

SECTION 3: USE REGULATIONS RENEWABLE ENERGY RELATED SECTIONS

3.36. Standards for Community-, and Utility- Scale Solar Energy Systems

- A. Purpose. The following section serves to encourage the efficient and effective development and use of all systems and facilities that generate renewable solar energy while protecting the public health, safety, and welfare of Routt County's residents.
1. To meet the goals of the Climate Action Plan and Master Plan, this section is intended to:
 - a. Remove barriers to community renewable energy facilities, e.g. solar gardens, on-site generation, and virtual net metering of solar PVs.
 - b. Determine criteria that help mitigate visual impacts to air quality, water quality, wildlife habitat or agricultural areas.
 - c. Support the reuse of former coal or other fossil fuel facilities or infrastructure to aid a transition to lower- carbon and renewable energy.
- B. Applicability and Definitions. This section applies to all systems that produce renewable solar energy. The following definitions are applicable to solar production in Routt County.
1. “Solar Energy Systems” (SES) means an energy system of any scale designed to convert sunlight into a different form of energy, including (1) solar collectors; (2) necessary equipment for converting sunlight into a different form of energy (including photovoltaics), and may also include charge regulators, inverters, and PV support structures (which may include buildings); (3) transmission lines and other overhead and underground electrical distribution, collection, transmission and communications lines, towers and related appurtenances, electric transformers, electric substations, switch stations, junction boxes, battery energy storage facilities (where allowed by this section), telecommunications equipment and lines, and related power generation and transmission facilities; (4) temporary and permanent roads, crane travel paths, fences, and gates; (5) control buildings, maintenance buildings, maintenance yards, septic systems, laydown and staging areas, and related facilities and equipment; and (6) associated landscaping, and parking lots.
 2. “Solar Collector” means a device used to absorb solar radiation and convert it into heat or electricity.
 3. “Community-Scale Solar Energy Systems” means renewable energy systems that are large in scale and primarily serve the energy demands off-site from the facility, either as retail or wholesale. Community-Scale Solar Energy Systems are typically used to generate community- or neighborhood-wide energy. Due to their larger size, Community-Scale Systems typically have more off-site and on-site impacts. Community-Scale Solar Energy Systems are those systems that are up to 20 acres in size and do not qualify as a Small-Scale Solar Energy System.

4. “Utility-Scale Solar Energy Systems” means renewable energy systems that are large in scale and primarily serve the energy demands off-site from the facility, either as retail or wholesale. Utility-Scale Systems are typically used to generate community- or neighborhood-wide energy. Due to their larger size, they typically have more off-site and on-site impacts. Utility-Scale Solar Energy Systems are those systems that are up to 20 acres or larger in size.
5. “Agrivoltaics” refers to any solar energy system that is co-located on the same parcel of land as agriculture production and/or ranching.
6. “Battery Energy Storage System” stores energy from different sources and discharges energy at a later time when needed to provide electricity or other grid services.
7. “Improved Area” means those geographic areas within the County that will be developed or altered directly by construction or operation of the project.
8. “Ground-mounted” is any solar energy system that is mounted on a rack or pole that is attached to the ground.
9. “Roof-mounted” is any solar energy system that is fastened or ballasted to a building roof.
10. “Solar Land Cover” is the entire land area that encompasses all components of the solar energy system, including but not limited to mounting equipment, panels and ancillary components of the system. Access roads, transmission lines, and fencing are not included in this calculation.
11. “Tilt” is the angle of the solar panel / collector relative to the horizontal ground plane. Tilt is most often between 5 and 40 degrees.

C. Review Process.

1. Community-scale solar systems are subject to a Planning Commission review for a Conditional Use Permit Approval, pursuant to **Section XX**. They must also comply with the requirements in 3.36.D as applicable.
2. Utility-scale solar systems are subject to a Planning Commission and BCC review for a Special Use Permit Approval, pursuant to **Section XX**. They must also comply with the requirements in 3.36.D as applicable.

D. Performance Standards. For Community-Scale and Utility-Scale Solar Energy Facilities, the following performance standards shall be met.

