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Policies Affecting Renewable Energy in Illinois, USA

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EAS 501.102: Renewable Energy Policy at the State and Local Level

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I. INTRODUCTION

Like many other states, Illinois is moving toward decarbonizing its energy sector. A major part of this effort is shifting to renewable electricity generation. As the nation's third-largest net electricity supplier, Illinois' energy sector decarbonization will have far-reaching effects throughout the Midwest. Since 2016, enabling state policies, namely the Future Energy Jobs Act and the Clean Energy Jobs Act, have allowed for vast growth in distributed generation development. Other state policies, including taxation of renewables, regulation of the energy sector, infrastructure investment, use of public lands, and siting authority are evolving to become more adaptable to Illinois' rapid expansion of renewable energy deployment. This paper discusses the current renewable energy policy landscape in Illinois and explores how coordinated policies collectively facilitate renewable energy deployment across the state.

II. BACKGROUND

Demographics

Although Illinois historically experienced some of the highest population growth rates in the country, rural areas of the state have seen a decline in population since the 1960s. The 2020 Census placed Illinois 4th in population decline rate, citing domestic migration as the primary reason due to limited housing and employment opportunities for the high levels of population decline in the state.[1]

The fastest shrinking county is Alexander County at the southern tip of the state, which lost 20 percent of its population between 2010 and 2020 and is predominantly made up of nationally protected lands.[2] Outside of the Chicago metro area, only five counties gained

population in the same period; Chicago has held steady in population, meaning there has been no urban growth to offset the decline seen in rural counties.

Aside from the Chicago metro area and a few districts in the state's northwest corner, Illinois has a largely red-leaning electorate (see Figure 1).

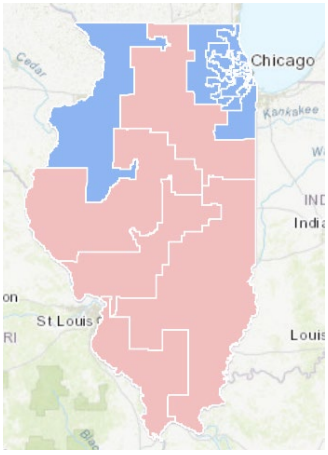


Figure 1. USA 117th Congressional Districts (Illinois Early Childhood Asset Map, 2021).

The same areas downstate experiencing population decline also see a significant political shift. Since 1998, Gubernatorial races have shown a consistent move toward the political right in the state's southern portion (see Figure 2). In the 2016 presidential election, growing and stable counties shifted left even as much of the Midwest shifted right.[3] In 2018, a few scattered counties shifted back to the left, notably three counties in the south that reverted to 2010 patterns.[4]

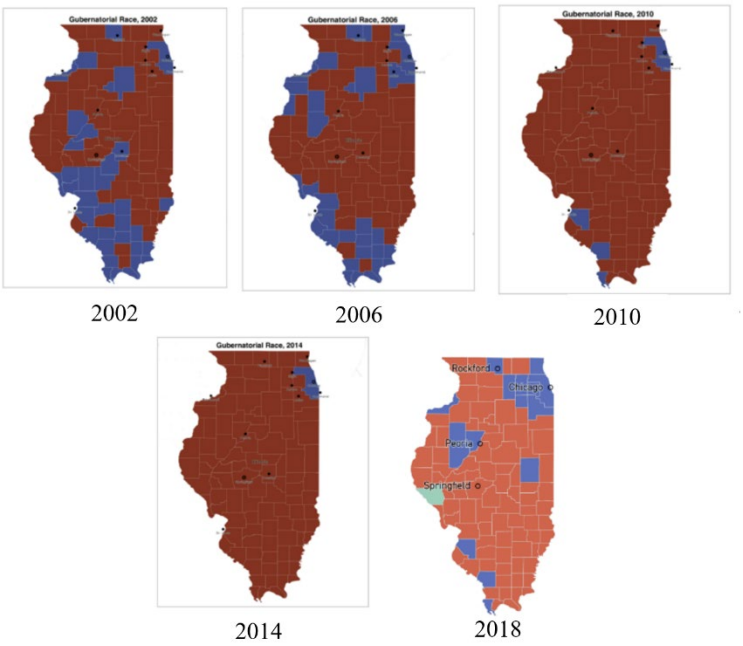
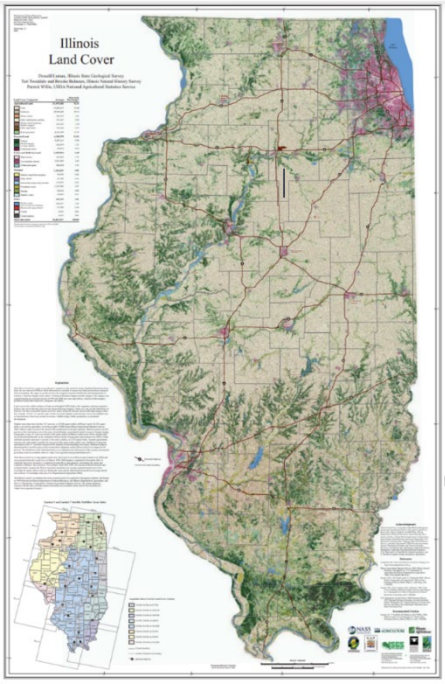


Figure 2. Illinois Gubernatorial Elections 2002-2018 (Conte, 2018, Politico, 2018).

Economic Base

Most economic activity in Illinois is centered in the Chicago metro area. Home to more than 400 major corporate facilities, the city ranks second in the United States for corporate headquarters, including 36 companies in the Fortune 500 and 31 in the S&P 500.[5] Chicago is also home to the largest futures exchange globally, the Chicago Mercantile Exchange, trading in agricultural products, currencies, energy, interest rates, metals, stock indexes, and weather.[6] Outside the Chicago metro area, agriculture accounts for much of the state's economic output, with corn and soybeans as the state's highest valued commodities.[7] Prime farmland closely aligns with crop distribution throughout the state, with most land covered by corn and soybean

crops (see Figure 3 and Figure 4). Most of the southern counties losing population tend to be forested rather than farmed.



Land Cover Categories[1]	Acreage[2]	Statewide Percentage[2]
Agricultural Land	**27,519,206**	**76.31**
Corn	11,409,233	31.64
Soybeans	10,504,048	29.13
Winter wheat	363,227	1.01
Other small grains and hay	331,467	0.92
Winter wheat/soybeans, double cropped	613,307	1.70
Other agriculture	134,326	0.37
Rural grassland	4,163,599	11.55
Forested Land	**4,150,179**	**11.51**
Upland	3,455,241	9.58
Partial canopy/ savanna upland	614,919	1.71
Coniferous forest	80,019	0.22
Urban and Built-Up Land	**2,325,924**	**6.45**
High density	615,825	1.71
Low/medium density	1,021,605	2.83
Urban open space	688,494	1.91
Wetland	**1,414,613**	**3.92**
Shallow marsh/wet meadow	92,078	0.26
Deep marsh	41,708	0.12
Seasonally/temporarily flooded	113,873	0.32
Floodplain forest	1,107,038	3.07
Swamp	20,254	0.06
Shallow water	39,662	0.11
Other	**653,215**	**1.81**
Surface water (does not include Lake Michigan)	604,687	1.68
Barren and exposed land	37,530	0.10
Clouds	6,875	0.02
Cloud shadows	4,123	0.01
Statewide totals	**36,063,137**	**100.00**

[1]Interpretation based on imagery acquired in 1999 and 2000.
[2]Area statistics calculated for Illinois only.

Figure 4. Illinois Land Cover (Luman et al., 2004)

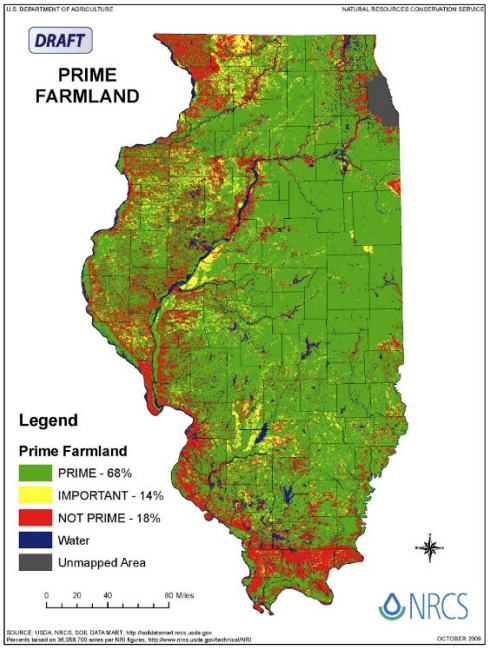


Figure 3. Prime Farmland (USDA, 2009).

Roughly 13% of the state's total output comes from manufacturing, with $108 billion in economic activity in 2018.[8] The Chicago area produces significant quantities of food products, chemicals, fabricated metals, computer and electronic products, and rubber products, while rural areas largely produce farm machinery and motor vehicles.[9]

Renewable energy is emerging as an economic powerhouse in the state. Most utility-scale renewable energy facilities are in the state's northern half, while clean energy businesses like contractors and installers are mainly headquartered in the Chicago metro area (see Figure 5).

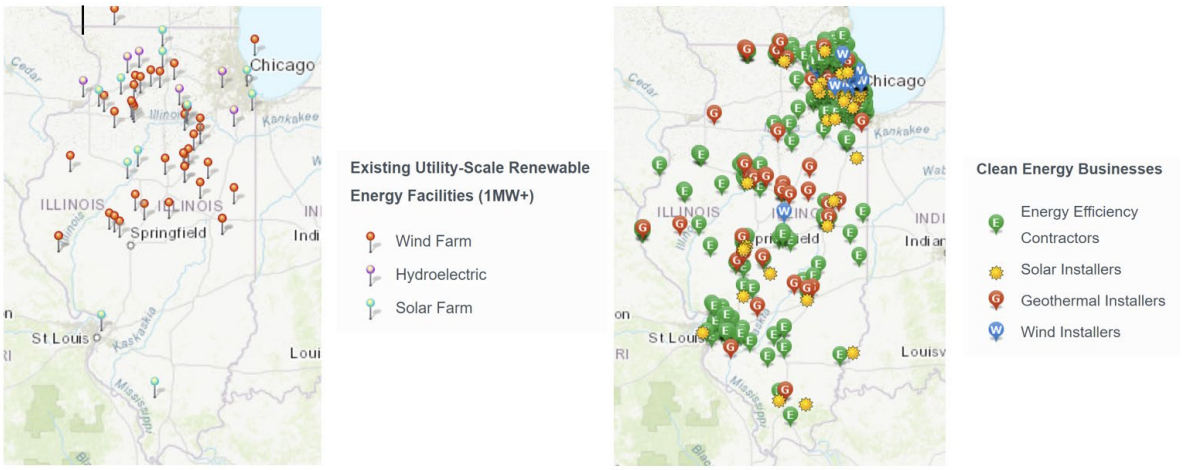


Figure 5. Clean Energy in Illinois (Environmental Entrepreneurs, 2018).

Public Lands and Fossil Fuel Mining

Approximately 2% of total land area in Illinois is owned by state and federal governments, ranking Illinois 37th in the country in total public lands.[10] Nationally owned land is consolidated in the southernmost portion of the state, including Shawnee National Forest and Cypress Creek National Wildlife Refuge (see Figure 6).

Figure 6. Nationally Owned Lands in Illinois (USDA, 2021).

As opposed to solar PV and wind installations in the state, energy production via coal mining is concentrated in the southern half of Illinois (Figure 7). As of 2014, the state was home to 22 active coal mines, with most coal production coming from underground mining. From a combination of underground and surface mines, Illinois was the fourth-largest coal producer in the United States, extracting approximately 31.6 million short tons of coal in 2020.[11] Of note, the same regions of Illinois that have experienced recent population decline due to limited employment opportunities are the same areas whose economy leans heavily on coal extraction.

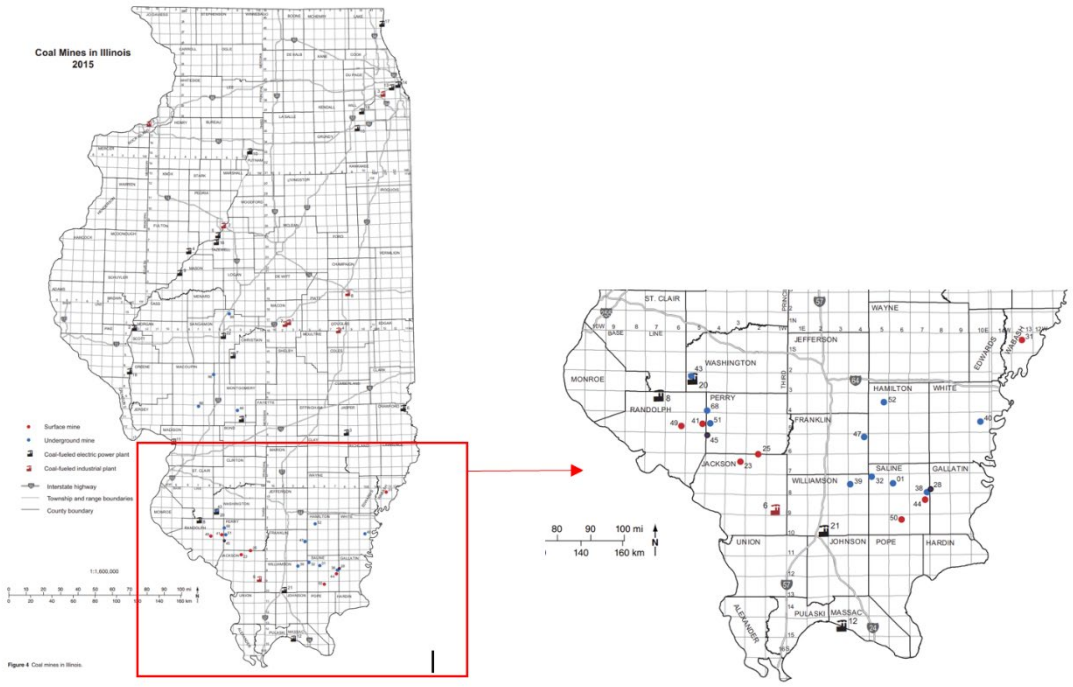


Figure 7. Coal Mines in Illinois (Xiaodong et al., 2016).

Existing Electricity Mix

Illinois is one of the top energy consumers and producers in the Midwest. As of March 2019, Illinois was generating about 58% of its electricity from nuclear, 18% from coal, 11% from renewables, and 14% from natural gas.[12] Figure 8 below gives a further breakdown of annual energy production in Illinois by types of generation. Illinois climate goals focus on shifting to 40% renewable energy by 2030, 50% by 2040, and ending the use of coal for electricity by 2045.[13][14] The state currently generates 94% of its renewable energy through wind, with a current 6300 MW of wind operating as of 2020. As of 2020, solar contributes very little to overall electricity generation, with more than four-fifths of the state's total solar generation coming from small-scale rooftop solar.[15] Twenty-year trends throughout the entire electric industry of Illinois are as follows:

- Nuclear generation has been increasing from 89 million MWh in 2000 to nearly 99 million MWh generated in 2019.

- Wind generation has drastically increased from zero MWh in 2001 to almost 14.5 million MWh in 2019.

- Solar came online in 2009 and has been increasing ever since, though still relatively low at under 62,000 MWh generated in 2019.

