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Wind Model Ordinance and Guide

Contents

Introduction

This Wind Model Ordinance and Guide is intended to assist local planning authorities (LPAs) with the development of their own ordinances and regulations for utility-scale wind land use. This ordinance is provided as a template for LPAs to adapt based on their local processes and requirements and does not substitute for zoning regulations that identify the proper locations and regulations that address wind energy systems from a land use perspective. There is no obligation for any LPA to adopt the wind ordinance as written.

Projects will still require local approvals, including but not limited to construction permits from fire code officials and construction permits from local building departments. Additional approvals — such as a Coastal Development Permit — may also be necessary depending on the project location. Jurisdictions are encouraged to involve relevant local authorities and stakeholders when tailoring this ordinance for adoption.

The rest of this section provides background on the following: 1) an overview of the wind permitting process; 2) an overview of the code adoption cycles related to wind; 3) the code adoption process, and; 4) using the Wind Model Ordinance and Guide. This background is provided to provide context for topics that come up throughout the wind ordinance template, which addresses the installation, operation, maintenance, and decommissioning of a wind energy system (a definition of wind energy system is provided in the "Applicability" section).

Overview of Local Ordinance Adoption Process

The adoption of a land use ordinance is guided by specific procedural requirements managed by LPAs in compliance with relevant California laws and regulations. A brief summary of common steps in the code adoption process is outlined below:

1. Formal initiation process: The process for developing and adopting an ordinance is often initiated through a resolution of intention issued by the local planning department or a request from the local Board of Supervisors, City Council, or other similar governing body
2. Staff proposal: The planning department issues a proposal for an ordinance
3. CEQA compliance: Any discretionary action or permit is required to submit an Environmental Impact Report (EIR) as defined by the California Environmental Quality Act (CEQA). Ordinance adoption is a discretionary action and therefore must undergo a CEQA-compliant EIR process. A full environmental review under CEQA may not be needed if the relevant local planning authorities issue a Negative Declaration or Mitigated Negative Declaration of significant impacts
4. Public hearings: A minimum of two public hearings must be held during the ordinance adoption process
    a. Planning level public hearing: The planning department makes its recommendation regarding ordinance adoption and discusses the EIR findings
    b. Board of Supervisors/City Council public hearing: The Board of Supervisors, City Council, or other similar governing body considers the environmental findings and approves (or rejects) the ordinance
    c. LPAs may have additional processes, such as meetings or additional public hearings, that are included or required as part of the ordinance adoption process.

Using the Wind Model Ordinance and Guide

Sections of this document in ***'italics'*** may be adopted into a local ordinance. Specific names, titles, or selected values that should be tailored to the adopting jurisdiction are indicated in brackets (e.g., [County/City/Town]). Sections in blue call-out boxes provide informational background and context for use by LPAs as they develop a wind ordinance. Ordinance regulations and additional context were developed in consultation with local planning authorities, developers, state agencies, and permitting lawyers through a series of one-on-one interviews, focus groups, and written comments. However, regulations provided within this document may not be comprehensive enough to meet all needs of an LPA. Local officials should solicit legal and regulatory advice from their own teams to ensure compatibility with local laws and regulations.

Acronym Table

ADLS	Aircraft Detection Lighting Systems
ANSI	American National Standards Institute
BANC	Balancing Authority of Northern California
CAISO	California Independent System Operator
CEQA	California Environmental Quality Act
COD	Commercial Operation Date
EIR	Environmental Impact Report
FAA	Federal Aviation Administration
IID	Imperial Irrigation District
LADWP	Los Angeles Department of Water and Power
LGIP	Large Generator Interconnection Procedures
LPA	Local Planning Authority
ROW	Right-of-way
SGMA	Sustainable Groundwater Management Act
SMUD	Sacramento Municipal Utility District
TID	Turlock Irrigation District
WAPA	Western Area Power Administration
WECS	Wind Energy Conversion System

Definitions

Note: Definitions should be reviewed for applicability to local use as well as changing wind technology.

Aircraft Detection Lighting System: A sensor-based system designed to detect aircraft as they approach a wind energy conversion facility; this system automatically activates obstruction lights until they are no longer needed.

Agricultural land: As defined by the California Land Conservation Act ("Williamson Act"), agricultural land is "land that is used for the purpose of producing an agricultural commodity for commercial purposes, including but not limited to food, fiber, or fuel".

Authority Having Jurisdiction: government agencies, departments, or officials that are legally empowered to review, approve, and enforce compliance with applicable laws, codes, and regulations. In the renewable permitting process, this may include local planning departments, local building departments, local and state fire officials, and/or state agencies.

Conditional Use Permit: A discretionary permit that requires review and approval from the applicable local jurisdiction, such as a planning commission or zoning board.

Construction Period: Period during which project has issued Notice to Proceed to start construction on the WECS, but prior to the start of the Operating Period.

Ecologically sensitive zones: Places with unique environmental attributes that require additional attention (i.e. rare ecosystems or zones that host species at risk).

Guy wire: A tensioned cable designed to add stability to wind turbines by anchoring the wind turbine tower to the ground at an angle.

Hub height: The distance from the ground to the center of the wind turbine's rotor hub, where the blades are attached.

Kilowatt (kW): A unit of power used to measure energy equal to 1,000 watts.

Local Planning Authority: The local government agencies, departments, or officials that are legally empowered to review, approve, and enforce land use-specific laws, codes, and regulations.

Megawatt (MW): A unit of power used to measure energy equal to 1,000,000 watts.

Nameplate capacity: The maximum electric power output of an energy system. Nameplate capacity can be output under optimal conditions, but may not reflect real-time output when operating in sub-optimal conditions.

Nonparticipating residence: An existing, occupied residence that is located on property that has not entered a written agreement with the facility owner to allow the facility owner to lease or purchase part or all of their property.

Nonparticipating property: Property in which the owner has not entered a written agreement with the facility owner to allow the facility owner to lease or purchase part or all of their property.

Operating Period: Period following the WECS Facility's In-Service Date, as determined by CAISO.

Participating property: Property in which the owner has entered a written agreement with the facility owner to allow the facility owner to lease or purchase part or all of their property.

Roter diameter: Distance across the circular area swept by the turbine's blades as they rotate, measured from the tip of one blade to the tip of the opposite blade.

Setback: The minimum required distance that a wind energy system must be installed from a specified boundary.

Shadow Flicker: Occurs when rotating wind turbine blades pass between the sun and an individual's home, casting a periodic shadow that may result in a flickering phenomenon. It typically only occurs for less than 30 hours cumulatively per year.

Tip height: The total vertical distance from the ground to the tip of a wind turbine blade at its highest point.

Total system height: Represented by tip height.

Wind energy conversion system (WECS): A system that harnesses the kinetic energy of wind moving and converts it into electrical energy.

Small wind system: Land-based wind energy system smaller than 50kW and has a smaller system height, primarily to reduce on-site electricity consumption.

Wind turbine: A device with a large vaned wheel rotated by the wind to generate electricity.

