NIST Smart Grid Program

The Green Button Initiative

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

www.greenbuttondata.org

Photo credit: Silver Spring Networks CustomerIQ™ Energy Portal

John Teeter, Presidential Innovation Fellow, NIST, john.teeter@nist.gov
Matt Theall, Presidential Innovation Fellow, DoE, Matthew.Theall@Hq.Doe.Gov

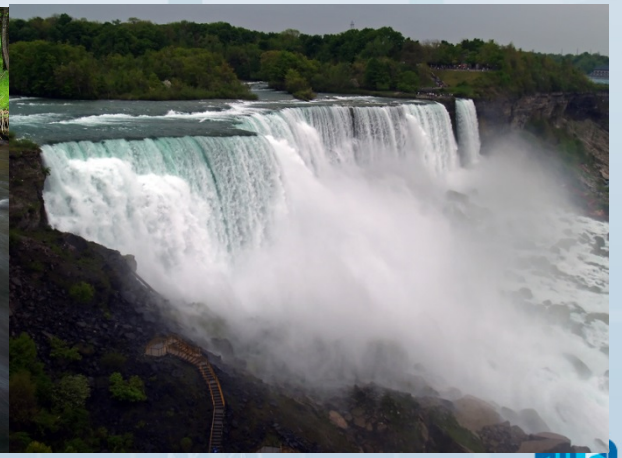
NIST National Institute of Standards and Technology U.S. Department of Commerce

engineering laboratory

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, 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, …



US Federal Government Commitment

Climate Action Plan

"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

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, December 5, 2013

Department of Energy American Energy Data Challenge

Challenge 2: Apps for Energy II (Jan-Mar2014), $100,000 total prizes, focus on best use of DOE APIs, best use of customer Green Button data, and best app addressing the "killer ideas" in Challenge 2. Details at http://energychallenge.energy.gov

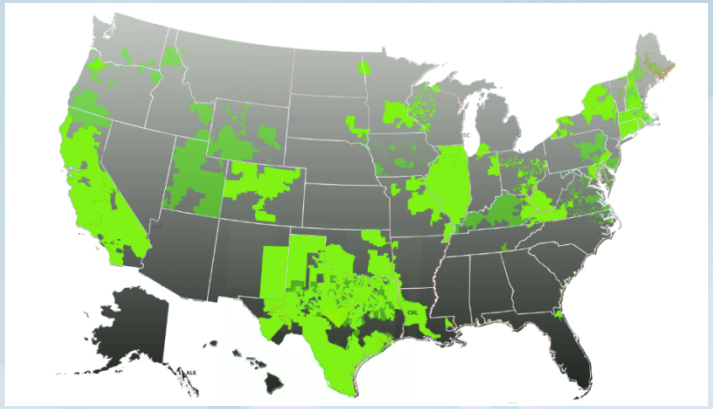
Green Button Download My Data & Connect My Data Now Rolling Out

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

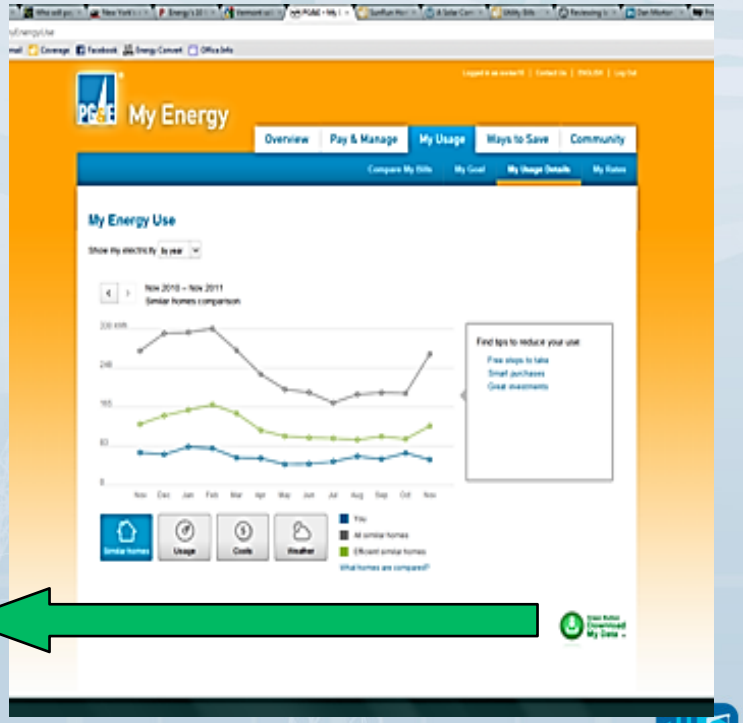
This powerful model allows a consumer to authorize a third-party service provider to receive direct access to their Green Button Data - no need to repeatedly login to their utility and download files. These authorizations are valid for an agreed upon time and can be revoked at anytime by the consumer.

