



## **Working Group 5: Electricity Markets**

Meeting No. 4

**Date:** July 30, 2018

**Time:** 2:00 – 5:00 pm

**Location:** Main Hearing Room, Illinois Commerce Commission  
160 North LaSalle, Suite C-800  
Chicago, Illinois 60601

### **WebEx Information:**

**Meeting number** (access code): 801 253 899

**Meeting password:** TyKCaF37

### **Meeting Summary**

*[Note: descriptions of comments and discussion are condensed summaries and paraphrases]*

### **Attendee List**

#### **Working Group members:**

##### **In-Person:**

- Amanda Alderson, *Illinois Industrial Energy Consumers*
- Mike Abba, *Ameren Illinois*
- Sara Reynolds, *Ameren Illinois*
- Jim Blessing, *Ameren Illinois*
- Paul Centonela, *Paul Centolella & Associates*
- Demi Charalab, *Exelon*
- Phil O'Connor, *PROactive Strategies, Inc.*
- Stacy O'Brien, *Commonwealth Edison Company*
- Phil Nevells, *Commonwealth Edison Company*
- Scott Vougt, *Commonwealth Edison Company*
- Chris Foley, *Commonwealth Edison Company*
- Chris Villarreal, *Plugged In Strategies*
- *Advanced Energy Economy Institute*
- John Wroble, *Sargent & Lundy LLC*
- *RCHemphill Solutions LLC*
- Chris Townsend, *Clark Hill PLC*
- Jeff Orcutt, *Chapman Energy Strategies*

##### **WebEx:**



- Roa Konidena, *Rakon Energy LLC*
- Curt Volkmann, *Vote Solar*
- Ryan Ellen, *Ameren Illinois*
- Mark Templeton, *Abrams Environmental Law Clinic at the University of Chicago Law School*
- Christian Sanchez, *S&C Electric Company*
- Gerard Fox, *Retail Energy Supply Association ("RESA")*
- Zhi Zhou, *Argonne National Laboratory*
- Katie Stonewater, *Illinois Chamber of Commerce*
- Tom Covert, *Booth School of Business*

Absent:

- *Enervee*
- *Midwest Energy Efficiency Alliance*
- *MeterGenius*
- *Glide Path*
- *Office of the Illinois Attorney General, Public Utilities Bureau*
- *Environmental Defense Fund*
- *Illinois Citizens Utility Board*
- *Invenergy LLC*
- *BOMA/Chicago*
- *Natural Resources Defense Council*
- *Open Access Technology International, Inc. (OATI)*
- *Direct Energy*
- *West Monroe Partners Energy & Utilities Practice*
- *American Petroleum Institute*
- *Quanta Technology*
- *Glidepath*

**Members of the public and non-group members:**

In Person:

- Christine Furus
- Annette Beitel, *NextGrid Senior Study Consultant*
- Marty Cohen, *NextGrid Senior Study Consultant*
- Terrance Garmon, *Illinois Commerce Commission*
- Katharine McErlean, *Illinois Commerce Commission*



WebEx:

- Lynnea Johnson, *University of Illinois, NextGrid Lead Facilitator Project Team*
- David Brawswell
- Chris Hills
- George Gross, *University of Illinois, NextGrid Lead Facilitator*
- Gwenda Johnson
- Brad Fults

**Agenda Item I: Meeting Agenda and overview**

Working Group Leader, Dr. Kiesling reviews the meeting agenda.

**Agenda Item II: Participant Introductions**

Annette Beitel, NextGrid Senior Study Consultant opens the meeting under the Open Meetings Act and encourages public participation and comments during the meeting. Opportunities for public comment will also be available at the appropriate time on the meeting agenda. The public is invited to observe and record the meeting. Minutes are being taken but there will be no verbatim transcript. Roll call is conducted with request individuals indicate their name and organization starting with people present in the room, then on WebEx and finally by telephone. (See above attendee list)

**Agenda Item III: Presentation: Implications of Retail Markets for Interaction with Wholesale Markets by Roa Konidea, Rakon Energy LLC (See Presentation)**

