



Big Data for Government Symposium

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Smart Grid Data Implications

white house inspired.
industry led.

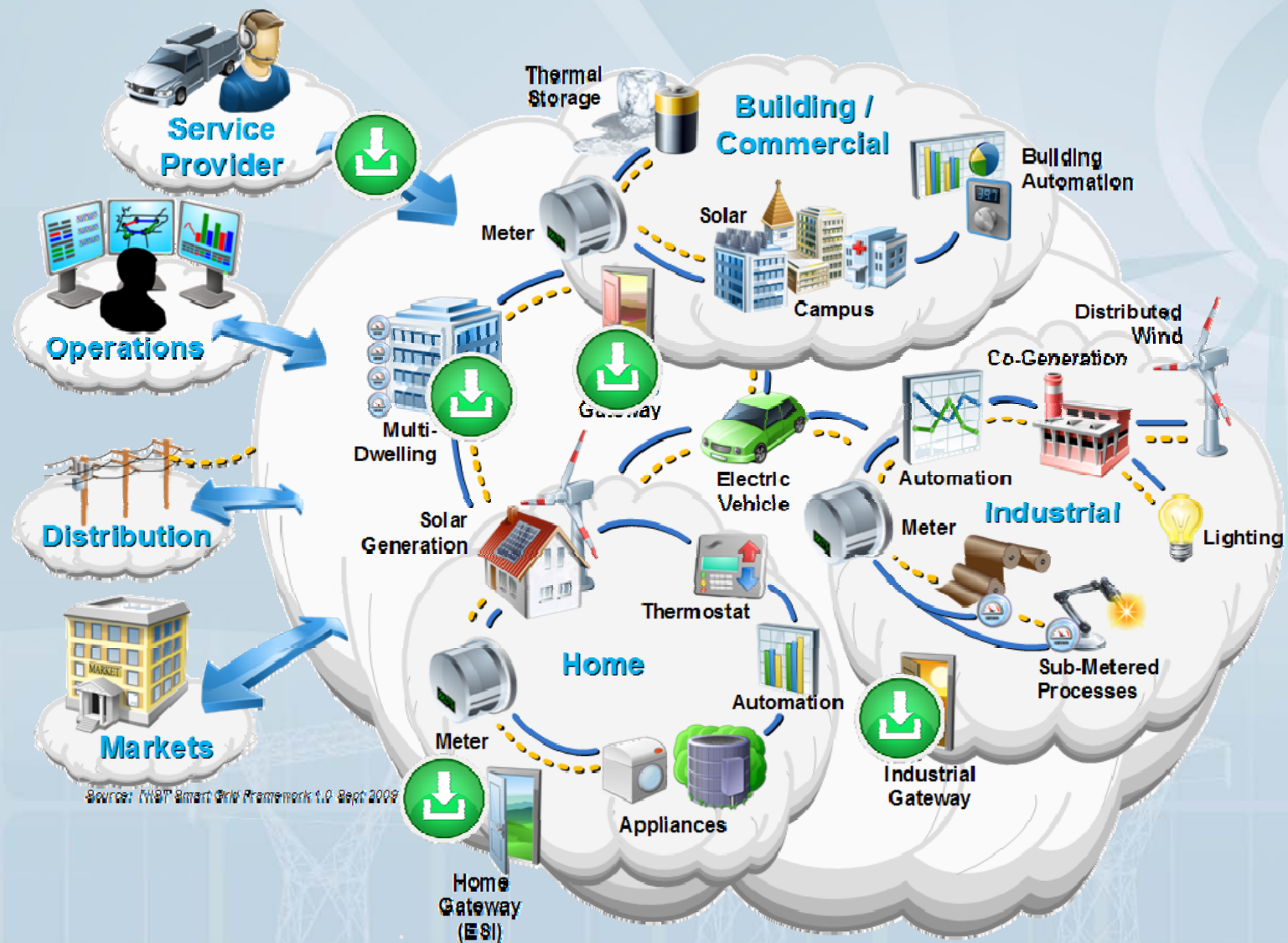
In response to the Obama Administration's call to action, 150+ utilities and service providers commit to provide 60+ million homes and businesses with their own energy usage information in the consensus industry standard Green Button format