- Behind nuclear generation, coal and natural gas are the second and third largest generation sources, at 48.8 million and 21.3 million MWh, respectively. After steadily increasing in generation for 15 years, coal generation began decreasing in 2015. Natural gas generation continues to increase steadily as of 2019.[16]

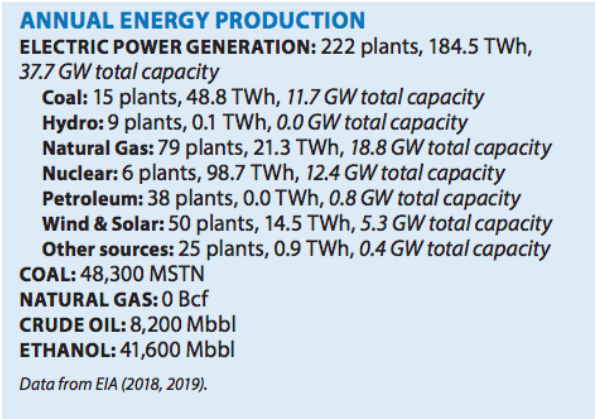


Figure 8. Annual energy production from Illinois by number of plants and total capacity for each source of energy (CESER, 2021).

Structure of Electricity Sector

Since 1999, Illinois has had zero net interstate imports of energy while net interstate exports range from 32 million to 48 million MWh each year, a large export volume compared to other states.[17] As the third-largest net electricity supplier to other states, Illinois exports around one-fifth of the power it generates to other states via interstate transmission lines. Regional grid systems, PJM Interconnection, and Midcontinent Independent System Operator (MISO) serve Illinois and allow for the export of electricity. Illinois has over 150 electric suppliers, with three

main utility companies, ComEd, MidAmerican, and Ameren, who maintain power lines and deliver electricity. Illinois is a deregulated energy market and electricity-choice state with 77 Alternate Retail Electricity Suppliers (ARES), including 41 municipal utilities, 26 cooperatives, three investor-owned utilities, and seven other utilities.[18] The large number of municipal utilities may lead to more community choice aggregation in the future; aggregations were serving over 76% of Illinois communities as of 2018.[19]

Renewable Energy Generation and Potential

Like many other states, Illinois is moving toward decarbonizing its energy sector. A major part of this effort is shifting to renewable electricity generation. Figure 9 below shows the land-based wind generation potential at the county level. The best wind generation potential in the state is in the north-central, in and north of Bloomington. Overall, observations show that the highest potential for land-based wind is concentrated in the state's upper northwest and central areas, with generation potential ranging from approximately 5 million - 10 million MWh annually.[20]

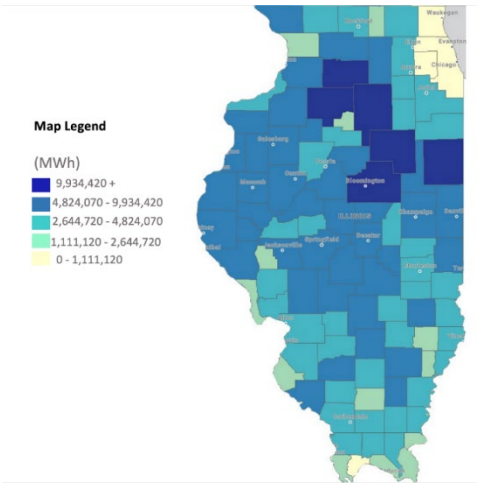


Figure 9. Land-based wind generation potential at the county level.

Figure 10 below shows the location of wind turbines in Illinois. Installed wind capacity closely mirrors resource potential in Illinois. According to the U.S. Wind Turbine Database, wind development is concentrated in the upper northwest region of the state, with an average turbine capacity hovering around 1.5-2 megawatts.[21]

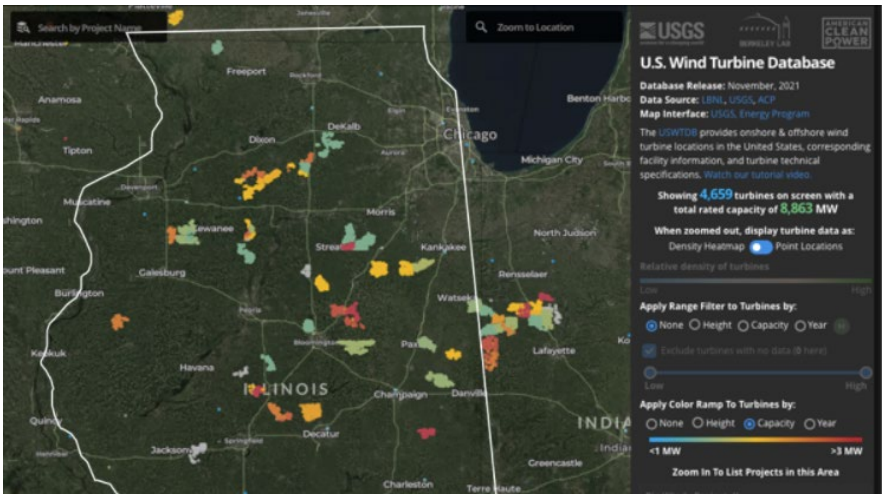


Figure 10. Illinois Wind Turbine Density Heatmap (U.S. Geological Survey, American Clean Power Association and Lawrence Berkeley Nation)

While solar generation in Illinois has mostly been limited to rooftop solar, the state has a high potential for larger solar array systems for commercial and utility scale projects. Figure 11 below shows the potential solar generation at the county level. Observations show that commercial rooftop solar potential is greatest in the metro Chicago area, where rooftops are more abundant and has a higher maximum potential when compared with residential rooftop solar potential. As for utility scale solar, there is greater availability of large high potential areas throughout the central part of the state, with the lower southern part of the state also being viable for large-scale solar array systems, as shown in figure 12. It should be noted that the order of magnitude difference between utility scale solar and residential/commercial scale solar is large and significant.

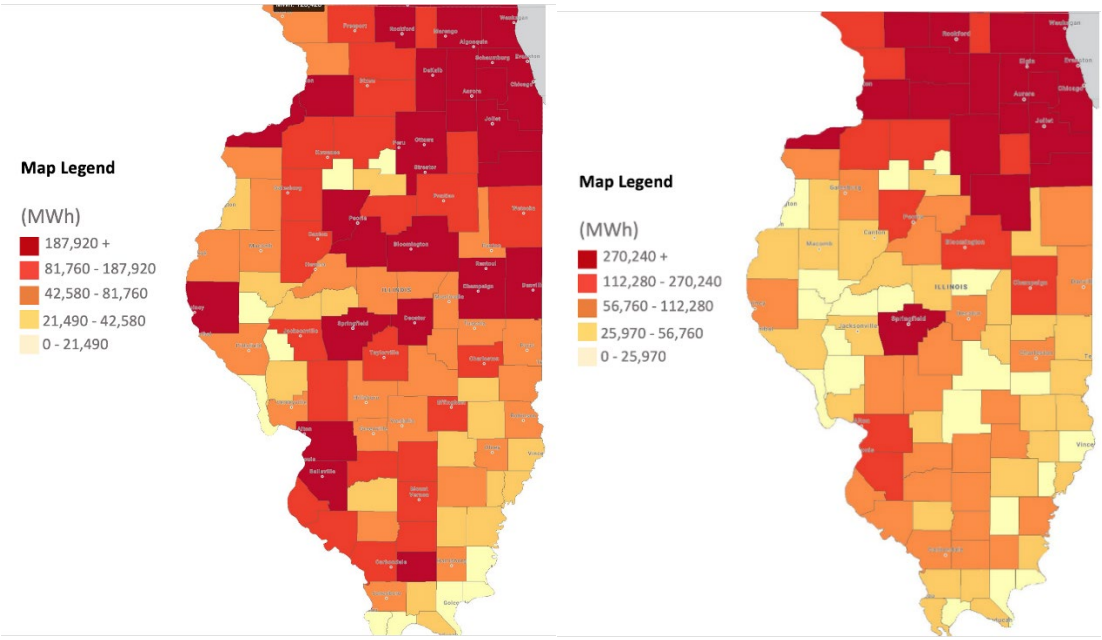


Figure 11. From left to right: (left) Residential Rooftop Generation Potential; (right) Commercial Rooftop Solar Generation Potential.

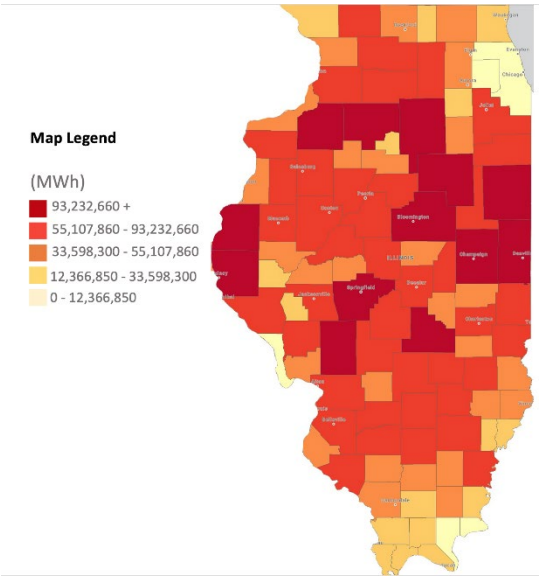


Figure 12. Utility scale solar generation potential.

Since 2019, solar energy installations have been sited mostly on commercial buildings, such as IKEA, Wal-Mart, and Target, followed by residential buildings, community solar, and a small amount of utility scale solar as seen in Figure 13.[22] Overall, Illinois currently only generates a small percentage of its electricity via solar. With current policy incentivizing mass investment in new large scale solar farms by 2031, the full potential of solar in the state of Illinois will begin to become clearer in the near future as more solar comes online.

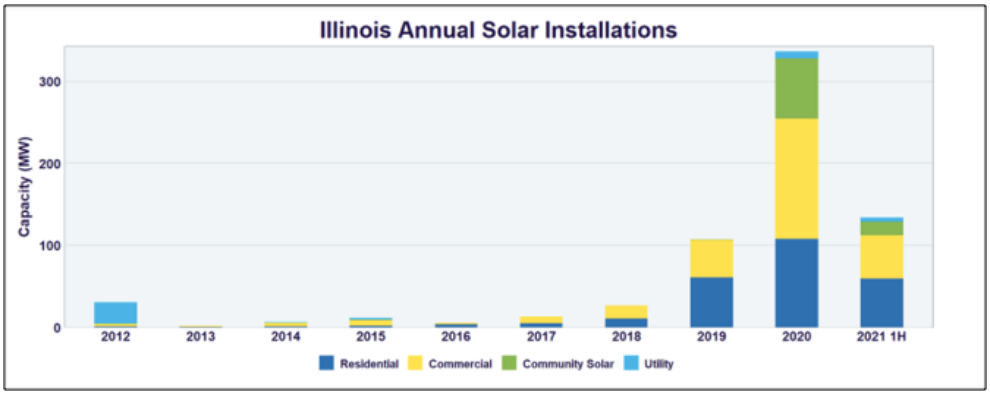


Figure 13. Distribution of solar installations by residential, commercial, community solar, and utility scale (SEIA, 2021)

While more distributed throughout the state when compared to wind, solar is being developed on a larger scale in the southern half of the state. Figure 14 below shows the location of solar projects throughout Illinois.[23]

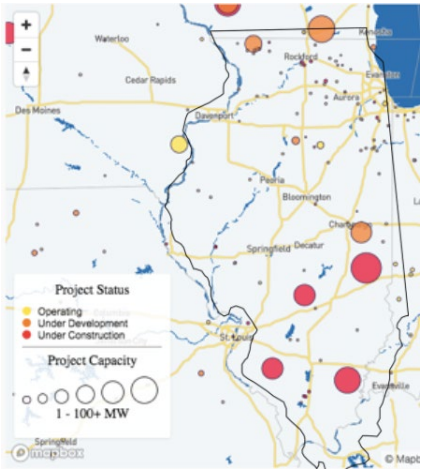


Figure 14. Ground-mounted solar projects 1 MW and above that are operating, under construction, or under development.

A 2020 study[24] explored the economic feasibility of solar and different storage systems in the state. This study determined that through various federal, state, and utility incentives, the financial benefits of solar plus storage systems along with energy efficiency load reductions would result in a financial benefit that would exceed the cost of system installation in most cases over the course of the system lifespan. This study also found that additional investments in solar could have the potential to greatly reduce consumer electricity bills. Policy recommendations included the need to explore different avenues that would further promote the growth of solar and storage technologies through more aggressive climate policies.[25]

Local Narratives

In Illinois, solar and wind energy has faced opposition from local actors based on noise, property values, and quality of life concerns. Local opposition grew strongly after the 2016 Future Energy Jobs Act. Deep-rooted opposition has led to legal action: lawsuits have deferred and prolonged certain projects, including the Alta Farms Wind Project in Dewitt County.[26] Main local opposition to the proposed 344 megawatt project derived from "shadow flicker," decreased property value, interrupted sightlines, and difficulties in crop dusting.[27] While construction eventually began in Dewitt County, the same cannot be said for Bellflower Township, where opposition has kept wind energy companies from developing.[28] Proposed solar farms are also facing similar resistance. Opposition to solar farms has been primarily concerned with changing landscapes of agriculture and farmland where residents cite lower property values.[29,30,31] Kankakee county became a hotbed of solar development due to its relatively inexpensive farmland and ready access to the ComEd grid.[32] However, opposition to the solar projects in Kankakee was exemplified in Momence as locals cited decreased property values and the changing landscape due to changing the zone standing from residential to agricultural.[33]

Illinois' coal reserves historically served as a great incentive to invest in coal power plants, leading to a reliance on coal plants that now challenges renewable energy deployment. The largest concern for residents of Havana, city in West Central Illinois facing coal plant closures, is the loss of tax funding and economic activity due to closed coal plants and skepticism that solar plants will bring about the same level of economic activity much needed in the community.[34] While new legislation includes promises for just transitions for the coal-to-solar communities, there is increased community concern about the promises of renewable energy. Opposition to renewable energy has also been backed by utility companies fighting state policy that invests in renewable energy by raising concerns about just transitions for local communities. Specifically, Exelon has long provided challenges to renewable energy in Illinois. In 2013 they focused their efforts on blocking a bill that would reform the state's RPS to allow the Illinois Power Agency to purchase renewable energy regardless of the supplier.[35] Early in 2021, Exelon threatened to close coal plants should it not receive aid through the new legislation; the final bill authorized $694 million in aid to keep the plants online.[36]

Local attitudes towards renewable energy on private property differ greatly from attitudes towards renewable energy in general, which are more aligned with statewide goals. Concerns with solar and wind were expressed in local settings where the change to livelihoods was ever-present. Some Illinois residents have unique concerns regarding their community's economic stability with the transition away from coal, posing some reluctance to embrace solar and wind projects. Nevertheless, much opposition came from renewable energy supporters with strong sentiments of NIMBYism.[37] Statewide newspapers present the opposition to renewables as an obstacle to attaining RPS goals. Moreover, the most recent Climate and Equitable Jobs Act of 2021 swayed statewide newspapers to present any opposition to renewable energies as hindering

state goals.[38,39] Community concerns were more likely to be highlighted in local newspapers, illustrating the nuanced nature of renewable energy deployment.

