Adding substantial volumes of utility-scale and distributed-scale wind and solar resources into the Illinois energy market will result in net energy supply cost reductions of over $1.2 billion for Illinois consumers between 2021 and 2031.

Cost Analysis of Renewable Energy Deployment in Illinois

The Power Bureau, May 2021

Contents

Executive Summary

The Renewable Portfolio Standard (RPS) is the primary state policy to support the development of new wind and solar resources in Illinois. The current RPS policy seeks to match 25% of consumer consumption for the state's large investor-owned utilities with generation from renewable energy resources by the 2025-26 compliance year subject to a cost cap. Current estimates are that the cost cap will limit the state to only an 8.3% RPS level by the 2025-26 compliance year.

The Path to 100 Act (HB 2640 / SB 1601) proposes to increase the Illinois RPS to a 40% goal by 2031. This study compares the incremental cost of expanding Illinois' RPS to 40% by 2031 with the cost savings that would result from deploying the additional renewable energy resources (e.g., reductions in wholesale energy and capacity costs, and the retail cost savings for consumer who participate in rooftop solar and community solar projects).

The general results of the study are presented in Figure 1 and show that between 2021 and 2031, increasing Illinois' RPS to 40% as proposed in HB 2640 / SB 1601 would result a net decrease of $1.21 billion in total statewide electricity costs based on the following:

Figure 1: Additional Renewable Energy Resources in Illinois Deliver $1.2 Billion in Consumer Savings

Cost and Benefit Elements	Cost Impact With New Renewable Resources (2021$ millions)		
	Ameren Illinois	Commonwealth Edison	Combined
Expanded Renewable Portfolio Standard Cost Increase	$881.96	$2,058.27	$2,940.24
Wholesale Energy Cost Savings	-$865.17	-$893.35	-$1,758.53
Wholesale Capacity Cost Savings	-$15.70	-$1,773.28	-$1,788.98
Retail Supply Cost Savings (Community Solar)	-$53.91	-$170.38	-$224.29
Retail Supply Cost Savings (Behind the Meter Solar)	-$94.50	-$284.29	-$378.80
Net Cost Impact of Additional Renewable Energy Resources	**-$147.33**	**-$1,063.03**	**-$1,210.36**

The study finds that increasing the supply of utility-scale and distributed-scale renewable energy resources would create a net cost benefit for all Illinois energy consumers by reducing wholesale electric costs and capacity costs, as well as creating direct savings for community and rooftop solar customers. This net benefit results from how utility-scale renewable resources can procure their fuel source (e.g.-wind, solar) at no cost as well as how distributed-scale renewable resources provide energy directly to the consumer, reducing the need for wholesale energy and capacity to be procured on the wholesale market.

The concept that increased renewable energy deployment can lower wholesale energy costs has been studies widely. This study's findings and methodology are aligned with 16 published academic studies regarding wholesale energy price impacts resulting from renewable energy deployment (Figure 6).

In short, the expansion of Illinois' RPS to 40% by 2031 would deliver over $1.2 billion in lower total electricity costs for Illinois based on:

- Increased RPS funding of $2.96 billion.
- Decreased wholesale electricity supply costs of $1.76 billion.

- Decreased wholesale capacity costs of $1.79 billion.
- Increased direct retail supply cost savings from distributed generation of $603 million.

These consumer savings are dependent on the mix of both utility-scale and distributed-scale renewable energy resources that is currently in place in Illinois' RPS. As shown in Figure 2 below, utility-scale resources deliver the bulk of the renewable energy generation required to meet the state's sustainability goals. At the same time, distributed scale generation delivers the bulk of the wholesale capacity cost savings and direct consumer cost savings (e.g., community solar and rooftop solar) that make the policy a net benefit for Illinois energy consumers.

Figure 2: Significant Renewable Energy Resources Delivered Under 40% RPS (2021-2031)

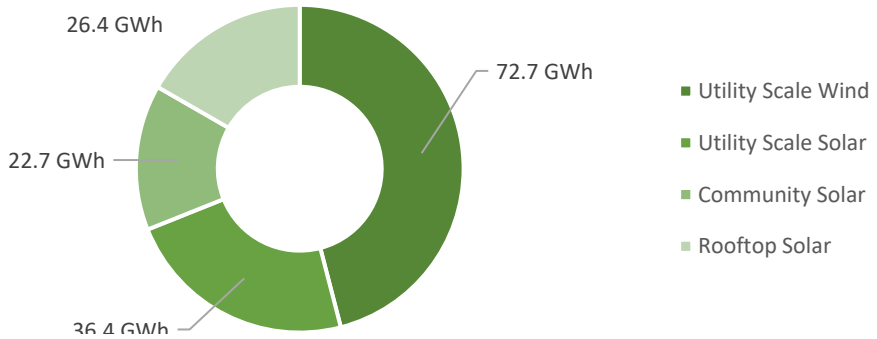
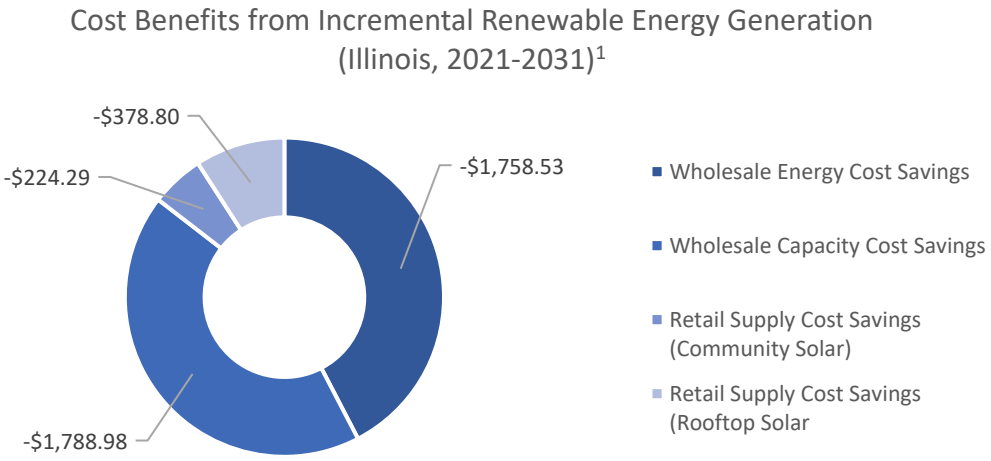


Figure 3: Sources of Cost Savings Resulting from 40% RPS (2021-2031)



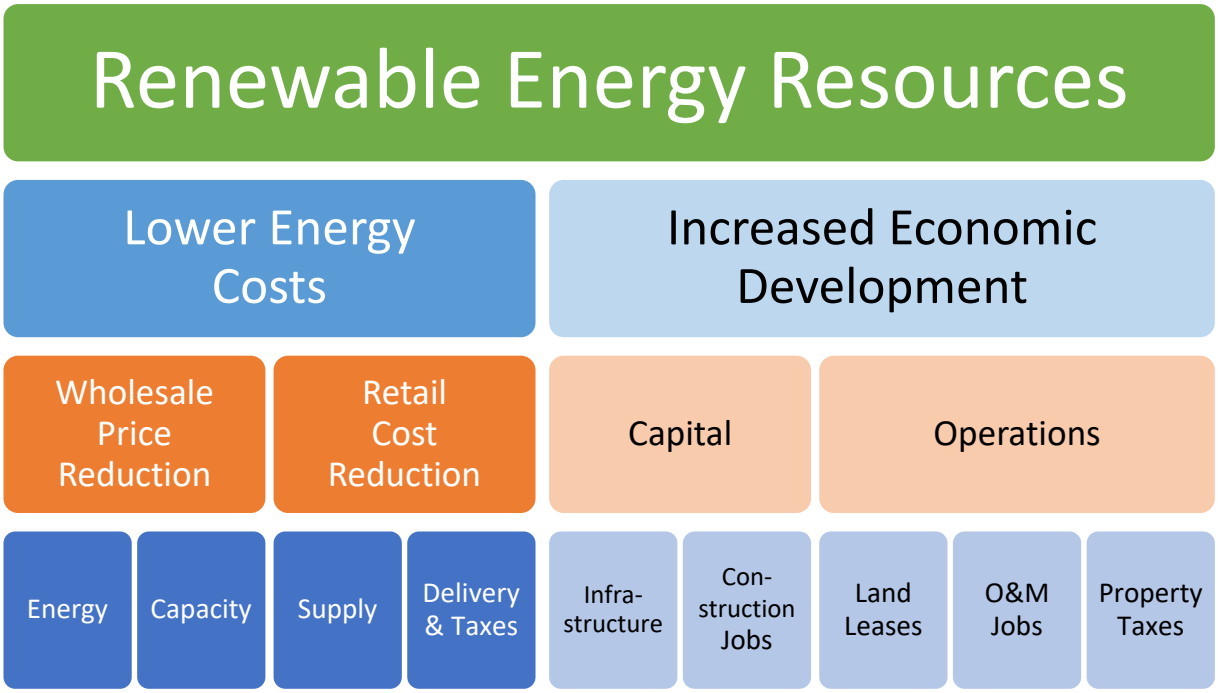
[1] A correction to the value for Retail Supply Cost Savings (Rooftop Solar) was inserted on 5/24/2021.

Price Impacts of Renewable Energy Resources

Deploying additional renewable energy resources would have a significant economic impact in Illinois. Figure 4 provides context regarding the range of economic impacts that result from investments in renewable energy resources.

While recent studies have documented that increasing the Illinois RPS to 40% would create 50,000 new jobs and $8.7 billion in increased economic output by 2033[2], this study examines only the electricity cost

Figure 4: Range of Economic Benefits Resulting from Renewable Energy Resource Deployment



impacts (including capacity) that would result from deploying incremental volumes of renewable energy resources in Illinois.

Wholesale Price Impacts.

Wholesale electricity markets in Illinois (PJM and MISO) provide two key commodities: energy and capacity. Energy is the electricity that is delivered to consumers and is typically measured in kilowatt-hours or megawatt-hours. Capacity is a commitment from a power generator to be deliver generation to the regional grid upon command over 1 to 3 years into the future. The wholesale prices of energy and capacity flow through to the rates that all Illinois consumers pay on their electric utility bills.

