Case/Matter Number: 14-M-0101

Case/Matter Title: Proceeding on Motion of the Commission in Regard to

Reforming the Energy Vision

Comments by New York State Smart Grid Consortium

on the DPS Staff Straw Proposal on Track One Issues

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Integrated Stakeholder Process for the development of NY State Distribution System Business and Technical Architecture, and associated Standards and Protocols

Staff's proposal concludes that "there is significant work needed to further define, scope, and plan for the full implementation of the DSP platform and market"[1] and recommends a three-part planning process that includes a Technical Platform Design Stakeholder Process, a Market Design Stakeholder Process, and a Jointly Filed Uniform DSP plan. The Staff proposal suggests these efforts are essential to develop the technology platform for the DSP market, the market design for the DSP market, and offer a level of standardization and uniformity across utility service territories that will help to ensure greater market efficiencies.

The New York State Smart Grid Consortium (Consortium) concurs with Staff's goals to maximize standardization in order to achieve greater efficiencies and agrees that a collaborative, stakeholder process is essential to ensure that such standardization can be achieved in a manner that reflects industry and technological trends. Such a stakeholder process will also help to incorporate progress made to date by standard-setting entities such as the National Institute of Standards and Technology (NIST) and others to ensure that New York's markets evolve in a manner that aligns with national trends.

Importantly, however, the Consortium believes that the three primary areas where Staff calls for stakeholder engagement – technical platform design, market design, and the identification and development of functions and capabilities that should be uniform across utilities – are interrelated, and as such, should be addressed in a single integrated stakeholder process.

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[1] Developing the REV Market in New York: DPS Staff Straw Proposal on Track One Issues, August 22, 2014, Pg. 66

Market design, which will be defined by Commission policy, will dictate the interactions among market participants, which will then drive the necessary functions and capabilities of the DSP, which will in turn influence enabling technologies and all associated standards and protocols requirements. It is essential that these topics not be assigned to separate stakeholder groups. They need to be addressed in an integrated fashion so that the implications of decisions in one area, and any corresponding tradeoffs and impacts on other areas, can be immediately identified and understood. Recognition of these interdependencies is a central tenet of the stakeholder process envisioned by the Consortium.

The Consortium proposes to facilitate this integrated stakeholder process. On September 10th, the Consortium's Board of Directors unanimously agreed that the Consortium would be a well-positioned entity to facilitate, and should facilitate, a collaborative process for New York to develop recommendations for the DSP business and technical architecture, including standards and protocols necessary to achieve the Public Service Commission's REV goals.

The collaborative process envisioned by the Consortium would integrate the platform technology, market design, and integrated DSP plan stakeholder processes called for in the Staff Straw Proposal. This integration would also effectuate the important objective underscored in the Staff proposal to have a clear line of sight from policy goals to functionality to technology investments. <u>The proposal is not for the Consortium itself to recommend a market design, but instead, for the Consortium to facilitate an open and collaborative discussion that begins with a recognition of the Commission's market design objectives, and the functions and capabilities that the DSP must have to achieve those market design objectives.</u> The ultimate goal of this effort would be to provide the best possible advice and information to the Commission and DPS Staff based upon input from New York utilities, technology vendors and other key stakeholders in the technical areas most critical to successful DSP implementation.

The Consortium is the appropriate entity to lead this stakeholder process. The Consortium is a not-for profit 501(c)6 corporation comprised of a broad spectrum of the major stakeholders engaged in grid modernization in New York, including New York utilities and power authorities, State policy makers, the New York Independent System Operator, global grid technology

companies, and research organizations such as NYSERDA, the Brookhaven National Laboratory, and the State's leading universities. The Chair of the NYS Public Service Commission is an Ex-officio member of the Consortium's Board of Directors, and serves in an advisory role to the Board. It is the only organization of its type and scale in the United States, and its purpose is to collectively harness the unique resources of New York State to help define and achieve the State's energy policy vision for the electric power system and its customers.

The process proposed by the Consortium members will be collaborative, transparent, inclusive, and open to all other parties participating in the REV proceeding. It will be balanced and objective, and not inappropriately dominated by the viewpoints of any particular interest or stakeholder group. It is anticipated that the Commission and DPS Staff would play a key advisory role in the process, and participate as the Commission or Staff deem appropriate.

<u>We urge the Public Service Commission and Department Staff to support this New York State Smart Grid Consortium led initiative and state its preference for the Consortium led stakeholder process to be the designated forum responsible for delivering recommendations in this area to the Commission</u>.

The Consortium's proposed process is attached, and we welcome the opportunity to discuss how this process might be further modified to best meet the Commission's overall goals for the REV proceeding.

