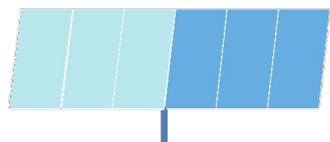
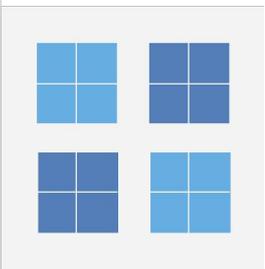
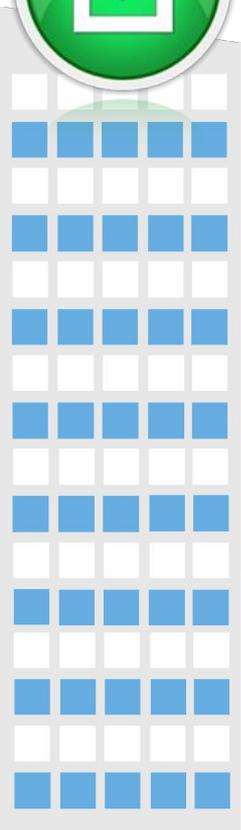




Green Button: Creating the Open Standard for Secure Consumer Access to Energy, Natural Gas, and Water Data

Motivation and development of the Green Button data-sharing program



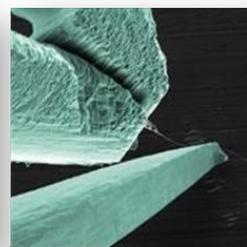
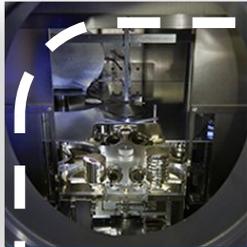
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National User Facilities

Outline

1. Context
2. Technical Foundation for Energy Usage Information
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Key concepts:
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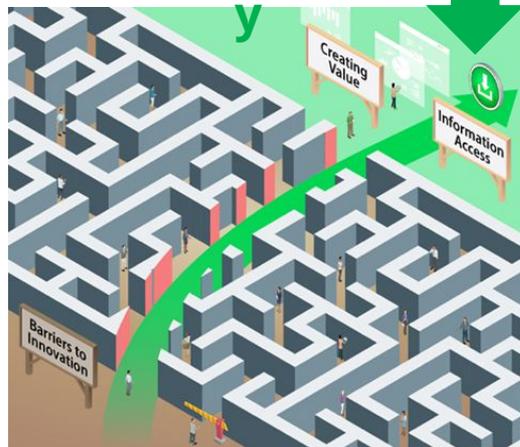
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**Case Study:
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2. Technology Foundation