Applicability

Requirements of the Ordinance are to apply to all land-based Wind Energy Conversion System (WECS) with a rated nameplate capacity great than or equal to or greater than 20 MW, permitted, constructed, or commissioned in [County/City/Town] after the effective date of this Ordinance.

A single Facility shall include all infrastructure necessary for wind energy generation, including, but not limited to: wind turbines, towers, foundations, nacelles, blades, transformers, collection lines, substations, energy storage systems (if applicable), operations and maintenance buildings including SCADA systems and control centers, meteorological towers, and access roads. The Facility must be designed to support delivery of electricity via a single gen-tie route to a single point of interconnection on the CAISO, LADWP, WAPA, BANC, SMUD, PacifiCorp, TID, or IID network.

This ordinance does not apply to the maintenance or repair of Facilities permitted and/or installed prior to the effective date. This ordinance does not apply to repowerings within the existing footprint of the project site. Facilities may be repaired and/or repowered without obtaining a new or amended use permit, provided that the repair and/or repowering is substantially conformant, as defined in [local General Plan], to the intent of the original permit.

This ordinance applies to land-based Utility-Scale WECS only. This ordinance does not apply to offshore wind energy systems. This ordinance does not apply to any battery energy storage systems that are paired with wind energy systems, but does apply to any wind components of a hybrid system.

[County/City/Town Planning Department] must provide public notice, published on the [County/City/Town website or other form of notification], at least [180] days in advance of any changes to use permit requirements. The notice does not need to include specific details of the upcoming changes, only that the requirements will be changing.

Applicability Commentary: This ordinance is intended to be applicable to all WECS greater than or equal to 20 MW. The 20 MW size minimum was selected to align with the threshold at which WECS are required to submit interconnection application requests through the CAISO Large Generator Interconnection Procedures (LGIP).

Modifications to WECS Commentary: It is possible that local code/ordinances already address thresholds and processes for modifications. If this threshold for modifications is already covered, generic language may not be needed in the wind ordinance. It is worth specifying in the wind ordinance that facility modifications involving a change in turbine height or location may have implications for environmental studies or compliance with FAA regulations and should therefore be considered as new project applications.

Notice of Upcoming Code Changes Commentary: By providing public notice of upcoming code changes (suggested 180 day notice above), LPAs will give developers advanced warning that projects under review will be subject to revised regulations. This may be covered through the formal initiation process that is outlined in the "Overview of Local Ordinance Adoption" section above. Based on this notice, developers may wait to submit an application to avoid encountering regulations that have changed after application submission. Developers are still encouraged to engage early with LPAs even if a notice of upcoming code changes has not been issued to align the preparation of a permit application with any anticipated code revisions and avoid time-consuming or costly design changes.

Substantial Conformance Commentary: Both during the development phase prior to construction and during any repairs or major maintenance periods after construction, it is common for wind developers to make small modifications to the project area and footprint to accommodate situations including (but not limited to) changes in equipment supply, title insurance requirements, any applicable environmental mitigation measures, and access road needs. In many cases, wind developers are required to submit revised land use permit applications when undergoing these minor modifications. To improve the efficiency of permitting and minimize iteration between planning staff and developers, LPAs should use a definition of substantial conformance that would allow for minor deviations that do not materially change the intent of the original land use permit approval. Examples of substantial conformance may include:

- An increase in the site footprint by up to [10%], provided the project remains compliant with the setback conditions of the underlying zoning district and the expanded site does not contain sensitive receptors
- An increase in the height of structures by up to [10%], provided the project remains compliant with the height restrictions of the underlying zoning district
- Changes in the layout and orientation of equipment, provided the project remains compliant with the setback conditions of the underlying zoning district
- Any other change that reduces the overall environmental impact of the project

Local General Plans may already include a definition of substantial conformance that is applicable to wind. If such definition is not already included or a modified definition is needed for wind, LPAs can add one to the above ordinance language.

Permit Types and Application Requirements

Discretionary vs. Ministerial Permit by Land Use Classification

Wind permits may be awarded on a discretionary or ministerial basis through an application for a Use Permit, depending on the existing land use designation of the project site footprint. The table below outlines the permit type (discretionary or ministerial) by land use classification.

Table 1. Permit Type by Land Use Classification

Land Use	Permit Type
Residential	Discretionary
Commercial (Neighborhood Commercial and General Commercial)	Discretionary
Commercial (Regional Commercial and Planned Commercial)	Discretionary
Industrial	Discretionary
Degraded or nonproductive agricultural lands	Ministerial (Permitted / Zoning Clearance)
Agricultural (other than degraded or nonproductive lands)	Discretionary
Mixed-Use	Discretionary
Public Lands / Open Space / Recreation	Discretionary

If projects sited across multiple parcels with different land use designations include any parcels that require a discretionary permit, the project must pursue a discretionary use permit; if all parcels are eligible for a ministerial permit, then the project may pursue a ministerial permit.

Permit Terminology Commentary: The terminology "Discretionary" is used above but LPAs may adjust to use the terms "Conditional" or "Special Use" depending on the terminology preferred in their jurisdiction. The terminology "Ministerial" is used above but LPAs may adjust to use the term "By-Right" depending on the terminology preferred in their jurisdiction.

Some California jurisdictions divide ministerial permits into two categories - "Permitted Uses," referring to structures that can be constructed outright, and "Zoning Clearance," referring to structures that must go through an administrative review process to confirm alignment with existing land use regulations. Either one may be appropriate for wind under certain land use classifications, depending on LPA preferences around site plan review.

Overview of Rationale for Discretionary and Ministerial Permitting for Wind Commentary: Both ministerial and discretionary permits require compliance with existing codes and regulations. Both permit types can require environmental review, aesthetic guidelines, and additional safety requirements, depending on criteria outlined for each permit type.

Discretionary permits require projects to go through the California Environmental Quality Act (CEQA) process for determining environmental impact. Projects may not require a full Environmental Impact Report (EIR) under CEQA if the project is issued a Negative Declaration or Mitigated Negative Declaration of significant impacts, meaning the project would undergo a relatively simpler environmental review process. Discretionary permits also require approval from a predesignated local approval body, often a County Board of Supervisors, for projects requiring a full EIR. Discretionary permits may be required in areas where LPAs want to exercise discretion in allowing a wind project to be built.

Ministerial permits offer a streamlined permitting process that is insulated from discretion and that does not go through the CEQA process.[1] Ministerial permits are issued by-right if the project satisfies all pre-defined criteria for permit application completeness. Pre-defined criteria can include environmental, safety, and aesthetic requirements and require LPA review of the project application to deem whether the permit application meets all criteria and is "complete." Ministerial permits may be appropriate for zones in which LPAs are comfortable with land use compatibility with the project type.[4] Allowing by-right construction of wind in particular predesignated regions can help LPAs direct developers towards selecting project locations viewed as most amenable for wind development. Although CEQA is not required for ministerial permits, a thorough environmental review process can still be required as a base condition and conducted on a programmatic basis across any tracts eligible for a ministerial permitting designation.

