



# **OpenADE: Overview, Capabilities, Status**

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**OpenSG**  
users group



# Introduction

- David Mollerstuen, Standards Development Architect
- Tendril: Premises Energy Management Company
- Chair, OpenADE
- Co-Chair, NAESB ESPI
- Plenary Secretary, SGIP





# Today's Presentation

- Introduction to OpenADE
- Relationship to other Projects
- History
- Functionality
- Ongoing Efforts

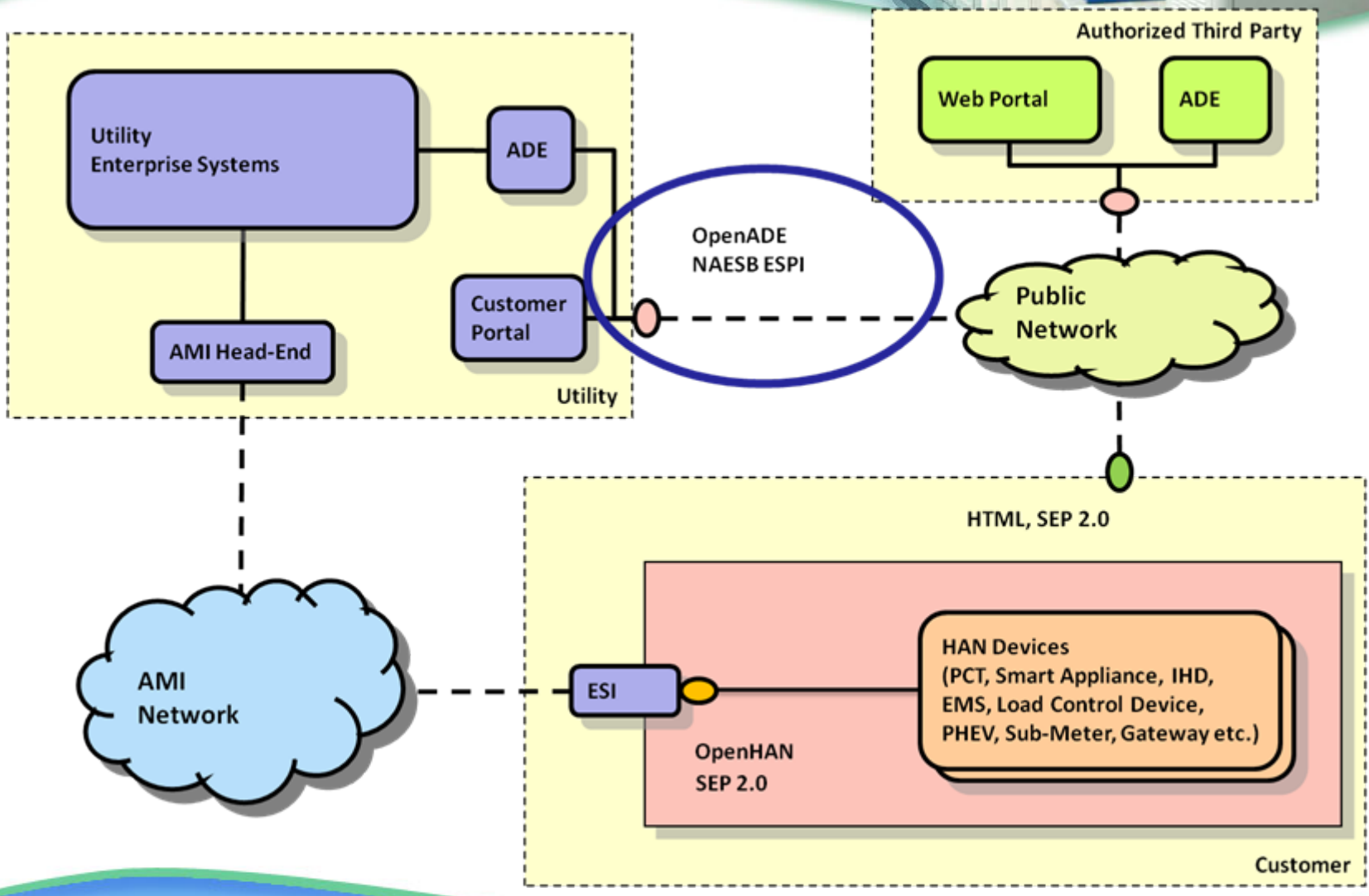




## Terminology

- OpenADE and ESPI often used interchangeably
- OpenADE: requirements effort with OpenSG
- ESPI: specific standardization effort with NAESB







## Relationship to Other Technologies

- NAESB REQ.18 / WEQ.19, "PAP10 Energy Usage Information"
- NAESB REQ.22, NAESB Data Privacy / "Third Party Access to Smart-Meter Based Information"





## Relationship to Other Technologies (cont)

- Green Button
  - Based on ESPI concrete data definition
  - “One time snapshot” of energy usage information, delivered to the consumer





# History

- April 2009: OpenADE initiated at CPUC meeting with CA IOUs and vendors asking for such a standardized interface
- Q3 2009: PAP10 initiated with SGIP
- January 2010: OpenADE 1.0 requirements complete
- Q3 2010: NAESB ESPI standardization effort begins
- Q4 2010: PAP10 complete (including NAESB REQ.18 / WEQ.19, "PAP10 Energy Usage Information")
- Q4 2011: NAESB ESPI complete (October 17, 2011)