III. ANALYSIS

Explicit Climate Policy

Foundational to Illinois' climate and energy legislation, the Illinois Power Agency Act of 2007[40] set the state's first renewable portfolio standard (RPS). The original RPS required investor-owned electric utilities (IOUs) and alternative retail electric suppliers (ARES) to source 25% of eligible retail electricity sales from renewable energy by 2025. Eligible renewable energy technologies include wind, solar thermal, and solar photovoltaics (PV), but also more controversial renewable sources, including dedicated crops grown for energy production, untreated and unadulterated organic waste biomass, trees and tree waste, in-state landfill gas, biodiesel, hydropower that does not involve the construction of new dams, and waste heat from industrial processes and anaerobic digestion.[41]

The Illinois Power Agency Act also created the Illinois Power Agency (IPA), a new state agency tasked with developing electricity procurement plans for IOUs and brokering contracts between utilities and suppliers to ensure "adequate, reliable, affordable, efficient, and environmentally sustainable electric service at the lowest total cost."[42] The IPA is responsible for developing and administering clean power procurement programs under this act and subsequent policies, most notably the Future Energy Jobs Act of 2016.

Building on the foundation established by the Illinois Power Agency Act, Illinois passed the Future Energy Jobs Act[43] (FEJA) in 2016. FEJA primarily mandated higher RPS targets than were established under the Illinois Power Agency Act, raising the goal to 100% renewables by

2050 and including provisions to make renewable energy more accessible in low- and moderate-income communities.[44] While FEJA did not explicitly increase funding for renewable energy, it did move the charge to the delivery side of electricity bills, which allowed the Illinois Power Agency to collect and invest funds much more easily.[45] Earlier RPS program rules placed funds in separate accounts for utilities and retail aggregators, making it difficult to reliably predict program funding when customers switched suppliers.[46] FEJA also placed all RPS compliance on the utility regardless of supply, which wasn't standard before the Act. That move made renewables much more lucrative and guaranteed long-term contracts for REC purchase, which stabilized the solar industry.[47]

The Act also tasked the IPA with developing the state's Long-Term Renewable Resources Procurement Plan to guide activities in support of the state's RPS, primarily the establishment of two new renewable procurement programs: the Adjustable Block Program (ABP) or Illinois Shines and Illinois Solar for All (IL SFA).[48] Both ABP and IL SFA operate as REC purchasing schemes, with the IPA mediating the sale of SRECs from solar developers to the state's IOUs. The IL SFA program, unlike the ABP, is 100% allocated to low-income system owners, community solar project subscribers, or those who host the community solar project on their property.

When FEJA passed, the Environmental Defense Fund estimated that Illinois would see an additional $12 billion to $15 billion in new private investment due to the bill's clean energy priorities.[49] The program dashboards showing capacity built for ABP and IL SFA have been disbanded as a result of overhauls from the Climate and Equitable Jobs Act of 2021, but interest in each program was significant from the outset when the programs began in 2019. In the first few weeks of program operation, developers submitted a total of 931 community solar project

applications, representing 1.8 gigawatts of capacity, and an additional 2,246 applications for smaller distributed generation projects (an additional 238 megawatts).[50] These applications far exceeded the program's initial capacity, demonstrating an overwhelming appetite for solar development in the state.

Few studies have been performed that specifically look at how energy policy has impacted renewable energy deployment. A 2018 study[51] looked into the economic and public health benefits of replacing coal plants in Illinois with local clean energy. This study showed that through FEJA and the continued retirement of coal plants, a transition to cleaner energy sources would result in even greater investment in renewable energy as the cost for solar continues to decrease, making traditional fossil fuel based systems harder to compete within the state, which would result in public health benefits due to the repurposing of old retired coal plants to be areas of clean energy generation. Additionally, it was shown that investing in developing new wind and solar farms would result in a direct cost reduction benefit for the residents while also helping the state achieve its RPS target. Furthermore, the study made policy recommendations that emphasized the need for consistent stakeholder engagement on behalf of the state, federal, utility regulators, power grid operators, and utility companies throughout the transition process. This would ensure that communities most directly affected by the retirement of coal plants in favor of renewable energy sources are not left behind.

Passed in September 2021 with bipartisan support, the Clean Energy Jobs Act[52,53] (CEJA) was devised to build on FEJA's renewable energy goals while addressing the public health and economic equity challenges brought to light by the Covid-19 pandemic. The multifaceted bill emphasizes the creation of good-paying clean energy jobs, improving the health of Illinoisans, and supporting disadvantaged communities through the expansion of energy-

focused programs already in place in Illinois: the energy transition, energy efficiency, electric vehicles, and electrification. CEJA also creates new workforce development initiatives and enhances utility rules and ethics reforms.

Article 5 of CEJA is focused on continuing the energy transition put in place by the Illinois Power Agency Act and FEJA. First, CEJA requires Illinois to achieve a 100% zero-emissions power sector by 2045, with substantial emissions reductions starting in 2021. These requirements notably apply to the Prairie State coal plant, the state's largest and the country's seventh-largest emitter of carbon pollution, which must reach net zero emissions by 2045.[54] Alongside the carbon-free power sector requirements, CEJA seeks to grow renewable energy generation capacity by a factor of five, investing $580 million a year to generate 50% of the state's energy from wind and solar PV by 2040. The changes to the state's clean energy goals in CEJA have also prompted the IPA to revise the Long-Term Plan, expanding both the Adjustable Block Program and Illinois Solar for All.[55] While these programs under FEJA led to a solar boom, legal and programmatic limitations meant that the influx of solar development in the state was short-lived and quickly tapped out. The clean energy provisions in CEJA are expected to revive solar power in Illinois, allowing solar developers to continue investing in Illinois, with a newly targeted focus on developing an equitable workforce and supporting diverse contractors.[56]

CEJA seeks to implement significant reform policies to weaken the political and financial power of IOU's in Illinois. Primarily, the bill employs an automatic rate system that replaces utility formula rates to require a contingency on utilities' profits on achieving equity and clean energy goals. Other utility reform measures include improving transmission planning, construction of new transmission lines, restrictions on utility lobbying and spending, and a new Illinois Commerce Commission (ICC) ethics oversight decision to enforce utility compliance. In

a more contentious arena, CEJA also provides financial support for two nuclear plants owned by Exelon, which are currently struggling to stay afloat in Illinois.[57] The payments total approximately $700 million over five years and will be reduced should the plants receive federal subsidies.

A major component of CEJA is investing in equitable, healthy communities, creating programs for disproportionately impacted communities and workers. By investing $40 million per year to replace lost property taxes, CEJA seeks to support communities and workers impacted by the bill's transition away from fossil fuels. CEJA also acknowledges that communities will be impacted by the closing of fossil plants by supporting job training and services to displaced workers. This includes an annual $115 million investment to create job training hubs and establish renewable energy career pipelines and support small clean energy businesses in disadvantaged communities. Finally, CEJA establishes and extends a variety of electrification and efficiency-based programs to bolster carbon reductions driven by the energy generation sector. Building code modifications include electrification measures in parallel with the extension of existing energy efficiency programs and increased efficiency investments in low-income households. Electrification efforts also extend to the transportation sector, with rebates for electric vehicles and charging infrastructure.

PUC Policy in Illinois

Public Utility services in Illinois are regulated by the Illinois Commerce Commission (ICC), staffed by five Commissioners. Each Commissioner is appointed by the Governor and confirmed by the Illinois State Senate for a five-year term, and no more than three Commissioners may belong to the same political party.[58] The ICC's mission is to "balance the interests of consumers and utilities to ensure adequate, efficient, reliable, safe and least-cost

public utility services while promoting the development of an effectively competitive energy supplier market."[59]

The Electric Service Customer Choice and Rate Relief Law of 1997 restructured Illinois' electric service industry to allow a choice of electric suppliers, known as Alternative Retail Electric Suppliers (ARES).[60] Approximately 75% of the electricity consumed by Illinois' utility customers is provided by an ARES.[61] While the ICC must certify any ARES doing business in Illinois, they are overall less regulated than the state's investor-owned utilities. Recent climate policies, particularly those related to community solar, have run into implementation issues when working with ARES customers.

By law, there is a significant amount of opacity between ARES and investor-owned utilities regarding individual customers' rates and electric usage. It is both administratively complex and legally vague for ARES and investor-owned utilities to communicate regarding community solar credits, meaning ARES customers may never see cost-saving credits applied to their utility bill.[62] For that reason, only non-ARES customers (about 25% of total customers) can currently sign up for community solar projects, adding nuance to the implantation of Illinois' climate and solar policies. One of the major aspects of CEJA was a stipulation that required utilities to always provide monetary credits to customers, regardless of whether the customer is with an ARES. While the stipulation is not yet implemented, it has the potential to solve this issue, allowing for a huge increase in the potential community solar customer base for developers.

Illinois SB680 (2007)[63] gives the ICC the authority to establish standards for interconnection and net metering for renewable energy systems. The ICC designates different

standards by system size, with projects greater than 10 megawatts being subject to more intensive review. Smaller projects with minimal transmission requirements typically receive an expedited and straightforward review from the ICC.[64] Net Metering (NEM) enables most solar development in Illinois and is regulated by the ICC. Both investor-owned utilities and ARES are required to offer net metering, while municipal utilities and electric cooperatives are exempt with no public initiatives to change this stipulation. Net metering is capped at 5% total peak demand supplied by each utility, and systems cannot exceed 2 megawatts. The Future Energy Jobs Act of 2016 made community solar and meter aggregation eligible for net metering, which launched the state's boom of community solar development.[65]

SB1601, the Illinois Enterprise Zone Act, included multiple provisions for the ICC to undertake studies related to interconnection.[66] Primarily, the Act required the formation of an Interconnection Working Group in 2019, which was tasked with addressing many of the fatal flaws of the interconnection process, including an inadequate dispute process, minimal space for material modifications, and outdated technical standards. The working group finalized a set of recommendations, but those were released simultaneously with CEJA. The legislature is currently evaluating whether the recommendations presented by the working group are in line with new requirements and guidelines established by CEJA.[67] Another major change coming out of the overall interconnection reform process is that utilities now require developers to pay nearly 100% of their interconnection service agreement (ISA) costs upfront.[68] This was established to minimize 'queue hoarding,' or the practice of claiming spots in the net metering or interconnection queue for projects that might not make it to completion.

Recent amendments to the Illinois Enterprise Zone Act require the ICC, in consultation with the IPA, to study and produce a report analyzing the potential for and barriers to the

implementation of energy storage in Illinois and to include a plan to procure energy from energy storage resources as part of its procurement plan for 2021.[69] This is expected to help propel the development of energy storage in Illinois, particularly paired solar and storage systems.

Taxation Policy of Renewables

Commercial/Utility Scale Solar

Commercial solar energy systems are defined in Illinois as an array of device(s) that produce electricity for the primary purpose of wholesale or retail sale. The valuation for commercial solar energy systems includes the land within the project boundaries and real property improvements, which subjects the property to be assessed at one-third of its fair cash value under the Illinois tax code. Currently, commercial, or utility, scale solar is assessed on a fair cash value assessment beginning with the assessment year 2018.[70] The assessment value for commercial solar energy systems is based on the nameplate capacity per megawatt and are valued at $218,000/MW of nameplate capacity in counties with less than 3,000,000 inhabitants.[71] The fair cash value used in the valuation is determined using the following formula: ($218,000 x trending factor) – Depreciation.[72] Where the term within the parenthesis is the "trended real property cost basis," from which a depreciation value is subtracted to give the taxable value for the current assessment year. The Illinois Department of Revenue defines the trending factor as the annual increase in the US consumer price index prior to the January 1 assessment date (CPI-U), divided by the US consumer price index for December 2017. The depreciation value stems from the age of the system divided by 25 then multiplied [SM1] by the trended real property cost basis. It is important to note that the depreciation value cannot be lower than 30% of the trended real property cost basis, which enforces a minimum floor for taxation of these systems. Table 1

below showcases the historical trending factors used for commercial solar energy systems valuation.[73]

Prior to 2017, Illinois did not have a consistent methodology for assessing the taxable value of a solar energy system. This resulted in ambiguous criteria that assessors would use that would not necessarily be consistent throughout the state. In the state's effort to provide predictability in valuing solar energy systems, an amendment to the property tax code in the state via SB 486 was enacted and resulted in the standardization used today.[74]

As time progresses, these commercial systems will depreciate in physical value, thus lowering the fair cash value of the system as well, resulting in an overall lower assessed value. This behavior in decreasing assessment value as time goes on is also an indicator that the associated property tax revenue will also decrease until the 30% floor is reached, at which point the revenue will remain constant until system decommissioning. This is of key consideration for local communities where solar farms are expected to dramatically increase throughout most of Illinois by the end of the decade. The additional property tax revenues can have the potential to bring new services and local investments to a local community area, so long as communities can properly navigate a slowly declining revenue stream throughout the life of the system.

Illinois Department of Revenue
History of CPI's and Trending Factors Used for Commercial Solar Energy Systems Valuation
01/14/2021

Year	December CPI-U	Assessment Year	Trending Factor
2017	246.524	2018	1.00
2018	251.233	2019	1.02
2019	256.974	2020	1.04
2020	260.474	2021	1.06

Table 1. Historical trending factors used for commercial solar energy systems valuation (Illinois Department of Revenue, 2021)

Preferential Assessments for Residential Solar

Prior to 2021, for non-commercial solar energy systems, i.e., systems where most of the solar energy produced is consumed on-site, the owner of the system was entitled to file a claim for an alternative assessment. The methodology, though, was largely written for solar thermal systems.[75] In early 2021, however, the Illinois General Assembly amended the property tax code such that future assessments of residential solar systems would "ascertain the value of the property without the solar energy system and the value of the property with the solar energy system. The alternate valuation computed as the lesser of those two values shall be applied to the property" as stated in HB373.[76]

Commercial/Utility Scale Wind

"Wind energy device," synonymous with "wind turbine," is defined in the state of Illinois as any device with a nameplate capacity of at least 0.5 MW of generated electricity being sold at the commercial level. Commercial wind systems are assessed on a fair cash value assessment beginning with the assessment year 2007, which is valued at $316,000/MW of nameplate capacity.[77] Similar to the valuation of commercial solar systems, the formula for determining the "trended real property cost basis" for wind systems is ($360,000 x trending factor) – Depreciation. [78] Wind energy systems also follow the same criteria as commercial solar systems for both the trending value term and the depreciating value term. Table 2 below showcases the historical trending factors used for commercial solar energy systems valuation.[79]

Illinois Department of Revenue History of CPI's and Trending Factors Used for Wind Energy Device Valuation 01/14/2021			
Year	**December CPI-U**	**Assessment Year**	**Trending Factor**
2006	201.8	2007	1.00
2007	210.086	2008	1.04
2008	210.228	2009	1.04
2009	215.949	2010	1.07
2010	219.179	2011	1.09
2011	225.672	2012	1.12
2012	229.601	2013	1.14
2013	233.049	2014	1.15
2014	234.812	2015	1.16
2015	236.525	2016	1.17
2016	241.432	2017	1.20
2017	246.524	2018	1.22
2018	251.233	2019	1.24
2019	256.974	2020	1.27
2020	260.474	2021	1.29

Table 2. Historical trending factors used for commercial wind energy valuation (Illinois Department of Revenue, 2021)

Local government impact from generated tax revenue

The taxation of renewables, both commercial and residential systems for solar and commercial for wind systems, fall under the Illinois definition of real property, "land and any permanent improvements" [5]. In Illinois, only real property is taxed. All revenue generated from these renewable systems/projects' property taxes funds local government services.[80] A 2020 economic impact analysis conducted by the Strategic Economic Research group investigated utility wind and solar energy in Illinois and went into comprehensive detail of the flow of property tax revenues to all taxing entities across the state. Figure 15 below shows a visualization of tax revenue generated by commercial wind and commercial solar farms from 2003 through 2019.[81]

