hosts?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Can a satellite also be a net-metered customer-generator?</td>
<td>Yes, but not on Buy-back (SC11)</td>
<td>No</td>
</tr>
<tr>
<td><strong>Forms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Forms</td>
<td>Form G</td>
<td>CDG Appendix A, B, and C</td>
</tr>
</tbody>
</table>

Yellow indicates recent change
Community DG: Process

• Read the Community DG Procedural Requirements for Value Stack before starting an application

• Follow the SIR process facilitated by PowerClerk
  – Select “Community DG”
  – If new account for export only, apply for New Service via Project Center
  – Submit CDG Appendix A and B with interconnection application, instead of Form G
  – Submit CDG Appendix C spreadsheet (Initial Allocation Request) through PowerClerk (preferred) or via email to cdgdevelopers@coned.com:
    – At least 60 calendar days before commencing CDG program
    – Include case number (MC-XXXXXX) in email subject line
What Happens After You Submit Your Interconnection Application

• Customer and contractor receive acknowledgment letters and a case number: MC-xxxxxx

• Case is assigned to a Customer Project Manager (CPM) in Energy Services

• Up to 50kW solar projects will follow expedited process (no engineering review, self-certification)

• 50kW - 5MW solar projects will follow SIR process including preliminary screens and engineering reviews
Best Practices for Applications

• Have your Customer’s Account Number and Meter Number
  – Con Edison Meters have 7-digits
  – Account Number we need is 14 digits (leave off 15th digit)
  – For Remote Net Metered/CDG cases, use Host Account
  – For New Service, enter MC number for Project Center Service case

• Select the appropriate type of metering, e.g. RNM or CDG

• Combination of different technologies on same premise:
  – One case for ESS hybrid projects (ESS + DG)
  – Separate cases for non-ESS projects (DG + DG)
Interconnection Process Improvements
Application Form G

Electronically filling Form G helps avoid errors that may result in delays in the interconnection process or billing.

Would you like to electronically fill out Application Form G? *

- Yes
- No, I will complete the form on my own

Once you complete this page, click “Generate Document” in order to print, review, and sign. Please upload signed Form G on the next page of the application.

If this is an application for electric generating equipment located and used at a customer’s Farm Operation, you cannot electronically fill out Form G. Please complete a paper copy.
Payment Summary Form

- The Payment Summary form becomes available in the “Available Forms” section once a CESIR payment is made.

- The form summarizes payments made and payments due for the CESIR study and upgrade costs.
Rate determination

• Based on the information the applicant enters in the application you will be able to view Preliminary Rate Information before submitting the application.

• Once the Design has been approved for Value Stack projects, the applicant will receive a Final Value Stack Summary document from Con Edison.

Preliminary Rate Information

Non-Net Metered Project
1

Please indicate if you are applying for any of the following (this should match your answers in Form G):

- Designated Technology Exemption (Section 5 B. of Form G)
- Targeted Exemption (Section 5 C. of Form G)
- Standby Rate Pilot under Rider Q (Section 5 G. of Form G)
- None of the above
Close out survey for cancelled projects

- We are collecting information as part of an effort to understand how to improve the DG Interconnection process.
- If the applicant cancels a project >50kW they have the option to fill out a cancellation survey.
Improvements to our engineering group

• Created one DE group that handles all DG projects, to improve consistency and streamline interconnection

• New CESIR template consistent across NYS
  – Fields not relevant to Con Edison territory, especially network areas, are marked with N/A

• Interconnection options are found in Section 2 – Executive Summary and Section 6 – Mitigations for system impact analysis failures
Feedback Session
Break
Navigating the DG website
Using Private Generation Energy Sources

www.coned.com/dg
Applying for Private Generation

• Interconnection Forms and Documentation
  – SIR Appendix F forms
  – Power Clerk web portal links
  – Customer Authorization
  – Contractor Certification for Verification Test

• Service and Rate Application Forms
  – Form G
  – CDG Procedural Requirements
  – Rider H
www.coned.com/privategenerationguides

**General Guides**

-_Energy Storage Guide:_ For customers considering installing or upgrading an Energy Storage System up to 5 MW.

-_Fuel Cell Guide:_ for customers interconnecting fuel cell less than 5 MW.