Identify the Need

Energy Usage Information is Key to Empowering Customers

Identify the Landscape

Multiple Stakeholders, Standards Developing Organizations, Competing Interests

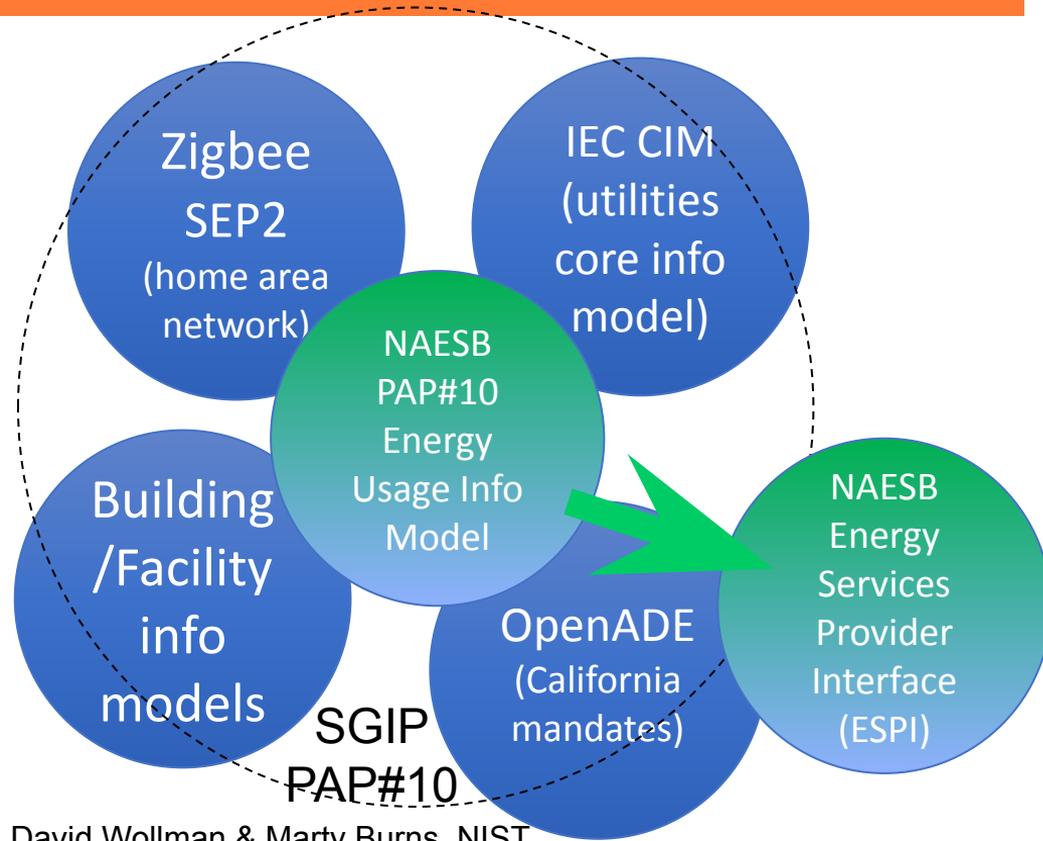
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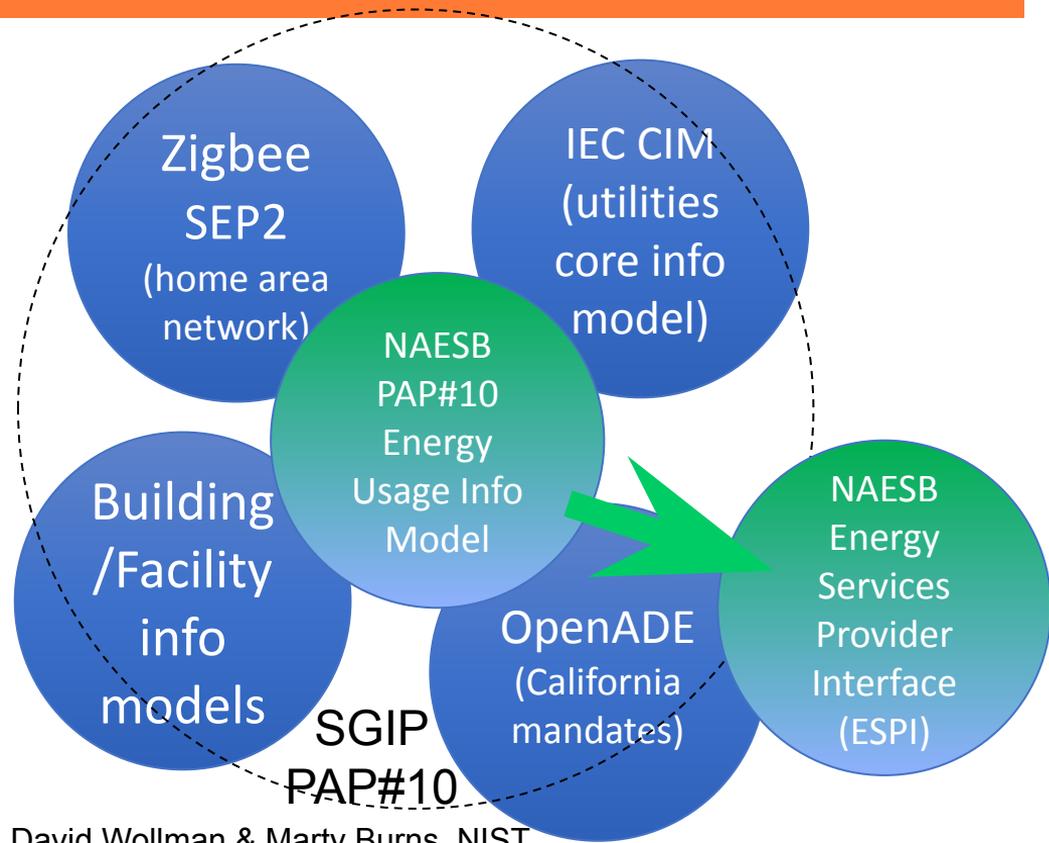
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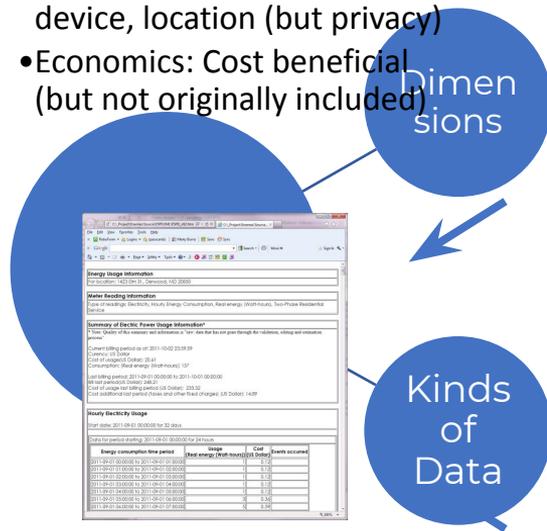


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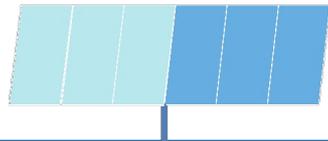
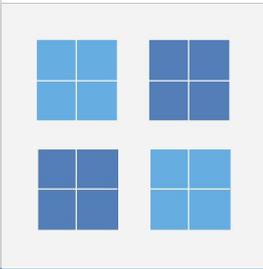
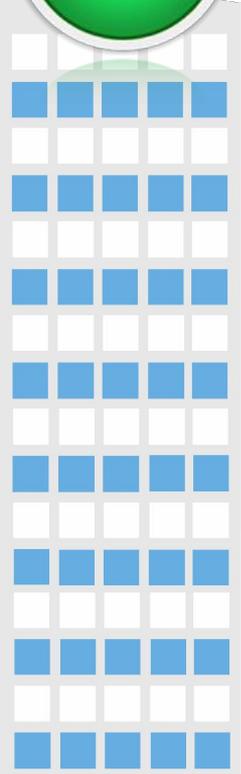