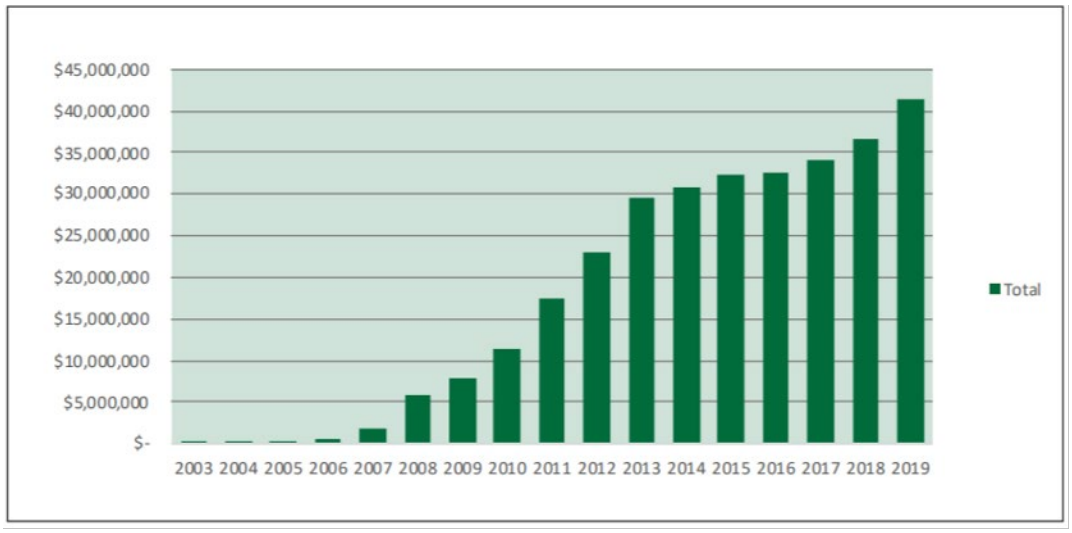


Figure 15. Illinois tax revenue per year is generated by commercial wind and commercial solar systems (Loomis, 2020)

Figure 15 showcases how significant revenue streams have been generated over the course of 16 years. According to the study, the grand total of tax revenue generated from commercial wind and commercial solar came to around $306,600,423.[82] A breakdown of where the funds were directed to the local level over the same time frame is shown below in Figure 16.[83]

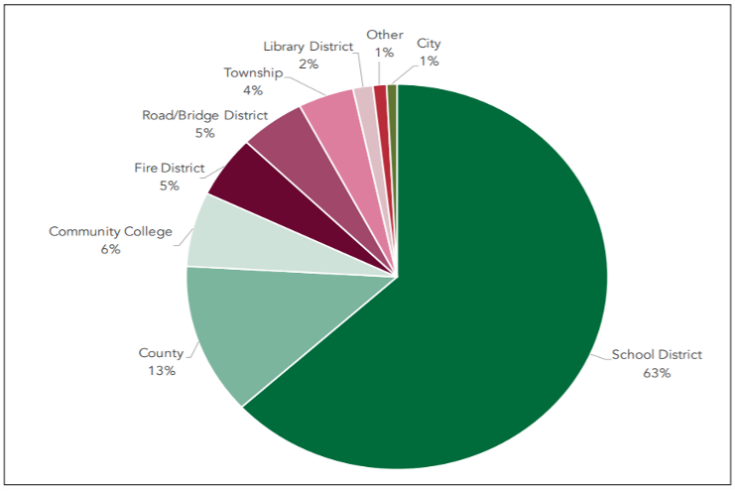


Figure 16. Property tax revenue by taxing area (Loomis, 2020)

Overall, Figures 15 and 16 illustrate the increase in funding that local governments have received since 2003. This is important to know since Illinois recently enacted the Clean Energy Jobs Act (HB804). The Clean Energy Jobs Act will significantly increase the amount of funding available for new commercial wind and solar systems along with increases in funding and expansion of residential based incentives for residential solar systems.[84] This dramatic increase in funding will result in more deployment in commercial wind and commercial solar systems, resulting in even more increases in tax revenue generated by these projects.

Much of the revenue generated by wind and solar projects are used for school districts in Illinois, with county governments the next largest group using these generated tax revenue funds, as seen in Figure 16 above. Illinois public schools receive just under two-thirds of their funding from local property taxes.[85] Revenue generated by the taxation of these wind and solar projects have the potential to provide sizable property tax revenue to local governments, which would most likely be directly going to funding these public schools. McLean County is one of the few counties in Illinois with the highest land-based wind generation potential. The Illinois State Board of Education used publicly available data for the 2019 – 2020-year found that local property taxes made up 69% of the total revenue source for public schools in McLean County.[86] In July of 2021, McLean County Board approved a new 250MW wind farm which is expected to generate $71.5 million in property taxes over 30 years, of which $43.7 million will go to school districts in Bellflower and West townships, McLean County over 30 years.[87]A 2019 economic impact report conducted by The Accelerate Group investigated the impacts on the economic opportunity to the State of Illinois that the Clean Energy Jobs Act could bring in. The report found that local and state tax revenue would generate over $6 billion by 2040.[88]

Siting Authority

In Illinois, the siting authority is at the local level, meaning that counties and municipalities have the decision-making power for siting both wind and solar projects.[89,90] Counties in Illinois also have jurisdiction over any wind siting on unincorporated areas outside the municipal zoning jurisdiction.[91] This jurisdiction over unincorporated areas does not apply to solar siting. Authority at the local government level has surfaced opposition to utility-scale wind and solar energy development, which has delayed, or halted in some cases, required approvals and breaking ground on multiple projects.[92] This increased difficulty in the development process causes renewable energy projects to be less attractive to developers.

Siting solar projects at retired coal-fired plants can reduce local opposition to renewable energy generation and storage because solar panels are kept out of sight for residential areas. Illinois legislators propose siting solar projects at retired or retiring coal facilities because the plants already have the infrastructure for generation and storage, are connected to transmission grids, and are sun and wind accessible.[93] Many groups, such as the Nature Conservancy, are pushing for siting solar projects on retired, retiring, or abandoned fossil fuel facilities and brownfields as well. Legislators have proposed incentive programs to accelerate this transition of retired coal plants to renewable sites that will help the state reach its carbon emission reduction goals faster. This solution also prevents retired plants from becoming vacant lands and brownfields, keeping the land use productive and contributing toward Illinois' renewable energy goals. The following infrastructure investment section discusses a more in-depth analysis of the "coal-to-solar" initiative.

In many cases, these coal-fired plants were in some capacity owned by a public utility, qualifying them as a public service. The legislators who wrote CEJA argue that this means

retired facilities should continue to be used for a public benefit, such as providing carbon-free electricity. While CEJA covers the "coal-to-solar" initiatives in depth, it does not change the fact that local governments have control over zoning these projects. If local zoning codes are not updated to allow for solar on these sites, this will be a barrier to implementing solar projects.

Use Of Public Lands

As of 2013, federal land accounts for slightly over 1% of land in Illinois.[94] Because this is such a small amount of land, there is not a focus on siting renewables on public lands. In fact, non-profit groups are working to protect remaining public lands from development.

An early iteration of the Lake Michigan Wind Energy Act (20 ILCS 896) created the Offshore Wind Energy Economic Development Policy Task Force, which analyzed and evaluated policies and economic options to facilitate offshore wind energy development and oversee the process of planning for and implementing offshore wind projects on Lake Michigan.[95,96] The Task Force released an Advisory Report in 2012 but has not released another since. The report discusses criteria for the Department to use when reviewing applications for offshore wind development of Lake Michigan lakebed leases and criteria for identifying areas that are "favorable, acceptable, and unacceptable for offshore wind development."[97] The report also outlines local, state, and federal authorities that have permitting, siting, and other approval authority for wind power, as well as legislative and regulatory offshore wind development governance recommendations.

As of August 9, 2019, and an amendment in Illinois HB 3482 became Public Act 101-0283 stating that "the bed of Lake Michigan is public land held in trust for the people of the State of Illinois and cannot be alienated to a private use or person; that federal and state policy as well

as the needs of the people of the State of Illinois, support exploration and development of renewable energy resources." The law directs the Department of Natural Resources (DNR) to identify areas of Illinois' public trust lands of Lake Michigan for wind development and gives DNR authority to grant assessment permits and leases that meet distance from shore and habitat protection criteria.[98] Offshore wind development is still in the early planning stages and faces strong public opposition due to concerns around obstructed views and ecological impacts.[99]

Infrastructure Investment

Illinois signed a historic infrastructure bill in 2019 that outlined the first capital plan in the state in nearly a decade. Governor JB Pritzker signed the Rebuild Illinois Capital Plan, and it was enacted in June 2019 through the passage of four bills SB 1939, SB690, HB142, and HB 62.[100] The bill allocated a total of $45 billion for infrastructure investment over six years dispersed across eight sectors.[101] A total of $1 billion was allocated for environment/conservation issues, where $70 million went to the Capital Development Board for solar and other renewable energy installation and upgrades at state facilities.[102] Another $70 million was allocated to the environmental protection agency (EPA) to invest in transportation electrification infrastructure projects mainly sourced as EV charging infrastructure.

While the historic infrastructure bill of 2019 focused solely on state facilities and transportation electrification, the 2021 CEJA allocated approximately $10 billion for statewide renewables.[103] The clean energy investments include a $50 million per year expansion to the Illinois Solar for All Program, over $80 million per year to build a network of workforce hubs and contractor development programs and over $35 million per year for business development grants. [104] CEJA will invest $580 million a year to meet the goals of generating 50% of energy from wind and solar by 2050 through grants.[105] The Act also prioritizes electric vehicle (EV)

charging infrastructure, aiming to put 1 million EVs on the road by 2030, and offers up to 80% of the cost of constructing charging stations.[106] Since 2019, solar energy installations are being sited mostly on commercial buildings, such as IKEA, Wal-Mart, and Target, followed by residential buildings, community solar, and a small amount of utility scale solar.[107]

Due to local opposition, Illinois recognizes the difficulty of constructing new utility-scale wind and solar facilities, thus instituted a "coal to solar" initiative. CEJA invests $280.5 million for grants to support the installation of energy storage facilities.[108] The bill promotes transmission infrastructure by providing the ability to be eligible for competitive REC procurement. Thus, as previously mentioned, siting solar projects at retired coal-fired plants can reduce local opposition to renewable energy generation and storage. Therefore, it targets installing new renewable facilities at already suitable facilities leading to its "coal to solar" transition incentives. This historic bill also increases investment in community solar programs that could utilize retired coal plants, as the location of these projects is less important than ownership in being classified as "community solar."[109]

IV. ASSESSMENT

Illinois has robust policy incentives for renewable energy, abundant wind, and a prime location with access to PJM and MISO, making it a very viable area for development. Illinois's connection to PJM and MISO allows projects in Illinois to deliver electricity eastward to states with clean energy goals. These features make Illinois a very viable place for wind energy development.[110] Overall, observations show that the highest potential for land-based wind is concentrated in the state's upper northwest and central areas, with generation potential ranging from approximately 5 million - 10 million MWh annually. Offshore wind is less viable due to the

significant amount of community pushback regarding view obstruction, public land protections, potential ecological damage, and the high cost of implementation.[111]

Wind in Illinois is projected to grow as rapidly as solar within the coming decade with the new REC commitments introduced in CEJA. Wind in Illinois has the benefit over solar in that the state has more experience with utility scale wind projects, and as such, it shows in the state's tax policy for wind farms. Providing a clear and consistent assessment methodology provides developers with the much-desired certainty about local payments made to the communities on which the wind farms are sited. While there is still opposition and challenges to wind in local communities with little to no experience with dealing with wind developers, the current landscape that the state has provided shows that the current policies in place are set to guide the state to meet its goals for wind development.

Illinois similarly is attracting solar development due to its aggressive climate legislation that incentivizes solar. Observations show that commercial rooftop solar potential is greatest in the metro Chicago area, where rooftops are more abundant and has a higher maximum potential when compared with residential rooftop solar potential. As for utility scale solar, there is greater availability of large high potential areas throughout the central part of the state, with the lower southern part of the state also being viable for large-scale solar array systems. The state-administered Adjustable Block Program mostly funds community solar and distributed generation projects, making the likelihood of receiving these funds for utility scale solar less viable. [112] Lack of funding has created a waitlist of over 4,000 projects. In addition to expanding community solar and distributed generation, Illinois focuses on siting utility scale solar using the coal-to-solar method or siting on other brownfields, such as landfills, as the most viable option.[113]

In addition to the policies presented, there are policy initiatives that currently play into benefiting the state in setting up the playing field such that rapid development of additional renewable infrastructure can occur. In addition to more renewable energy generation, Illinois has also enacted several separate laws from CEJA that paves the way for an easier development process for developers and manufacturers of respective transportation and infrastructure sectors. One example is the Reimagining Electric Vehicles (REV) Illinois Program that governor J.B Pritzker signed in 2021. This program is an additional tax incentive to manufacturers of electric vehicles and the respective manufacturers for individual components (batteries, charging stations, etc.).[114] This program is primarily focused on positioning the state of Illinois as a hub for electric vehicle manufacturers to move their operations into the state, providing jobs to the communities they are located to while providing the means to help the state meet the infrastructure goals that CEJA outlines.

Overall, policies across the state align to encourage more development of renewables, particularly distributed solar resources. In zoning, policies are in place that encourages solar, such as Illinois Municipal Code 65. This code grants zoning authority to municipalities to regulate any structure or activity that might block the sunlight necessary for the proper functioning of a solar energy system.[115] Another law, Public Act 097-0105, expands upon a decade old bill that prevents homeowner's associations (HOAs) from banning homeowners from using or installing solar energy systems. In July 2021, Governor Pritzker signed Public Act 102-0161(HB 644) into law, expanding protections and closing loopholes, making it more difficult for HOAs to block homeowner solar projects.[116,117] Additionally, public utilities commission policies and rulemakings are increasingly aligning with the state's renewable development goals. Recent efforts to ease community solar implementation by adjusting ARES rules under CEJA,

along with working groups to address issues with distributed generation interconnection, show that the Illinois Power Authority is working to update PUC rules that have hindered renewable energy development in the past.

The landscape of policies in Illinois is constructed so policies work together to appeal to the communities that are most viable to utility scale renewable energy in its initial phases. CEJA's guiding climate policy has incentivized programs that center equitable communities. New REC commitments to wind are accompanied by tax policies that promote community benefits, especially for local school districts.[118] Solar investment outline in CEJA incentivizes community solar projects that can be as large as 5 MW installments. The solar development tax policy similarly provides communities with substantial tax revenue.[119] Moreover, public utility reforms are working to similarly encourage community solar and work on the distributed energy interconnection problems. As previously mentioned, the additional locations for utility scale wind and solar are in coal plants or brownfields. Therefore, apart from tax policy, the infrastructure investment into coal-to-solar programs under CEJA aims to alleviate economic disruption to workers and communities reliant on coal.[120] There is also expansive investment in CEJA for disadvantaged communities and those impacted by the transition.[121] Hence, the explicit climate policy, tax policy, infrastructure investment, and public utility commission policy are constructed to highlight and encourage community benefits to utility scale wind and solar projects.

The additional state policy that impacts community benefits from the development of renewable energy projects is siting and using public lands that work together to protect communities' interests. Siting authority is located at the local level leaving the decision for siting of utility scale projects to the communities to determine for themselves whether and where these

projects belong.[122] The use of public lands, while federally controlled, impacts Illinois as it has the potential for offshore wind. Nevertheless, the state of Illinois created a task force that works with the department of natural resources to assess the permits and leases for setback distance and habitat protection.[123] Communities have some power in the decision-making process for siting of these projects; therefore, while the other state policies work together to promote community benefits, if those benefits are not readily seen by the communities, state policy allows them to decide the fate of development.

