Testing and Certification for Green Button

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Grid-Interop 2012

OpenADE: Green Button Test Plan

- What is Green Button
- SGIP PAP20 Green Button ESPI Evolution
- Why we need Testing and Certification
- Role of UCAIug and OpenADE
- Testing Requirements Derivation and Implementation

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Green Button Enabling Vision

Overall Usage

History of Usage

Cost of Usage

Green Button

- Green Button is an industry-led effort to provide customers with access to their energy usage data via a "Green Button" on their electric utilities' website.
  - A policy
    - Green Button is a White House initiative by the Office of Science and Technology Policy (OSTP), the Department of Energy (DOE), the National Institute of Standards and Technology (NIST), and the Council on Environmental Quality (CEQ).
  - A brand
    - Green Button Logo implies specific capabilities
    - Interoperability standards along with testing and certification ensure those expectations are met
  - A set of technologies and associated standards
    - Green Button Download My Data (ESPI data file)
    - Green Button Connect My Data (ESPI automated data exchange)

An overnight success … years in the making

- OpenADE (Open Automated Data Exchange)
  - Early requirements effort for securely sharing energy information with third parties
- NIST SGIP Priority Action Plan
  - Accelerates issue resolution and consensus development
- OpenADE / SGIP inputs to NAESB standard REQ21
  - Energy Services Provider Interface (ESPI)
  - Privacy: REQ22 Third Party Access to Smart-Meter-based Information
- Flexible Green Button file format
  - Initial implementation uses a subset of ESPI and energy usage information

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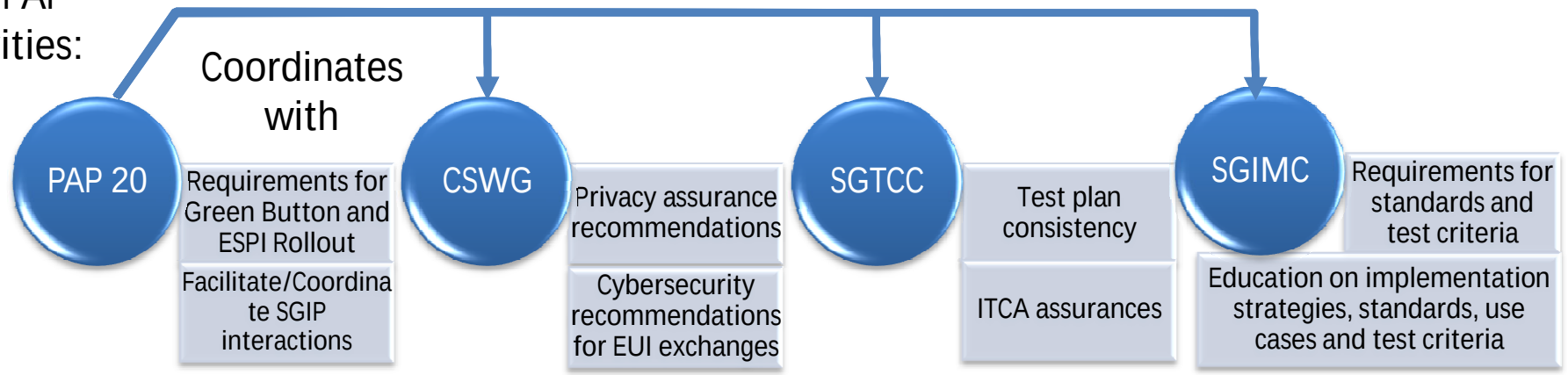
SGIP PAP20: Green Button ESPI Evolution Roadmap Going Forward …

SGIP PAP Activities:



Specification Deliverables:

Standards (NAESB)	REQ.18/WEQ.19 Maintenance Update	ESPI Errata Update	REQ.21/REQ.22 ESPI New Reqs Update	International Version
T&C (UCAIug)	Green Button Download My Data Test Plan	Green Button Connect My Data Test Plan	UCAIug ITCA	
Implementation (EnergyOS)	Green Button SDK	OpenESPI		

