

**STATE OF NEW YORK
PUBLIC SERVICE COMMISSION**

In the Matter of Retail Access Business Rules

Case 98-M-1343

**Proceeding on Motion of the Commission
Regarding Cyber Security Protocols and
Protections in the Energy Market Place**

Case 18-M-0376

**In the Matter of Comprehensive
Energy Efficiency Initiative**

Case 18-M-0084

JOINT UTILITIES STATUS REPORT ON GREEN BUTTON CONNECT MY DATA®

I. Introduction

Central Hudson Gas & Electric Corporation (“Central Hudson”), Consolidated Edison Company of New York, Inc. (“Con Edison”), National Fuel Gas Distribution Corporation (“NFGDC”), New York State Electric & Gas Corporation (“NYSEG”), Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”), Orange and Rockland Utilities, Inc. (“O&R”), and Rochester Gas and Electric Corporation (“RG&E”) (collectively, “Joint Utilities”) submit this report identifying Green Button Connect My Data® (“GBC”) terms and conditions. The Joint Utilities submit this report pursuant to the New York State Public Service Commission’s (“Commission”) December 13, 2018 *Order Adopting Accelerated Energy Efficiency Targets* (“Order”) which directed the Joint Utilities to conduct a collaborative, convened by Department

of Public Service Staff (“Staff”), with providers of distributed energy resources to develop and file GBC terms and conditions.¹

The Commission has encouraged the Joint Utilities to adopt GBC, or other tools that will allow customers to share their energy data with third parties, urging quick implementation by utilities that are in the process of implementing advanced metering infrastructure (“AMI”) in their service territories. The Commission has also directed that these tools must protect customer privacy and the cyber security of utility, customer, and third-party systems.²

Since the Order was issued, Staff convened several collaborative meetings with the Joint Utilities and other interested parties to discuss development of GBC terms and conditions. During these collaborative meetings, it became clear that the development of GBC terms and conditions is integrally dependent on the Commission’s adoption of a form of Data Security Agreement (“DSA”) in the Commission’s Cyber Security Proceeding.³ Indeed, much of the discussion in collaborative meetings hinged on the provisions contained in the DSA. Given that the timing of Commission consideration of the DSA is unknown, and because certain of the Joint Utilities have already implemented GBC with third parties successfully using the GBC tool, the Joint Utilities submit this report regarding the terms and conditions for third-party use of GBC.

¹ Initially, the GBC terms and conditions were due to be filed by February 29, 2019. On February 26, 2019, Staff requested an extension of time to April 29, 2019, to file the GBC terms and conditions. The Secretary granted Staff’s request. The Joint Utilities filed, and the Secretary granted, two subsequent extension requests, requiring GBC terms and conditions to be filed on October 15, 2019.

² The Joint Utilities (except NFGDC) articulated their data sharing strategies in the jointly filed November 1, 2016 Supplemental Distributed System Implementation Plan (“DSIP”), and in each utility’s subsequent DSIP update, filed July 31, 2018.

³ Case 18-M-0376, *Proceeding on Motion of the Commission Regarding Cyber Security Protocols and Protections in the Energy Market Place* (“Cyber Security Proceeding”). The Joint Utilities filed a form of DSA in this proceeding on February 4, 2019.

II. Joint Utility Status of GBC Implementation

Before discussing the required GBC terms and conditions, on a Joint Utility basis, the following is the status of the GBC implementation:

- Con Edison and O&R have implemented GBC, and their customers can currently share their energy data with two third parties, with 25 additional third parties in various stages of the onboarding process.
- Central Hudson does not offer GBC but offers Green Button Download My Data. The features of GBC are generally preferred in instances where more granular data from AMI meters is available to the majority or all of a utility's customers. At this time Central Hudson does not have plans to deploy AMI meters on a system-wide basis. Additionally, Central Hudson is replacing its foundational customer information system ("CIS"). Because of the CIS system replacement, any effort to build a GBC interface at this time would require a future rebuild to connect to the new CIS system and would result in unnecessary cost to customers. Until there is greater demand for GBC, which Central Hudson has not experienced, or there is a system-wide deployment of AMI meters or implementation of the new CIS is completed, Central Hudson does not see GBC as a prudent investment. Once any of these three factors occurs Central Hudson will re-evaluate the benefits and costs necessary to enable GBC functionality.
- National Grid is currently planning to implement GBC for its electric and gas customers by March 31, 2021. National Grid may deliver these services ahead of this date if possible and cost effective to do so. This GBC implementation schedule is a departure from National Grid's original plan where GBC implementation would coincide with AMI

deployment.⁴ National Grid will collaborate with Con Edison and the other Joint Utilities, as applicable, to develop similar processes and onboarding requirements as part of its GBC implementation.

- NYSEG allowed customers to use GBC using a third party vendor as part of its Energy Smart Community (ESC) Energy Manager pilot. Customers in the ESC were temporarily able to use GBC to share energy usage data with six (6) approved third party vendors. NYSEG and RG&E's full implementation of GBC as part of their Energy Manager Web Portal is subject to the Commission's approval of the Companies' AMI proposal in their ongoing rate proceeding, Cases 19-E-0378 *et al.* NYSEG and RG&E anticipate using the Con Edison model as the basis for their GBC design and implementation efforts, allowing for modifications to reflect any NYSEG and RG&E-specific design and/or system requirements.
- NFGDC is participating in this filing in compliance with Ordering Clauses No. 1 and 5 of the Order. NFGDC does not currently have an AMI system in place and is not planning to install one because it is cost prohibitive. Without AMI technological capabilities, and recognizing that GBC benefits largely accrue to electric or combination utilities, NFGDC

⁴ National Grid first proposed an AMI business case in its initial DSIP filing. *See* Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding"), Niagara Mohawk Power Corporation d/b/a National Grid Initial Distributed System Implementation Plan (DSIP) (filed June 30, 2016). National Grid filed an updated AMI business case in Cases 17-E-0238 *et al.*, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service* ("Rate Case Proceeding"). In response to the directives of the Commission in its March 15, 2018 Order Adopting Terms of Joint Proposal and Establishing Electric and Gas Rate Plan in the Rate Case Proceeding, National Grid initiated an AMI collaborative process that culminated in National Grid filing a report with the Commission. *See* Rate Case Proceeding, Report of Niagara Mohawk Power Corporation d/b/a National Grid on the Proposed Implementation of Advanced Metering Infrastructure (filed November 15, 2018). On September 4, 2019, National Grid filed a supplemental AMI Implementation Report in the Rate Case Proceeding. In response thereto, the Commission issued a Notice Soliciting Comments on September 30, 2019 ("Notice") in the Rate Case Proceeding whereby parties have until November 14, 2019 to file comments to the Notice.

is not planning to implement GBC. NFGDC articulated this sentiment during the Commission-ordered collaborative on GBC, noting that GBC does not provide tangible benefits to gas-only utilities. Moreover, the Commission recognized that GBC reporting is administered in the Commission's DSIP proceeding,⁵ and DSIP requirements only apply to combination utilities, as gas-only utilities are not the distributed system platform provider of the electric grid. Based on the foregoing, NFGDC believes that GBC terms and conditions should apply only to electric or combination utilities, and should not be required of NFGDC.

