

ONC's API Task Force Virtual Hearing

January 26, 2016

Green Button for Energy Usage Information – Ecosystem and APIs

Dr. David Wollman – Deputy Director, Smart Grid and Cyber-Physical Systems Program Office, Engineering Laboratory, National Institute of Standards and Technology (NIST)
U.S. Department of Commerce



david.wollman@nist.gov

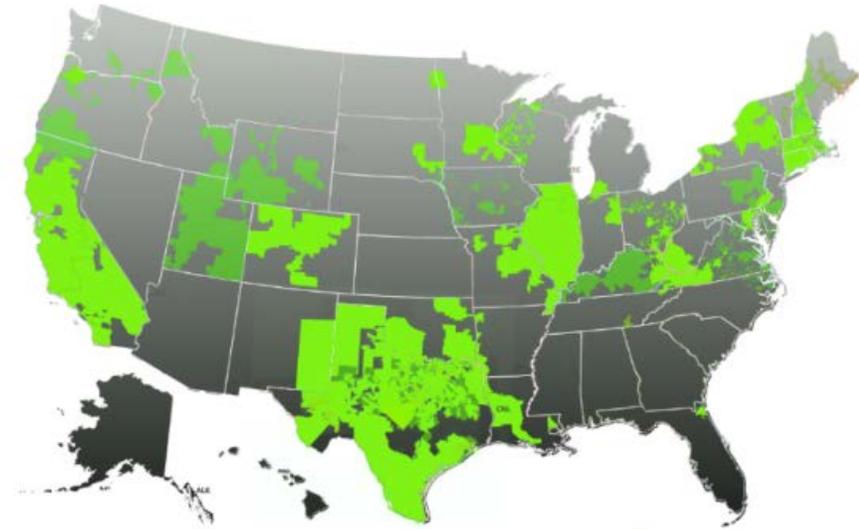
Dr. Marty Burns – SG&CPS Program Office, NIST
martin.burns@nist.gov



Green Button Initiative

- My Data: Enables electronic consumer access to energy data and supports development of ecosystem (apps) – Blue Button inspiration
- US: Available to 60+ million customers (100M people) and CANADA: 2.6 million+ (8M)
- Result of collaboration among White House, NIST, DOE, utilities, vendors, state regulators, UCA International Users Group (UCAIug), Smart Grid Interoperability Panel (SGIP), and North American Energy Standards Board (NAESB)
- Green Button Download My Data  and Green Button Connect My Data 