1. Coordination with YVEA: All Applicants must work independently and directly with the Yampa Valley Electric Association, or other electric utility, as may be applicable.
2. Site Access:
 - a. Prior to the issuance of the Use Permit, the applicant shall apply for and obtain Access Permit(s) from the Routt County Department of Public Works or CDOT, as applicable. The application shall comply with all requirements, including the then-adopted Routt County Road and Bridge Roadway Standards or CDOT standards, as applicable.

- b. New access drives shall be designed to minimize the extent of soil disturbance, water runoff, and soil compaction on the site.
 - c. Land disturbance or clearing shall be limited to what is minimally necessary for the installation and operation of the system.
- 3. Road Engineering Study. A Road Engineering Study shall be submitted with the application. All recommendations from the study identified by the Routt County Public Works Department as required, shall be installed prior to construction of the facility commencing.
- 4. Height limitation. Ground-mounted solar collectors shall not exceed twenty-five (25) feet in height, measured from the lowest grade below each solar collector to the highest extent of the solar collector rotation.
- 5. Visual Impacts: In order to minimize the potential visual impacts of the Solar Energy System, certain activities should be minimized or avoided, detailed below. A site plan and visual impacts statement shall be included in the application to determine compliance with these standards.
 - a. Avoid clear-stripping of right-of-way or easement. Any required clearing shall be designed to create a natural appearance that blends with surrounding vegetation by using variations in clearing width.
 - b. Avoid creation of access scars.
 - c. Avoid visually important scenic vistas.
 - d. Preserve as much as possible the natural landscape.
 - e. Minimize alteration of the natural slope or aspect of any hillside.
 - f. Stockpiles shall be limited to ten (10) feet in height.
- 6. Setbacks. The area of solar land cover shall conform to the setback requirements of the underlying zone district.
 - a. Collective Lots. Adjoining lots may be collectively utilized for a single facility across property lines. When the lots do not share one single owner, collective grouping is only allowed if an agreement signed by the owners of the affected lands is recorded with the Routt County Clerk and Recorder.
 - b. When adjacent to an existing residential building, setbacks shall comply with the following:
 - i. Community-Scale Solar Energy Systems: The improved area must be at least one hundred (100) feet from existing residential buildings.
 - ii. Utility-Scale Solar Energy Systems: The improved area must be at least one hundred (100) feet from existing residential buildings.
 - iii. The residential setback requirement may be reduced by up to fifty (50) percent if appropriate screening through landscaping, if an opaque fence is installed, or upon submittal of a waiver or informed consent signed by the affected landowner agreeing to the lesser setback. If landscaping or opaque fencing is substituted for setback, a landscaping plan or fencing plan shall be submitted and approved through the review process. In no case will the

setback be reduced to less than that required by the underlying zone district for properties that are not part of the improved area.

7. Site Design. Applicants shall implement a site design that considers vegetation cost, effectiveness in infiltration, and diversity of an ecosystem, both under and between arrays.
8. Screening. Screening and buffering shall mitigate any adverse visual and audible impacts to adjacent developments. Screening is required to minimize the impacts of solar energy system from any point located on an adjacent right-of-way.
 - a. Vegetation or other screening techniques, such as fencing, may be used to effectively screen the area. All fencing shall comply with the wildlife fencing requirements outlined in [Section 3.36.D.21.g](#).
 - b. Developments may be exempt from this screening requirement if the Planning Department finds that the screening requirements could negatively impact system performance.
9. Dust mitigation. A dust mitigation plan is required at the time of application, to be approved by the Planning Director.
 - a. A dust mitigation plan is necessary in one or both of the following instances:
 - i. When major soil disturbances or heavy equipment construction activities—such as clearing, excavation, demolition or excessive vehicle traffic—occur on site; and
 - ii. When the improved area includes unimproved and gravel surfaces, including on the facility, as well as gravel or dirt roads to reach the site.
 - b. The operators of the facility shall continuously employ practices detailed in their dust mitigation plan [per Section XXX](#), which include, at a minimum:
 - i. Limit area of disturbance to reduce dust generation. Minimize overlot grading for projects and phase grading with construction.
 - ii. Gravel, water or chemically stabilize public and private access roads, stripped areas, transfer points and excavations to minimize dust.
 - iii. Increase watering operations immediately in response to periods of high wind conditions or dust complaints.
 - iv. Revegetate disturbed areas as soon as possible.
10. Fencing. The facility shall be enclosed with a security fence approved pursuant to a fencing plan. Appropriate signage shall be placed upon the fencing that warns the public of the high voltage. All fencing shall comply with the wildlife fencing requirements outlined in [Section 3.36.D.22.g](#).
11. Ground Cover and Vegetation Preservation and Management.