III. GBC Terms and Conditions

At this time, there are two basic requirements for parties connecting to GBC – a signed DSA, including self-attestation, and the attached third-party onboarding process.

The Joint Utilities articulated in the Cyber Security Proceeding and in the collaborative meetings the reasons that signing and complying with the DSA is a vital and necessary condition for third parties' use of GBC. These minimum data security requirements are necessary to protect utility and third-party systems, as well as the privacy of customer data. Con Edison and O&R have been requiring third parties to complete the DSA and self-attestation as part of the GBC onboarding process, and will continue to do so. The other Joint Utilities intend to require the DSA and self-attestation if/when they fully implement GBC.

The Joint Utilities also require third parties to complete business and technical onboarding in order to use GBC, or equivalent data access platforms. These more technical terms and conditions include submitting required registration information, demonstrating technical capability to exchange information, and testing. Con Edison and O&R's Third-Party Onboarding

⁵ Case 16-M-0411, *In the Matter of Distributed System Implementation Plans*.

documents are attached hereto as an example of the types of business onboarding documents required for third-party use of GBC.

IV. Conclusion

Together, the business onboarding requirements and the DSA, including the self-attestation, are the terms and conditions the Joint Utilities require from third parties seeking to use GBC. The Joint Utilities will modify these terms and conditions, as appropriate, to remain current with cyber security and customer data best practices and policies.

Dated: October 15, 2019

Respectfully submitted,

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Third-Party Onboarding Document

Green Button Share My Data

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Last Print Date	

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2. DOCUMENT REFERENCES

#	Document	Document link / Reference ID
1	REQ.21 – Energy Services Provider Interface, NAESB 2010,	http://www.naesb.org/ESPI_Standards.asp
2	The OAuth 2.0 Authorization Framework, RFC 6749	http://www.ietf.org/rfc/rfc6749.txt
3	The OAuth 2.0 Authorization Framework: Bearer Token Usage, RFC 6750	http://www.ietf.org/rfc/rfc6750.txt
4	RESTful Web services: The basics”, IBM Developer Works	https://www.ibm.com/developerworks/webservices/library/ws-restful/

TABLE 1: DOCUMENT REFERENCE

3. DOCUMENT CONTROL

Change Record

Date	Author	Version	Change Reference
Nov 28, 2017	[REDACTED]	0.1	Initial document
Mar 14, 2018	[REDACTED]	1.0	Edited and Formatted
Mar 16, 2018	[REDACTED]	2.0	Updated as per new Business process
Mar 28, 2018	[REDACTED]	2.0	Updated diagram to replace acronym "DER" with correct phrase
Apr 18, 2018	[REDACTED]	2.0	Incorporated peer review comments

Peer Reviewers

Name	Position	Date Received
[REDACTED]	[REDACTED]	Apr 17, 2018
[REDACTED]	[REDACTED]	

Approvers

Name	Position	Signature
[REDACTED]	[REDACTED]	

4. OVERVIEW

Definition and Origin -

- Launched in 2012 as a national energy usage data sharing standard to provide customers with quick and easy access to their usage data in an easy to read format.
- Green Button was inspired by the success of Blue Button, which gave veterans quick and easy access to their medical records.
- Green Button was developed by the energy industry in a consensus process and now may be adopted voluntarily by Utilities.
- It aims to ensure that customers have timely access to their own energy data in customer-friendly and computer-friendly formats.

What Value does Green Button Offer?

- **Saving Money:** understanding home energy usage and finding ways to reduce electricity consumption and reduce bills
- **Insight:** entrepreneur-created web portals that can analyze energy usage and provide actionable tips
- **Heating and Cooling:** customized heating and cooling activities for savings and comfort
- **Education:** community and student energy-efficiency competitions
- **Retrofits:** improved decision-support tools to facilitate energy-efficiency retrofits
- **Verification:** measurement of energy-efficiency investments
- **Real Estate:** provision of energy costs for tenants and/or new home purchasers
- **Solar:** optimize the size and cost-effectiveness of rooftop solar panels

Key Facts

No Personal Identifiable Information (PII)

- There is no PII contained within the standard Green Button data, it contains only measured interval usage information.
- The data representation has been fully reviewed by the cyber-security teams at the National Institute of Standards and Technology from this perspective.

Metered Data Represented in Standard Format

- Green Button data is represented in standard formats so that many stakeholders may use the data without the burden of proprietary data conversion technologies.

Green Button Data Formats Are Based Upon International Standards

- The North American Energy Standards Board (NAESB) REQ 21 standard provides the basis for the Green Button representation.
- It uses a defined set of resources, along with an industry and internet standard representation.

Green Button Certified Service Providers

- All Green Button files are not necessarily interoperable.

Two Ways A Utility Customer Can Share their Data

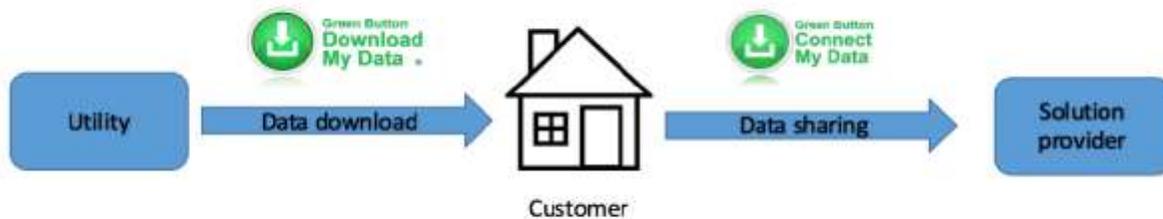
Green Button Download My Data (DMD)

- A customer visits their Utility website, they can simply login and download their Green Button Data to share with a Third-Party (TP).



