Pacific Northwest
NATIONAL LABORATORY

Restrictions and Barriers to Renewable Energy in Local Zoning Ordinances

July 2022

Local zoning ordinances are emerging as a nationwide barrier to siting and building renewable energy projects. Counties, cities, or towns in all 50 states have imposed restrictions on renewables at the local ordinance level. Local restrictions have been applied to distributed and to utility-scale projects; to wind and to solar; and include ordinances that apply blanket bans or moratoria on project construction. This memo surveys and categorizes local ordinances that limit or prohibit renewable energy projects.

I. Introduction

As of 2021, 38 states, four territories, and Washington, DC had adopted renewable portfolio standards or voluntary renewable energy goals, directing states to generate a percentage of their electricity from renewable energy sources by a target year. Ten of those states, plus Washington, DC, Puerto Rico, and Guam have a renewable energy target of 100%, to be achieved between 2030 and 2050.[1]

In order to achieve these targets, states must turn to the work of planning for and building renewable energy generating capacity, and much of the work involved in siting and permitting renewable energy projects happens at the local level, where local zoning ordinances are often key to determining whether projects are able to move forward. While permitting authority for renewable energy systems may fall under federal, state, county, or municipal jurisdiction, depending on the type of project, its size, location, and applicable state law, this memo examines zoning ordinances at the local level that impose limits, restrictions, or bans on renewable energy projects in county and municipal code.

Restrictions on renewable energy deployment in local zoning ordinances is a nationwide phenomenon: analysis from Columbia Law School's Sabin Center for Climate Change Law found examples of zoning restrictions on renewable energy in all 50 states.[2] These limits may also be imposed using a range of tools and approaches, including limits on system size or location; limits on where energy generated from a renewable energy project may be consumed; or outright moratoria or bans on certain projects, either in certain zoning areas or within a jurisdiction entirely. In addition, many limitations or restrictions are overlaid within one jurisdiction's ordinances. For example, a county may require both height limits and lengthy setbacks for wind turbines, or a city may limit a ground-mounted solar system's location within a property while also limiting that system to energy generation for on-site use at that property.

To be clear, many of the limitations on the characteristics or locations of renewable energy systems outlined in local zoning ordinances provide reasonable safety or other protections, in the same way that zoning ordinances establish reasonable guidelines for the construction and siting of other structures and

[1] (State Renewable Portfolio Standards and Goals, 2021)
[2] (Goyal, Marsh, McKee, & Welch, 2021)

building modifications. This memo focuses on ordinances that impose notable limits on the scale or adoption of renewable energy at the local level.

II. Overview of Renewable Energy Zoning Restrictions

Local zoning ordinances use a range of approaches to restrict or ban renewable energy systems of different types. These approaches are categorized below, with more information and specific examples of ordinances under each category provided in Section III below.

