

What is Green Button? How is it useful to Federal Agencies?

white house inspired.
industry led.

In response to the Obama Administration's call to action, 150+utilities and service providers commit to provide 60+ million homes and businesses with their own energy usage information in the consensus industry standard Green Button format



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Agenda



- What is Green Button? ↪ ↪
 - Brief history of the initiative, goals, current status
- Federal Call to Action
 - Presidential Vision and Direction

Matt Theall – Presidential Innovation Fellow, DOE

- How is Green Button Useful to Federal Agencies
 - GSA Pilot: Goals and Achievements
- Detailed Discussion
 - Overview of the Moving Parts

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Federal Government Interest in Data



Open Data Initiatives

- Making government information resources more publicly accessible in “computer-readable” form; encouraging its use by entrepreneurs fueling the creation of new products, services, and jobs
- Project Open Data: <http://project-open-data.github.io>
- Examples: Federal Register 2.0, Data.gov, Health Data Initiative, ...

My Data Initiatives

- Empowering consumers with secure access to their own personal health, energy, and education data
- Blue Button (health info), Green Button (energy), Education, ...

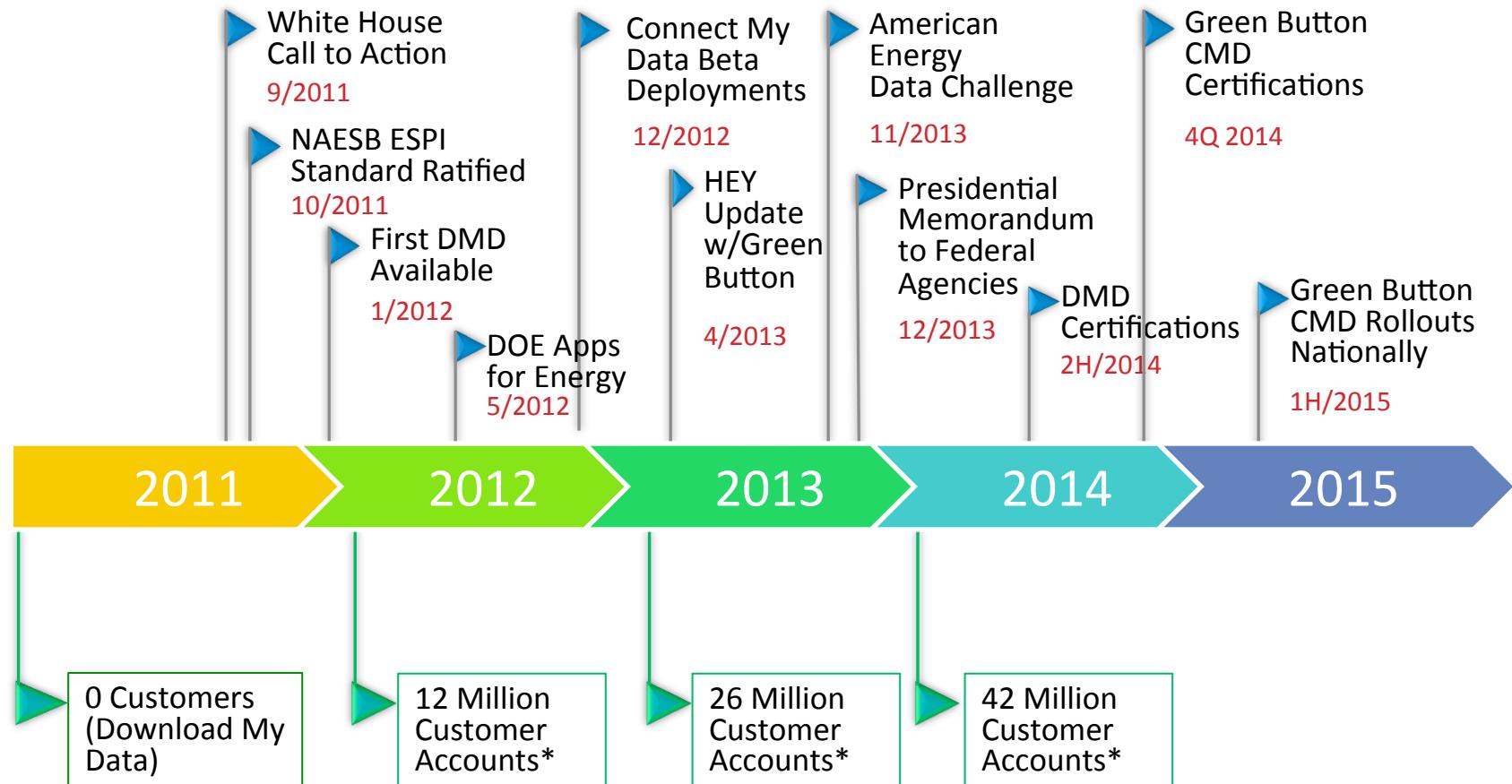


What is Green Button? – How is it useful to Federal Agencies?



- The Green Button Initiative encourages all utilities and service providers to standardize the format and communication of energy data so customers and third-party service providers can easily access and exchange energy usage information from utility or electricity suppliers.
- Agencies can benefit from having Green Button Data available, in a cost effective common format, from all their energy suppliers and using that data to more cost-effectively manage their energy use information.

Green Button Evolution



* Represents Customer Accounts with Access to Green Button Data – Primarily DMD; Actual Customer download numbers are not available

Download My Data and Connect My Data



**Green Button
Download
My Data**

A customer visits their utility web portal, they can simply login and download their Green Button Data as an XML-formatted file.



**Green Button
Connect
My Data**

This powerful model allows a consumer to authorize a third-party service provider to receive direct access to their Green Button Data - no need to repeatedly login to their utility and download files. These authorizations are valid for an agreed upon time and can be revoked at anytime by the consumer.

Green Button Supports Innovation in New Applications



Insight: entrepreneur-created web portals 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, Virtual Energy Audits;

Verification: measurement of energy efficiency investments;

Real Estate: provide energy costs for tenants and/or new home purchasers; and

Solar: optimize the size and cost-effectiveness of rooftop solar panels.



Green Button Connect My Data In Washington DC Governmental Services



Green Button
Connect
My Data

Providing 15 Minute
Interval Data for 400
Buildings in DC

Local Utility (Pepco Holdings) providing first in the nation deployment with Green Button Connect My Data inside!



The District of Columbia is saving money, saving energy and creating one of the greenest cities in the world.

Transparency

Build Smart DC is a public, visual record of building energy use in the District. Established with a core of publicly-managed facilities, the platform is expanding to provide building performance and energy efficiency project data on the broadest possible swath of buildings in Washington, DC.

Efficiency

From building management system optimization to improved HVAC and lighting scheduling, Build Smart DC captures and highlights the significant savings achieved through no- and low-cost improvements to building energy management.

