GridWise® Architecture Council

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Chairman, GWAC
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Chairman, UCAIug
Administrator, NIST SGiP
GridWise Architecture Council

- Strategic Impact
- Diverse team of leaders embedded in industry
- Shaping the guiding principles for a highly intelligent, interactive electric power system
- Guidance for public and private infrastructure investment
GWAC Activity Area’s

- Interoperability
  - Exchange of actionable information
    - between two or more systems
    - across organizational boundaries
  - Shared meaning of the exchanged information
  - Agreed expectation of the response to information exchanges
  - Requisite quality of service of information exchange

- Managing Complexity
  - Multiple versions and mixtures of technology
    - Including today tech with tomorrow’s innovations
  - Multiple vendors with multiple products
  - Multiple services needing integration
  - Multiple organization structures

- Transactive Energy
  - Extends the interplay between economic activity (transactions) and the technical operation of an electric power system from end-to-end

- Strategic forum for GWAC members and third parties to address big problems

- Organizational support – NIST, SGiP, DoE
GWAC Impact - Interoperability

Interoperable Systems - Expected Impact:

- Integration cost
- Cost to operate
- Capital IT cost
- Installation cost
- Upgrade cost
- Security management
- Choice in products
- Price points & features

All items provide compounding benefits
Phases of Progress

**Goal:** Develop a culture for implementation-ready electric automation products & services

- **Formation Phase**
- **Foundation Phase**
- **Industry Engagement**
- **Procure and Implement**
- **Pervasive Community Interoperability**
- **Application Phase**

**Impact**

- **Principles**
- **How-To Framework**

**Time**

- 2004
- 2006
- 2008
- 2010
- 2012

Sustainability and Practicality
What’s in it for you
GWAC Work Products in Context of Technology Adoption Lifecycle

- Pragmatic
  - Support the Business Case
  - Security
  - Hybrid System Support

- Value
  - Financial
  - Environmental
  - Reliability
  - Safety
GWAC Impact - Metrics

- 2011 Document Downloads
  
<table>
<thead>
<tr>
<th>Document Title</th>
<th>Downloads</th>
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<tr>
<td>GridWise® Interoperability Context-Setting Framework</td>
<td>1811</td>
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<tr>
<td>Decision-Maker's Interoperability Checklist</td>
<td>1701</td>
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<tr>
<td>Meeting Minutes</td>
<td>1138</td>
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<td>Financial Benefits of Interoperability</td>
<td>394</td>
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<td>GridWise® Interoperability Constitution</td>
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<td>Reliability Benefits of Interoperability</td>
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<td>Standards Mapping</td>
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<td>Interoperability Path Forward Whitepaper</td>
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<td>GridWise Architecture Tenets and Illustrations</td>
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<td>Bylaws</td>
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<td>Mission &amp; Structure</td>
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<td>Other</td>
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- Paper references
  
  40% of IEEE smart grid related conference papers reviewed by the IEEE PES IGCC in 2012 to date referenced the GWAC stack (double 2011 rate) versus 25% referencing NIST Framework

- H-Index = 21 (standard measure of productivity and impact for publications)
Industry Challenges

- Transactive Energy (more markets, more distributed, more players - smart devices and systems acting intelligently on our behalf in a business context)
- Enhanced reliability and quality – new metrics needed – old ones too course
- Concepts and strategy for pervasive DER
- Electrification of transportation
- Opportunities for the application of Microgrids
  - New interoperability concepts, standards and metrics required
- Regulatory reform required
  - Facilitate/allow utility infrastructure investment
  - More uniformity across states
- Education
  - Utility engineers – new skills necessary for grid modernization
  - Regulators – what is possible, what is necessary
  - Universities – what is needed by industry – creating smart grid engineers
- Leadership
  - Federal entity leadership necessary to help mitigate impacts of regulatory balkanization
Success Story – Green Button

• Common sense idea – consumers own energy use data, have access to it in a standard format, apps and services available to use it – a policy, a brand, a set of technologies
• White House idea to first implementation in 90 days
• Utilizes new, fast tracked interoperability standard (ESPI)
• Implements many key principals of the GWAC constitution and utilizes almost all layers of the GWAC stack
• Lots of political haymaking, satisfied customers, market for apps, low cost energy provider implementation
• 10 million customer accounts have access now, 20 million more associated with utility commitments
• > 70 vendors offering products and services
Next Steps for the GWAC

• Sustainability
  ➢ The GWAC is working to ensure that the success achieved to date is sustainable
  ➢ Manufacturers and utilities applying GWAC principles and work products have done so successfully in green field situations
  ➢ Pervasive interoperability necessitates applying the principles in hybrid systems as well – integrating existing infrastructure and processes with the new

• Assessing the Landscape
  ➢ Articulating our observations on industry deployment progress, issues and challenges, and sage advice on how to achieve long term goals
  ➢ Supporting public and private entities with independent informed ideas, views – support and enhance leadership
Summary

• We are an collection of diverse industry experts donating our time to provide independent viewpoints, strategy, and ideas in multiple contexts for a diverse stakeholder community with the guidance and administrative support of the DoE.

• GWAC has a successful historical and ongoing role and reputation in developing strategy for grid modernization including the concepts and benefits associated with standards based interoperable systems.

• We offer our support to you in fulfilling your mission and we request your support and advice on how to best leverage the council in your activities and the activities of others that you engage and influence.

• We invite you to participate in our numerous venues for strategic discussion and information exchange including our 2-3 day meetings (3 or 4 per year), teleconferences (monthly), conferences (GridInterop and Connectivity Week), and workshops (transactive energy, interoperability maturity model, and others)
Questions and Resources

- GWAC Web Site – All publications available here
  http://www.gridwiseac.org/

- List Server
  http://www.smartgridlistserv.org/cgi/wa.exe?SUBED1=GWAC-INTEREST

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