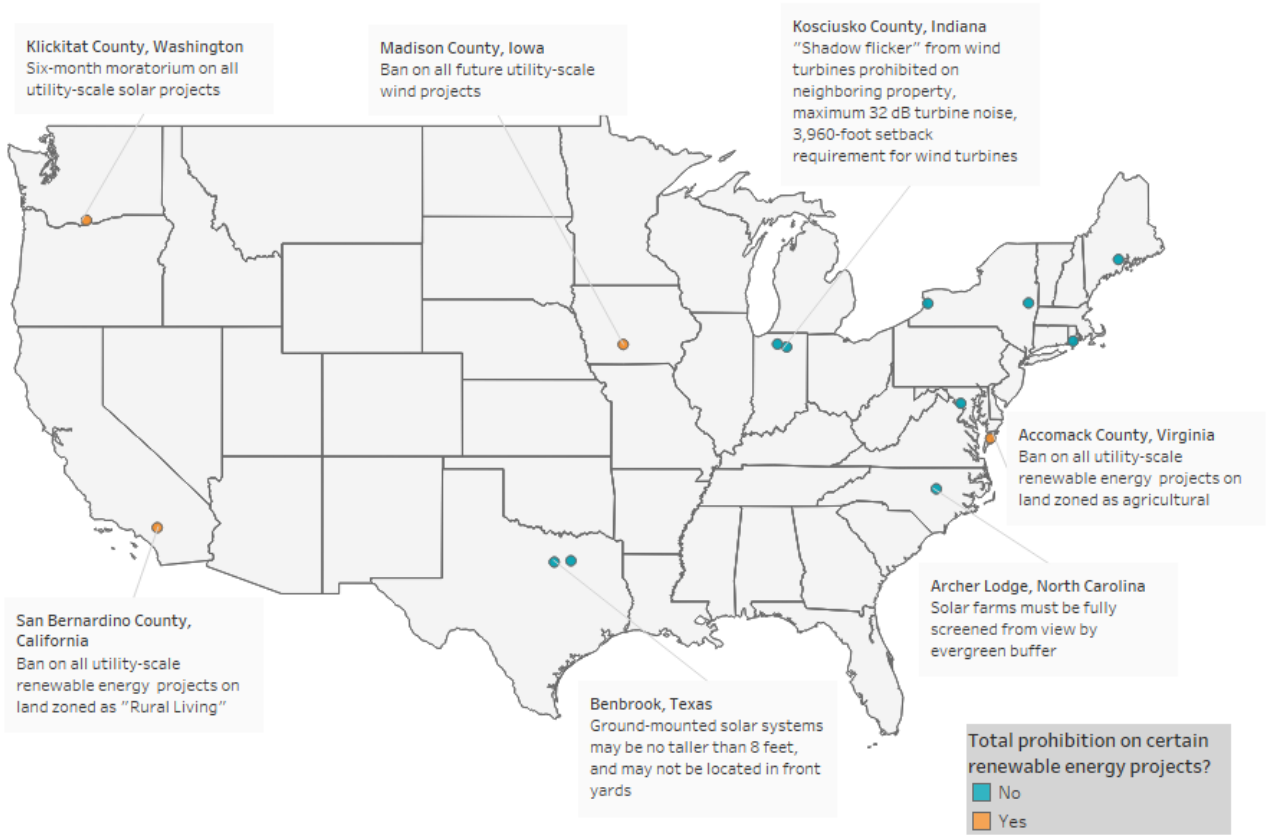
1. **On-site energy consumption requirements:** Some zoning ordinances include requirements that renewable energy systems, usually solar panels, be used exclusively for on-site energy consumption, prohibiting systems from grid interconnection or otherwise providing electricity for other properties. In some cases, ordinances set limits based on, and require documentation of, historic or estimated energy use to ensure compliance with on-site consumption requirements. For example, an ordinance may require a rooftop or ground-mounted solar system to generate no more than 120% of the property's average electricity consumption, as is the case in Montgomery County, Maryland. This restriction primarily limits the deployment of community solar or other shared systems.
2. **Physical size or height requirements:** Many cities or counties impose maximum height requirements for ground-mounted solar panels or wind turbines in certain zoning areas, set maximum size requirements for various types of solar systems, or include the height of rooftop solar panels in building height limits. In some cases, low height requirements are designed to prohibit the siting of most large energy projects, especially wind turbines. Height restrictions can also impede the adoption of solar panels, including by prohibiting the installation of rooftop solar panels on buildings that are already at a jurisdiction's maximum allowed height. Some cities or counties, including Austin, Texas, have passed ordinances that exempt rooftop solar panels from height requirements, while others have set alternative standards to allow solar to be sited on more roofs.
3. **Setback requirements:** Many jurisdictions include setback requirements for renewable energy systems, meaning that a wind or solar system must be located a certain minimum distance from property lines or other structures. Reasonable setbacks can help ensure safety, especially for properties near large wind turbines, but larger setback distances – up to a mile, such as in Montville, Maine – have been implemented to prevent renewable energy development in some areas entirely.
4. **Energy capacity limits:** Separate from energy capacity limits applied to distributed solar panels in statewide net metering laws or public utility commission regulations, some town or county zoning boards have imposed maximum energy capacity limits for renewable energy systems, which act as a ban on larger systems in certain zones or within a jurisdiction entirely. Clifton Park, New York, for example, has a moratorium on all ground-mounted solar facilities above 25 kW of capacity.
5. **System placement or location restrictions:** Some jurisdictions limit renewable energy system placements or types. These restrictions can include permitting rooftop-mounted solar panel systems but not ground-mounted systems, or limiting system installations to certain property locations, such as a side yard or backyard. Benbrook, Texas, for example, permits ground-mounted solar systems only in the back or side yard of a residential property.
6. **Homeowners' association restrictions:** Homeowners' associations (HOA) rules are separate from municipal or county zoning ordinances, but are another category of local-level barriers to renewable energy deployment. Some HOA rules impose limitations on the quantity, visibility, or other characteristics of solar panels, or prohibit them entirely.
7. **Partial or total prohibitions:** Many jurisdictions have imposed blanket bans on certain renewable energy systems in certain land use zones, or within a jurisdiction entirely. In some