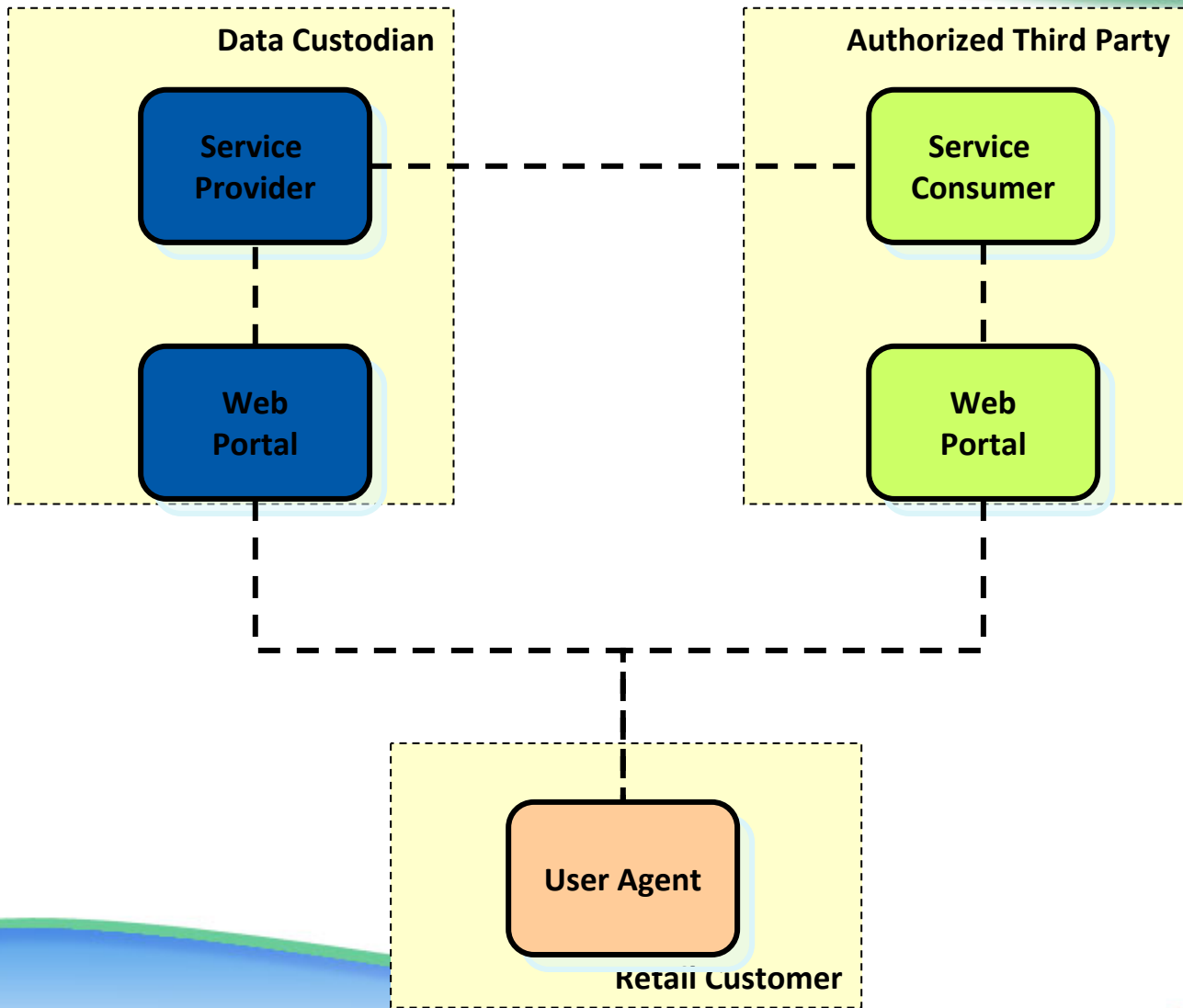


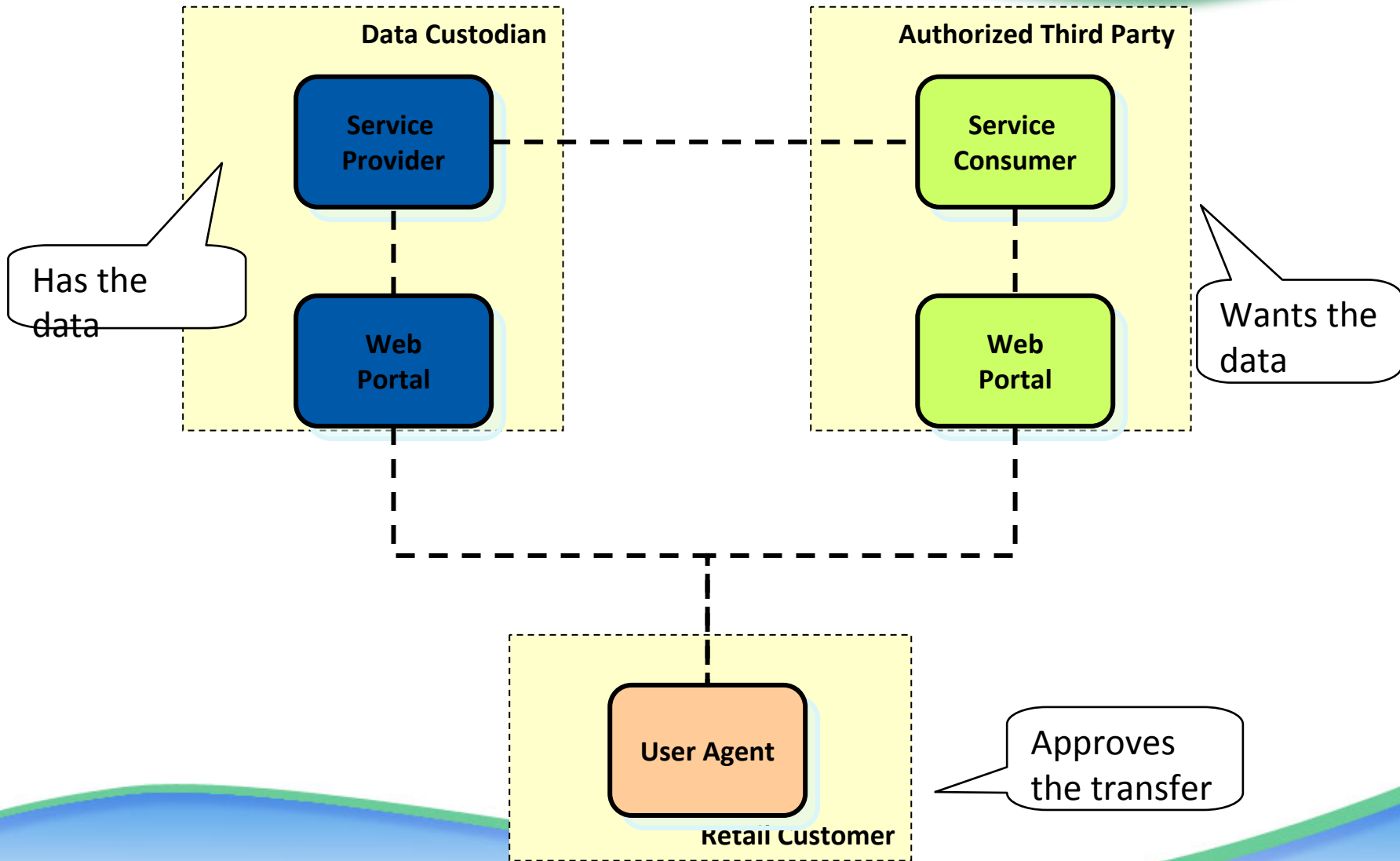


# OpenADE Use Cases

- **Configure**
  - Certificates, 3<sup>rd</sup> Party Access, Keys
- **Authorize**
  - Manage Access Grants per User / Resource
- **Exchange**
  - Asynchronous: Subscribe / Notify / Push, Pull
  - Synchronous: Request / Reply
  - **Information Model**
    - Meter Readings
    - Usage & Quality Summaries









# Access Grant Example

- One time set-up step
- Renew / periodic management

Utility.com      Signed in as JoeUser      [Sign Out](#)

Do you approve 3rdParty.com to receive the following data:

Consumption data from 1/1/2009 through 6/1/2011:  
From 123 Main St.  
Hourly Energy Consumption from Meter 747362  
Daily Gas Consumption from Meter 372844

[Grant Access](#)      [Deny Access](#)