Attachment follows

Identifying New York Distribution System Platform (DSP) Business Architecture, Standards & Protocols

A Proposed Stakeholder Process to be facilitated by the
New York State Smart Grid Consortium
(9/22/2014)

1. Introduction

Target Stakeholders:

The target stakeholders for this effort include the NYS Public Service Commission and Staff, New York State utilities, 3rd party energy technology and service providers, power producers, and essentially all interested parties participating in the REV proceeding.

Topic of Support:

DSP Business Architecture, Standards and Protocols ("S&P")

1.1. Context

The Commission's REV effort had a specific subgroup on S&P and its mandate was to:

- Identify relevant and leading industry S&P and key considerations.

- Identify relevance of platform architecture and its potential role in supporting interoperability, standardization, and commonality.

The subgroup delivered a preliminary report on the need for selecting S&P for the DSP for all interactions to work effectively. The subgroup also recommended the adoption of a formal architectural approach to the overall design process. The rigor and governance of a formal architectural approach was deemed critical to managing the volume and complexity of integration requirements necessary in a successful design. Given the fact that many of the S&P need to be accepted and delivered by the vendor community, it is also important to maintain flexibility and openness in the consideration of these standards and protocols because the identification of the appropriate DSP business architecture has not been completed.

1.2. Proposed Consortium Activity

The Consortium will facilitate an open and collaborative stakeholder process to advise and provide the best possible information to the Commission, Commission Staff, the NYS utilities, technology companies, and other key industry stakeholders regarding the appropriate DSP Business Architecture and associated Standards and Protocols. The activity will result in the development of an implementable DSP structure based on Commission specified market design objectives, and will provide a thorough understanding of the interactions and interdependencies among all the market participants.

Why the Consortium?

The Consortium is a unique non-profit organization comprised of the key stakeholders engaged in furthering grid modernization in New York State, including the electric power companies, global technology companies, universities and energy research organizations, and State Energy Policy makers. The Chair of the NYS PSC is an Ex-officio member of the Consortium Board, and serves in an advisory role to the Board. All points of view can be brought to the table in identifying and assessing the need for appropriate DSP standards and protocols. The Consortium will be unbiased in its approach to the solution and not favor any specific vendor-favored solution or protocol. As a facilitator to this effort, the Consortium will provide a transparent, efficient and organized approach to building DSP Business, Functional and Technical architectures in collaboration with all parties.

1.3. Guiding Principles and Priorities

- Any action taken regarding the technology platform policy mapping or technology development must maintain a clear "line of sight" back to the Commission Policy goals.

- Initial emphasis in developing the DSP business architecture will be on the DSP functions expected to animate markets the fastest, and those that should be uniform across all utility service territories.

- The effort will include the identification and design of the appropriate interface between the DSPs and the NYISO.

- Do not reinvent the wheel – New York should try to avoid creating a unique set of standards and protocols that only apply to it. Existing standards will be used where they are available and appropriate. Standards will be created only where none exists. However, at a minimum, standards for the architecture of the grid should be identified that will ensure interoperability within and ideally between service territories.

- Vendors, technology companies and utilities need to own this outcome and buy into it – the rules developed will govern their business operations and market interactions.

- Any development of S&P should initially focus on the expected Business Architecture, which includes a combination of the Business Architecture, Functional and Technical architecture. These business capabilities will likely be grouped unto 'waves of functionality' which will be enabled over a period of time as supporting standards, technologies, and market mechanisms mature.

- A key aspect of any market especially in the distribution/retail space is the need to send price signals both for real-time settlements for energy delivered to the grid and for supporting investments in Distributed Energy Resources (DERs) through the delivery of future price-signals.

We propose investigating the concepts of transactive energy[i] as proposed and developed at DOE's Pacific Northwest National Labs and implemented in two of the largest ARRA Smart Grid demo projects. The principles of transactive energy embrace both the economics and engineering of the power system – a vitally important consideration.

2. Overall Approach for the effort

This section discusses the approach, deliverables and timelines. It is suggested as a starting point, and will be modified as necessary based on discussions with and among stakeholders.

2.1. Architecture definitions and details

There are three main components here:

- Start with the Business Architecture. Identify and define the highest priority set of business capabilities that are required to achieve market design objectives and to carry out the tasks associated with the DSP function, which might include:
  - Retail provisions and services
  - Transaction management and settlement functions
  - Financial management and billing
  - Market information and participant interfaces
  - Market rules and procedures
  - Meter data management

- As a next step, move to the Functional Architecture which should include sufficient information to support the following interactions and also the processing need internally to support the interactions:
  - Flow of information
  - Flow of energy
  - Flow of dollars
  - Identify interfaces needing S&P– and their prioritization

- Next, the focus would be on the associated Technical/Application Architecture – these are the set of technologies and applications needed to support the business capabilities. Fundamental to the effort here is the need to 1) adopt an appropriate communications architecture to ensure interoperability and 2) complete an assessment of technology availability and maturity and technology/functionality mapping and gap analysis.