<http://www.buildsmartdc.com>

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Climate Action Plan Commitment



“The Administration will leverage the ‘Green Button’ standard – which aggregates energy data in a secure, easy to use format – within federal facilities to increase their ability to manage energy consumption, reduce greenhouse gas emissions, and meet sustainability goals.”

The President’s Climate Action Plan,
June 25, 2013

US Federal Government Commitment



Presidential Memorandum (to all Federal agencies)

"Sec. 3. Building Performance and Energy Management .. each agency shall: ... incorporate Green Button into reporting, data analytics and automation, and processes, in consultation with local utilities ..." [.. GSA, EPA pilots ...]

Presidential Memorandum on Federal Leadership in Energy Management, Dec 5, 2013

Buildings use 40% of our Energy Resources; 75% of our Electricity

Achieving Efficiency is a National Priority

Green Button provides the missing feedback loop

And helps to engage the consumer in the solution

Federal Leadership in Energy Management



Sec. 3. Building Performance and Energy Management.

A - To encourage continuous improvement and better manage building performance, enhance energy efficiency, and reduce energy waste in an open and transparent way, each agency shall:

- (i) install building energy meters and sub-meters
- (ii) install water meters at agency buildings
- (iii) ... agency buildings associated monthly performance data is entered into the EPA Energy Star Portfolio Manager.
- (iv) publicly disclose ... web-based tracking system annual energy performance data
- (v) ... incorporate Green Button into reporting, data analytics and automation, and processes, in consultation with local utilities

Presidential Memorandum for Heads of Exec.
Departments and Agencies
Dec 2013

Agenda



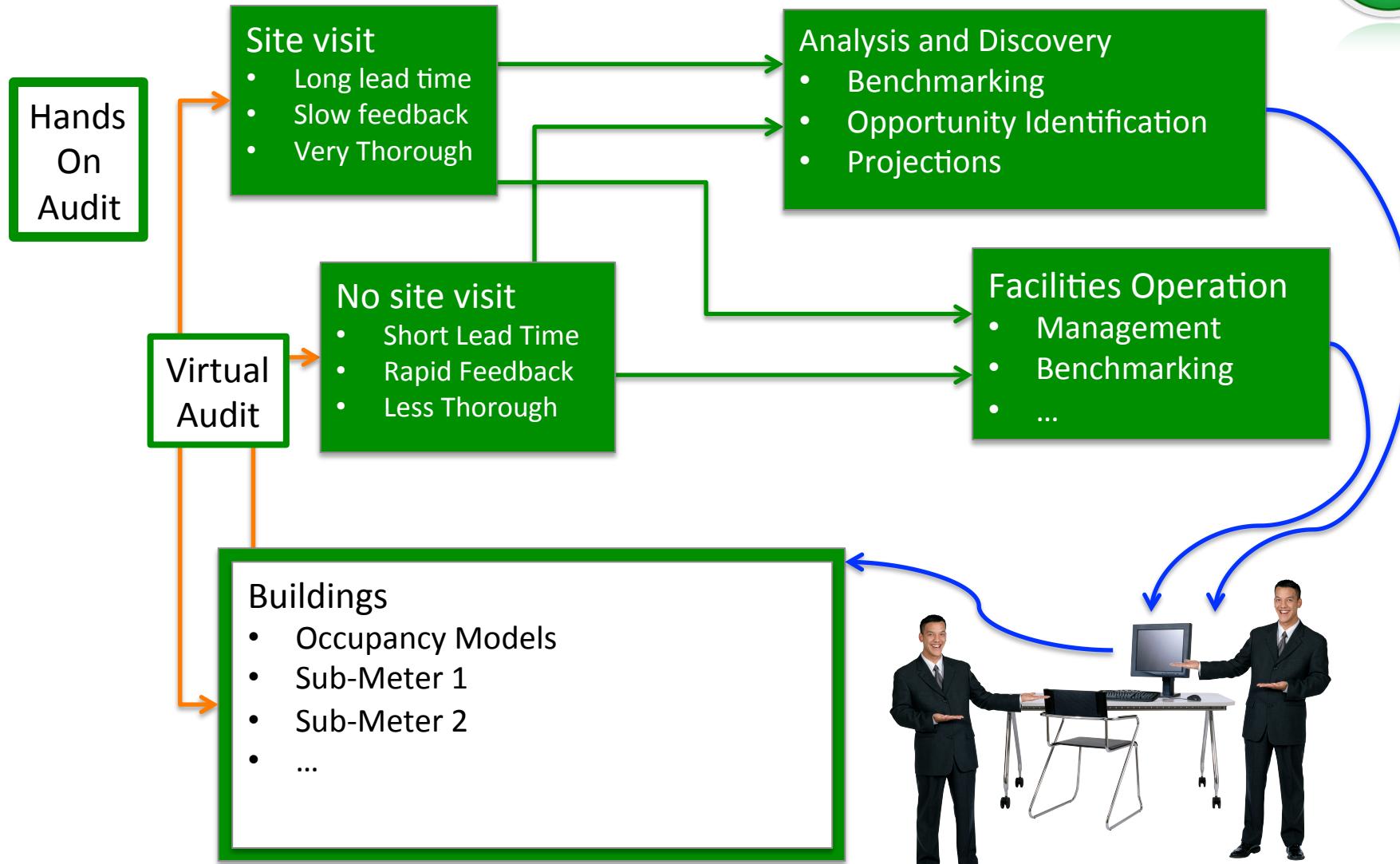
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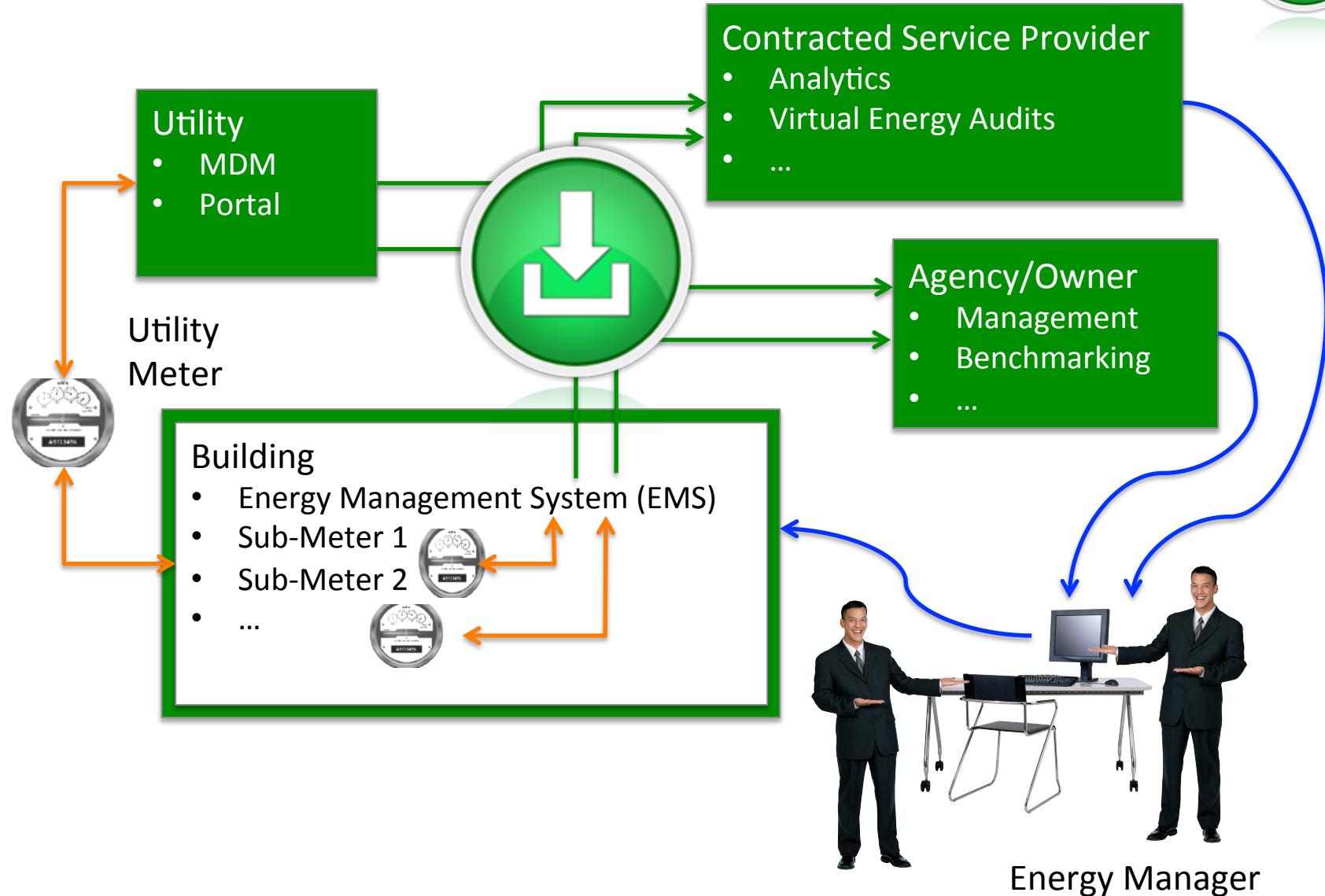
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Use Case: The Energy Audit