Examples of Ministerial Permitting for Energy and Industrial Infrastructure Commentary: Permitting standards for wind and other clean energy infrastructure should generally align with existing standards for public utility or other energy infrastructure. Ministerial permitting already exists for energy and industrial infrastructure in many zoning districts across California. For example:

- Kings County allows the development and construction of oil and gas wells by-right in industrial and agricultural zones.
- Sacramento County allows major utility uses by-right in commercial, industrial, agricultural, and recreation zones (see Table 3.1-F). These are defined in Chapter 7 of the Zoning Code as "generating plants, electrical substations, above ground electrical transmission lines, refuse collection or disposal facilities, water reservoirs, water or wastewater treatment plants, and similar facilities of public agencies or public utilities."
- Los Angeles County allows electric generating stations with a "ministerial site plan review" in industrial zones M-1.5, M-2, and M-2.5 (see Table 22.22.030-B), meaning these projects can be approved by-right after the completion of a defined set of pre-application criteria is verified.

It is important to note that some energy-related uses retain discretionary elements in the approval process despite their ministerial classification in the zoning code. For example, the CEC retains exclusive discretionary permitting authority for thermal generating stations larger than 50 MW. That said, there is clear precedent for classifying energy uses as ministerial at the land use level.

[1] Ministerial permits do not have to go through the CEQA process, unless any environmental impacts are identified as part of the pre-application process that would trigger discretionary review at the state level (in which case, the project would go through the discretionary permitting process) (CA Code of Regulations Tit. 14, § 15268).

Alternative Pathways to Ministerial Permitting for Wind Commentary: An alternative solution to establishing an entire land use type as eligible for ministerial permits that would also provide LPAs with the ability to classify particular tracts as suitable for wind development is the creation of a wind overlay or combining district, which would sit on top of existing zoning designations and create special allowances for wind construction that abides by certain development standards included in the ordinance.

There is some precedent for using overlay or combining districts to streamline renewable energy development in California. Kern County's Wind Energy Combining District, for example, allows for the by-right construction of wind energy systems that comply with a defined set of base conditions. The county retains discretion over the boundaries of the district, which ensures that new developments comply with these conditions.

Industrial Land Use Permits Commentary: Industrial zones are generally well-suited to accommodate utility-scale infrastructure due to their existing land use designations and supporting infrastructure. Industrial zones are also likely to be in areas with less sensitive habitat and wildlife, therefore making it appropriate to conduct an environmental review at the local level rather than through CEQA.

Residential Land Use Permits Commentary: In contrast to industrial land uses, residential areas are primarily intended for housing and different types of dwellings, meaning that siting wind facilities in these areas may warrant a greater degree of discretion to ensure compatibility with existing uses.

Commercial Land Use Permits Commentary: Commercial zones can vary in terms of density and allowable uses, with many LPAs differentiating between high-density commercial areas in city centers or adjacent to residential uses and lower-density commercial areas located off freeways or arterial roads. LPAs should consider the underlying land use designations governing commercial development to determine the correct approach for permitting wind in these zones. For example, a project located in a central neighborhood with proximity to residential and mixed-use spaces may warrant discretionary review, while a project located in a freeway-adjacent industrial park in proximity to a utility substation may be better suited for ministerial review.

It is worth noting that AB 130 and SB 131, which were signed into law in June 2025, require the California Office of Land Use and Climate Innovation to develop a map of urban sites that will be eligible for streamlined CEQA review for infill housing by no later than July 1, 2027. In any industrial or commercial zones where ministerial permitting may be appropriate for wind development, LPAs should ensure that appropriate setbacks from residential uses are incorporated as base conditions for land use permit applications.

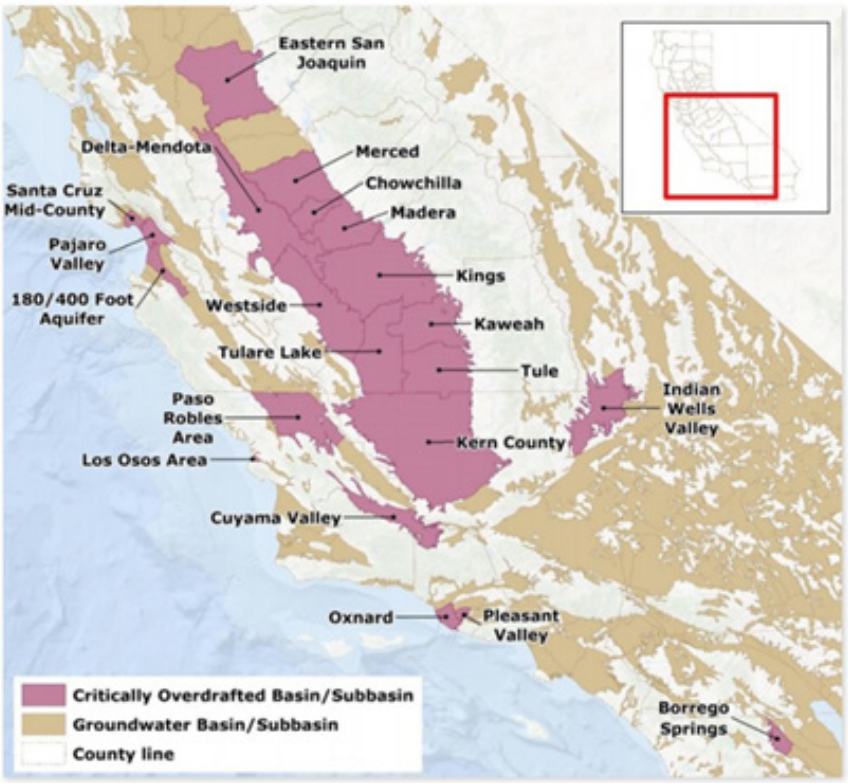
Agricultural Land Use Permits Commentary: The table above recommends making degraded or nonproductive agricultural lands eligible for ministerial permits; although many agricultural activities can still be conducted around wind turbines given their small footprint, a discretionary permit may still be preferred by LPAs to be able to assess impacts of construction activities within the framework of CEQA.

The definition of "degraded or nonproductive" should be determined by each LPA based on their familiarity with the local land types and uses. Several options for agricultural land types that could be eligible for ministerial permits are discussed below.

Options for Agricultural Lands Eligible for Ministerial Permits - SGMA Lands

One option that LPAs could reference in defining "degraded or nonproductive lands" eligible for ministerial permits is the Sustainable Groundwater Management Act (SGMA) of 2014. These lands, which have typically been identified as critically overdrafted basins by the California Department of Water Resources, may be well-suited for wind development given reduced opportunities for irrigation and agricultural uses and the temporary nature of wind installations to enable resuming agricultural activities after the useful lifetime of the wind project if water levels have been restored. The figure below provides a map of basins that are designated as critically overdrafted in California.

