

# Sumter City-County Planning Commission

August 24, 2016

## OA-16-08, Solar Energy Systems (County)

### I. THE REQUEST

**Applicant:** Sumter County

**Request:** Request to amend the Sumter County Zoning and Development Standards Ordinance, specifically, Article 3, Sections 3.k.3, 3.l.3, and 3.n.3, 3.o.3, 3.p.3; amend Article 3, Exhibit 5, to add Solar Energy System - Primary or Accessory, with SIC Code 4911, as a Conditional Use in the Light Industrial (LI-W), Heavy Industrial (HI), Agricultural Conservation (AC), Conservation Preservation (CP), and Agricultural Conservation – 10 (AC-10) zoning districts; amend Article 5, Section 5.b.1 to add “m” Solar Energy System and associated review criteria; amend Article 10, to add definitions of Solar Energy System-Primary, and Solar Energy System-Accessory; and to amend the Ordinance by adding Appendix D-Decommission Plan for Solar Energy System.

### II. BACKGROUND

Concerns regarding the potential impact of solar energy projects near Shaw Air Force Base and Poinsett RCD have been expressed during the update process of the Sumter-Shaw Joint Land Use Study (JLUS). As a result, Sumter County Council requested planning staff research the issue and prepare an ordinance amendment that addresses impacts, such as reflectivity, that may interfere with Air Force and Sumter County Airport operations.

According to a June 15, 2016 report by the Solar Energy Industries Association (SEIA), 17 megawatts (MW) of solar energy is currently installed in South Carolina, which is enough energy to power 1,900 homes. SEIA reports that over \$10 million was invested in solar installation in South Carolina during 2015, ranking the state 34<sup>th</sup> in the country in installed solar capacity. According to SEIA, South Carolina is expected to install 765 MW of solar electric capacity over the next five (5) years, ranking the state 20<sup>th</sup> in the nation.<sup>1</sup>

A Solar Energy System (SES) is generally classified into one of three categories based upon the size, purpose, and ownership of the SES. Additionally, SES are classified either as *accessory use*, where the system is constructed to supplement the main power source from the local electric utility provider, or *primary use*, where the SES is designed solely for the purpose of generating, selling, and feeding electricity into a local and/or regional energy grid.<sup>2</sup>

1. A small-scale SES serves residential properties and is typically roof-mounted, although some systems are ground-mounted. These SES supplements the main power source from

the local electric utility company by providing an energy source for hot water and some electrical service in the home. These systems are considered an accessory SES because it serves the primary use of the property, a residential dwelling.

2. A commercial-scale SES is also considered an accessory system because it serves the primary commercial use located on the property and supplements the main power source from the local electric utility company. These systems may also be roof or ground-mounted and can vary significantly in size.
3. A utility-scale SES is more commonly known as a solar farm. Solar farms are the largest solar generating facilities and are considered the primary use of the land upon which the system is built. Solar farms range in size from 15 acres (+/- 2 MW) to 150 + acres. The smaller solar farms typically tie into existing substations and local electric transmission lines, while larger solar farms construct new substations that tie into the regional electric grid. The development of a solar farm occurs as a partnership between a solar energy company, a property owner, and an electric utility provider. The solar energy company leases land from a property owner and enters into an agreement with an electric utility to provide energy from the solar farm to the electric grid.

Permitting activity in Sumter County indicates that interest in small-scale residential systems is slowly increasing. Although to date no commercial or utility-scale solar projects have been installed in Sumter County, the planning staff has received two inquiries regarding the potential development of large-scale solar farms. Currently all Solar Energy Systems (SES) are classified under SIC Code 4911 as “electrical services” and are allowed as a permitted use by right in all commercial, industrial, agricultural, residential, and conservation-preservation zoning districts.

According to planning staff research, apparently the most recent and largest SES in South Carolina was developed in Colleton County in 2013 (see pictures below). This facility is built on 15 acres, contains 10,010 solar panels, and generates 2.3 MW of electricity to power nearly 300 homes. This facility was developed with a mixture of fixed panels, as well as single-axis panels that tilt during the day to follow the sunlight.