Green Button Initiative

- Enables electronic consumer access to energy data and supports development of ecosystem (apps)
- US: Available to 42+ million customers now and 59+ million in the future based on utility commitments CANADA: 2.6 million+
- Result of collaboration among White House, NIST, DOE, state regulators, utilities, vendors, SGIP, and North American Energy Standards Board
- Green Button Download My Data and Green Button Connect My Data



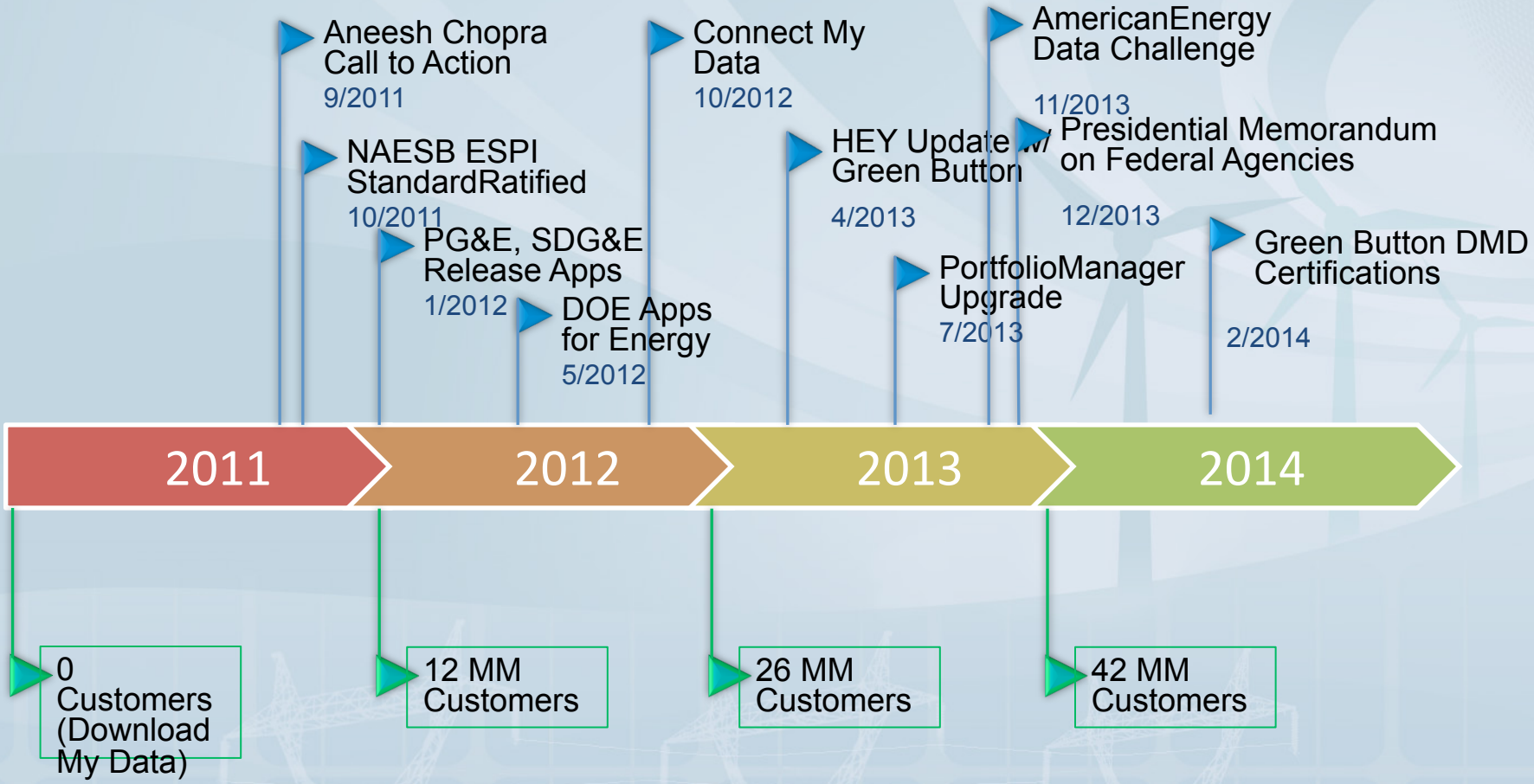
Map of US Green Button Commitments



Green Button Connect My Data

Green Button Download My Data

Green Button Evolution



Green Button for America team

- U.S. Federal Government: OSTP (White House), NIST, DOE (Energy), + others
  - Presidential Innovation Fellows: John Teeter (NIST), Matt Theall (DOE), Charles Worthington (DOE)
- Goals:
  - Grow (x2) Green Button ecosystem (utilities and vendors commitments and implementations, address challenges, …)
  - Improve Green Button data consistency (testing and certification, interaction and support for implementers, …)
  - Leverage Green Button in Federal facilities as part of federal government response to climate action plan
- Future:
  - Continued Federal government support and encouragement to enable industry to become driving force to develop ecosystem
  - Increased consumer engagement after foundation is secure

"Solar companies are also eager for consumer data because understanding a homeowner's electricity use is key to the sales process." – San Jose Mercury News

Example use case: solar PV proposal

Courtesy of Matt Theall, Green Button Presidential Innovation Fellow (DOE)

RE: PV Proposal

Dear Matt,

PV quote based on state average annual electricity consumption (Green Button data not available yet)

In lieu of an electric bill, we have used the state average annual residential electrical consumption- 7,200 kWh. As a monthly average, this would equate to 600 kWh at a cost of $118/ month. Estimated 20 year total would be 144,000 kWh at a cost of $50,323* ($0.35 per kWh). Installing solar has the potential to cut this cost by 66%.

The 6.62 kW system we are proposing is comprised of (27) SunPower 245 Watt module with estimated production equal to 94% of your current annual electrical load. The system array gross demensions are approximately 23' by 29'. See Google Earth photo rendering for the actual layout.

