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Grid Modernization Initiatives at ComEd

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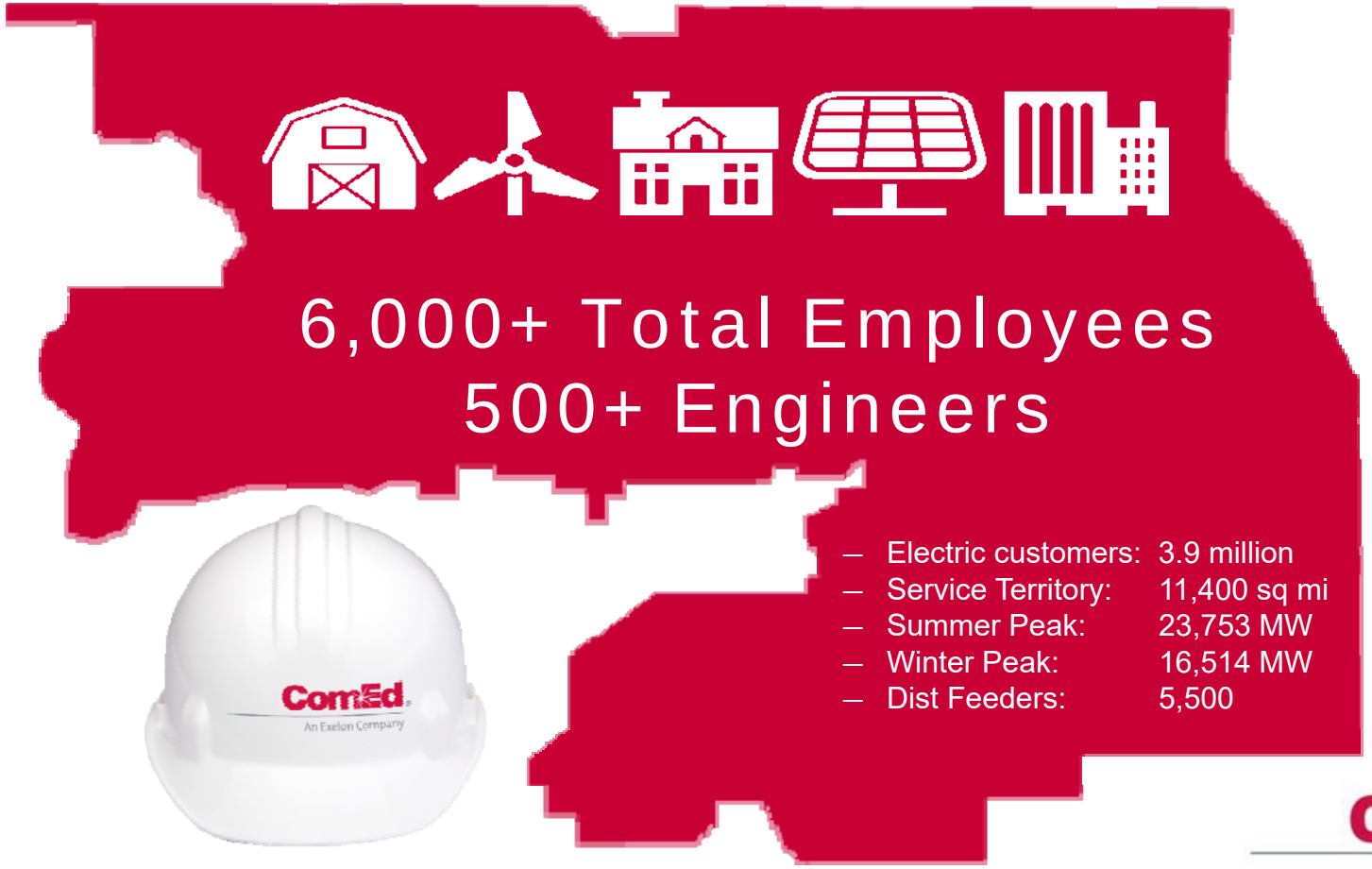

6,000+ Total Employees
500+ Engineers

- Electric customers: 3.9 million
- Service Territory: 11,400 sq mi
- Summer Peak: 23,753 MW
- Winter Peak: 16,514 MW
- Dist Feeders: 5,500

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From EIMA to the Future Energy Jobs Act

In October 2011, the Illinois General Assembly enacted the Energy Infrastructure Modernization Act (EIMA), setting in motion a $2.6 billion, ten-year investment plan by ComEd to strengthen and modernize the state's electric grid.