- MISO adopted lots of DERS through a Staggered approach. Market system analysis- distribution resources enhanced market systems.
- 7 bullets on the slide 2- obligations, transmission owner, balancing party, MISO has compliance obligations, terms of structure to design platform, appreciate compliance obligations of the system operator.
- Last bullet of slide 2- PJM most states are integrated, MISO they are not. Integrated resource planning captured by voluntary capacity option. Frame this conversation in that way. More connected around distributed resources.
- Slide 3- MISO auction process, left hand side see results, on right hand side see cables and how much demand response has created. Note- distributed resources and capacity market, see line items. Ameren II is in zone 4. Integrated resource planning is captured in line shows fixed rate of planning. Auction of miso. Demand response resources are cheaper.
- Slide 4- Illustrations of business practices of MISO. Go to node zone.
- Slide 5- see how retail and wholesale connection have, on the top is market participant level, generation aspect and sulfuric acid. Distinction here is implications from many retail sources.
- Additive issues-
- Pricing at EP nodes is possible (slide 6): 3 or 5 examples on this. Behind the meter aspect modeling. Resources behind the meter
- Last slide is marketing- energy markets in digitalization and decentralization

**Discussion:**

- **Q1:** Tell us more about market system enhancement program? How far down has MISO moved down the system. Talk about pricing for DER behind the meter? Are there limits? As we get more smart devices and EVs, is there some computational limit? What does that look like?
  - Market systems enhancement- MISO is advocating having more DERs. MISO cross in timeline challenge, we don't know when DER action will come. Given, challenge of ISO, MISO, make sure compliance filling with load, with enhanced markets platform. Ensuring storage capabilities. Have not seen market growth on this.
- **Q2:** What level did the CP and EP go down too? Below the bulk down to sub transmission distribution system? Today, emissions goal for transmissions system are mostly behind the meter.
  - There is a transition for wholesale market opportunity- could use elemental pricing for behind the meter resource located on customer side that is connected to distribution feeder but not transmission.
- **Q3:** Have an EP price, how do you value? How do you get transition from the L&P to ZP?
- **Q4 (WGL):** Is there as an architectural point, sounds like there is a blurring of the distribution and transmission technically. Have 80-year-old definition of what constitutes a wholesale market and resale market.
  - Yes, some states can opt in and out. Challenging for the future. ISO implications for some of these.
- **Q5:** Statement that the RTO needs to provide more visibility in the distribution system, challenge, how would it, agree conceptually, can have a node at every transformer or meter, load balancing authority, distribution operator?
  - Work for 3<sup>rd</sup> party aggregator. I would like to offer my services from. pros and Cons approach.
- **Q6:** Raising an important point- FERC has jurisdiction over interstate commerce, does not have jurisdiction over distribution. Storage facility should be able to acquire energy power it needs at a wholesale LNP if selling back to that market at a wholesale. FERC regulated distribution rate to facilitate that. Credited against the local utility revenue requirements by the states. Problem is when you think about DER located on a distribution system being used to optimize the distribution system while also participating in wholesale market. Not a mechanism and sensitive to conflict with local and potential dispatch to serve a DER purpose. If I were still a state regulator I would encourage cooperation.

**Agenda Item IV: Presentation by Phil Neves, ComEd (See Presentation):**

- Context: Public information from Office of retail Market development of last year. Critical part of success of any market is the amount of choice that individuals participating in that market have. State of choice in current retail market. 98 retail suppliers. 43% of ComEd. Described as unconcentrated which is great. On right hand side talk about participation, commercial and retail. Want customers to feel they can participate.
  - Total usage in ComEd- 73% is through retail suppliers and 27% is just ComEd
  - Retail suppliers have non-residential, commercial and 14% residential.
  - Residential- 35% is attributable to Retail suppliers