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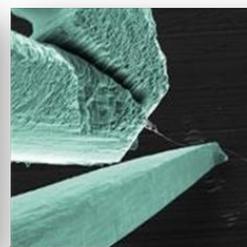
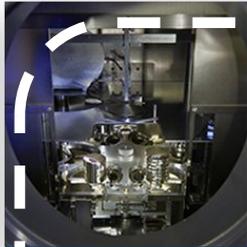
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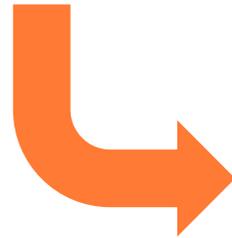
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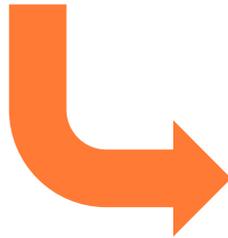
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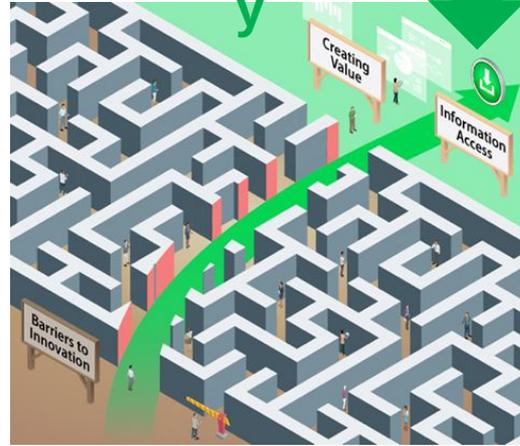
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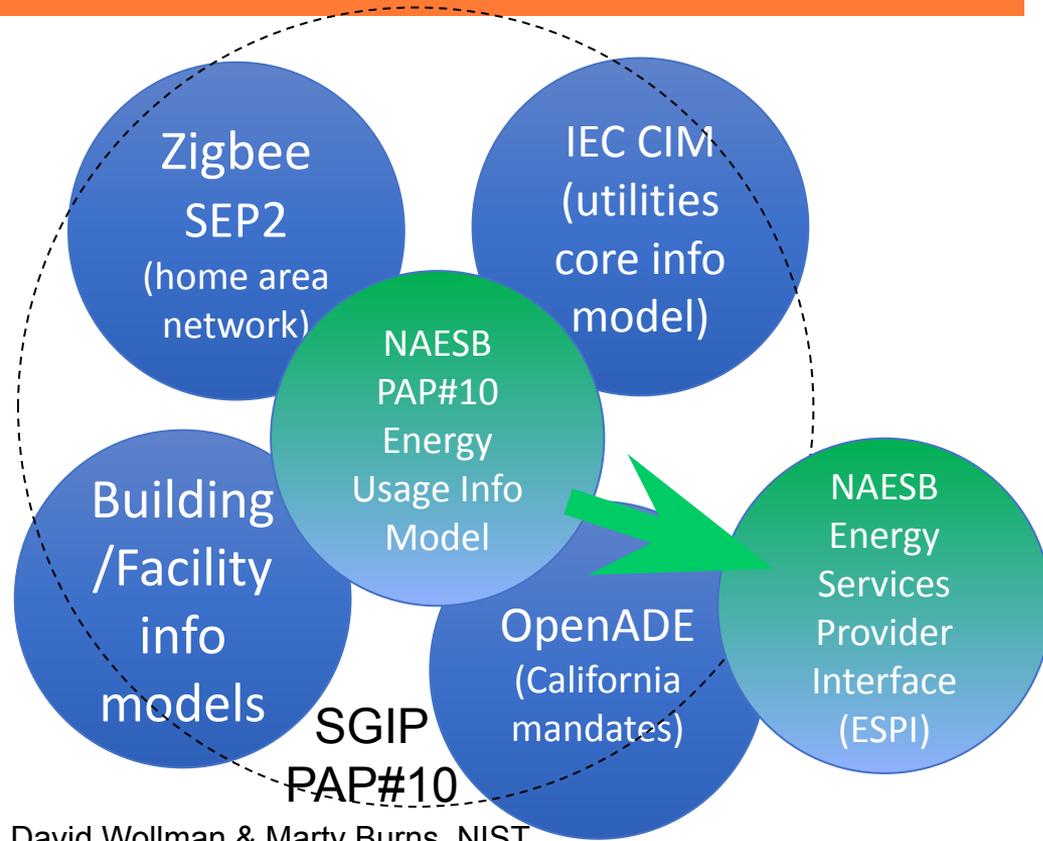
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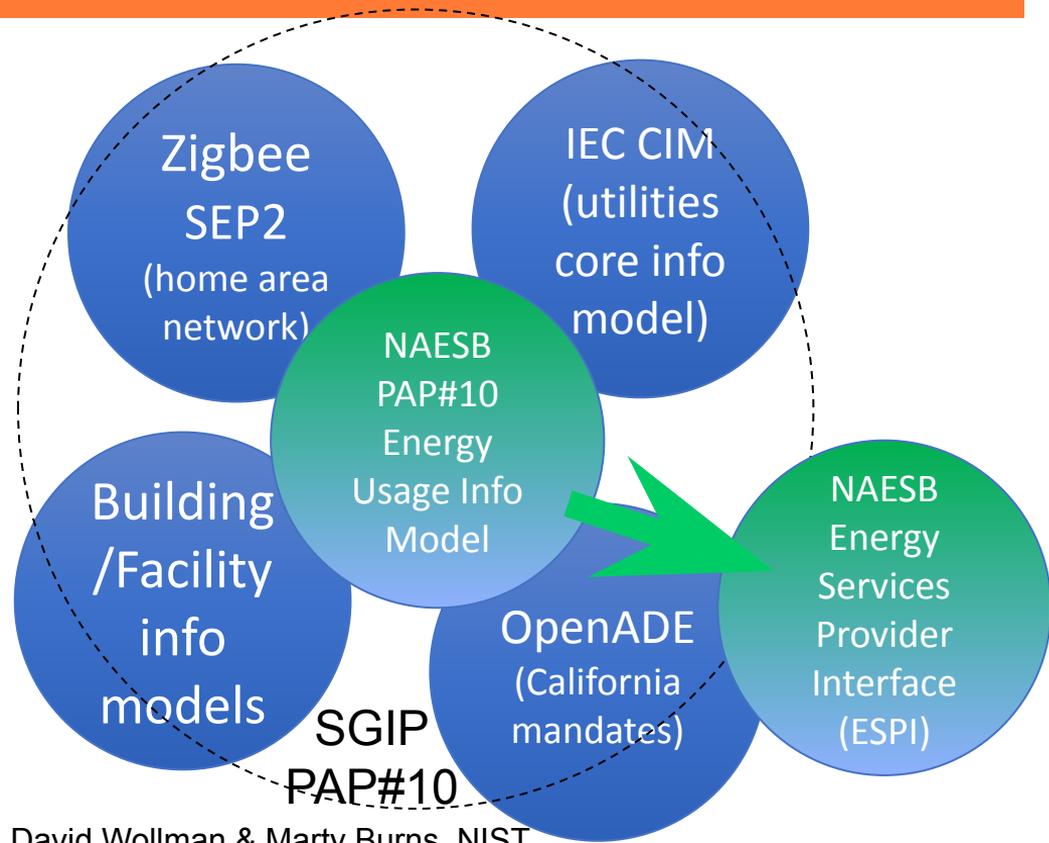
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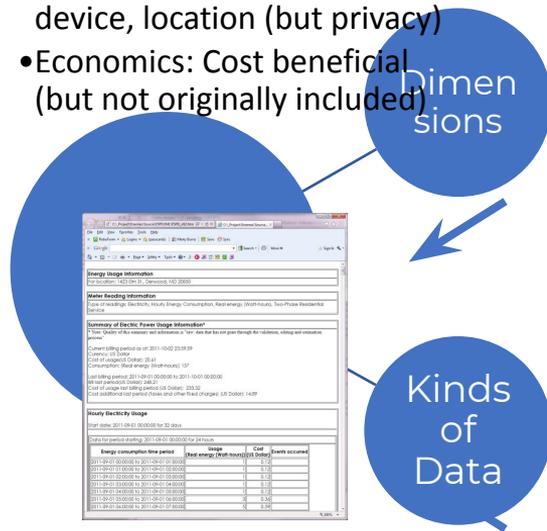