### III. REFLECTION FROM SOLAR ENERGY SYSTEMS (SES) <sup>3,4,5</sup>

Reflection from Solar Energy Systems (SES) is a common concern, especially for communities that have civilian and/or military aviation operations. However, advancements in solar

technology design include textured solar panel surfaces that absorb and diffuse more sunlight, thereby reducing reflectivity. Reflection from SES is also successfully reduced through proper site mitigation analysis that considers the size, distance, tilt and orientation of the panels, environmental conditions in the area, and observations of the site from key points in the vicinity of the proposed SES.

Many communities with civilian and military airport operations require the developers of SES to verify that the proposed SES will not cause a distraction, diversion, or nuisance to aviation operations on-site at the airport as well as from the air. Developers of SES often provide communities with “glare studies” that perform a technical analysis of potential reflectivity from a SES and propose mitigation measures that reduce the chances of reflectivity impacting aviation, motorists, and residentially developed areas.

For SES projects located within two miles of an airport regulated by the Federal Aviation Administration (FAA), the FAA requires the developer of a SES to analyze the potential for glare by utilizing a free web-based Solar Glare Hazard Analysis Tool (SGHAT). The SGHAT is a software program that processes technical data that includes the location and size of the SES, local flight operations, and observation points by latitude and longitude such as an air traffic control tower. The SGHAT produces a report that specifies where and when glare may result from a proposed SES, from which the developer is able to make adjustments to the design of the SES.

#### **IV. SOLAR ENERGY SYSTEM (SES) REGULATORY APPROACHES**

Some jurisdictions choose to enact regulations to address where the use of a SES is allowed, setbacks for the development, solar panel system height, and decommissioning standards. For communities with civilian and/or military airports, notification of SES development is typically sent to the airport for projects located within a certain distance of civilian and military airports. Additionally, the FAA has developed solar glare analysis standards for projects within two nautical miles of an FAA controlled airport. Ultimately, the SES developer is responsible for completing any required processes related to solar development near airports.

#### **V. SOLAR ENERGY SYSTEM (SES) AMENDMENT FOR SUMTER COUNTY**

*Attachment 1* provides proposed amendment language that addresses the following:

- Provides a definition for a Primary Solar Energy System, which is essentially a ground-mounted solar farm of any size.
- Provides a definition for an Accessory Solar Energy System, which applies to ground or roof-mounted solar systems that are installed as an accessory to a primary use, and 10,000 square feet or greater in size.
- Applies to sites located within five nautical miles of the center point of the runway for Shaw Air Force Base and Sumter County Airport, as well as the center point of Poinsett Electronic Combat Range (ECR).
- Allows SES as a conditional use in the Light Industrial (LI-W), Heavy Industrial (HI), Agricultural Conservation (AC), Conservation Preservation (CP), and Agricultural Conservation – 10 (AC-10) zoning districts.
- Proposes development review criteria addressing glint and glare analysis, setbacks for the development, maximum height, provides notice of proposed SES development to Shaw

Air Force Base, Poinsett ECR, and Sumter County Airport, and requires a decommissioning plan.

***Other Jurisdictions:***

Given that solar energy is a relatively recent and evolving industry, only a few jurisdictions within the State of South Carolina have enacted regulations specific to SES. This ordinance amendment compiled information from South Carolina, as well as other state and federal resources, regarding the regulation of SES.

**VI. DRAFT ORDINANCE AMENDMENT**

*See Attachment 1– Sumter County Zoning and Development Standards Ordinance.*

**VII. STAFF RECOMMENDATION**

Staff recommends approval of OA-16-08, Solar Energy Systems (SES), as detailed in *Attachment 1*.