Framing the Energy Management Discussion



Energy Manager

GSA Pilot Overview



- Leverage existing Energy Management Pilot to include agency owned energy management systems via Green Button Connect My Data.
- Coordinate with local utility Green Button Connect My Data deployments to receive data obtained from utility owned meters.
- Authorize third party to receive Green Button Connect My Data streams from utility and agency owned systems for 5 target buildings in GSA Region 11.
- Coordinate with EPA as they determine Green Button integration possibilities for Portfolio Manager.
- Provide input to FEMP to aid in the preparation of guidance to be provided to the agencies.

GSA Pilot In Facility Management



**Encourage vendors to support Green Button standard
when providing energy-related services to GSA**

- **Details:**
 - Request Schneider-Energy EEM product team to provide Green Button Connect My Data to transmit submetering interval data to Energy Services Vendor (First Fuel)
 - Request First Fuel to Provide Green Button data in monthly format to EPA Portfolio Manager using Green Button Connect My Data
- **Desired Outcome:**
 - Prove benefits of interoperable access to Green Button data for GSA Energy Efficiency Processes
 - Increase ability of businesses and other agencies to participate in energy efficiency programs using Green Button

Engage Utilities (Pepco Holdings)



Ask utilities to provide GSA electricity data in Green Button format

- **Details:**
 - GSA usage utilities that serve its buildings
 - GSA asks utilities to use “Connect My Data” standard to link data directly to energy management/efficiency systems and vendors (First Energy)
- **Desired Outcome:**
 - Prove Utility Interval Data Supports GSA Efficiency Programs
 - Integrate Utility Data with (Interoperable) Green Button Data from Building Sub-Meter systems

Future Goal: Publish GSA's Utility Data



Publish GSA facilities utility data (ideally in the Green Button format)

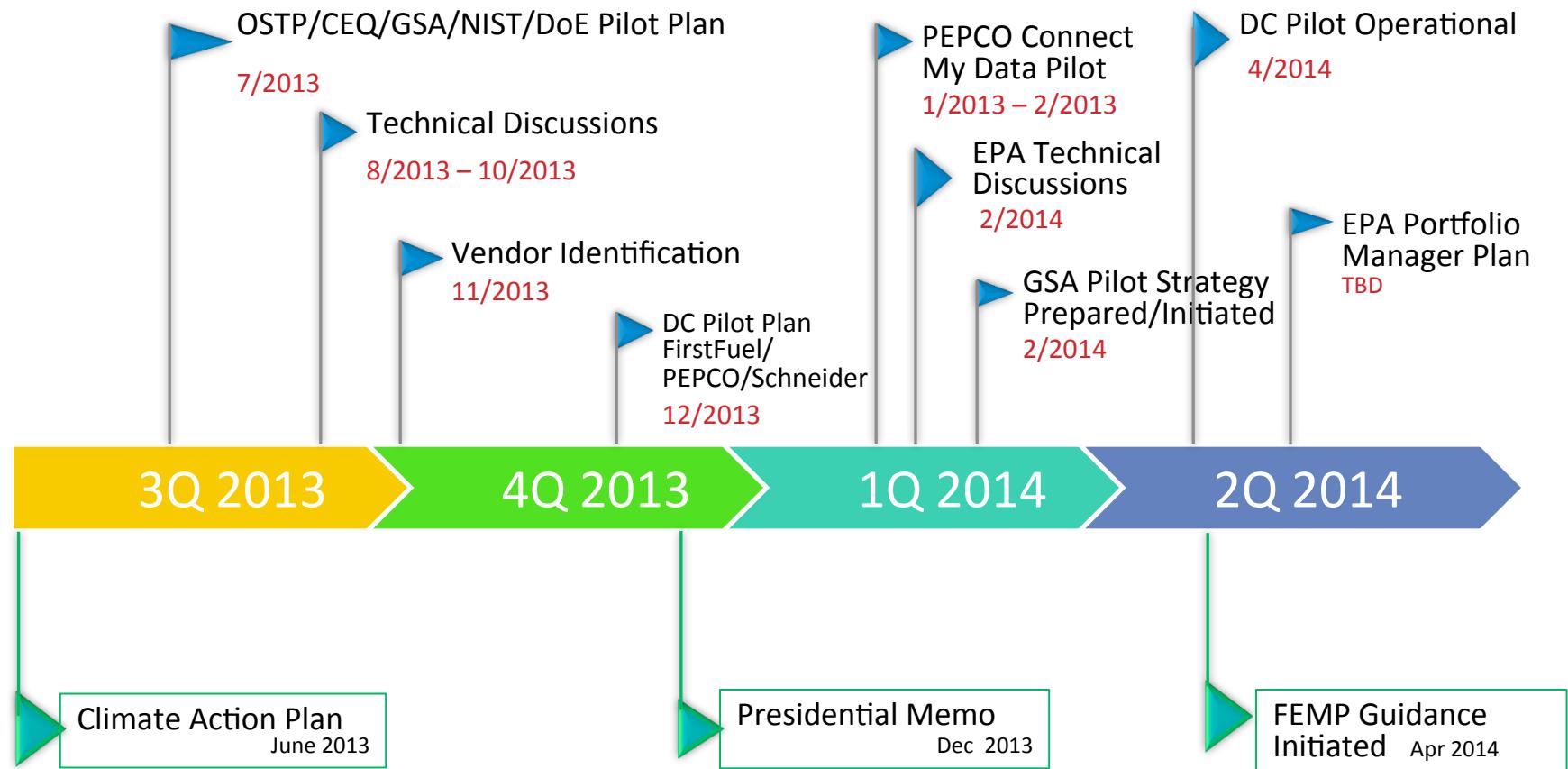
- **Details:**
 - Send Green Button data to EPA/Portfolio Manager using Green Button Connect My Data
 - DOE's Building Performance Database is seeking data
 - data.gov to support public consumption of energy efficiency information
- **Desired Outcome:**
 - Significantly increase the volume of publically available building and utility data available to researchers, developers and the public
 - Increase effectiveness of energy benchmarking tools by providing a significant increase in data availability