-_Solar Photovoltaics Guide:_ For customers who are considering installing or upgrading photovoltaic (solar) power generators less than 5 MW.
Energy Services Contacts

• You can reach Energy Services from 7 a.m. to 3:30 p.m. Mon- Fri

• If no response from your CPM within 2 business days, contact their Manager:

<table>
<thead>
<tr>
<th>Employee</th>
<th>Manager</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Mattina</td>
<td>Rob Klopf</td>
<td>212-460-3223</td>
<td><a href="mailto:klopf@coned.com">klopf@coned.com</a></td>
</tr>
<tr>
<td>Shashi Ramjattan</td>
<td>Rob Klopf</td>
<td>212-460-3223</td>
<td><a href="mailto:klopf@coned.com">klopf@coned.com</a></td>
</tr>
<tr>
<td>Kevin Dekeris</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mike Brown</td>
<td>Richard Vitolo</td>
<td>914-925-6962</td>
<td><a href="mailto:vitolor@coned.com">vitolor@coned.com</a></td>
</tr>
<tr>
<td>Mike Tucci</td>
<td>Richard Vitolo</td>
<td>914-925-6962</td>
<td><a href="mailto:vitolor@coned.com">vitolor@coned.com</a></td>
</tr>
<tr>
<td>Seretse Henry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gerald Thompson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jack Chen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antoine Adams</td>
<td>Zhen Shao</td>
<td>212-460-4230</td>
<td><a href="mailto:shaoz@coned.com">shaoz@coned.com</a></td>
</tr>
<tr>
<td>Peter Aufdemorte</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phyllis DelRe</td>
<td>Tracy Downing</td>
<td>646-341-2906</td>
<td><a href="mailto:downingt@coned.com">downingt@coned.com</a></td>
</tr>
</tbody>
</table>

If still no response within 2 business days, contact the Department Manager Directly:

Tom McAndrews
mcandrewst@coned.com
212-460-4490

• For emails, include the Job Number (MC-xxxxxxx) in the subject and the project address, your CPM’s name, and your contact information in the email body

Note: All this information is also available on our website
VDER Value Stack
Receive NEM for 20 years from in-service date
Can opt into Value Stack subject to Phase One cap

NEM for life of system
Value Stack for 25 years

Value Stack for 25 years with MTC

Mass market
tLarge C&I RNM
CDG
What is the VDER Value Stack?

Combination of time- and location-specific credit components based on hourly net injections

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Value</td>
<td>Volumetric credit based on Day Ahead Hourly LBMP</td>
<td>All projects</td>
</tr>
<tr>
<td>Installed Capacity Value</td>
<td>Volumetric credit applied to production in all hours with option for higher credit in summer on-peak periods</td>
<td>All projects, solar get Alternative 1</td>
</tr>
<tr>
<td>Environmental Value</td>
<td>Volumetric credit valued at NYSERDA REC or cost of carbon</td>
<td>Renewable technologies</td>
</tr>
<tr>
<td>Distribution Relief Value</td>
<td>Monetary credit for performance during 10 peak distribution hours of previous year valued at Marginal Cost of Service (MCOS)</td>
<td>Applicable to customers not eligible for MTC (already built in to MTC)</td>
</tr>
<tr>
<td>Market Transition Credit</td>
<td>Volumetric credit for mass market accounts to bring compensation close to NEM</td>
<td>For mass market subscribers (SC1 &amp; SC2) to CDG projects</td>
</tr>
<tr>
<td></td>
<td>Declines for new projects as tranches fill</td>
<td></td>
</tr>
<tr>
<td>Locational System Relief</td>
<td>Additional incentive for DERs in high value areas</td>
<td>Customers in high value areas, until cap is reached</td>
</tr>
<tr>
<td>Value (LSRV)</td>
<td>Monetary credit determined same way as DRV</td>
<td></td>
</tr>
</tbody>
</table>
Common Service Classifications

Mass Market

SC 1: Residential/Religious
• Energy only (kWh)

SC 2: General – Small
• Energy and Fixed Demand Charge (kWh)
• Only for customers with demand < 10kW

Demand Billed

SC 8: Multiple Dwelling – Redistribution
• Energy and Demand Charges (kWh & kW)
• Highest 30 minutes of demand sets demand charge for entire month