2.2. Approach Details

- Identify key stakeholders – utilities, the NYISO, technology companies, energy service companies, vendors, and others. At least one representative participating on the working group from each utility and the NYISO. All stakeholders are invited to participate.
- Develop a collaborative, transparent, and open process by which this effort will be carried out – consistent with NY PSC guidance.
- Conduct collaborative workshops to:
  - Confirm the market design and associated Business Architecture – identifying the highest priority DSP functions, and identify those that should be uniform across utility service territories.

- o Confirm the Functional Architecture and define the necessary interactions between the DSPs and the NYISO and the functionality within each specific capability.
- o Confirm the Technical/Application Architecture associated with the identified Business Architecture.
- o Test the Business Architecture by:
  - ▪ Developing/identifying Distributed Energy Resource (DER) interface standards.
  - ▪ Developing/identifying DER functional requirements, which would include how those resources should perform when they are interconnected to the grid.
- o Develop Functional Requirements for other key components that interact with the Business Architecture.
- o Confirm all associated interfaces.[ii]
  - ▪ Identify those that have mature standards or standards under development– identify the standards.
  - ▪ Identify those for which standards still need to be developed; either develop the standards or identify the right standards organization to lead the development of this effort.

- Identify and define the list of use cases, and explore whether use-cases from other industry efforts can be utilized – e.g., NIST, etc. If none exist – then formulate teams to develop them.
- Develop recommendations regarding the final architecture including S&P according to all appropriate NY PSC and FERC guidelines.
- Deliver the entire architecture and recommended S&P to the PSC and stakeholders for consideration.
- Conduct training workshops for all stakeholders on the architectures, standards and protocols developed throughout this process.
- Identify mechanisms and methodologies for estimating and communicating the market value of DER within the proposed DSP framework.

2.3. Deliverables

- List of stakeholders and the stakeholder collaborative process.
- Participant interaction model along with the (1) participants and their roles (2) information flow between them and (3) identify interfaces needing S&P– and their prioritization
- Full DSP business architecture with:

  - o Key capabilities (identified by their grouping in section 1.3 required for the DSP mechanism to work – prioritized by time frame of both availability and need)
  - o Extend the interaction into a Functional Architecture by adding:
    - ▪ Flow of information, energy, and money
    - ▪ Functionality within each capability
  - o Develop the Technical/Application Architecture
- Identification of Preferred Architecture and standards.
- Approved Use Cases.
- Train stakeholders in S&P essentials.
- Monitor and report out on S&P development nationally on an ongoing basis.

2.4. Time Frame to develop the above deliverables

- 1-8 months from start – Main deliverables.
- Following 12 months – S&P monitoring, updating and training to be ongoing.

[i] Information taken from GridWise Transactive Energy Framework prepared by GridWise Architecture Council October 2013. In this report, they have defined "transactive energy" as – techniques for managing the generation, consumption or flow of electric power within an electric power system through the use of economic or market based constructs while considering grid reliability constraints. The term "transactive" comes from considering that decisions are made based on a value. These decisions may be analogous to or literally economic transactions.

Transactive energy provides a way to maintain reliability and security of the power system while increasing efficiency. These multiple goals pose a multi-objective control and optimization problem. The same considerations outlined for the electric grid apply to building energy systems and other local energy systems such as microgrids.

[ii] Let us use interactions with energy storage as an example– this is intended to be illustrative in nature only

- Type of information –
  - Controls need to be sent to the storage device to perform a certain function and
  - Data needs to be brought back from the storage device in terms of status, health etc.
- Frequency of information
  - (Maybe) once every 15 minutes – or with a transactive energy approach, it is preferred to make it every 5 minutes, at least.
- Number of pieces of data
  - Control – we envisage at least 5 sets of controls to be sent.
    - Charge to full
    - Discharge to empty
    - Charge until some level
    - Discharge until some level
    - Do nothing
  - Data
    - Identifying information such as ID, location, connectivity node, nameplate info, type of storage etc.
    - Level of charge
    - Connection status – connected to grid or disconnected from grid
    - Amount of power/energy either consumed or discharged and when
    - Other status information such as temperature and others.
- Medium
  - Electronic
  - Through cellular mode