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Contents

I. INTRODUCTION

Like many other states, Illinois is moving toward decarbonizing its energy sector. A major part of this effort is shifting to renewable electricity generation. As the nation's third-largest net electricity supplier, Illinois' energy sector decarbonization will have far-reaching effects throughout the Midwest. Since 2016, enabling state policies, namely the Future Energy Jobs Act and the Clean Energy Jobs Act, have allowed for vast growth in distributed generation development. Other state policies, including taxation of renewables, regulation of the energy sector, infrastructure investment, use of public lands, and siting authority are evolving to become more adaptable to Illinois' rapid expansion of renewable energy deployment. This paper discusses the current renewable energy policy landscape in Illinois and explores how coordinated policies collectively facilitate renewable energy deployment across the state.

II. BACKGROUND

Demographics

Although Illinois historically experienced some of the highest population growth rates in the country, rural areas of the state have seen a decline in population since the 1960s. The 2020 Census placed Illinois 4th in population decline rate, citing domestic migration as the primary reason due to limited housing and employment opportunities for the high levels of population decline in the state.[1]

The fastest shrinking county is Alexander County at the southern tip of the state, which lost 20 percent of its population between 2010 and 2020 and is predominantly made up of nationally protected lands.[2] Outside of the Chicago metro area, only five counties gained

population in the same period; Chicago has held steady in population, meaning there has been no urban growth to offset the decline seen in rural counties.

Aside from the Chicago metro area and a few districts in the state's northwest corner, Illinois has a largely red-leaning electorate (see Figure 1).

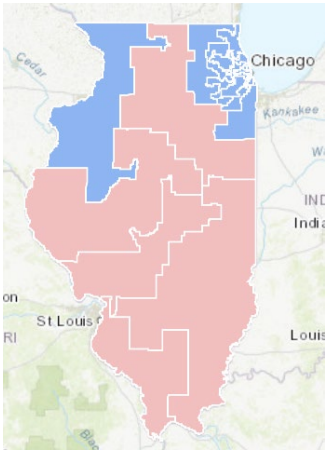


Figure 1. USA 117th Congressional Districts (Illinois Early Childhood Asset Map, 2021).

The same areas downstate experiencing population decline also see a significant political shift. Since 1998, Gubernatorial races have shown a consistent move toward the political right in the state's southern portion (see Figure 2). In the 2016 presidential election, growing and stable counties shifted left even as much of the Midwest shifted right.[3] In 2018, a few scattered counties shifted back to the left, notably three counties in the south that reverted to 2010 patterns.[4]

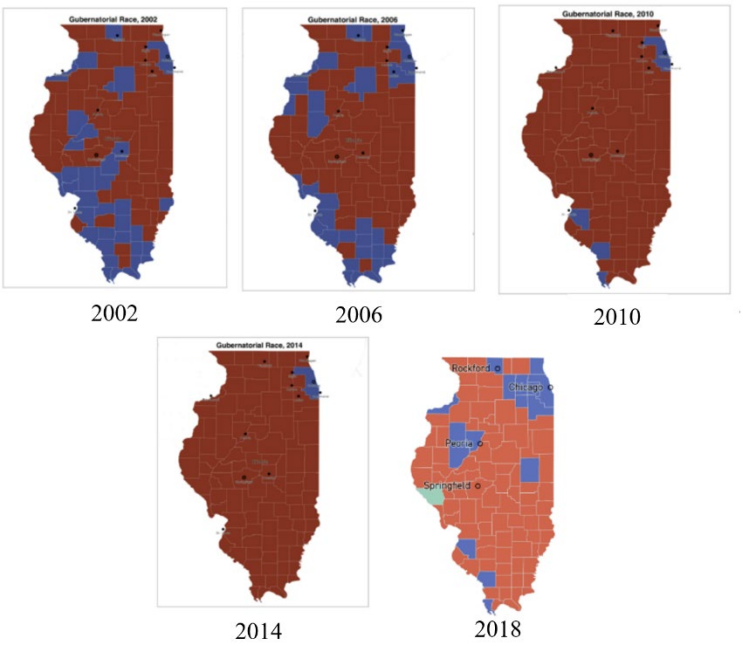
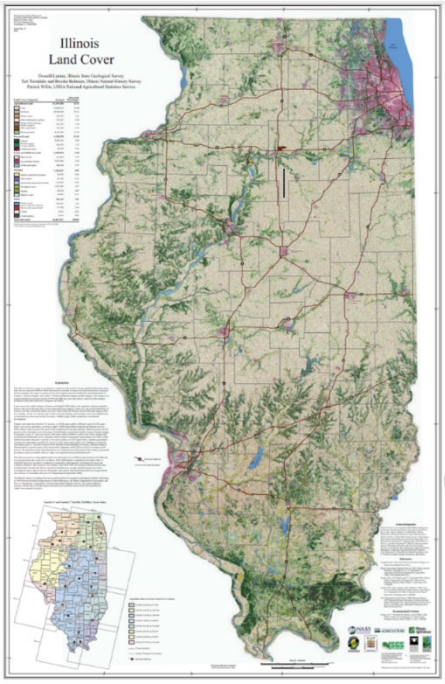


Figure 2. Illinois Gubernatorial Elections 2002-2018 (Conte, 2018, Politico, 2018).

Economic Base

Most economic activity in Illinois is centered in the Chicago metro area. Home to more than 400 major corporate facilities, the city ranks second in the United States for corporate headquarters, including 36 companies in the Fortune 500 and 31 in the S&P 500.[5] Chicago is also home to the largest futures exchange globally, the Chicago Mercantile Exchange, trading in agricultural products, currencies, energy, interest rates, metals, stock indexes, and weather.[6] Outside the Chicago metro area, agriculture accounts for much of the state's economic output, with corn and soybeans as the state's highest valued commodities.[7] Prime farmland closely aligns with crop distribution throughout the state, with most land covered by corn and soybean

crops (see Figure 3 and Figure 4). Most of the southern counties losing population tend to be forested rather than farmed.



Land Cover Categories[1]	Acreage[2]	Statewide Percentage[2]
Agricultural Land	**27,519,206**	**76.31**
Corn	11,409,233	31.64
Soybeans	10,504,048	29.13
Winter wheat	363,227	1.01
Other small grains and hay	331,467	0.92
Winter wheat/soybeans, double cropped	613,307	1.70
Other agriculture	134,326	0.37
Rural grassland	4,163,599	11.55
Forested Land	**4,150,179**	**11.51**
Upland	3,455,241	9.58
Partial canopy/ savanna upland	614,919	1.71
Coniferous forest	80,019	0.22
Urban and Built-Up Land	**2,325,924**	**6.45**
High density	615,825	1.71
Low/medium density	1,021,605	2.83
Urban open space	688,494	1.91
Wetland	**1,414,613**	**3.92**
Shallow marsh/wet meadow	92,078	0.26
Deep marsh	41,708	0.12
Seasonally/temporarily flooded	113,873	0.32
Floodplain forest	1,107,038	3.07
Swamp	20,254	0.06
Shallow water	39,662	0.11
Other	**653,215**	**1.81**
Surface water (does not include Lake Michigan)	604,687	1.68
Barren and exposed land	37,530	0.10
Clouds	6,875	0.02
Cloud shadows	4,123	0.01
Statewide totals	**36,063,137**	**100.00**

[1]Interpretation based on imagery acquired in 1999 and 2000.
[2]Area statistics calculated for Illinois only.

Figure 4. Illinois Land Cover (Luman et al., 2004)

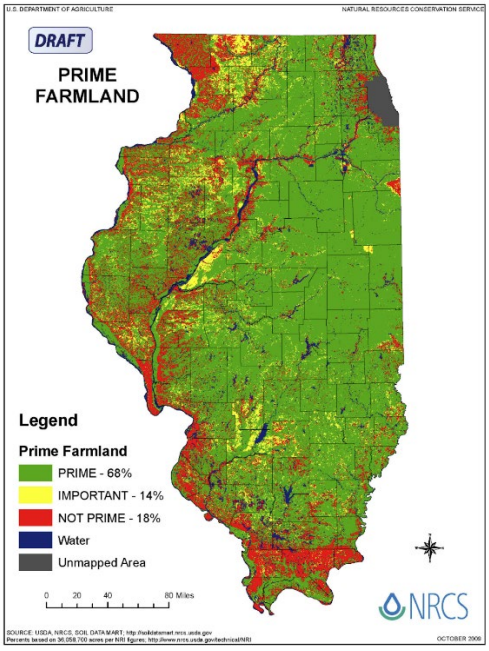


Figure 3. Prime Farmland (USDA, 2009).

Roughly 13% of the state's total output comes from manufacturing, with $108 billion in economic activity in 2018.[8] The Chicago area produces significant quantities of food products, chemicals, fabricated metals, computer and electronic products, and rubber products, while rural areas largely produce farm machinery and motor vehicles.[9]

Renewable energy is emerging as an economic powerhouse in the state. Most utility-scale renewable energy facilities are in the state's northern half, while clean energy businesses like contractors and installers are mainly headquartered in the Chicago metro area (see Figure 5).

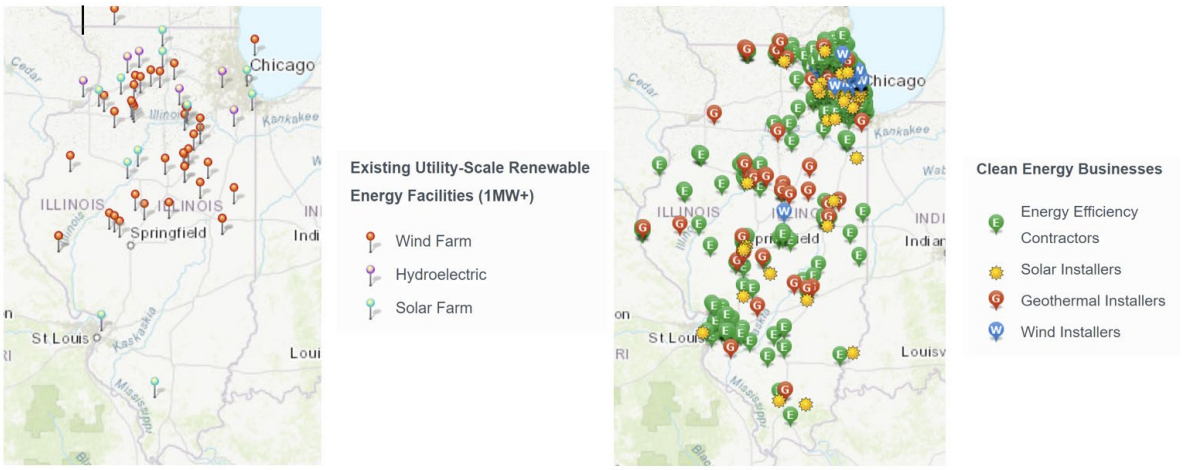


Figure 5. Clean Energy in Illinois (Environmental Entrepreneurs, 2018).

Public Lands and Fossil Fuel Mining

Approximately 2% of total land area in Illinois is owned by state and federal governments, ranking Illinois 37th in the country in total public lands.[10] Nationally owned land is consolidated in the southernmost portion of the state, including Shawnee National Forest and Cypress Creek National Wildlife Refuge (see Figure 6).

Figure 6. Nationally Owned Lands in Illinois (USDA, 2021).

As opposed to solar PV and wind installations in the state, energy production via coal mining is concentrated in the southern half of Illinois (Figure 7). As of 2014, the state was home to 22 active coal mines, with most coal production coming from underground mining. From a combination of underground and surface mines, Illinois was the fourth-largest coal producer in the United States, extracting approximately 31.6 million short tons of coal in 2020.[11] Of note, the same regions of Illinois that have experienced recent population decline due to limited employment opportunities are the same areas whose economy leans heavily on coal extraction.

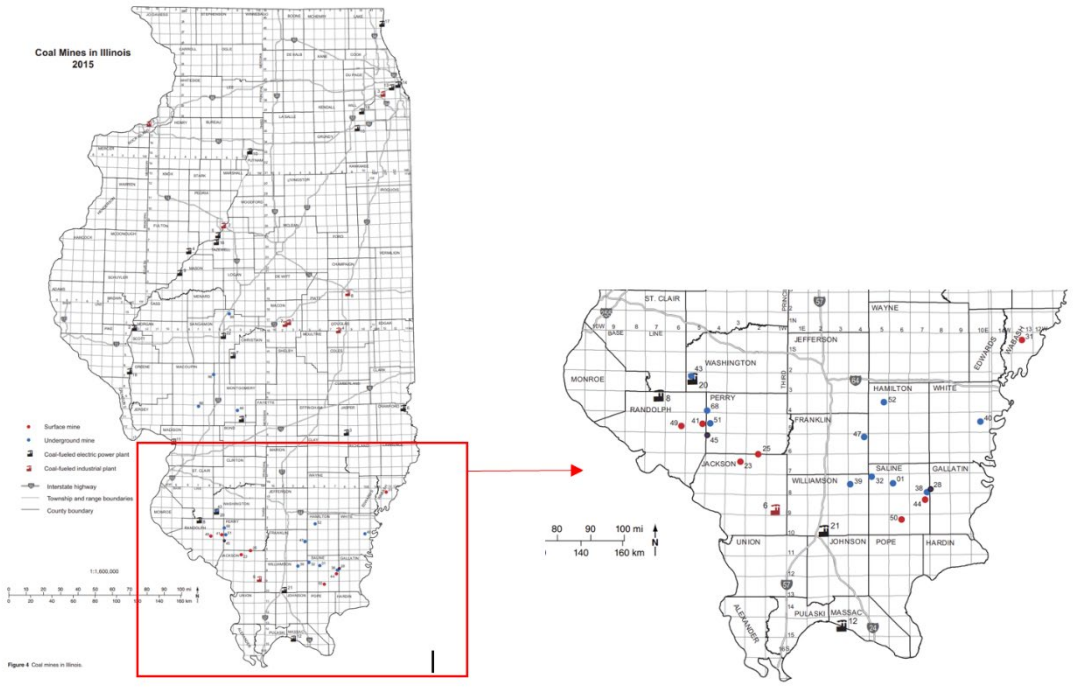


Figure 7. Coal Mines in Illinois (Xiaodong et al., 2016).

Existing Electricity Mix

Illinois is one of the top energy consumers and producers in the Midwest. As of March 2019, Illinois was generating about 58% of its electricity from nuclear, 18% from coal, 11% from renewables, and 14% from natural gas.[12] Figure 8 below gives a further breakdown of annual energy production in Illinois by types of generation. Illinois climate goals focus on shifting to 40% renewable energy by 2030, 50% by 2040, and ending the use of coal for electricity by 2045.[13][14] The state currently generates 94% of its renewable energy through wind, with a current 6300 MW of wind operating as of 2020. As of 2020, solar contributes very little to overall electricity generation, with more than four-fifths of the state's total solar generation coming from small-scale rooftop solar.[15] Twenty-year trends throughout the entire electric industry of Illinois are as follows:

- Nuclear generation has been increasing from 89 million MWh in 2000 to nearly 99 million MWh generated in 2019.

- Wind generation has drastically increased from zero MWh in 2001 to almost 14.5 million MWh in 2019.

- Solar came online in 2009 and has been increasing ever since, though still relatively low at under 62,000 MWh generated in 2019.