**VIII. PLANNING COMMISSION – AUGUST 24, 2016**

The Sumter City – County Planning Commission at its meeting on Wednesday, August 24, 2016 voted to defer this request until the September 28, 2016 meeting in order to receive comments from Shaw AFB

**IX. PLANNING COMMISSION – SEPTEMBER 28, 2016**

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1. Solar Energy Industries Association, “Solar Spotlight: South Carolina,” June 15, 2016, <http://www.seia.org/state-solar-policy/south-carolina>.
  2. NC Sustainable Energy Association and NC Solar Center, “Template Solar Energy Development Ordinance,” December 18, 2013, [https://nccleantech.ncsu.edu/wp-content/uploads/Template-Solar-Ordinance\\_V1.0\\_12-18-13.pdf](https://nccleantech.ncsu.edu/wp-content/uploads/Template-Solar-Ordinance_V1.0_12-18-13.pdf).
  3. Lovelady, Adam, “Planning for Solar in North Carolina,” UNC School of Government, 2014, <http://sogpubs.unc.edu/electronicversions/pdfs/pandzsolar2014.pdf>.
  4. Eastern Carolina Council, “Mitigation Techniques for the Impact of Solar Panel Installations on Low-Level Military Flight Paths, 2014, [http://www.eccog.org/wp-content/uploads/2013/10/Mitigation-Techniques-for-the-Impact-of-Solar-Panel-Installations-on-Low-Level-Military-Flight-Paths\\_2014.pdf](http://www.eccog.org/wp-content/uploads/2013/10/Mitigation-Techniques-for-the-Impact-of-Solar-Panel-Installations-on-Low-Level-Military-Flight-Paths_2014.pdf).
  5. Hillesheim, M., Kandt, A., Phillips, S., Mitigating the Impacts of Glint and Glare, retrieved from <http://themilitaryengineer.com/index.php/tme-articles/tme-magazine-online/item/511-mitigating-the-impacts-of-glint-and-glare>.

**Attachment 1, Option A – OA-16-08**

**Proposed Sumter County Zoning and Development Standards Ordinance Text Amendments:**

***Amend Article 3, Section 3.k.3. Conditional Uses*** in the Light Industrial-Warehouse (LI-W) District to add *Solar Energy System, Primary or Accessory, with SIC Code 4911* as new item ‘c’ and re-letter remaining items.

***Amend Article 3, Section 3.l.3 Conditional Uses*** in the Heavy Industrial (HI) District to add *Solar Energy System, Primary or Accessory, with SIC Code 4911* as new item ‘c’ and re-letter remaining items.

***Amend Article 3, Section 3.n.3. Conditional Uses*** in the Agricultural Conservation (AC) District to add *Solar Energy System, Primary or Accessory, with SIC Code 4911* as a new item ‘e’ and re-letter remaining items.

***Amend Article 3, Section 3.o.3. Conditional Uses*** in the Conservation Preservation (CP) District to add *Solar Energy System, Primary or Accessory, with SIC Code 4911* as a new item ‘a’ and re-letter remaining items.

***Amend Article 3, Section 3.p.3. Conditional Uses*** in the Agricultural Conservation - 10 (AC-10) District to add *Solar Energy System, Primary or Accessory, with SIC Code 4911* as a new item ‘c’ and re-letter remaining items.

***Amend Article 3, Exhibit 5 Permitted and Conditional Uses in the Commercial, Industrial, Agricultural, and Conservation Districts Table to add the following:***

Add *Solar Energy System, Primary or Accessory, SIC Code 4911*, with an ‘C’ in the LI-W, HI, AC, CP, and AC-10 columns. All other columns to remain blank.

***Amend Article 5, Section 5.b.1 to add letter ‘m’ as follows:***

- m. Solar Energy System (SIC Code 4911). Applies to all Primary and Accessory Solar Energy Systems as defined in Section 10.b.1, and located within five nautical miles of the center point of the runway for Shaw Air Force Base and Sumter County Airport, as well as the center point of Poinsett Electronic Combat Range (ECR).
  1. All ground-mounted solar collectors and associated outdoor storage shall maintain a minimum 50’ setback from all property lines, or the minimum yard setbacks as indicated for the zoning district within which the project is located, whichever is greater. This provision excludes any security fencing.
  2. All ground-mounted solar collectors shall be limited to a maximum height of twenty (25) feet above the ground when oriented at maximum tilt. This provision shall not include the interconnection poles, substation equipment, or other devices necessary for the electricity to be delivered to the public utility station.
  3. On-site electrical interconnections and power lines shall be installed underground wherever reasonably practical.

