Working Group 6: Regulatory and Environmental Policy Issues

Meeting No. 2 – Climate and Grid Resiliency

June 20, 2018

Meeting Summary

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

Agenda Item I: Welcome and Introductions

Working Group 6 Facilitator Mary Gade made welcoming remarks and introduced the topic for the working group meeting. Her presentation included definitions for "resilience," "climate adaptation," and "climate mitigation."

(for additional detail, see PowerPoint presentation)

Agenda Item II: Presentation by Tom Skilling, WGN and *Chicago Tribune*

Tom Skilling, Chief Meteorologist for WGN-TV, presented on the effects of climate change and the increased frequency of extreme weather. His presentation included examples of the effects of climate change (sustained record temperatures, polar ice melts, and sea level rise) and of extreme weather events (tropical cyclones, tornadoes, and major flooding) globally and in Illinois/the Midwest. His presentation also noted the growth of the renewable energy sector of the economy and the investments other nations are putting into green jobs.

(for additional detail, see PowerPoint presentation)

Agenda Item III: Presentation by James Breitkreitz, Zurich North America

James Breitkreitz, Chief Risk Assessor for Zurich North America, presented on the insurance perspective and need for resilience solutions. His presentation described the impacts that climate and weather events can have on grid infrastructure in terms of physical damage and business interruption. His presentation used examples like hurricanes and solar storms to demonstrate the susceptibility of the grid to natural disasters and to highlight the need for

repairs and investments in resilience in the present to avoid higher costs in the future. His presentation also discussed the need for risk from alternative energy solutions, such as snow loading and wind loading, to be properly evaluated when those solutions are deployed. *(for additional detail, see PowerPoint presentation)*

Agenda Item IV: Group Discussion

Pre-Working Group Survey Results

Facilitator Mary Gade reviewed results from a survey of Working Group 6 participants on three questions conducted before Meeting No. 2.

- **Survey Q6:** Given the climate change impacts that Illinois might reasonably anticipate, what are the specific risks and considerations for energy demand, generation, distribution, transmission and grid infrastructure considerations?
- **Survey Q6 Responses:**
    - Projected Illinois Climate Impacts:
        - Temperature increases, including hotter summers, more heat waves and urban heat islands.
        - More extreme weather, including extreme cold/polar vortexes, greater weather event intensity/frequency and damaging winds.
        - More precipitation.
    - Demand and Generation Considerations:
        - More peak air conditioning.
        - Annual gross/peak energy increases.
        - More use of water resources.
        - Essential services customers (water/communication).
        - First Responders.
        - Communities most at risk.
    - Grid Infrastructure:
        - Heat stress on equipment.
        - Freezing coal piles.

        - Interrupted coal supply.
        - Natural gas supply constraints.
        - Cooling water and thermal discharge challenges.
        - Transmission/Distribution wind threats.
- **Survey Q7:** How can these risks be mitigated?
- **Survey Q7 Responses:**
    - Grid Management:
        - Appropriate management and governance.
        - Flexibility and capacity to adapt and respond.
        - Develop demand response capabilities.
        - Differentiated standards of service for essential services.
    - Infrastructure:
        - Design transmission projects to withstand extreme weather.
        - Reduce reliance on large centralized power stations.
        - Strategic transmission expansion to reduce air pollution/global warming.
        - More under-grounding of distribution lines.
        - Build in redundancy of power service including micro-grids.
    - Renewable Generation:
        - Greater integration of DER.
        - Integrate more wind and solar generation.
        - Deploy batteries with renewables.
        - Avoid overdependence on natural gas generation.
    - Development:
        - Invest in energy efficiency.
        - Foster innovation to meet new grid needs.
        - Invest in R&D technologies to conserve energy and water resources.
        - Modify standards for design specs, material selection, construction practices.
    - Policy/Engagement/Education:

        - Assist 3rd party suppliers, stakeholders, customers adapt.
        - Educate individuals on global impacts.
        - Enact legislation/regulations to establish incentives for energy efficiency.
        - Convene community stakeholders on ways to pay/value resiliency upgrades.
- **Survey Q8:** What can policy makers and others do to facilitate and implement the potential solutions to these challenges?
- **Survey Q8 Responses:**
    - Future Perspective:
        - Break down large future goal into small, manageable steps.
        - Start small in establishing policies and grow them.
    - Grid Planning:
        - Require integrated community and regional planning and responses.
        - Incorporate climate change considerations into all grid decision making.
        - Continue support/focus on grid modernization and reliability.
        - Ensure energy efficiency/demand response programs effectively implemented.
    - Easing Regulatory Environment:
        - Work to remove policy barriers between PJM/MISO.
        - Urge MISO/PJM to properly value DERs.
    - Promoting Sustainable Energy Choices:
        - Advocate for transmission/distribution changes to support wind/solar integration.
        - Do not subsidize coal-fired generation.
        - Explore and implement time varying rates to increase load efficiency/incentivize DER.
        - Strengthen programs to support zero-carbon energy resources.
    - Economic Development:

- Establish Disadvantaged Business Enterprise incentives/local hire programs for DERs.
- Require "just transition plans" for fence-line communities/workers before approving new generation.

