

AGENDA

Introductions	
Background	<ul style="list-style-type: none">▪ Electricity Market Conditions▪ Forward PJM Market View
Grid Supply Options	<ul style="list-style-type: none">▪ Services Required▪ Options
Discussion	<ul style="list-style-type: none">▪ Conclusions
Appendix	



INTRODUCTIONS

Introductions

Mark Pruitt
Principal
The Power Bureau
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Background

Current Work

Power Bureau. Advisor on energy policy, planning, and procurement for developers and consumers.

Illinois Community Choice Aggregation Network. Advisor to municipalities for energy supply options (municipal aggregation, community solar)

Past Work

Illinois Power Agency. Agency Director responsible for wholesale electricity sourcing for ComEd and Ameren, Illinois Renewable Portfolio Standard, Clean Coal Portfolio Standard.

University of Illinois. Managed electricity and natural gas procurement, hedging, and billing for state executive agencies.

Nicor Solutions. Cogeneration and energy efficiency project developer for federal facilities.

Other Activities

Research. Argonne National Laboratory (Net Zero World – Indonesia)

Teaching. Northwestern University



BACKGROUND

Power Supply Management is Projected to Become more Challenging over Time

Background

Overview

Market Geography

Market Operations

Outlook

Current Market

Growing Demand. Datacenter, electric vehicles, “electrify everything”.

Falling Capacity & Variable Supply. Existing coal and natural gas power plants are retiring due to economics and regulation.

- **Capacity.** The maximum amount of peak output that can be delivered by generators on demand in an emergency is falling.

- **Supply.** The volume of electricity delivered to the grid each hour is becoming less controlled (e.g., variable)

Outlook

Rising Capacity Prices. Capacity prices for ComEd customer will increase by as much as \$30/month for large single family homes starting in June 2025.

Greater Volatility. Hourly electricity prices during peak demand hours are starting spike