Prices for wholesale energy and capacity are set through separate auction processes. Prices for energy and capacity resulting from the auctions reflect the relative balance between supply and demand within

[2] "Economic Impact of Wind and Solar Energy in Illinois and the Potential Impacts of Path to 100 Legislation", Strategic Economic Research, LLC, David G. Loomis, December 2020

the region. As with other commodities, increasing supply or decreasing demand for energy or capacity will have the effect of reducing prices.

Figure 5 provides general descriptions for how utility-scale and distributed-scale renewable energy resources suppress prices for wholesale energy and capacity.

Figure 5: Renewable Energy Resources Reduce Wholesale Energy and Capacity Costs

Type of Renewables	Market Function of Renewable Energy Resources	
	Wholesale Energy Price Reductions	Wholesale capacity Price Reductions
Utility Scale Renewables	**A. Increased Energy Supply** ▪ Renewables with $0 fuel costs bid into energy auctions at near $0. ▪ More renewables clear in the energy auctions. ▪ Clearing prices decline as more expensive thermal generators are not required to meet hourly energy demand.	**C. Increased capacity Supply[2]** ▪ Renewables with $0 fuel costs bid into capacity auctions at near $0. ▪ More renewables clear in the capacity auctions. ▪ Clearing prices decline as more expensive capacity from thermal resources are not required to meet capacity requirements.
Distributed Generation Renewables	**B. Reduced Energy Demand** ▪ Distributed Generation replaces grid-sourced energy causing lower demand in hourly energy auctions. ▪ Lower demand allows lower clearing prices in energy auctions. ▪ Lower demand also reduces total energy supply costs by reducing the volume of energy purchased by consumers.	**D. Lower capacity Requirement** ▪ Distributed Generation reduces peak demand within a region. ▪ RTOs reduce the minimum required capacity volumes that must be secured through the capacity auctions. ▪ Clearing prices decline as the lower capacity requirements can be met with lower cost capacity resources.

This study considers the cost savings attributable from increasing utility-scale and distributed-scale renewable energy resources in Illinois on wholesale Energy prices (Items A and B in Figure 5). Additionally, this study considers the cost savings attributable from increasing distributed-scale renewable energy resources in Illinois on wholesale Capacity prices (Item D in Figure 5).

[3] capacity cost savings resulting from increased supply of utility-scale renewables was note estimated as current PJM and MICO capacity accreditation and market rules are evolving to better accommodate these resources. Those market rule changes were not final at the time this report was completed.

Wholesale Energy Price Impact. Numerous academic studies demonstrate the mechanics and impacts on costs resulting from the deployment of additional utility-scale renewable energy resources. Figure 6 below identifies a sampling of academic studies that document the cost impact of renewables on wholesale energy prices.

Figure 6: Academic Studies Identifying Energy Cost Impact of Renewable Energy Resources

Study	Market	Study Period	Average Renewable Energy Resource Penetration (% of Demand)	Decrease in Average Wholesale Power Energy Prices Resulting from Average Renewable Energy Resource Deployment
Woo et al (2011)	ERCOT	2007-10	5.1%	Wind: $2.70/MWh (ERCOT-N) Wind: $6.80/MWh (ERCOT -W)
Woo et al (2013)	Pacific NW	2006-12	n/a	Wind: $3.90/MWh
PJM (2009)	PJM	Generic	Wind: 15,000 MW	Wind: $4.50-6.00/MWh
Woo et al (2014)	CAISO (SP15)	2010-12	Wind: 3.4% Solar: 0.6%	Wind: $8.90/MWh Solar: $1.20/MWh
Loomis et al (2011)	Illinois	2003-11	Wind: 3,335 MW	Wind: $1.30/MWh
Woo et al (2016)	CAISO (SP15)	2012-15	Wind: 4.3% Solar: 2.6%	Wind: $7.70/MWh Solar: $2.10/MWh
Gil and Lin (2013)	PJM	2010	Wind: 1.3%	Wind: $5.30/MWh
Wiser et al (2016)	Various Regions	2013	All Renewables: 0-16%	Wind: $8.90/MWh Solar: $1.20/MWh
Craig et al (2018)	CAISO	2013-15	Solar (DG): 5%	Solar: <$1.00/MWh
Tsai and Eryilmaz (2018)	ERCOT	2014-16	Wind: 11%	Wind: $1.45-4.45/MWh
Quint and Dahlke (2019)	MISO	2014-16	Wind: 6%	Wind: $6.70/MWh
Jenkins (2017)	PJM	2008-16	n/a	Wind: $1-2.50/MWh
Wiser et al (2017)	CAISO	2008-16	Wind: 3.3%+ Solar: 9.5%+	Wind: $0.40/MWh Solar: $1.90/MWh
Wiser et al (2017)	ERCOT	2008-16	Wind: 10.8%+ Solar: 0.3%+	Wind: $0.70/MWh Solar: $0.00/MWh
Haratyk (2017)	Midwest	2008-15	Wind: 9.0%+	Wind: $4.60/MWh
Bushnell and Novan (2018)	CAISO	2012-16	Solar (Utility Scale): 8.3%+	Solar: $5.20/MWh

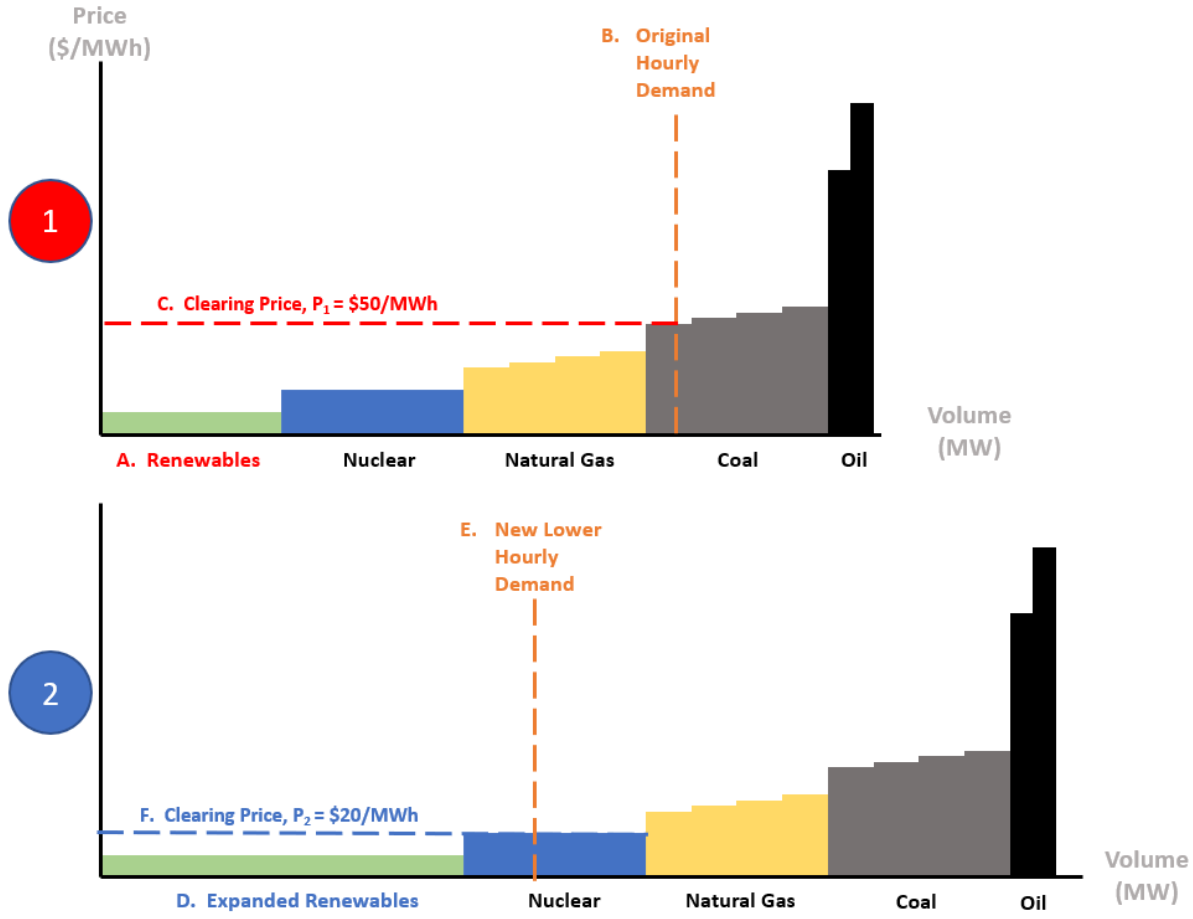
Utility-scale renewable energy resources are zero marginal cost generators because the marginal fuel cost for these resources (sunlight and wind) is zero. As such, these resources will almost always clear in the energy auction process and be accepted first by the grid operator, thereby displacing power generators with higher operating costs. Distributed generation renewables (e.g., rooftop solar, community solar) reduce hourly demand by replacing grid-sourced electricity within the wholesale market region. In

combination, the increase in energy supply due to utility-scale renewables coupled with the reduction in energy demand due to distributed-scale renewables result in lower wholesale market clearing prices in those hours when the renewable energy resources are in operation.

Figure 7 below conveys how price reductions in the regular PJM and MISO energy auctions result from increased utility scale and distributed scale renewable energy resources under two scenarios:

- Scenario 1 (Current level of renewable energy resources in the market)
  - Renewable energy resource bid into the energy auction at near $0/MWh to reflect no fuel costs (A).
  - Hourly Demand is set by the wholesale market manager (PJM, MISO) (B)
  - The hourly supply clearing price is set by the marginal generation unit (C)
- Scenario 2 (Increased level of renewable energy resources in the market)
  - More utility scale renewable energy resources bid into the energy auction at near $0/MWh (D).
  - More distributed scale renewable energy resources operating in the market reduce demand for grid-supplied energy and allows the RTO to set a lower level of hourly energy demand (E)
  - A lower hourly clearing price is set through a combination of additional utility scale renewable supply and lower demand resulting from additional distributed generation renewables (F).