Facilitated Breakout Discussions

Following the presentation of the survey results, Working Group 6 participants were divided into four breakout discussion groups to address three additional discussion questions. The questions were discussed internally by each group before being reported out to the entire working group for further discussion.

- **Discussion Q1:** Given the climate impacts that Illinois might reasonably anticipate, what are the specific risks and considerations for demand, energy generation and grid infrastructure?
- **Discussion Q1 Responses:**

  <u>Group 1</u>

  - Potential for extreme weather events, impact and planning
  - Potential for increased costs
  - Potential for more outages
  - Aging infrastructure that fails in extreme weather
  - Temperature extremes increase energy consumption
  - Need for additional repairs from storm damage
  - Changes to planning processes [e.g. more peak hours during heat waves require additional generation and delivery, which may decrease utilization of system as a whole]
  - Potential for stranded assets if events don't happen frequently
  - Opportunities: risk, but cost for innovation, opportunities for leveraging DER, more micro-grids
  - Customers taking on risk and considering self-supply for themselves
  - Transition costs moving from traditional grid to point-of-use generation

Group 2

- Peak events affecting demand/supply/infrastructure
- Are people ready for infrastructure failures? Will they be patient? Can we build up resilience?
- Is infrastructure ready for events?
- Have to be ready for customers using energy differently
- Lack of public understanding and support about the risks of climate change
- AC will affect demand
    - Higher peaks
    - Increased downtime
- Need for storage: don't always have solar/wind, so grid has to be able to import energy from outside region or backup solar/wind [national grid]

Group 3

- Higher peaks
    - Plants running harder at peaks, increasing pollution and health consequences
    - Ongoing cooling stress on urban and other infrastructure
    - Increased demand at times of crisis with fewer resources
- Greater stress on system, not necessarily more consumption (flat for 10 years), weather conditions lead to more damage to generation, T&D infrastructure
- Other dimension of risk: availability of fuel (pipelines, frozen coal piles, etc.)
- Customer impact
    - People in vulnerable communities (heat wave)
    - Humidity and high concentrations of air pollution from generation combining to produce health risks for local communities
- Financial impact
    - Increased costs to maintain/repair/rebuild T&D could lead to rate increases
- Smart grid investment to shorten time to repair

- Role of DER behind meter on customer side
    - Essential customers like police/fire/hospitals
- Even temporary outages have impacts on families (food cooling, etc.)

Group 4

- Sustained outages
- Loss of essential services
- Lack of redundancy
- Transmission and distribution infrastructure risks
- Increased weather and storm risk
- Increased load and changes to load profile [what's needed and where on grid as usage shifts]
- Increase in importance in grid management technology/practices [at macro grid and individual/firm level]
- Increased need for mitigation measures
- Managing changes to peak demand shape
- Problems with reliable generation in storm weather [resource adequacy]

- **Discussion Q2:** What are the potential economic, social and environmental impacts that could result from climate change impacts on Illinois' grid?
- **Discussion Q2 Responses:**

  Group 1

  - Increased prices for consumers
    - Greater proportion of income spent on electricity means more disconnections
  - Disparate impacts on low-income communities, access to public resources/health impacts (heat, electricity, AC)
  - Inequity in infrastructure and how new investments are dispersed
  - Inequity in how impacts of extreme events are felt
    - Less investment = less resiliency

- Exacerbated environmental impacts from weather impacts on physical infrastructure
- Increased strain on public and private emergency response systems and social services
- More expensive insurance, which will then be harder to obtain in lower income areas
- Increased pollution from coal peaker plants
- Opportunity for investment in more eco-friendly systems and consumer goods
- More green space?
- Broader acceptance of conservation and alternative energy sources

Group 2

- Chaos
  - Cascade of events if grid went down (food shortages, water shortages, healthcare, infrastructure, deaths, economic losses)
- Burden of affordability on distressed households
- Building more infrastructure affecting the environment
- Transportation failures (going to work, healthcare, places with heating and cooling)
- Movement to and from places with sustainable electricity
- Effects on water
- Potential for new jobs and economic development potential associated with investing in grid

Group 3

- Benefits of successful adaption
  - New jobs in renewables and energy efficiency
  - Lower costs and fewer power outages
  - Cleaner air and reduced harm from fossil fuel extraction
- Higher costs/rates, more frequent outages (business interruption), increased air pollution