The Future Energy Jobs Act (FEJA) was passed in December 2016. The bill includes provisions for energy efficiency, low income assistance, distributed generation, and allows for enhanced grid reliability programs.

2011

Investing in Illinois energy infrastructure

- $1.3B in Reliability Investments
- $1.3B in Smart Grid Investments
- 2,000 full time jobs
- Smart Grid Test Bed
- $50M for customer assistance

Stabilizing the regulatory environment

- Annual filing and reconciliation
- ROE formula

Value for our customers

- Reliability targets
- Customer service improvement targets
- Sunsets in 2019
- Average rates increase < 2.5%

2016

Keeping the grid up and running

- Support for 2 at risk nuclear power plants
- Saving 4,000 jobs across Illinois
- Zero Emission Standard
- Job training for clean energy jobs

Investing in efficiency and Renewable Portfolio Standard (RPS)

- $180M-$220M for renewables energy funding
- Enhanced grid security and reliability
- Strengthen RPS standards

Customer savings and low income assistance

- $750M in low income assistance
- Expand energy efficiency pgms
- Voltage optimization
- Preservation of competitive rates

FEJA Legislation Highlights

	High-Level Summary
Energy Efficiency	• Allows ComEd to gradually increase EE spending to $400M+ per year (included in rate base) • Sets Cumulative Persisting Annual Savings (CPAS) goals • Exempts large customers >10MW from EE programs
Renewable Portfolio Standard (RPS)	• Requires Illinois Power Agency (IPA) to procure Renewable Energy Credits (RECs) • Requires annual procurement of RECs each from new wind and solar • Provides residential solar 15-year REC payment upfront; small C&I over 5 years • ComEd will collect funds from all customers via new line item on the bill
CARE	• Extension of CARE bill payment assistance program at $10M/year for five years starting June 1, 2017
Solar for All	• Uses Renewable Energy Resources Fund monies to fund Solar for All initiatives • Utilities shall propose community solar projects up to $20M
Net Metering	• Residential NEM unchanged until 5% cap reached • $250/kW nameplate capacity rebate available to non-residential NEM customers
Zero Emissions Standard	• Zero Emissions Credits (ZECs) are procured from Illinois nuclear power plants • The Illinois Commerce Commission (ICC) will set the rate • ComEd will collect funds from all customers via new line item on the bill
Jobs Training	• ComEd to fund $30M in jobs training distributed in $10M increments in 2017, 2021, and 2025 • Purpose is to train installers who can work on RPS and Solar for All projects
Bill Impact Caps	• Imposes a residential cost cap based on total bill impact • Imposes two commercial cost caps based on 2015 price per kWh

Expanding Renewables

SOLAR REBATES*

- ✓ Solar rebates of $250/kW of installed capacity will be made available initially to existing and new commercial customers and community solar subscribers, up to a maximum of 2,000 kW per customer account
- ✓ Designed to compensate customers for the value their systems provide to the grid
- ✓ Illinois Commerce Commission will set process and methodology for determining rebate value for all customers including residential

NET METERING

- ✓ Maintains net-metering for residential customers up to the point when the energy demand of net-metering customers equals 5 percent of utility-supplied peak demand
  - Proceedings on the value of solar begin when installed capacity of solar reaches 3% (~240MW)
  - Resulting rebate becomes effective at 5% (~400MW)
- ✓ Once the 5 percent cap is passed, net-metering will apply only to the supply portion of a new solar customers' bill
  All customers who entered into net metering full retail prior to the 5 percent cap being reached can stay on net-metering for the life of their systems

*Rebate terms apply to other forms of renewable energy, including wind.