- Behind nuclear generation, coal and natural gas are the second and third largest generation sources, at 48.8 million and 21.3 million MWh, respectively. After steadily increasing in generation for 15 years, coal generation began decreasing in 2015. Natural gas generation continues to increase steadily as of 2019.[16]

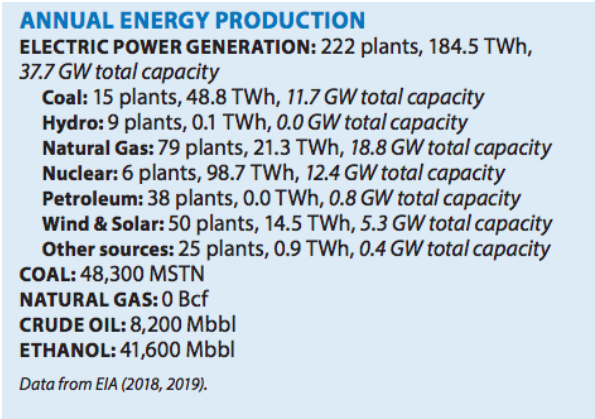


Figure 8. Annual energy production from Illinois by number of plants and total capacity for each source of energy (CESER, 2021).

Structure of Electricity Sector

Since 1999, Illinois has had zero net interstate imports of energy while net interstate exports range from 32 million to 48 million MWh each year, a large export volume compared to other states.[17] As the third-largest net electricity supplier to other states, Illinois exports around one-fifth of the power it generates to other states via interstate transmission lines. Regional grid systems, PJM Interconnection, and Midcontinent Independent System Operator (MISO) serve Illinois and allow for the export of electricity. Illinois has over 150 electric suppliers, with three

main utility companies, ComEd, MidAmerican, and Ameren, who maintain power lines and deliver electricity. Illinois is a deregulated energy market and electricity-choice state with 77 Alternate Retail Electricity Suppliers (ARES), including 41 municipal utilities, 26 cooperatives, three investor-owned utilities, and seven other utilities.[18] The large number of municipal utilities may lead to more community choice aggregation in the future; aggregations were serving over 76% of Illinois communities as of 2018.[19]

Renewable Energy Generation and Potential

Like many other states, Illinois is moving toward decarbonizing its energy sector. A major part of this effort is shifting to renewable electricity generation. Figure 9 below shows the land-based wind generation potential at the county level. The best wind generation potential in the state is in the north-central, in and north of Bloomington. Overall, observations show that the highest potential for land-based wind is concentrated in the state's upper northwest and central areas, with generation potential ranging from approximately 5 million - 10 million MWh annually.[20]

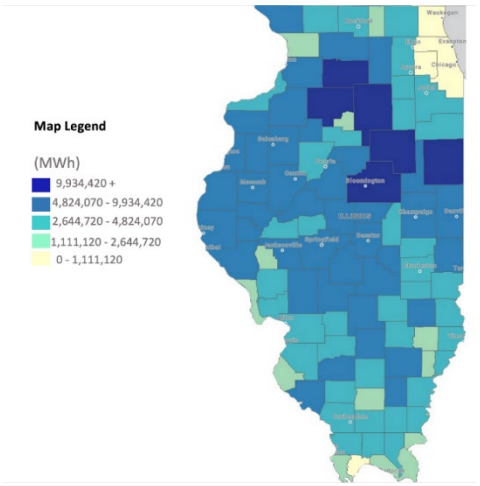


Figure 9. Land-based wind generation potential at the county level.

Figure 10 below shows the location of wind turbines in Illinois. Installed wind capacity closely mirrors resource potential in Illinois. According to the U.S. Wind Turbine Database, wind development is concentrated in the upper northwest region of the state, with an average turbine capacity hovering around 1.5-2 megawatts.[21]

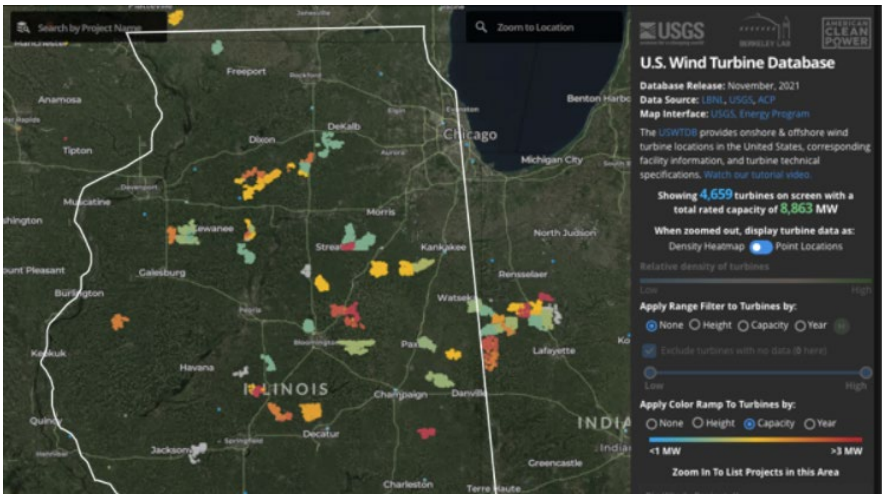


Figure 10. Illinois Wind Turbine Density Heatmap (U.S. Geological Survey, American Clean Power Association and Lawrence Berkeley Nation)

While solar generation in Illinois has mostly been limited to rooftop solar, the state has a high potential for larger solar array systems for commercial and utility scale projects. Figure 11 below shows the potential solar generation at the county level. Observations show that commercial rooftop solar potential is greatest in the metro Chicago area, where rooftops are more abundant and has a higher maximum potential when compared with residential rooftop solar potential. As for utility scale solar, there is greater availability of large high potential areas throughout the central part of the state, with the lower southern part of the state also being viable for large-scale solar array systems, as shown in figure 12. It should be noted that the order of magnitude difference between utility scale solar and residential/commercial scale solar is large and significant.

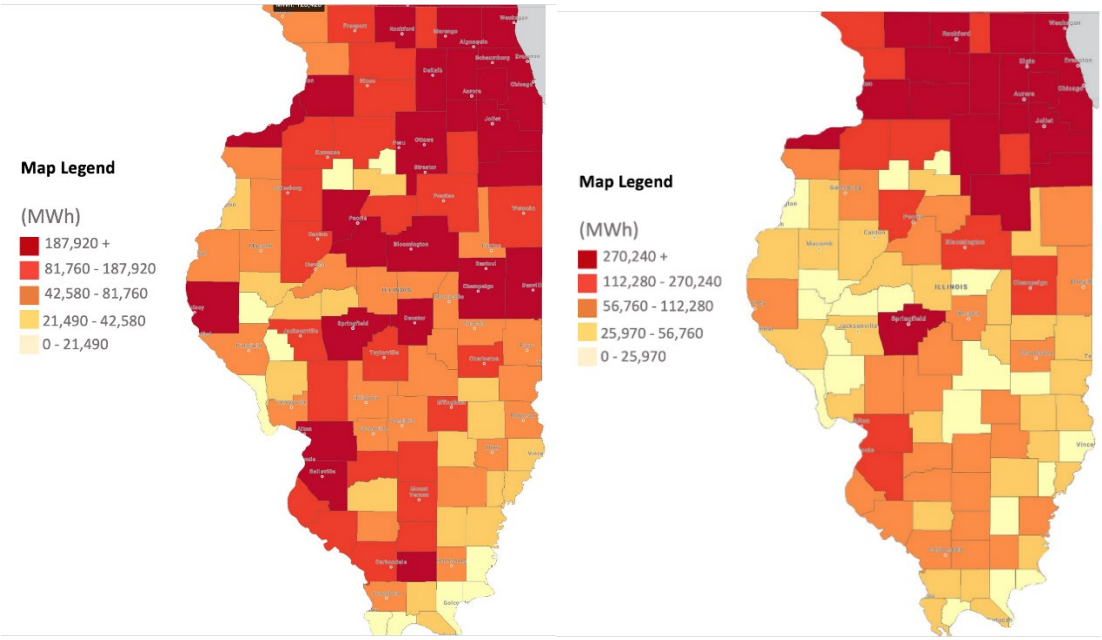


Figure 11. From left to right: (left) Residential Rooftop Generation Potential; (right) Commercial Rooftop Solar Generation Potential.

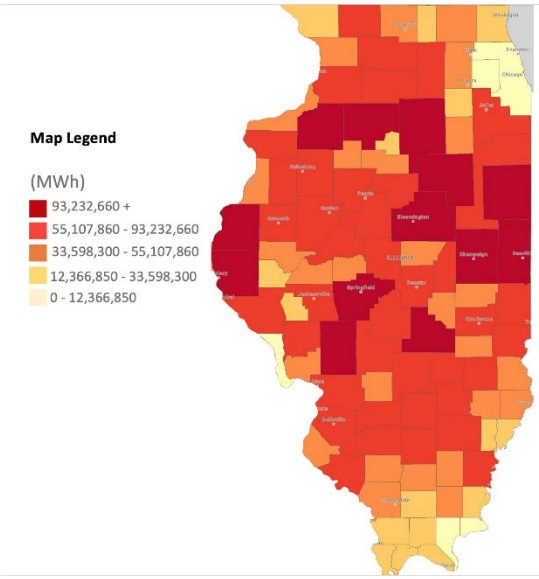


Figure 12. Utility scale solar generation potential.

Since 2019, solar energy installations have been sited mostly on commercial buildings, such as IKEA, Wal-Mart, and Target, followed by residential buildings, community solar, and a small amount of utility scale solar as seen in Figure 13.[22] Overall, Illinois currently only generates a small percentage of its electricity via solar. With current policy incentivizing mass investment in new large scale solar farms by 2031, the full potential of solar in the state of Illinois will begin to become clearer in the near future as more solar comes online.

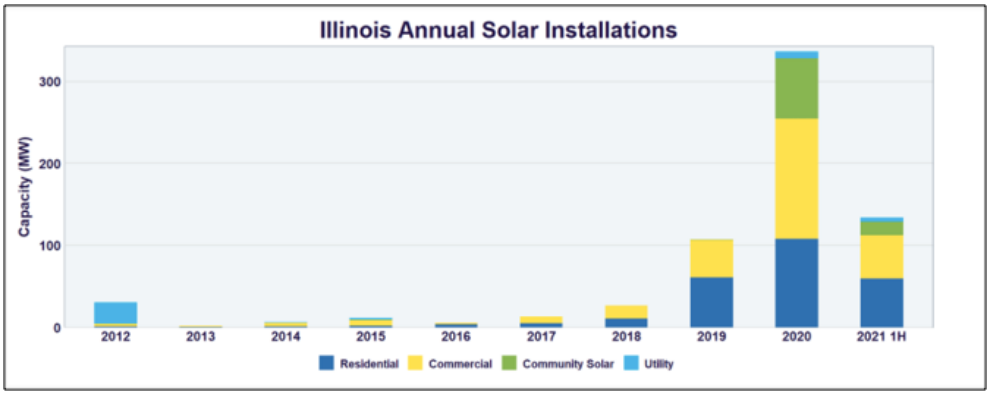


Figure 13. Distribution of solar installations by residential, commercial, community solar, and utility scale (SEIA, 2021)

While more distributed throughout the state when compared to wind, solar is being developed on a larger scale in the southern half of the state. Figure 14 below shows the location of solar projects throughout Illinois.[23]

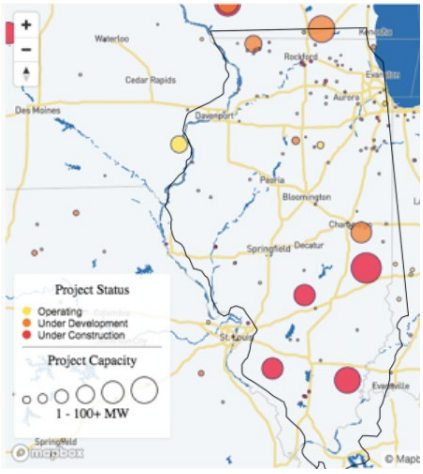


Figure 14. Ground-mounted solar projects 1 MW and above that are operating, under construction, or under development.

A 2020 study[24] explored the economic feasibility of solar and different storage systems in the state. This study determined that through various federal, state, and utility incentives, the financial benefits of solar plus storage systems along with energy efficiency load reductions would result in a financial benefit that would exceed the cost of system installation in most cases over the course of the system lifespan. This study also found that additional investments in solar could have the potential to greatly reduce consumer electricity bills. Policy recommendations included the need to explore different avenues that would further promote the growth of solar and storage technologies through more aggressive climate policies.[25]

Local Narratives

In Illinois, solar and wind energy has faced opposition from local actors based on noise, property values, and quality of life concerns. Local opposition grew strongly after the 2016 Future Energy Jobs Act. Deep-rooted opposition has led to legal action: lawsuits have deferred and prolonged certain projects, including the Alta Farms Wind Project in Dewitt County.[26] Main local opposition to the proposed 344 megawatt project derived from "shadow flicker," decreased property value, interrupted sightlines, and difficulties in crop dusting.[27] While construction eventually began in Dewitt County, the same cannot be said for Bellflower Township, where opposition has kept wind energy companies from developing.[28] Proposed solar farms are also facing similar resistance. Opposition to solar farms has been primarily concerned with changing landscapes of agriculture and farmland where residents cite lower property values.[29,30,31] Kankakee county became a hotbed of solar development due to its relatively inexpensive farmland and ready access to the ComEd grid.[32] However, opposition to the solar projects in Kankakee was exemplified in Momence as locals cited decreased property values and the changing landscape due to changing the zone standing from residential to agricultural.[33]

Illinois' coal reserves historically served as a great incentive to invest in coal power plants, leading to a reliance on coal plants that now challenges renewable energy deployment. The largest concern for residents of Havana, city in West Central Illinois facing coal plant closures, is the loss of tax funding and economic activity due to closed coal plants and skepticism that solar plants will bring about the same level of economic activity much needed in the community.[34] While new legislation includes promises for just transitions for the coal-to-solar communities, there is increased community concern about the promises of renewable energy. Opposition to renewable energy has also been backed by utility companies fighting state policy that invests in renewable energy by raising concerns about just transitions for local communities. Specifically, Exelon has long provided challenges to renewable energy in Illinois. In 2013 they focused their efforts on blocking a bill that would reform the state's RPS to allow the Illinois Power Agency to purchase renewable energy regardless of the supplier.[35] Early in 2021, Exelon threatened to close coal plants should it not receive aid through the new legislation; the final bill authorized $694 million in aid to keep the plants online.[36]

Local attitudes towards renewable energy on private property differ greatly from attitudes towards renewable energy in general, which are more aligned with statewide goals. Concerns with solar and wind were expressed in local settings where the change to livelihoods was ever-present. Some Illinois residents have unique concerns regarding their community's economic stability with the transition away from coal, posing some reluctance to embrace solar and wind projects. Nevertheless, much opposition came from renewable energy supporters with strong sentiments of NIMBYism.[37] Statewide newspapers present the opposition to renewables as an obstacle to attaining RPS goals. Moreover, the most recent Climate and Equitable Jobs Act of 2021 swayed statewide newspapers to present any opposition to renewable energies as hindering

state goals.[38,39] Community concerns were more likely to be highlighted in local newspapers, illustrating the nuanced nature of renewable energy deployment.