Green Button Share My Data (CMD)

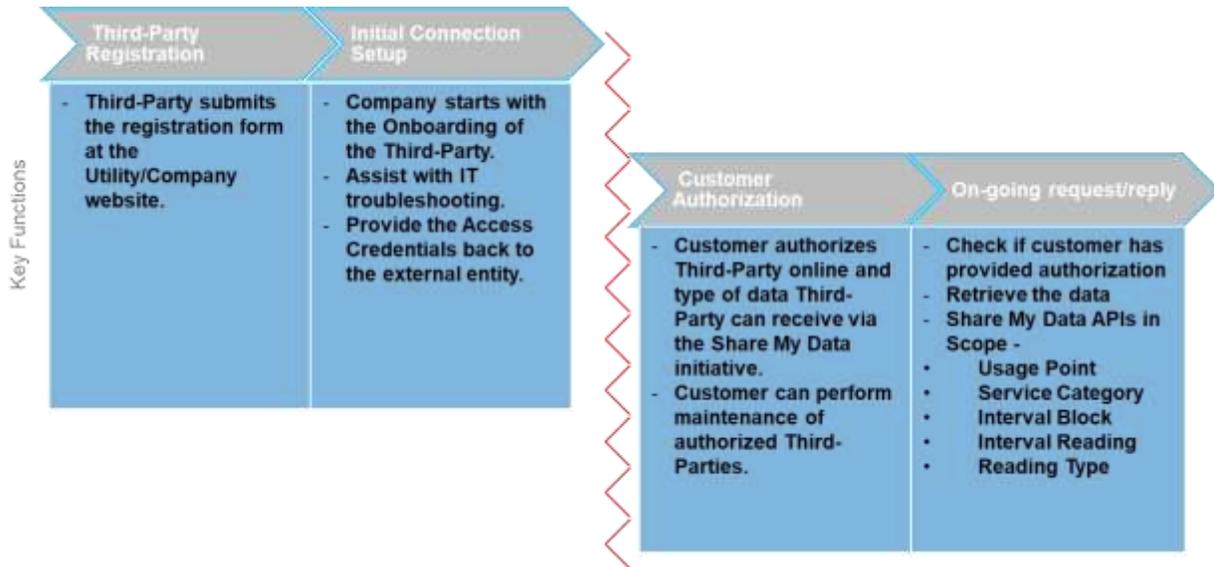
- Green Button Share My Data allows a customer to authorize a Third-Party service provider to receive direct access to their Green Button Data
- There is no need for the customer to repeatedly login to the Utility website to download files
- These authorizations are valid for an agreed upon time and can be revoked at any time by the customer



5. OBJECTIVES

The purpose of this document is to help Third-Parties onboard on the Utilities Company’s Green Button Share My Data Initiative. The Green Button Share My Data is introduced to enhance the existing functionality of Green Button Download My Data (GBDMD) which results in a file containing the Utility Customer’s Energy Usage Information being downloaded to their computer.

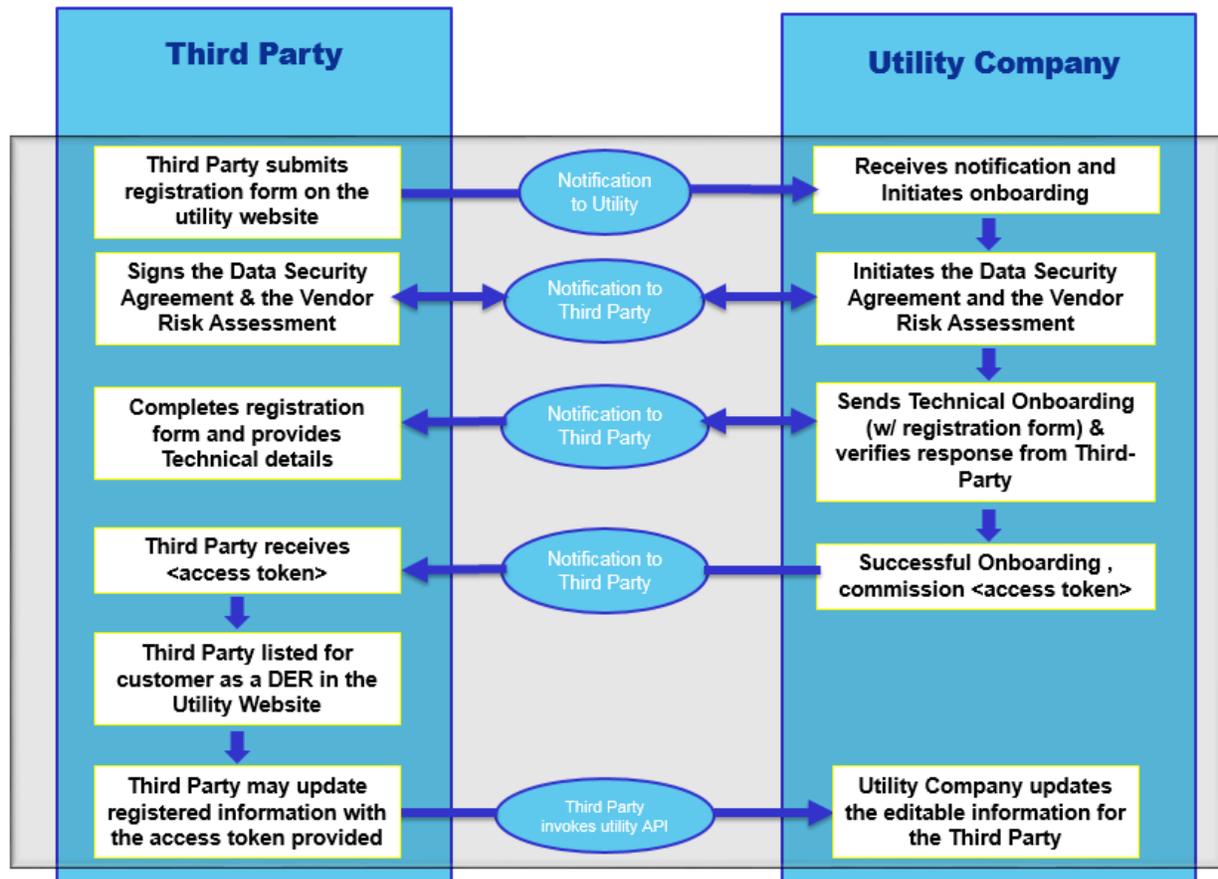
The end-to-end process for Green Button Share My Data involves four steps. After the initial two set up steps, there is a break in the process until the Utility customers provide authorization.



The following section in the document details out the complete functionality of each step in the Green Button Share My data independently.

5.1 Third-Party Registration

The figure below portrays the Third-Party registration and the following business onboarding handshake between Third-Party & Utility company -



5.1.1 [Submit Registration Form](#)

- Share My Data registration process allows the Third-Party to identify itself to Utility company as a vendor—or other entity—that would like to access customer-authorized data and set up access to Share My Data APIs.
- To register as a Third-Party provider, the Third-Party needs to fill out the requested information and submit intent to become a green button Third-Party.
- Links below for the Con Edison & ORU Registration Forms—

✓ <https://www.coned.com/accounts-billing/share-energy-usage-data/become-a-third-party/registration-form>

- ✓ <https://www.oru.com/accounts-billing/share-energy-usage-data/become-a-third-party/registration-form>

Note: The registration form URL is different for Con Edison and Orange & Rockland (ORU). The Customers Authorization via the Con Edison Website remains Active across the ORU website and vice-versa

The screenshot shows the top navigation bar of the Con Edison website with the logo on the left and links for 'Account & Billing', 'Services & Outages', 'Save Energy & Money', and 'Our Energy Future' in the center. On the right, there are links for 'Contact Us', 'Language', 'Search', and 'Login or Register'. Below the navigation is the main heading 'Register as a Third-Party Company' with a sub-heading 'Please enter your information to be added as an authorized third-party company in the Share My Data program.' The form itself is titled 'Business & Contact Information' and contains the following fields: 'Company Name', 'First Name', 'Last Name', 'Phone Number', 'Ext (optional)', and 'Email'. There is a checkbox for 'I'm not a robot' with a CAPTCHA image. A green 'Submit' button is at the bottom of the form. A small disclaimer at the bottom of the page reads: 'Con Edison's account services and customer-specific information are solely intended for use by the customer who is the'.