NSTAR

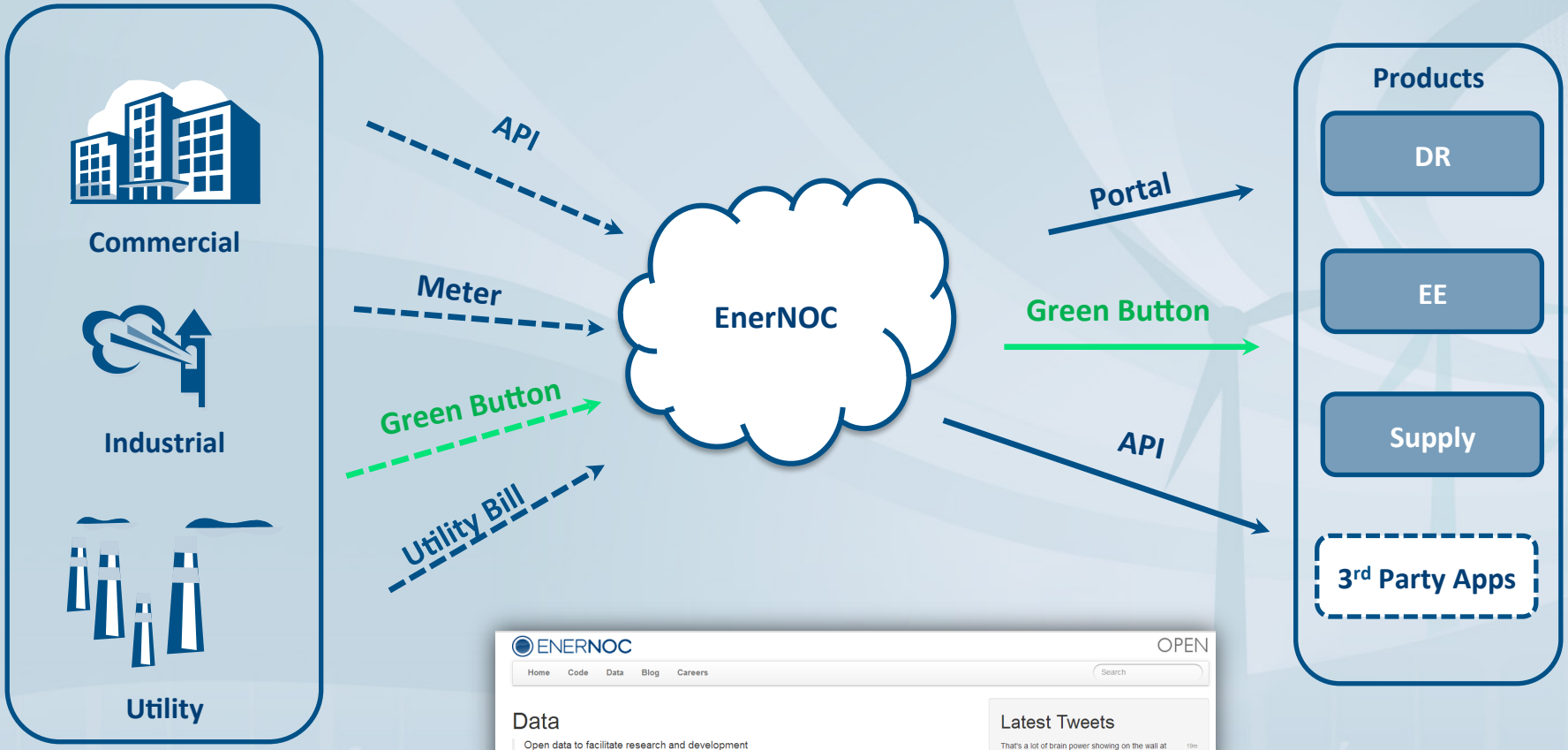
Green Button Download My Data

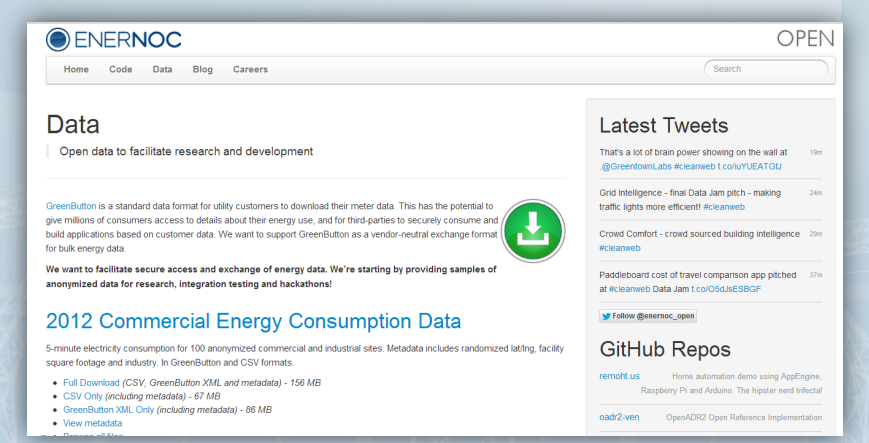
Estimated	Actuals/month
600 kWh/month $118/month	16398/12 = 1366.50 kWh/month $2,774.04/12 = $231.17/month

Based on Matt's Green Button Data: 16,398 x 20yrs = 327,960 kWh @ 0.35 = $114,786

More than 2X Higher Than Estimated!

Third party vendor implementation: EnerNOC





Green Button Connect My Data In Washington DC Governmental Services

Green Button
Connect
My Data

Providing 15 Minute Interval Data for 700 Buildings in Washington

Local Utility (PEPCO) Providing first in the Nation deployment with Green Button Connect My Data inside!

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;
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.

www.greenbuttondata.org

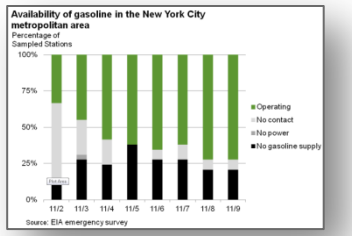
Support for Innovation

Department of Energy: American Energy Data Challenge

Challenge One

Energy Ideas Contest

Nov 6 - Dec 13 '13



Focus:

- *High value data sets*
- *Killer ideas*

Challenge Two

Apps for Energy II

Jan – Mar '14

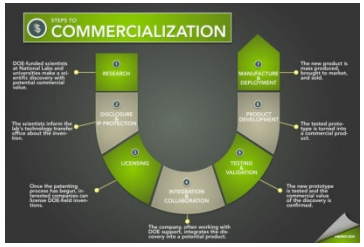
Green Button

Focus:

- *Best use of specific DOE APIs, best use of customer Green Button data, and best app that uses one of the "killer ideas" identified in Challenge One*

Challenge Three

Energy Data by Design
Apr – Jun'14



Focus:

- *Improving the clarity and discoverability of energy information*

Challenge Four

American Energy Challenge

Jul – Oct '14

Focus:

- *Building bold ideas for reimagining America's energy infrastructure*

SMARTGRID.GOV
RECOVERY ACT SMART GRID PROGRAMS

http://energychallenge.energy.gov

Information for YOU!

Thank You