III. ANALYSIS

Explicit Climate Policy

Foundational to Illinois' climate and energy legislation, the Illinois Power Agency Act of 2007[40] set the state's first renewable portfolio standard (RPS). The original RPS required investor-owned electric utilities (IOUs) and alternative retail electric suppliers (ARES) to source 25% of eligible retail electricity sales from renewable energy by 2025. Eligible renewable energy technologies include wind, solar thermal, and solar photovoltaics (PV), but also more controversial renewable sources, including dedicated crops grown for energy production, untreated and unadulterated organic waste biomass, trees and tree waste, in-state landfill gas, biodiesel, hydropower that does not involve the construction of new dams, and waste heat from industrial processes and anaerobic digestion.[41]

The Illinois Power Agency Act also created the Illinois Power Agency (IPA), a new state agency tasked with developing electricity procurement plans for IOUs and brokering contracts between utilities and suppliers to ensure "adequate, reliable, affordable, efficient, and environmentally sustainable electric service at the lowest total cost."[42] The IPA is responsible for developing and administering clean power procurement programs under this act and subsequent policies, most notably the Future Energy Jobs Act of 2016.

Building on the foundation established by the Illinois Power Agency Act, Illinois passed the Future Energy Jobs Act[43] (FEJA) in 2016. FEJA primarily mandated higher RPS targets than were established under the Illinois Power Agency Act, raising the goal to 100% renewables by

2050 and including provisions to make renewable energy more accessible in low- and moderate-income communities.[44] While FEJA did not explicitly increase funding for renewable energy, it did move the charge to the delivery side of electricity bills, which allowed the Illinois Power Agency to collect and invest funds much more easily.[45] Earlier RPS program rules placed funds in separate accounts for utilities and retail aggregators, making it difficult to reliably predict program funding when customers switched suppliers.[46] FEJA also placed all RPS compliance on the utility regardless of supply, which wasn't standard before the Act. That move made renewables much more lucrative and guaranteed long-term contracts for REC purchase, which stabilized the solar industry.[47]

The Act also tasked the IPA with developing the state's Long-Term Renewable Resources Procurement Plan to guide activities in support of the state's RPS, primarily the establishment of two new renewable procurement programs: the Adjustable Block Program (ABP) or Illinois Shines and Illinois Solar for All (IL SFA).[48] Both ABP and IL SFA operate as REC purchasing schemes, with the IPA mediating the sale of SRECs from solar developers to the state's IOUs. The IL SFA program, unlike the ABP, is 100% allocated to low-income system owners, community solar project subscribers, or those who host the community solar project on their property.

When FEJA passed, the Environmental Defense Fund estimated that Illinois would see an additional $12 billion to $15 billion in new private investment due to the bill's clean energy priorities.[49] The program dashboards showing capacity built for ABP and IL SFA have been disbanded as a result of overhauls from the Climate and Equitable Jobs Act of 2021, but interest in each program was significant from the outset when the programs began in 2019. In the first few weeks of program operation, developers submitted a total of 931 community solar project

applications, representing 1.8 gigawatts of capacity, and an additional 2,246 applications for smaller distributed generation projects (an additional 238 megawatts).[50] These applications far exceeded the program's initial capacity, demonstrating an overwhelming appetite for solar development in the state.

Few studies have been performed that specifically look at how energy policy has impacted renewable energy deployment. A 2018 study[51] looked into the economic and public health benefits of replacing coal plants in Illinois with local clean energy. This study showed that through FEJA and the continued retirement of coal plants, a transition to cleaner energy sources would result in even greater investment in renewable energy as the cost for solar continues to decrease, making traditional fossil fuel based systems harder to compete within the state, which would result in public health benefits due to the repurposing of old retired coal plants to be areas of clean energy generation. Additionally, it was shown that investing in developing new wind and solar farms would result in a direct cost reduction benefit for the residents while also helping the state achieve its RPS target. Furthermore, the study made policy recommendations that emphasized the need for consistent stakeholder engagement on behalf of the state, federal, utility regulators, power grid operators, and utility companies throughout the transition process. This would ensure that communities most directly affected by the retirement of coal plants in favor of renewable energy sources are not left behind.

Passed in September 2021 with bipartisan support, the Clean Energy Jobs Act[52,53] (CEJA) was devised to build on FEJA's renewable energy goals while addressing the public health and economic equity challenges brought to light by the Covid-19 pandemic. The multifaceted bill emphasizes the creation of good-paying clean energy jobs, improving the health of Illinoisans, and supporting disadvantaged communities through the expansion of energy-

focused programs already in place in Illinois: the energy transition, energy efficiency, electric vehicles, and electrification. CEJA also creates new workforce development initiatives and enhances utility rules and ethics reforms.

Article 5 of CEJA is focused on continuing the energy transition put in place by the Illinois Power Agency Act and FEJA. First, CEJA requires Illinois to achieve a 100% zero-emissions power sector by 2045, with substantial emissions reductions starting in 2021. These requirements notably apply to the Prairie State coal plant, the state's largest and the country's seventh-largest emitter of carbon pollution, which must reach net zero emissions by 2045.[54] Alongside the carbon-free power sector requirements, CEJA seeks to grow renewable energy generation capacity by a factor of five, investing $580 million a year to generate 50% of the state's energy from wind and solar PV by 2040. The changes to the state's clean energy goals in CEJA have also prompted the IPA to revise the Long-Term Plan, expanding both the Adjustable Block Program and Illinois Solar for All.[55] While these programs under FEJA led to a solar boom, legal and programmatic limitations meant that the influx of solar development in the state was short-lived and quickly tapped out. The clean energy provisions in CEJA are expected to revive solar power in Illinois, allowing solar developers to continue investing in Illinois, with a newly targeted focus on developing an equitable workforce and supporting diverse contractors.[56]

CEJA seeks to implement significant reform policies to weaken the political and financial power of IOU's in Illinois. Primarily, the bill employs an automatic rate system that replaces utility formula rates to require a contingency on utilities' profits on achieving equity and clean energy goals. Other utility reform measures include improving transmission planning, construction of new transmission lines, restrictions on utility lobbying and spending, and a new Illinois Commerce Commission (ICC) ethics oversight decision to enforce utility compliance. In

a more contentious arena, CEJA also provides financial support for two nuclear plants owned by Exelon, which are currently struggling to stay afloat in Illinois.[57] The payments total approximately $700 million over five years and will be reduced should the plants receive federal subsidies.

A major component of CEJA is investing in equitable, healthy communities, creating programs for disproportionately impacted communities and workers. By investing $40 million per year to replace lost property taxes, CEJA seeks to support communities and workers impacted by the bill's transition away from fossil fuels. CEJA also acknowledges that communities will be impacted by the closing of fossil plants by supporting job training and services to displaced workers. This includes an annual $115 million investment to create job training hubs and establish renewable energy career pipelines and support small clean energy businesses in disadvantaged communities. Finally, CEJA establishes and extends a variety of electrification and efficiency-based programs to bolster carbon reductions driven by the energy generation sector. Building code modifications include electrification measures in parallel with the extension of existing energy efficiency programs and increased efficiency investments in low-income households. Electrification efforts also extend to the transportation sector, with rebates for electric vehicles and charging infrastructure.

PUC Policy in Illinois

Public Utility services in Illinois are regulated by the Illinois Commerce Commission (ICC), staffed by five Commissioners. Each Commissioner is appointed by the Governor and confirmed by the Illinois State Senate for a five-year term, and no more than three Commissioners may belong to the same political party.[58] The ICC's mission is to "balance the interests of consumers and utilities to ensure adequate, efficient, reliable, safe and least-cost

public utility services while promoting the development of an effectively competitive energy supplier market."[59]

The Electric Service Customer Choice and Rate Relief Law of 1997 restructured Illinois' electric service industry to allow a choice of electric suppliers, known as Alternative Retail Electric Suppliers (ARES).[60] Approximately 75% of the electricity consumed by Illinois' utility customers is provided by an ARES.[61] While the ICC must certify any ARES doing business in Illinois, they are overall less regulated than the state's investor-owned utilities. Recent climate policies, particularly those related to community solar, have run into implementation issues when working with ARES customers.

By law, there is a significant amount of opacity between ARES and investor-owned utilities regarding individual customers' rates and electric usage. It is both administratively complex and legally vague for ARES and investor-owned utilities to communicate regarding community solar credits, meaning ARES customers may never see cost-saving credits applied to their utility bill.[62] For that reason, only non-ARES customers (about 25% of total customers) can currently sign up for community solar projects, adding nuance to the implantation of Illinois' climate and solar policies. One of the major aspects of CEJA was a stipulation that required utilities to always provide monetary credits to customers, regardless of whether the customer is with an ARES. While the stipulation is not yet implemented, it has the potential to solve this issue, allowing for a huge increase in the potential community solar customer base for developers.

Illinois SB680 (2007)[63] gives the ICC the authority to establish standards for interconnection and net metering for renewable energy systems. The ICC designates different

standards by system size, with projects greater than 10 megawatts being subject to more intensive review. Smaller projects with minimal transmission requirements typically receive an expedited and straightforward review from the ICC.[64] Net Metering (NEM) enables most solar development in Illinois and is regulated by the ICC. Both investor-owned utilities and ARES are required to offer net metering, while municipal utilities and electric cooperatives are exempt with no public initiatives to change this stipulation. Net metering is capped at 5% total peak demand supplied by each utility, and systems cannot exceed 2 megawatts. The Future Energy Jobs Act of 2016 made community solar and meter aggregation eligible for net metering, which launched the state's boom of community solar development.[65]

SB1601, the Illinois Enterprise Zone Act, included multiple provisions for the ICC to undertake studies related to interconnection.[66] Primarily, the Act required the formation of an Interconnection Working Group in 2019, which was tasked with addressing many of the fatal flaws of the interconnection process, including an inadequate dispute process, minimal space for material modifications, and outdated technical standards. The working group finalized a set of recommendations, but those were released simultaneously with CEJA. The legislature is currently evaluating whether the recommendations presented by the working group are in line with new requirements and guidelines established by CEJA.[67] Another major change coming out of the overall interconnection reform process is that utilities now require developers to pay nearly 100% of their interconnection service agreement (ISA) costs upfront.[68] This was established to minimize 'queue hoarding,' or the practice of claiming spots in the net metering or interconnection queue for projects that might not make it to completion.

Recent amendments to the Illinois Enterprise Zone Act require the ICC, in consultation with the IPA, to study and produce a report analyzing the potential for and barriers to the

implementation of energy storage in Illinois and to include a plan to procure energy from energy storage resources as part of its procurement plan for 2021.[69] This is expected to help propel the development of energy storage in Illinois, particularly paired solar and storage systems.

Taxation Policy of Renewables

Commercial/Utility Scale Solar

Commercial solar energy systems are defined in Illinois as an array of device(s) that produce electricity for the primary purpose of wholesale or retail sale. The valuation for commercial solar energy systems includes the land within the project boundaries and real property improvements, which subjects the property to be assessed at one-third of its fair cash value under the Illinois tax code. Currently, commercial, or utility, scale solar is assessed on a fair cash value assessment beginning with the assessment year 2018.[70] The assessment value for commercial solar energy systems is based on the nameplate capacity per megawatt and are valued at $218,000/MW of nameplate capacity in counties with less than 3,000,000 inhabitants.[71] The fair cash value used in the valuation is determined using the following formula: ($218,000 x trending factor) – Depreciation.[72] Where the term within the parenthesis is the "trended real property cost basis," from which a depreciation value is subtracted to give the taxable value for the current assessment year. The Illinois Department of Revenue defines the trending factor as the annual increase in the US consumer price index prior to the January 1 assessment date (CPI-U), divided by the US consumer price index for December 2017. The depreciation value stems from the age of the system divided by 25 then multiplied [SM1] by the trended real property cost basis. It is important to note that the depreciation value cannot be lower than 30% of the trended real property cost basis, which enforces a minimum floor for taxation of these systems. Table 1

below showcases the historical trending factors used for commercial solar energy systems valuation.[73]

Prior to 2017, Illinois did not have a consistent methodology for assessing the taxable value of a solar energy system. This resulted in ambiguous criteria that assessors would use that would not necessarily be consistent throughout the state. In the state's effort to provide predictability in valuing solar energy systems, an amendment to the property tax code in the state via SB 486 was enacted and resulted in the standardization used today.[74]

As time progresses, these commercial systems will depreciate in physical value, thus lowering the fair cash value of the system as well, resulting in an overall lower assessed value. This behavior in decreasing assessment value as time goes on is also an indicator that the associated property tax revenue will also decrease until the 30% floor is reached, at which point the revenue will remain constant until system decommissioning. This is of key consideration for local communities where solar farms are expected to dramatically increase throughout most of Illinois by the end of the decade. The additional property tax revenues can have the potential to bring new services and local investments to a local community area, so long as communities can properly navigate a slowly declining revenue stream throughout the life of the system.

Illinois Department of Revenue
History of CPI's and Trending Factors Used for Commercial Solar Energy Systems Valuation
01/14/2021

Year	December CPI-U	Assessment Year	Trending Factor
2017	246.524	2018	1.00
2018	251.233	2019	1.02
2019	256.974	2020	1.04
2020	260.474	2021	1.06

Table 1. Historical trending factors used for commercial solar energy systems valuation (Illinois Department of Revenue, 2021)

Preferential Assessments for Residential Solar

Prior to 2021, for non-commercial solar energy systems, i.e., systems where most of the solar energy produced is consumed on-site, the owner of the system was entitled to file a claim for an alternative assessment. The methodology, though, was largely written for solar thermal systems.[75] In early 2021, however, the Illinois General Assembly amended the property tax code such that future assessments of residential solar systems would "ascertain the value of the property without the solar energy system and the value of the property with the solar energy system. The alternate valuation computed as the lesser of those two values shall be applied to the property" as stated in HB373.[76]

Commercial/Utility Scale Wind

"Wind energy device," synonymous with "wind turbine," is defined in the state of Illinois as any device with a nameplate capacity of at least 0.5 MW of generated electricity being sold at the commercial level. Commercial wind systems are assessed on a fair cash value assessment beginning with the assessment year 2007, which is valued at $316,000/MW of nameplate capacity.[77] Similar to the valuation of commercial solar systems, the formula for determining the "trended real property cost basis" for wind systems is ($360,000 x trending factor) – Depreciation. [78] Wind energy systems also follow the same criteria as commercial solar systems for both the trending value term and the depreciating value term. Table 2 below showcases the historical trending factors used for commercial solar energy systems valuation.[79]

Illinois Department of Revenue History of CPI's and Trending Factors Used for Wind Energy Device Valuation 01/14/2021			
Year	**December CPI-U**	**Assessment Year**	**Trending Factor**
2006	201.8	2007	1.00
2007	210.086	2008	1.04
2008	210.228	2009	1.04
2009	215.949	2010	1.07
2010	219.179	2011	1.09
2011	225.672	2012	1.12
2012	229.601	2013	1.14
2013	233.049	2014	1.15
2014	234.812	2015	1.16
2015	236.525	2016	1.17
2016	241.432	2017	1.20
2017	246.524	2018	1.22
2018	251.233	2019	1.24
2019	256.974	2020	1.27
2020	260.474	2021	1.29

Table 2. Historical trending factors used for commercial wind energy valuation (Illinois Department of Revenue, 2021)

Local government impact from generated tax revenue

The taxation of renewables, both commercial and residential systems for solar and commercial for wind systems, fall under the Illinois definition of real property, "land and any permanent improvements" [5]. In Illinois, only real property is taxed. All revenue generated from these renewable systems/projects' property taxes funds local government services.[80] A 2020 economic impact analysis conducted by the Strategic Economic Research group investigated utility wind and solar energy in Illinois and went into comprehensive detail of the flow of property tax revenues to all taxing entities across the state. Figure 15 below shows a visualization of tax revenue generated by commercial wind and commercial solar farms from 2003 through 2019.[81]