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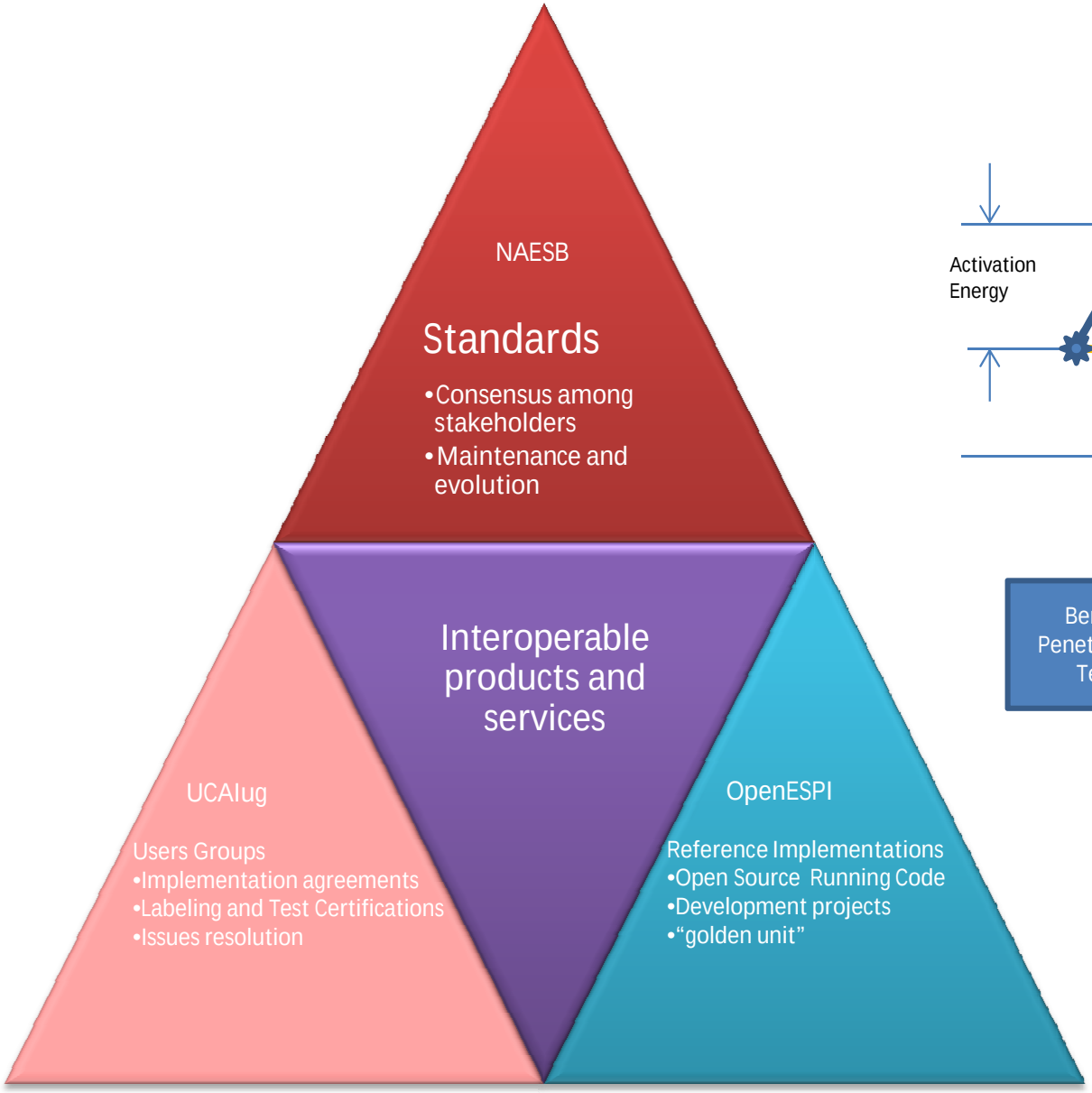
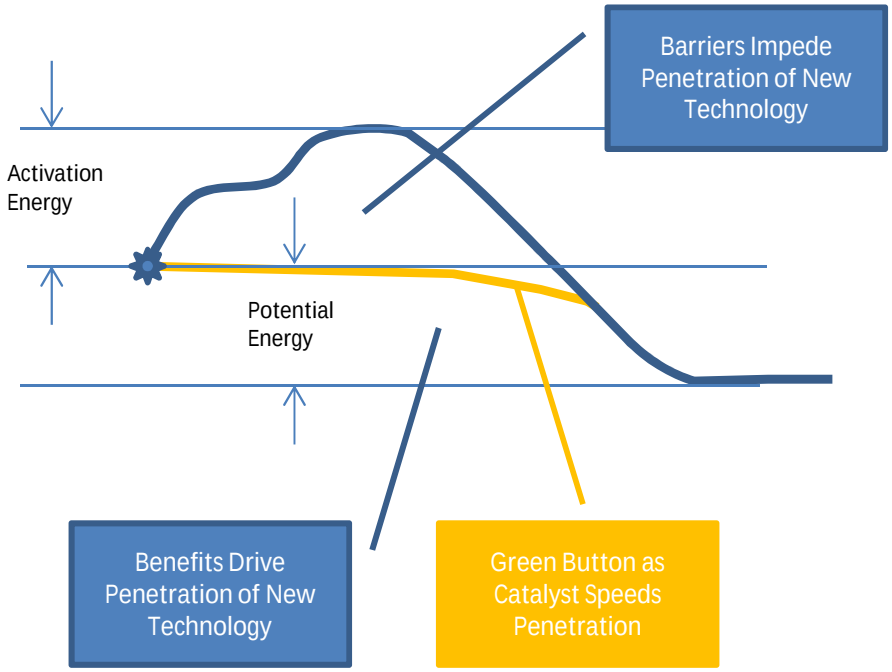
How to Reduce Barriers to Penetration





