



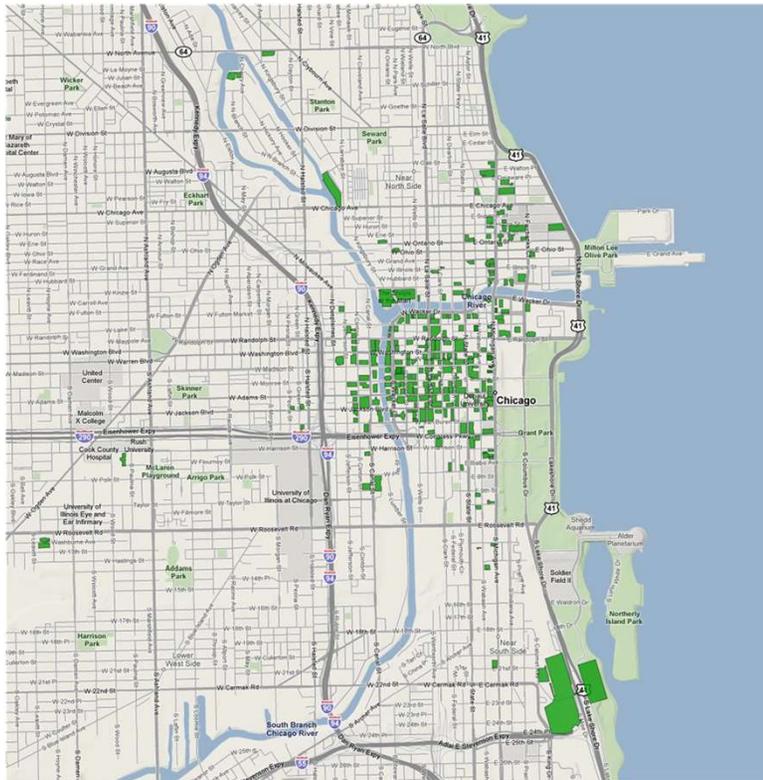
NextGrid Illinois

BOMA/CHICAGO'S PRESENTATION ON ISSUES RELATED TO GRID INTEGRATION, DEMAND
RESPONSE, AND ENERGY EFFICIENCY

NEW TECHNOLOGY DEPLOYMENT AND GRID INTEGRATION ("NTDGI") WORKING GROUP

BY: MICHAEL MUNSON FEBRUARY 28, 2018

WHO IS BOMA/CHICAGO



- BOMA/Chicago is a trade association that has represented the interests of the Chicago office building industry since 1902. Membership includes 239 commercial office, institutional and public buildings and 169 companies that provide commercial building services to support operational excellence. BOMA/Chicago members constitute approximately 80 percent of all rentable office space and more than 98 percent of rentable space in Class A buildings downtown.

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SOME BUILDING ENERGY MARKET GOALS

- With sophisticated Building Automation Systems (BAS) buildings are becoming some of the most sophisticated consumers in the energy markets.
- Some of the goals include:
 - Prove buildings can integrate into all supply-side and demand-side markets
 - Monetize operational flexibility & automation
 - Deploy new technologies, innovation & infrastructure
- Enable smarter investment decisions for owners, managers & tenants
- Reliably measure and verify improvements & efficiencies
 - With real-time data access & control capabilities
 - Through employment of real-time data access & control structures
- Prove the business case
 - Develop blueprint for broad implementation & replication
 - From large building applications to smaller consumer applications



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KEY GUIDING PRINCIPLES OF NEW TECHNOLOGY DEPLOYMENT

- **Empower Customers & Deliver Benefits to Customers**
- **Ensure Transparent & Open Process:**
 - **In the NextGrid Process itself; and**
 - **In Regulatory, Policy, & Legislative Proposals**
- **Ensure that any “Solution” is Designed to Address a Real “Problem”**
- **Cost Benefit Analysis of Each Potential Technology**
- **Advance Competitive Markets**
- **Encourage Full Disclosure of Cost Components & Accurate Cost Allocation**
- **Using a cost-benefit approach to benefit all stakeholders**



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COST BENEFIT APPROACH

Key questions include:

- What is the status of technologies that already have been deployed? Are there efforts already underway to expand the deployment of the technology?
- What are the benefits to customers of each technology? Will rates be lowered by implementation / expansion of each technology? Are the benefits applicable generally to all customers, or only to certain customers or customer classes? Are the benefits to parties other than customers (e.g., society, utilities)?
- Are there barriers preventing customers from currently realizing the benefits of the technology? If so, how can those barriers be minimized or eliminated? At what cost?
- Are there existing or potential market mechanisms to facilitate development and deployment of each technology?
- Is it necessary for the utility (or any other third-party) to act as a gatekeeper for any given technology? Is it necessary for the ICC to regulate any given technology?
- How will costs be allocated, if at all, among different customer classes?
- How will historic or existing adoption of such technologies by certain customers or customer classes be incorporated and valued?