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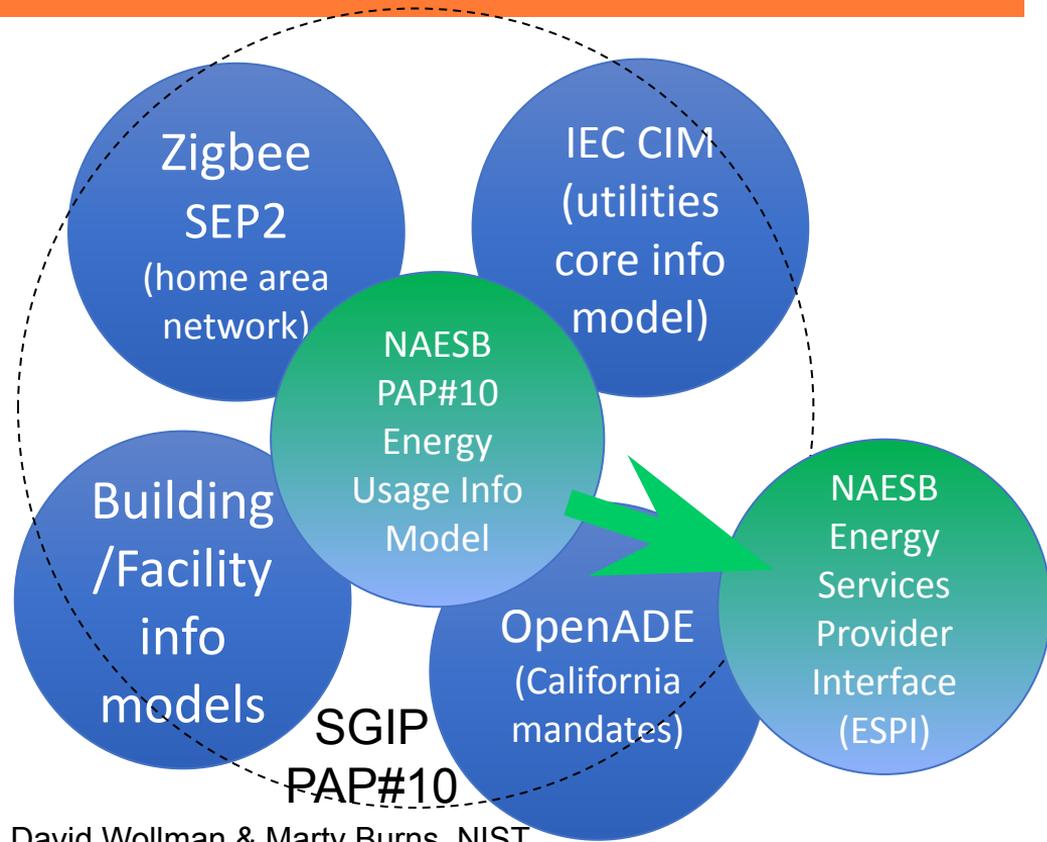