GSA Building Selections



- New Executive Office Building
- Orville Wright Building
- National Building Museum
- Department of Education
- Switzer Building

Section 3.B.i - GSA Pilot Activities

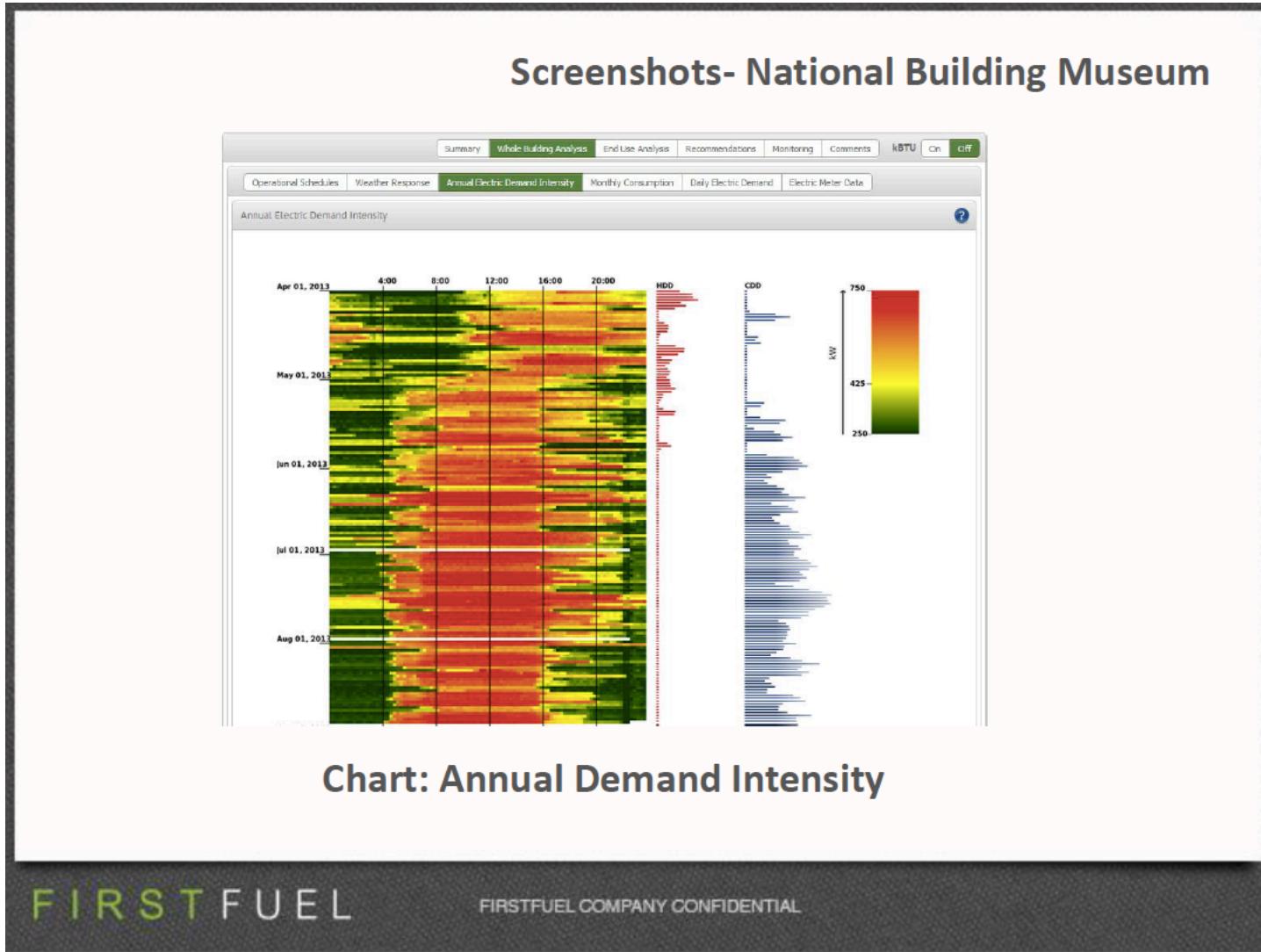


Pilot Status

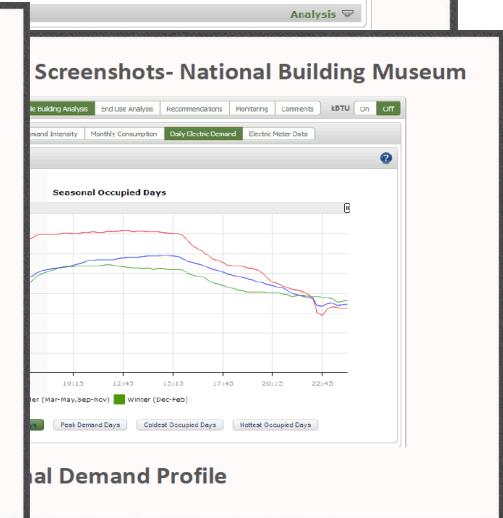
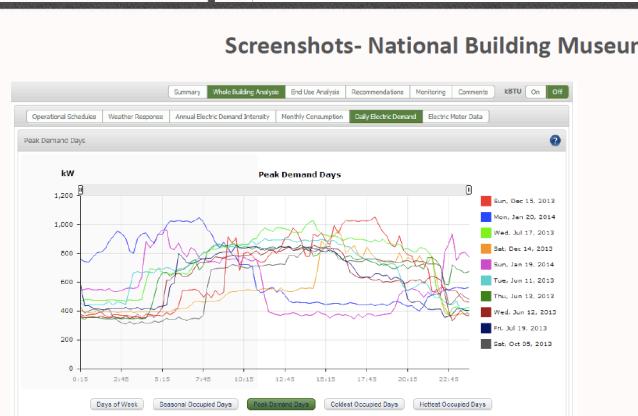
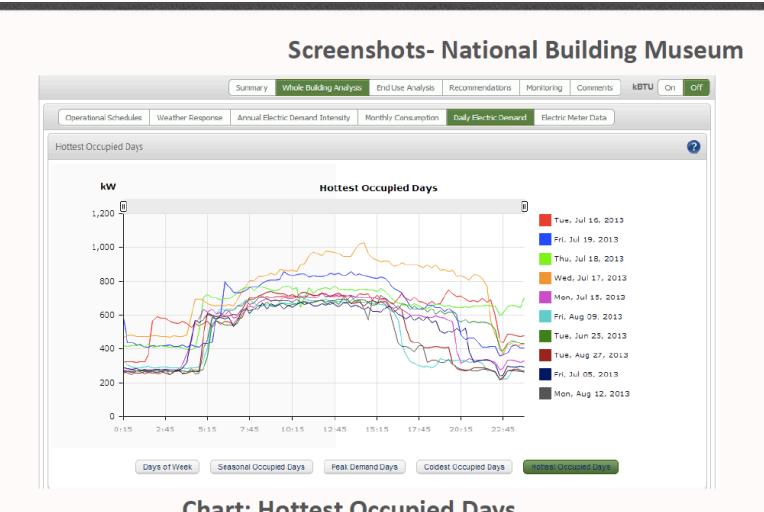


- Utility Green Button data flowing to First Fuel
- Green Button Certification for Schneider-Electric Energy Profiler Online (EPO) product