Figure 1. SGMA Critically Overdrafted Basins[2]

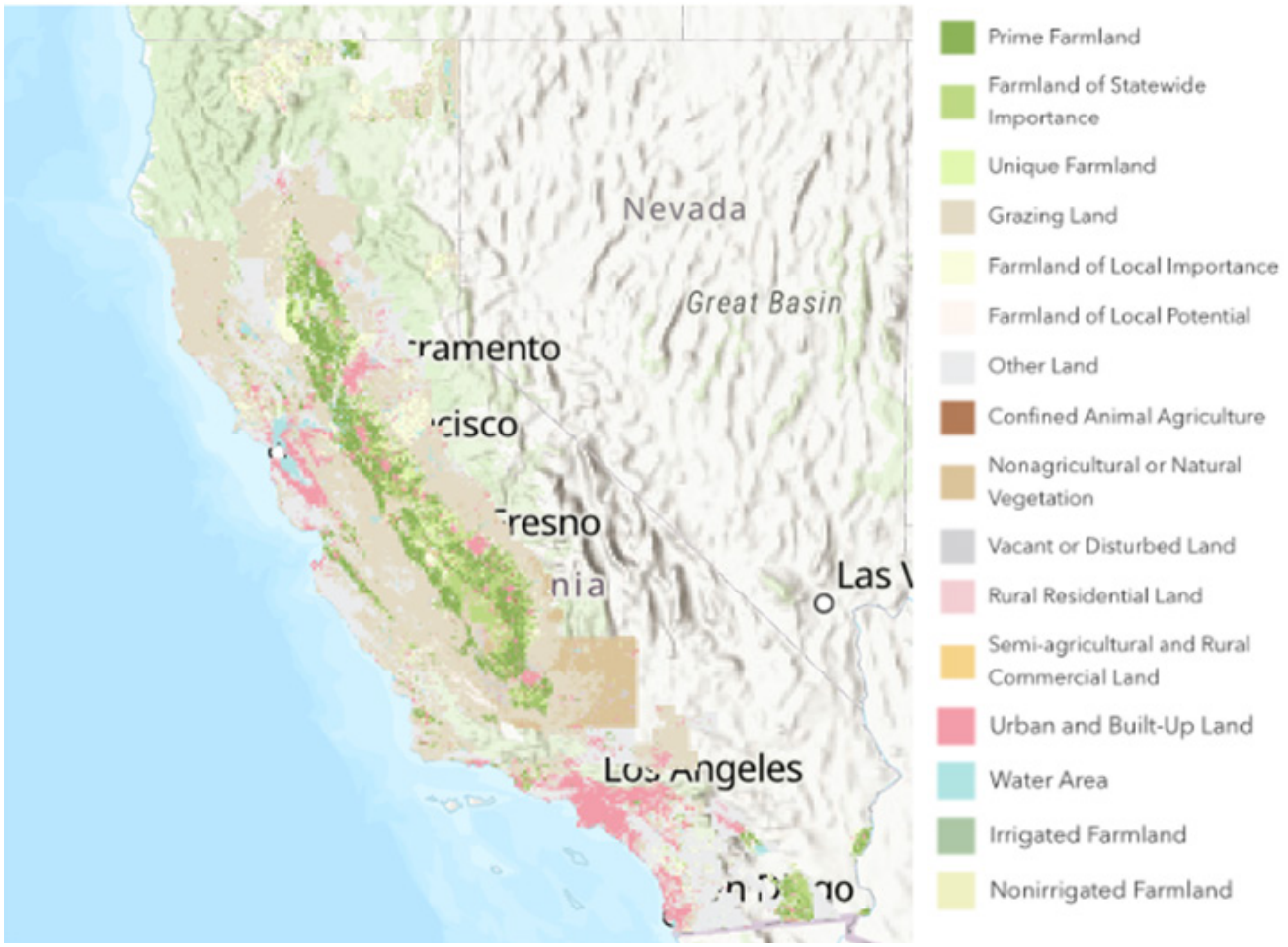


[2] California Department of Water Resources. Critically Overdrafted Basins. https://water.ca.gov/programs/groundwater-management/bulletin-118/critically-overdrafted-basins.

Options for Agricultural Lands Eligible for Ministerial Permits – CA Department of Conservation Agricultural Land Classifications

Another option that LPAs could reference in determining agricultural lands eligible for ministerial permits are the agricultural land classifications from the California Department of Conservation.[3] Prime Agricultural Land, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance are deemed particularly well-suited for agricultural activities and therefore may warrant a discretionary permit to ensure compatibility between wind and existing land uses. If LPAs determine that other agricultural lands beyond those listed are compatible with wind, those projects could be made eligible for ministerial permits. The map below illustrates agricultural land use classifications as defined by the California Department of Conservation, as of the 2022 Farmland Conservation Report.

Figure 2. California Department of Conservation Land Use Classifications



Permits for Mixed and Public Land Uses: Mixed-use and public lands represent special cases and should also be evaluated with greater scrutiny, given their diverse functions and heightened public interest. "Open Space" is included with public lands and recreation in the table above to require a discretionary permit. Based on local General Plans,[4] LPAs may assess whether "Open Space" lands may be eligible to receive a ministerial permit.

[3] California Department of Conservation. Important Farmland Categories. https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx.

[4] Local General Plans refers to the foundational long-term planning documents that counties and cities in California are required to adopt per California Government Code §65300

Application Requirements

Overview of Application Requirements Commentary: Application requirements are divided into the following categories in this section:

1. Pre-application Conditions for Ministerial Permits
2. Application Conditions for Discretionary Permits
3. Conditions of Approval for Use Permits (Ministerial and Discretionary)
4. Additional Considerations for Use Permits (Ministerial and Discretionary)

Applications for both ministerial and discretionary permits should include detailed project information and site plans, an assessment of environmental and cultural impacts, and any mitigation plans that may be required based on the results of these assessments. A key difference between ministerial and discretionary permit requirements is the timeline of submission of some materials. Projects eligible for a ministerial permit submit all documentation required for approval along with permit application; because this documentation is prepared ahead of the application, these materials are referred to as "pre-application conditions."

Discretionary permits, on the other hand, involve an ongoing review process led by the LPA in accordance with CEQA with some elements of the application process, including public hearings and the preparation and submittal of environmental reports taking place after the permit application is submitted and prior to the LPA's issuance of discretionary approval. Therefore, materials for a discretionary permit are referred to as "application conditions."