Reliability. Reserve margins are projected to shrink over time

Power Supply Management Requires Delivering CAPACITY and ENERGY

Background

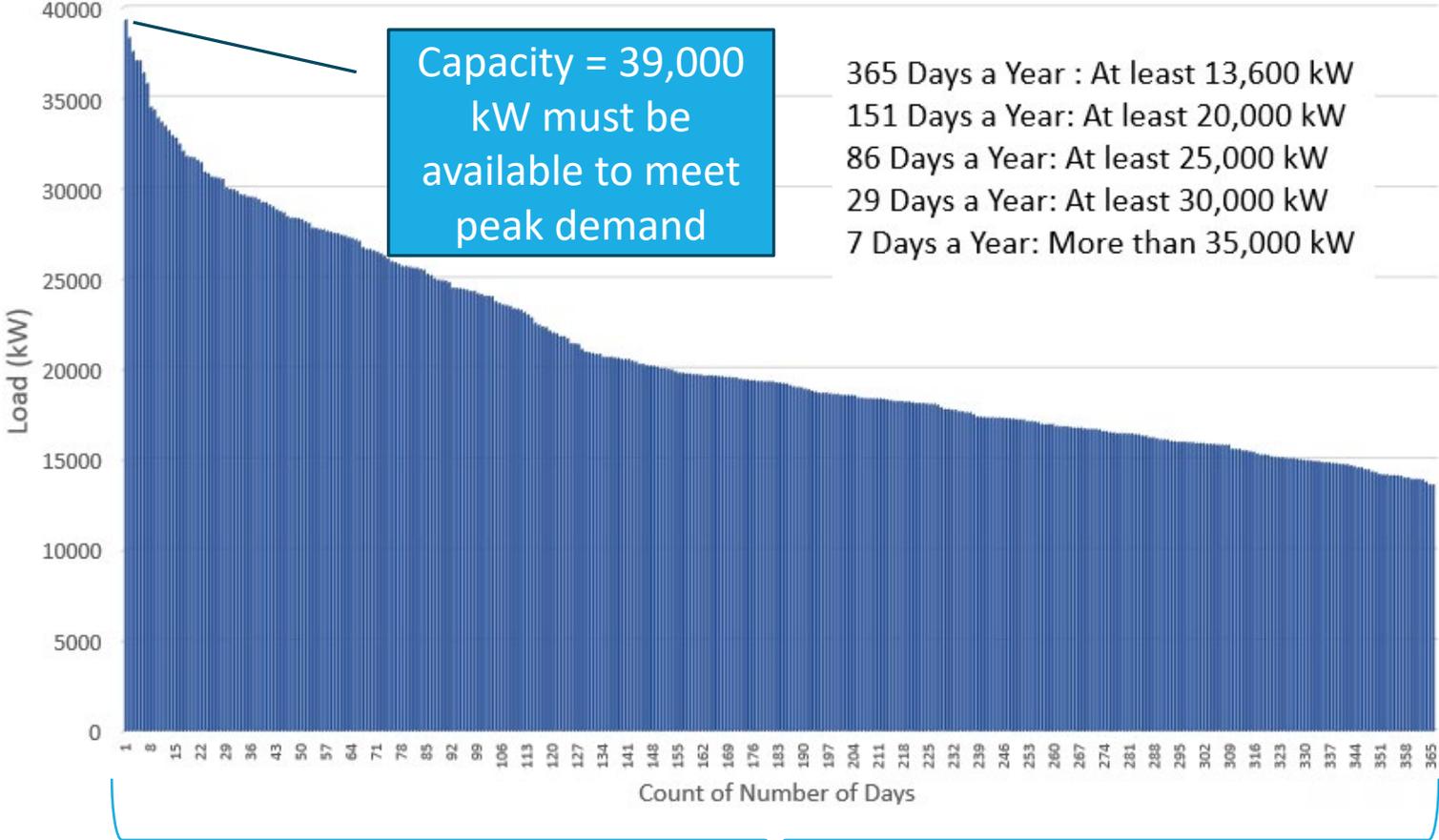
Overview

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Winnetka W&E Peaks (2020-2023)
kW Capacity demand of the system

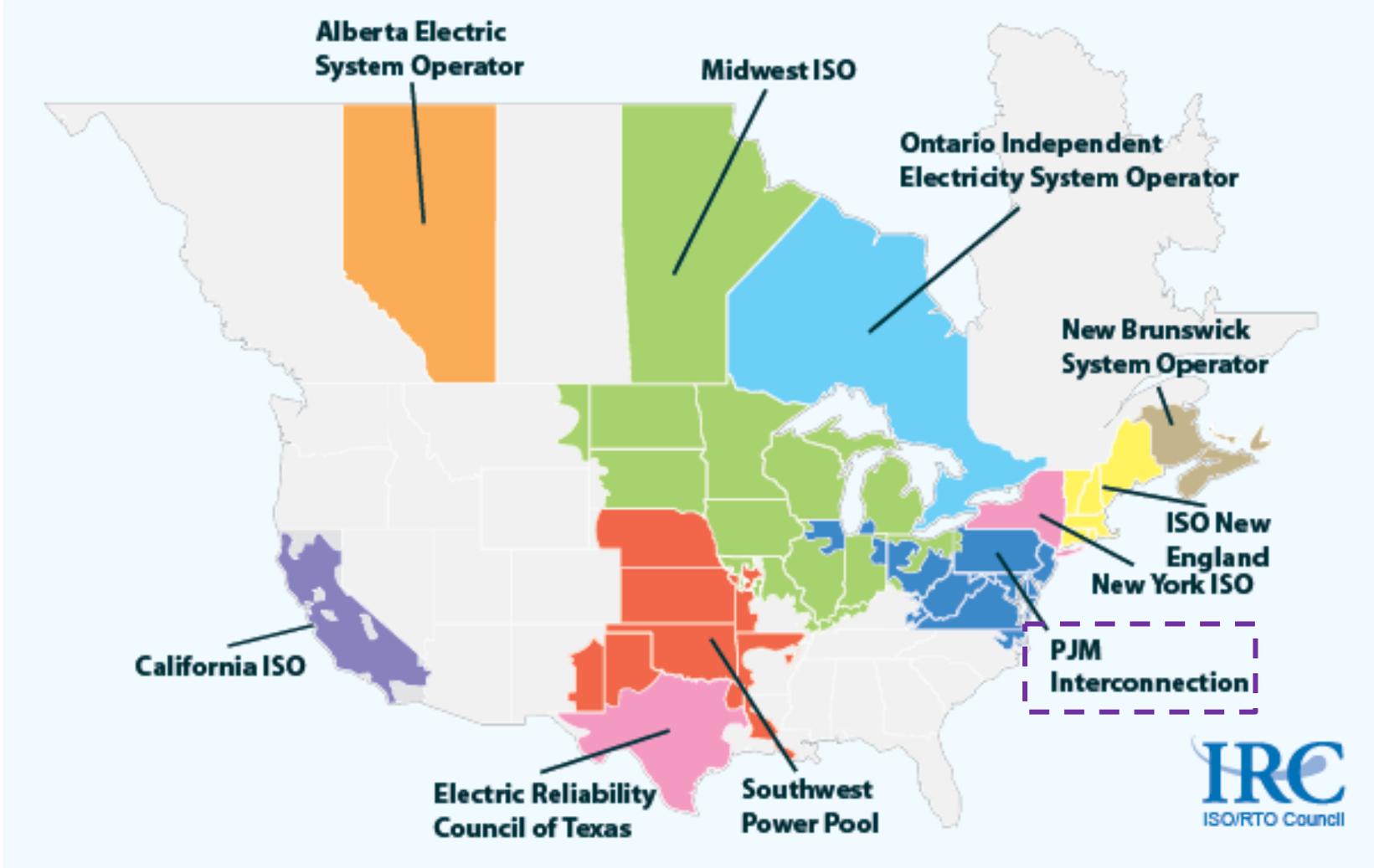


Energy = 121,000,000 kWh of electricity consumed annually

Capacity and Energy in Northern Illinois is Secured through PJM

Background

- Overview
- Market Geography
- Market Operations
- Outlook



PJM Delivers Electricity into Northern Illinois from Power Plants via Transmission

