

## GEW133-14

202, 610, 610.1, 610.1.1, 610.1.2, 610.2, 610.2.1, 610.2.2, 610.2.2.1, 610.3, 610.3.1, 610.4, 610.5, 610.5.1, 610.5.2

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**Revise definitions as follows:**

**ONSITE RENEWABLE ENERGY SYSTEM.** An energy generation system located on the building or building site that derives its energy from a renewable energy source.

**RENEWABLE ENERGY CREDIT (REC).** An REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. An REC, and its associated attributes and benefits, is sold separately from the underlying physical electricity associated with an onsite renewable energy source. ~~REC's allow organizations to support renewable energy development and protect the environment where renewable power products are not locally available. There are two approaches to verifying REC ownership and the right to make environmental claims: (1) REC contracts from a list of approved providers, including an audit of the chain of custody; and (2) REC tracking systems.~~

**RENEWABLE ENERGY SOURCE, ~~ONSITE.~~** Energy derived from solar radiation, wind, waves, tides, biogas, biomass, or geothermal energy. ~~The energy system providing onsite renewable energy is located on or adjacent to the building site, and generate energy for use on the building site or to send back to the energy supply system.~~

**Revise as follows:**

### **610-BUILDING ONSITE RENEWABLE ENERGY SYSTEMS**

**610.1 Renewable energy systems requirements.** ~~Buildings that consume energy shall comply with this section. Each building or surrounding lot or building site where there are multiple buildings on the building site shall be equipped with one or more renewable energy systems in accordance with this section.~~

~~Renewable energy systems shall comply with the requirements of Section 610.2 for solar photovoltaic systems, Section 610.3 for wind systems, or Section 610.4 for solar water heating systems, and Section 610.5 for performance monitoring and metering of these systems as approved by the code official. These systems shall be commissioned in accordance with the requirements of Section 611.~~

**Exception:** Renewable energy systems are not required for the following:

- ~~1. Buildings or building sites where there are multiple buildings on the building site providing not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the site, with onsite renewable energy using a combination of renewable energy generation systems complying with the requirements of Section 610.2, 610.3, or 610.4.~~
- ~~2. Where not less than 4 percent of the total annual building energy consumption from renewable generation takes the form of a 10-year commitment to renewable energy credit ownership, confirmed by the code official.~~
- ~~3. Where the combined application of onsite generated renewable energy and a commitment to renewable energy credit ownership as confirmed by the code official, totals not less than 4 percent of the total annual building energy consumption from renewable generation.~~

Any combination of onsite renewable energy systems shall be provided for buildings or building sites in accordance with Section 610.2. Compliance shall be demonstrated in accordance with Section 610.1.1 or 610.1.2.

**Exceptions:**

1. Onsite renewable energy systems are not required where it is confirmed by the building official that compliance with Sections 610.1.1 or 610.1.2 cannot be provided by onsite renewable energy systems alone, and renewable energy credits are purchased to provide not less than 0.5 watt per square foot of conditioned floor area. Renewable energy credits shall be for a period of 10 years, shall be paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.
2. Onsite renewable energy systems are not required where it is confirmed by the building official that compliance with Sections 610.1.1 or 610.1.2 cannot be provided by onsite renewable energy systems alone, and any combination of onsite renewable energy systems and renewable energy credits provide a rating of not less than 0.5 watt per square foot of conditioned floor area. Renewable energy credits shall be for a period of 10 years, paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.
3. Onsite renewable energy systems are not required for the following building occupancies, where not less than 10 percent of the building's total annual estimated hot water demand is met onsite with geothermal or solar thermal systems designed, constructed and installed in accordance with manufacturer's instructions.
  - 3.1. Group A-2, restaurants and banquet halls
  - 3.2. Group F, laundries
  - 3.3. Group R-1, boarding houses (transient), hotels (transient), motels (transient)
  - 3.4. Group R-2 occupancies
  - 3.5. Group A-3, health clubs and spas
  - 3.6 Group I-2, hospitals, mental hospitals and nursing homes
4. Onsite renewable energy systems are not required for buildings where not less than 10 percent of the building's total annual estimated space heating or space cooling demand is met by onsite geothermal or solar thermal systems designed, constructed and installed in accordance with manufacturer's instructions.

**610.1.1 Building performance-based compliance.** ~~Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.1, performance-based compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual energy use of the building, or collective buildings on the site.~~

Buildings or their building sites shall be equipped with one or more onsite renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual electrical energy demand of the building, or collective buildings on the site.

**610.1.2 Building prescriptive compliance.** ~~Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the building site, with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, or 610.4.~~

Buildings or their building sites shall be equipped with one or more onsite renewable energy systems that have the capacity to provide not less than 0.50 watt per square foot of conditioned floor area of the building or collective buildings on the site.

**~~610.2 Solar photovoltaic systems On-site renewable energy system requirements.~~** Solar photovoltaic systems shall be sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.

Installation, inspection, maintenance, repair and replacement of onsite renewable energy systems shall comply with manufacturer's instructions, the International Fire Code, the International Building Code and NFPA 70.

**~~610.2.1 Limitation—Onsite renewable energy system performance verification.~~** Solar photovoltaic systems shall not be used to comply with Section 610.1 where building sites have total global insolation levels lower than 2.00 kWh/m<sup>2</sup>/day as determined in accordance with NREL SERI TR-642-761.

Onsite renewable energy systems shall be tested upon installation to verify that the installed performance meets the design specifications. A report of the tested performance shall be provided to the building owner and the building official.