Figure 7: Renewable Energy Resources Reduce Wholesale Energy Prices by Reducing Demand and Increasing Supply



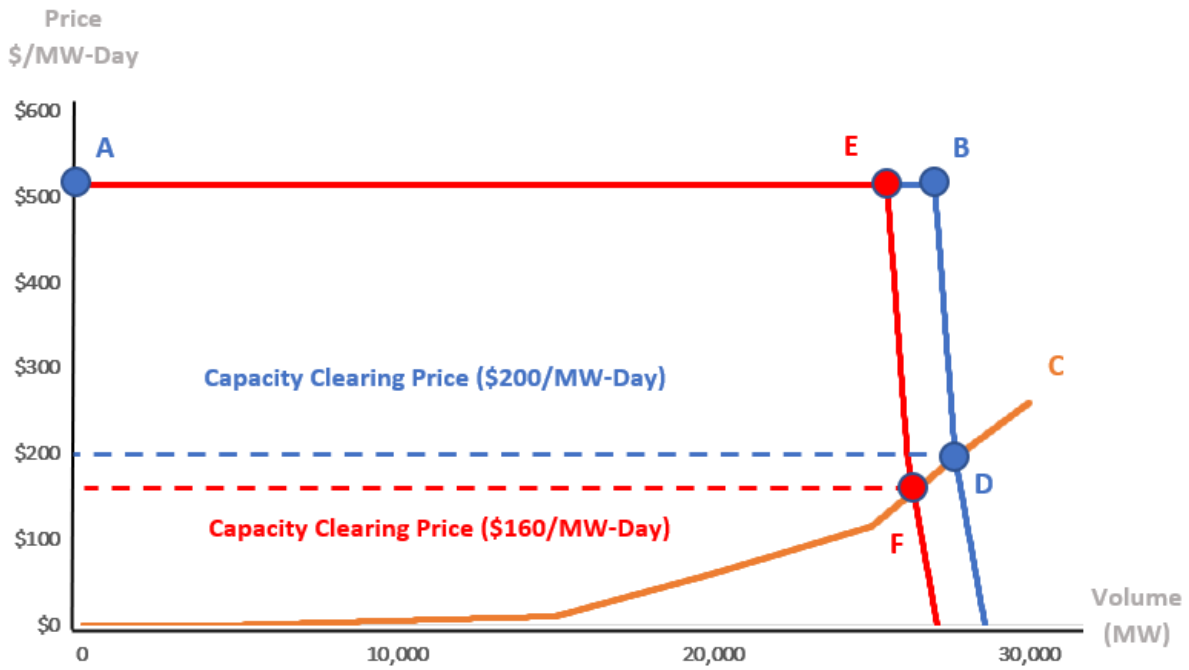
Wholesale Capacity Price Impact. PJM and MISO set minimum capacity volumes to be secured through the auction process to ensure that the regional energy market will have sufficient generation available to meet peak electric demand. Grid operators recognize that distributed generation (e.g., rooftop solar and community solar) resource reduce total peak demand within a region and adjust the minimum capacity requirements for their regional markets based on the amount of distributed-scale energy resources operating in that market.[4] Reductions in minimum capacity requirements yield lower total capacity costs.

Figure 8 below conveys how price reductions in the regular PJM capacity auctions resulting from increased distributed scale renewable energy resources:

- Scenario 1 (Current level of renewable energy resources in the market, blue demand curve)
  - PJM sets a demand curve with a minimum capacity requirement (segment AB)
  - Generating units bid in their offers to provide capacity to the PJM region (C)
  - The clearing price for capacity is set where capacity supply curve intersects the demand curve (D)
- Scenario 2 (Increased level of renewable energy resources in the market, red demand curve)
  - PJM sets a Demand Curve that reflects a lower minimum capacity requirement (segment AE)
  - The same generating units bid in their offers to provide capacity to the PJM region (C)
  - A lower capacity clearing price is set where supply intersects the new declining demand curve (F)

Increasing the volume of distributed generation resources results in a lower volume of required capacity purchases and (potentially) a lower capacity clearing price. In combination, these reductions result in lower total capacity costs within the wholesale market region which lower costs for consumers.

Figure 8: Renewable Energy Resources Reduce Capacity Prices by Reducing Regional Peak Demand and Resulting Minimum Capacity Requirements



[4] PJM Load Forecast Report (January 2021), page 56

Retail Cost Impact. Illinois consumers have the option to secure their electricity supply from rooftop solar or other distributed-scale resources. While individual cases vary, the general case in Illinois is that distributed-scale generation is deployed when the consumer can achieve a level of cost savings. The basis of cost savings varies based on type of distributed-scale resource selected (e.g., rooftop solar, community solar), energy supply rate (e.g., default fixed-rate supply, hourly electricity supply, retail electricity supply) and account size.

Rooftop Solar. Consumers that install solar panels will offset at least a portion of the volumetric charges associated with grid-supplied electricity. If the cost of the rooftop solar is lower than the grid supplied cost – either through a power purchase agreement or on a levelized purchase rate basis – then the consumer can achieve cost savings. Figure 9 conveys a range of current volumetric charges for large and small consumers served by Commonwealth Edison and Ameren Illinois.

Figure 9: Current Volumetric Charges for Grid-Source Electricity Supply (ComEd, Ameren Illinois)

Volumetric Charges for Consumers Utilizing Behind the Meter Solar	Commonwealth Edison		Ameren Illinois	
	Residential Customer Charges ($/kWh)	Large Customer Charges ($/kWh)	Residential Customer Charges ($/kWh)	Large Customer Charges ($/kWh)
Supply Costs				
Average Energy + Capacity Cost	$0.0550000	$0.0450000	$0.0320000	$0.0290000
Delivery Costs				
Distribution Facilities Charge	$0.0349400	$0.0229938	$0.0230000	$0.0208210
IEDT	$0.0011900	$0.0011900	$0.0011732	$0.0011732
Fees and Tax Costs				
Energy Efficiency Program Charges	$0.0018800	$0.0013700	$0.0020900	$0.0012000
Renewable Energy Portfolio Charges	$0.0018915	$0.0018915	$0.0181000	$0.0181000
Zero Emission Credits Charges	$0.0019500	$0.0019500	$0.0017800	$0.0017800
Environmental Cost Recovery Charges	$0.0002800	$0.0002800	$0.0017987	$0.0010478
State Taxes	$0.0033000	$0.0027000	$0.0033000	$0.0027000
Municipal Taxes	$0.0055000	$0.0030000	$0.0055000	$0.0030000
TOTAL	**$0.1059315**	**$0.0803753**	**$0.0887419**	**$0.0788220**

Community Solar. Consumers in Illinois may also access distributed-scale generation by subscribing to community solar farms. As a subscriber, a consumer receives net metering credits for a share of the electricity generated by a community solar resource. The net metering credits are valued at either the utility's Purchased Electricity Charge (for consumers served on the utility's default fixed rate) or the wholesale rate of electricity supply (for consumers served on the utility's hourly electricity rate or receiving service from a retail electricity supplier). Typically, consumers with community solar subscriptions share approximately 80% of these net metering credits with the community solar developer as compensation for the subscription. This approach allows community solar subscribers to keep 20% of the net metering credits. Figure 10 conveys a range of current net metering credit values for community solar subscriptions for consumers served by Commonwealth Edison and Ameren Illinois.

Figure 10: Current Market Values of Net Metering Credits for Community Solar Subscriptions (ComEd, Ameren Illinois)

Value of Net Metering Credits	Commonwealth Edison		Ameren Illinois	
	Small Subscriber Net Metering Credit Value ($/MWh)	Large Subscriber Net Metering Credit Value ($/MWh)	Small Subscriber Net Metering Credit Value ($/MWh)	Large Subscriber Net Metering Credit Value ($/MWh)
Current Vlaue of Net Metering Credits	$52.38	$29.10	$30.11	$29.18
Projected Average Value of Net Metering Credits 2021-2031	$56.85	$34.81	$36.74	$35.82

Wholesale Energy Cost Analysis

Illinois incentivizes renewable energy resources with funding available under the Renewable Portfolio Standard (RPS). By introducing additional utility and distributed scale renewable resources into the market, the RPS policy effectively changes the supply and demand balance within the Illinois markets. The following analysis demonstrates how the addition of new renewables in Illinois will suppress market prices for energy in the regions of Illinois served by PJM and MISO.

Approach. The Aurora XMP software package (Aurora) was used to evaluate the price effect resulting from the deployment of additional utility and distributed scale renewable energy resources in Illinois. Aurora is a commercially available electric power market forecasting tool that simulates the operations of power markets throughout North America. The Aurora forecasting tool is used by grid operators, government entities and energy businesses to model and forecast energy prices.

The Aurora model follows the same economic dispatch logic used by PJM and MISO that stipulates that the resources with the lowest marginal cost will be dispatched first. As such, Aurora forecasts future hourly demand at each load center, and then applies its algorithms to economically dispatch resources to meet demand in every hour at every load center, subject to transmission availability. The result is an hourly local market clearing price equal to the marginal cost of the last resource dispatched.

Figure 11 below conveys the updates to the Aurora database to generate the results for this study.

Figure 11: Wholesale Market Data Used in Aurora Model.

Category	Description	
	Source	Description
Fuels		
Prices	▪ EIA Annual Energy Outlook (2020)	Reference Case data used (2021-31)
Load		
Energy	▪ 2021 PJM Load Forecast Report ▪ MISO Load Forecast (State Utility Forecasting Group, 2020)	Annual consumption
capacity	▪ 2021 PJM Load Forecast Report ▪ MISO Load Forecast (State Utility Forecasting Group, 2021)	Summer peak demand
Generation		
Retirements	MISO, PJM, US DOE (EIA-860 survey data), state regulatory filings	Generating assets scheduled to retire (2021-31).
Additions (General)	US DOE (EIA-860 survey data)	All generating assets as having regulatory approvals for construction
Additions (Special)	HB 2640 / SB 1601 Illinois legislation	▪ Utility scale. Proportionate to existing interconnection applications. ▪ Distributed scale. Proportionate to relative size of utility customer base.