SC 9: General – Large
## Compensation for DERs: Outcome of Value of DER Order

<table>
<thead>
<tr>
<th>Mass Market*</th>
<th>Systems in operation as of March 9, 2017</th>
<th>Traditional NEM for life of system (no change) Can opt-in to <strong>Value Stack</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Billed</td>
<td>New residential &amp; small commercial systems installed through sooner of January 1, 2020 or Phase 2 Order</td>
<td><strong>Phase One NEM</strong> for 20 years</td>
</tr>
<tr>
<td></td>
<td>New Remote Net Metering (RNM) installations</td>
<td><strong>Value Stack</strong> without transition credit for 25 years</td>
</tr>
<tr>
<td></td>
<td>New Community DG (CDG) projects</td>
<td>Tranche 1-3: <strong>Value Stack</strong> for 25 years with transition credit (MTC) for mass market subscribers (declines by tranche) (Tranche 0: <strong>Phase One NEM</strong> for 20 years)</td>
</tr>
<tr>
<td></td>
<td>New large commercial and industrial installations</td>
<td><strong>Value Stack</strong> without transition credit for 25 years</td>
</tr>
</tbody>
</table>

* SC 1 accounts cannot be RNM or CDG hosts
VDER Value Stack Project Interconnection Milestones

Initial Application
Preliminary Rate Information displayed in PowerClerk

Design Approved – Pending Construction *
Final Value Stack Summary communication sent to developer; value stack rates and eligibility locked-in

Start of first billing cycle following Final Acceptance
Value Stack credits start accruing

Application Submitted ➔ Application Accepted ➔ Preliminary Screen ➔ CESIR Study ➔ Pending Design Approval ➔ Design Approved ➔ Construction Complete ➔ Verification Test ➔ PTO

Able to opt-out of Environmental Value ➔
Able to change Installed Capacity Value Alternative

* Occurs once 25% of interconnection upgrade costs are paid or SIR contract is executed if no payment is required.
Monthly Bill

Your account number:
Service delivered to:
Your electric rate: EL9 General Large
Next billing date: Wednesday, March 20, 2018

Your billing summary as of Feb 20, 2018
Remaining balance: None
Your new charges - details start on page 2
Billing period: Nov 17, 2017 to Dec 20, 2017
Electricity charges - for 33 days: $475.04
Adjustments: -$325.37
Total new charges: $109.67
Total amount due: $109.67

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.

VDER Statement

<table>
<thead>
<tr>
<th>Customer Name</th>
<th>Account Number</th>
<th>Billing Period Start Date</th>
<th>Billing Period End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Billed consumption kWh</th>
<th>2602</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total injections from DER kWh</td>
<td>-1483.5</td>
</tr>
<tr>
<td>Value Stack Components</td>
<td></td>
</tr>
<tr>
<td>Energy Component $/kWh</td>
<td>0.03</td>
</tr>
<tr>
<td>Capacity Component $/kWh</td>
<td>0.01</td>
</tr>
<tr>
<td>Environmental Component $/kWh</td>
<td>0.02</td>
</tr>
<tr>
<td>Subtotal Credit per kWh</td>
<td>$/kWh</td>
</tr>
<tr>
<td>Demand Reduction Value (monthly lump sum) $/kWh-month</td>
<td>($168.53)</td>
</tr>
</tbody>
</table>

| Locational System Relief Value (LSRV) (monthly lump sum) $/kWh-month | - |
| Total credit per-kWh elements | ($197.04) |
| Total credit from DER + LSRV | ($168.72) |
| Total Dollar Credit from DER this Billing Period | ($585.57) |
| 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 | ($555.57) |
| Remit to Utility | $109.67 |
| Dollar Credits Carried Over from Previous Billing Period (if any) | - |
| Excess Dollar Credits Carrying Over to Next Billing Period | - |
Value Stack Eligibility
Expansion Order
## Expanded Eligibility Order Highlights

September 12, 2018: Order on Value Stack Eligibility Expansion and Other Matters ([link](#))

Effective 12/1/18

### Certain restrictions removed

- Removal of size limits based on customer type
- Interzonal credits for RNM & CDG permitted
- Any Tier 1-eligible technology\(^1\) can be a CDG host

### New technologies eligible for Value Stack

- Standalone Energy Storage, Regenerative Braking, and Vehicle-to-Grid (V2G)\(^2\)
- Tidal and Biomass/Biogas
- Newly eligible technologies are subject to Standby and Buy-back provisions

---

1. Tier 1-eligible technologies include Solar PV, Wind, Tidal, Fuel Cell, Biomass/Biogas, Micro-Hydro
2. To be eligible for Value Stack accounts with these technologies must go on MHP for import (unless storage capacity < 115% of demand)
### Value Stack for Stand-Alone Storage