cases these bans are permanent, while in other cases cities or counties have enacted temporary moratoria on a type of renewable energy, often in response to local pushback about a specific proposed project. For example, after approving two locally controversial wind farms, Madison County, Iowa enacted a permanent ban on all future wind projects.

8. **Miscellaneous other restrictions:** Some jurisdictions have adopted other ordinances intended to limit the adoption of renewable energy systems by imposing additional requirements, often aesthetic, that may be difficult for developers to meet. Such restrictions can include bans on "shadow flicker" from wind turbines on neighboring property, low maximum decibel limits for wind turbine noise, or rules that limit a project's visibility from nearby properties.

9. **Obstacles from lack of renewable energy-specific zoning ordinances:** Many county or municipal zoning ordinances make no mention of renewable energy systems specifically, meaning that solar, wind, or battery storage systems must be sited according to other rules. A lack of specific guidance can create its own barriers in renewable energy siting, often in the form of process delays due to a lack of clear guidance. However, a lack of renewable energy-specific zoning rules is not universally an obstacle to efficient renewable energy deployment, as lack of expertise or local political opposition have led to the zoning barriers described in this memo.

Examples of Local Zoning Ordinances that Limit or Ban Renewable Energy Projects



Note: *the map above, and the examples discussed in this memo, are a subsection of existing restrictive ordinances and do not represent a comprehensive survey of zoning ordinances that restrict or prohibit renewable energy projects.*[3]

[3] For a more comprehensive list of state-by-state restrictive ordinances, see (Goyal, Marsh, McKee, & Welch, 2021)

III. Examples of Renewable Energy Zoning Restrictions in Practice

1. On-site energy consumption requirements:

Some jurisdictions have imposed requirements that all solar systems sited in certain zones be used exclusively for on-site energy consumption, generally including an energy generation limit based on the property's energy usage. These requirements bar adoption of grid-connected systems that provide electricity for properties beyond the system location. In some cases, ordinances require documentation of historic or estimated energy use to ensure compliance with on-site consumption requirements. In Montgomery County, Maryland, solar advocacy groups have cited the county's on-site energy requirement in its zoning ordinance as an obstacle to the wider adoption of community solar and other shared systems.[4]

- **Montgomery County, Maryland:** "In the Agricultural, Rural Residential, Residential, Commercial/Residential, and Employment zones, it is allowed only as an accessory use where the system produces a maximum of 120% of on-site energy consumption and must satisfy the same development standards as an accessory structure; however it may be located in the side yard of a property in a Rural Residential or Residential Detached zone if the main building is set back a minimum of 70 feet from the side lot line and the Solar Collection System is setback a minimum of 50 feet from a side lot line and the height of the Solar Collection System is a maximum of 20 feet." *(Montgomery County Code Chapter 59, Section 3.7.2)*