Figure 12 conveys the volumes of additional utility and distributed scale renewable energy resources used in the analysis based on the demand needed to meet targets in HB 2640 / SB 1601.

Figure 12: Projected Volumes of Incremental Utility and Distributed Scale Resources Deployed in Illinois Under HB 2640 / SB 1601

Proposed RPS Targets	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Annual Consumption (MWh)										
Commonwealth Edison	85,984,200	85,633,200	85,226,400	85,141,800	84,594,600	84,339,900	84,045,600	84,025,800	83,610,000	83,281,500
Ameren Illinois	37,512,375	39,401,250	39,906,750	40,317,750	40,634,250	40,936,500	41,256,000	41,535,750	41,783,250	42,033,750
MidAmerican Energy	497,943	523,016	529,726	535,182	539,383	543,395	547,636	551,350	554,635	557,960
Total Annual Consumption	**123,994,518**	**125,557,466**	**125,662,876**	**125,994,732**	**125,768,233**	**125,819,795**	**125,849,236**	**126,112,900**	**125,947,885**	**125,873,210**
Illinois RPS Gap (RECs)										
Proposed Annual RPS Goal (%)	19.0%	20.5%	22.0%	23.5%	25.0%	28.0%	31.0%	34.0%	37.0%	40.0%
Proposed Annual RPS Goal (RECs)	23,558,958	25,739,281	27,645,833	29,608,762	31,442,058	35,229,543	39,013,263	42,878,386	46,600,717	50,349,284
Sum of All Existing RPS Purchases (RECs)	9,003,876	8,980,726	9,980,476	9,976,095	9,976,043	9,968,979	9,961,986	9,964,779	9,948,207	9,941,420
RPS Gap (Actual to Goal)	**14,555,082**	**16,758,555**	**17,665,357**	**19,632,667**	**21,466,015**	**25,260,564**	**29,051,277**	**32,913,607**	**36,652,510**	**40,407,864**
Cumulative Additional Utility Scale Wind Volumes (MWh)										
Commonwealth Edison	0	0	1,515,295	3,030,590	4,545,885	6,061,180	7,576,475	9,091,769	10,607,064	12,122,359
Ameren Illinois	0	0	505,098	1,010,197	1,515,295	2,020,393	2,525,492	3,030,590	3,535,688	4,040,786
TOTAL	**0**	**0**	**2,020,393**	**4,040,786**	**6,061,180**	**8,081,573**	**10,101,966**	**12,122,359**	**14,142,752**	**16,163,146**
Cumulative Additional Utility Scale Solar Volumes (MWh)										
Commonwealth Edison	0	0	626,322	1,252,644	1,878,966	2,505,288	3,131,609	3,757,931	4,384,253	5,010,575
Ameren Illinois	0	0	383,875	767,749	1,151,624	1,535,499	1,919,374	2,303,248	2,687,123	3,070,998
TOTAL	**0**	**0**	**1,010,197**	**2,020,393**	**3,030,590**	**4,040,786**	**5,050,983**	**6,061,180**	**7,071,376**	**8,081,573**
Cumulative Additional Distributed Scale Solar Volumes - Community Solar (MWh)										
Commonwealth Edison	0	353,569	707,138	1,060,706	1,414,275	1,767,844	2,121,413	2,474,982	2,828,550	3,182,119
Ameren Illinois	0	151,529	303,059	454,588	606,118	757,647	909,177	1,060,706	1,212,236	1,363,765
TOTAL	**0**	**505,098**	**1,010,197**	**1,515,295**	**2,020,393**	**2,525,492**	**3,030,590**	**3,535,688**	**4,040,786**	**4,545,885**
Cumulative Additional Distributed Scale Solar Volumes - Behind the Meter (MWh)										
Commonwealth Edison	353,569	707,138	1,060,706	1,414,275	1,767,844	2,121,413	2,474,982	2,828,550	3,182,119	3,535,688
Ameren Illinois	151,529	303,059	454,588	606,118	757,647	909,177	1,060,706	1,212,236	1,363,765	1,515,295
TOTAL	**505,098**	**1,010,197**	**1,515,295**	**2,020,393**	**2,525,492**	**3,030,590**	**3,535,688**	**4,040,786**	**4,545,885**	**5,050,983**

Results. Increasing utility and distributed scale renewable energy resources in Illinois ratably to 40% of consumer consumption by the 2030-31 delivery year would increase total annual renewable energy generation in Illinois to nearly 50 million MWh. By 2030-31, new renewable energy resources would equal approximately 22.3 million MWh of additional generation from utility scale wind and solar resources, and approximately 8.3 million MWh of additional generation from distributed solar resources.

The addition of utility scale resources will increase the supply of electricity bidding into the PJM and MISO wholesale hourly energy auctions. At the same time, the addition of distributed resources will decrease demand for electricity supply in the PJM and MISO wholesale energy auctions.

Using the additional volumes of renewable energy resources noted in Figure 13, the Aurora simulation projected incremental reductions in the average clearing price of energy for both the PJM (Commonwealth Edison) and MISO (Ameren Illinois) regions of Illinois. As noted, the introduction of the identified volumes of additional renewables into Illinois would result in the following over the 2021-22 to 2030-31 delivery years:

- Over $1.7 billion in wholesale energy cost reductions statewide; and,
- An average energy price reduction of $1.06/MWh (2.9%) in the ComEd service region and $2.03/MWh (5.5%) in the Ameren Illinois service region.

Figure 13: Projected Wholesale Energy Cost Savings Resulting from Increased Deployment of Renewable Energy Resources (2021-2031)

Metrics	Price ***Without*** Path to 100 (2021$/MWh)	Price ***With*** Path to 100 (2021$/MWh)	Price Change ***With*** Path to 100 (2021$/MWh)	Electricity Consumption (GWh)	Cost Impact ***With*** Path to 100 (2021$ millions)
Wholesale Energy Price Impact					
Illinois Average	**$36.67**	**$35.26**	**-$1.41**	**1,251**	**-$1,758.53**
Commonwealth Edison (PJM)	$36.68	$35.63	-$1.06	846	-$893.35
Ameren Illinois (MISO)	$36.64	$34.50	-$2.13	405	-$865.17

Figures 14 and 15 convey the details of the projected cost reductions for wholesale energy in the ComEd and Ameren Illinois markets.

Figure 14: Projected Wholesale Energy Cost Savings Resulting from Increased Deployment of Renewable Energy Resources (ComEd Region, 2021-2031)

Commonwealth Edison	DELIVERY YEARS										
	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	Cumulative
Energy Cost (Business as Usual)											
Baseline Energy Consumption (MWh)	85,984,200	85,633,200	85,226,400	85,141,800	84,594,600	84,339,900	84,045,600	84,025,800	83,610,000	83,281,500	845,883,000
Modeled Electricity Price (LMP, $/MWh)	$29.17	$29.85	$30.55	$31.47	$32.04	$39.46	$41.32	$43.42	$44.52	$45.63	$36.68
Energy Cost ($/Year)	$2,508,159,114	$2,556,151,020	$2,603,666,520	$2,679,412,446	$2,710,410,984	$3,328,052,454	$3,472,764,192	$3,648,400,236	$3,722,317,200	$3,800,134,845	$31,029,469,011
Energy Cost (with Additional DG)											
Baseline Energy Consumption (MWh)	85,984,200	85,633,200	85,226,400	85,141,800	84,594,600	84,339,900	84,045,600	84,025,800	83,610,000	83,281,500	845,883,000
Distributed Generation Reductions (MWh)	353,569	1,060,706	1,767,844	2,474,982	3,182,119	3,889,257	4,596,395	5,303,532	6,010,670	6,717,807	35,356,881
Net Energy Consumption (MWh)	85,630,631	84,572,494	83,458,556	82,666,818	81,412,481	80,450,643	79,449,205	78,722,268	77,599,330	76,563,693	810,526,119
Modeled Electricity Price (LMP, $/MWh)	$29.10	$29.65	$30.00	$30.45	$30.95	$38.32	$40.14	$41.82	$42.86	$43.52	$35.63
Energy Cost ($/Year)	$2,502,140,220	$2,539,024,380	$2,556,792,000	$2,592,567,810	$2,618,202,870	$3,231,904,968	$3,373,590,384	$3,513,958,956	$3,583,524,600	$3,624,410,880	$30,136,117,068
Distributed Generation Driven Energy Cost Reductions											
Energy Cost (Business as Usual)	$2,508,159,114	$2,556,151,020	$2,603,666,520	$2,679,412,446	$2,710,410,984	$3,328,052,454	$3,472,764,192	$3,648,400,236	$3,722,317,200	$3,800,134,845	$31,029,469,011
Energy Cost (with Additional DG)	$2,502,140,220	$2,539,024,380	$2,556,792,000	$2,592,567,810	$2,618,202,870	$3,231,904,968	$3,373,590,384	$3,513,958,956	$3,583,524,600	$3,624,410,880	$30,136,117,068
Annual Energy Cost Savings from Additional Renewables	**$6,018,894**	**$17,126,640**	**$46,874,520**	**$86,844,636**	**$92,208,114**	**$96,147,486**	**$99,173,808**	**$134,441,280**	**$138,792,600**	**$175,723,965**	**$893,351,943**

Figure 15: Projected Wholesale Energy Cost Savings Resulting from Increased Deployment of Renewable Energy Resources (Ameren Illinois Region, 2021-2031)