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Smart Grid Consumer Domain





GREEN BUTTON

Green Button – Access and Moving information

Managing Data Access and Privacy control

Energy Usage Information In Practice (Virtual Benchmarking and Efficiency Management)

Testing and Certification – Building to interoperable standards

Information and Data Driven Customer Engagement

US Federal Government Interest in Data Access



- Open Data Initiatives

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



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**

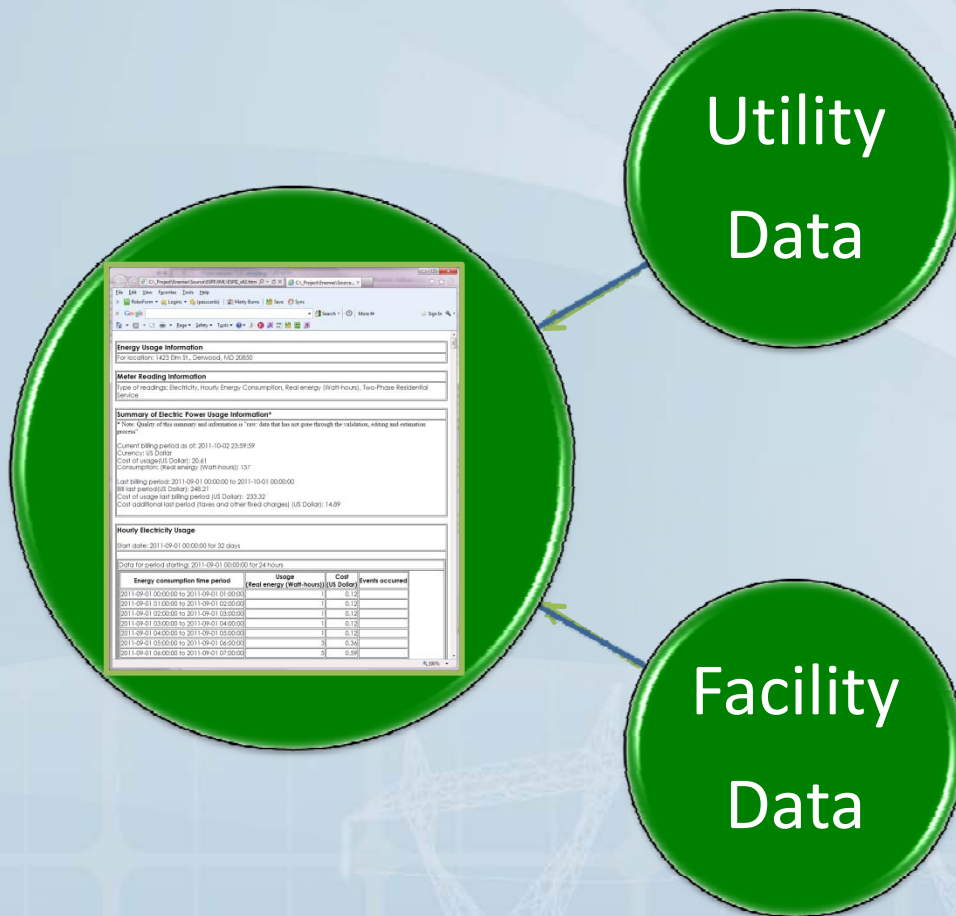
Consumer to authorized and controlled data movement between Utilities and Third Party service providers - no need to repeatedly login and download files. These authorizations are valid for an agreed upon time and can be revoked at anytime by the consumer.





Both Utility and Facility Data

7



- 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 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





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 Connect My Data In Washington DC Governmental Services



Green Button
Connect
My Data

Providing 15 minute
interval Data for 400
buildings in DC daily

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

A screenshot of the Build Smart DC website. The header features the 'BUILD SMART DC' logo with three red stars. Below the header is a search bar with the text 'Go to...'. The main image shows the U.S. Capitol building. Below the image, there is a quote: 'The District of Columbia is saving money, saving energy and creating one of the greenest cities in the world.' followed by sections for 'Transparency' and 'Efficiency' with descriptive text.