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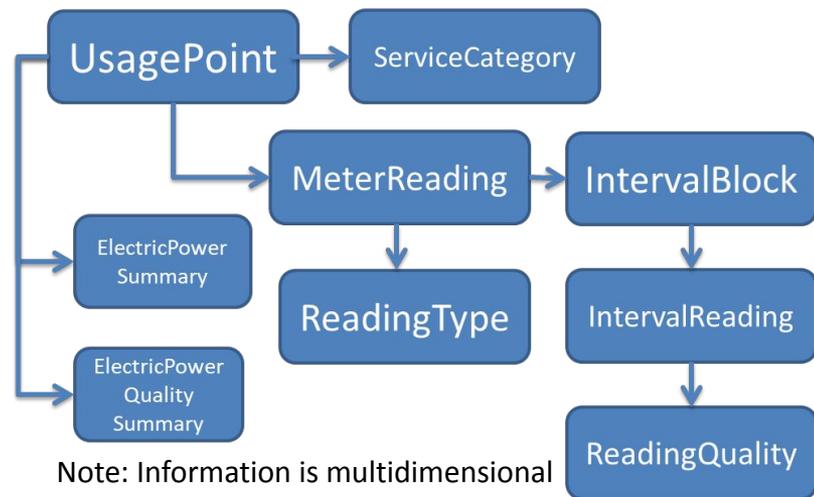


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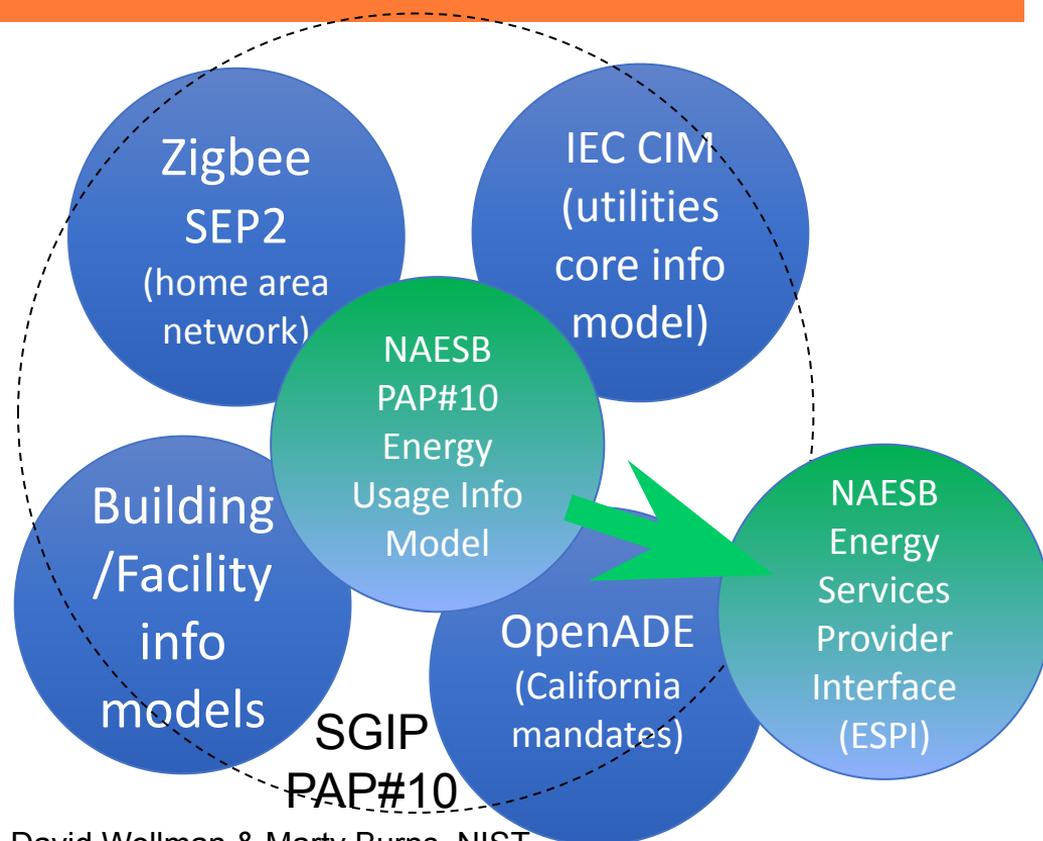


Composition of Energy Usage Information



Note: Information is multidimensional and modeled in UML; which is used to generation documentation and XML Schemas. Many different reading types, summaries, and readings possible.

2. Technology Foundation



XML

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <?xml-stylesheet type="text/xsl" href="ESPI1_xst2.xsl"?>
3 <feed xmlns="http://www.w3.org/2005/Atom" xsi:schemaLocation="http://naesb.org/espi http://naesb.org/espi/ESPI1.xsd">
4 <id>um:uid:046638c0-8701-11e0-9d78-0800200c9a69</id>
5 <title>ThirdParty Batch Feed</title>
6 <updated>2012-05-21T18:01:00Z</updated>
7 <link rel="self" href="/ThirdParty/83e269c1/Batch"/>
8 <entry>
9 <id>um:uid:c990b150-8320-11e0-9d78-0800200c9a69</id>
10 <link rel="self" href="/User/9b6c7063/UsagePoint/0">
11 <link rel="up" href="/User/9b6c7063/UsagePoint/0">
12 <link rel="related" href="/User/9b6c7063/UsagePoint/0">
13 <title>1423 Elm St., Derwood, MD 20850</title>
14 <content>
15 <UsagePoint xmlns="http://naesb.org/espi">
16 <ServiceCategory>
17 <kind>0</kind>
18 </ServiceCategory>
19 </UsagePoint>
20 </content>
21 <published>2012-05-21T18:01:00Z</published>
22 <updated>2012-05-21T18:01:00Z</updated>
23 </entry>
24 <entry>
25 <id>um:uid:f2034e91-8320-11e0-9d78-0800200c9a69</id>
26 <link rel="self" href="/User/9b6c7063/UsagePoint/0">
27 <link rel="up" href="/User/9b6c7063/UsagePoint/0">
28 <link rel="related" href="/User/9b6c7063/UsagePoint/0">
29 <link rel="related" href="/ReadingType/07"/>
30 <title>Hourly Energy Consumption</title>
31 <content>
32 <MeterReading xmlns="http://naesb.org/espi">
33 </content>
34 <published>2012-05-21T18:01:00Z</published>