Pre-Application Conditions for Ministerial Permits

An application for a ministerial land use permit shall include the following information:

1. A project summary, including, to the extent available:

A. A narrative description of the project including relevant context in non-technical terms and including the project location

B. A description of the applicant, project owner and operator; including the names, addresses, and phone numbers of the applicants, owners and operators

C. Total nameplate generating capacity of the WECS facility

D. Total number of wind turbines proposed

E. Name plate generating capacity of each wind turbine

F. Typical Original Equipment Manufacturers (OEMs) of key project components (e.g., blades, transformers)

G. Electrical diagram detailing the system layouts and interconnection

H. The maximum height of proposed wind turbines and maximum diameter of the rotor

2. A preliminary site plan for the installation of the WECS facility showing:

A. The planned location of each of the primary structures

B.Property lines (including identification of adjoining properties), setback lines, public access roads and turnout locations

C. Substation(s), including electrical cabling from the WECS to the substation's ancillary equipment, proposed options for intertie transmission lines from the facility to the utility substation with clearly identified county or city-maintained roads, public or private access easements

Note: public access easements, including use of public road rights-of-way, may require the processing of a franchise agreement)

D. Layout of all structures within the geographical boundaries of any applicable setback

3. Any reports, approvals or requirements demonstrating compliance with any mitigation measures incorporated into an environmental document (such as a programmatic EIR) adopted for the implementation of ministerial permitting for specific parcels

4. Demonstration that the project will not present adverse environmental impacts incremental to those already contemplated in the environmental document (such as a programmatic EIR) adopted for the underlying zoning district. This may include the preparation of resources such as:

A. Phase I Environmental Site Assessment

B. Avian Impact Survey

C. Cultural Resources Survey

D. Traffic Impact Assessment

E. Geotechnical Survey

5. Written certification that the FAA Obstruction Evaluation forms have been submitted to the FAA in accordance with FAA requirements (FAA Form 7460-1, Notice of Proposed Construction or Alteration).

6. Any other information required by the [County/Town/City] as part of its zoning regulations, including all studies, reports, certifications, and approvals demonstrating compliance with the provisions of all applicable federal, state, and local regulations

Application Conditions for Discretionary Permits

An application for a discretionary land use permit shall include the following information:

1. A project summary, including, to the extent available:

A. A narrative description of the project including relevant context in non-technical terms and including the project location

B. A description of the applicant, project owner and operator; including the names, addresses, and phone numbers of the applicants, owners and operators

C. Total nameplate generating capacity of the WECS facility

D. Total number of wind turbines proposed

E. Total nameplate generating capacity of the WECS facility

F. Typical Original Equipment Manufacturers (OEMs) of key project components (e.g., blades, transformers)

G. Electrical diagram detailing the system layouts and interconnection

H. The maximum height of proposed wind turbines and maximum diameter of the rotor

2. *A preliminary site plan for the installation of the WECS facility showing:*

   A. *The planned location of each of the primary structures*

   B. *Property lines (including identification of adjoining properties), setback lines, public access roads and turnout locations*

   C. *Substation(s), including electrical cabling from the wind turbines to the substation's ancillary equipment, proposed options for intertie transmission lines from the facility to the utility substation with clearly identified county or city-maintained roads, public or private access easements*

Note: public access easements, including use of public road rights-of-way, may require the processing of a franchise agreement)

   D. *Layout of all structures within the geographical boundaries of any applicable setback*

3. *Written certification that the FAA Obstruction Evaluation forms have been submitted to the FAA in accordance with FAA requirements (FAA Form 7460-1, Notice of Proposed Construction or Alteration).*

The preparation and submission of an EIR as well as any required public hearings should take place in accordance with any regulations or requirements established under CEQA.

Conditions of Approval for Use Permits (Ministerial and Discretionary)

Both ministerial and discretionary use permits should be awarded conditional upon the complete submission of the following safety and operational plans prior to receipt of a construction permit:

1. *Signatures from all surface property owners on which the WECS facility is located*
2. *Stormwater assessment including a Stormwater Pollution Prevention Plan to minimize, mitigate, and repair any impacts to site drainage during site preparation and project construction*
3. *Vegetation management plan (construction and operations)*
4. *Decommissioning Plan complying with the requirements of the "Decommissioning Plan" section of this ordinance*

Conditions of Approval for Use Permit Commentary: Several assessments or plans, including a Stormwater Pollution Prevention Plan, Vegetation Management Plan, and Decommissioning Plan, are covered in construction permit requirements and are therefore not needed in a use permit. However, local planning authorities and developers indicated in focus group feedback that inclusion of these requirements in a use permit application as a condition of approval can provide reassurance to the public of the enforcement of these requirements.

In practice, conditions of approval would enable LPAs to issue conditional approval of a use permit; that approval would be revoked or finalized after issuance of a construction permit. Because conditions of use permit approval are structured such that meeting construction permit requirements would satisfy these conditions of approval, it should never be the case that a construction permit is issued by use permit conditions of approval are not met.

LPAs may have their own process for adding conditions of approval to issuance of a use permit, in which case those processes can be followed for these requirements. Ordinance language for LPAs without their own process for adding conditions of approval is suggested in the relevant sections. LPAs should still solicit legal and regulatory advice from their own teams to ensure compatibility with conditions of approval.

Additional Considerations for Use Permit Conditions (Ministerial and Discretionary)

An application for a discretionary or ministerial use permit may optionally include the following information:

1. ***Status of interconnection request (e.g. Phase I Study, Phase II Study, Interconnection Agreement or queue number).***

Optional Status of Interconnection Queue Commentary: LPAs may optionally request that developers provide the high-level status of their interconnection request. This would be particularly appropriate for LPAs that receive many permit applications to help prioritize the order of application review. For projects requesting interconnection through CAISO, this information could include indication of which phase of the interconnection process the project is in (e.g. Phase I Study, Phase II Study, Interconnection Agreement) or queue number.

The further along a project is in the CAISO interconnection process, the more likely the project is to come online if granted a permit; therefore, this information can help LPAs understand the likelihood for projects to come online if granted a permit and more accurately assess the cumulative land use impacts of all clean energy permit requests in their jurisdiction. Projects in the interconnection queue get whittled down due to a number of factors, such as if study results find that prohibitively expensive upgrades are required to bring the project online. Under its Interconnection Process Enhancements, CAISO also caps its interconnection studies to 150% of the available and planned transmission capacity in specific zones. Project scores, based on commercial interest, project viability, and system need, are used to inform the order in which projects are advanced into the study and any projects that do not fit in the 150% capacity are withdrawn from the queue. Due to this nature of projects getting whittled down in the interconnection queue, developers also tend to submit interconnection requests for more projects than they anticipate developing; this further exacerbates the artificial inflation of projects in the queue and potentially also the projects requesting use permits from local planning authorities.

However, it is worth noting that interconnection queue status can change quickly; for example, the withdrawal of other projects from the study process can impact the status of any particular project in the queue. Therefore, interconnection queue status alone should not be relied on for assessing the timeframe for when a project could begin construction.

Notice of Withdrawal of Interconnection Request Commentary: A best practice for developers is to notify an LPA as soon as their project is withdrawn from the queue. If developers do not proactively notify LPAs, LPAs could also periodically request updated interconnection queue status for projects that have submitted permit applications.

Pre-Application Meetings Commentary: A best practice is for LPAs to offer and/or encourage developers to participate in pre-application meetings to facilitate the preparation of the application. Pre-application meetings can help avoid incomplete or improperly prepared applications, which can cause permitting delays by requiring revisions or curative work.

Permit Fees

Local resolutions governing permit fees and review costs should be updated to include WECS upon adoption of this ordinance. Permit fees must be set by the relevant [County/City/Town Planning Department] and should generally be capped at the actual cost of application review.