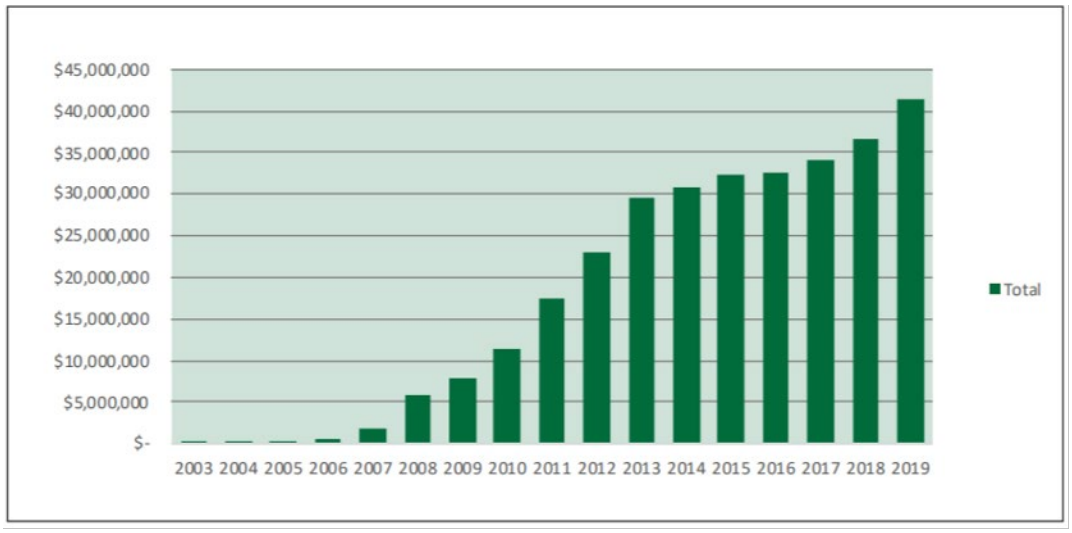


Figure 15. Illinois tax revenue per year is generated by commercial wind and commercial solar systems (Loomis, 2020)

Figure 15 showcases how significant revenue streams have been generated over the course of 16 years. According to the study, the grand total of tax revenue generated from commercial wind and commercial solar came to around $306,600,423.[82] A breakdown of where the funds were directed to the local level over the same time frame is shown below in Figure 16.[83]

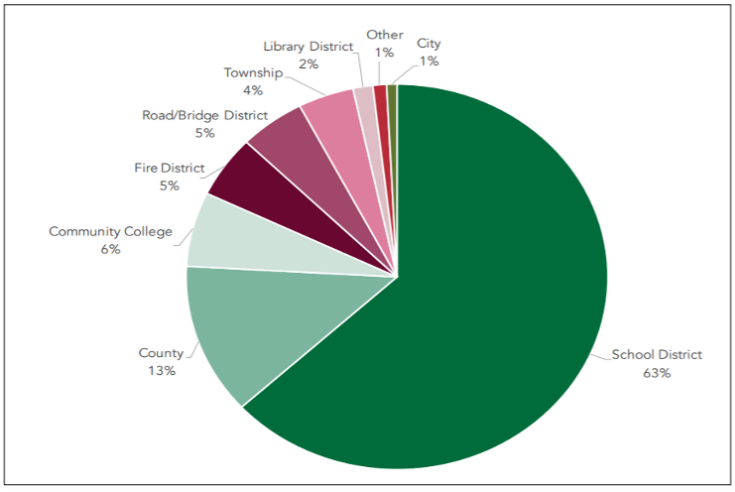


Figure 16. Property tax revenue by taxing area (Loomis, 2020)

Overall, Figures 15 and 16 illustrate the increase in funding that local governments have received since 2003. This is important to know since Illinois recently enacted the Clean Energy Jobs Act (HB804). The Clean Energy Jobs Act will significantly increase the amount of funding available for new commercial wind and solar systems along with increases in funding and expansion of residential based incentives for residential solar systems.[84] This dramatic increase in funding will result in more deployment in commercial wind and commercial solar systems, resulting in even more increases in tax revenue generated by these projects.

Much of the revenue generated by wind and solar projects are used for school districts in Illinois, with county governments the next largest group using these generated tax revenue funds, as seen in Figure 16 above. Illinois public schools receive just under two-thirds of their funding from local property taxes.[85] Revenue generated by the taxation of these wind and solar projects have the potential to provide sizable property tax revenue to local governments, which would most likely be directly going to funding these public schools. McLean County is one of the few counties in Illinois with the highest land-based wind generation potential. The Illinois State Board of Education used publicly available data for the 2019 – 2020-year found that local property taxes made up 69% of the total revenue source for public schools in McLean County.[86] In July of 2021, McLean County Board approved a new 250MW wind farm which is expected to generate $71.5 million in property taxes over 30 years, of which $43.7 million will go to school districts in Bellflower and West townships, McLean County over 30 years.[87]A 2019 economic impact report conducted by The Accelerate Group investigated the impacts on the economic opportunity to the State of Illinois that the Clean Energy Jobs Act could bring in. The report found that local and state tax revenue would generate over $6 billion by 2040.[88]

Siting Authority

In Illinois, the siting authority is at the local level, meaning that counties and municipalities have the decision-making power for siting both wind and solar projects.[89,90] Counties in Illinois also have jurisdiction over any wind siting on unincorporated areas outside the municipal zoning jurisdiction.[91] This jurisdiction over unincorporated areas does not apply to solar siting. Authority at the local government level has surfaced opposition to utility-scale wind and solar energy development, which has delayed, or halted in some cases, required approvals and breaking ground on multiple projects.[92] This increased difficulty in the development process causes renewable energy projects to be less attractive to developers.

Siting solar projects at retired coal-fired plants can reduce local opposition to renewable energy generation and storage because solar panels are kept out of sight for residential areas. Illinois legislators propose siting solar projects at retired or retiring coal facilities because the plants already have the infrastructure for generation and storage, are connected to transmission grids, and are sun and wind accessible.[93] Many groups, such as the Nature Conservancy, are pushing for siting solar projects on retired, retiring, or abandoned fossil fuel facilities and brownfields as well. Legislators have proposed incentive programs to accelerate this transition of retired coal plants to renewable sites that will help the state reach its carbon emission reduction goals faster. This solution also prevents retired plants from becoming vacant lands and brownfields, keeping the land use productive and contributing toward Illinois' renewable energy goals. The following infrastructure investment section discusses a more in-depth analysis of the "coal-to-solar" initiative.

In many cases, these coal-fired plants were in some capacity owned by a public utility, qualifying them as a public service. The legislators who wrote CEJA argue that this means

retired facilities should continue to be used for a public benefit, such as providing carbon-free electricity. While CEJA covers the "coal-to-solar" initiatives in depth, it does not change the fact that local governments have control over zoning these projects. If local zoning codes are not updated to allow for solar on these sites, this will be a barrier to implementing solar projects.

Use Of Public Lands

As of 2013, federal land accounts for slightly over 1% of land in Illinois.[94] Because this is such a small amount of land, there is not a focus on siting renewables on public lands. In fact, non-profit groups are working to protect remaining public lands from development.

An early iteration of the Lake Michigan Wind Energy Act (20 ILCS 896) created the Offshore Wind Energy Economic Development Policy Task Force, which analyzed and evaluated policies and economic options to facilitate offshore wind energy development and oversee the process of planning for and implementing offshore wind projects on Lake Michigan.[95,96] The Task Force released an Advisory Report in 2012 but has not released another since. The report discusses criteria for the Department to use when reviewing applications for offshore wind development of Lake Michigan lakebed leases and criteria for identifying areas that are "favorable, acceptable, and unacceptable for offshore wind development."[97] The report also outlines local, state, and federal authorities that have permitting, siting, and other approval authority for wind power, as well as legislative and regulatory offshore wind development governance recommendations.

As of August 9, 2019, and an amendment in Illinois HB 3482 became Public Act 101-0283 stating that "the bed of Lake Michigan is public land held in trust for the people of the State of Illinois and cannot be alienated to a private use or person; that federal and state policy as well

as the needs of the people of the State of Illinois, support exploration and development of renewable energy resources." The law directs the Department of Natural Resources (DNR) to identify areas of Illinois' public trust lands of Lake Michigan for wind development and gives DNR authority to grant assessment permits and leases that meet distance from shore and habitat protection criteria.[98] Offshore wind development is still in the early planning stages and faces strong public opposition due to concerns around obstructed views and ecological impacts.[99]

Infrastructure Investment

Illinois signed a historic infrastructure bill in 2019 that outlined the first capital plan in the state in nearly a decade. Governor JB Pritzker signed the Rebuild Illinois Capital Plan, and it was enacted in June 2019 through the passage of four bills SB 1939, SB690, HB142, and HB 62.[100] The bill allocated a total of $45 billion for infrastructure investment over six years dispersed across eight sectors.[101] A total of $1 billion was allocated for environment/conservation issues, where $70 million went to the Capital Development Board for solar and other renewable energy installation and upgrades at state facilities.[102] Another $70 million was allocated to the environmental protection agency (EPA) to invest in transportation electrification infrastructure projects mainly sourced as EV charging infrastructure.

While the historic infrastructure bill of 2019 focused solely on state facilities and transportation electrification, the 2021 CEJA allocated approximately $10 billion for statewide renewables.[103] The clean energy investments include a $50 million per year expansion to the Illinois Solar for All Program, over $80 million per year to build a network of workforce hubs and contractor development programs and over $35 million per year for business development grants. [104] CEJA will invest $580 million a year to meet the goals of generating 50% of energy from wind and solar by 2050 through grants.[105] The Act also prioritizes electric vehicle (EV)

charging infrastructure, aiming to put 1 million EVs on the road by 2030, and offers up to 80% of the cost of constructing charging stations.[106] Since 2019, solar energy installations are being sited mostly on commercial buildings, such as IKEA, Wal-Mart, and Target, followed by residential buildings, community solar, and a small amount of utility scale solar.[107]

Due to local opposition, Illinois recognizes the difficulty of constructing new utility-scale wind and solar facilities, thus instituted a "coal to solar" initiative. CEJA invests $280.5 million for grants to support the installation of energy storage facilities.[108] The bill promotes transmission infrastructure by providing the ability to be eligible for competitive REC procurement. Thus, as previously mentioned, siting solar projects at retired coal-fired plants can reduce local opposition to renewable energy generation and storage. Therefore, it targets installing new renewable facilities at already suitable facilities leading to its "coal to solar" transition incentives. This historic bill also increases investment in community solar programs that could utilize retired coal plants, as the location of these projects is less important than ownership in being classified as "community solar."[109]

IV. ASSESSMENT

Illinois has robust policy incentives for renewable energy, abundant wind, and a prime location with access to PJM and MISO, making it a very viable area for development. Illinois's connection to PJM and MISO allows projects in Illinois to deliver electricity eastward to states with clean energy goals. These features make Illinois a very viable place for wind energy development.[110] Overall, observations show that the highest potential for land-based wind is concentrated in the state's upper northwest and central areas, with generation potential ranging from approximately 5 million - 10 million MWh annually. Offshore wind is less viable due to the

significant amount of community pushback regarding view obstruction, public land protections, potential ecological damage, and the high cost of implementation.[111]

Wind in Illinois is projected to grow as rapidly as solar within the coming decade with the new REC commitments introduced in CEJA. Wind in Illinois has the benefit over solar in that the state has more experience with utility scale wind projects, and as such, it shows in the state's tax policy for wind farms. Providing a clear and consistent assessment methodology provides developers with the much-desired certainty about local payments made to the communities on which the wind farms are sited. While there is still opposition and challenges to wind in local communities with little to no experience with dealing with wind developers, the current landscape that the state has provided shows that the current policies in place are set to guide the state to meet its goals for wind development.

Illinois similarly is attracting solar development due to its aggressive climate legislation that incentivizes solar. Observations show that commercial rooftop solar potential is greatest in the metro Chicago area, where rooftops are more abundant and has a higher maximum potential when compared with residential rooftop solar potential. As for utility scale solar, there is greater availability of large high potential areas throughout the central part of the state, with the lower southern part of the state also being viable for large-scale solar array systems. The state-administered Adjustable Block Program mostly funds community solar and distributed generation projects, making the likelihood of receiving these funds for utility scale solar less viable. [112] Lack of funding has created a waitlist of over 4,000 projects. In addition to expanding community solar and distributed generation, Illinois focuses on siting utility scale solar using the coal-to-solar method or siting on other brownfields, such as landfills, as the most viable option.[113]

In addition to the policies presented, there are policy initiatives that currently play into benefiting the state in setting up the playing field such that rapid development of additional renewable infrastructure can occur. In addition to more renewable energy generation, Illinois has also enacted several separate laws from CEJA that paves the way for an easier development process for developers and manufacturers of respective transportation and infrastructure sectors. One example is the Reimagining Electric Vehicles (REV) Illinois Program that governor J.B Pritzker signed in 2021. This program is an additional tax incentive to manufacturers of electric vehicles and the respective manufacturers for individual components (batteries, charging stations, etc.).[114] This program is primarily focused on positioning the state of Illinois as a hub for electric vehicle manufacturers to move their operations into the state, providing jobs to the communities they are located to while providing the means to help the state meet the infrastructure goals that CEJA outlines.

Overall, policies across the state align to encourage more development of renewables, particularly distributed solar resources. In zoning, policies are in place that encourages solar, such as Illinois Municipal Code 65. This code grants zoning authority to municipalities to regulate any structure or activity that might block the sunlight necessary for the proper functioning of a solar energy system.[115] Another law, Public Act 097-0105, expands upon a decade old bill that prevents homeowner's associations (HOAs) from banning homeowners from using or installing solar energy systems. In July 2021, Governor Pritzker signed Public Act 102-0161(HB 644) into law, expanding protections and closing loopholes, making it more difficult for HOAs to block homeowner solar projects.[116,117] Additionally, public utilities commission policies and rulemakings are increasingly aligning with the state's renewable development goals. Recent efforts to ease community solar implementation by adjusting ARES rules under CEJA,

along with working groups to address issues with distributed generation interconnection, show that the Illinois Power Authority is working to update PUC rules that have hindered renewable energy development in the past.

The landscape of policies in Illinois is constructed so policies work together to appeal to the communities that are most viable to utility scale renewable energy in its initial phases. CEJA's guiding climate policy has incentivized programs that center equitable communities. New REC commitments to wind are accompanied by tax policies that promote community benefits, especially for local school districts.[118] Solar investment outline in CEJA incentivizes community solar projects that can be as large as 5 MW installments. The solar development tax policy similarly provides communities with substantial tax revenue.[119] Moreover, public utility reforms are working to similarly encourage community solar and work on the distributed energy interconnection problems. As previously mentioned, the additional locations for utility scale wind and solar are in coal plants or brownfields. Therefore, apart from tax policy, the infrastructure investment into coal-to-solar programs under CEJA aims to alleviate economic disruption to workers and communities reliant on coal.[120] There is also expansive investment in CEJA for disadvantaged communities and those impacted by the transition.[121] Hence, the explicit climate policy, tax policy, infrastructure investment, and public utility commission policy are constructed to highlight and encourage community benefits to utility scale wind and solar projects.

The additional state policy that impacts community benefits from the development of renewable energy projects is siting and using public lands that work together to protect communities' interests. Siting authority is located at the local level leaving the decision for siting of utility scale projects to the communities to determine for themselves whether and where these

projects belong.[122] The use of public lands, while federally controlled, impacts Illinois as it has the potential for offshore wind. Nevertheless, the state of Illinois created a task force that works with the department of natural resources to assess the permits and leases for setback distance and habitat protection.[123] Communities have some power in the decision-making process for siting of these projects; therefore, while the other state policies work together to promote community benefits, if those benefits are not readily seen by the communities, state policy allows them to decide the fate of development.

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