- a. Applicant shall maximize the preservation of pre-construction vegetation.
 - b. For the purpose of preventing erosion and managing runoff, disturbed land, including the land under and around the solar collectors, shall be seeded with a vegetation seed mix based on prairie grasses and forbs (wildflowers) native to Colorado, as determined by Colorado Parks and Wildlife's "Native Plant Revegetation Guide for Colorado" which includes pollinator plants where compatible with site conditions (e.g. some pollinator plants should not be established underneath solar collectors due to their height). Seeding shall occur prior to, during, and after construction.
 - c. Deep-rooted vegetative cover between and under arrays shall be used to lower bulk density, increase infiltrative capacity, and reduce the need for vegetative maintenance over the life of the project.
 - d. Ground cover and vegetation shall be continually maintained on the site and replaced as needed for the duration of the Use Permit. The applicant shall include a ground cover vegetation establishment and management plan as part of the application. Such plan shall include:
 - i. Vegetation establishment must include invasive plant species and noxious weed control.
 - ii. Incorporate the staged use of compatible cover crop with the final vegetative mix to bridge the time between the end of construction and establishment of final vegetative cover.
 - iii. Use appropriate vegetative cover under the array that can be self-sustaining and sufficient to maintain the vegetative root system and infiltrative capacity.
12. Erosion and Sedimentation Control. Erosion and sedimentation control measures that ensure that disturbed areas and soil stockpiles are stabilized during construction shall be implemented.
- a. Topsoil that is disturbed during site preparation and construction shall be retained and used on-site. Topsoil shall be used during operation of the solar facility, as reasonably feasible, in order to minimize soil compaction and improve overall stormwater flows.
 - b. When topsoil is stockpiled for use during reclamation efforts, the following standards shall be met. Efforts shall be implemented to save and store all salvageable topsoil for use at reclamation for higher quality revegetation.
 - i. Topsoil stockpiles shall be contoured and conditioned to a slope conducive to establishing vegetative cover.
 - c. All disturbed areas shall be revegetated within one growing season.
13. Stormwater and Water Quality. Solar Energy Systems shall not result in a degradation of Routt County's water resources. The following standards seek to ensure these resources are adequately maintained throughout the life of the solar energy system.

- a. The application includes a calculation of the watershed function. Use of the National Renewable Energy Lab (NREL)'s Photovoltaic Stormwater Research and Testing project (PV-SMaRT) may be used to determine the impact.
 - b. Infiltration shall be incorporated into the solar array layout to ensure sheet flow. This is particularly important in areas with Class C or D soils (tight soils, fine soils, clay, etc.), and information about the site's soils shall be included in the application.
 - c. Soil bulk density. Applicants are required to implement measures that limit bulk density (the compaction of soils) as a method of managing stormwater runoff, water quality, and vegetation.
 - i. The soil bulk density shall be between 1.1-1.5 g/cm³. This standard may be adjusted depending on the soil classification or texture.
 - ii. The site design (array layout, vegetation selection, final stabilization procedures) shall be modified to reduce bulk density, particularly for sites with finer soils.
 - iii. Bulk density shall be measured both before and after construction, both between arrays and under arrays.
 - iv. Post-construction, if bulk density is high, the areas of arrays shall be decompacted to a minimum of six inches and under arrays to a minimum of four inches.
 - v. Minimize grading to the extent practical and select pile and array systems that require less or no grading.
 - v. During construction, the use of heavy equipment shall be limited to specific areas to minimize soil compaction and plan for post-construction decompaction as needed.
14. Solar Collectors must be arranged in a way that:
- a. Allows the passage of runoff between each Solar Collector, thereby minimizing the creation of concentrated runoff;
 - i. larger panels require both additional separation or disconnection due to more volume at the drip edge (primarily for fixed rather than tracking arrays) and increases the need for dissipation BMPs to ensure sheet flow.
 - ii. design array to ensure a parallel layout of the drip edge to contours or install devices to ensure sheet flow from the drip edge.
 - b. Allows for the growth of vegetation beneath and between the collectors; and
 - c. Provides pathways between the sections for the purpose of allowing the movement of wildlife.
15. Underground cables. All electrical cables on the improved area shall be buried except for direct current string wires that connect between solar collectors, direct current collection circuits between rows of solar arrays that are no more

than four (4) feet above grade crossings, substations, switchyards, and circuit voltages greater than 34.5 kilovolts (where necessary).