Map of US Green Button Commitments

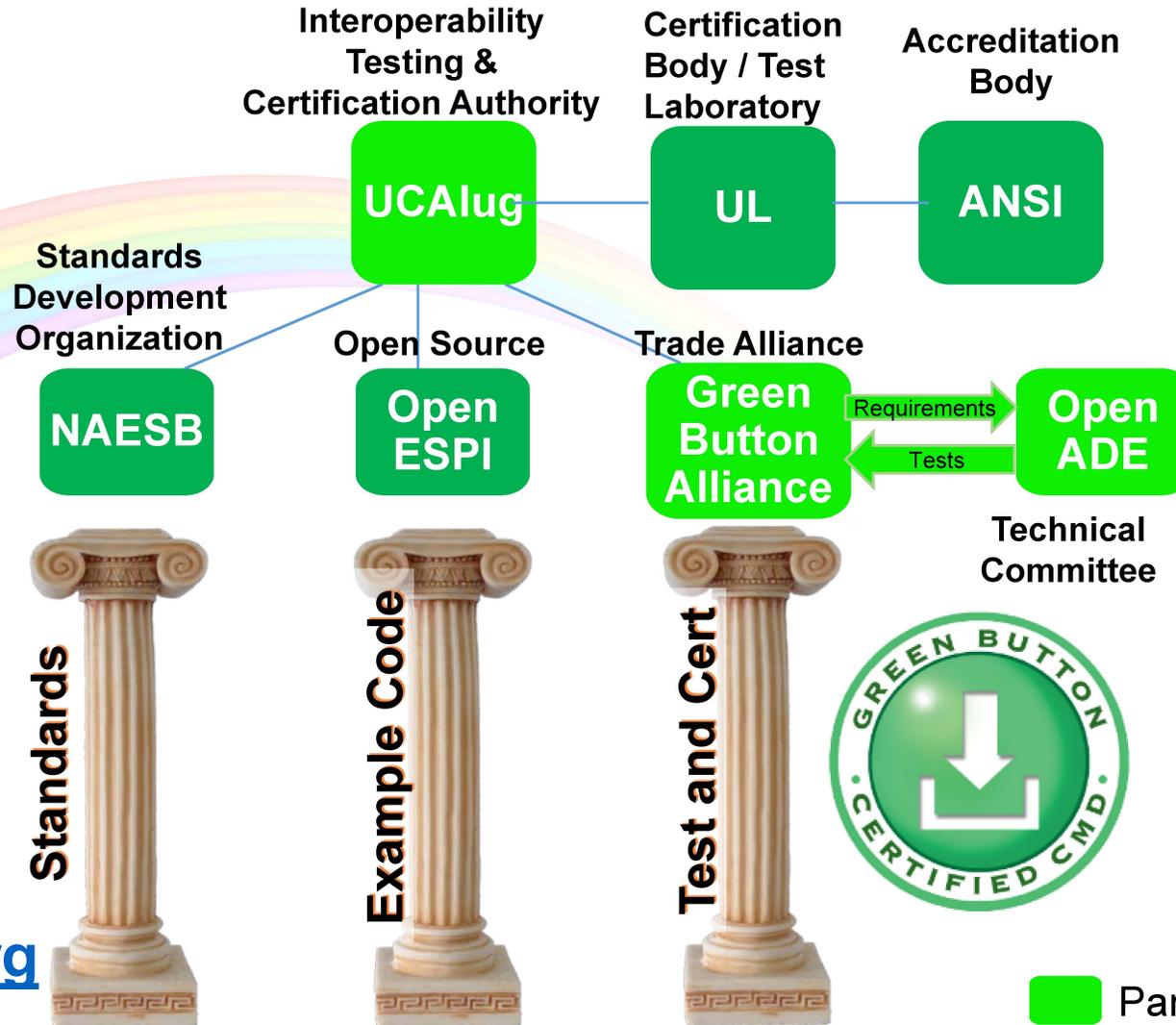


Green Button Ecosystem

NIST + OSTP + DOE



www.greenbuttondata.org
www.greenbuttonalliance.org



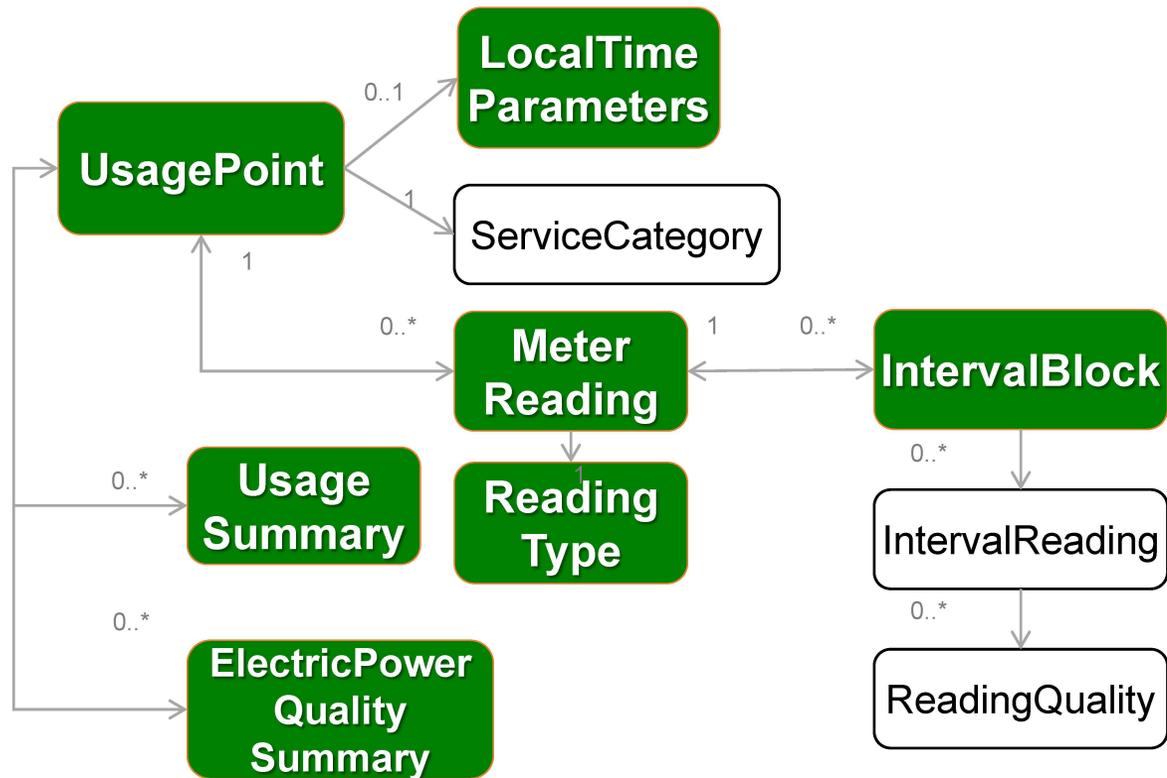
Organizational based on ISO/IEC 17065:2012

