1. **PAP Scope (from the PAP Charter):**

This action plan will lead to data standards to exchange fine grained and timely information about energy usage. The first goal is agreement on a core information set to enable integration of usage information throughout facility decision processes. Customers and customer-authorized third-party service providers will use these standards to access energy usage information from the Smart Grid and meter, enabling them to make better decisions about energy use and conservation. Consumers and premises-based systems will use these standards to provide real-time feedback on present and projected performance. Using the Smart Grid infrastructure, this information will be shared with the facility: a home, building, or industrial installation. Two-way flows of usage information will improve collaboration and thereby energy efficiency.

The data standards will enable immediate and widespread benefit. They will support access to monthly usage information, which may already be available, as well as near-real-time information as smart meters and other devices are deployed. The standards will enable innovation by third-party service and software providers in providing novel ways to help consumers and operations manage their energy usage. In the absence of these standards, software developers and utilities would have to negotiate pair-wise interfaces, an impractical situation. The standards will also promote more responsive facilities: devices that deliver and understand common usage information can be deployed more quickly.

These standards must be developed on an aggressive timetable. States such as California and Texas have mandated that consumers have electronic access to such data in 2010. This action plan will result in both an initial specification of narrower information to satisfy regulatory mandates by February 2010 and a requirements-based definition for standard energy usage within the facility as well as to and from the Smart Grid by mid 2010.

Attempts to encourage consumers of electricity to conserve energy are enhanced when consumers have
the means to track their actual energy use. Real-time, or near real-time, information supports energy management decisions and action far more effectively than after-the-fact billing. Today, limited access to information already collected hinders customer-focused energy management. Making understandable, actionable energy-usage information readily available to consumers requires widely adopted data standards. Such standards will support innovation in automated energy management services and products, help to build national and global markets for these technologies, and help to conserve energy.

The on-premises meter can provide information about energy consumption. This information can also be made available through energy delivery systems (such as those operated by utilities or aggregating service providers) and through consumer devices. In larger facilities, customer owned sub-meters are common, but accurate meter information at the boundary of the facility is still critical information. Anticipated initial users of this information model will be utilities and other service providers, which will provide energy usage information to customers via the World Wide Web, or public Internet. The model also will support development of on-premises devices that can access meters and provide usage information directly to the occupant.

Device and facility usage is the other target—sharing of usage and load and demand historical and projected information inside a facility makes that facility more valuable to the Smart Grid, as aggregated projections can be passed on to the Smart Grid operations domain, making forecasting and management better. Inside the facility, the energy efficiency goals of EISA 2007 and Department of Energy initiatives are better served by consistent usage information exchange.

This effort will support information standards for load curtailment, load shaping, and energy market operations. The initial focus, however, is on immediate steps to define and standardize energy usage information up through the existing Smart Grid infrastructure and to make it more readily available. The energy transaction is the informational hand-off within and between adjacent domains in the Smart Grid, just as the meter is the hand-off within and between domains. Shared energy-transaction information is essential to interactions between:

- Distribution and the industrial, commercial, and home premise;
- The service provider and industrial, commercial, and home premises;
- Distributed energy resources and all other domains; and
- Plug-in electric vehicles.
2. NIST Domains Impacted:

<table>
<thead>
<tr>
<th>Markets</th>
<th>X</th>
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<tbody>
<tr>
<td>Operations</td>
<td>X</td>
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<tr>
<td>Service Providers</td>
<td>X</td>
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<tr>
<td>Bulk Generation</td>
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<tr>
<td>Transmission</td>
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<tr>
<td>Distribution</td>
<td>X</td>
</tr>
<tr>
<td>Customer</td>
<td>X</td>
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</tbody>
</table>

3. Levels in the ISO 7 Layer Model Impacted: INSTEAD: Layers in the GWAC Stack (ISO not used in SGIP for the most part, GWAC Stack is)

<table>
<thead>
<tr>
<th>Application</th>
<th>X</th>
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<tbody>
<tr>
<td>Presentation</td>
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<tr>
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<tr>
<td>Transport</td>
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<td>Data Link</td>
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<tr>
<td>Physical</td>
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4. Does this PAP have an impact on any other PAP?

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<td>030</td>
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</tbody>
</table>

4a. Has this cross PAP impact been discussed by the SGAC on a team call? _No, but Cross PAP Working Party was involved___________(DATE)

4b. What were the action items that resulted from that discussion?

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Assigned to</th>
<th>Status</th>
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<tbody>
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</table>
What other PAPs have an impact on this PAP?

<table>
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<td>030</td>
</tr>
</tbody>
</table>

Has this cross PAP impact been discussed by the SGAC on a team call? _No, but Cross PAP Working Party was involved___________(DATE)_

What were the action items that resulted from that discussion?