#### Modified Value Stack

<table>
<thead>
<tr>
<th>Feature</th>
<th>Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (LBMP)</td>
<td>Yes</td>
</tr>
<tr>
<td>Capacity (ICAP)</td>
<td>Yes, Alternative 3</td>
</tr>
<tr>
<td>Environmental (REC)</td>
<td>No</td>
</tr>
<tr>
<td>Demand Reduction Value (DRV)</td>
<td>Yes</td>
</tr>
<tr>
<td>Market Transition Credit (MTC)</td>
<td>No, stand-alone battery not eligible for CDG</td>
</tr>
<tr>
<td>Locational System Relief Value (LSRV)</td>
<td>Yes, if in eligible location</td>
</tr>
</tbody>
</table>

#### Mandatory Hourly Pricing (MHP): to be eligible for Value Stack accounts must go on MHP for import (unless storage capacity < 115% of demand)
Application Forms for Stand-Alone Storage: SIR Appendix K

“Energy Storage System (ESS) Application Requirements / System Operating Characteristics / Market Participation” (link)

- Enter all details on specs and planned operating parameters, for example:
  - How and when will it charge and discharge?
  - What is the Protection & Control scheme?
  - Will the system be compensated by the NYISO or a utility tariff?

- Complete electronically in PowerClerk as part of initial application submittal (same for Hybrid)
Application Forms for Stand-Alone Storage: Form G

“Application for Rider R or Standby Service and/or Buy-Back Service”

• Request type of service and compensation:

<table>
<thead>
<tr>
<th>Section 3. Type of Service Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please check one of the following services that you are requesting:</td>
</tr>
<tr>
<td>Grand Fathered Net Metering (Rider R)</td>
</tr>
<tr>
<td>Standby Service</td>
</tr>
<tr>
<td>Buy-back Service (SC 11) with Payment for Energy</td>
</tr>
<tr>
<td>Buy-back Service (SC 11) with Value Stack compensation under Rider R</td>
</tr>
<tr>
<td>Standby Service and Buy-back Service (SC 11) with Payment for Energy</td>
</tr>
<tr>
<td>Standby Service and Buy-back Service (SC 11) with Value Stack compensation under Rider R</td>
</tr>
</tbody>
</table>

• Enter key information related to Standby and Buy-Back provisions

• Complete electronically (preferred) or by hand and then sign and attach in PowerClerk as part of initial application submittal

Choices for Storage

Effective 12/1/2018
Standby Service
Standby Service & Standby Rates

• Standby Service is provided to backup and/or supplement the energy ordinarily generated by a generating facility on customer premises

• Customers receiving Standby Service are billed under Standby Service Rates unless exempt

• If exempt under Designated Technology or Targeted Exemptions, customers are billed under their corresponding standard rate

**Standby Rate Components:**

– **Contract Demand:** based on the customer’s maximum potential demand on Con Edison’s system

– **As-Used Demand charges:** based on the customer’s maximum actual demand for each weekday from 8am-10pm.

– **Other misc. charges:** Customer charges, metering charges, associated MACs, SBC, and taxes
Standby Pilot Rate Program (Rider Q)

• Pilot rate program allows options for Standby Service customers to:
  – Option A: Choose their own contract demand with penalties
  – Option B: Select a different As-Used demand period*
  – Option C: Receive credits for consistent export of power via the buy-back (SC-11) rate

* Customers under Option B will also receive shadow billing, for informational purposes, at the applicable Standby Service rates
Electric Buy-Back (SC-11)

• Customer pays a customer charge and a contract demand charge based the generating facility’s ability to deliver energy to the grid

• As an alternative to Value Stack, customers may sell energy to Con Edison:
  – The payment rate for energy will be based on the applicable wholesale rate, which is the Locational Based Marginal Price (LBMP) set by the New York Independent System Operator (NYISO)
  – Customers delivering energy at the secondary distribution level will have the LBMP increased by a factor of 1.066 to account for line losses
Con Edison Resources

- Con Edison DG website: [www.coned.com/dg](http://www.coned.com/dg)
- Con Edison solar website: [www.coned.com/solar](http://www.coned.com/solar)
- Con Edison Guides: [www.coned.com/privategenerationguides](http://www.coned.com/privategenerationguides)
- Con Edison Electric Tariff

Billing questions
- Residential customers: netmetering@coned.com or 212-780-6600
- Large/commercial customers: dl-CCGNet-metering@coned.com

Technical, process, or rate questions: dgexpert@coned.com
Thank you!

dgexpert@coned.com