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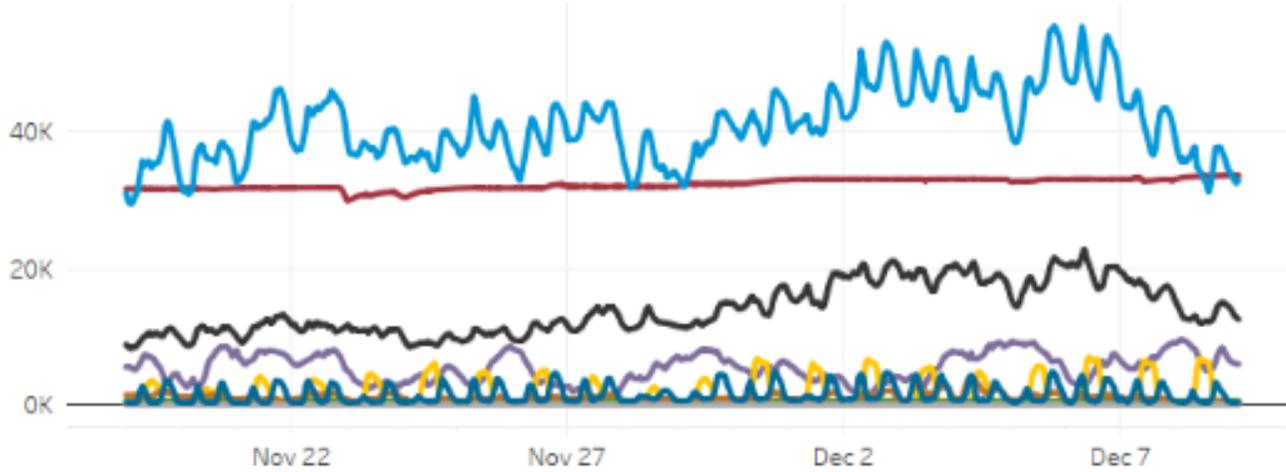


Source: [2023 Illinois State Infrastructure Report \(January 1, 2023 – December 31, 2023\) June 2024](#)

Market Operations: PJM Manages Power Plants to ALWAYS Balance Supply with Demand

Generation by fuel source

megawatthours (MWh)



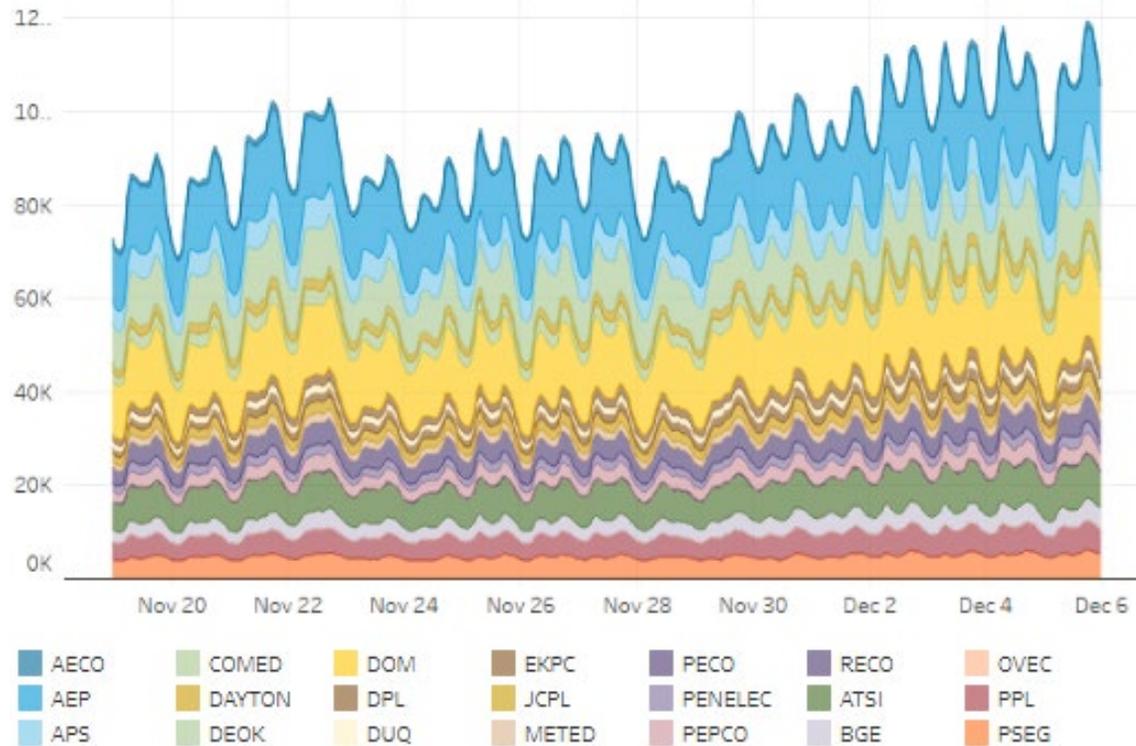
Click to filter

- Coal
- Natural Gas
- Nuclear
- Other & Storage
- Other Fossil
- Hydro
- Other Renewables
- Solar
- Wind