- Schneider-Electric EEM product aggregating in facility data
- Automated movement of data from both sources to First Fuel on a daily basis
- Benchmarking by First Fuel
- Pilot Summary and Lesson Learned to be finalized and delivered to FEMP

Analytics for Active Management



Analytics for Active Management



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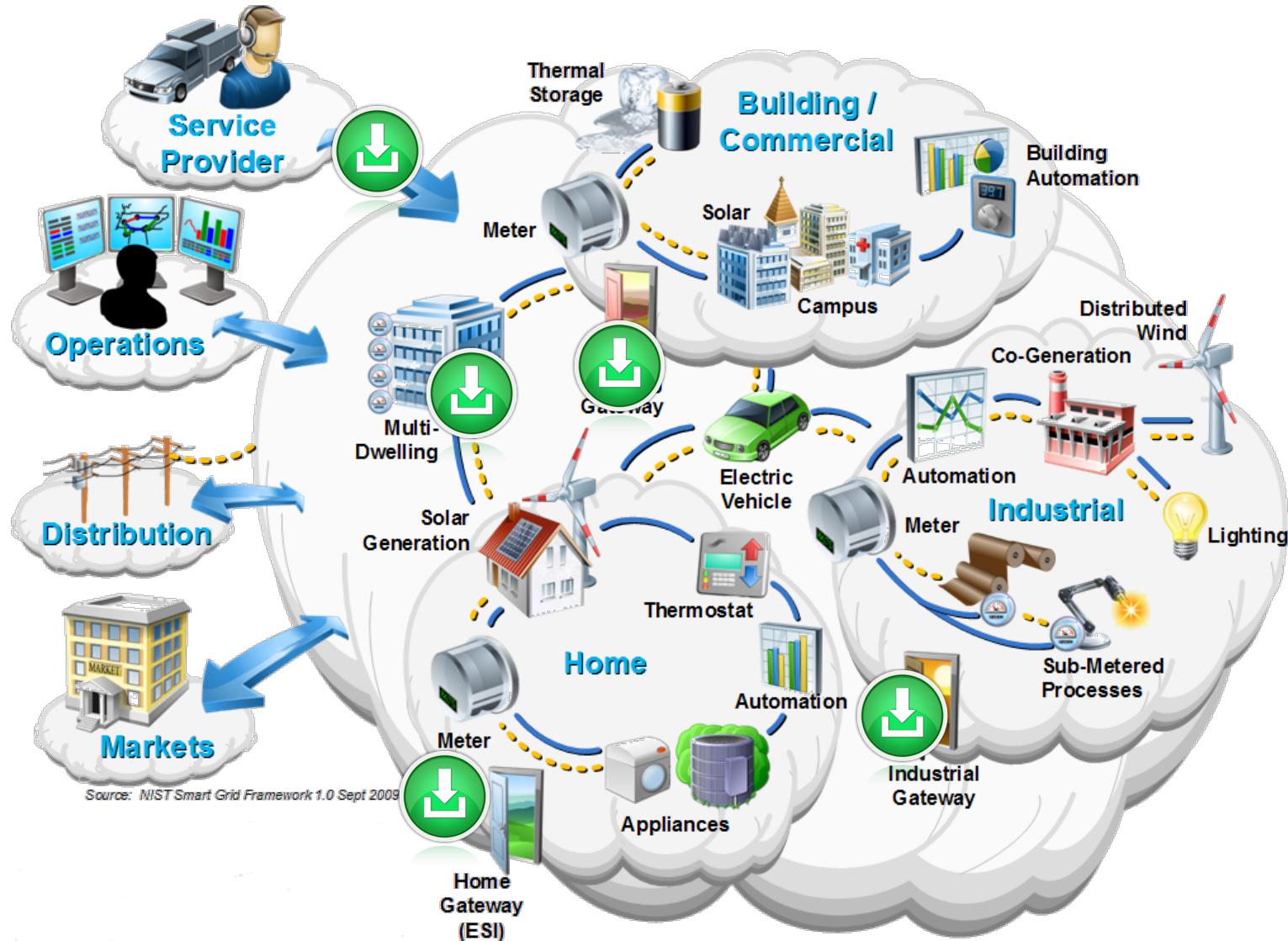
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Smart Grid Consumer Domain