Permit Fees Commentary: The above ordinance language generally recommends permit fee costs be roughly equivalent to the cost of application review, but does not prescribe a method for setting permit fees. Local planning authorities who participated in interviews and focus groups recommended real-time billing as one method to determine the actual cost of application review. Real-time billing by LPAs would charge for time spent on reviewing a submitted application. An applicant must submit a deposit upfront and that deposit will go towards paying for local permitting staff time for application review. If the full deposit is not spent, the remaining amount will be returned to the applicant. If the cost to review nears the deposit amount, the local permitting staff would alert the applicant and determine if an additional deposit is needed. If LPAs prefer other methods besides real-time billing, they should use any alternative methods best suited for their staff and systems.

Design Standards

Maximum Height

The maximum height of a Wind Energy Facility, as measured from ground level to the tip of the rotor blade at its highest point, shall not exceed the manufacturer's recommendation for the equipment class specified in the use permit classification. The maximum height shall also not exceed the height allowed under the Determination of No Hazard for that turbine from the Federal Aviation Administration (FAA) Obstruction Evaluation / Airport Airspace Analysis.

Purpose of Maximum Height Restrictions Commentary: Maximum heights are typically required for fire and structural safety considerations. Maximum height requirements are also often incorporated for minimizing environmental impacts, such as impacts on migratory birds, or visual impacts and other aesthetic reasons.

Optimal heights for wind turbines vary significantly based on project scale and location. Utility-scale WECS height is usually designed to optimize energy capture from local wind speeds. Wind speeds typically increase at higher altitudes, although this effect may vary depending on the site's topological conditions (for example, valleys and ridgelines may create wind tunnels at lower altitudes). As such, energy generation per turbine is generally higher at a greater system height.

Federal Aviation Administration Regulations Commentary: All structures, including wind turbines, over 200 ft tall or within 20,000 feet of an airport[5] are subject to Federal Aviation Administration (FAA) review. The FAA will assess whether the structure poses any adverse effects, such as impeding aviation operations or impacting safety.

[5] A wind turbine may be subject to FAA regulation if within 20,000 ft of a public-use airport with runways >3,200 ft, if within 10,000 ft of a public-use airport with runways <3,200 ft, or within 5,000 ft of a public-use heliport.

Examples of Maximum Height Restrictions Commentary: Local jurisdictions in California have instituted a range of maximum height restrictions on utility-scale wind. Several jurisdictions have set maximum height limitations of 200 ft or lower (Monterey County has a height restriction of 200 ft, Contra Costa County[6] and Santa Clara County have height limitations of 100 ft, Sonoma County has a height restriction of 80 ft). Based on recent installations, these height limitations may impede the optimal turbine height for a proposed project. For reference, the most recent large-scale wind project to come online in California as of 2025, the Strauss Wind Farm in Santa Barbara County, had a height of 492 ft.[7]

Several jurisdictions have set maximum height limitations in the 500-600 ft range (San Bernadino County has a 500 ft height restriction, Kern County has a 600 ft height restriction). Other jurisdictions such as El Dorado County[8] and Yolo County have deferred to manufacturer's recommendations for allowable maximum heights. Other jurisdictions do not set maximum height restrictions explicitly (Lassen County, Marin County) or have maximum height restrictions determined during the use permit application process (Imperial County, Tehama County, Yuba County).

Setbacks

WECS shall comply with the setbacks listed in the table below.

Table 2: Setback Recommendations

Setback	Definition	Distance Required
Participating Property Lines	Distance to properties participating in the project	Setback is commonly waived
Nonparticipating Property Lines	Distance to properties not involved in the project	1.1x tip height or 500 ft, whichever is greater, subject to reduction or waiver by landowner agreement
Participating Residences	Distance to residences participating in the project	1.1x tip height or 500 ft, whichever is greater
Nonparticipating Residences	Distance to adjacent residences not involved in the project	2.1x tip height or 1,000 ft, whichever is greater
Occupied Structures by Civic Use	Distance to schools, hospitals, or other structures that are regularly occupied	2.1x tip height or 1,000 ft, whichever is greater
Roads and Railways	Distance to public transportation routes	1.1x tip height or 500ft, whichever is greater
Public Roads or Railways ROW	Rights of way reserved for future public works such as road expansions or repaving, connections of new water delivery or sewage infrastructure, or new gas pipelines	1.1x tip height or 500ft, whichever is greater
Overhead lines	Distance to overhead communication lines, transmission lines, and/or distribution lines	1.1x tip height or 500 ft, whichever is greater
Ecologically sensitive zones	Distance to State and / or Federal Protected Lands / Parks (e.g., FWS protected areas and State Nature Preserve Protected Lands)	2.1x tip height or 1,000ft, whichever is greater, subject to reduction based on site-specific environmental assessments

[6] Contra Costa County sets a maximum height restriction of 100 ft for wind installations on >5 acres of land

[7] County of Santa Barbara. Strauss Wind Energy Project. https://www.countyofsb.org/912/Strauss-Wind-Energy-Project.

[8] El Dorado maximum height restrictions are based on manufacturer's recommendations for wind projects >1,000 kW.

Evidence or affidavit of any applicable setback reduction or waiver easement agreement shall be provided at the time of application.

Purpose of Setbacks Commentary: Setbacks are the minimum allowable distance between the WECS and nearby buildings, structures, or property lines. Setbacks are an important tool that LPAs can use to ensure that land will be used in a way that is safe and acceptable to the local community. Setback requirements are designed to protect public health, safety, environment, and welfare within host communities. Setbacks are also intended to mitigate potential sound and shadow flicker impacts on occupied residences, businesses, etc.

Overview of WECS Setback Requirements Commentary: There are two ways in which WECS setback requirements can be structured:

1. Relative distance: Setbacks for WECS are frequently related to the tip height of the wind turbine, meaning taller turbines will inherently have larger setbacks.

2. Absolute distance: It is also possible for setback requirements to have a static distance applied to all projects regardless of the project design (e.g. 1,500 feet).

It is possible for LPAs to include both types of setbacks (relative distance and absolute distance. In that case, the more restrictive (i.e. larger setback distance) would apply.

Rationale for Recommended Setbacks Commentary: The table below provides context and rationale for each setback recommendation.

Table 3: Setback Recommendations - Details and Rationale

Setback	Rationale for Setback
Participating Property Lines	The setback is commonly waived by the property owner per the terms of any land use agreements signed with the WECS developer
Nonparticipating Property Lines	A minimum 500' ft setback is recommended to reduce any visual, noise, or other aesthetic impacts of the WECS.
Participating Residences	A minimum 500' setback is recommended for participating residences to ensure resident health and safety. This setback may be waived by the property owner.
Nonparticipating Residences and Occupied Structures by Civic Use	A minimum 1,000' setback is recommended for nonparticipating residences and occupied structures to reduce any visual, noise, or other aesthetic impacts of the WECS.
Roads and Railways	A minimum 500' setback avoids driver distraction from visual impact of rotating turbines and any shadow flicker that may occasionally occur.
Public Roads or Railways ROW	A minimum 500' setback can preserve the rights of way (ROW) for future transportation planning.
Overhead lines	A minimum 500' setback can mitigate fire risk by ensuring that rotating turbines do not interfere with overhead lines.
Ecologically sensitive zones	A minimum 1,000' setback can protect ecologically sensitive zones, especially for bird and bat populations or for ground species and habitats during construction activities, but a modified setback may be required based on environmental assessment findings

Consultation with Local Code Officials: LPAs should also consult with local fire and building code officials to understand if there are any additional setback requirements that should be incorporated to ensure compliance with fire and building code.