Hourly actual demand for electricity by region

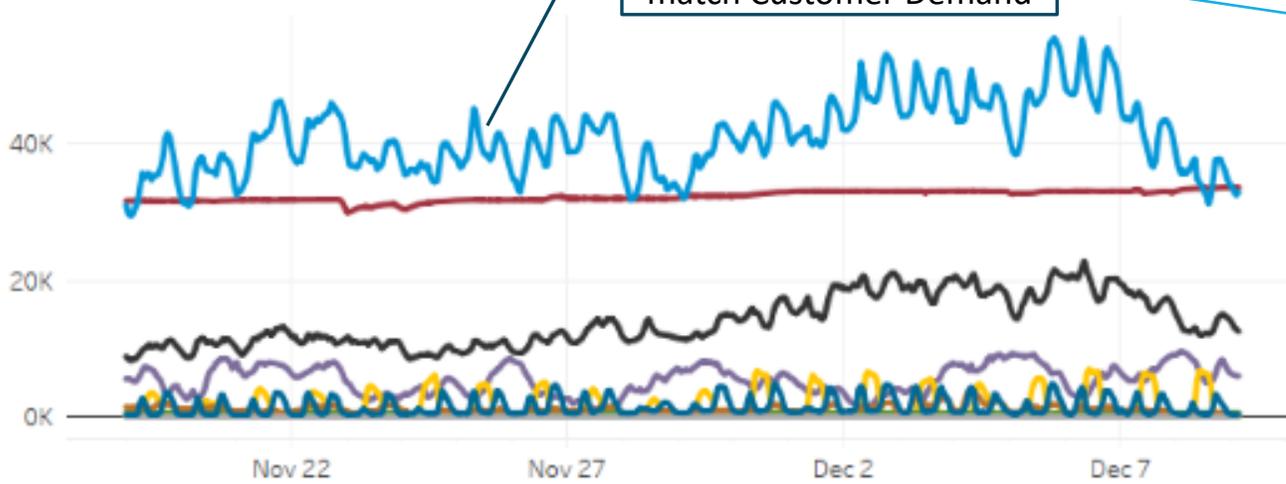
megawatthours (MWh)



Source: [Energy Information Administration](https://www.eia.gov/)

Market Operations: PJM Manages Power Plants to ALWAYS Balance Supply with Demand

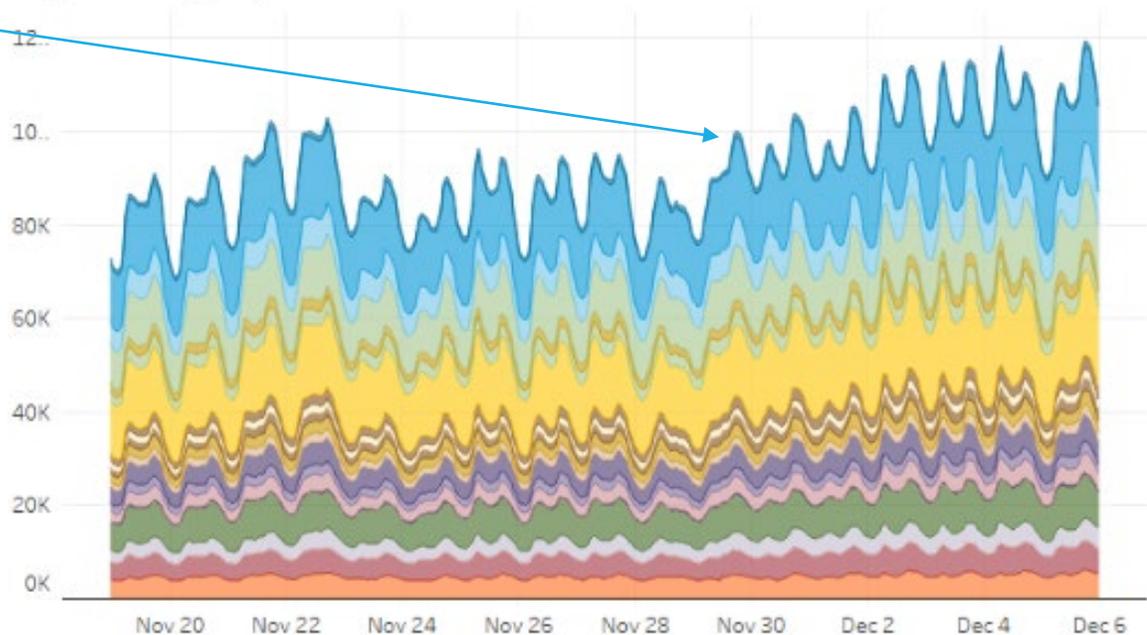
Generation by fuel source
megawatthours (MWh)



Dispatchable = Able to match Customer Demand

①

Hourly actual demand for electricity by region
megawatthours (MWh)



Click to filter

Coal	Natural Gas	Nuclear	Other & Storage	Other Fossil	Hydro	Other Renewables	Solar	Wind
Dispatchable					Variable			

- AECO, AEP, APS, COMED, DAYTON, DEOK, DOM, DPL, DUQ, EKPC, JCP, METED, PECO, PENELEC, PEPCO, RECO, ATSI, BGE, OVEC, PPL, PSEG

Source: [Energy Information Administration](#)