Green Button Privacy and Security

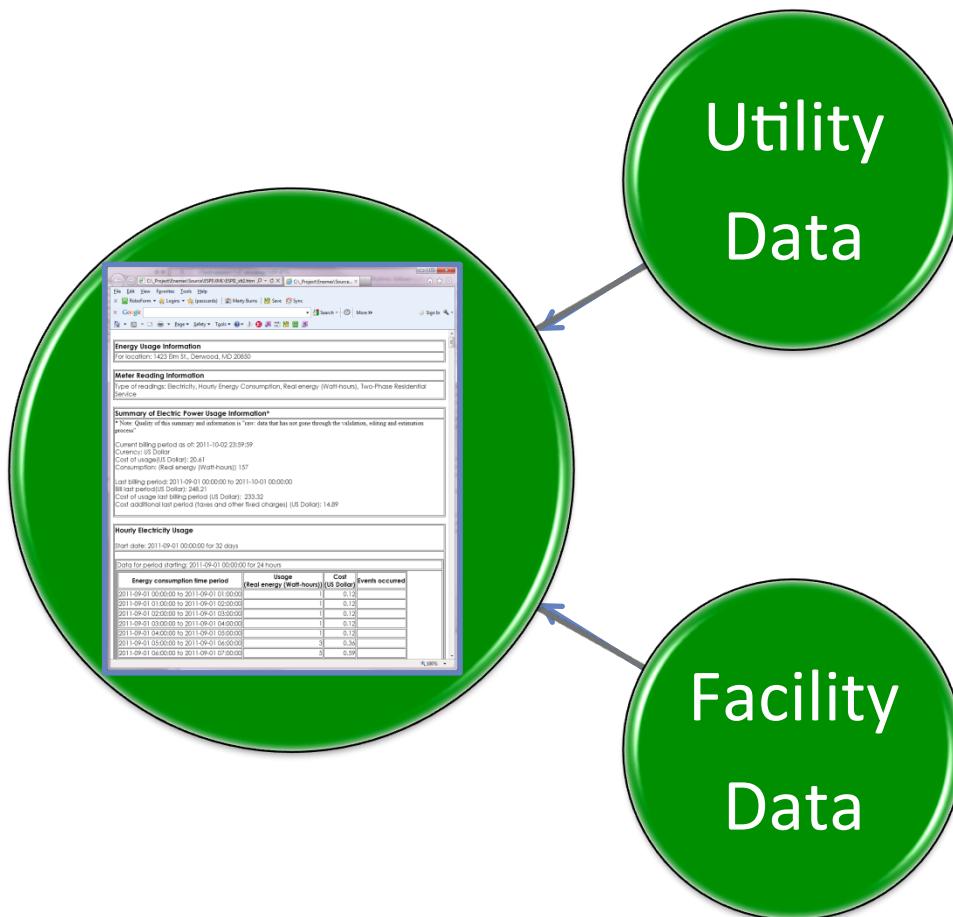


- Data Security.
 - Standard Certificate Based HTTPS and SFTP
 - Uses IETF OAuth2 authorization
 - Requires 128 bit (Third Party) and 256 bit (Data Custodian) Transport Layer Security
 - Aligned with NIST best practices
- Personal Identifiable Information (PII)
 - Certified Green Button Metered Data contains no PII
 - All Location information must be exchanged separately from Metered Data
 - Account and Portfolio information must be exchanged separately from Metered Data
 - DOE is leading a Voluntary Code of Conduct Stakeholder Process