16. Provisions for Battery Facilities. All batteries shall be configured so that battery cells shall be placed in a Battery Energy Storage System. The Energy Storage System shall provide a secondary layer of physical containment to the batteries and be equipped with cooling, ventilation, and fire suppression systems.
17. Sound. The sound pressure level of the solar energy system and all ancillary equipment shall not exceed the residential standard of 55 dBA at the property line of an adjoining non-participating lot. The site plan shall include modeled sound isolines extending from the sound source to the property lines to demonstrate compliance with this standard.
18. Agricultural Lands. The facility shall not have significant adverse impacts on agricultural lands and agricultural operations and the following criteria shall be met:
 - a. The facility shall be sited on land that has not been identified nor is being used as highly productive agricultural lands. This finding shall be included in the application's narrative, **per Section XXX**, and shall be based on the latest available mapping from the CSU Agriculture Extension Office or the US Department of Agriculture. The facility shall avoid lands such as irrigated meadows and pastureland, cropland used for dry land agriculture, lands along valley floors that intermingle with but are not dedicated to cropland, and farm and ranch headquarters. Consultation with the CSU Agriculture Extension Office will be required, prior to submitting an application, to determine if this standard has been met; and
 - b. The facility shall protect and maintain flows in affected irrigation ditches.
19. Agrivoltaics
 - a. The use of land for both agriculture, including livestock farming, and solar photovoltaic energy generation, may be permitted if:
 - i. Only shade tolerant crops are used;
 - ii. A written erosion and sediment control plan is developed for agricultural plowing or tilling activities; and
 - iii. Application of chemical fertilization or herbicides/pesticides is limited to the agronomic needs of the crop(s).
20. Parking. Staging activities and parking of equipment and vehicles is prohibited on County maintained roads. All staging and parking shall occur on-site.
21. Maintenance. The facility shall be maintained and operated to ensure the safety of site personnel and the public, and in a manner that reduces fire risk caused by vegetation.

22. Workforce Housing Plan. All workers used to construct the facility shall be housed in permanent housing units within Routt County. Temporary Workforce Housing shall not be allowed.
23. Wildlife. Sensitive wildlife species and their habitats shall be avoided to the greatest extent possible, especially during critical periods. All efforts shall be made so that facility activities and uses avoid bisecting any existing habitats and wildlife corridors on, and adjacent to, the site. This includes the clearing of land and placement of infrastructure, such as collectors, transmission lines, roads and other appurtenances that may bisect the important habitat or wildlife corridors. The following actions shall be taken to mitigate the impact that the project has on both the local wildlife of the site, as well as the overall wildlife patterns in the region.
 - a. The facility shall maintain connectivity of habitats and provide wildlife corridors around and within the improved area.
 - b. For Utility-Scale, access corridors for wildlife to navigate through the improved area shall be provided and identified on the Site Plan submitted to the County.
 - c. Applicant shall work with CPW to identify high priority habitat and design their project to avoid, minimize and mitigate potential impacts to wildlife and their habitats.
 - d. A pre-development wildlife and habitat survey (“Pre-Development Wildlife Survey”) shall be performed. Such survey shall be conducted for at least one year prior to application and will be required to assess any potential impacts on the natural environment including, but not limited to wetlands and other fragile ecosystems, wildlife, endangered and threatened species. Consultation with CPW will be required before survey protocol is finalized.
 - i. The Pre-Development Wildlife Survey shall identify all appropriate measures to minimize, eliminate, or mitigate adverse impacts identified and show those measures on the site plan, where applicable.
 - e. The Pre-Development Wildlife Survey shall be used to avoid, minimize and mitigate potential impacts to wildlife and their habitats. A narrative identifying impacts and what measures and alternatives were considered shall be submitted.
 - f. A post-development wildlife and habitat survey shall be conducted. Such survey shall be at least one year in length and shall be conducted using similar methods as the pre-development survey.
 - g. Pre-construction and post-construction wildlife reports are required to with all forms of raw data collected at onset, during, and post construction surveys after a yearlong study is completed. A referral from CPW, submitted at the time of application, shall be used to confirm compliance with this standard.