5.1.2 [External Onboarding Process - Gather Required Information](#)

Utility Company will track the External and the Internal Onboarding process for the Third-Party registering to be part of the Green Button Share My Data initiative.

The steps below detail out the Business Approval process as part of the Third-Party & Con Edison handshake -

- The Third-Party submits Third-Party online registration form
- The submission of Third-Party registration form will initiate an email notification to the Utility company DL - Sharemydata@coned.com
- Utility representative (representing both CECONY and O&R) will reach out to Third-Party and send electronically the following:

- i. Data Security Agreement
 - ii. Vendor Risk Assessment form
- d. Third-Party must complete the Vendor Risk Assessment form and send back to Utility representative for review
 - i. A Utility representative or Cyber Security Specialist may follow up with Third-Party if additional information or clarification is needed regarding the Vendor Risk Assessment
- e. A Utility representative will follow up with Third-Party when Vendor Risk Assessment is approved or denied
 - i. If Vendor Risk Assessment is approved, Third-Party will execute Data Security Agreement(s) and send back to Utility representative
 NOTE: If a Third-Party would like to access data from both CECONY and O&R, Third-Party must execute the Data Security Agreement for each respective Utility
 - ii. If Vendor Risk Assessment is not approved, Third-Party will not be authorized to access customer data
- f. Utility representative will not start Third-Party on technical onboarding while Vendor Risk Assessment is pending
- g. Upon successful completion of the Vendor Risk Assessment and, Data Security Agreement, a Utility representative will electronically send the Technical Onboarding document with the Third-Party registration form as part of the Technical Onboarding process



Third-Party
Registration Form

- h. Third-Party must complete the Registration form and send back to Utility representative for review
- i. Upon successful review and completion of technical onboarding, Third-Parties will be authorized to access customer data for which they have received customer consent
- j. Third-Party will be added as potential party for customers to share their data with via Share My Data

5.1.3 [Notify Third-Party – Onboarding process outcome](#)

- a. If Approved, Third-Party will receive a Notification from company Admin on the Registered email address with the following information -
 - ✓ Application Information Id - The unique key to access Third-Party application information from Utility company Server
 - ✓ Access Credentials: from the Utilities' s Authorization Server to request the Utility's Customer Data
 - ✓ Registration Client URI – Using this URL Third-Party can view/update its information after successful onboarding process
 - ✓ Registration Access Token - Using Application ID, URL and this token, Third-Party can update some of its provided information after successful onboarding process

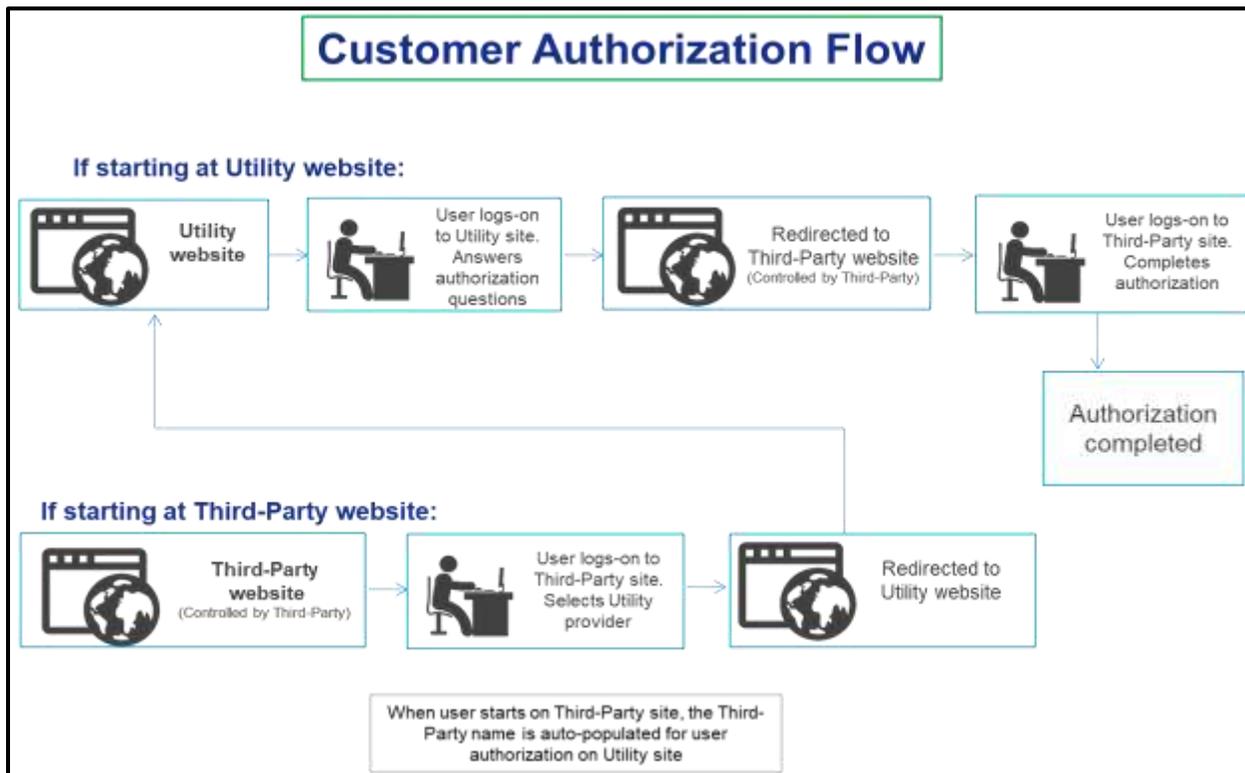
- ✓ Data Custodian Bulk Request URI – Using this URL Third-Party can issue a “bulk” request for all customers that have been authorized with a matching {BulkID}
 - ✓ Authorization Server Token Endpoint – Using this URL Third-Party can generate token required to access Share My Data Authorization and Data Access APIs.
 - ✓ Subscription Key – A key required by Third-Party to invoke any of the Share My Data API
- b. Third-Party will now be appearing on the Utility website(UI) under the Share My Data Available connections for Utility customers to authorize them.
 - c. At this point, the Customer will be able to Authorize the Third-Party to request its data.