- In ComEd have fewer customers in government aggregation programs vs. Ameren
- Slide 2- Electricity markets can be a mechanism for accommodating the increasing complexity of the Power delivery ecosystem. Layer 3 is where we consider operational level and in consideration of the market- where we are going from and what we are going to. Coming from growth in a fairly static world to the future- a much more dynamic world.
- Slide 3- If have a market, what types of products do you have reacting within that market?
  - 1. Real Power
  - 2. Reactive Power
  - 3. Reserve Power
  - This mirrors the platform paper that was circulated. Values are associated with each of these. Maintaining voltages within limits on the system. Will require a combination of these types of power.
- Slide 4- As we start to think about the broad components of any markets, want to focus on functions. What functions are needed to have a successful market?
  - Functions include:
    - Privacy mechanisms, price is key point, analytics for locational value of DER, methodology for commodity based, scheduling tools, to name a few.
    - Need market integrity and legitimacy- oversight is a critical component coupled with tools for sharing information.
    - Operating principles-coordination and transmission interface, Real time dispatch. Not making any statement who should do what. Suggesting components of market design of the future.
- Key Criteria to consider: investment efficiency, dynamic efficiency, participant equity, price stability, customer choice, simplicity and feasibility, utility return stability and impact to grid operations.
  - Lots of different considerations and there are trade offs
- Final Slide: two main axes- price and granularity and transaction freedom. Start with wholesale market interface, everything is centralized, as proceed forward and into a greater level of complexity, Utility is purchasing, start to introduce bilateral trades, all these transactions go up in complexity. Could imagine a world in where all these different levels of complexity start to exist together.

#### **Discussion:**

- **Comment 1:** monitor and try to draw cross subsidization- barriers can't take advantage of lower prices and services. Measuring whether that happens is a huge consideration.
  - Energy efficiency status provides lessons learned.
- **Q 1:** Identified various functions as we go through this transition- Does ComEd have a view on which function it wants to undertake? Do you think functions will overlap? If ComEd is not going to do them, who will?
  - ComEd does not have a view of which function and who should be doing those functions. Don't necessarily need an entity for every single function.

#### **Agenda Item IV: Presentation by Mike Abba, Ameren Illinois (See Presentation):**



- Assuming we are moving to markets like this what are technical considerations we need to think about?
- Lots of things to consider. None of these challenges are insurmountable but we need to be thoughtful as we move.
- As we create the grid of the future:
  - AMI is fully deployed in 2019. ComEd is a year ahead. 60 min data for RES and C&I. Moving toward direction of 15-minute data.
  - We download 4 times a day.
  - Real time more granular data, maybe down to 5 mins, likely transmit right, then and there.
- Will need a more robust communication system, right now Ameren manages lots of communication networks.
- Talking tens of thousands, millions of more smart meters, need a more robust communication system. How do we do that? Further develop of mesh, more LTE. To do this at a real-time basis is something we are going to have to build out.
- Software, system monitor and control- this is the brains of our operations. Have thousands of devices.
- Need common communication standards and a system that can take it all in and manage. Requires broad capabilities, we want a system to do and unidentified capabilities. No off the shelf product that can do all that now or has been defined. Going to need a lot of computing power to do this.
- System models today.
- Mapping for transmission and down to distribution system. Have all mapped and not all fully modeled. What does a DER look like. All need to be integrated and in real-time.
- At RTO do a financial model, use a market system to figure out what model looks like and what balancing system looks like. Need to figure out techniques to do real- time market. Plus, price issues, who is going to settle that?
- How many customers have to be on real time pricing?
- Will DR and other end uses be priced equally?
- Utilities still have to maintain current role while this transaction is occurring.

#### Discussion:

- **Q1:** struck by communications slide by 3 utility owned networks, next slide a lot about control by non-utility assets. In the planning for microgrids or EV charging stations managed by someone else. EV charging company- why do you need access to their charger when you can get access to their information?
  - Still learning how granular we need to get. Not a whole lot different than peak time rewards program today. Going to want more direct access.
- **Q2:** When the Utility is asked about value to the grid it is important to extract value of 3<sup>rd</sup> party resources, there is value in Utility's ability to control because has to be risk taken on in order to get value back. A battery that has the potential to participate in five to six different markets depending on what's economic to the battery at that time. Needs to be a tradeoff, quid pro quo, that your there to perform a job when expected to perform a job.