Why We Need Certification

- Testing and Certification affords implementers confidence they will likely interoperate with other independently developed implementations
- Minimum agreed performance threshold provides interoperability value and increases the value of the brand
- Dispersion of implementations cost implementers
  - Exception handling code quickly exceeds implementation code
  - Differences risk functionality applications depend on
- Dispersion of implementations cost Data Custodians
  - Need to deal with Third Parties with different needs and expectations
  - Unwanted support calls from consumers about difficulties with their applications due to inconsistent implementation

Role of UCAIug

- Establish Green Button brand
  - Register trademark
  - Guard brand on behalf of certificate holders
  - Pool marketing resources to promote brand
- Provide for certification of implementations
  - Establish an ITCA (based on NIST's SGIP IPRM V.2)
  - Implement testing and certification process
  - Develop the test plan specifications and software tools to enable certification by authorized test labs

How Testing And Certification Is to be Accomplished

- OpenADE Task Force develops requirements and implementation agreements for ESPI and produces a test plan that encompasses
  - Green Button Download My Data
  - Green Button Connect My Data
- OpenADE Task Force moves test plan matrix (spreadsheet) forward to provide basis for test plan and tools
- ESPI Green Button Download and Automated Data Exchange Conformance Suite
  - Builds out test plan to deliverable status
  - Builds implementing test tools

Green Button Test Plan Requirements Hierarchy

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Applications Profiles
- Section 3 GBTP

Function Blocks
- Section 5 GBTP

Test Requirements
- Rows of GBTC spreadsheet
  - From source documents
  - From experience

Test Cases
- Rows of GBTC spreadsheet

3.2 Green Button Connect My Data

Required Conformance Block Definition Data Custodian: FB_1 [M], FB_3 [M], FB_4 [M], FB_5 [O], FB_6 [O], FB_7 [O], FB_8 [O], FB_9 [O], FB_10 [O], FB_11 [O], FB_12 [O], FB_13[M], FB_14 [M], FB_15 [O], FB_16 [O], FB_17 [O], FB_18 [O], FB_19 [O]