Technical Elements

Part of UCAIug

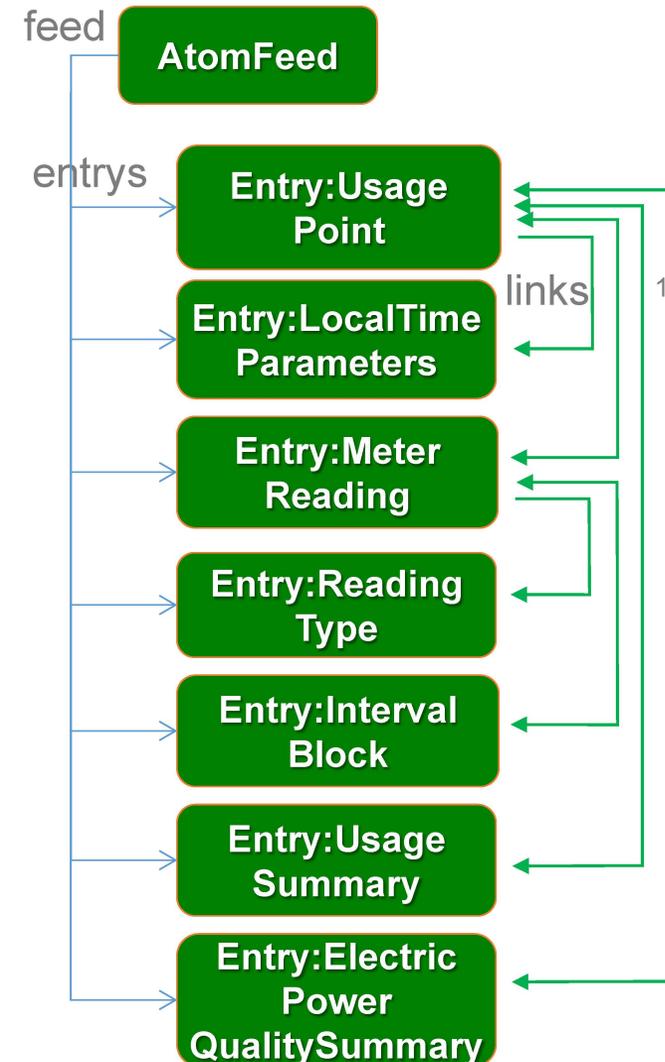
Green Button Data: Composition and Atom Feed