Both Utility and Facility Data

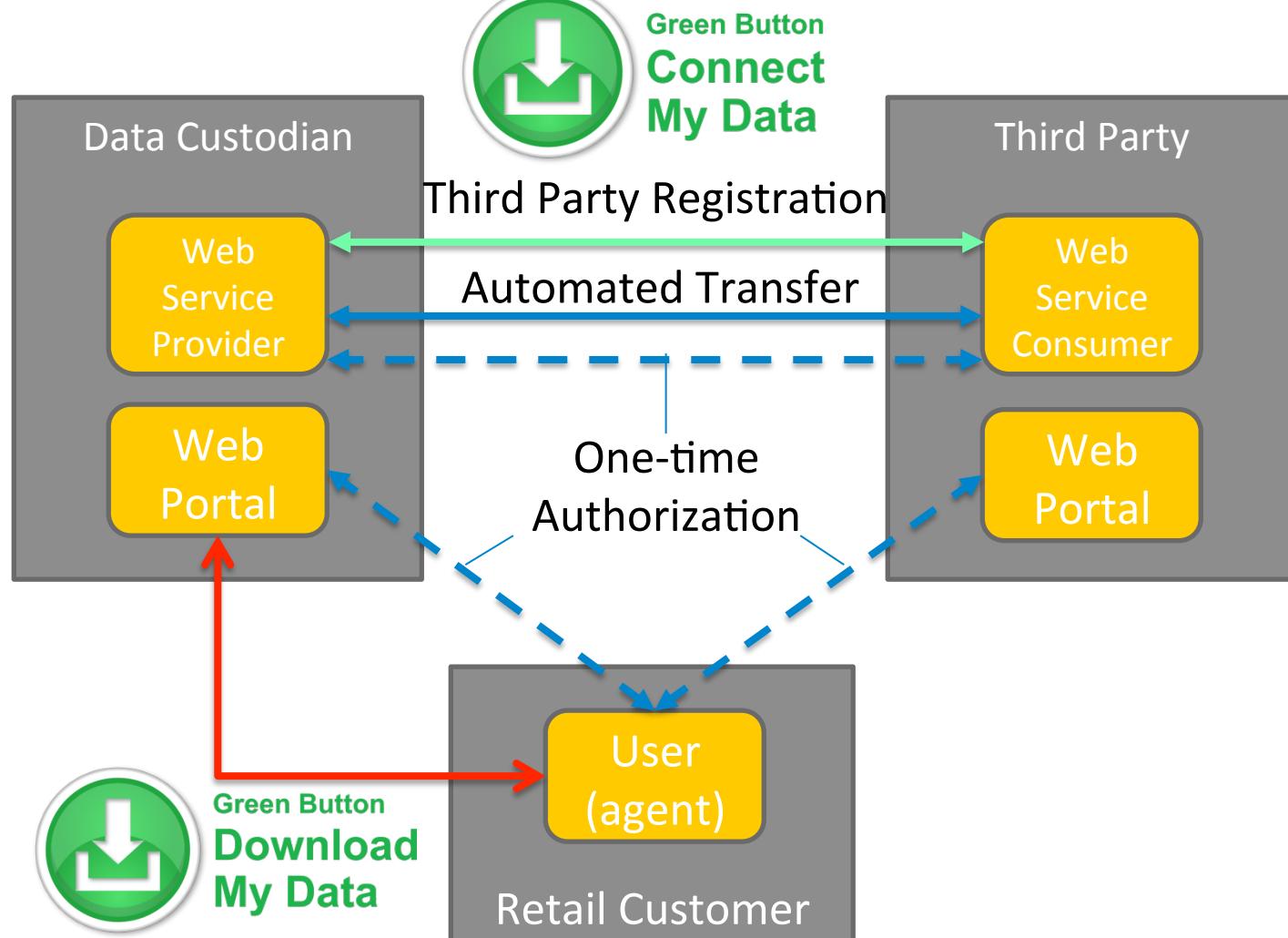


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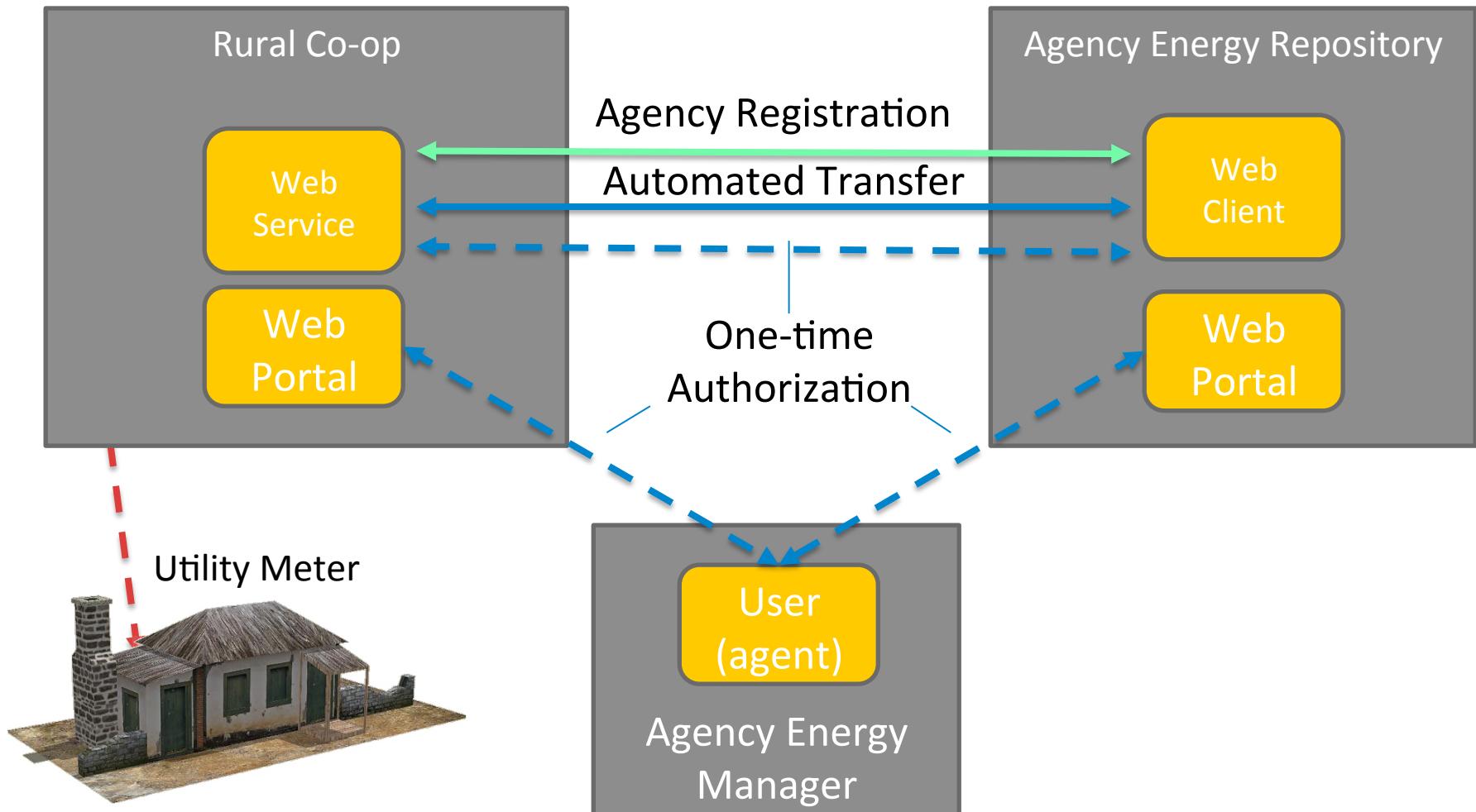


- Measurements of power, energy, gas, water, ...
- Quality: Raw, validated, estimated, ...
- Source: Meter near real-time, utility back end, third party
- Economics: Consumers need to know the cost of their consumed power (but we did not construct a pricing model)
- Identification: by customer, device, location
 - Interval data
 - Summary Information
 - Power Quality Metrics