- **Q3:** how are bilateral markets going to interact with utilities? Efficient allocation of capital investments may be done by 3<sup>rd</sup> parties, that things that can be cheaper than utility.
- **Q4:** can we rely on 3<sup>rd</sup> party agreement working properly? Have to maintain the integrity of the grid.
- **Q5:** Utility is expected to deliver, expected to know how, providing a service and utility is going to avoid costs, only way utility will extract value is going to require a level of control. Utility has to recover those costs from customers.
- **Q6:** California required visibility into everything. Had to trust the algorithm. To some extent re-learning the lessons we learned on the 90s.
- **Q7:** Look at ComEd and Ameren's process with DG inverters. Control has to change with dynamics on the system. Describe control as being passive control right now. If know how it's going to generate that is ok. Peer to peer, who is buying energy from whom. Utility does not need to be involved.
- **Q8:** Think of a transformer on cul-de-sac that operates as micro-grid. All distribution needs to see is what is going in and out of transformer. Then create products and services into a market for VARS and services.
- **Q9:** Resources of micro grid can only do three things, if providing larger value of reserve power, larger grid needs to have a call option that it can call on that reserve power. No double dipping.

**Agenda Item VI: Discussion of Survey, Final Report Outline, Draft and Timeline by Dr. Kiesling, Working Group Leader:**

**Survey: 5 questions**

- 2 on functionality requirements
- Categorize in 4 and if any were missing
- 18 Design principles- asked to rank
  - Which ones do I individually prioritize?
- Caveat- results are not statistically significant, have around 33 participants.
- Results are suggestive and not definitive. Will give us a starting point for drafting our report
- Results suggest there is some broad consensus at a very high level
- What does the word equity mean to you? In results as, important stuff to talk about.
- **Q1:** 14 functionality requirements assessed under essential, more important, less important and unimportant (1-4). Took everyone's results and took average and ranked from lowest to highest. 1 was essential and 4 was not important. Ones with highest means were less important. Even the least important one still had a mean of 2.22. So still in the range of important.
- Look at minimum and maximum- ones that generally floated to top categorized as essential or more important.
- Using the idea of variance and a measure to the extent to which there is consensus. Pretty small variance, broad consensus that reliable delivery is pretty essential.
- 1<sup>st</sup> Category of blue -eye balled where there were breaks in data. First 3 with lowest mean, reliability, grid operator can manage large transactions and flexible and transparent integration of wholesale market- those things floated up as most important and general consensus of very important.



- 2<sup>nd</sup> category of yellow. Consumers ability to participate, data protection and privacy (essential and more important)
- 3<sup>rd</sup> category- green category, less consensus in how exactly important it is to have investment in net neutrality etc.
- **Q2:** Offer other functionality requirements not on the list?
- List of other requirements: grid constraints, price signals that reflect marginal cost, reflecting costs at appropriate market level, avoiding free riding and leaning on distribution system, enable equitable access, utility recovery of grid costs without distorting marginal grid pricing.
- **Q3:** Designed principles ranked by importance- 18 different principles to use to evaluate a market design. (Used Qualtrix)
- Lowest mean, more people ranked as more important. Look at maximum column compared to minimum Column. Some people ranked as being number 1 in categories and verifiability lowest rank was 12.
- In the lower part of rankings- market liquidity, highest rank is 8 and lowest was 16 so it was consistently in lower half of ranking. Variances are not directly comparable.
- Equity? What does it mean? Everyone has a different definition of it. Asked what are some definitions of equity. Generated some useful input. See repetition of important focus on access.
- Four respondents highlighted the idea of open access, equal access. Contextualization, equity depends on where you sit. Different parties are going to have different definitions and concepts of equity.
  - Pareto Optimality- equity is the idea if we enter into voluntary exchange, only enter into things that is mutually beneficial.
  - Bond wright framework- vertical equity, are different customers treated differently, and different customers treated similarly.
  - Rawlsian distributed resource.