5.2 Customer Authorization – Utility’s Website to Third-Party

A Customer authorizes a Registered Third-Party:

1. Via starting at the Utility website
2. Via starting at the Third-Party website

The below figure portrays both the above processes that the customer follows via logging in the Utility website OR the Third-Party website -



5.2.1 [Customer starting at the Utility Website](#)

The Customer Authorization process is specifically defined as part of the Green Button Standard. The high-level process flow is as follows:

1. Customer navigates to Utility’s website
2. Customer logs into Utility’s website
3. Customer navigates to Share My Data page and selects a registered Third-Party to give explicit authorization to share data
4. Customer is redirected to the Third-Party website

5. Customer logs into Third-Party website
 6. Customer provides explicit authorization
 7. Customer confirms authorization in Third-Party website
- Per Green Button Standard, customer ends at the Third-Party website*
- Note: This process can also be initiated from the Third-Party website.

5.2.2 [Customer starting at Third-Party Website](#)

The Customer Authorization process is specifically defined as part of the Green Button Standard. The high-level process flow is as follows:

1. Customer navigates to the Third-Party website
 2. Customer logs into the Third-Party website
 3. Customer selects Utility from the Third-Party website
 4. Customer is redirected to the Utility's website
 5. Customer logs into Utility's website
 6. Customer selects account to share data to Third-Party (the Third-Party name is auto-populated)
 7. Customer is redirected again to the Third-Party website
 8. Customer provides explicit authorization
 9. Customer confirms authorization in the Third-Party website
- Per Green Button Standard, customer ends at the Third-Party website.*

5.2.3 [After successful Authorization](#)

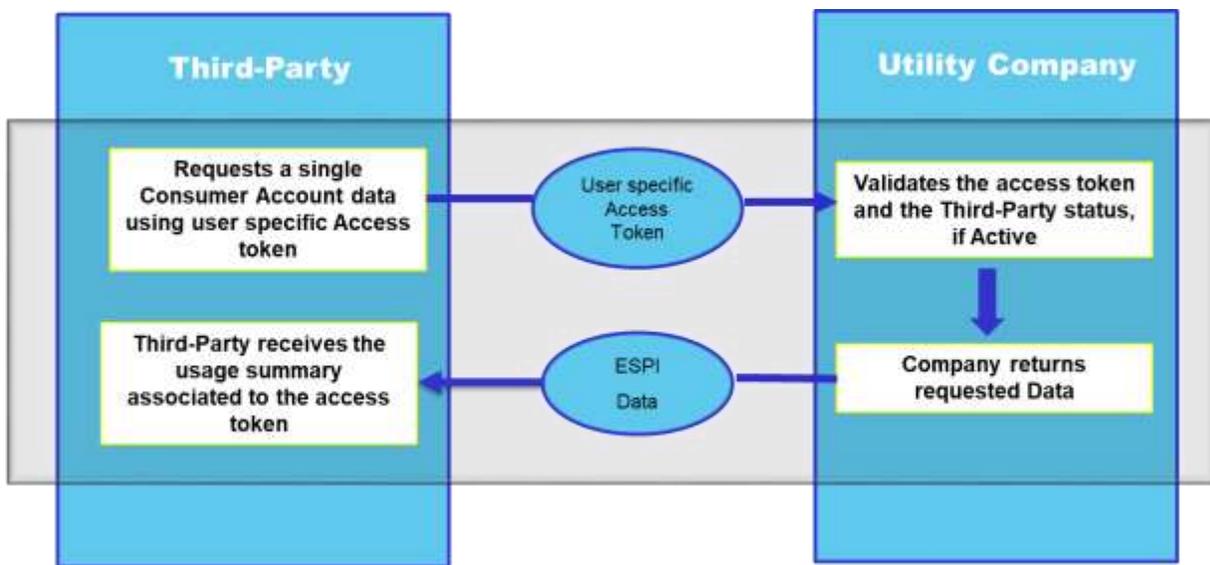
- All customers will receive a monthly report detailing the kind of information retrieved by the Third-Party from customer's account during the Month.
- Customers will be able to update their authorizations by doing the following:
 - a. *Update or extend the end date of the authorization period*
 - b. *Revocation or Expiration of the authorization granted*

5.3 Exchange of Resources by Authorized Third-Party

Green Button standard supports the below nature of requests for the exchange of resources by the authorized Third-Parties -

5.3.1 Data Access – Synchronous Request

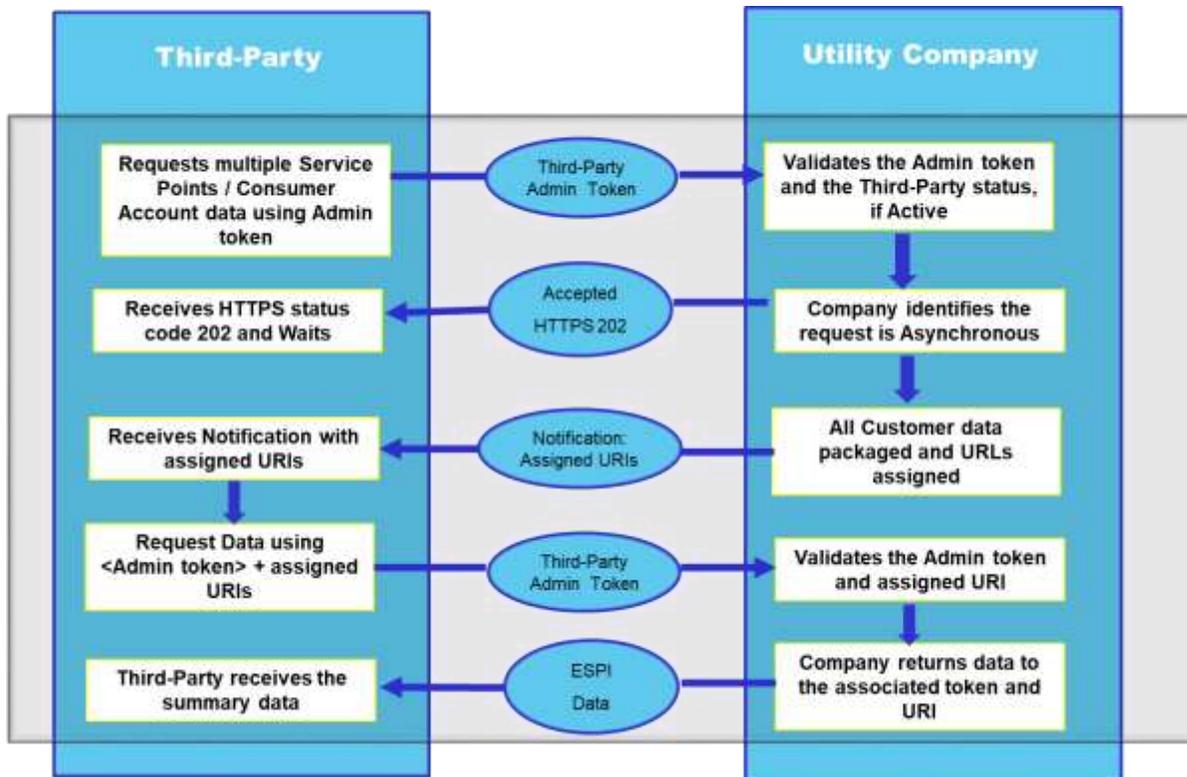
The Synchronous request allows the Third-Party to request data for a single Service Point and customer information for a single authorization. The service can only be utilized by the Third-Party that have received Customer Authorization.