Ameren Illinois	DELIVERY YEARS										
	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	Cumulative
Energy Cost (Business as Usual)											
Baseline Energy Consumption (MWh)	37,512,375	39,401,250	39,906,750	40,317,750	40,634,250	40,936,500	41,256,000	41,535,750	41,783,250	42,033,750	405,317,625
Modeled Electricity Price (LMP, $/MWh)	$29.04	$29.75	$30.45	$31.24	$32.11	$39.10	$41.10	$43.08	$44.15	$44.70	$36.64
Energy Cost ($/Year)	$1,089,359,370	$1,172,187,188	$1,215,160,538	$1,259,526,510	$1,304,765,768	$1,600,617,150	$1,695,621,600	$1,789,360,110	$1,844,730,488	$1,878,908,625	$14,850,237,345
Energy Cost (with Path to 100)											
Baseline Energy Consumption (MWh)	37,512,375	39,401,250	39,906,750	40,317,750	40,634,250	40,936,500	41,256,000	41,535,750	41,783,250	42,033,750	405,317,625
Distributed Generation Reductions (MWh)	151,529	303,059	606,118	909,177	1,212,236	1,515,295	1,818,354	2,121,413	2,424,472	2,727,531	13,789,186
Net Energy Consumption (MWh)	37,360,846	39,098,191	39,300,632	39,408,573	39,422,014	39,421,205	39,437,646	39,414,337	39,358,778	39,306,219	391,528,439
Modeled Electricity Price (LMP, $/MWh)	$29.10	$29.65	$30.00	$30.45	$30.95	$38.32	$40.14	$41.82	$42.86	$43.52	$34.50
Energy Cost ($/Year)	$1,087,200,604	$1,159,261,355	$1,179,018,952	$1,199,991,040	$1,220,111,326	$1,510,620,568	$1,583,027,103	$1,648,307,566	$1,686,917,219	$1,710,606,645	$13,985,062,380
Path to 100 Driven Energy Cost Reductions											
Energy Cost (Business as Usual)	$1,089,359,370	$1,172,187,188	$1,215,160,538	$1,259,526,510	$1,304,765,768	$1,600,617,150	$1,695,621,600	$1,789,360,110	$1,844,730,488	$1,878,908,625	$14,850,237,345
Energy Cost (with Path to 100)	$1,087,200,604	$1,159,261,355	$1,179,018,952	$1,199,991,040	$1,220,111,326	$1,510,620,568	$1,583,027,103	$1,648,307,566	$1,686,917,219	$1,710,606,645	$13,985,062,380
Annual Energy Cost Savings from Additional Renewables	**$2,158,766**	**$12,925,833**	**$36,141,585**	**$59,535,470**	**$84,654,441**	**$89,996,582**	**$112,594,497**	**$141,052,544**	**$157,813,269**	**$168,301,980**	**$865,174,965**

Wholesale capacity Cost Analysis

Introducing additional distributed-scale renewable resources into the Illinois market will reduce the required levels of capacity defined by PJM and MISO. The following analysis calculates the reduction in capacity costs for the regions of Illinois served by PJM and MISO.

Approach. capacity markets do not lend themselves to the same modeling techniques used for energy markets due to different auction rules and operations. However, we can approximate the cost savings value of additional distributed generation renewables by applying the following analysis to the results of the most recent PJM and Ameren Illinois capacity auctions.

- Adopt the most recent peak demand projections plus the regional reserve margins for the load zones that include ComEd and Ameren Illinois as the minimum capacity requirements for each delivery year between 2021-22 and 2030-31.
- Adjust the projected minimum capacity requirements to reflect the peak demand reductions resulting from the addition of distributed renewable energy resources in Illinois (factored for Class average capacity factor).
- Estimate the resulting capacity clearing prices for each delivery year using the 2021-22 supply curve.
- Multiply the resulting capacity clearing prices by the new reduced minimum capacity requirements to calculate annual capacity costs.

Figure 16 conveys the results of adjusting PJM's capacity demand curve to reflect the increase in distributed generation capacity noted in Figure 17 and adjusted for Class Average Capacity Factors.

Figure 16: capacity Price Reduction Resulting from Deployment of Incremental Distributed Generation Renewables in the ComEd Service Region

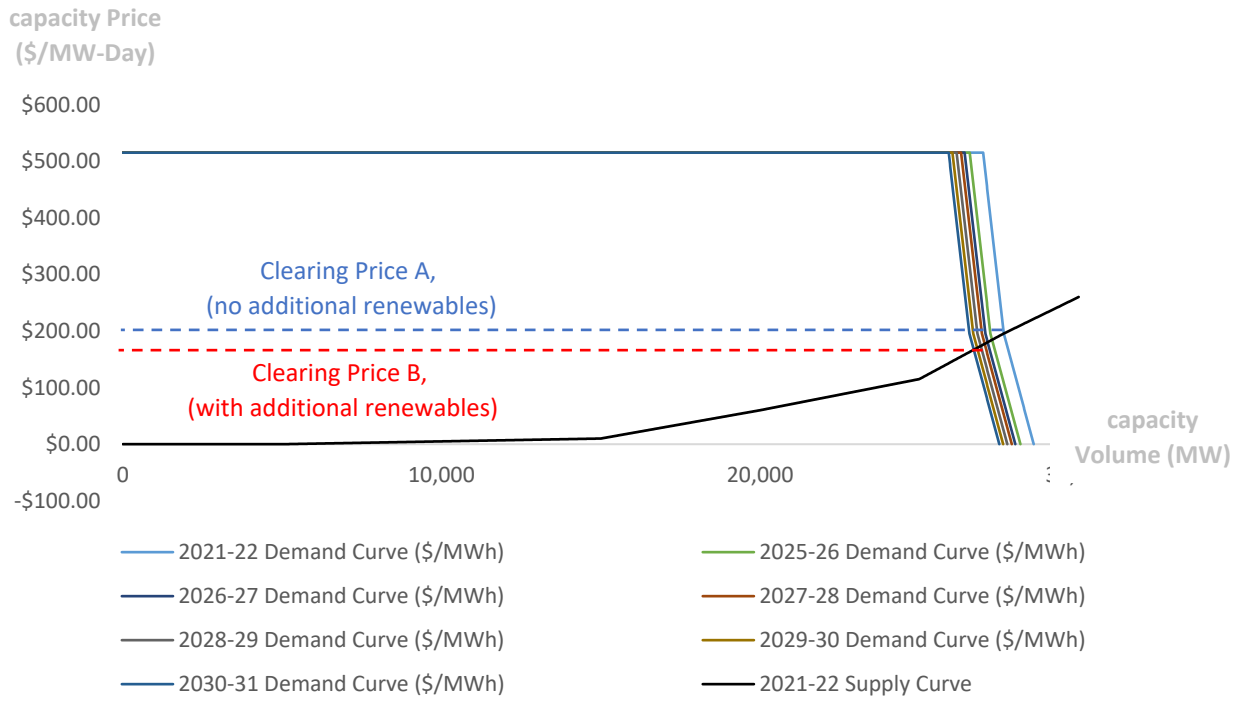


Figure 17: Cumulative Incremental Distributed Generation Capacity Additions in Illinois

Modeled Volumes of Distributed Generation	Delivery Years									
	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Incremental Distributed Scale Solar Volumes (MWac, Adjusted for Class Average Capacity, Pre-Existing RTO Planning Volumes for Distributed Generation)										
Commonwealth Edison	0	0	0	0	479	650	781	939	1,088	1,226
Ameren Illinois	0	122	200	277	354	432	509	586	664	741
TOTAL	**0**	**122**	**200**	**277**	**833**	**1,082**	**1,290**	**1,526**	**1,752**	**1,966**

Figures 18 and 19 present the capacity cost reduction calculations for the ComEd and Ameren regions. As noted, we approximate the cost savings of additional distributed generation renewables by adjusting the most recent capacity demand curves to reflect changes in minimum capacity requirements, and adjusting capacity purchasing volume to reflect lower total capacity requirements.

A few details of note include:

- For the ComEd service region:
  - Changes in wholesale capacity costs are not expected to impact consumer bills until the 2025-26 program year due to the 3-year forward schedule for the PJM capacity auction process.
  - Nameplate capacity of distributed generation resources was adjusted downward to reflect the Class Average Capacity Factors that PJM applies to renewable resources.
  - Reserve Margins were assumed to remain at 15.3% for all years of the study.
  - Clearing prices for wholesale capacity reduce over time with the introduction of additional distributed generation due to the upward sloping supply curve applied by PJM in its most recent auction.
  - Only capacity from distributed generation – not utility scale wind and solar - were included in the analysis.

- For the Ameren Illinois service region:
  - Changes in wholesale capacity costs are not expected to impact consumer electricity bills until the 2022-23 program year due to the 1-year forward capacity auction purchasing schedule applied by MISO.
  - Nameplate capacity of distributed generation resources was adjusted downward to reflect the Class Average Capacity Factors that MISO applies to renewable resources.
  - Reserve Margins were assumed to settle and remain at 10.7%.
  - Clearing prices for wholesale capacity remain constant over time even with the introduction of additional distributed generation due to the relatively flat supply curve evidenced in the most recent MISO capacity auction (see Figure 5).
  - Only capacity from distributed generation – not utility scale wind and solar - were included in the analysis.