- **Town of South Kingstown, Rhode Island:** "(D) Ground-mounted accessory solar energy systems shall be sized to generate no more energy than one hundred twenty-five (125) percent of the energy that is necessary to support the principal use(s) of the parcel. Ground-mounted solar energy systems that generate more energy than stated above shall be classified as major or minor solar energy systems, based on the size of the system, and shall be governed by the requirements of section 510. (E) At the time of application for a building permit or development plan review, as is applicable pursuant to this section, the applicant must demonstrate that the ground-mounted accessory solar energy system has been designed to produce no more than one hundred twenty-five (125) percent of the energy that is necessary to support the other uses occupying the parcel. On parcels with existing principal use(s), the applicant shall provide the energy consumption documentation for the use(s) for the previous three-year period. For new single-family and duplex residential dwellings proposing accessory solar arrays, the applicant shall provide an estimate of electrical usage based on data received from the utility company. For all other new principal use(s), the applicant shall provide an estimate of electrical usage for the use(s), prepared and certified by an electrical engineer." *(South Kingstown Code of Ordinances, Sec. 510)*

2. Physical size or height requirements:

Many cities or counties impose maximum height requirements for ground-mounted solar panels or wind turbines in certain zoning areas, set maximum size requirements for various types of solar systems, or include the height of rooftop solar panels in building height limits. In some cases, height requirements are set in order to prohibit the siting of most large energy projects, especially wind turbines. According to the Energy Information Administration, the average commercial wind turbine height in the United States is 280 feet.[5] Height restrictions can also impede the adoption of solar panels, including by prohibiting the installation of rooftop solar panels on buildings that are already at a jurisdiction's maximum allowed height.[6] Conversely, some areas – such as Austin, Texas – have explicitly exempted renewable energy

[4] (Delman, Zoning rules in Mont. Co. keep community solar out, 2017)
[5] (Hoff & DeVilbiss, 2017)
[6] (Solar Energy: SolSmart's Toolkit for Local Governments - Planning, Zoning & Development, n.d.)

systems, such as solar installations, from standard residential height limit requirements in order to expand renewable energy adoption.[7]

- **Marshall County, Indiana:** "In order to protect the public health, safety, and general welfare of the community while accommodating the energy needs of residents and businesses, these regulations are necessary in order to…protect the public and not allow commercial WECS, large wind systems and wind farms. A WECS that has a nameplate capacity (manufacturer's rating) of more than 50 kilowatts per wind tower, or a total height of more than 140', or a swept area of more than 40'. Any WECS meeting one or more of these criteria shall be considered a large wind system." *(Marshall County Zoning Ordinance February 2020)*[8]

- **Benbrook, Texas:** "Solar Energy Systems…Ground-Mounted Systems: i. Height: The height of system shall not exceed eight feet above the existing grade at the location of the installed system." *(Benbrook Code of Ordinances 17.84.014)*

3. Setback requirements:

Many jurisdictions include setback requirements for renewable energy systems, meaning that a wind or solar system must be located a certain minimum distance from property lines or structures. In general, setback requirements are likely to restrict the possible placement of systems in urban or suburban areas.[9] Reasonable setbacks can help ensure safety in the event of an unlikely but dangerous event, such as ice slinging from wind turbine blades or the detaching of a blade entirely, and the American Planning Association has recommended a standard setback of 1,000 feet from neighboring properties as a standard to ensure safety.[10] Larger setbacks, though, can serve to block renewable energy development in some areas entirely—wind developers have described a 1,500-foot setback requirement as "the upper limit of what is typically workable for designing a utility-scale wind project."[11] Many cities and counties have approved minimum setbacks much larger than 1,500 feet, which can restrict or in some cases altogether prohibit large renewable energy projects, in response to local concerns or pushback.[12] Large setback requirements are more prevalent for wind turbines than for solar systems.