5.3.2 Data Access – Asynchronous Request

An asynchronous request allows the Third-Party to request multiple Service Points or customer information for multiple authorizations. The service requires the Third-Party to input the Admin token received during Registration process.

NOTE: An asynchronous request's response (i.e. data) is available for Third-Party only for 48 hours. Third-Party will have to re-initiate the Share My Data asynchronous request to access the required consumption data.



5.3.3 Third-Party - Token Types

Each Third-Party will receive and use the tokens outlined below, following a successful customer authorization with the Utility company

1. **Third-Party Admin – Access Token [Client Access Token]**
 - a. The Third-Party can generate this token following successful completion of onboarding process
 - b. This token can be used to retrieve either 'customer authorization details for all or specific customer accounts' or 'retrieve all customer's consumption data', which are authorized with the Third-Party

2. Third-Party User – Access Token [Access Token]

- a. The Third-Party receives this token following completion of the Customer Authorization process
- b. This token can be used to retrieve customer specific account data and cannot be shared across multiple authorizations

5.4 Third-Party Application Termination

Con Edison may terminate the registered Third-Party upon occurrence of any one of the following events:

- a. Poor business practices
- b. Data Breaches
- c. Does not abide to the Data Security Agreement
- d. Failure to complete testing within 90-day period

Once terminated, the Third-Party will no longer have access to any Customer's data i.e. all the customer authorizations for this Third-Party will be revoked and the Third-Party will no more be a part of the Green Button Share My Data initiative.

If any of these actions are taken, the Utility company will notify all the associated customers regarding the Third-Party Termination.

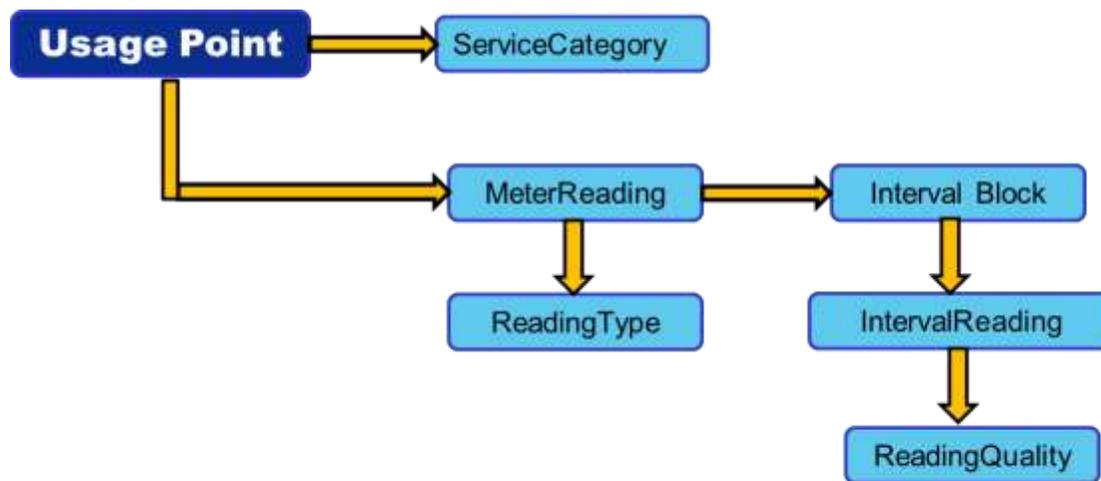
NOTE: Once an authorization is revoked or expired the action cannot be reversed and the customer will have repeat the process of Authorization via the Website

6. GREEN BUTTON RESOURCES / DATA ELEMENTS

REST describes the exchange of Resources. Resources are represented by URLs. Additionally, ESPI resources have UUIDs (as part of the Atom Feed presentation format). The REQ.21 standard identifies the following as Resources:

6.1 Supported Resources for Data exchange

The figure below portrays the company resources in scope of data exchange between Con Edison and Third-Party. The reference between each resource has been identified as represented below -



6.2 Supported Usage Data as part of Data exchange

Green Button's Share My Data initiative supports Interval data exchange and an Authorized Third-Party can access all the below categories of Meter Readings per mentioned intervals for an Electricity or Gas account -

Customer Category	Usage Data Available
Electric Commercial Customers with AMI Meters	5-minute intervals
Electric Residential Customers with AMI Meters	15-minute intervals
Electric Customers with Legacy Interval Meters	15-minute intervals
All Gas Customers with AMI Meters	1-hour intervals
All customers with Non-Interval Meters	Monthly

TABLE: GREEN BUTTON DATA ELEMENTS

7. EXAMPLE API REQUEST FROM THIRD-PARTY - CUSTOMER DATA

If a Third-Party is Authorized by the customer to receive the Customer Account data, there are two ways for a Third-Party to request the Customer data (OR) the describes the most significant way of consuming any Share My Data API -

7.1 Synchronous (Single customer data request)

One approach to request customer data is to use the synchronous API for requesting customer information for a single customer authorization:

Example Synchronous Request URL:

<https://gbc.azurewebsites.net/v1/resource/Subscription/{subscriptionId}/UsagePoint/{usagePointId}>

- **SubscriptionId:** The ID provided by Utility company post completion of the successful Third-Party Authorization process.
- **UsagePointId:** The Associated Service Point ID for the Customer Account Number.
- API will be showing only 2000 entries in single atom feed.
 - Entry starts from 0 index and end to 1999
 - If more data is available, then user will get “<espi: HasMore>true</espi:HasMore>” attribute in feed metadata
 - User can apply “startIndex” attribute to fetch next set of 2000 records
 - For. E.g.: GET <https://{ResourePath}/resource/UsagePoint?startIndex=2000>

Note: The synchronous API is at the individual Customer level which corresponds to a single customer authorization.

7.2 Asynchronous (Multiple customer data request)

A Third-Party can also request customer data via the asynchronous API for requesting information for all the authorized customers.

To support Asynchronous requests, the application will need to support the Notifications per the Third-Party Notification URL you provided during registration -

Example Asynchronous Request URL:

<https://gbc.azurewebsites.net/v1/resource/Batch/Bulk/{bulkId}>

- **BulkID** = BulkID provided in the ApplicationInformation resource retrieved during registration.

8. SAMPLE API RESPONSES TO THIRD-PARTY [XML FORMAT]

The section supports Third-Party with the data format representation of the SHARE MY DATA APIs during the exchange of resources. Also, highlights the significant tokens a Third-Party should input for data request.