Required Conformance Block Definition Third Party: FB_1 [M], FB_21 [M], FB_22 [M], FB_23 [M], FB_24 [O], FB_25[O] , FB_26[M]

Note: the creation and operation of the Green Button Connect My Data is explicitly defined in the Use Cases of the ESPI standard. Green Button Connect My Data extends the concepts and benefits of Green Button Download My Data; while Download My Data provides a one-time download of historical energy usage information directly to the consumer, Connect My Data enables the secure delivery of historical and ongoing usage information from the Data Custodian to one (or possibly more) 3rd Parties, as selected by the Retail Customer.

5.2 Data Custodian Role

5.2.1 [FB_2]Green Button Download My Data

This block contains the test requirements that are unique to the Green Button Download My data application.

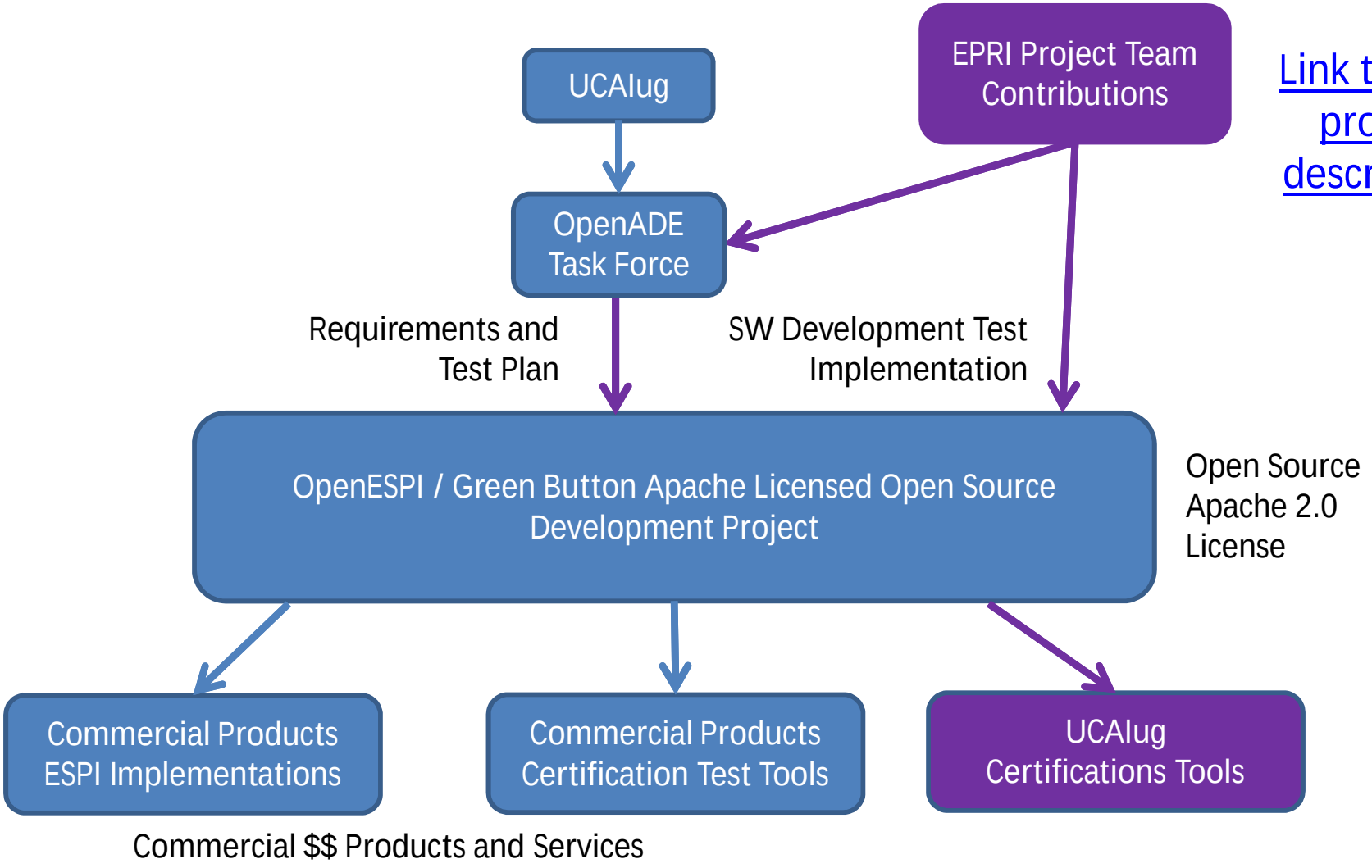
[TR_GB.1] Green Button: Customers shall have the ability to download usage data using a Green Button