More Variable Output Resources are Required to Meet Consumer Demand

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EFFECTIVE LOAD CARRYING CHARACTERISTICS (ELCC) OF DIFFERENT GENERATING ASSETS									
GENERATING RESOURCE	DELIVERY YEARS								
	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35
VARIABLE OUTPUT RESOURCES									
Hydroelectric	38%	40%	37%	37%	37%	37%	39%	38%	38%
Onshore Wind	35%	33%	28%	25%	23%	21%	19%	17%	15%
Solar (Fixed-Tilt)	7%	6%	5%	5%	4%	4%	4%	4%	3%
Solar (Tracking)	11%	8%	7%	7%	6%	5%	5%	5%	4%
DISPATCHABLE RESOURCES									
Coal	84%	84%	84%	85%	85%	86%	86%	83%	79%
Diesel	92%	92%	92%	92%	92%	93%	93%	93%	93%
Natural Gas (Combined Cycle)	79%	80%	81%	83%	83%	85%	85%	84%	82%
Natural Gas (Combustion Turbine)	61%	63%	66%	68%	70%	71%	74%	76%	78%
Nuclear	95%	95%	95%	95%	95%	96%	96%	94%	93%
Storage (4-hour)	56%	52%	55%	51%	49%	42%	42%	40%	38%

Capacity Example:

- A. 1,000 kW of Solar (Tracking) resource can only be credited to meet 110 kW of capacity
- B. 1,000 kW of Natural Gas (Combined Cycle) resource can only be credited to meet 790 kW of capacity

Replacing Dispatchable Generation with Variable Generation Leads to Lower Reserve Margins and a Resulting Lesser Ability to Meet Customer Demand with Generation

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Reserve Margin	2023	2024	2025	2026	2027	2028	2029	2030
Low New Entry								
2023 Load Forecast	23%	19%	17%	15%	11%	8%	8%	5%
Electrification	22%	18%	16%	13%	10%	7%	6%	3%
High New Entry								
2023 Load Forecast	26%	23%	21%	19%	17%	16%	17%	15%
Electrification	25%	22%	20%	18%	15%	14%	14%	12%

Low New Entry is a scenario where **very few new** generating assets come online

High New Entry is a scenario where **many new** generating assets come online

Reserve margin is a **measure of the extra supply available** in a region to meet peak demand and ensure the reliability of the grid.

The Commerce Commission Forecasts Capacity Shortfalls to Occur in Northern Illinois (ComEd Zone)

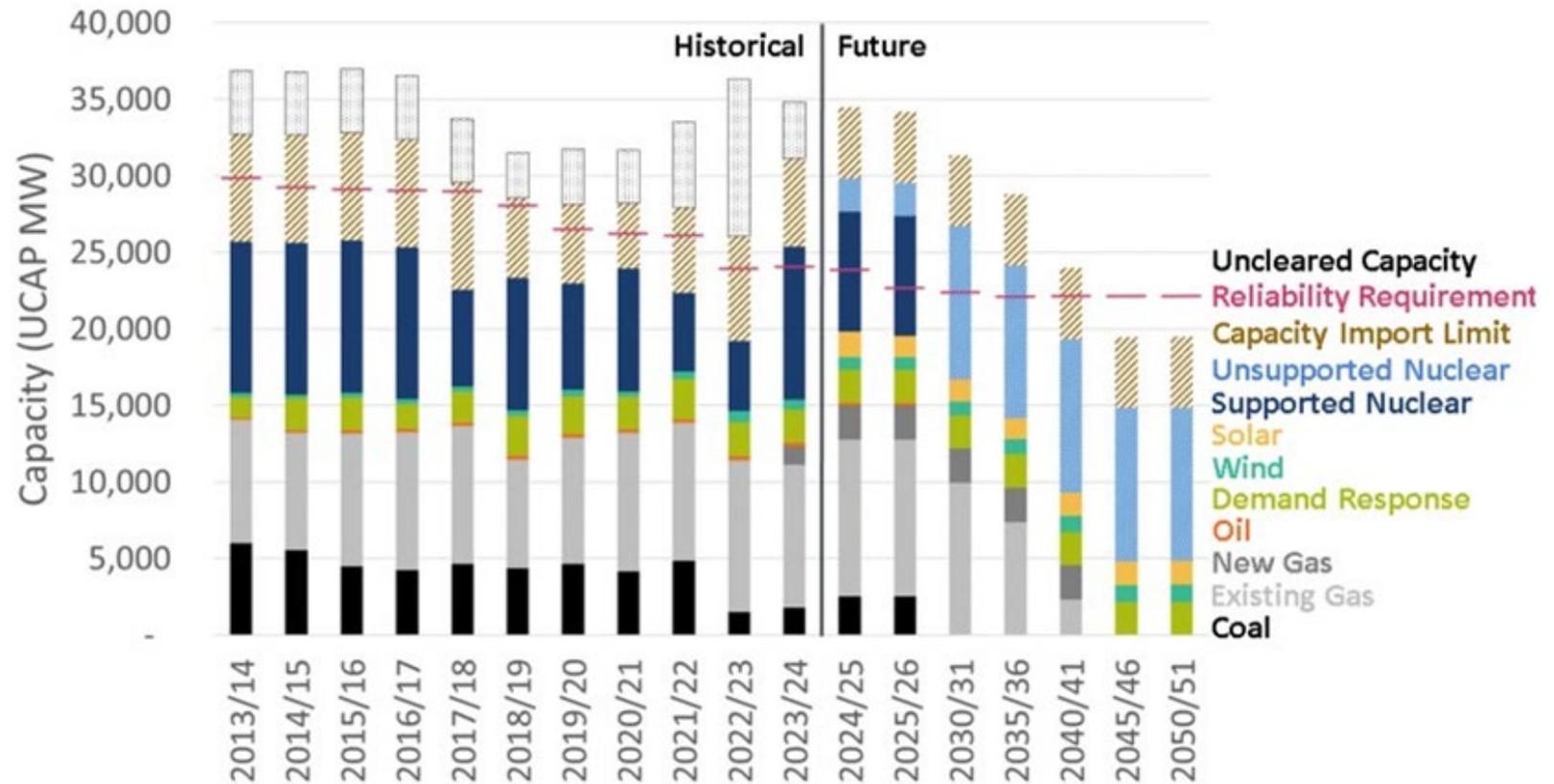
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Less Dispatchable Capacity + Higher Load Growth = Higher Costs