- **Kosciusko County, Indiana:** "Each wind turbine generator or meteorological testing towers (MET) and any associated features shall be set back from any adjoining property lot line, road right-of-way, railroad right-of-way or overhead electrical transmission or distribution lines a minimum distance of 3,960 feet or 6.5 times the height of the tower from the base to the tip of the blade in vertical position, whichever is greater." *(Kosciusko County Code of Ordinances Sec. 3.29)*

- **Town of Montville, Maine:** "Setbacks to property lines are a minimum buffer of one mile from the Project Boundary. This is assuming a 1.5 MW industrial wind turbine, which has a Turbine Height of approximately 400 feet. However, larger wind turbines are louder, so a varying setback basis is required. A one mile setback is approximately equal to 13 times the turbine height for a 400 foot turbine. Therefore, the Setback Distance is defined as the larger of one mile or 13 times the Turbine Height, measured horizontally from the Project Boundary to the nearest property line." *(Town of Montville Wind Turbine Generator Ordinance, 12.0)*

---

[7] (Cyrs, 2018)

[8] Marshall County's ordinance defines "large wind systems" as any turbines over 140 feet in height, and subsequently bans all large wind systems. This ordinance may be classified as either a height restriction or an outright ban.

[9] (Owens, n.d.)

[10] (Rynne, Flowers, Lantz, & Heller, 2011)

[11] (Johannsen, Oster, & Guyer, 2021)

[12] (Stephens, 2018)

4. Energy capacity limits:

Several jurisdiction levels limit the energy capacity of renewable energy systems. At the state level, limits on rooftop solar system capacity can be included in net metering laws.[13] Individual utilities or public utility commissions may also impose such capacity limits for distributed systems.[14] At the zoning level, some town or county zoning boards have imposed maximum capacity limits for renewable energy systems, effectively or explicitly banning larger systems in certain zones or within a jurisdiction entirely.

- **Balch Springs, Texas:** "Utility grid wind energy systems larger than 20 kw are prohibited within the city." *(Balch Springs Code of Ordinances, Section 3)*

- **Clifton Park, New York:** In January 2021, the town of Clifton Park adopted a six-month moratorium on all ground-mounted solar facilities above 25 kW of capacity, and extended the moratorium in July 2021. *(Town of Clifton Park Town Board Meeting, Tuesday, July 6, 2021)*

5. System placement or location restrictions:

Some jurisdictions limit renewable energy system placements or types. These restrictions can include permitting rooftop-mounted solar panel systems but not ground-mounted systems, or limiting system installations to certain property locations, such as a side yard or backyard.

- **Town of West Seneca, New York:** "(3) Solar energy systems shall be restricted to the roof of the structure in which they are intended to serve." *(Town of West Seneca Code of Ordinances, Part II, Sec. 120-69)*

- **Benbrook, Texas:** "Solar Energy Systems:…Ground-Mounted Systems….ii. Placement: (a) Front Yard: No system shall be located forward of the primary structure on the lot or within the front yard setback. (b) Side and Rear Yard: No system shall be located less than ten feet from any side or rear property line." *(Benbrook Code of Ordinances 17.84.014)*

6. Homeowners' association restrictions:

In addition to limitations imposed by city or county zoning ordinances, homeowners' associations (HOA) rules can also impose limitations on the quantity, visibility, or other characteristics of solar panels, or prohibit them entirely.[15] In Indiana alone, more than 400 HOAs have reportedly adopted full or partial prohibitions on rooftop solar panels.[16] In response to this phenomenon, at least 16 states and Washington, DC have passed laws that prohibit HOAs from prohibiting or imposing unreasonable limitations on the installation of rooftop solar panels.[17]

7. Partial or total prohibitions:

Many jurisdictions have imposed blanket bans on certain renewable energy systems in certain land use zones, or within a jurisdiction entirely. In some cases these bans are permanent, while in other cases cities or counties have enacted temporary moratoria on a type of renewable energy, often in response to

[13] (Net Metering – Selections from Other States, n.d.)