# Data Elements

- Energy Usage Information

- User Identifier

- Shared Key

- Usage Point

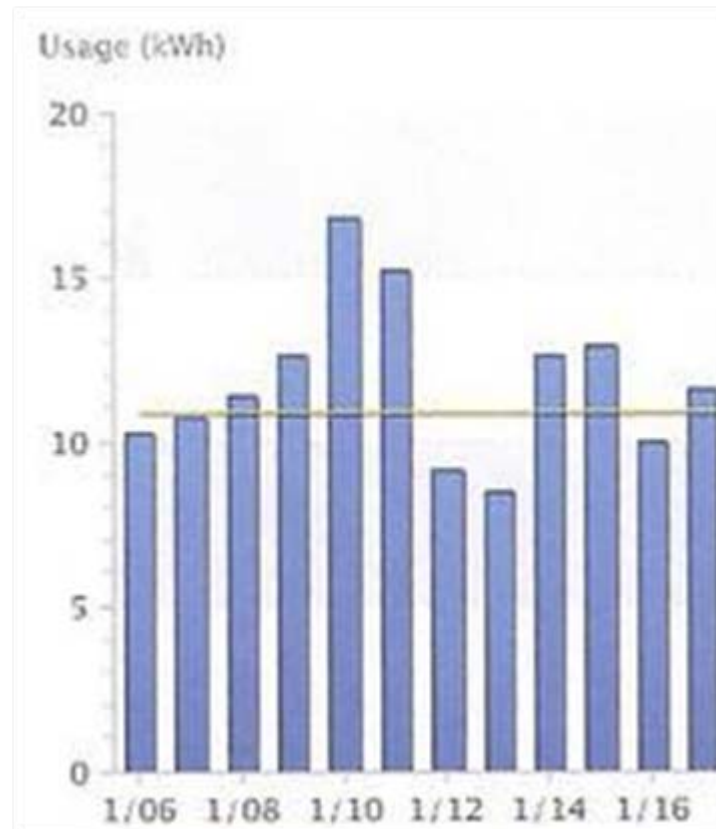
- Identifier
- Shareable name

- Reading Type

- Kind
- Direction
- Unit of Measure

- Interval / Reading

- Date/time
- Value
- Quality





# Data Format

- NAESB ESPI XML IEC CIM PAP10 + IETF AtomPub

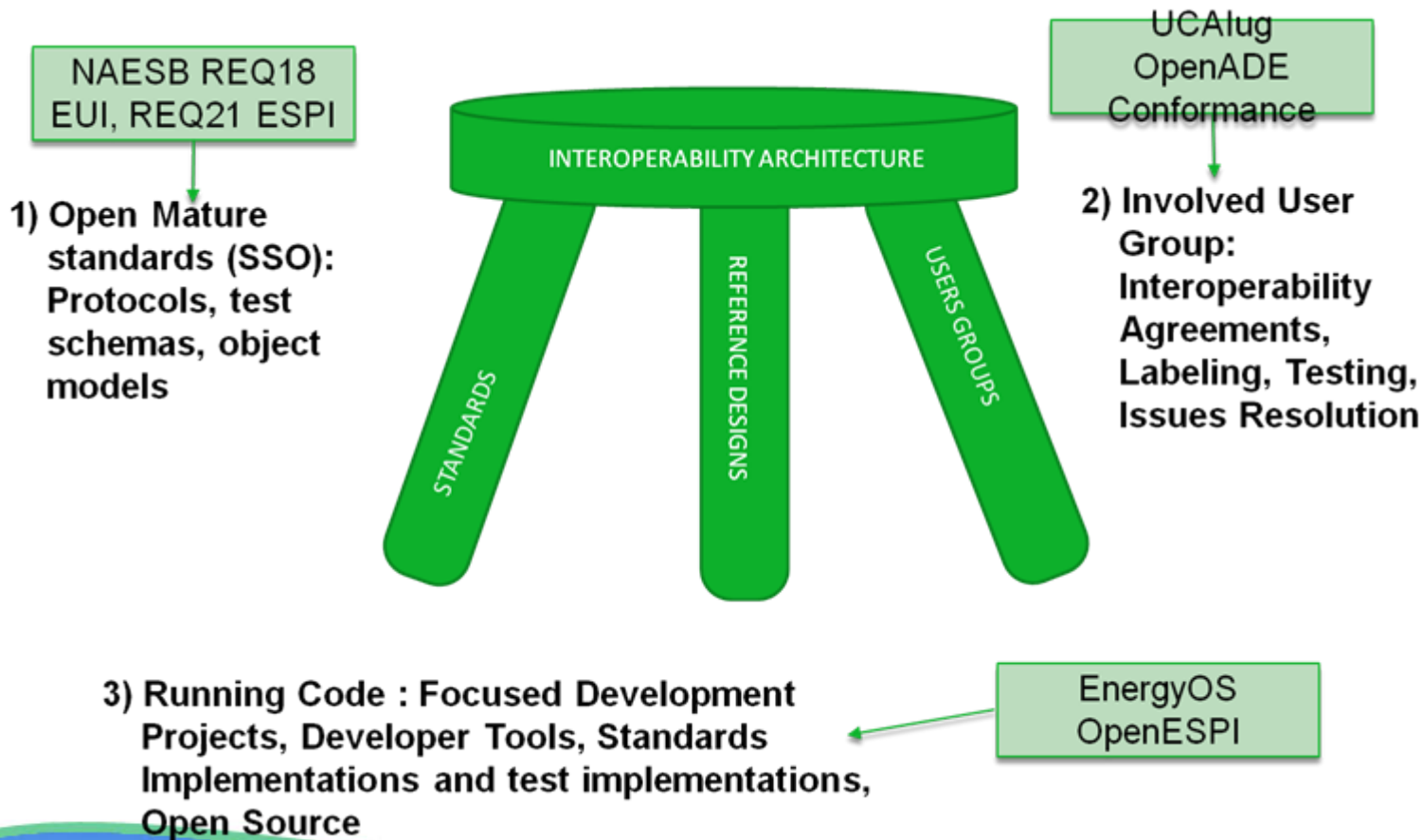
[...]

```
<entry>
  <id>urn:uuid:f2034e93-8320-11e0-9d78-0800200c9a66</id>
  <link rel="self"
href="/User/9b6c7063/UsagePoint/01/MeterReading/01/IntervalBlock/0173"/>
  <link rel="up" href="/User/9b6c7063/UsagePoint/01/MeterReading/01/IntervalBlock"/>
  <title>Hourly Usage for 1/1/2012</title/>
  <content>
    <IntervalBlock xmlns="http://naesb.org/espi">
      <interval><duration>86400</duration><start>1325397600</start></interval>
      <IntervalReading>
        <timePeriod><duration>3600</duration><start>1325397600</start></timePeriod>
        <value>383</value>
      </IntervalReading>
    </IntervalBlock>
  </content>
</entry>
```