BUILD SMART DC

Go to...

**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 publically-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>





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

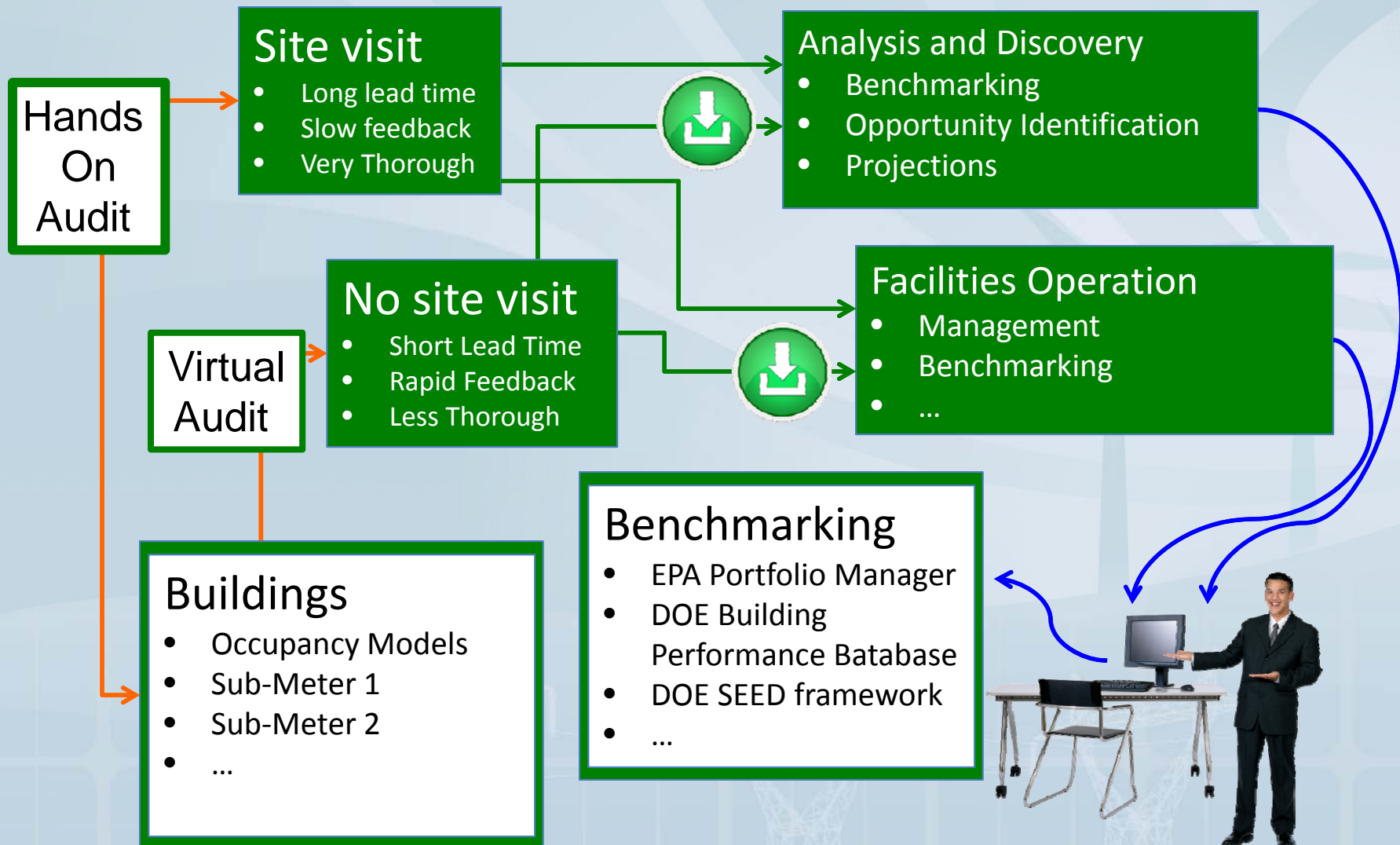
Green Button provides the missing feedback loop