Background

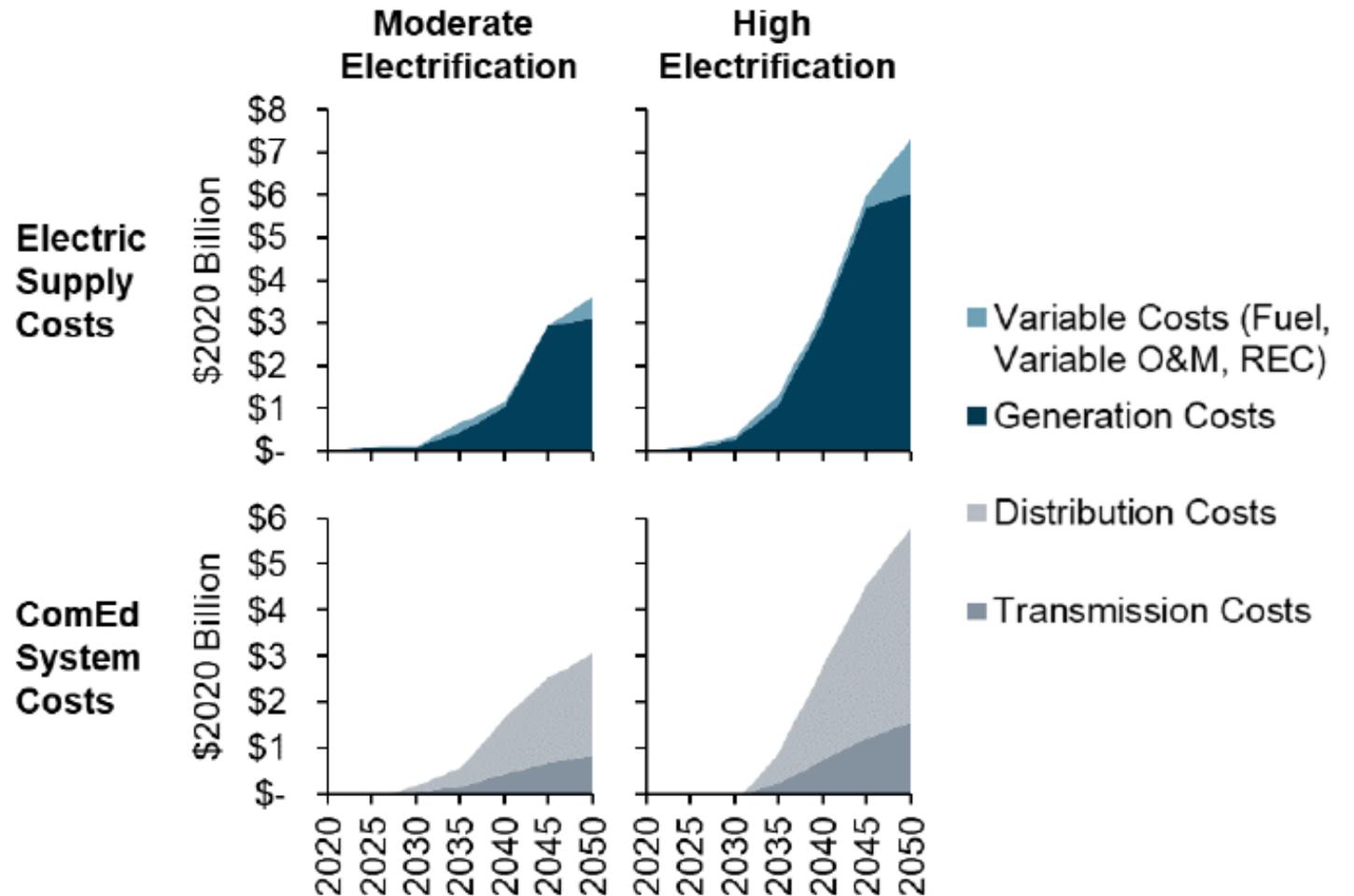
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Figure 24: ComEd Region Annual Incremental Electric System Costs



Summary: Power Supply Management is Projected to Become more Challenging over Time

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Greater Volatility. Hourly electricity prices during peak demand hours are starting spike