Figure 18: Projected Wholesale capacity Cost Savings Resulting from Increased Deployment of Renewable Energy Resources (ComEd Region, 2021-2031)

Commonwealth Edison	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Scenario 1: Capacity Cost with Current Volumes of Renewable Energy Resources										
Gross ComEd Capacity Projection (MW, UCAP)	20,101	19,977	19,863	19,748	19,677	19,569	19,502	19,428	19,338	19,239
Reserve Margin	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%
Minimum Capacity Auction Volume	24,594	24,442	24,303	24,161	24,075	23,943	23,861	23,770	23,660	23,539
2021-22 Capacity Rate ($/MW-Day)	$195.55	$195.55	$195.55	$195.55	$195.55	$195.55	$195.55	$195.55	$195.55	$195.55
Zonal Factor	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384
Forecast Pool Requirements	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820
Days in Compliance Year	365	365	365	365	365	365	365	365	365	365
Projected Annual Capacity Cost	$2,127,663,726	$2,114,564,929	$2,102,514,037	$2,090,253,563	$2,082,813,447	$2,071,391,296	$2,064,265,551	$2,056,406,273	$2,046,870,349	$2,036,391,311
Annual Consumption (MWh)	85,984,200	85,633,200	85,226,400	85,141,800	84,594,600	84,339,900	84,045,600	84,025,800	83,610,000	83,281,500
Average Capacity Cost/MWh	**$24.74**	**$24.69**	**$24.67**	**$24.55**	**$24.62**	**$24.56**	**$24.56**	**$24.47**	**$24.48**	**$24.45**
Scenario 2: Capacity Cost with Incremental Increase in Renewable Energy Resoruces										
Gross PJM Capacity Projection (MW, UCAP)	20,101	19,977	19,863	19,748	19,677	19,569	19,502	19,428	19,338	19,239
Incremental DG Solar Capacity (MW, UCAP)	0	0	0	0	-479	-650	-781	-939	-1,088	-1,226
Adjusted PJM Capacity Projection (MW, UCAP)	20,101	19,977	19,863	19,748	19,198	18,919	18,721	18,488	18,249	18,013
Reserve Margin	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%
Minimum Capacity Auction Volume	24,594	24,442	24,303	24,161	23,489	23,148	22,905	22,621	22,328	22,039
2021-22 Capacity Rate ($/MW-Day)	$195.55	$195.55	$195.55	$195.55	$187.23	$178.91	$176.83	$172.67	$168.51	$166.43
Zonal Factor	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384	1.11384
Forecast Pool Requirements	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820	1.08820
Days in Compliance Year	365	365	365	365	365	365	365	365	365	365
Projected Annual Capacity Cost	$2,127,663,726	$2,114,564,929	$2,102,514,037	$2,090,253,563	$1,945,654,925	$1,832,157,778	$1,791,857,873	$1,727,976,550	$1,664,518,095	$1,622,695,771
Annual Consumption (MWh)	85,630,631	84,572,494	83,458,556	82,666,818	81,412,481	80,450,643	79,449,205	78,722,268	77,599,330	76,563,693
Average Capacity Cost/MWh	**$24.85**	**$25.00**	**$25.19**	**$25.29**	**$23.90**	**$22.77**	**$22.55**	**$21.95**	**$21.45**	**$21.19**
Capacity Cost Savings										
Scenario 1: Projected Annual Cost	$2,127,663,726	$2,114,564,929	$2,102,514,037	$2,090,253,563	$2,082,813,447	$2,071,391,296	$2,064,265,551	$2,056,406,273	$2,046,870,349	$2,036,391,311
Scenario 2: Projected Annual Cost	$2,127,663,726	$2,114,564,929	$2,102,514,037	$2,090,253,563	$1,945,654,925	$1,832,157,778	$1,791,857,873	$1,727,976,550	$1,664,518,095	$1,622,695,771
Projected Consumer Cost Savings	$0	$0	$0	$0	$137,158,522	$239,233,518	$272,407,677	$328,429,722	$382,352,254	$413,695,540

Figure 19: Projected Wholesale capacity Cost Savings Resulting from Increased Deployment of Renewable Energy Resources (ComEd Region, 2021-2031)

Ameren Illinois	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Scenario 1: Capacity Cost with Current Volumes of Renewable Energy Resources										
Base Capacity Projection (MW, UCAP)	7,117	7,201	7,268	7,320	7,360	7,399	7,443	7,482	7,516	7,549
DG Solar Capacity (MW, UCAP)	0	0	0	0	0	0	0	0	0	0
Net MISO Capacity Projection (MW, UCAP)	7,117	7,201	7,268	7,320	7,360	7,399	7,443	7,482	7,516	7,549
Reserve Margin	11.3%	11.1%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%
Minimum Capacity Auction Volume	7,921	8,001	8,045	8,103	8,147	8,191	8,240	8,282	8,320	8,357
2021-22 Capacity Rate ($/MW-Day)	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00
Days in Compliance Year	365	365	365	365	365	365	365	365	365	365
Projected Annual Capacity Cost	$28,913,269	$29,202,919	$29,365,424	$29,574,887	$29,737,802	$29,897,807	$30,075,268	$30,229,456	$30,369,097	$30,502,920
Annual Consumption (MWh)	39,957,238	40,416,940	40,773,329	41,054,436	41,268,270	41,478,099	41,711,153	41,915,376	42,095,573	42,271,766
Average Capacity Cost/MWh	**$0.89**	**$0.85**	**$0.82**	**$0.82**	**$0.82**	**$0.81**	**$0.80**	**$0.79**	**$0.78**	**$0.76**
Scenario 2: Capacity Cost with Incremental Increase in Renewable Energy Resoruces										
Base Capacity Projection (MW, UCAP)	7,117	7,201	7,268	7,320	7,360	7,399	7,443	7,482	7,516	7,549
DG Solar Capacity (MW, UCAP)	0	0	0	0	0	0	0	0	0	0
Incremental DG Solar Capacity (MW, UCAP)	0	-122	-200	-277	-354	-432	-509	-586	-664	-741
Adjusted MISO Capacity Projection (MW, UCAP)	7,117	7,079	7,068	7,043	7,006	6,968	6,934	6,895	6,852	6,808
Reserve Margin	11.3%	11.1%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%	10.7%
Minimum Capacity Auction Volume	7,921	7,865	7,824	7,796	7,755	7,713	7,676	7,633	7,586	7,537
2021-22 Capacity Rate ($/MW-Day)	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00
Days in Compliance Year	365	365	365	365	365	365	365	365	365	365
Projected Annual Capacity Cost	$28,913,269	$28,706,710	$28,558,591	$28,455,643	$28,306,147	$28,153,743	$28,018,793	$27,860,571	$27,687,802	$27,509,214
Annual Consumption (MWh)	39,805,708	40,113,881	40,167,211	40,145,259	40,056,033	39,962,804	39,892,799	39,793,963	39,671,101	39,544,234
Average Capacity Cost/MWh	**$0.89**	**$0.84**	**$0.80**	**$0.79**	**$0.78**	**$0.77**	**$0.75**	**$0.73**	**$0.71**	**$0.69**
Capacity Cost Savings										
Scenario 1: Projected Annual Cost	$28,913,269	$29,202,919	$29,365,424	$29,574,887	$29,737,802	$29,897,807	$30,075,268	$30,229,456	$30,369,097	$30,502,920
Scenario 2: Projected Annual Cost	$28,913,269	$28,706,710	$28,558,591	$28,455,643	$28,306,147	$28,153,743	$28,018,793	$27,860,571	$27,687,802	$27,509,214
Projected Consumer Cost Savings	$0	$496,210	$806,834	$1,119,244	$1,431,654	$1,744,065	$2,056,475	$2,368,885	$2,681,295	$2,993,706

Results. The addition of approximately 5,000 MW of installed distributed renewable capacity in Illinois between delivery years 2021-22 and 2030-31 is projected to result in a net reduction of unforced capacity requirements of approximately 1,966 MW. Reducing the minimum capacity requirements for the ComEd service region will result in a reduction in purchased capacity volumes as well as lower clearing prices for capacity. Reducing the minimum capacity requirements for the Ameren Illinois service region is projected to result in lower volumes of capacity purchases only.

Figure 20 conveys the capacity cost savings of introducing additional renewable capacity into Illinois over the 2021-22 to 2030-31 delivery years.

- Over $1.73 billion in statewide capacity cost reductions; and,
- An average capacity price reduction of $1.12/MWh (4.6%) in the ComEd region and $0.01/MWh (1.4%) in the Ameren Illinois region.

Figure 20: Projected Wholesale capacity Cost Savings Resulting from Deployment of Incremental Renewable Energy Resources (2021-31)

Metrics	Price ***Without*** Path to 100 (2021$/MWh)	Price ***With*** Path to 100 (2021$/MWh)	Price Change ***With*** Path to 100 (2021$/MWh)	Electricity Consumption (GWh)	Cost Impact ***With*** Path to 100 (2021$ millions)
Wholesale Capacity Price Impact					
Illinois Average	**$15.34**	**$14.01**	**-$1.43**	**1,251**	**-$1,788.98**
Commonwealth Edison (PJM)	$24.58	$23.47	-$1.12	846	-$1,773.28
Ameren Illinois (MISO)	$0.72	$0.71	-$0.01	405	-$15.70

Additional capacity cost savings could occur in the event of any of the following:

- Revisions to the Minimum Offer Price Rule (MOPR) standard as interpreted by FERC.
- Unannounced retirements of existing baseload power plants within the PJM and MISO footprints.
- Earlier or greater deployment of distributed generation renewables in Illinois

Retail Cost Savings Analysis

Introducing additional distributed-scale renewable resources into the Illinois market will allow consumers the ability to achieve direct cost savings against their standard utility charges. The following analysis calculates average cost reductions expected for Illinois consumers through rooftop solar and community solar options.

Approach. While individual distributed-scale resource projects will carry their own economic costs and benefits, we can estimate a conservative, generalized level of consumer cost savings for rooftop and community solar projects.

- Community Solar. Based on current program data, we assumed that 75% of community solar subscriptions would be assigned to consumers with small accounts (Residential and Small Commercial rate class accounts for ComEd, DS1 and DS2 rate class accounts for Ameren Illinois) and would be served on the utility fixed rate default service. Also, we assumed that the remaining 25% of community solar subscriptions would be assigned to consumers with large accounts. Lastly, we assumed that all consumers that secured a community solar subscription would retain 20% of the net metering credits applied to their accounts.

  We then applied the volumetric assumptions to the current value basis for net metering credits (figure 10). By multiplying the volume and value basis for each consumer group we were able to project a net consumer cost savings for the 2021 to 2031 period.

- Rooftop Solar. Based on current program data, we assumed that 50% of rooftop solar installations would serve consumers with small accounts (Residential and Small Commercial rate class accounts for ComEd, DS1 and DS2 rate class accounts for Ameren Illinois). Also, we assumed that the remaining 50% of rooftop solar installations would serve consumers with large accounts. Lastly, we assumed that all consumers served by rooftop solar arrays would achieve an average 15% cost savings against the average cost of electricity supply, delivery, and taxes.

  We then applied the volumetric assumptions to the current value basis for electricity supply, delivery, and taxes (Figure 9) and then escalated that value by 1% per annum for the term of the study. By multiplying the volume and value basis for each consumer group we were able to project a net consumer cost savings for the 2021 to 2031 period.