And helps to engage the consumer in the solution



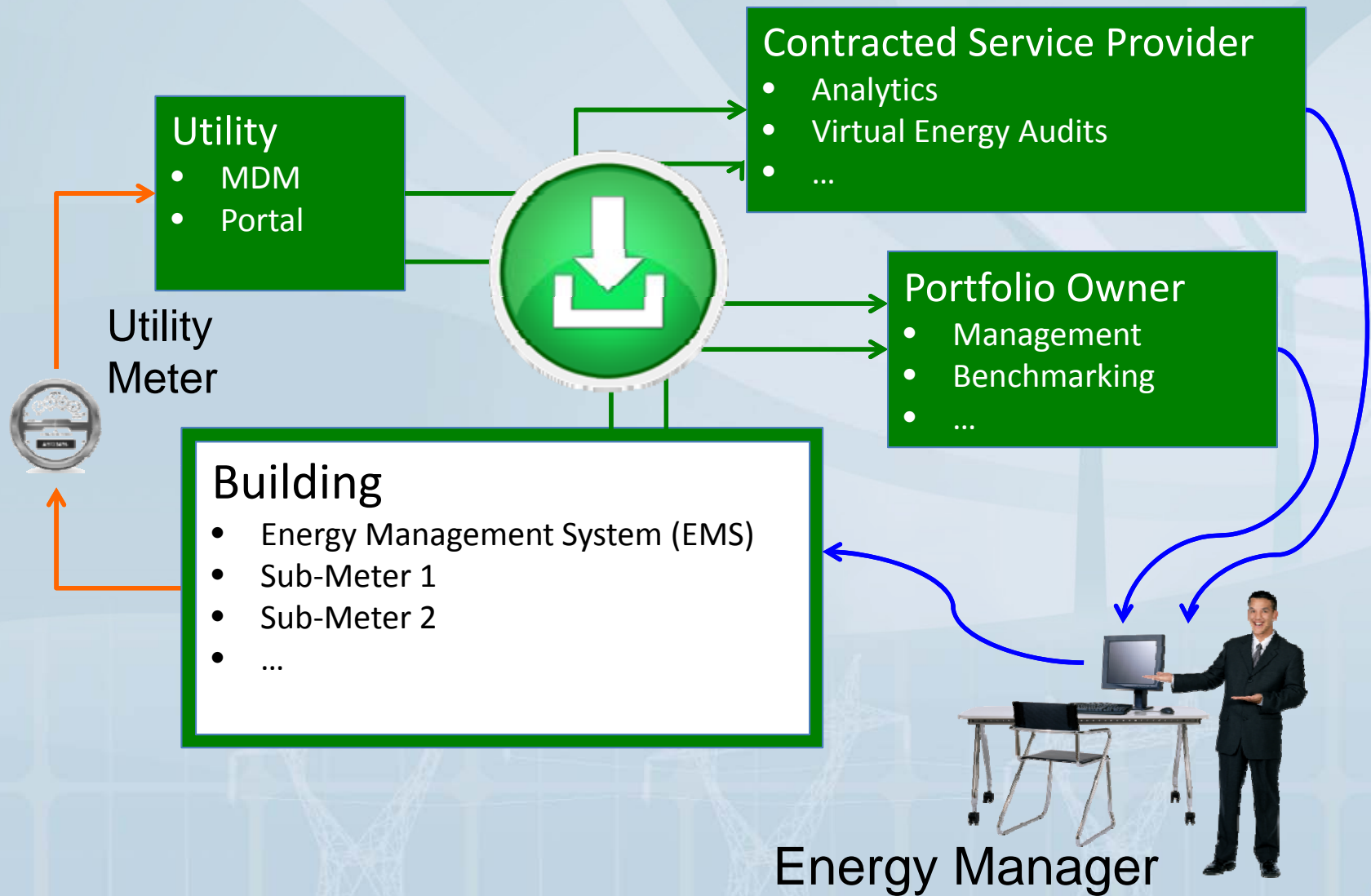


The Energy Audit





Framing the Energy Management Discussion



GSA Building Selections



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



Analytics for Active Management



Screenshots- National Building Museum

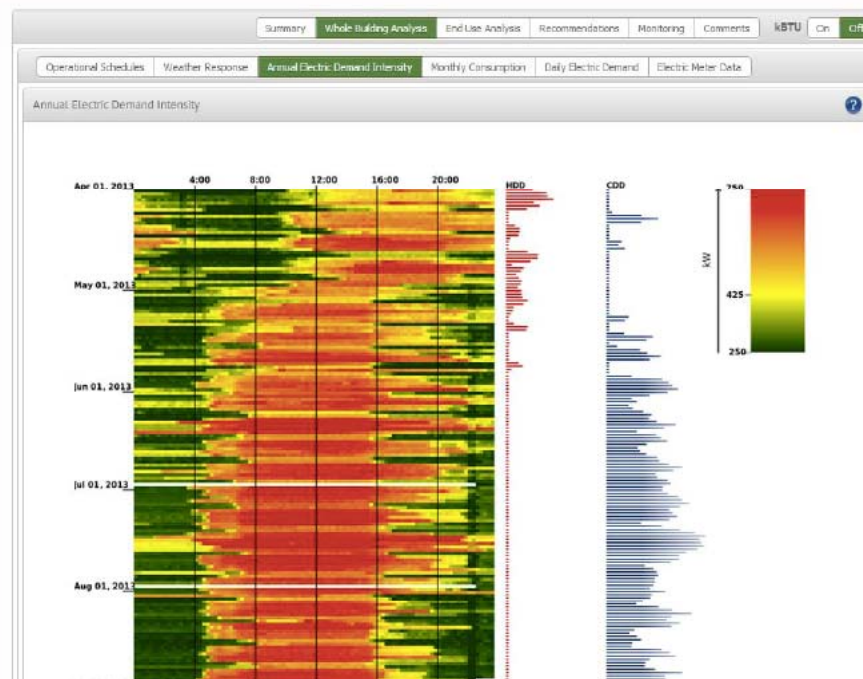


Chart: Annual Demand Intensity

FIRSTFUEL