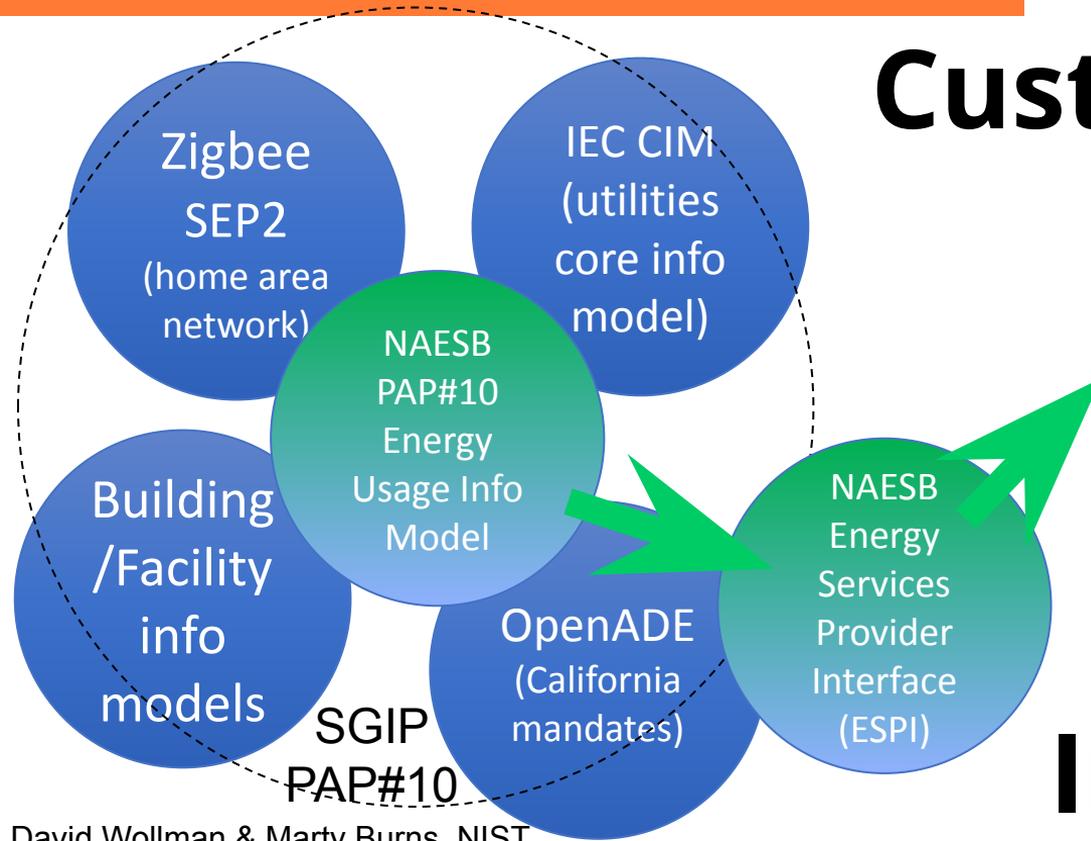
```

Web Presentation

Meter Reading Information	
Type of readings: Electricity, Hourly Energy Consumption, Real Service	
Summary of Electric Power Usage Information*	
* Note: Quality of this summary and information is "raw": data that has not been processed	
Current billing period as of: 2011-10-02 23:59:59	
Currency: US Dollar	
Cost of usage (US Dollar): 20.61	
Consumption: (Real energy (Watt-hours)) 157	
Last billing period: 2011-09-01 00:00:00 to 2011-10-01 00:00:00	
Bill last period (US Dollar): 248.21	
Cost of usage last billing period (US Dollar): 233.32	
Cost additional last period (taxes and other fixed charges) (US Dollar): 14.89	
Hourly Electricity Usage	
Start date: 2011-09-01 00:00:00 for 32 days	
Data for period starting: 2011-09-01 00:00:00 for 24 hours	
Energy consumption time period	Usage (Real energy (Watt-hours))
2011-09-01 00:00:00 to 2011-09-01 01:00:00	157
2011-09-01 01:00:00 to 2011-09-01 02:00:00	157
2011-09-01 02:00:00 to 2011-09-01 03:00:00	157
2011-09-01 03:00:00 to 2011-09-01 04:00:00	157
2011-09-01 04:00:00 to 2011-09-01 05:00:00	157
2011-09-01 05:00:00 to 2011-09-01 06:00:00	157
2011-09-01 06:00:00 to 2011-09-01 07:00:00	157

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Implementatio
Customer interest
?
Business value
Policy
Mandate
Interoperabilit

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Role of Government