Information Model Profile View of Navigable Complex Data

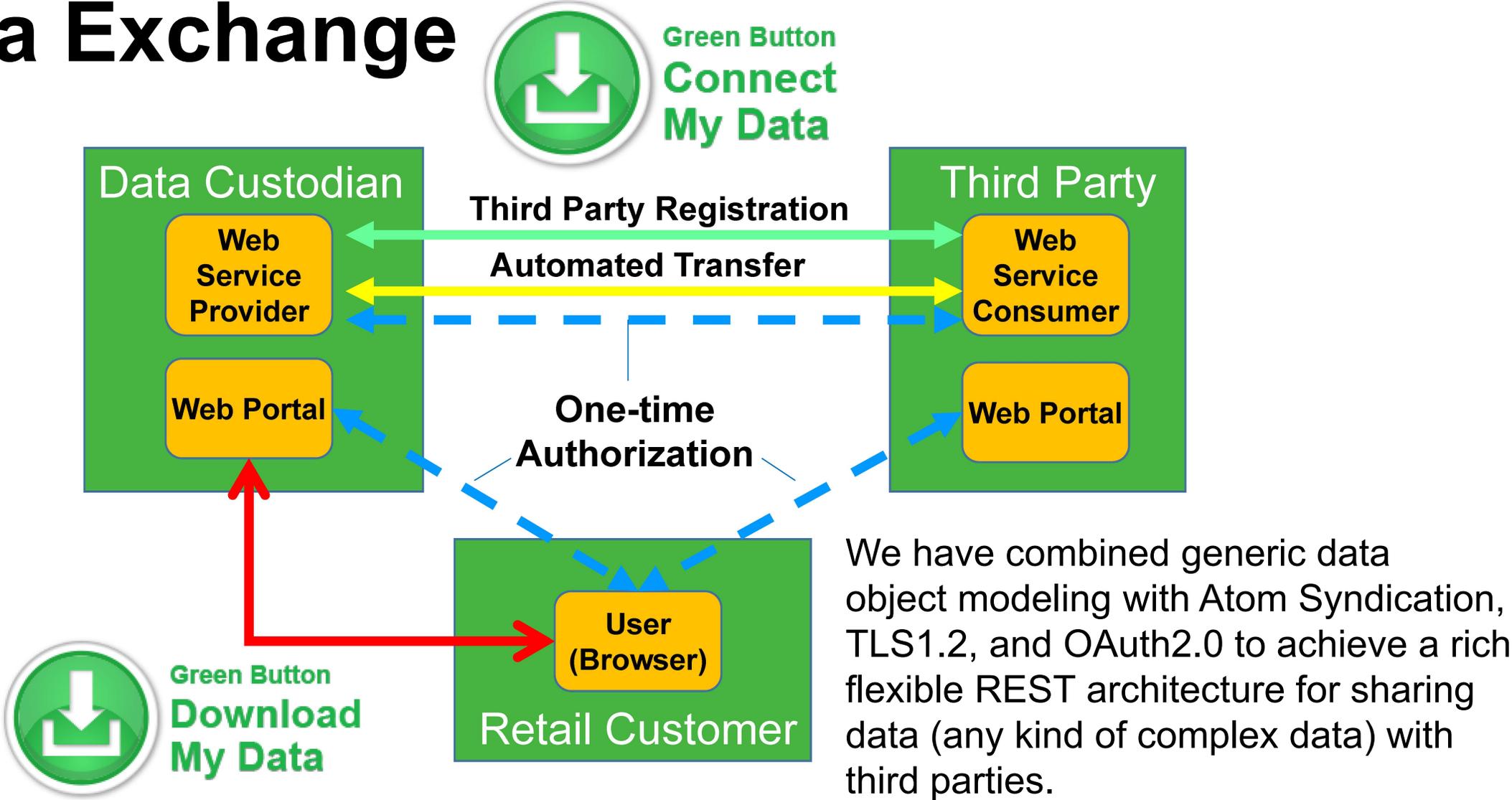


Note: This information is multidimensional. Many different reading types, summaries, and readings possible. i.e. not “flat”