  While rooftop solar and community solar installations would be expected to generate savings for a 20–30-year project lifespan, this analysis only calculates the cost reductions for the first ten years.

  Results. Figure 21 conveys the projected consumer cost savings for the proposed expansion of community solar and rooftop solar in Illinois for the years 2021-2031. Figures 22 and 23 convey the details of the analysis.

Figure 21: Projected Wholesale capacity Cost Savings Resulting from Deployment of Incremental Renewable Energy Resources (2021-31)

Metrics	Cost Impact ***With*** New Renewable Resources (2021$ millions)
Retail Supply Cost Impact of Distributed Generation (Community Solar)	
Illinois Total	**-$224.29**
Commonwealth Edison	-$170.38
Ameren Illinois	-$53.91
Retail Supply Cost Impact of Distributed Generation (Behind the Meter Solar)	
Illinois Total	**-$378.80**
Commonwealth Edison	-$284.29
Ameren Illinois	-$94.50

Figure 22: Projected Retail Cost Savings Resulting from Deploying incremental Community Solar Resources (2021-31)

Community Solar (Retail Customer Benefits)	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Commonwealth Edison										
Volumes of Resources (MWh)	-	353,569	707,138	1,060,706	1,414,275	1,767,844	2,121,413	2,474,982	2,828,550	3,182,119
Large Subscriber Percentage	-	25%	25%	25%	25%	25%	25%	25%	25%	25%
Large Subscriber Credit Rate	-	$29.10	$29.65	$30.00	$30.45	$30.95	$38.32	$40.14	$41.82	$42.86
Large Subscriber Share	-	20%	20%	20%	20%	20%	20%	20%	20%	20%
Large Subscriber Value	-	$514,443	$1,048,332	$1,591,060	$2,153,234	$2,735,739	$4,064,627	$4,967,288	$5,914,499	$6,819,282
Small Subscriber Percentage	-	75%	75%	75%	75%	75%	75%	75%	75%	75%
Small Subscriber Credit Rate	-	$52.38	$52.93	$53.28	$53.73	$53.24	$59.62	$61.19	$62.38	$62.92
Small Subscriber Share	-	20%	20%	20%	20%	20%	20%	20%	20%	20%
Small Subscriber Value	-	$2,777,978	$5,614,294	$8,477,128	$11,398,301	$14,117,773	$18,971,320	$22,716,934	$26,464,852	$30,032,947
Annual ComEd Consumer Cost Savings	-	**$3,292,420**	**$6,662,625**	**$10,068,188**	**$13,551,535**	**$16,853,512**	**$23,035,947**	**$27,684,223**	**$32,379,351**	**$36,852,229**
Ameren Illinois										
Volumes of Resources (MWh)	-	151,529	303,059	454,588	606,118	757,647	909,177	1,060,706	1,212,236	1,363,765
Large Subscriber Percentage	-	25%	25%	25%	25%	25%	25%	25%	25%	25%
Large Subscriber Credit Rate	-	$29.18	$29.90	$30.43	$31.07	$31.77	$39.56	$41.69	$43.70	$45.06
Large Subscriber Share	-	20%	20%	20%	20%	20%	20%	20%	20%	20%
Large Subscriber Value	-	$221,109	$453,138	$691,702	$941,524	$1,203,336	$1,798,502	$2,211,143	$2,648,580	$3,072,744
Small Subscriber Percentage	-	75%	75%	75%	75%	75%	75%	75%	75%	75%
Small Subscriber Credit Rate	-	$30.11	$30.83	$31.36	$31.99	$32.69	$40.49	$42.62	$44.62	$45.99
Small Subscriber Share	-	20%	20%	20%	20%	20%	20%	20%	20%	20%
Small Subscriber Value	-	$684,373	$1,401,507	$2,138,245	$2,908,755	$3,715,236	$5,521,780	$6,780,749	$8,114,106	$9,407,644
Annual Ameren Illinois Consumer Cost Savings	-	**$905,483**	**$1,854,645**	**$2,829,947**	**$3,850,279**	**$4,918,571**	**$7,320,282**	**$8,991,891**	**$10,762,686**	**$12,480,387**
All Utilities										
Annual ComEd Consumer Cost Savings	-	$3,292,420	$6,662,625	$10,068,188	$13,551,535	$16,853,512	$23,035,947	$27,684,223	$32,379,351	$36,852,229
Annual Ameren Illinois Consumer Cost Savings	-	$905,483	$1,854,645	$2,829,947	$3,850,279	$4,918,571	$7,320,282	$8,991,891	$10,762,686	$12,480,387
TOTAL ANNUAL CONSUMER COST SAVINGS	-	**$4,197,903**	**$8,517,271**	**$12,898,135**	**$17,401,814**	**$21,772,083**	**$30,356,229**	**$36,676,114**	**$43,142,037**	**$49,332,616**

Figure 23: Projected Retail Cost Savings Resulting from Deploying Incremental Rooftop Solar Resources (2021-31)

Behind the Meter (Retail Customer Benefits)	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Commonwealth Edison										
Volumes of Resources (MWh)	353,569	707,138	1,060,706	1,414,275	1,767,844	2,121,413	2,474,982	2,828,550	3,182,119	3,535,688
Large Subscriber Percentage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Large Subscriber Credit Rate	$80.38	$81.18	$81.99	$82.81	$83.64	$82.53	$83.35	$84.18	$85.03	$85.88
Large Subscriber Share	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Large Subscriber Value	$2,131,366	$4,305,359	$6,522,618	$8,783,793	$11,089,538	$13,130,264	$15,471,827	$17,858,909	$20,292,186	$22,772,342
Small Subscriber Percentage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Small Subscriber Credit Rate	$105.93	$106.99	$108.06	$109.14	$110.23	$109.39	$110.48	$111.58	$112.70	$113.83
Small Subscriber Share	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Small Subscriber Value	$2,809,056	$5,674,292	$8,596,553	$11,576,691	$14,615,573	$17,403,817	$20,507,498	$23,671,512	$26,896,756	$30,184,137
Annual ComEd Consumer Cost Savings	**$4,940,421**	**$9,979,651**	**$15,119,171**	**$20,360,484**	**$25,705,111**	**$30,534,081**	**$35,979,325**	**$41,530,421**	**$47,188,941**	**$52,956,479**
Ameren Illinois										
Volumes of Resources (MWh)	151,529	151,530	303,059	454,589	606,118	757,648	909,177	1,060,707	1,212,236	1,363,766
Large Subscriber Percentage	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Large Subscriber Credit Rate	$78.82	$79.61	$80.41	$81.21	$82.02	$81.06	$81.87	$82.69	$83.52	$84.35
Large Subscriber Share	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Large Subscriber Value	$447,895	$452,374	$913,795	$1,384,400	$1,864,325	$2,303,136	$2,791,401	$3,289,201	$3,796,678	$4,313,975
Small Subscriber Percentage	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Small Subscriber Credit Rate	$88.74	$89.63	$90.53	$91.43	$92.35	$91.49	$92.40	$93.33	$94.26	$95.20
Small Subscriber Share	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Small Subscriber Value	$1,512,789	$1,527,920	$3,086,396	$4,675,888	$6,296,861	$7,798,067	$9,451,257	$11,136,731	$12,854,969	$14,606,458
Annual Ameren Illinois Consumer Cost Savings	**$1,960,684**	**$1,980,295**	**$4,000,191**	**$6,060,287**	**$8,161,186**	**$10,101,204**	**$12,242,658**	**$14,425,932**	**$16,651,646**	**$18,920,432**
All Utilities										
Annual ComEd Consumer Cost Savings	$4,940,421	$9,979,651	$15,119,171	$20,360,484	$25,705,111	$30,534,081	$35,979,325	$41,530,421	$47,188,941	$52,956,479
Annual Ameren Illinois Consumer Cost Savings	$1,960,684	$1,980,295	$4,000,191	$6,060,287	$8,161,186	$10,101,204	$12,242,658	$14,425,932	$16,651,646	$18,920,432
TOTAL ANNUAL CONSUMER COST SAVINGS	**$6,901,105**	**$11,959,945**	**$19,119,362**	**$26,420,771**	**$33,866,296**	**$40,635,285**	**$48,221,984**	**$55,956,353**	**$63,840,587**	**$71,876,911**

Cost-Benefit Analysis

A primary financial tool for supporting renewable energy resource development in Illinois is the state's renewable portfolio standard (RPS). The financial resources available through the RPS are constrained by a formula-based cost cap that is tied to retail electricity prices for electricity in 2007. The Path to 100 legislation proposes an increase in the RPS cost cap to allow more funding for new renewable energy resources in Illinois. The funding levels proposed by the HB 2640 / SB 1601 are on par with the funding schedule for the state's Energy Efficiency Portfolio Standard.

Our analysis concludes the following:

- The current RPS cost cap allows annual expenditures of approximately $240 million.
- The HB 2640 / SB 1601 would allow annual expenditures to scale up to approximately $600 million.
- Between 2021-31, the proposed increase in RPS funding of renewables by $2.96 billion (see Figure 25 on the next page).
- The resulting deployment of new in-state renewable energy resources between 2021 and 2031 would reduce statewide wholesale energy costs by $1.76 billion and capacity costs by $1.79 billion.
- Customers who choose to use distributed generation would reduce their electric supply costs by $623 million between 2021 and 2031.

Figure 24 below compares the cost of HB 2640 / SB 1601 when factored for the projected cost savings for wholesale energy and capacity plus consumer retail cost benefits resulting from achieving a 40% renewable energy resource level in Illinois by 2031. In short, increasing the cost cap for the Illinois RPS by $2.9 billion between 2021 and 2031 will result in a net energy cost reduction of $1.2 billion.

