



# The Value Proposition of Interoperability

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- What is ELCON?
  - The national association for large industrial users of electricity in the U.S.
    - Founded in 1976
    - Members from a wide range of industries from traditional manufacturing to high-tech
- I emphasize:
  - ELCON recognizes that there may be many benefits for consumers from a “Smart Grid” – and, thus, we are not opposed to the idea
    - However, these benefits are not yet demonstrated to the satisfaction of consumers – and there are large concerns from both large and small consumers
- The views today are mine alone

- Our panel today addresses interoperability:
  - As economists like to say, interoperability is a necessary but not sufficient condition for the success of a “Smart Grid”
- Without interoperability
  - A variety of approaches could emerge, leading to incomparabilities among energy management products and services
    - And there is going to be a tremendous technology development – although we do not know what this technological development will actually look like
  - There will be stranded costs -- perhaps a lot of stranded costs – due to such factors as the premature abandonment of the existing and “smart” metering systems
  - Of particular concern in these very difficult economic times
- Of course, there may be stranded costs with interoperability
  - But interoperability has the potential to greatly minimize expenditures that later are useless

- There are many issues that must be addressed regarding the implementation of a Smart Grid including (but certainly not limited to):
  - Rapidly developing technology
  - Access to data and confidentiality
  - Cyber security
  - Whether consumers have the choice to participate or not
- Interoperability will entail:
  - Cuts across many industry lines including energy, telecom, cyber, etc.
  - Over time as technology is developed both hardware and software will change
- Without standards to assure interoperability we could end up with billions of dollars of useless software and hardware for which consumers will be required to pay

- Will we get interoperability?
  - President George W. Bush signed the Energy Independence and Security Act of 2007 (EISA)
  - EISA highlighted 10 characteristics of a Smart Grid
  - EISA identified the process by which an interoperability framework will be created through the use of existing applicable standards and the development of new standards to address the gaps in interoperability

- FERC issued a Proposed Policy Statement in March 2009 stating that a smart grid would:
  - Apply digital technologies to the grid
  - Enable real-time coordination of information from generation supply resourced, demand resources, and distributed energy resources
  - Bring new efficiencies through improved communication and coordination
  - Bring savings to consumers and let them better manage their electric energy costs

- In January 2010, the National Institute of Standards and Technology (NIST)
  - Released version 1.0 of the “NIST” Framework and Roadmap for Smart Grid Interoperability Standards
  - The framework report:
    - Is a high-level conceptual reference model for the Smart Grid
    - It identifies 75 existing standards that are applicable (or likely to be applicable) to the ongoing development of the Smart Grid
    - Specified 15 high-priority gaps and harmonization issues (in addition to cyber security) for which new or revised standards and requirements are needed
    - Documents action plans with aggressive timelines by which designated standards-setting organizations will address these gaps
    - And describes the strategy to establish requirements and standards to help ensure Smart Grid cyber security
- The gaps identified in the framework report
  - Have grown from 15 to 18 areas
  - And are now organized into “priority action plans” (PAPS)

- The Identified Gaps include:

- Meter upgradeability
- Role of Internet protocols
- Wireless Communications
- Common price communication model
- Common scheduling mechanism
- Standard meter data profiles
- Common semantic model for meter data tables
- Electric storage interconnection guidelines
- Common information model for distribution grid management
- Standard demand-response and distributed energy resource signals
- Standard energy usage information
- Common object models for electric transportation
- Mapping Distributed Network Protocol DNP3 to IEC 61850 devices
- Time synchronization
- Transmission and distribution power systems mapping
- Harmonized power line carrier standards for appliance communication in the home
- Wind plant communications, and
- Facility Smart Grid information standards

- Obviously, the task of developing standards that will assure interoperability is very difficult
  - NITS created the Smart Grid Interoperability Panel (SGIP) in November 2009
  - The SGIP requested that the North American Energy Standards Board (NAESB) participate and develop standards in four of the PAPs
  - NAESB has been tasked to finish its work by year-end 2010 using a very aggressive timetable
- I emphasize – I commend NAESB, NITS and others for their commitment and concentrated efforts
  - My comments in no way criticize any of the standards development processes
  - I simply point out that it takes time to develop standards and it has very significant cost consequences

- Once NAESB has completed its tasks, other work is required such as:
  - The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) is expected to extend the NAESB standards to create a facilities data model providing additional energy-use data elements for facility energy management including buildings
  - The Open ADE Task Force, operating within the UCA International Users Group, has submitted a standards request to NAESB seeking the standardization of the exchange of energy usage information that is intended to facilitate the transfer of information between designated parties
  - And Endeavor Engineering has asked NAESB to create common interfaces and data structures necessary for enrolling demand response sites into a DR program

- Obviously, standards that assure interoperability are not now in existence
- However, literally millions of so-called “smart meters” have already been installed
  - And many more will be soon
- Further, billions of dollars of other smart-grid-related hardware and software has been committed
  - Most on a 50-50 matching basis requiring consumers to pay at least half of the total costs
- In my view:
  - There is a tremendous potential for a lot of stranded costs
  - Costs that will be paid by consumers
  - Whether they are useful and beneficial – or not

- Conclusions:
  - A smart (or at least smarter) grid may be a great idea and bring great consumer benefits
  - We certainly are not opposed to cost-effective measures to bring consumers benefits
  - But literally billions of dollars are being spent moving in that direction
  - And since standards that will assure interoperability are not yet developed, the potential for stranded costs is great
- We recommend moving carefully forward
  - To try to minimize the potential for stranded costs
  - Consumers do not want to pay more than necessary
  - For software and hardware that they may or may not actually want
  - Without caution, the current consumer backlash against the Smart Grid will grow