[14] See Washington Utilities and Transportation Commission net metering rules and guidelines for one example (Net Metering, n.d.)

[15] (Landis, 2019)

[16] (Bowman, 2018)

[17] Arizona Rev. Stat. Ann. § 33-439; California Civ. Code § 714; Colorado Rev. Stat. Ann. § 38-30-168; D.C. Code § 8-1774.51; Florida Statute XI 163.04; Hawaii Rev. Stat. Ann. § 196-7; Idaho Code Ann. § 55-115; 765 Illinois Comp. Stat. Ann. 165/20; Maryland Code, Real Property § 2-119; New Jersey Statute 45:22A-48.2; New Mexico Stat. Ann. § 3-18-32; Consolidated Laws of New York, Chapter 50, Article 9-C; North Carolina 160A-201, 153A-144, 22B-20; Texas Property Code Title 11, Chapter 202; Virginia Code § 67-701; West Virginia Code §36-4-19

local pushback about a specific proposed project. While large-scale renewable energy projects are restricted to certain land use types in most areas (e.g. utility-scale wind farms are rarely, if ever, permitted in residential zoning areas), some bans are wider, and have been imposed reactively in response to concerns about renewable energy projects in proximity to local property. In one example, after receiving pushback for approving permits for a utility-scale solar farm sited on agricultural land – an action that was at the time allowable within the county's zoning ordinances – the Accomack County Board of Supervisors voted in 2017 to remove "renewable energy production" as an eligible use of agricultural zoned land, citing concerns about the "industrial" nature of renewable energy generation from local farmers.[18]

- **Accomack County, Virginia:** "WHEREAS, the Planning Commission of Accomack County recommended to the Board of Supervisors that the Agricultural District ordinance of Accomack County should be amended because utility scale solar and wind are more industrial in nature than originally believed and that utility scale solar and wind are not traditional agricultural land uses; and WHEREAS, the Board of Supervisors concurs with the recommendation of the Planning Commission; and WHEREAS, after public hearing held on January 18, 2017, the Board of Supervisors desires to amend Chapter 106, Zoning, Article III, Agricultural District 'A' Section 106-51, remove 'renewable energy production' from the statement of intent; Section 106-54 (11) 'Large Wind Energy Systems, Utility Scale'; and Section 106-54 (12) 'Large Solar Energy Systems, Utility Scale'..." *(Accomack County Code of Ordinances, Ordinance of 01-18-2017 (1))*

- **Madison County, Iowa:** "The purpose of this ordinance is to provide for the present and future conditions regarding the Macksburg and Arbor Hill Wind Project(s), thereby promoting the conservation of energy resources as set forth in Iowa Code Section 335.5 and implementing the smart planning principles under Section 18B.1 to provide for a clean, renewable and efficient energy source. Due consideration has been given to maintaining the historical character of the County, the welfare of the citizens of Madison County, the economic benefits of tourism and the conservation of our natural resources, and eliminating the possibility of future Wind Energy Conversion Projects and/or C-WECS construction permitted in Madison County, Iowa; except for those permitted in 55.03 and 55.04 as set forth below." *(Madison County Code of Ordinances, Title V, Chapter 55: Amended Madison County Wind Ordinance)*[19]

- **San Bernardino County, California:** "RE 4.10.1: Prohibit development of utility-oriented RE projects in the Rural Living land use districts throughout the County. RE 4.10.2: Prohibit development of utility-oriented RE projects within the boundaries of existing community plans, which at the time of adoption of this Element are the Bloomington, Muscoy, Bear Valley, Crest Forest, Hilltop, Lake Arrowhead, Lytle Creek, Oak Glen, Homestead Valley, Joshua Tree, Lucerne Valley, Morongo Valley, Oak Hills and Phelan/Pinon Hills Community Plans." *(Resolution No. 2019-17, Amendment of the Renewable Energy and Conservation Element of the County General Plan)*