- Impacts on agriculture
- Interruptions to critical services
- Increased division between haves/have-nots
- Affordability for low income households
- Equity considerations
- Increased disease risk
- Climate refugees – displacement to northern states
- More flexible planning
    - Need for different revenue model for utility delivery services if peaks rise relative to consumption
    - More utility reliance on wind and solar will require new transmission pathways

Group 4

- Economic
- Cost of repairs
    - "Build back better"
- Affordability of infrastructure investment and repairs
- Electricity will get more expensive, who will pay?
    - Utilities, subsidies, etc.
- Cost of resiliency investments, T&D improvements
- Cost of outages to businesses
- Cost of service
- Cost on grid of ancillary effects/ripple effects
- Improvement in quality of service as investments in resilience increase
- More access for disadvantaged populations through DER, etc.
- Social
- Affordability (who pays/can pay?)
- Lack of access (have/have nots, rich people putting solar on homes)
- Environmental impacts on vulnerable populations of specific events

- Social fabric of having reliable power
    - Reliability of electricity system has societal impact of keeping people connected (i.e. internet going out)
- Adverse impacts on vulnerable communities
- Environmental
- Increased peak demand could lead to more peaker plants, GHG emissions, etc.
- Grid reacting to extreme weather that IL isn't used to (i.e. climate becoming more like Texas)
- Potential for grid to become cleaner and more efficient

- **Discussion Q3:** How can all of these risks and impacts be mitigated or addressed? And, what can policy makers and others do to facilitate and implement the potential solutions to these challenges?
- **Discussion Q3 Responses:**

  Group 1

  - Public education
  - Long-term planning vs. short-term band-aid investments
  - Allow/incentivize distributed generation, DER, micro-grids
    - Solar on all rooftops (California)
  - Encouraging P3 investment to pool resources and encourage profitable investments
  - RPS goals/mandates
  - Rate design that encourages sharing peaks
    - Changing how utilities get paid
  - Empowering/encouraging energy independence in all neighborhoods (equity lens)
  - Access to data for everyone
  - Government investment in research, technology, innovation
  - Allow for innovation in private sector/marketplace
  - More electrification

- Stricter fuel economy standards for vehicles
- Policy focus on equitable investment

Group 2

- Investment in portfolio of solutions
- Technical
    - Develop resiliency and state-level involvement
- Anticipate and plan
    - GHG/carbon price/goals
- Politics
    - Qualified candidates in cabinet positions
    - Macro-scale engagement
    - Education of next generation of leaders
- Global level of mitigation
- Transportation electrification
- Kyoto 2.0

Group 3

- Pricing
    - Setting price signals to let customers know TOU rates
    - Value on avoided CO2 emissions
    - Tradeable credits
    - Tax
    - Rates that encourage efficient/optimal use
    - Rates that internalize true cost on grid and social cost on health
- Investment and resilience targeted for critical services
- Mitigation and planning before additional changes
- Scenario planning across seasons to offset impact
- Consider equity
- Take climate change into account for infrastructure and utility planning
- Battery storage policies at household level

- Targeted workforce development
- Incentivize utilities and businesses to help find solutions/make right investments
- Focus on vulnerable community needs
- More solar and wind generation
- Responsive, flexible, efficient, resilient grid
- Invest in resilience
    - Smart grid
    - Behind the meter resources
- Targeted resilience for critical service customers (i.e. first responders)
- Communities locally know own needs best: enable more distributed energy customized to communities needs

Group 4

- Federal legislation establishing carbon policy
- More micro-grids
    - Trade-off between collective benefits to grid and more localized benefits
- Ensure wholesale market value reflects 'values' (resilience, environmental concerns, equity, etc.)
- Setting up investment incentives informed by system-wide efficiency (grid and distribution level) and by equity considerations
- Ensure state policies continue to evolve to address failure of feds; states filling the gap as IL has done
- Price signals, dynamic pricing to signal changes in behavior
    - Real-time surge pricing
- More energy storage
- Distribution planning
- Efficient electrification
- Further undergrounding opportunities (where risky)
- Plan for world of electric vehicles
- Federal carbon policy

- Equity and efficiency tradeoffs
- Delivering on FEJA and looking ahead
- Tradeoff between centralized and distributed generation
- Future of coal

Agenda Item V: Next Steps / Session 4 Topics

Following the final breakout session, potential topics for the fourth working group session were discussed, including the following:

- Beneficial Electrification
- Environmental Implications of Natural Gas
- Fossil Fuel Legacy and Lessons for Next Generation
- Land Use/Siting/Agriculture
- Economic Impacts (e.g. Green Jobs)
- Price signals
- Brainstorming ideas for actionable next steps

Final topic choices will be finalized in coordination with ICC.

The next working group meeting is scheduled for July 11 with the topic of "Pathways to De-carbonization."