FIRSTFUEL COMPANY CONFIDENTIAL



Analytics for Active Management



Screenshots- National Building Museum

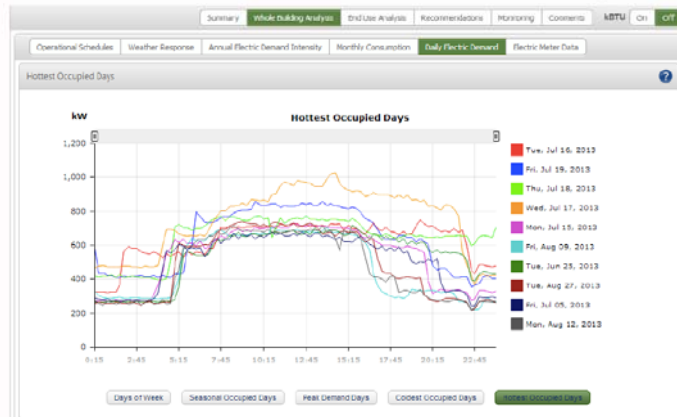


Chart: Hottest Occupied Days

Screenshots- National Building Museum



Screenshots- National Building Museum



Seasonal Demand Profile

Screenshots- National Building Museum



Chart: Peak Demand Days

Screenshots- National Building Museum

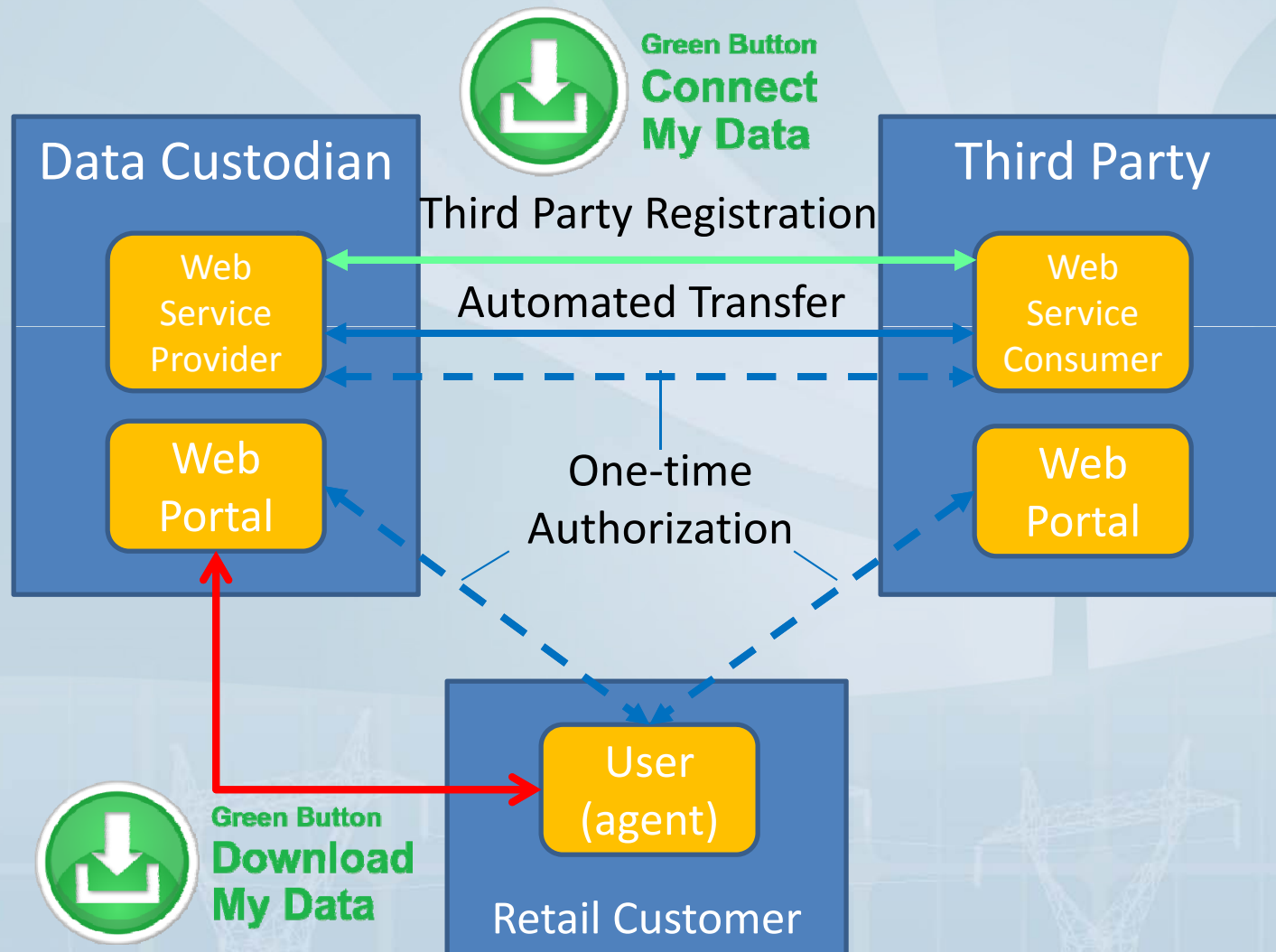


