

GEW 40-14

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Revise as follows:

603 ENERGY METERING, MONITORING AND REPORTING

603.1 Purpose Scope. Buildings that consume energy shall comply with Section 603. The purpose of this section is to provide requirements that will ensure that buildings are constructed or altered in a way that will provide the capability for their energy use, production and reclamation to be measured, monitored and reported. This includes the design of energy distribution systems so as to isolate load types, the installation of or ability to install in the future meters, devices and a data acquisition system, and the installation of, or the ability to provide, public displays and other appropriate reporting mechanisms in the future.

All forms of energy delivered to the building and building site, produced on the building site or in the building and reclaimed at the building site or in the building shall be metered and all energy load types measured in accordance with this section.

This section requires the capability to meter purchased energy. These requirements include the capability to separate energy use by end use category and fuel type, and providing a data acquisition system.

603.1.1 Buildings with tenants. In buildings with tenants, the metering required by Section 603.3 shall be collected for the entire building and for each tenant individually. Tenants shall have access to all data collected for their space.

603.2 Energy distribution design requirements and load in buildings Load type isolation. Energy distribution systems within, on or adjacent to and serving a building shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy use type as defined in Sections 603.2.1 through 603.2.5. The energy use type served by each distribution system shall be clearly designated on the energy distribution system with the use served, and adequate space shall be provided for installation of metering equipment or other data collection devices, temporary or permanent, to measure their energy use. The energy distribution system shall be designed to facilitate the collection of data for each of the building energy use categories in Section 603.4 and for each of the end use categories listed in Sections 603.2.1 through 603.2.5. Where there are multiple buildings on a building site, each building shall comply separately with the provisions of Section 603.

Exception: Buildings designed and constructed such that the total usage of each of the load types described in Sections 603.2.1 through 603.2.5 shall be permitted to be measured through the use of installed sub-meters or other equivalent methods as approved.

Energy distribution systems shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy end use category as specified in Section 603.3. The energy end use served by each distribution system shall be clearly designated on the energy distribution system.

603.2.1 HVAC system total energy use. The HVAC system total energy use category shall include all energy used to heat, cool, and provide ventilation to the building including, but not limited to, fans, pumps, boiler energy, chiller energy and hot water.

603.2.2 Lighting system total energy use. The lighting system total energy use category shall include all interior and exterior lighting used in occupant spaces and common areas.

603.2.3 Plug loads. The plug loads energy use category shall include all energy use by devices, appliances and equipment connected to convenience receptacle outlets.

~~603.2.4 Process loads. The process loads energy use category shall include the energy used by any single load associated with activities within the building, such as, but not limited to, data centers, manufacturing equipment and commercial kitchens, that exceeds 5 percent of the peak connected load of the whole building.~~

~~603.2.5 Energy used for building operations loads and other miscellaneous loads. The category of energy used for building operations loads and other miscellaneous loads shall include all vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, inground spas, snow-melt systems, exterior lighting that is mounted on the building or used to illuminate building facades and the use of any miscellaneous loads in the building not specified in Sections 603.2.1 through 603.2.4.~~

~~603.3 Energy-type metering Separation of energy end use categories Buildings shall be provided with the capability to determine energy use and peak demand as provided in this section for each of the energy types specified in Sections 603.3.1 through 603.3.7. Utility energy meters or supplemental sub-meters are permitted to be used to collect whole building data, and shall be equipped with a local data port connected to a data acquisition system in accordance with Section 603.5.~~

Energy metering shall be capable of separating and reporting the energy end use categories specified in this section. Where the same equipment provides HVAC and service water heating, the HVAC and service water heating end uses shall be permitted to be combined. Separation of energy use into other end use categories shall be permitted where approved as appropriate to the use of the building.

HVAC including, but not limited to, fans, pumps, boiler energy, and chiller energy.

Service hot water heating including any associated pumps.

Lighting including both interior and exterior lighting.

Building operations including vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, snowmelt systems, and other building operations.

Plug loads include the electric energy used by devices, appliances, and equipment connected to convenience receptacle outlets.

Process loads. Energy used by any single process load that exceeds 5 percent of the projected energy expenditures for the whole building. Process loads include, but are not limited to, data centers, manufacturing equipment, commercial kitchens.

Total building energy use, separated by purchased fuel type.

Exceptions: The following shall not require separation into end use categories:

1. Buildings containing less than 25,000 square feet of conditioned space.
2. End use categories projected to be less than 5 percent of the building's energy expenditures.
3. Spaces that are projected to use an average of less than 2 watts per square foot for all purchased energy.