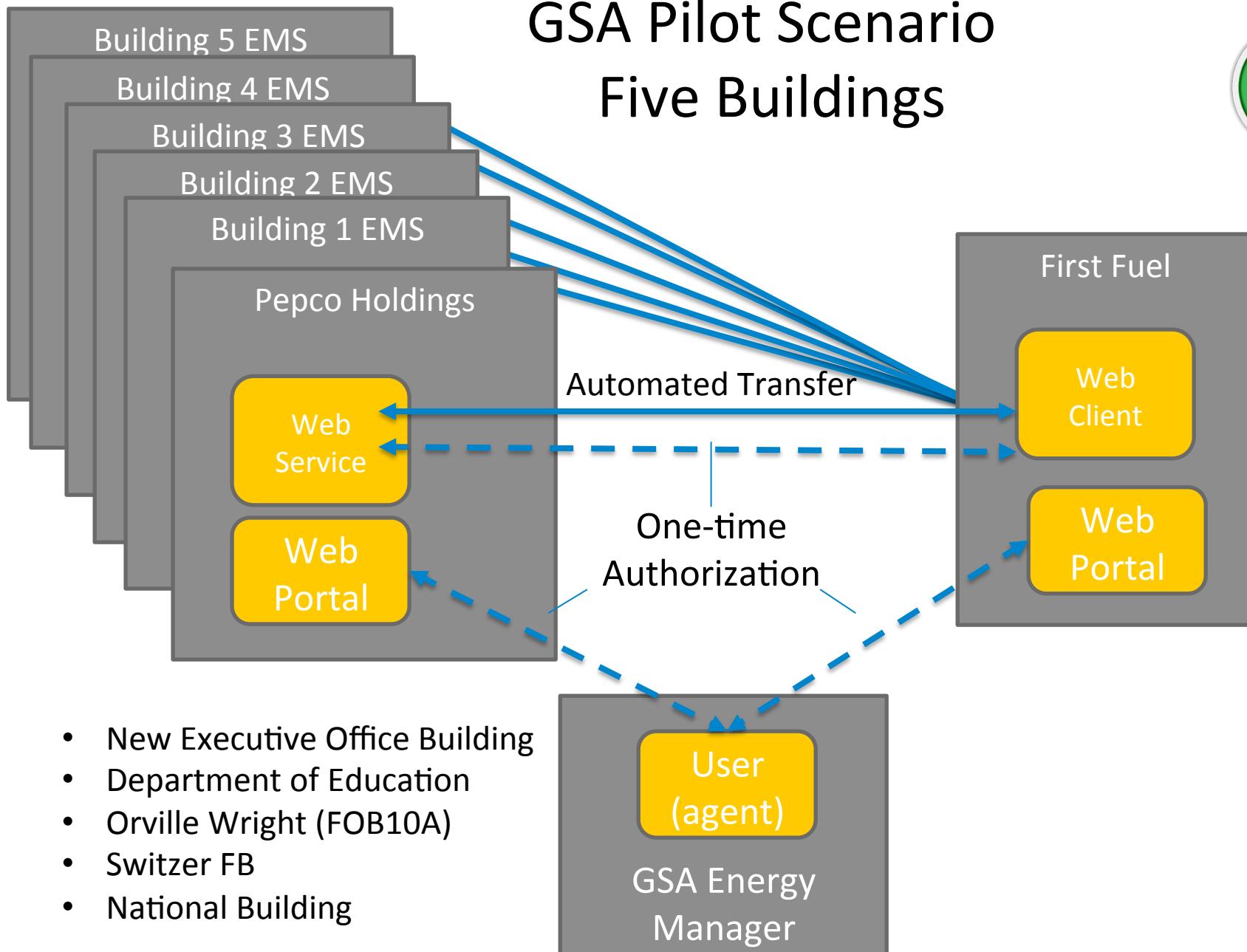
Green Button Data Exchange



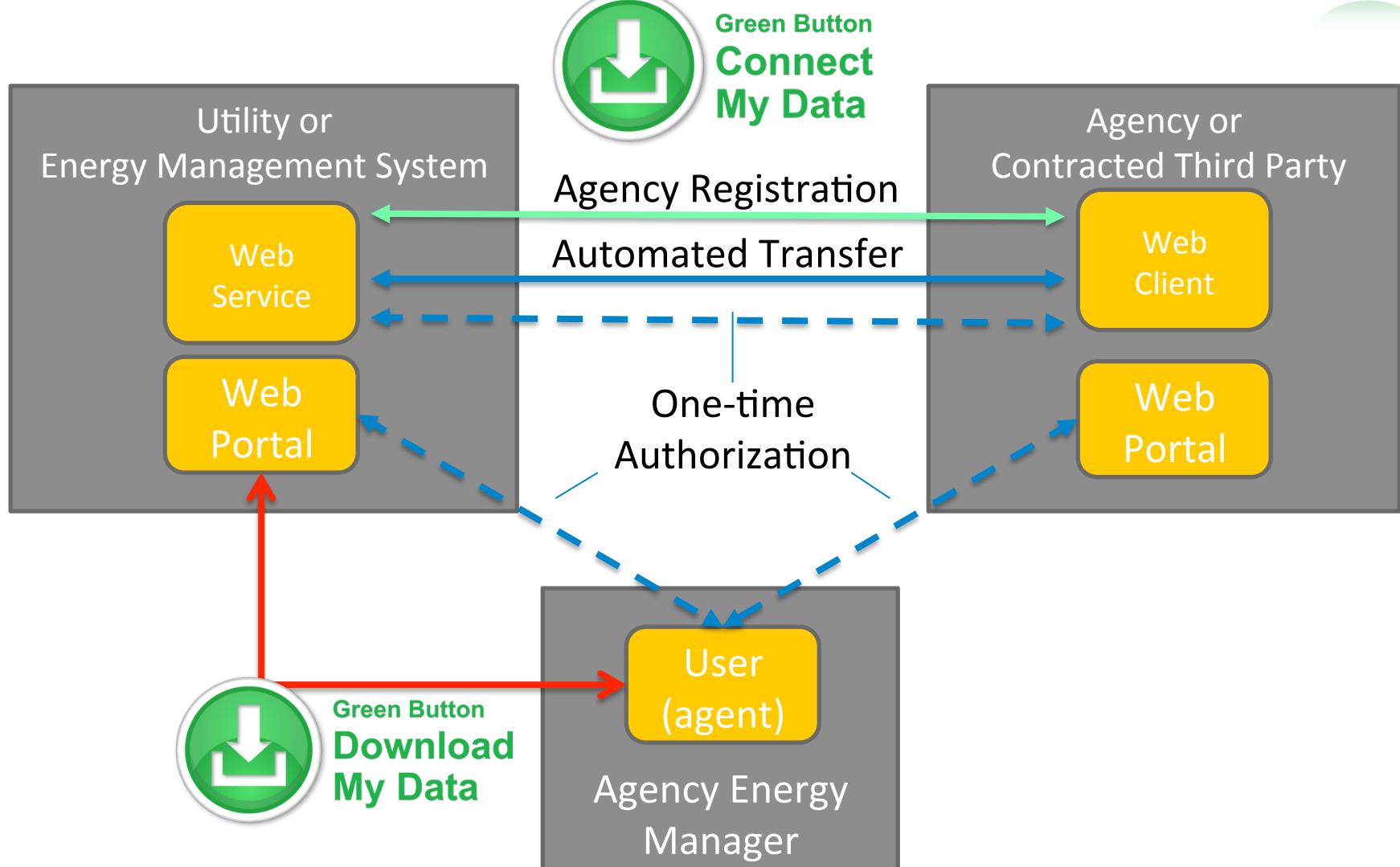
Simple Agency Energy Manager



GSA Pilot Scenario Five Buildings



General Federal Support



Value Propositions



Cost Effective Improvements to Advanced Metering Infrastructure

- Utility did not charge additional fees for Green Button capabilities
- Offsets GSA's capital expenditure to install additional metering where utility interval data is available
- Offsets O&M costs associated with maintaining meters
- Compatible with agency metering systems
- Green Button can lower the cost of deployment for agency energy management

Value Propositions



Data Quality/Data Validation/Data Scaling

- 12% of GSA metering infrastructure is missing data due to meters being offline. Green Button Data gives GSA the opportunity to replace this missing data with utility interval data from second (utility) source.
- Green Button Data can also be used to correct data anomalies in Energy Management Systems such as spikes, blanks, null values etc.
- Green Button encourages multiple vendors to present data to GSA in a uniform, interoperable manner.

Lessons Learned



Significant value achieved through active management

- Virtual energy audit for all properties is possible
- Data drives efficient management

Interoperability is KEY

- Look for Certified Connect My Data implementations in 2015
- Leverage your purchasing power to bring your service providers on-board!

Early in the Green Button Connect My Data life cycle

- Pepco/Schneider first in the nation commercial deployment
- National Rollout 2015-2016 – plan for success now!

What is Green Button? – How is it useful to Federal Agencies?



- Green Button is a standard for data exchange inspired by the federal government and enabled by the private sector
- The Green Button carries the metered data that enables active management of resource usage
- Green Button provides a uniform way for energy managers to use metered data across multiple utilities to manage large portfolios
- Agencies can save on their energy costs
- Agencies can provide uniform data to Portfolio Manager
- Agencies can leverage real, measured data to monitor and manage their energy and resource usage

FAQ Development



- How do I find out if my utility supports Green Button Connect My Data?
- Is a Smart (AMI) meter required for Green Button Support?
- How do I determine when in Facility Metering is justified?
- Is there a roadmap for agency support of Green Button in their energy management processes?
- Are agencies to be provided information as to vendors whose products and services support Green Button?
- Do agencies have a sense as to how many of their facilities are in services areas of utilities that support Green Button?
- What authority do agency managers have to initiate Green Button energy management activities?
- How are larger facilities such as campuses or bases to approach the Green Button opportunity

<http://www.greenbuttondata.org/fed-faq/>



Thank You