- h. All screening techniques shall be placed to provide pathways that enable the movement of wildlife. The use of permeable fencing, which is constructed to allow wildlife to pass through the fence, is required. All fencing shall be considered wildlife-friendly according to Colorado Division of Parks and Wildlife’s “Fencing With Wildlife in Mind” standards. Fencing shall comply with the following requirements:
 - i. White wire, the most visible to wildlife, shall be used for the fence.
 - ii. Fencing wire shall be placed on the side of the fence posts where the domestic animals are located.
 - iii. Smooth wire or rounded rail for the top of the fence, smooth wire on the bottom.
 - iv. The height of the fence’s top rail or wire shall be 42 inches or less.
 - v. A gap of at least 12 inches shall be between the top two wires.
 - vi. A gap of at least 16 inches shall be between the bottom wire or rail and the ground.
 - vii. Posts shall be at minimum 16 feet apart.
 - viii. Gates, drop-downs, removable fence sections or other passages shall be placed where animals concentrate and cross;
 - ix. A rail, high-visibility wire, flagging or other visual markers shall be placed on the top of the fence.
- 24. Lighting. Any lights installed as necessary for the facility’s operation shall comply with the following:
 - a. Be limited to the inverter and/or substation locations only.
 - b. Have cut-off shields and use down-lighting to avoid illuminating dark skies and reduce visibility from beyond the project site.
 - c. Be the minimum amount of brightness necessary for operational safety and security.
 - d. Be controlled by automatic controls including timers or motion detectors.
 - e. Flashing or intermittent lights are prohibited.
- 25. Transmission Lines. If additional overhead transmission lines are required, measures to minimize impacts to birds shall be implemented. These may include, but are not limited to increasing line visibility, insulating wires to cover exposed connections, and increasing the distance between wires so there is no risk of contact with energized wires.
- 26. A Decommissioning/Reclamation Plan. A Decommissioning/Reclamation Plan shall be submitted with the application and address the following:
 - a. Decommissioning/reclamation shall commence after six (6) months of the facility having equipment removed, disconnected from power, or loss of lease. All decommissioning/reclamation shall be completed within twelve (12) months from the start date of the work.
 - b. All non-utility owned equipment, conduits, structures, fencing, and foundations shall be removed to a depth of at least three (3) feet below grade. Any soil exposed during the removal shall be stabilized in accordance with the

currently effective CDOT erosion control and stormwater quality standards.

- c. All fences, graveled areas and access roads shall be removed unless a landowner agreement to retain these items is presented, in writing, in which the property owner agrees for these items to remain.
- d. Property shall be restored to a condition reasonably similar to its condition prior to development of the facility.
- e. The developer or owner of the facility is responsible for the decommissioning.
- f. Decommissioning/Reclamation Surety. Valid surety shall be a condition of operating a Community-Scale or Utility-Scale Solar Facility. However, nothing in this section shall relieve the applicant of liability for closure, post-closure, or corrective action costs.
 - i. Surety, in a form in compliance with the Routt County Insurance and Surety Requirements policy, for the decommission and reclamation of the site shall be required within ten (10) years of commercial operation. The surety shall be an amount equal to the estimated cost of decommissioning based on approved engineer cost estimates plus 150% and shall be in compliance with the Routt County Insurance and Surety Requirements policy.
 - ii. The surety amount shall be updated every five (5) years, in concurrence with the updated engineer cost estimate detailed in Section 3.36.D.11.g, Decommissioning and Reclamation Cost Estimates.
- g. Decommissioning and Reclamation Cost Estimates. An engineer cost estimate for decommissioning/reclamation is required. Engineered cost estimates shall be updated every five (5) years from the establishment and submittal of the surety, shall include all costs associated with the dismantlement, recycling, and safe disposal of facility components and site reclamation activities, including the following elements:
 - i. All labor, equipment, transportation, and disposal costs associated with the removal of all facility components from the facility site;
 - ii. All costs associated with full reclamation of the facility site, including removal of non-native soils, grading to approximate pre-development contours, fences, and constructed access roads;
 - iii. All costs associated with reclamation of any primary agricultural soils at the facility site to ensure that each area of direct impact is materially similar to the condition it was before construction;
 - iv. All decommissioning/reclamation activity management, site supervision, site safety costs;
 - v. All costs related to complete revegetation of the site to return it to its condition prior to the development of the facility; and
 - vi. Any other costs, including administrative costs, associated with the decommissioning and reclamation of the facility site.
- h. Revegetation. Land disturbed as part of the construction, commercial operation and/or decommissioning process shall be reseeded or revegetated to a