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What We're Working Through

✓ Smart inverter tariff - solar rebate
- Created internal taskforce with cross-functional expertise to develop smart inverter requirements
- Technical requirements for smart inverters including required control functions and default settings per FEJA rebate program
- Verification processes for solar rebates

✓ Anticipating pace and amount of solar growth
- Overhauling our interconnection process
- Customer experience
- Hosting Capacity Maps

✓ Anticipating timing of reaching the 5 percent cap
- Fixed rebate => Value of DER

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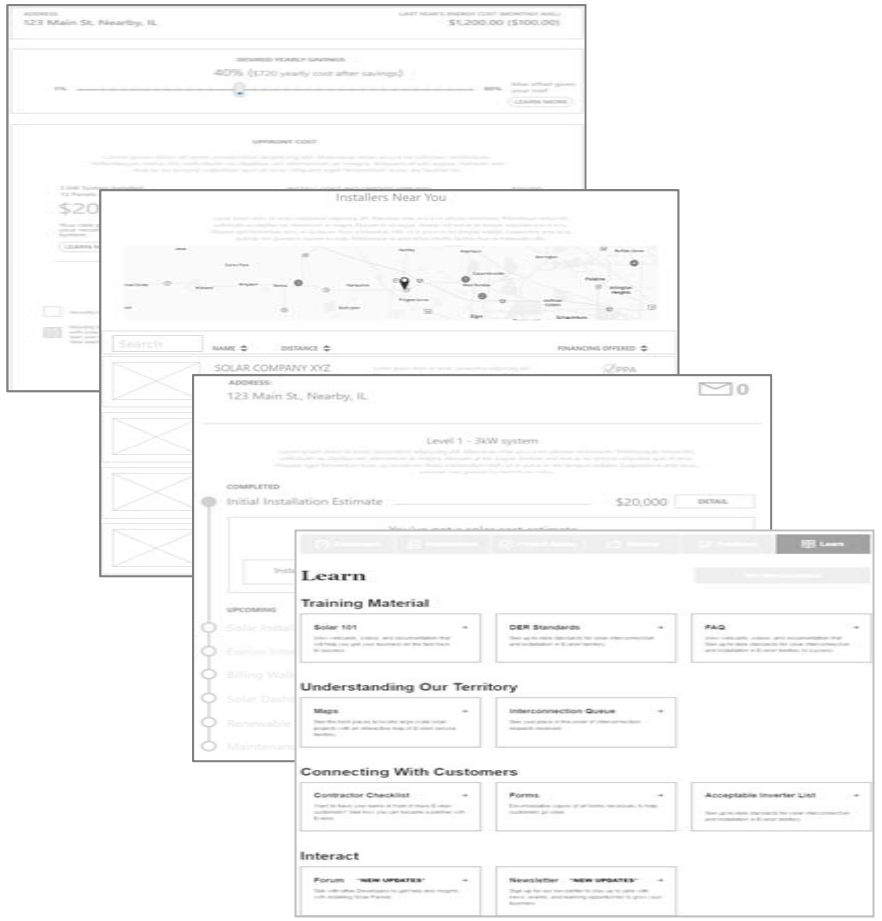
Online Tools...

- ✓ Make the end-to-end experience of understanding, adopting, and using solar simple, responsive, flexible, transparent, proactive and personalized:
  - Solar Calculator
    - Demonstrate potential benefits of community and rooftop solar
  - Hire Right
    - Learn about solar installers in your community
  - Solar Tracker
    - Monitor project progress and communicate with ComEd your installer
  - Solar Trade Ally
    - Forum to connect developers with other developers and to ComEd



So How Does That Affect Planning?