4. The applicant has the burden of proving that glare produced from a SES will not have a significant adverse impact on aviation interests, motor vehicle traffic, or neighboring properties.
5. The applicant shall provide documented proof of having notified the Shaw Air Force Base/Poinsett ECR Military Garrison Commander, or the commander's representative, and the Sumter County Airport Director, of a SES proposal. The applicant shall allow fourteen (14) days for written comments to be provided from these agencies. Any written comments received shall be submitted with the conditional use application.
6. It shall be demonstrated that the solar farm shall not unreasonably interfere with the view of, or from, sites of significant public interest such as public parks and other historic resources.
7. For Primary Solar Energy Systems, written documentation of an agreement with an electric utility provider for interconnection of the completed facility shall be submitted at time of Special Exception application. Once constructed, the project shall provide a copy of the signed certification of completion from the electric utility prior to issuance of the certificate of occupancy for the system.
8. Satisfactory completion of Decommissioning Plan, per Appendix D. The Decommissioning Plan shall be recorded in the Sumter County Register of Deeds Office and included with any lease documents with the property owner.

***Amend Article 10, Section 10.b.1 Definitions*** to add the following definition:

*A Solar Energy System - Primary is proposed to be defined as: A ground-mounted solar facility with components and subsystems that generate electricity from sunlight, to be sold to a wholesale electricity market through a regional transmission organization and an inter-connection with the local utility power grid. The area of the facility includes all the land inside the perimeter of the system, which extends to any fencing, land area required for setbacks, landscaping, and signage.*

*A Solar Energy System - Accessory is proposed to be defined as: A ground or roof-mounted solar facility, 10,000 square feet in size or greater, with components that provide for the collection, storage, and use of solar energy for space heating or cooling, electricity generation, or water heating for the primary use.*

***Add Appendix D, Decommissioning Plan for Solar Energy Systems***

APPENDIX D: Decommissioning Plan for Solar Energy Systems

Decommissioning Plan for (insert name) Solar Energy System (Date)

Prepared and submitted by (insert name), the Owner of (insert name) Solar Energy System  
 As required by the County of Sumter, (insert name) presents this decommissioning plan for  
(insert name) Solar Energy System (the "Facility"), located at (insert address) and further  
 identified as tax map parcel number(s) (insert tax map number(s)).

Decommissioning shall occur and be completed within six (6) months of any of the following occurring:

1. The land lease ends
2. The system does not produce power for twelve (12) months
3. The system is damaged and will not be repaired or replaced

The Owner of the Facility, as provided for in its lease with the landowner, will do the following as a minimum to decommission the project:

1. Remove all non-utility owned equipment, conduits, structures, fencing, and foundations to a depth of at least three feet below grade.
2. Remove all graveled areas and access roads, unless the owner of the leased real estate requests in writing for those areas to remain.
3. Restore the land to a condition reasonably similar to its condition before development of the solar farm, including replacement of top soil if removed or eroded.
4. Revegetate any cleared areas with grasses that are native to the region, unless the owner of the leased real estate requests in writing not to revegetate due to plans for agricultural planting or immediate redevelopment.

The Owner of the Facility is responsible for this decommissioning. Nothing in this plan relieves any obligation that the real estate property owner may have to remove the facility as outlined in the Special Exception approval in the event the Owner of the Facility does not fulfill this obligation.

Within thirty (30) days of a change in the Owner of the Facility, the Owner shall record the updated Decommissioning Plan in the Sumter County Register of Deeds Office. A copy of the updated Decommissioning Plan shall be provided to Sumter County. The updated Decommissioning Plan shall also be incorporated into any revised lease agreements with the landowner.

This Decommissioning Plan may be modified from time to time. Within thirty (30) days of a modification, the Owner shall record the updated Decommissioning Plan in the Sumter County Register of Deeds Office. A copy of the modified Decommissioning Plan shall be provided to Sumter County. The modified Decommissioning Plan shall also be incorporated into any revised lease agreements with the landowner.

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Printed Name/Signature of Facility Owner

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name/Signature of Property Owner

\_\_\_\_\_  
Date

NOTARY SIGNATURE BLOCKS