Figure 24: Additional Renewable Energy Resources in Illinois Deliver $1.2 Billion in Net Cost Savings

Cost Element	Cost Impact With New Renewable Resources (2021$ millions)		
	Ameren Illinois	Commonwealth Edison	Combined
Expanded Renewable Portfolio Standard Cost Increase	$881.96	$2,058.27	$2,940.24
Wholesale Energy Cost Savings	-$865.17	-$893.35	-$1,758.53
Wholesale Capacity Cost Savings	-$15.70	-$1,773.28	-$1,788.98
Retail Supply Cost Savings (Community Solar)	-$53.91	-$170.38	-$224.29
Retail Supply Cost Savings (Behind the Meter Solar)	-$94.50	-$284.29	-$378.80
Net Cost Cost Impact of Renewables	**-$147.33**	**-$1,063.03**	**-$1,210.36**

Figure 25: Projected RPS Costs with HB 2640 / SB 1601

Region	Math	RPS CALCULATIONS										
		2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	Cumulative
Ameren Illinois												
Current RPS - Base Year Rate ($/MWh)	A	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60	$89.60
Current RPS - Rate Cap (%)	B	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%
Current RPS - Rate Cap ($/MWh)	C=A*B	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540	$1.80540
Current RPS - Energy Projection (MWh)	D	37,512,375	39,401,250	39,906,750	40,317,750	40,634,250	40,936,500	41,256,000	41,535,750	41,783,250	42,033,750	405,317,625
Current RPS - Annual RPS Cost Cap	E=C*D	$67,724,842	$71,135,017	$72,047,646	$72,789,666	$73,361,075	$73,906,757	$74,483,582	$74,988,643	$75,435,480	$75,887,732	$731,760,440
Path to 100 - Base Year Rate ($/MWh)	F	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70	$107.70
Path to 100 - Rate Cap (%)	G	3.500%	3.500%	3.750%	3.750%	3.750%	4.000%	4.000%	4.000%	4.000%	4.000%	2.015%
Path to 100 - Rate Cap ($/MWh)	H	$3.76950	$3.76950	$4.03875	$4.03875	$4.03875	$4.30800	$4.30800	$4.30800	$4.30800	$4.30800	$4.12160
Path to 100 - Energy Projection (MWh)	I	37,360,846	39,098,191	39,300,632	39,408,573	39,422,014	39,421,205	39,437,646	39,414,337	39,358,778	39,306,219	391,528,439
Path to 100 - Annual RPS Cost Cap	J	$140,831,707	$147,380,630	$158,725,426	$159,161,373	$159,215,658	$169,826,550	$169,897,378	$169,796,963	$169,557,615	$169,331,191	$1,613,724,492
Path to 100 Cost Cap Premium ($/MWh)	K	$1.96	$1.96	$2.23	$2.23	$2.23	$2.50	$2.50	$2.50	$2.50	$2.50	$2.32
Path to 100 Cost Cap Premium ($)	L	$73,106,865	$76,245,613	$86,677,780	$86,371,707	$85,854,583	$95,919,793	$95,413,796	$94,808,320	$94,122,135	$93,443,459	$881,964,052
Commonwealth Edison												
Current RPS - Base Year Rate ($/MWh)	M	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88	$93.88
Current RPS - Rate Cap (%)	N	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%
Current RPS - Rate Cap ($/MWh)	O=M*N	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170	$1.89170
Current RPS - Energy Projection (MWh)	P	85,984,200	85,633,200	85,226,400	85,141,800	84,594,600	84,339,900	84,045,600	84,025,800	83,610,000	83,281,500	845,883,000
Current RPS - Annual RPS Cost Cap	Q=O*P	$162,656,311	$161,992,324	$161,222,781	$161,062,743	$160,027,605	$159,545,789	$158,989,062	$158,951,606	$158,165,037	$157,543,614	$1,600,156,871
Path to 100 - Base Year Rate ($/MWh)	R	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20	$118.20
Path to 100 - Rate Cap (%)	S	3.500%	3.500%	3.750%	3.750%	3.750%	4.000%	4.000%	4.000%	4.000%	4.000%	2.015%
Path to 100 - Rate Cap ($/MWh)	T	$4.13700	$4.13700	$4.43250	$4.43250	$4.43250	$4.72800	$4.72800	$4.72800	$4.72800	$4.72800	$4.51365
Path to 100 - Energy Projection (MWh)	U	85,630,631	84,572,494	83,458,556	82,666,818	81,412,481	80,450,643	79,449,205	78,722,268	77,599,330	76,563,693	810,526,119
Path to 100 - Annual RPS Cost Cap	V	$354,253,921	$349,876,406	$369,930,049	$366,420,672	$360,860,821	$380,370,640	$375,635,843	$372,198,882	$366,889,633	$361,993,139	$3,658,430,007
Path to 100 Cost Cap Premium ($/MWh)	W	$2.25	$2.25	$2.54	$2.54	$2.54	$2.84	$2.84	$2.84	$2.84	$2.84	$2.62
Path to 100 Cost Cap Premium ($)	X	$191,597,610	$187,884,081	$208,707,268	$205,357,929	$200,833,216	$220,824,852	$216,646,782	$213,247,276	$208,724,596	$204,449,525	$2,058,273,136
MidAmerican Energy												
Current RPS - Base Year Rate ($/MWh)	Y	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61	$61.61
Current RPS - Rate Cap (%)	Z	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%	2.015%
Current RPS - Rate Cap ($/MWh)	AA=Y*Z	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150	$1.24150
Current RPS - Energy Projection (MWh)	AB	497,943	523,016	529,726	535,182	539,383	543,395	547,636	551,350	554,635	557,960	5,380,227
Current RPS - Annual RPS Cost Cap	AC=AA*AB	$618,196	$649,325	$657,655	$664,428	$669,644	$674,625	$679,890	$684,501	$688,579	$692,708	$6,679,551
Path to 100 - Base Year Rate ($/MWh)	AD	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80	$61.80
Path to 100 - Rate Cap (%)	AE	3.500%	3.500%	3.750%	3.750%	3.750%	4.000%	4.000%	4.000%	4.000%	4.000%	2.015%
Path to 100 - Rate Cap ($/MWh)	AF	$2.16300	$2.16300	$2.31750	$2.31750	$2.31750	$2.47200	$2.47200	$2.47200	$2.47200	$2.47200	$2.36729
Path to 100 - Energy Projection (MWh)	AG	497,943	523,016	529,726	535,182	539,383	543,395	547,636	551,350	554,635	557,960	5,380,227
Path to 100 - Annual RPS Cost Cap	AH	$1,077,051	$1,131,284	$1,227,640	$1,240,284	$1,250,020	$1,343,273	$1,353,757	$1,362,936	$1,371,058	$1,379,278	$12,736,581
Path to 100 Cost Cap Premium ($/MWh)	AI	$0.92	$0.92	$1.08	$1.08	$1.08	$1.23	$1.23	$1.23	$1.23	$1.23	$1.13
Path to 100 Cost Cap Premium ($)	AJ	$458,854	$481,959	$569,985	$575,856	$580,376	$668,648	$673,866	$678,436	$682,478	$686,570	$6,057,029
All Utilities												
Current RPS - Annual RPS Cost Cap	AM	$230,999,349	$233,776,666	$233,928,082	$234,516,837	$234,058,324	$234,127,171	$234,152,534	$234,624,750	$234,289,096	$234,124,053	$2,338,596,862
Path to 100 - Annual RPS Cost Cap	AN	$496,162,679	$498,388,320	$529,883,116	$526,822,329	$521,326,499	$551,540,464	$546,886,978	$543,358,782	$537,818,306	$532,703,607	$5,284,891,080
Path to 100 Cost Cap Premium ($)	AO=AN-AM	$265,163,330	$264,611,654	$295,955,034	$292,305,492	$287,268,175	$317,413,293	$312,734,444	$308,734,032	$303,529,210	$298,579,554	$2,946,294,218
Energy Consumption (MWh)	AP	123,994,518	125,557,466	125,662,876	125,994,732	125,768,233	125,819,795	125,849,236	126,112,900	125,947,885	125,873,210	1,256,580,852
Current RPS - Annual RPS Cost Cap	AQ=AO/AP	$2.14	$2.11	$2.36	$2.32	$2.28	$2.52	$2.48	$2.45	$2.41	$2.37	$2.34

Conclusions

In conclusion, providing funding to expand Illinois' RPS to 40% by 2031 will support the deployment of utility-scale and distributed-scale wind and solar projects that will deliver lower statewide wholesale energy and capacity costs and reduce electricity costs for renewable energy customers. The net result would be a reduction in consumer electricity costs of $1.2 billion between 2021 and 2031.

While supporting additional wind and solar projects in Illinois will require significant investment this analysis projects that the costs associated with increasing the existing RPS cost cap to meet the 40% renewable energy by 2031 goal will be more than offset by the resulting reductions in wholesale energy and capacity as well as the cost savings captured by renewable energy customers.

In short, the expansion of Illinois RPS to 40% by 2031 would deliver a net reduction in total electricity costs of $1.2 billion based on the following:

- Incremental increase in RPS funding of $2.96 billion.
- Decrease in wholesale energy costs of $1.76 billion.
- Decrease in wholesale capacity costs of $1.79 billion.
- Direct retail consumer cost savings from community solar and rooftop solar $603 million.
- Resulting net wholesale and retail savings for Illinois consumers of $1.2 billion.

About the Power Bureau

The Power Bureau is an independent consulting firms specializing in energy planning and procurement. Led by Mark Pruitt, The Power Bureau assists public and private organizations model, evaluate, and transact in wholesale and retail energy markets. Prior to his work with The Power Bureau, Pruitt served as the first Director of the Illinois Power Agency, the state agency responsible for planning and managing wholesale energy, capacity and renewable energy procurement for consumers receiving service from Ameren Illinois and ComEd through default rate service. Before serving at the Illinois Power Agency, Pruitt managed natural gas and electricity planning, procurement and billing for all State of Illinois agencies located in the state's investor-owned utility service regions.

About American Energy Action (Research Sponsor)

American Energy Action (AEA) is a 501(c)(4) organization launched in 2016 with a mission to advocate for sound policies on behalf of the renewable energy industry and educate the public and lawmakers on the many benefits of renewable energy. AEA is dedicated to creating American jobs, providing economic benefits for state and local economies, innovating for the future, and securing the nation's energy independence. Through its work, AEA is helping advance renewable energy as a significant part of the policy debate at both state and federal levels. For more information, visit americanenergyaction.org.