#### **Discussion:**

- **Q1:** Are we going to send out survey to broader audience? Something that would happened after the NextGrid process. Product designed to be consumed by just a small group of people. Involves articulating what we face going down the road. Would be good exercise to get more feedback from stakeholders.
  - Envision report describing the importance of testing. General idea of survey, gathering what kind of customer are you, who is your service provider, do you have an EV etc.

#### **Agenda Item VII: Public Comment:**

Floor opened for public comment. No Public Comments received.

#### **Agenda Item VIII: Draft outline of Report Discussion Lead by Dr. Kiesling, Working Group Leader:**

- WGL- constructed strawman draft outline. Instructed participants to review and discuss the draft outline with neighbors for a few minutes.
- 1. Introduction- motivation on “why retail markets?” in Illinois.
  - DER market growth, falling costs



- Broader economic growth- will lead to a set of retail markets that takes advantage of digitization and transactive markets. Value proposition is not lower prices. May be lower, can't categorically say will be lower prices.
- **Comment 1:** Dr. Gross- "state product- macroeconomic productivity."
- Climate change and cost-effective decarbonization
- Add customer
- 2. Relevant literature-data evidence- summarize
  - Consumer information, consumer behavior
  - Transactive Energy
  - Platform economic
  - May want to summarize other important data and information to meet grand goal of awareness and education.
- **Comment 2:** Since 19997, Illinois had lowest average increase in electricity prices in the country. It was almost flat growth. Compared to for example, Wisconsin had the highest increase in electricity prices. Way to frame this is can't rest on our laurels.
- **Comment 3:** - Inevitable that these technologies are coming, as technologies become more effective and available need to be set to implement them.
- WGL Comment- add competitiveness
- 3. Market functionality
- 4. Market Design Principles
- 5. Conclusions
- **Two questions for break out groups discussion:**
  - 1. Suggestions to modify the outline?
  - 2. What are some things we want to focus on in our conclusion?
    - Analysis and testing of market design.

#### Discussion Report out:

- **WG 1:** Starting point of outline needs to set the current state of where we are in Illinois, discuss wholesale, resale constructs and what are the motivations for markets- customers choosing to do things differently. These technologies are inevitable, through significant reductions in costs for renewables, EVs, we don't know the pace of change, but want to be able to enable change. Timeline is difficult to predict. We are not recommending certain policies such as who is going to be the system operator. Want to enable these changes to take place.
- **WG 2:** Outline should encompass things we talked about in the work group. There needed to be a recommendation to develop a road map to get to some point. Not going to happen all at once. Steps and analysis will be taken. Road map needs to have some high-level influence. Can't get to reliability and sustainability in combination. Other functions of net value created for customers. May/ may not involve the expansion of the utilities.
- **WG 3:** Opposite conclusion to road map idea. Discussion was about the need to preserve optionality. To use the report- describe what design principles and functionalities could be. Here are the different things that the smart grid could be. Describe the possibilities. Acknowledgement that we don't know where we are going and need more discussion. Questions for Commission- describe pilots that have been done in other states and recommend



small pilots, identify issues we need to think through, what are a couple of small steps we could take at this time. Not going to foreclose options at this point.

- WGL- Look at other states and Europe- lots of interesting stuff going on in Europe, New York Rev, California and Texas. Be an early mover, not a first mover, and not replicate mistakes.
- In early 90s learned from what other industries were doing?
- What to combine road map and optimality?
  - Not mutually exclusive?
  - Road map – some idealized value proposition at the end and have some analysis of what you know today and in between there is a gap. Try to understand and learn what may be available. That may include pilots and analysis.
- WGL cautions defining end space too teleologically.
- Identification of function principles presume what those function principles will support.
- Comment 5: Huge mistake if do not capture huge success in supply market. Highlight our previous success.
- Need to have a shared set of definitions
- Next steps- Take feedback- task out different pieces, with deadline, writing process, receive draft- draft by end of august.

Meeting Adjourned.