Permitting, Safety, and Environmental Compliance

FAA Compliance

The WECS facility shall be designed and operated in accordance with FAA regulations. An application shall be submitted with evidence of FAA compliance on proposed system height. The facility shall be lighted in compliance with FAA regulations.

FAA Compliance Commentary: The FAA will assess whether the structure will pose adverse effects to aviation and other uses of airspace such as radar. Specific areas that the FAA focuses on are whether the structure exceeds obstruction standards, whether it harms airport capacity and/or efficiency, whether it blocks the view from a control tower, and whether it affects safety. Their review also includes assessing the turbine for potential of radar interference and implementing lighting requirements to ensure aviation safety.

Physical Security and Signage

The base of the wind turbine shall be secured by means of an appropriate enclosure to prevent access or climbing by unauthorized persons. No advertising is permitted on the facility, except for signage being utilized for product identification and warnings. A clearly visible warning sign concerning voltage must be placed at the base of all pad-mounted transformers and substations. Visible, reflective, colored objects, such as flags, reflectors, or tape shall be placed on the anchor points of guy wires and along the guy wires up to a height of ten feet from the ground.

Physical Security and Signage Commentary: Ensuring that the WECS is protected from unauthorized access will ensure public safety. The WECS could contain equipment that has potential for harm (i.e. rotating parts) and securing access to the turbine will prevent potential safety incidents occurring with unauthorized personnel. Signage is important to ensure that emergency responders understand the site and the hazards of the facility and specific equipment.

Environmental Compliance

Projects applying for discretionary use permits shall comply with all applicable California Environmental Quality Act (CEQA) requirements.

Projects applying for ministerial use permits shall comply with any mitigation measures identified in the programmatic EIR prepared for the underlying zoning district. Projects applying for ministerial permits shall also submit environmental and cultural resource surveys evaluating whether the project introduces incremental environmental impacts beyond those contemplated in the programmatic EIR prepared for the underlying zoning district. If so, the project must comply with any recommended mitigation measures identified by the LPA as a condition for application completeness.

An applicant shall notify and consult with relevant local, state, and federal environmental jurisdictions and agencies regarding the proposed project and potential protected resources that may be present before submission of a site plan application.

CEQA Requirements Commentary: For renewable energy projects, LPAs are typically the lead agency for the CEQA process. Therefore, LPAs will be involved in the determination of any requirements based on CEQA review of the project. Requirements from CEQA may include describing any avoidance, minimization, or mitigation measures for protected resources incorporated into the project plan. If consultation is required, the applicant shall coordinate with relevant local, state, or federal agencies and jurisdictions.

For projects that impact any state or federally-listed protected species, projects must also provide mitigation that is roughly proportional to the level of impact to the protected species as part of the California Endangered Species Act (CESA) and federal Endangered Species Act.

Stormwater Assessment

An applicant shall provide a stormwater assessment including a Stormwater Pollution Prevention Plan compliant with [County/City/Town] construction permit requirements as a condition of approval.

Stormwater Assessment Commentary: A stormwater assessment is conducted to minimize, mitigate, and repair any impacts to site drainage during site preparation and project construction. A stormwater assessment, including a Stormwater Pollution Prevention Plan, is required for issuance of a construction permit to any ground-disturbing development, including a WECS; therefore, it is not necessary for a stormwater assessment to be included as part of a use permit application. However, LPAs may choose to include a stormwater assessment as a condition of approval to instill confidence that this assessment will be complete for the proposed project.

Vegetation Management

The WECS facility must provide a vegetation management plan compliant with [County/City/Town] fire code as a condition of approval.

Purpose of Vegetation Management Commentary: As discussed in the "Fire Safety" section, risk of fire from WECS is very low. Proper vegetation management can help to minimize the risk of a WECS fire starting or spreading.

Vegetation Management Requirements in Local and CA Fire Code Commentary: The CA Fire Code (CFC) does not include any WECS-specific vegetation management requirements. Therefore, the local fire code may or may not choose to adopt its own vegetation management requirements.

If LPAs choose to include vegetation management requirements as a condition of approval of a use permit, LPAs should consult with the local fire code officials to understand any local fire code requirements for vegetation management. Since compliance with the local fire code is required for a construction permit, it is not strictly necessary that LPAs include vegetation management in the use permit. The condition of approval is recommended to instill public confidence in the safety of the land use for WECS.

Decommissioning

The wind conversion energy system owner shall provide a decommissioning plan that ensures that the facility is dismantled, removed, and the site restored to a condition reasonably similar to its original state once the system has reached the end of its useful life or is otherwise no longer in operation for a continuous period of 12 months. The decommissioning plan shall contain:

1. *An estimate of when the decommissioning should be triggered for wind and any accompanying infrastructure, based on lease tenor, asset life, and equipment performance*
2. *A description of the time and activities required and an estimation of the cost to decommission and remove the Wind Energy System and any ancillary structures*
3. *A description of the time and activities required and an estimation of the cost to repair any damage caused to the property by the installation and removal of the Wind Energy System, sufficient to ensure that the property shall be returned to its condition prior to the installation of the energy system or to some other condition reasonably appropriate for the designated land use*
4. *Plan for the disposal and/or recycling of Wind Energy System components including turbines, towers, foundations, nacelles, and blades systems, including disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations*
5. *The provision of a decommissioning security which shall adhere to the following requirements:*

    I. *The deposit, executions, or filing with the [County/Town/City] Clerk of cash, bond, or other form of security reasonably acceptable to the [County/Town/City] attorney and/or engineer, shall be in an amount sufficient to ensure the good faith performance of the terms and conditions of the permit issued pursuant hereto and to provide for the removal and restorations of the site subsequent to removal. The amount of the bond or security shall be [115]% of the cost of removal and site restoration for the Wind Energy System and shall be revisited every [5] years and updated as needed to reflect any changes (due to inflation or other cost changes). The decommissioning amount shall be reduced by the amount of the estimated salvage value of the Wind Energy System*

    II. *The security bond shall be posted in the following increments:*

        i. *25% at COD*

        ii. *50% within 5 years of COD*

        iii. *100% within 10 years of COD*

    III. *In the event of default upon performance of such conditions, after proper notice and expiration of any cure periods, the cash deposit, bond, or security shall be forfeited to the [County/Town/City], which shall be entitled to maintain an action thereon. The cash deposit, bond, or security shall remain in full force and effect until restoration of the property as set forth in the decommissioning plan is completed.*

Purpose of Decommissioning Plan Commentary: A decommissioning plan is an important assurance that the land will be restored to its pre-project state after the useful lifetime of the project.