Further details on the List of SHARE MY DATA APIs with their description and the Calling parameters are described in section [APIs](#)

8.1 UsagePoint

A *UsagePoint* is where a resource is measured. Typically, it is your Utility Smart Meter, but it could be the outlet on the wall as well. UsagePoints provide the reference for all meter readings that are contained within the Green Button data. UsagePoints have a *ServiceCategory* that defines what *kind* of resource — such as an electricity, gas, or water measurement — is being reported.

[The below table identifies the Data elements retrieved as part of the API Call –](#)

COLUMN_NAME	Description
ServiceCategory	Category of service provided to the customer, Service classification Examples are: 0 - electricity 1 - gas

Data exchange response for “Get Usage point by Id for Subscription Id”
<pre><? xml version="1.0" encoding="utf-8"?> <feed xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom"> <title type="text">Green Button Feed</title> <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=244</id> <updated>2017-12-11T07:04:58Z</updated> <link rel="self" href="https://cdecxd.azure- api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914" /> <HasMore>false</HasMore> <entry xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom"> <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=245</id> <title type="text">Usage Point data</title> <published>2017-12-11T07:04:58Z</published> <updated>2017-12-11T07:04:58Z</updated> <link rel="up" href="https://cdecxd.azure- api.net/gbc/resource/Subscription/132/UsagePoint" /> <link rel="self" href="https://cdecxd.azure- api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914" /> <link rel="related" href="https://cdecxd.azure- api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading" /> <link rel="related" href="https://cdecxd.azure-api.net/gbc/resource/LocalTimeParameters/1" /> <content type="xhtml"> <espi: UsagePoint xmlns: espi="http://naesb.org/espi"> <espi: ServiceCategory></pre>

```

    <espi: kind>0</espi: kind>
  </espi:ServiceCategory>
</espi: UsagePoint>
</content>
</entry>
</feed>

```

8.2 MeterReading

A MeterReading is a container for all the measured *IntervalBlocks* within the Green Button data captured at a *UsagePoint*

[The below table identifies the Data elements retrieved as part of the API Call –](#)

COLUMN_NAME	Description
Meter IDs	Set of values obtained from the meter

```

Data exchange response for "Get Meter Reading by Id for Subscription Id"
<? xml version="1.0" encoding="utf-8"?>
<feed xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Green Button Feed</title>
  <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=248</id>
  <updated>2017-12-11T07:11:37Z</updated>
  <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading" />
  <HasMore>>false</HasMore>
  <entry xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
    <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=249</id>
    <title type="text">Meter Reading Data</title>
    <published>2017-12-11T07:11:37Z</published>
    <updated>2017-12-11T07:11:37Z</updated>
    <link rel="up" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading" />
    <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading/70100403
3" />
    <link rel="related" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading/70100403
3/IntervalBlock" />
    <link rel="related" href="https://cdecxd.azure-
api.net/gbc/resource/ReadingType/SP_100050500072111914_KWH%2015%20Minute%20Interval%2
0Read%20Interval" />
    <link rel="related" href="https://cdecxd.azure-
api.net/gbc/resource/ReadingType/SP_100050500072111914_KVARH%2015%20Minute%20Interval
%20Read%20Interval" />
    <content type="xhtml">
      <espi: MeterReading xmlns: espi="http://naesb.org/espi" />
    </content>

```

```
</entry>
</feed>
```

8.3 ReadingType

A *ReadingType* provides detail as to the specifics of the reading data that is being obtained. Green Button follows international standards and can represent large industrial resources as well as those used in a residence.

[The below table identifies the Data elements retrieved as part of the API Call –](#)

COLUMN_NAME	Description
accumulation Behavior	Code indicating how value is accumulated over time for Readings of ReadingType. The list of valid values per the standard are defined in AccumulationBehaviorType. Examples are: 0 = Not Applicable
Commodity	Code for commodity classification of Readings of ReadingType. The valid values per the standard are defined in CommodityType. Examples are: 1 = Electricity secondary metered value (a premise meter is typically a secondary meter) 7 = NaturalGas
flowDirection	Direction associated with current related Readings. Valid values per the standard are defined in FlowDirectionType. Examples are: 1 = Forward 2 = Lagging 4 = Net (Forward - Reverse)
intervalLength	Default interval length specified in seconds for Readings of ReadingType. Examples are: 2592000 = 1 Month 3600 = 1 Hour 900 = 15 minutes 300 = 5 minutes
powerOfTenMultiplier	Code for the power of ten multiplier which, when used in combination with the uom, specifies the actual unit of measure for Readings of ReadingType. Valid values per the standard are defined in PowerOfTenMultiplierType. Examples are: 0 = None (For Natural Gas) 3 = Kilo = 10**3 (For Electricity)
uom	Code for the base unit of measure for Readings of ReadingType. Used in combination with the powerOfTenMultiplier to specify the actual unit of measure. Valid values per the standard are defined in UomType. Examples are: 72 = Wh (Real energy, Watt hours) 73 = VARh (Reactive energy, Volt Ampere reactive hours) 123 = ft3compensatedPerH (Volumetric flow rate, compensated cubic feet per hour)

Data exchange response for "Get Reading Type by Id"

```
<? xml version="1.0" encoding="utf-8"?>
<feed xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Green Button Feed</title>
  <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=250</id>
  <updated>2017-12-11T07:15:23Z</updated>
  <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/ReadingType/SP_100050500072111914_KVARH%2015%20Minute%20Interval
%20Read%20Interval" />
  <HasMore>>false</HasMore>
  <entry xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
    <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=251</id>
    <title type="text">Type of Meter Reading Data</title>
    <published>2017-12-11T07:15:23Z</published>
    <updated>2017-12-11T07:15:23Z</updated>
    <link rel="up" href="https://cdecxd.azure-api.net/gbc/resource/ReadingType" />
    <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/ReadingType/SP_100050500072111914_KVARH%2015%20Minute%20Interval
%20Read%20Interval" />
    <content type="xhtml">
      <espi: readingType xmlns: espi="http://naesb.org/espi">
        <espi: accumulationBehaviour>0</espi: accumulationBehaviour>
        <espi: commodity>1</espi: commodity>
        <espi: flowDirection>2</espi: flowDirection>
        <espi: intervalLength>900</espi: intervalLength>
        <espi: powerOfTenMultiplier>3</espi: powerOfTenMultiplier>
        <espi: uom>73</espi: uom>
      </espi: readingType>
    </content>
    <subscriptionId>132</subscriptionId>
  </entry>
</feed>
```

8.4 IntervalBlock

IntervalBlocks are the primary data carrier within the Green Button data. *IntervalBlocks* may have one or more *Intervals*, each with a start and duration, as well as the specific *IntervalReading*

[The below table identifies the Data elements retrieved as part of the API Call –](#)

COLUMN_NAME	Description
timePeriod	The date time and duration of a reading. If not specified, readings for each "intervalLength" in ReadingType are present
value	Value in units specified by ReadingType

