

GEW 132-14

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, 610.6 (New), A106, A106.6,

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Revise definition 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 a 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 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.

Buildings shall include onsite renewable energy systems that provide not less than 2 percent of the estimated annual electrical energy used for heating, cooling, ventilation, lighting, and service water heating.

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.

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.

610.2 Solar photovoltaic systems. Building averaging. 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.

The required renewable energy shall be computed for each building or for a group of buildings.

610.2.1 Limitation. 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/m²/day as determined in accordance with NREL SERI TR-642-761.

610.2.2 Requirements. 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.

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. Alternative sources. 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.

The following shall be considered as substitutes for any portion of the renewable energy requirement of Section 610.1:

1. Conserving additional non-renewable energy, where the conserved non-renewable energy equals twice the renewable energy credited.
2. Renewable energy credits (RECs) or local utility green power is purchased, where the purchased amount equals ten times the renewable energy credited. Documentation of the purchase shall be provided.

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

Buildings or their building sites that are designed and constructed 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 shall be considered to be in compliance with Section 610.

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

The installation, inspection, 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.

610.5.1 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.

610.6 Performance verification. *Onsite renewable energy systems shall be tested upon installation to verify that the installed performance meets the design specifications. Such testing shall be documented.*

Revise as follows:

A106.6 Renewable energy system project electives. Buildings seeking a renewable energy system project elective or electives shall be equipped with one or more renewable energy systems in accordance with Section 610.1 that have the capacity to provide the percent of annual energy used within the building as selected in Table A106. Capacity shall be demonstrated in accordance with Sections 610.1.1 and 610.1.2.

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI is at least 5 points lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project zEPI is at least 10 points lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project zEPI is at least 15 points lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project zEPI is at least 20 points lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project zEPI is at least 25 points lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project zEPI is at least 30 points lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project zEPI is at least 35 points lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project zEPI is at least 40 points lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	Project zEPI is at least 45 points lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project zEPI is at least 51 points lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

Reason: Electricity from renewable sources is usually environmentally preferable to electricity generated from conventional sources. This proposal simplifies the existing renewables section, which is overly complex and difficult to enforce. This also adds new options, as renewable systems are impractical for some buildings.

- --New 610.1 gives the basic requirement, 2% of the electricity is renewables, in a simple and clear manner.

- --New 610.2 makes it clear the requirement can be computed for either individual buildings or a group of buildings.
- --New 610.3 offers important alternatives. An onsite renewables requirement is not viable unless practical alternatives are included. For example many downtown buildings are nested between, and shaded by larger buildings. This proposal allows three options.

Item #1 allows twice as much non-renewable energy savings as an alternative to renewables.

Item #2 allows purchased Renewable Energy Credits (RECs) or electricity from a local green power program. Both the RECs and the green power options require the up front purchase of 10 years worth of the renewable electricity requirement for the building.

Utility green power programs are available many places and local utility programs will often be the simplest. For example, over 150 utility green energy programs are listed in the US Department of Energy's web site at: <http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml?page=2>

Consumers can also buy green power in the form of renewable energy certificates (RECs), which are usually available regardless of whether the local utility offers a green power product.

- --New 610.4 is a prescriptive alternative of 0.5 w/ft2 (existing Section 610.1.2) doesn't require estimating overall energy use and is useful for buildings that want PV.
- --New 610.5 references other standards already in the IGCC, with all references moved to this one section.
- --New 610.6 requires the renewable system to be tested.
- --Revised definitions for RECs, renewable energy systems, and onsite renewables energy systems are more concise. Commentary material is removed. The existing IGCC leaves out some types of renewables, but the use of these definitions includes them.
- --References to the old text are removed from the existing Appendix A.

Overall this revised renewable section is much more usable than the existing renewables section. The addition of multiple alternative is particularly important.

Cost Impact: Will not increase the cost of construction.

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