Seasonal Demand Profile



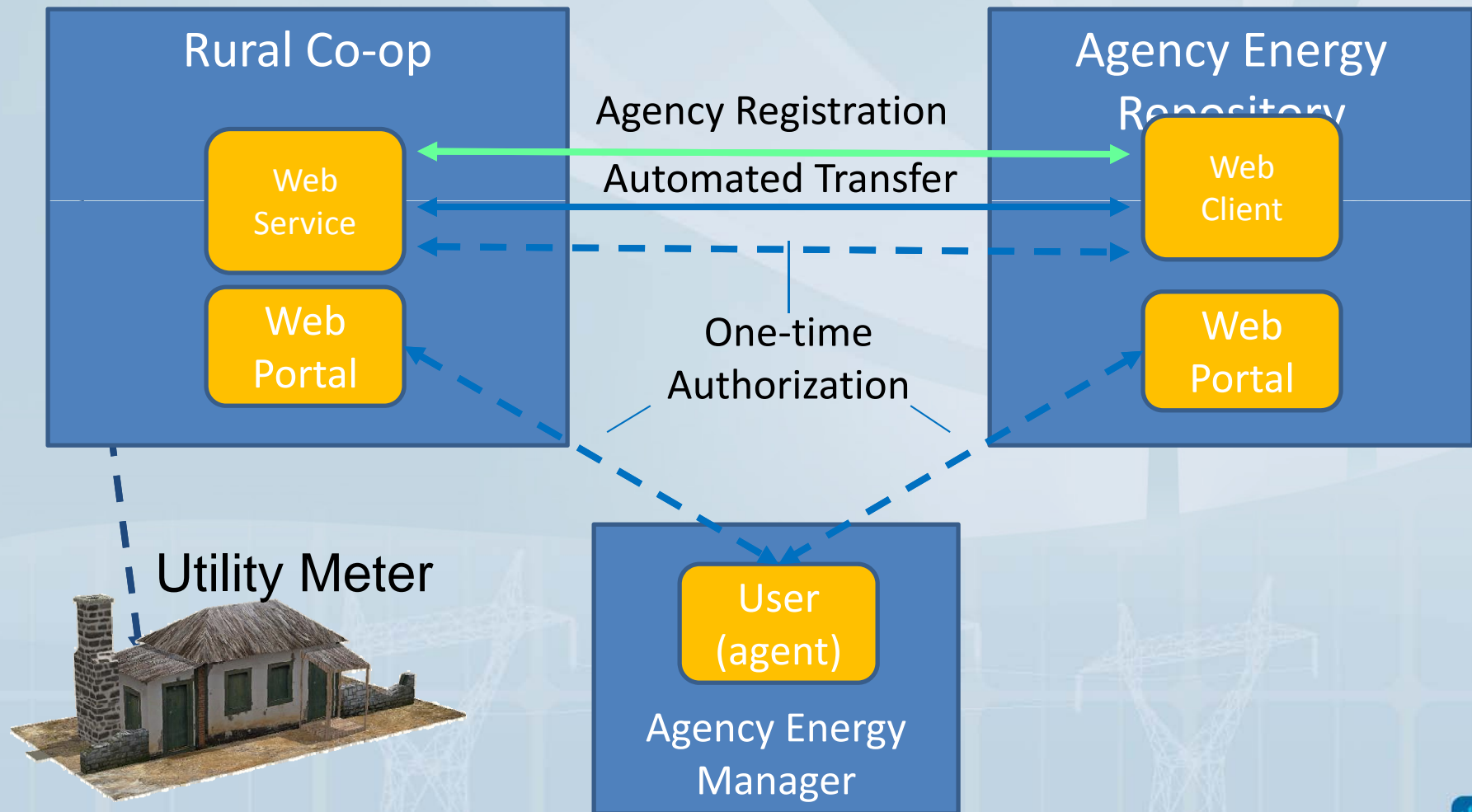


Green Button Data Exchange





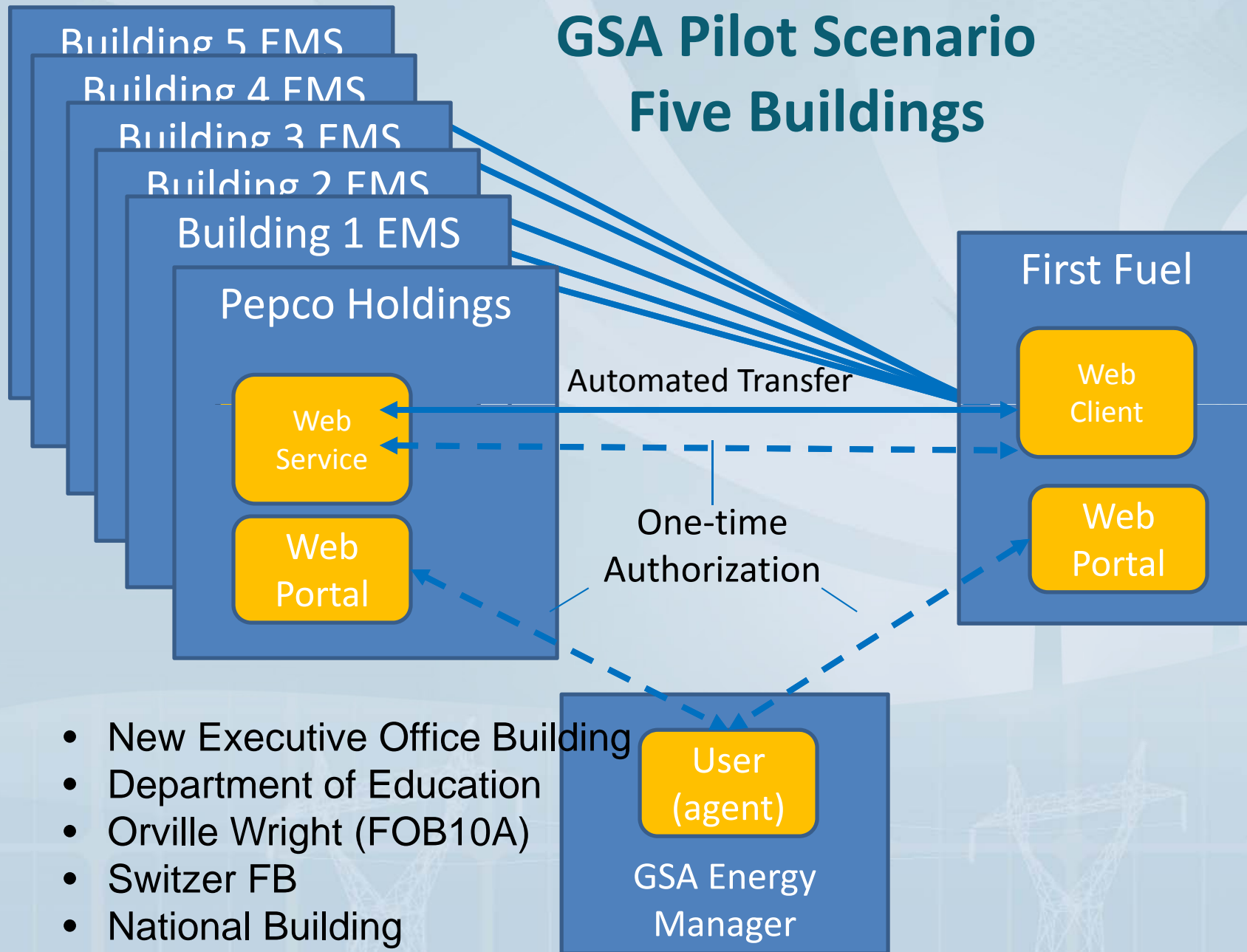
Simple Agency Energy Manager





GSA Pilot Scenario

Five Buildings



- New Executive Office Building
- Department of Education
- Orville Wright (FOB10A)
- Switzer FB
- National Building





General Value Propositions

Cost Effective Improvements to Advanced Metering Infrastructure

- Utility generally does not charge additional fees for Green Button capabilities
- Offsets Agency'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





Green Button Certification

Certification Program is being Initiated

- Download My Data Certification in 1H2014
Connect My Data Certification in 2H2014
- Certification Authority to manage testing
- Utilities, Service Providers, and Vendors
- Driving uniformity and interoperability in the Green Button ecosystem
- Look for “Certified Green Button”





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





Links to Additional Information

- Primary Website: <http://www.greenbuttondata.org>
- Standard: http://www.naesb.org/ESPI_Standards.asp
- Sandbox: <https://services.greenbuttondata.org>
- Open Source: <http://github.com/energyos>



Thank You