condition reasonably similar to its condition prior to development of the facility, as determined after a complete growing season.

- i. Soil shall be tested twice. The first test shall be prior to the system's production and the second shall be after the system ceases production but before any equipment is removed. The two shall be compared to evaluate any soil contamination and develop remediation program.
 - A. Soil tests sample shall be representative of the overall area through a combination of five (5) sample spots in the area.
 - B. Areas that have a clear difference in soil type, drainage, or plant growth shall be avoided for sample collection.
- ii. Land disturbed as part of the decommissioning process shall be reseeded or re-vegetated with crops and native seed mixes according to the Colorado Parks and Wildlife's "Native Plant Revegetation Guide for Colorado" or with other vegetative species that provide ecological services, such as carbon sequestration, increased soil health, habitat preservation, or water quality improvements.
- iii. Revegetation or other land disturbance mitigation shall be completed within one (1) calendar year of removal of the solar facility. A one-time extension of six-months may be granted by the Planning Director if required to ensure a complete growing season.

3.37. Standards for Small-Scale Solar Energy Systems

A. Purpose. The following requirements and performance standards are intended to guide the safe and efficient construction and operation of solar for both ground- and roof-mounted, small-scale, single-site use. This section also sets standards for placement and maintenance of these facilities to mitigate impacts on adjacent lands and the surrounding environment.

B. Definitions

1. "Small-Scale Solar Energy Systems" means renewable energy systems that are used on an individual site scale. These are facilities that are intended for private use on the parcel, or an adjacent parcel. These are typically smaller solar collectors able to produce energy necessary for all, or a fraction of, the energy demands on the individual site. Due to their limited size, they typically have fewer off-site impacts.

C. Review Process

1. Small-Scale Solar Energy Systems, both roof-mounted and ground-mounted, are exempt from a separate land use review, and may apply for a building permit. Confirmation of compliance with 3.36 will be evaluated through the building permit review. Solar Energy Systems are a use by right in all zone districts.
2. Small-Scale Solar Energy Systems that require a modification to standards in 3.37 are required to receive a variance from BOA pursuant to Section XX.

D. Small-Scale Solar Energy Systems

1. These systems shall be located on a buildable lot/parcel or platted out-lot.
2. This use is may be ground or roof mounted.
 - a. Roof-Mounted Solar Systems.
 - i. Roof-mounted collectors may be mounted on any legal structure, subject to review through the building permit process.
 - ii. Systems shall be mounted as flush as possible to the roof. To achieve proper solar orientation, collectors may exceed the roofline by up to five (5) feet or the maximum permitted height of the structure by up to five (5) feet (whichever is more restrictive).
 - iii. Systems shall comply with applicable state and local fire codes to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide areas for smoke ventilation, and provide emergency egress from the roof.
3. The solar energy collector shall be located to minimize glare and visual impact on adjacent properties and roadways.
4. Ground mounted Solar Systems shall be subject to the following setbacks:
 - a. Property line setbacks of the underlying zone district;
 - b. Subject to waterbody setbacks according to **Section 5.11.5, Minimum Setbacks from a Waterbody;**
 - c. Minimum of 5 (five) feet from the lot line; and
 - d. Minimum of forty-five (45) feet from the centerline of the roadway, or fifteen (15) feet from the edge of the roadway, whichever is greater.