✓ **Energy Efficiency**

- Expands energy efficiency programs to drive customer savings.
- Allows ComEd to earn on energy efficiency investments.
- $500M investment in Voltage Optimization
  - ~3,000 feeders

✓ **Renewable Portfolio Standard**

- Expands funding for renewables in Illinois.
  - Wind
  - Solar (Utility scale, Community, & Rooftop)
- Interconnections will grow from 300 per year to ??? per year
  - IPA SREC prices favor community solar (2MW max to qualify for rebate)
- Hosting Capacity maps
- Value of DER

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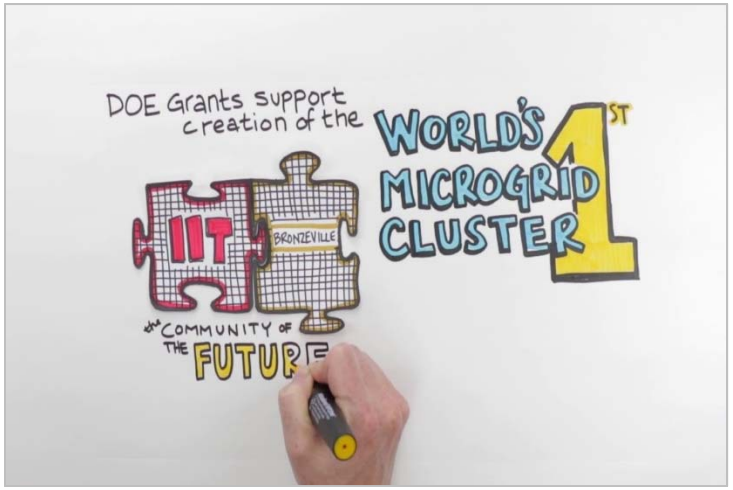
Bronzeville Community Microgrid

- ✓ ComEd sought commission approval of the Bronzeville Community Microgrid (BCM) in July 2017, after the project failed to make it into a larger Future Energy Jobs Act (FEJA) passed by the state legislature in December 2016.
- ✓ In February 2018, the state regulators approved the BCM project.
- ✓ **BCM Quick Facts:**
  - 1,060 residential, commercial, and small industrial customers
  - 7 MW aggregate load
  - Phase I – 2.5 MW load, solar PV and battery storage, diesel back-up (Focus on DOE SHINES grant requirements)
    - 490 customers
    - Phase I critical public service customers: De La Salle Institute; the Chicago Bee Public Library, the Perspectives/IIT Math & Science Academy; and part of the Public Safety Headquarters of the City of Chicago
  - Phase II – 4.5 MW load, 7-MW of controllable generation
    - Additional 570 customers
    - Phase II critical public service customers: Kensington Place Nursing and Rehabilitation Center; Illinois College of Optometry; Symphony of Bronzeville Skilled Nursing and Living Center; Chicago Military Academy at Bronzeville; Heartland Human Care Services; and the remainder of the Public Safety Headquarters of the City of Chicago
  - Clustering demonstration with existing microgrid at the Illinois Institute of Technology (IIT)
  - Cost: Total $25 million.
    - $11.3 million for distribution upgrades
    - $14.7 million for generation
  - Contributions: $4 million DOE grant; $600,000 from partners



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NextGrid: Illinois Utility of the Future Study

- ✓ NextGrid is an approximately 18-month consumer-focused study initiated by the Illinois Commerce Commission (ICC) and launched on Sept. 28, 2017.

- ✓ NextGrid will be managed by the ICC, with the Power and Energy System Area of the Electrical and Computer Engineering Department at the University of Illinois at Urbana-Champaign (UIUC/ECE) serving as an independent third-party facilitator.

- ✓ The study will examine the use of new technologies to improve the state's electric grid while minimizing energy costs to consumers.
  - New Technology Deployment and Grid Integration
  - Metering, Communications and Data
  - Reliability, Resiliency and Security
  - Customer and Community Participation
  - Electricity Markets
  - Regulatory and Environmental Policy Issues
  - Ratemaking

NextGrid Illinois

- ✓ The public is invited and encouraged to participate in the study.

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Potential Policy Issues

- ✓ Value of DER
- ✓ Rate design
- ✓ Planning and System Operations
- ✓ Data access
- ✓ Low income participation
- ✓ Platforms

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Questions...

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