Data exchange response for "Get Interval block by Id for Subscription Id"

```
<? xml version="1.0" encoding="utf-8"?>
<feed xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Green Button Feed</title>
  <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=254</id>
  <updated>2017-12-11T07:17:34Z</updated>
  <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading/70100403
3/IntervalBlock" />
  <HasMore>True</HasMore>
  <entry xmlns: espi="http://naesb.org/espi" xmlns="http://www.w3.org/2005/Atom">
    <id>uuid:1a098eba-591a-4faf-9e11-90a716dc50dd; id=255</id>
    <title type="text">Interval Block Data</title>
    <published>2017-12-11T07:17:34Z</published>
    <updated>2017-12-11T07:17:34Z</updated>
    <link rel="up" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading/70100403
3/IntervalBlock" />
    <link rel="self" href="https://cdecxd.azure-
api.net/gbc/resource/Subscription/132/UsagePoint/100050500072111914/MeterReading/70100403
3/IntervalBlock/SP_100050500072111914_KVARH%2015%20Minute%20Interval%20Read%20Interva
l" />
    <content type="xhtml">
      <espi: IntervalBlock xmlns: espi="http://naesb.org/espi">
        <espi: interval>
          <espi: start>1502236800</espi: start>
          <espi: duration>63113904</espi: duration>
        </espi: interval>
        <espi: IntervalReading>
          <espi: timePeriod>
            <espi: start>1502236800</espi: start>
            <espi: duration>900</espi: duration>
          </espi: timePeriod>
          <espi: value>0.0044</espi: value>
        </espi: IntervalReading>
        ...
        ...
        <espi: IntervalReading>
          <espi: timePeriod>
            <espi: start>1504122300</espi: start>
            <espi: duration>900</espi: duration>
          </espi: timePeriod>
          <espi: value>0.09</espi: value>
        </espi: IntervalReading>
      </espi: IntervalBlock>
    </content>
  </entry>
</feed>
```

9. APPENDIX

9.1 Exposed Share My Data APIs

Please refer the URL below to get details on the Green Button Share My Data REST API interfaces. This list of APIs details the standard Green Button Share My Data APIs in scope for an authorized Third-Party to request a customer account information.

<https://gbc.azurewebsites.net/swagger/ui/index>

9.2 Supported Scope String for Data Exchange

Scope String is a list of scope terms that define resources to which Third-Party may be granted access to by the Customer during authorization process. Scope string describes all the possible combinations of data exchange parameters for instance, what / how and when a Third-Party can request data on behalf of the customer.

While per Green Button Share My Data Phase 1, the supported scope string for data exchange is only one, the upcoming implementations of GC may have multiple scope strings for the customers to opt for –

FB=1 3 4 5 6 7 10 13 14 18 32 33 35 36 37 38 40 41 44;
IntervalDuration=Monthly 3600 900 300; BlockDuration=Bi-Yearly; HistoryLength= 63113904; BR=1

Scope Term	Definition
FB	Specifies the function Blocks in scope for Green Button Share My Data Phase 1. Refer Function Block for more details.
IntervalDuration	This is the minimum default length of an interval in seconds, 900 for residential 300 for commercial. (e.g. 900 for 15 minutes, 3600 for one hour)
BlockDuration	This is the length of a block that contains the intervals.
HistoryLength	Defines how far back data can a Third-Party request on behalf of the Customer. This is the maximum default length of consumption data represented in seconds 63113904 (i.e. 2 years)
BR	Bulk Request ID (provided in the ApplicationInformation Resource retrieved during registration)

TABLE 22: SCOPE STRING

9.3 Function Blocks for Green Button Share My Data Scope String

Function Blocks are group of functionalities which are validated for conformance with Green Button Standard. The combination of Function blocks defines the scope of data exchange between Third-Party and Utility company

FB Term	Function Block
1	[FB_1] Common Data Custodian Required of all Data Custodian implementations.
2	[FB_3] Core Green Button Share My Data Support for the authorization and automated REST web services for Green Button data.
3	[FB_4] Interval Metering Support for Interval (time based) series of measurements.
4	[FB_5] Interval Electricity Metering Specific support for Wh interval readings.
5	[FB_6] Demand Electricity Metering Support for W, VAR, and VA measurements
6	[FB_7] Net Metering Support for NET metering measurements.
7	[FB_10] Gas Support for Gas Therms consumption readings.
8	[FB_13] Security and Privacy classes In CMD, required security and privacy based on section Error! Reference source not found..
9	[FB_14] Authorization and Authentication Support for OAuth 2.0 and related requirements.
10	[FB_18] Multiple Usage Points Support for multiple UsagePoint resources in a single file.
11	[FB_32] Resource Level REST Support for APIs that access by resource types.
12	[FB_33] Management REST Interfaces Support for management REST interface that allows all APIs without further authorization.
13	[FB_35] REST for Bulk Support for Bulk data using REST GET to pull data from Data Custodian (single access of all resources authorized under single BulkID see section Error! Reference source not found.).

FB Term	Function Block
14	[FB_36] Third-Party (Client) Dynamic Registration Support for dynamic registration of Third-Parties via API.
15	[FB_37] Query Parameters Support for updated and published max and min date query parameters in REST requests.
16	[FB_38] On Demand Requests Support for On-Demand REST requests (without need for prior Notification).
17	[FB_40] Offline Authorization Support for non-api based authorizations (no OAuth).
18	[FB_41] Manage Authorization Resource Ability to PUT and DELETE the Authorization resource to make updates to an authorization.
19	[FB_44] Manage ApplicationInformation Resource Ability to PUT and DELETE the ApplicationInformation resource to make updates to the Third-Party/ Data Custodian relationship.

TABLE 33: FUNCTION BLOCK

10. KEY DECISIONS

The following are the Key Decisions to be taken care during the Third-Party Business Onboarding handshake between Company and Third-Party:

#	Key Decision
1	Third-Party would require a unique E-mail information during Registration. A Third-Party Cannot be Onboarded twice with the same E-mail information. Also, since E-mail in Share My Data system is a non-editable field, TP should not use any personal E-mail instead a company's E-mail should be provided for contact.
2	For Third-Party scope selection, irrespective of Functional Scope selected by user during authorization process, it will get replaced with the confirmed Scope for Share My Data Phase 1. Refer the Table 2 for the confirmed Scope string.
4	The Third-Party Admin Token and the user level tokens are active / alive only for 1 hr. Post which the Third-Party will have to request a new token by providing the refresh token. For more details on the tokens refer Token Types
6	Refresh Tokens associated with user level access token shared with the Third-Party upon authorization are required to be used at least once every 45 days to keep them alive. Failing to do so, will result in token expiration with no access to customer data until customer authorizes the Third-Party again to generate new Refresh Token.
7	Third-Party will always receive up to last two years of data from the time of request and will have No filter to select the time range for requesting any customer's data.

TABLE 44: KEY DECISIONS

11. ACRONYMS

#	Acronym	Description
1	CECONY/CON EDISON	Consolidated Edison Company of New York
2	O&R/ORU	Orange and Rockland Utilities
3	GBC	Green Button Connect

TABLE 55: ACRONYMS