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KEY CONSIDERATION: COMPETITIVE MARKET SUCCESS IN ILLINOIS

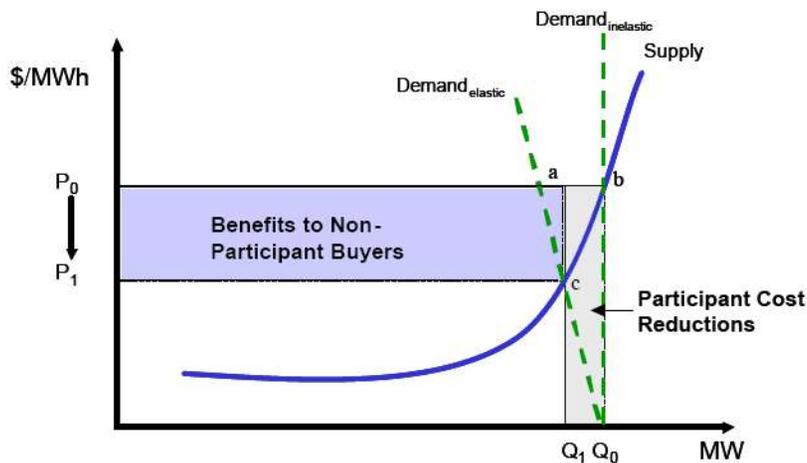
First paragraph of *ICC March 22, 2017 NextGrid Resolution*:

- The 1997 Choice Act “opened the door to energy competition, customer choice, and electric industry innovation, and has saved Illinois electricity consumers tens of **billions of dollars.**”
- How Many Billions?
 - In May 2015, former ICC Chairman Phil O’Connor estimated Illinois customer savings at **\$41.3 billion** as a result of competitive energy markets.
 - Plus additional benefits, such as price certainty, generation source options, and innovative services.
- **Seek to replicate that competitive market model as the primary deployment methodology for NextGrid solutions.**

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BENEFITS OF DEMAND RESPONSE TO SOCIETY

THE SUPPLY CURVE EFFECT



*SOURCE: KATHAN, DAVID, "POLICY AND TECHNICAL ISSUES ASSOCIATED WITH ISO DEMAND RESPONSE PROGRAMS," THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, JULY 2002.

- Improves Market Efficiency.
- As load and price increase due to scarcity of generation, Demand Response can shift the quantity of generation and lower price to the market as a whole.
- Accordingly, all consumers benefit from concentrated Demand Response actions during high price periods.

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DISTRIBUTED GENERATION – FEATURES

- Not centrally planned – is often installed, owned and operated by an independent power producer (IPP)
- Not centrally dispatched – IPP paid for the energy produced and may be required to provide ancillary services (reactive power, voltage support, frequency support and regulation)
- Connection – at any point in the electric power system
 - Can provide benefits to the distribution and transmission grid (e.g. batteries)
- Common Types of distributed generation
 - Dispatchable (if desired) – engine-generator systems (natural gas, biogas, small hydro)
 - Non dispatchable (unless associated with electricity storage) – wind, solar

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DISTRIBUTED GENERATION – DRIVERS

- Promoting the use of local energy sources – wind, solar, hydro, biomass, biogas, others
- Creating local revenue streams (electricity sales, lower costs, DR)
- Creating employment opportunities (manufacturing, erection, maintenance, operation)
- Responding to public interest and concerns about the environment – public acceptance can be secured
- Green power – Greenhouse Gas (GHG) reduction

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SOME BARRIERS TO ADDRESS

- Inadequate information about available technologies
- Limited understanding of life-cycle costs & benefits
- Impact of Inadequate Information
 - Limits available investment capital
 - Increases transactions costs
 - Distorts investment priorities
- The Energy Efficiency “Gap”
 - Consumers’ Actual Investments
 - Investments Made in Consumers’ Interests



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