Syntactic Model Feed View



Green Button Data Exchange



Cyber Security/Privacy = Authentication + Authorization

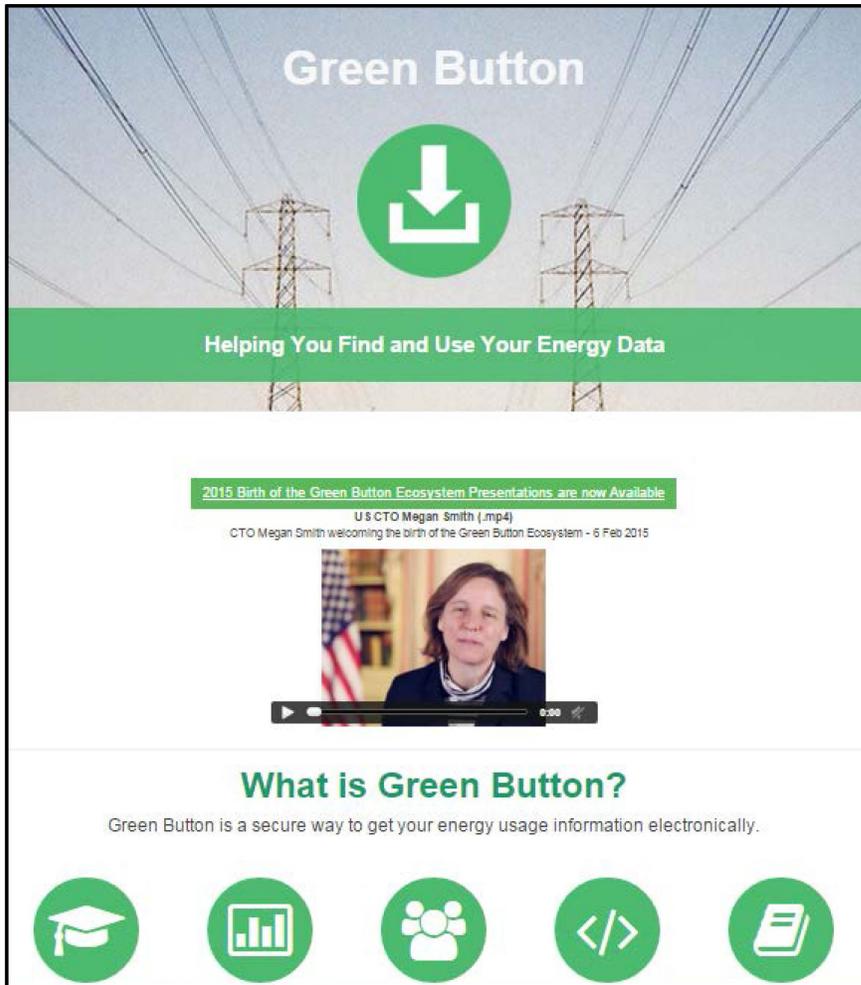
- Authentication identifies Client to Server and allows communications over a secure channel
- Authorization identifies access rights to an authenticated party
- OAuth allows management of the conveyance of rights to data for a specific individual or account to a third party that is already authenticated to a data custodian
- No PII In Green Button Data
- Secure Messaging
 - HTTPS
 - TLS 1.2
 - > TLS_RSA_WITH_AES_128_CBC_SHA
 - FIPS 140-2 level 1 or higher code base
- Mutual Authentication
 - Mutual Traceable Certificates audited according to the criteria of ETSI or WebTrust
- Opaque Identifiers
 - Tokens RFC2422
 - Obfuscated IDs >48 bits
- Third Party secure authorization
 - OAuth 2.0

Green Button Use of OAuth 2.0

- Uses “Bearer” token to indicate authorization
- Uses “Scope Negotiation” to allow tailoring of relationship to a subset of data that may be available for a customer – thus not all or nothing access.
- Extends OAuth2.0 (outside of OAuth2.0) to enable long-lived authorizations with short-lived tokens
- Adds “Bulk” access via client_access_token of collections of data from authorized individual customers

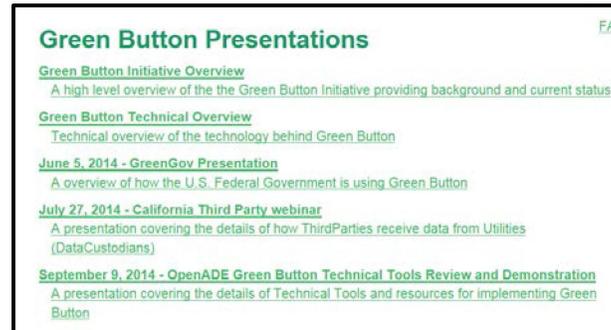
Web resources – API sandbox, much more...

<http://www.greenbuttondata.org>



The image shows the homepage of the Green Button website. At the top, it says "Green Button" with a large green download icon. Below that is the tagline "Helping You Find and Use Your Energy Data". A video player is featured with the title "2015 Birth of the Green Button Ecosystem Presentations are now Available" and a video of U.S. CTO Megan Smith. Below the video is a section titled "What is Green Button?" with a brief description and five icons representing different energy-related concepts.