- **Klickitat County, Washington:** Citing property owner concerns, Klickitat County adopted a six-month moratorium on utility-scale solar projects in the county in March 2021.[20] The moratorium was repealed in July 2021, but the county is in the process of reviewing more permanent restrictions that fall short of a moratorium, including setback requirements.[21]

8. Miscellaneous other restrictions:

Some jurisdictions have adopted other ordinances intended to limit the adoption of renewable energy systems by imposing additional requirements, often aesthetic, that may be difficult for developers to meet.

[18] (Delman, Solar farms and land use concerns, 2016)

[19] The projects "permitted in 55.03 and 55.04" noted in the ordinance text are two specific projects already approved, the named Macksburg and Arbor Hill projects. The ordinance bans all future wind energy projects in the county.

[20] Klickitat County Ordinance 0033021

[21] Klickitat County Ordinance 0070621

Such restrictions can include bans on "shadow flicker"[22] from wind turbines on neighboring property, low maximum decibel limits for wind turbine noise, or limits on an energy project's visibility from nearby properties.

- **Town of Archer Lodge, North Carolina:** (b) Solar farms shall be fully screened from adjoining properties and adjacent roads by an evergreen buffer capable of reaching a height of ten feet within three years of planting, with at least 75 percent opacity at the time of planting….(d) Any electrical wiring used in the system shall be underground (trenched) except where wiring is brought together for inter-connection to system components and/or the local utility power grid." *(Archer Lodge Code of Ordinances, Sec. 30-100)*

- **Kosciusko County, Indiana:** "(D) Maximum Noise Levels. Any proposed wind turbine generator shall produce sound levels that are no more than 32 decibels as measured on the dB(A) scale at the property lines of the site in question… (X) Shadow Flicker. At no time shall a wind turbine's tower, nacelle, or blades create shadow flicker on any non-participating landowner's property. For the purpose of this section a nonparticipating landowner shall be defined as a landowner on which a tower does not physically sit." *(Kosciusko County Code of Ordinances Sec. 3.29)*

9. Obstacles from lack of renewable energy-specific zoning ordinances:

Many county or municipal zoning ordinances make no mention of renewable energy systems specifically, meaning that solar, wind, or battery storage systems must be sited according to other rules. A lack of specific guidance can create its own barriers in renewable energy siting, often in the form of process delays due to a lack of clear guidance.[23] When zoning ordinances are written with the intention of encouraging, or at least clarifying, rules for building solar, wind, or other renewable energy projects, the specific inclusion of renewable energy in these ordinances can help deploy projects more rapidly and efficiently. To this end, some state laws mandate that counties and municipalities prioritize, for example, the right to solar access without unreasonable burdens in designing their zoning rules.[24]

However, a lack of specificity in zoning rules is not universally an obstacle to efficient renewable energy deployment. Local government officials – especially in smaller or less-resourced communities – may lack the expertise to design effective zoning rules for renewable energy systems, leading to rules that impose unintentional barriers to renewable energy deployment, including many of the barriers described above.[25] In addition, political opposition to renewable energy projects has driven the development of zoning ordinances that intentionally restrict or block renewable energy, as is the case in many of the above examples.

[22] The "shadow flicker" ban for wind turbines appears to be most prevalent in Indiana, where at least six counties have adopted such a restriction (Goyal, Marsh, McKee, & Welch, 2021).
[23] (Bronin, Zoning Rules Stifle Urban Clean Energy. Can The Rules Be Rewritten?, 2020)
[24] (Bronin, Solar Rights, 2009)
[25] (Gross, 2020)

REFERENCES

Bowman, S. (2018, January 18). *HOAs rain on homeowners' solar parade, residents' property rights*. Retrieved from IndyStar: https://www.indystar.com/story/news/2018/01/18/hoas-rain-homeowners-solar-parade-residents-property-rights/1024741001/

Bronin, S. (2009). Solar Rights. *Boston University Law Review, 89*, 1217-1265.