Federal Government – Agencies and Missions

Federal Government as convener, motivator, first user, regulator, funding

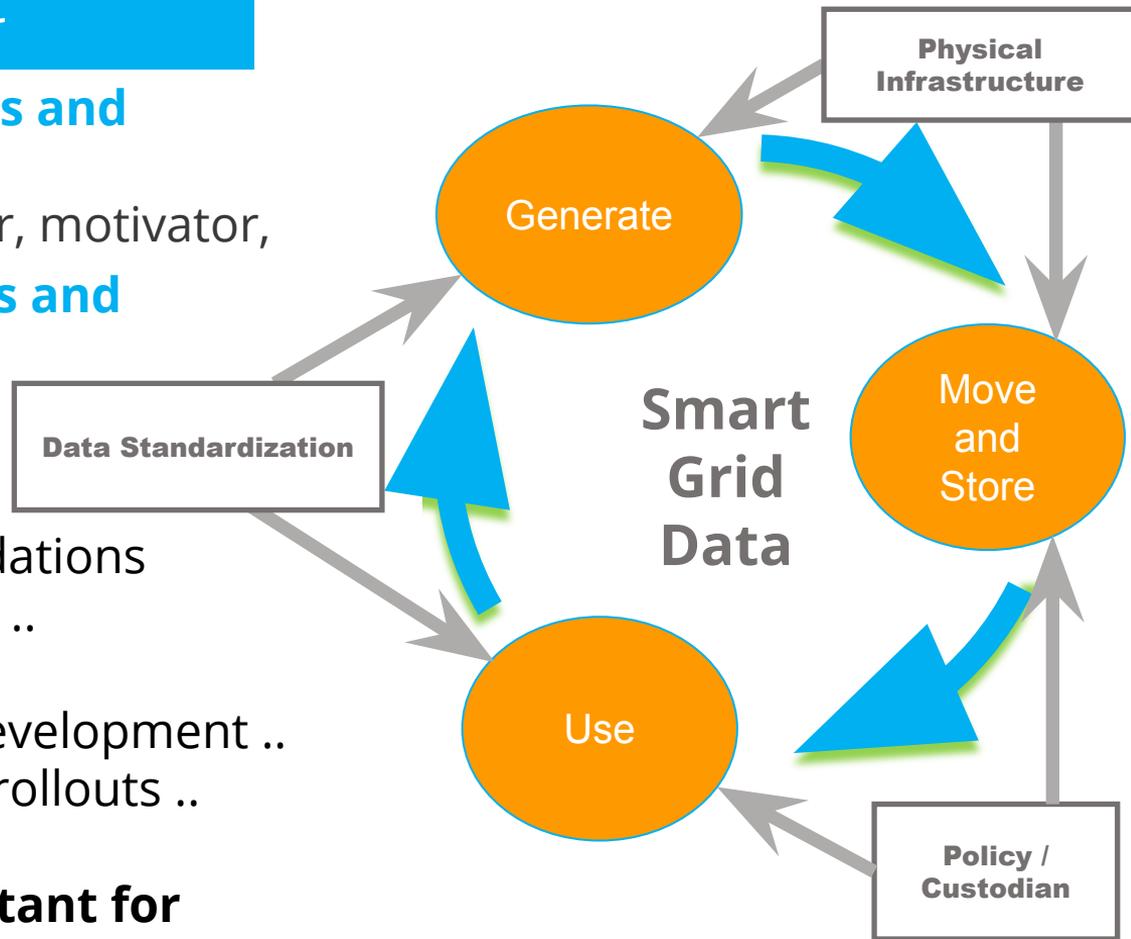
State Government – Regulators and Policy

Jurisdiction distribution systems, state energy policies

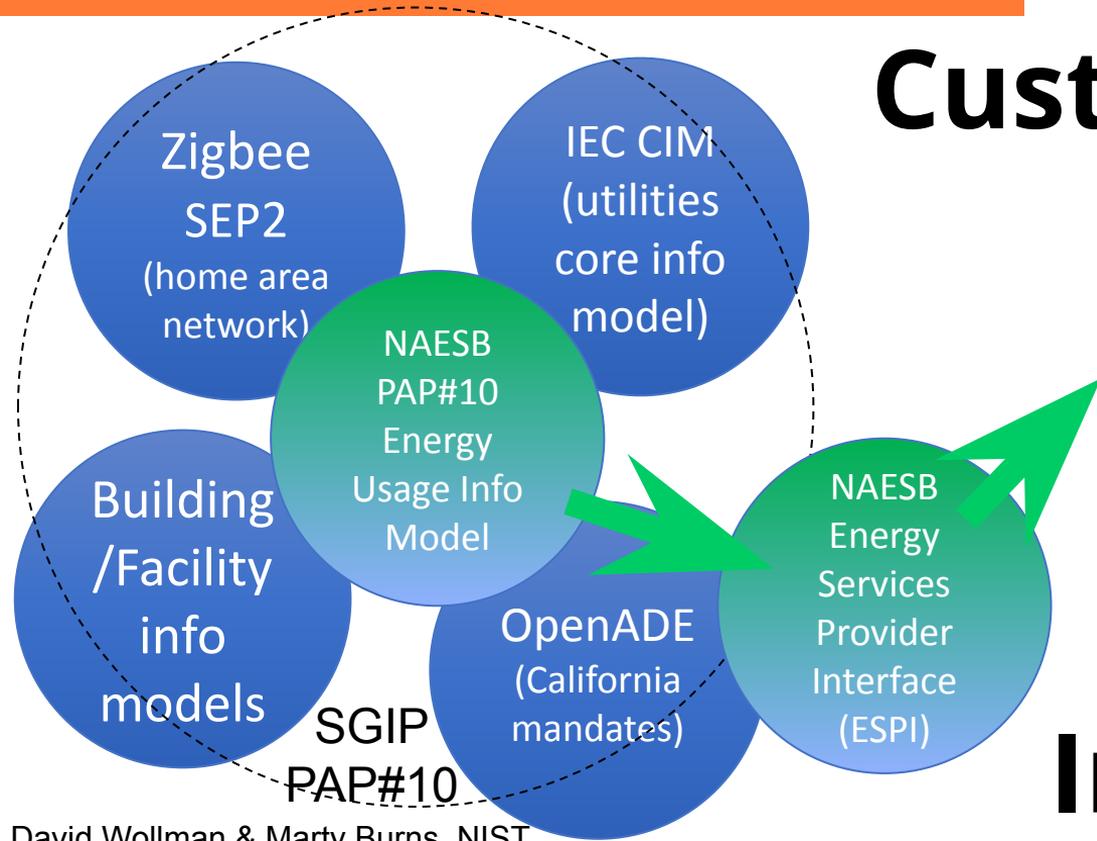
Top-down & Bottom-up

Vision/policy .. early R&D .. foundations (tech/standards/interoperability) .. tech development tools .. pilot implementations .. ecosystem development .. testing & certification .. broader rollouts .. consumer awareness ..

industry leadership is important for long term impact (common US perspective)



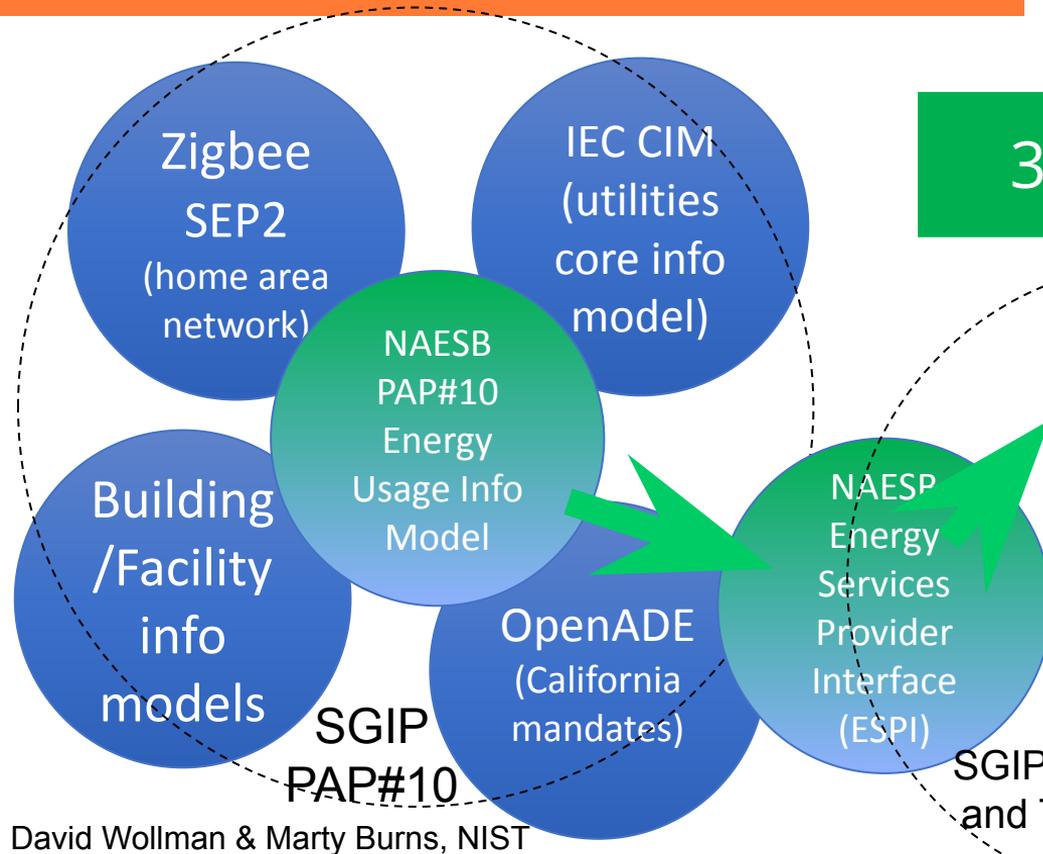
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White House and Interagency Partners

Office of Science and Technology Policy (OSTP), NIST, Department of Energy ...

Alignment with Federal Government Priorities and Initiatives

Open Data/My Data (Green Button modeled after Blue Button health data), Smart Grid, Privacy Blueprint, ...



Aneesh Chopra – former U.S.
Chief Technology Officer –
September 2011

A Challenge – Design a “Green Button”

A Challenge to Industry: How can we safely and securely provide customers electronic access to their energy information, thereby supporting the continuing development of innovative new products and services in the energy sector?

Conference Keynote followed by
OSTP Blog: Modeling a Green Energy
Challenge after a Blue Button

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white house inspired.
industry led.

In response to the Obama Administration's call to action, 35 utilities and energy providers committed to provide 36 million homes and businesses with their own energy usage information in the consensus, industry-standard Green Button format.

[Learn more >>](#)



Photo credit: Silver Spring Networks CustomerIQ™ Energy Portal

3. Green Button Initiative and 4. Building an Ecosystem

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Active Engagement with the “Coalition of the Willing” and Skeptics

Regulators; California utilities and other implementers; industry; privacy; start-ups: ...

Solved Many Challenges (Tech and Non-Tech) and Grew Ecosystem

Websites; branding/copyright; API sandbox; interoperability test harnesses; T&C; standard updates based on real-life experiences; DOE Data Guard (privacy)

Leveraged Many Different Government Mechanisms for Support

Challenges (DOE Apps for Energy), Executive Orders, Agency Programs (GSA, EPA)

5. Passing the Baton to Industry

Creation of Green Button Alliance

Establishment of non-profit organization, launched in 2015

Continuing Engagement

NIST has ex-officio board position; NIST-GBA cooperative agreement (small grant)



Thank you!

david.wollman@nist.gov