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<thead>
<tr>
<th>Action Item</th>
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<th>Status</th>
</tr>
</thead>
</table>

(Add rows as needed)

NOTE YOUR ITEM NUMBERING SHOULD BE SECTION NUMBERS _I’LL DO ANOTHER VERSION AFTER GETTING THIS TO YOU_

1. Does this PAP have any architectural Considerations?

Yes [X] No

4a. If so what are they?

Extension of CIM therefore shares semantics with other SG models

The model is overly complex for the stated purpose, but the conformance and “minimal conforming view” provide a simpler and more flexible model

2. Has this PAP had scope changes since it was originally written?

Yes [X] No

5a. If so what are they?
The scope was narrowed to “grid side” provided information; the facility information for usage and demand was moved to PAP17.

3. When reviewing the PAP, are there new use cases being developed?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>X</th>
</tr>
</thead>
</table>

4. If there are new use cases, has their impact been covered in the Conceptual Architecture – Requirements Document already? N/A

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

8a. If not, what new requirements need to be added?

1.

2.

3.

(add lines as needed)

8b. The conceptual architecture lead was notified on ____________________ (Date)

5. Is there an impact on the Semantic Working Group?

<table>
<thead>
<tr>
<th>Yes</th>
<th>X</th>
<th>No</th>
</tr>
</thead>
</table>

9a. If so, what are the impacts?

1. NAESB Energy Usage Seed Model will impact information models that are derived from it

2. NAESB Energy Usage Seed Model will impact domain models that need to incorporate energy usage data

3. It’s a core information model for SG

(add lines as needed)

9b. The semantic framework lead was notified on ___11/18/10 – Jay Britton________(Date)

6. Which Standards Development Organizations are involved?

1. NAESB

2. OASIS

3. ASHRAE
4. Zigbee*
5. EIS Alliance*
6. OpenADE*
7. IEC CIM
8. ANSI C12

* Not an SDO.

(add lines as needed)

7. What standards are being produced/modified? (was “discussed”)
   1. NAESB PAP10 Energy Usage Information Business Practice
   2. 
   3. 
   (add lines as needed)

8. Standard Status:

<table>
<thead>
<tr>
<th>Standard ID</th>
<th>SDO</th>
<th>Maturity</th>
<th>Level of Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>REQ18,WEQ19</td>
<td>NAESB</td>
<td>New [A]</td>
<td>New [A]</td>
</tr>
</tbody>
</table>

(Note: add additional rows as needed)

*Maturity (for use in the table above)*

A. A new standard that is being created by a new working group
B. A new standard that is being created by an established working group
C. A standard that was in draft form, but not finalized yet
D. A standard that was released but does not have a testing and conformance plan
E. A standard that is released, has a testing and conformance plan, but is undergoing a major revision
F. A standard that is mature, has testing and conformance and no major revisions are pending

*Level of Modification (for use in the table above)*
A. 90 percent or more of the existing work will have to be modified or written from scratch
B. 75 to 90 percent existing work will have to be modified or written from scratch
C. 50 to 75 percent existing work will have to be modified or written from scratch
D. 25 to 50 percent existing work will have to be modified or written from scratch
E. Less than 25 percent existing work will have to be modified or written from scratch
F. No modification is required

9. Does this PAP limit options for innovation in the future?
   [ ] Yes  [X]  No

10. If yes, what limits are placed on innovation?
    1. Evolution and extension requires a NAESB Standard Update unless the information model can be extended while maintaining conformance. (this appears to be the case)
    2.
    3.

    (Add additional lines as needed)

11. Other Comments:

    There should be a foot note that the pricing information (for cost calculation) is available to the meter from somewhere else. Cost is carefully described, but in present contracts and tariffs is not determinable from the contract, only from actual usage. So cost is meaningful only for sufficiently past intervals. Fortunately it's optional in the model.

    There should also be a foot note that weather information is available also from other sources to calculate readings like:

    + currentDayLastYearNetConsumption: SummaryMeasurement [0..1]
    + currentDayNetConsumption: SummaryMeasurement [0..1]
    + currentDayOverallConsumption: SummaryMeasurement [0..1]
    + previousDayLastYearOverallConsumption: SummaryMeasurement [0..1]
    + previousDayNetConsumption: SummaryMeasurement [0..1]
    + previousDayOverallConsumption: SummaryMeasurement [0..1]
A list of abbreviations and references (e.g. WSG84) would be useful.

There is sufficient flexibility in the model to handle historical, current and projected data and that the handling of uniform and non-uniform time intervals is appropriate.

UsagePoint = a logical point on a network that is just a string. This will be communicated between systems. Should this have a stronger semantic and be qualified?

It is assumed that QualityOfReading will be extended. The "other" may be ambiguous.

Conformance is well defined, and does not require adherence to the complete [and overly complex] model, but only to the essential information. This is well done.

PAP10 must conform to or be mappable to PAP04 Schedule Communication with the handling of time-series/fixed time interval/variable time interval data. This was evaluated in the committee work of NAESB EUI and conformance/mapping issues appear to be addressed.