Reliability. Reserve margins are projected to shrink over time



GRID SUPPLY OPTIONS

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Requirements of a Load Serving Entity (handled in-house or contracted)

Resource Planning/Analysis

- Peak demand and hourly load planning
- Capacity resource planning
- Generation resource planning
- Transmission planning
- Ancillary services planning
- Environmental goals/attainment
- Energy efficiency and demand response
- Rates analysis and formation

Legal/Compliance

- Compliance with PJM/FERC Rules (38)
- Compliance with Open Access transmission Tariff (OATT)
- Monitor FERC/PJM/Congressional/State Legislature proceedings
- Regular reporting and stakeholder participation (FERC, DOE, DHS)
- Contract negotiations
- Risk management

Hedging/Procurement

- Risk identification and management
- Procurement (energy, capacity)
- Hedging (financial swaps, Financial Transmission Rights, Auction Revenue Rights)
- Credit maintenance/Counterparty risk
- Contingency option planning
- Fuel hedging/scheduling

Operations/Engineering

- Hourly load scheduling and monitoring
- Transmission system voltage monitoring
- Daily market settlements/payments
- Creation/Access to control room
- Interconnections/behind the meter/ expansions/ improvements
- Curtailment management/emergency response

Estimated staffing support: Up to 24 individual experts with net 8 FTE

Grid Supply Services Options: Approaches

Option	Description	Viability	Comments
Illinois Power Agency	Replace IMEA service with Illinois Power Agency	Very Low	<ul style="list-style-type: none"> Not allowed under the Illinois Power Agency Act (220 ILCS 3855)
Commonwealth Edison	Replace IMEA service with Commonwealth Edison	Low	<ul style="list-style-type: none"> Would require transfer of ownership of Winnetka utility assets to ComEd under the Public Utilities Act (220 ILCS 5) Would require referendum per local code Under ComEd, only residential and non-residential accounts <100kW can receive fixed rates Under ComEd, non-residential accounts >100kW can receive hourly variable rate or contract with a retail energy supplier
Power Marketer	Replace IMEA service with Illinois Power Agency	Partially	<ul style="list-style-type: none"> Could fulfill Hedging/Procurement functions Not willing/able to fulfill most resource planning, legal, and operations functions Would surrender post 2035 financial benefits
Joint Action Agency	Replace IMEA services with a new group of municipalities	Yes	<ul style="list-style-type: none"> Would need to be created (long lead time) Would require up-front funding (unknown) Would surrender post 2035 financial benefits
“Go it Alone”	Replace IMEA services with in-house staff	Yes	<ul style="list-style-type: none"> Would need to expand internal resources May suffer from lack of scale as an energy purchaser Would surrender post 2035 financial benefits
IMEA Extension	Accept IMEA agreement extension	Yes	<ul style="list-style-type: none"> Maintains access to post-2035 financial benefits Would require action to address sustainability questions

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Operating in a volatile market requires at least the following capabilities:

Overall Cost	<ul style="list-style-type: none">• Access to existing portfolio (long/short-term hedges)• Low overhead to manage transactions
Capability	<ul style="list-style-type: none">• Awareness of market opportunities• Financial capacity to plan and execute
Governance	<ul style="list-style-type: none">• High level of engagement/awareness of energy purchasing by authorizing authorities• Stable process to support decision-making
Time Horizon	<ul style="list-style-type: none">• Authority to commit to deliveries over 10-20 years• Authority to commit to contracts starting in 5-10 years
Scale	<ul style="list-style-type: none">• Size to attract/support opportunities• Size to achieve economies of scale
Independence	<ul style="list-style-type: none">• Ability to plan for local needs• Ability to execute unilaterally



Trade-offs between Different Grid-Supply Services Approaches

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Requirements	Solo Approaches		Group Approaches		
	Power Marketer	Go it Alone	ComEd	Joint Action Agency	IMEA
Cost	↔	↓	↓	↓	↑
Capability	↔	↓	↔	↔	↑
Governance	↔	↓	↔	↔	↑
Horizon	↔	↔	↓	↔	↑
Scale	↓	↓	↓	↔	↑
Independence	↑	↑	↔	↔	↔

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Go it Alone

Cost	<ul style="list-style-type: none">• Enter bilateral contracts at currently unknown prices• Unknown constraints with securing supply prior to 2035• Will lose access to post-2035 below-market electricity/capacity prices from Prairie State
Capability	<ul style="list-style-type: none">• Unknown level of wholesale market insights• Capabilities would have to be developed internally or contracted to a third party• Could outsource some functions to third parties
Governance	<ul style="list-style-type: none">• Requires development of new Village-level governance protocols for all wholesale market operations• Compliance with Open Meetings Act, etc.
Horizon	<ul style="list-style-type: none">• Could take 2+ years to establish (including time for governance)• Likely could not contract until much closer to 2035
Scale	<ul style="list-style-type: none">• Contracting size would limit access to large new projects• May require credit posting to execute purchases
Independence	<ul style="list-style-type: none">• Village controls 100% of portfolio decisions

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Power Marketer (e.g., Constellation, NextEra, etc.)