# Stepstool to Interoperability



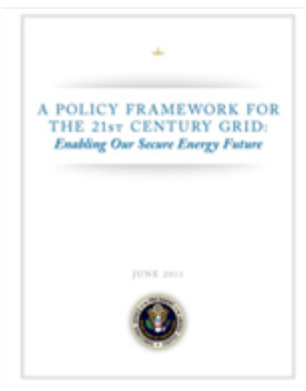


## Ongoing Efforts

- Interoperability Testing and Conformance Authority (ITCA)
- Sample Implementation – OpenESPI
- OpenADE PEV Submetering



# DOE Smart Grid Data Access FOA (DE-FOA-0000579)



- **NSTC Subcommittee on Smart Grid June 2011 Report includes 4 key Federal policy recommendations:**
  - Enable cost-effective smart grid investments
  - Unlock innovation
  - Empower and inform consumers
  - Secure the grid



- **FOA Supports NSTC recommendation & Implementation of Green Button Initiative**
  - Requires a standardized data format be made available to residential customers and designated third parties
  - Specifies NAESB PAP10 EUI and ESPI standards





# Links

- GREEN BUTTON INITIATIVE WEBSITES
  - Aneesh Chopra on Green Button Initiative: <http://youtu.be/NRZoSz0EwBU>
  - SGIP TWiki: <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonInitiative>
  - <http://www.greenbuttondata.org/>
- NIST SGIP PAP10
  - <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP10EnergyUsagetoEMS>
- NAESB REQ21 ESPI, REQ18/WEQ19 PAP10 EUI
  - [http://www.naesb.org/espi task force.asp](http://www.naesb.org/espi_task_force.asp)
  - [http://www.naesb.org/smart\\_grid\\_PAP10.asp](http://www.naesb.org/smart_grid_PAP10.asp)
- EnergyOS
  - Web Site: <http://www.openespi.org>
  - Repository: <https://github.com/energyos/OpenESPI>
  - Mail List: [energyos\\_espi@googlegroups.com](mailto:energyos_espi@googlegroups.com)
- UCAlug OpenADE:
  - <http://osgug.ucaiug.org/sgsystems/OpenADE/default.aspx>
  - [OpenSG-OpenADE@SmartGridListServ.org](mailto:OpenSG-OpenADE@SmartGridListServ.org) (Join: <http://www.smartgridlistserv.org/cgi/wa.exe?A0=OPENSG-OPENADE>)