[TR_GB.2] GB Access: Customer will access the information based on current login to access their consumption data

	A	D	E	F	G	H	I	J	K
1	Test Name	Test ID	M/O	Test Type	Category	Method	IUT	Test Purpose / Requirement	Initial Conditions
2	HTTP	PROTO1		Positive	Protocol		Either	Verify implementation of HTTP	
3	HTTPS	PROTO2		Positive	Protocol		Either	Verify implementation of HTTPS	
4	Configure Third Party	CONF1		Positive	Security		Both	Verify ability to authorize and configure a third party	
	Atom feed - GET	FND1		Positive	Fundamental		Either	Verify GET behavior for feeds	Third Party has been authorized and configured

GBTP – Green Button Test Plan Document
GBTC – Green Button Test Cases Spreadsheet

Green Button Download and Automated Data Exchange Conformance Suite



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Questions

Green Button Technical Activities

Smart Grid Interoperability Panel (SGIP)
- SGIP PAP20 Green Button ESPI evolution: http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonESPIEvolution
- SGIP Green Button Initiative TWiki: https://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonInitiative
- SGIP Green Button FAQ: https://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonFAQ

Standards:
- NAESB PAP10 Task Force Project Page : http://www.naesb.org/smart_grid_pap10.asp
- NAESB ESPI Task Force Project Page : http://www.naesb.org/espi_task_force.asp
- NAESB ESPI and PAP10 email lists: to subscribe contact Denise at NAESB - drager@naesb.org
- NAESB Green Button Portal - http://www.naesb.org/ESPI_Standards.asp

Users Group:
- UCAIug OpenADE Task Force Home Page: http://osgug.ucaiug.org/sgsystems/OpenADE/default.aspx
- UCAIug OpenADE Mail List: http://www.smartgridlistserv.org/cgi/wa.exe?A0=OPENSG-OPENADE
- UCAIug OpenADE Meetings: tuesdays at 3:00 EST - https://www2.gotomeeting.com/join/844935738, 415-363-0070 #844-935-738
- UCAIug OpenADE Green Button Issues List: http://osgug.ucaiug.org/HelpDesk/Lists/servicerequests/GreenButton.aspx

Open Source Implementations and tools:
- EnergyOS OpenESPI Mail List: http://groups.google.com/group/energyos_espi/subscribe?hl=en
- EnergyOS OpenESPI Web Site: http://www.openespi.org/
- EnergyOS OpenESPI Meetings: mondays at 12:00 EST - https://www2.gotomeeting.com/join/129392235, +1 (516) 453-0010 #129-392-235
- EnergyOS OpenESPI GitHub: https://github.com/energyos/OpenESPI
- EnergyOS OpenESPI GitHub Issues List: https://github.com/energyos/OpenESPI/issues
- General OpenESPI information: https://github.com/energyos/OpenESPI/wiki/
- Energy OS home page: http://energyos.org/

Other:
- NREL OpenEnergyInfo Green Button Apps Repository: http://en.openei.org/wiki/Main_Page
- Green Button Data Sample/Developmental Web Site: http://www.greenbuttondata.org