Cost	<ul style="list-style-type: none">• Pass through forward market prices with a mark-up• Will lose access to post-2035 below-market electricity/capacity prices from Prairie State
Capability	<ul style="list-style-type: none">• Village outsources capacity/supply procurement function• Very innovative, but recommendations could be opaque• Execution dependent on buyer's credit
Governance	<ul style="list-style-type: none">• Would require the Village to direct the portfolio• Would require the Village to fulfill all other PJM requirements beyond procurement
Horizon	<ul style="list-style-type: none">• Could take 2+ years to set up (including time for governance)• Typically will execute 3-5 year supply contracts• Likely would not contract until much closer to 2035
Scale	<ul style="list-style-type: none">• Contract size would limit access to large new projects• Size to achieve economies of scale
Independence	<ul style="list-style-type: none">• Village controls 100% of portfolio decisions

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Commonwealth Edison

Cost	<ul style="list-style-type: none">• Consumers would start making their own supply decisions – unknown costs• Will lose access to post-2035 below-market electricity/capacity prices from Prairie State
Capability	<ul style="list-style-type: none">• Consumers would start making their own supply decisions – unknown level of sophistication
Governance	<ul style="list-style-type: none">• No obligation for ongoing role for the Village• Loss of local control and delivery system• Village could create a municipal aggregation for residential and small commercial (<10,000 kWh/Yr)
Horizon	<ul style="list-style-type: none">• Unknown timeline to effect a transfer
Scale	<ul style="list-style-type: none">• Consumers would start making their own supply decisions• Village could create a municipal aggregation for residential and small commercial (<10,000 kWh/Yr)
Independence	<ul style="list-style-type: none">• Consumers would start making their own supply decisions

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Joint Action Agency

Cost	<ul style="list-style-type: none">• Start up costs associated with start-up (legal, etc.)• Require wholly-new portfolio of supply options• Will lose access to post-2035 below-market electricity/capacity prices from Prairie State
Capability	<ul style="list-style-type: none">• Unknown level of wholesale market insights• Capabilities would have to be developed internally or contracted to a third party
Governance	<ul style="list-style-type: none">• Requires development of governance protocols• Compliance with Open Meetings Act, etc.
Horizon	<ul style="list-style-type: none">• Unknown timeline for recruitment/development
Scale	<ul style="list-style-type: none">• Could be large enough to justify buying from/developing large new projects• Could be large enough to achieve economies of scale
Independence	<ul style="list-style-type: none">• Could require the Village to share portfolio decisions with other parties (risk of divergent goals)

Grid Supply Services Options

Grid Supply Services Required

Grid Supply Services Approaches

Requirements

Scorecards

Extend IMEA Agreement

Cost	<ul style="list-style-type: none">• Maintains access to post-2035 below-market electricity/capacity prices from Prairie State• Village would continue on a pay-as-you-go basis
Capability	<ul style="list-style-type: none">• Informed wholesale market insights• Experience in developing and responding to market developments
Governance	<ul style="list-style-type: none">• Established governance protocols• Compliance with Open Meetings Act, etc.
Horizon	<ul style="list-style-type: none">• Track record of long-term supply contracts
Scale	<ul style="list-style-type: none">• Access to utility scale projects/Power Purchase Agreements (PPAs)• Has achieved economies of scale
Independence	<ul style="list-style-type: none">• Member Directed Resource (10%) which could begin prior to 2035• REC/Carbon Offset purchases do not appear to be limited

Renewables

Renewable Energy / Carbon-Free Supply

<h4>Renewable Energy / Carbon Credits</h4>	<ul style="list-style-type: none">• A receipt certifying that 1,000 kWh of energy from a renewable or carbon-free resource has been delivered to the grid• Pairing 1 credit with 1,000 kWh of grid supply creates “Renewable Energy” or “Clean Energy”
<h4>Credit Purchases</h4>	<ul style="list-style-type: none">• Bundled: Credits are <i><u>sold together</u></i> with the underlying energy commodity• Unbundled: Credits <i><u>sold separately</u></i> from the underlying energy commodity
<h4>“100%” anything</h4>	<ul style="list-style-type: none">• Only happens when clean energy is consumed at the site where it is generated• Most “100%” claims are “Net”<ul style="list-style-type: none">- Grid supply continues as usual- A Credit is purchased to make renewable energy claims associated with the grid supply
<h4>Additionality</h4>	<ul style="list-style-type: none">• When the purchase of a Credit supports a new Renewable or Clean Energy Resource• Can be accomplished with long-term REC purchases at a price that supports development



DISCUSSION

DISCUSSION

Conclusions

- Winnetka needs Capacity and Supply to meet residents' energy needs
 - 39-40,000 kW of Capacity to ensure that peak demand can always be met
 - ~122,000,000 kWh in annual Supply volumes to meet day-to-day consumer consumption needs
- PJM operates the regional grid and wholesale market where Capacity and Supply needs are planned and purchased
 - Demand is growing while Capacity is shrinking
 - Prices are on an upward trajectory
- Multiple options are available to the Village to navigate the requirements to secure Capacity and Supply in the PJM market
 - Solo Approaches: Go it Alone, Power Marketer
 - Group Approaches: New Joint Action Agency, IMEA

Discussion

- Questions and Comments

THANK YOU

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