Bronin, S. (2020, September 29). *Zoning Rules Stifle Urban Clean Energy. Can The Rules Be Rewritten?* Retrieved from Kleinman Center for Energy Policy at the University of Pennsylvania: https://kleinmanenergy.upenn.edu/podcast/zoning-rules-stifle-urban-clean-energy-can-the-rules-be-rewritten/

Cyrs, T. H. (2018). Enabling renewable energy on both sides of the meter: A focus on state-level approaches in New York and Texas. *Current Sustainable / Renewable Energy Reports, 5*(1), 45-58.

Delman, B. (2016, December 1). *Solar farms and land use concerns*. Retrieved from Solar United Neighbors: https://www.solarunitedneighbors.org/news/solar-farms-land-use-concerns/

Delman, B. (2017, September 6). *Zoning rules in Mont. Co. keep community solar out*. Retrieved from Solar United Neighbors: https://www.solarunitedneighbors.org/news/zoning-rules-in-mont-co-keep-community-solar-out/

Goyal, R., Marsh, K., McKee, N., & Welch, M. (2021). *Opposition to Renewable Energy Facilities in the United States.* Columba Law School Sabin Center for Climate Change Law.

Gross, S. (2020). *Renewables, Land Use, and Local Opposition in the United States.* The Brookings Institution. Retrieved from https://www.brookings.edu/wp-content/uploads/2020/01/FP_20200113_renewables_land_use_local_opposition_gross.pdf

Hoff, S., & DeVilbiss, J. (2017, November 29). *Wind turbine heights and capacities have increased over the past decade*. Retrieved from U.S. Energy Information Administration: https://www.eia.gov/todayinenergy/detail.php?id=33912#:~:text=Since%202012%2C%20the%20average%20height,such%20as%20trees%20or%20buildings.

Johannsen, K., Oster, J., & Guyer, S. (2021). *Successful County Wind Siting Practices in Iowa.* Iowa Environmental Council.

Landis, J. B. (2019, April). Sunny and Share: Balancing Airspace Entitlement Rights Between Solar Energy Adopters and Their Neighbors. *Vanderbilt Law Review, 72*(3), 1075-1114.

Net Metering. (n.d.). Retrieved from Washington Utilities and Transportation Commission: https://www.utc.wa.gov/regulated-industries/utilities/energy/net-metering

Net Metering – Selections from Other States. (n.d.). Retrieved from Institute for Local Self-Reliance: https://ilsr.org/rule/net-metering/2560-2/

Owens, K. (n.d.). *Change Height & Setbacks to Encourage Renewables*. Retrieved from Sustainable Development Code: https://sustainablecitycode.org/brief/change-height-setbacks-to-encourage-renewables-2/

Rynne, S., Flowers, L., Lantz, E., & Heller, E. (2011). *Planning for Wind Energy.* American Planning Association. Retrieved from https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/research/wind/pdf/pas566.pdf

Solar Energy: SolSmart's Toolkit for Local Governments - Planning, Zoning & Development. (n.d.). Retrieved from SolSmart: https://solsmart.org/solar-energy-a-toolkit-for-local-governments/planning-zoning-development/

State Renewable Portfolio Standards and Goals. (2021, August 13). Retrieved from National Council of State Legislatures: https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Stephens, S. (2018, November 22). *DeKalb County Approves Tough Wind Ordinance*. Retrieved from Northern Public Radio: https://www.northernpublicradio.org/illinois/2018-11-22/dekalb-county-approves-tough-wind-ordinance

Stoel Rives LLP. (2017). Retrieved from The Law of Solar: A Guide to Business and Legal Issues: https://www.stoel.com/legal-insights/special-reports/the-law-of-solar/sections/permitting-and-land-use