**~~610.2.2 Requirements—Onsite renewable energy system metering.~~** The installation, inspection, maintenance, repair and replacement of solar photovoltaic systems and system components shall comply with the manufacturer's instructions, Section 610.2.2.1, the International Fire Code, the International Building Code and NFPA 70.

Onsite renewable energy systems shall be individually metered in accordance with Section 603.3.7.

**~~610.2.2.1 Performance verification.~~** Solar photovoltaic systems shall be tested on installation to verify that the installed performance meets the design specifications. A report of the tested performance shall be provided to the building owner.

**~~610.3 Wind energy systems.~~** Wind energy systems shall be designed, constructed and sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with NFPA 70 and Section 610.1.1 or 610.1.2.

**~~610.3.1 Installation, location and structural requirements.~~** Wind energy systems shall be located on the building, adjacent to the building, or on the building site.

**~~610.4 Solar water heating equipment.~~** Not less than 10 percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.

**~~610.5 Renewable energy system performance monitoring and metering.~~** Renewable energy systems shall be metered and monitored in accordance with Sections 610.5.1 and 610.5.2.

**~~610.5.1 Metering.~~** Renewable energy systems shall be metered separately from the building's electrical and fossil fuel meters. Renewable energy systems shall be metered to measure the amount of renewable electric or thermal energy generated on the building site in accordance with Section 603.

**~~610.5.2 Monitoring.~~** Renewable energy systems shall be monitored to measure the peak electric or thermal energy generated by the renewable energy systems during the building's anticipated peak electric or fossil fuel consumption period in accordance with Section 603.

**Reason:** Renewable Energy Systems are crucial to goals for net zero energy buildings. This proposal reorganizes this section, and recognizes approved 2015 code change proposals for fire, building and electrical code compliance for a variety of renewable energy systems. Companion changes to this Section 610 rewrite are required for Chapter 2 Definitions. Most importantly, the

credible use of Renewable Energy Credits is provided as an alternate method to meet the onsite renewable energy system requirement under certain conditions.

The following is a breakdown of the reasons for the reorganization of Section 610.

**Section 610.1.** The charging paragraph states that onsite renewable energy systems are required and identifies installation as well as compliance mechanisms. It is important to note that the renewable energy systems can be located on the buildings or on the building site. Existing language was removed that detailed requirements for various types of renewable energy systems. The detailed installation, fire, structural, electrical, and other requirements for these systems are now very clearly defined in the IBC, IFC, and NFPA and referenced in section 610.2.

**Exceptions:**

The existing exceptions were rewritten for clarity and to add new exceptions for systems that cannot be complied with in the same way as those that produce electricity.

Exception 1 recognizes that there are circumstances where the onsite renewable energy system alone cannot provide the minimum of 2% of the building's electrical energy use. When this condition is confirmed by the building official, the purchase of Renewable Energy Credits that provide 0.5 watts per square foot of conditioned floor area is permitted. Therefore, under this exception, the entire requirement may be met by RECs alone. Purchase of the required RECS must be for a ten year period, shall be paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.

Exception 2 recognizes that there are circumstances where the onsite renewable energy may provide a portion of the minimum of 2% of the building's electrical energy use. When this condition is confirmed by the building official, a combination of the onsite renewable energy system and the purchase of Renewable Energy Credits that provide a combined 0.5 watts per square foot of conditioned floor area is permitted. Purchase of the required RECS must be for a ten year period, shall be paid in full and non--and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.

Exception 3 granted to certain occupancies where there is a high volume of hot water consumption. In these cases, if 10% of the hot water needs in these buildings is met by geothermal or solar thermal systems, then the 2% minimum for renewable energy is not required. For other occupancies where the hot water consumption is relatively low, it is more beneficial to provide 2% of their annual energy usage with other renewable energy systems or RECS.

Exception 4 granted to buildings where geothermal or solar thermal systems provide at least 10% of the buildings space heating or space cooling, then the 2% minimum for renewable energy is not required.

**Section 610.1.1 and Section 610.1.2.** These sections identify a performance based or prescriptive compliance path for the onsite renewable energy system requirement.

**Section 610.2.** This section refers the user to the appropriate codes and manufacturer's instructions for requirements related to installation, inspection, etc. of onsite renewable energy systems.

Existing sections 610.2, 610.3, 610.4 attempted to put system specific requirements in this code. In the 2015 IBC the system specific requirements were adequately added/addressed. There is no longer a need for this type of information in the IgCC so it is deleted.

**Section 610.2.1.** This existing section related to performance verification has been adapted to apply to all renewable energy systems.

**Section 610.2.2.** This existing section has been changed to reflect the fact that monitoring requirements did not make the cut and are not found in section 603. The appropriate reference is made to the metering section.

**Chapter 2:**

Definitions for Renewable Energy Credit (REC) and Renewable Energy Source, Onsite have been modified. A new definition for Onsite Renewable Energy System has been added.

Renewable Energy Credit (REC), was modified to remove unnecessary language from the definition. The deleted language is more appropriate for a user guide.

Renewable Energy Source, Onsite was modified to Renewable Energy Source and to remove language that is related to systems. Onsite Renewable Energy System is a new added definition that defines systems using renewable energy sources as a means of generating energy for the building or building site. This term is widely used throughout section 610.

**Cost Impact:** Will not increase the cost of construction. This proposal simplifies this requirement and will ease compliance and enforcement of onsite renewable energy systems.

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