Consultation with Local Fire and Building Code Officials

The California Fire Code does not have any requirements specific to wind energy system decommissioning. Local fire and building code may institute decommissioning requirements; LPAs should consult with local fire and building code officials to ensure alignment of any overlapping or similar decommissioning requirements in the local fire and/or building code.

Recovery, Reuse, and Recycling of Raw Materials

A best practice during decommissioning is to recover, reuse, and/or recycle any valuable raw materials. In current WECS, 85-90% of material is recyclable. For example, a U.S. Department of Energy report reports that wind turbine towers, which can make up 40%-80% of wind turbine mass, currently has a 95%+ recycling rate.[9] Composite components, such as the blades, are much more difficult to recycle, and are typically landfilled.

Additional Considerations

Visual Impacts

The facility must comply with any [County/City/Town] visual requirements for the relevant zoning district. All wind turbine towers and blades shall be painted with non-reflective, neutral colors (e.g., white or light gray) to minimize visual impact and blend with the surrounding environment, except when obstruction marking is required for aviation purposes. The FAA regulates allowable colors for wind turbines to ensure compatibility with aviation safety.

Shadow flicker shall be limited to 30 hours per year at neighboring occupied structures or non-participating residences. Permit applicants may request waivers for shadow flicker requirements at participating residences.

Visual Impacts Commentary: Visual impacts from utility-scale Wind Energy Facilities can be significant due to the height of turbines, often exceeding 150 meters at blade tip. One visual impact that can be most concerning to nearby residents is shadow flicker. Shadow flicker is the effect of the sun (low on the horizon) shining through the rotating blades of a wind turbine, which can cast a moving shadow. While shadow flicker can be perceived as a nuisance, shadow flicker has not shown to have any impact on human health . Computer models can help determine when, where, and to what degree shadow flicker will occur. Where shadow flicker could occur, counties can request that shadow flicker impacts on nearby residences be studied. The typical threshold for impact is that shadow flicker should not occur for more than 30 hours cumulatively in a year.

[9] https://docs.nrel.gov/docs/fy25osti/87970.pdf

Sound

Average and hourly sound measured at the nearest occupied structure must not exceed the auditory limits established for each applicable land use zone as set in the [County/City/Town] regulations. Wind Energy Facilities shall also comply with the most recent industry-standard Wind Turbine Sound Modeling specifications.

A WECS facility may exceed these limits only upon agreement with an affected property owner through recorded sound waiver easement agreement. Evidence or affidavit of any applicable sound waiver easement agreement shall be provided at the time of application.

Sound Commentary: Wind turbine noise impacts can be impacted by a variety of factors, including the model of wind turbine, atmospheric conditions, distance between the turbine and the listener, and existing ambient sound levels. A typical wind turbine decibel range falls between 35-45 dB from a 1,000-foot distance, which is typically the closest that turbines are typically placed to the nearest residences. For reference, 40 dB corresponds to the noise typically emitted from a refrigerator.

While there is currently no universal standard for sound level limits, some communities approach sound limits by establishing a single upper threshold for acceptable maximum sound levels at designated points (such as houses or property lines). Communities can also create separate standards for daytime and nighttime operations. Nighttime levels typically feature a lower allowable threshold than daytime to limit noise when most of the population is sleeping. Another variation may include limited exceptions, temporarily allowing wind turbines to operate at sound levels that exceed maximum limitations during isolated events, usually related to weather variables such as a high wind event.

As of 2025, the most relevant industry standard on sound mitigation is ANSI/ACP 111- 1 (2022).

Lighting

The WECS shall comply with [County/City/Town] lighting requirements and regulations and with FAA requirements.

Overview of Lighting Impacts Commentary: Lighting on wind turbines, primarily needed for aviation safety, can contribute to visual impacts at night.

Compliance with Lighting Requirements Commentary: If WECS is already subject to regulations outside a wind-specific ordinance that would govern lighting requirements, LPAs may find it redundant to include the language above in a wind ordinance.

Any additional lighting requirements in the fire code will be required for the building and construction permits and therefore are not needed in the use permit. Lighting requirements from the local fire or building code may include but are not limited to providing sufficient illumination for inspection, maintenance, and emergency response.

FAA Regulations Commentary: For a WECS with a maximum height greater than the FAA threshold, the facility is required to be equipped with air traffic warning lights and to have prominent markings on the rotor blade tips of an international orange color. Aircraft detection lighting systems (ADLS) may be used to activate lights only when aircraft are detected, subject to approval by FAA.

Advanced Lighting Technologies Commentary: Advanced technologies like Aircraft Detection Lighting Systems (ADLS) and careful light placement help balance aviation safety and reduce lighting impacts on communities at night. ADLS usage is subjected to FAA evaluation; wind farms or certain turbines within a wind farm may not be allowed to use ADLS due to proximity to airports, low-altitude flight routes, military training areas, or other areas of frequent activity.

Fire Safety

Overview of WECS Fire Safety Risks Commentary: Fire risk from WECS is very low but may come from the potential for electrical faults or damaged or improperly installed electrical equipment. Fire safety risks can be further minimized with proper maintenance (such as clearing overgrown foliage or animal nesting). An Operations & Maintenance agreement can help reduce fire safety risks posed by maintenance neglect. Vegetation Management plans (discussed in the section below) can also help minimize the fire risk from SES.

WECS Fire Safety Requirements Covered in Construction Permit Commentary: Fire safety-related requirements are not recommended for inclusion in use permit requirements since any requirements necessary to ensure fire safety of these installations will be covered through compliance with fire code. Compliance with the local fire code (which at minimum, must incorporate the standards in the California Fire Code), is required as part of the construction permit.

Review Timeline

Review Timeline Commentary: Review timelines for a use permit application (i.e. timeline for review once all application requirements have been met and all materials have been submitted) for a WECS can be the same as review timelines for other types of permit applications. Some LPAs have referenced the Permit Streamlining Act20 as a guideline or best practice that is used to set review timelines. Some LPAs have sought to expedite review timeline for renewable projects given the acknowledged importance and time-sensitivity of these projects for supporting clean energy.

For discretionary permits, review timelines should include notice of completeness (or notice of deficiency if application is not deemed complete) and should follow timelines and procedures that may be required as part of CEQA or the local permitting process for public hearings or other requirements for public participation.

Resources

American Clean Power Association, "Utility-Scale Wind Energy Conversion Systems": https://cleanpower.org/wp-content/uploads/gateway/gateway/2024/11/ACP_Model-Commercial-Wind-Ordinance_StandardsPractices_241114.pdf

NYSERDA, "New York Wind Energy Guidebook for Local Governments": https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Siting-Resources/Wind-Guidebook

WINDExchange, "Large Community Wind Handbook": https://windexchange.energy.gov/large-community-wind-handbook