<http://www.greenbuttondata.org/Presentations/index.html>



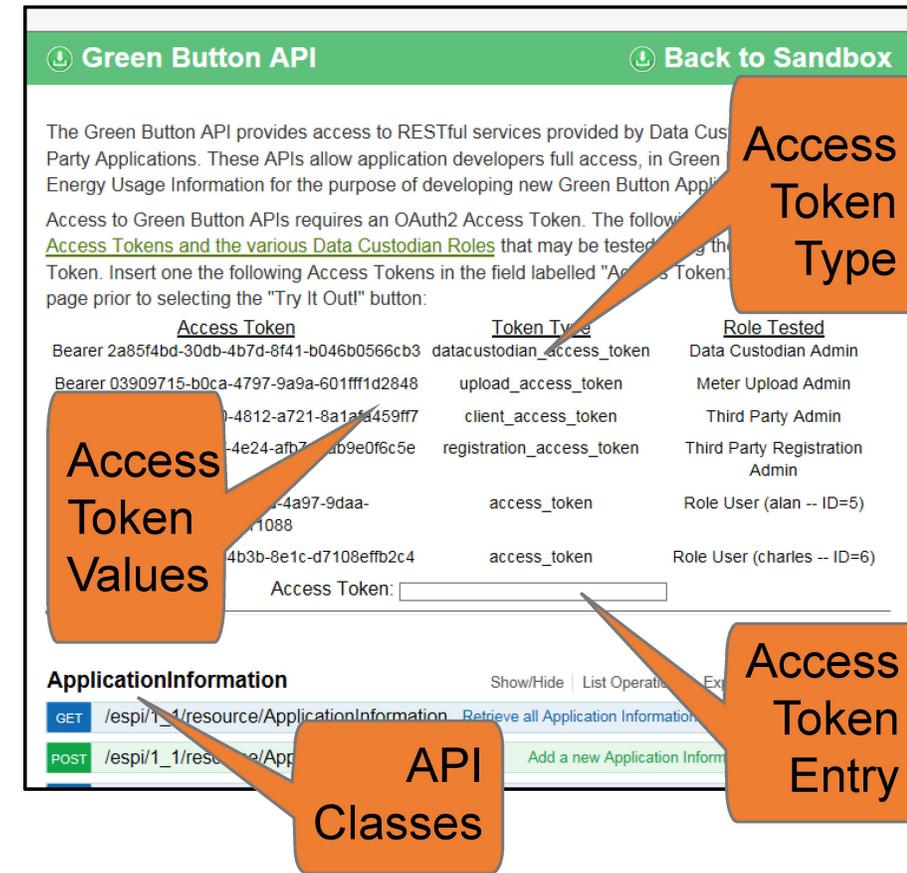
The image shows a page titled "Green Button Presentations" with a list of links to various presentations and technical overviews. The links include "Green Button Initiative Overview", "Green Button Technical Overview", "June 5, 2014 - GreenGov Presentation", "July 27, 2014 - California Third Party webinar", and "September 9, 2014 - OpenADE Green Button Technical Tools Review and Demonstration".

<http://www.greenbuttonalliance.org>



The image shows the homepage of the Green Button Alliance. It features a large green download icon with the text "GREEN BUTTON ALLIANCE" inside it. Below the icon is the tagline "Helping You Find and Use Your Energy Data".

<http://energyos.github.io/OpenESPI-GreenButton-API-Documentation/API/>



The image shows the Green Button API sandbox interface. It includes a table of access tokens, a form for entering an access token, and a section for application information. Callout boxes highlight specific parts of the interface.

Access Token	Token Type	Role Tested
Bearer 2a85f4bd-30db-4b7d-8f41-b046b0566cb3	datacustodian_access_token	Data Custodian Admin
Bearer 03909715-b0ca-4797-9a9a-601fff1d2848	upload_access_token	Meter Upload Admin
4-4812-a721-8a1afa459ff7	client_access_token	Third Party Admin
4e24-afb7-7ab9e0f6c5e	registration_access_token	Third Party Registration Admin
4-4a97-9daa-1088	access_token	Role User (alan -- ID=5)
4b3b-8e1c-d7108effb2c4	access_token	Role User (charles -- ID=6)

Callout boxes in the image point to: "Access Token Type" (pointing to the Token Type column), "Access Token Values" (pointing to the Access Token column), "API Classes" (pointing to the Application Information section), and "Access Token Entry" (pointing to the Access Token input field).