~~603.3.1 Gaseous fuels Use of utility energy meters. Gaseous fuels including, but not limited to, natural gas, LP gas, coal gas, hydrogen, landfill gas, digester gas and biogas shall be capable of being metered at the building site to determine the gross consumption and peak demand of each different gaseous fuel by each building on a building site. The installation of gas meters and related piping shall be in accordance with the *International Fuel Gas Code*.~~

Utility energy meters shall be permitted to be used to collect any data for which they satisfy the requirements of Section 603. Where utility energy meters provide the metered data, the

data acquisition system shall be capable of automatically integrating the utility meter data with the other data storage and reporting.

603.3.2 Liquid fuels. Metering system data. ~~Liquid fuels including, but not limited, to fuel oil, petroleum-based diesel, kerosene, gasoline, bio diesel, methanol, ethanol and butane shall be capable of being metered at the building site to allow a determination of the gross consumption and peak demand of each liquid fuel use by each building on a building site. The installation of meters and related piping shall be in accordance with the *International Mechanical Code*.~~

The metering system shall be capable of collecting hourly data automatically. The system shall be capable of storing not less than 36 months of data . The system shall be capable of transferring the data for use in monitoring or analysis in real time.

603.3.3 Solid fuels. ~~Solid fuels including, but not limited to, coal, charcoal, peat, wood products, grains, and municipal waste shall be capable of having their use determined at the building site to allow a determination of the gross consumption and peak demand of each solid fuel use by each building on a building site.~~

603.3.4 Electric power. ~~Electric power shall be capable of being metered at the building site to allow a determination of the gross consumption and peak demand by each building on a building site. The installation of electric meters and related wiring shall be in accordance with NFPA 70.~~

603.3.5 District heating and cooling. ~~Hot water, steam, chilled water, and brine shall be capable of being metered at the building site, or where produced on the building site, to allow a determination of the gross consumption of heating and cooling energy by each building on a building site. Energy use associated with the production of hot water, steam, chilled water or brine shall be determined based on the fuel used.~~

603.3.6 Combined heat and power. ~~Equipment and systems with a connected load greater than 125,000-Btu/hr (36.63 kW) providing combined heat and power (CHP) shall be capable of being metered to allow a determination of the gross consumption of each form of delivered energy to the equipment. The output of CHP shall be metered in accordance with the applicable portions of Section 603 based on the forms of output from the CHP.~~

603.3.7 Renewable and waste energy. ~~Equipment and systems providing energy from renewable or waste energy sources which is included in the determination of the building zEPI, shall be capable of being metered to allow a determination of the output of equipment and systems in accordance with Sections 603.3.7.1 through 603.3.7.5.~~

603.3.7.1 Solar electric. ~~Equipment and systems providing electric power through conversion of solar energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

603.3.7.2 Solar thermal. ~~Equipment and systems providing heat to fluids or gases through the capture of solar energy shall be capable of being metered so that the peak thermal energy (Btu/h) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of heat captured (Btu) for delivery to the building and its systems can be determined intervals of 1 hour or less.~~

Exception: ~~Systems with a rated output of less than 100 kBtu/hr shall not be required to have the capacity to be metered.~~

603.3.7.3 Waste heat. ~~Equipment and systems providing energy through the capture of waste heat shall be capable of being metered so that the amount of heat captured and delivered to the building and its systems can be determined at intervals of 1 hour or less.~~

Exception: ~~Systems with a rated output of less than 100 kBtu/hr shall not be required to have the capacity to be metered.~~

603.3.7.4 Wind power systems. ~~Equipment and systems providing electric power through conversion of wind energy directly to electric power shall be capable of being metered so that the peak electric power (kW)~~

~~provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

~~**603.3.7.5 Other renewable energy electric production systems.** Equipment and systems providing electric power through conversion of other forms of renewable energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

~~**603.4 Energy load type submetering. Space for energy metering.** For buildings that are not less than 25,000 square feet (2323 m²) in *total building floor area* the energy use of the categories specified in Section 603.2 shall be metered through the use of sub-meters or other *approved*, equivalent methods meeting the capability requirements of Section 603.3.~~

~~For buildings exempted from the installation of end use category metering in Section 603.3, space shall be shall be identified and reserved for the future installation of metering capable of compliance with Section 603.3.~~

~~**603.4.1 Buildings less than 25,000 square feet.** For buildings that are less than 25,000 square feet (2323 m²) in *total building floor area*, the energy distribution system shall be designed and constructed to accommodate the future installation of sub-meters and other *approved* devices in accordance with Section 603.4. This includes, but is not limited to, providing access to distribution lines and ensuring adequate space for the installation of sub-meters and other *approved* devices.~~

~~**603.5 Minimum energy measurement and verification.** Meters, sub-meters, and other *approved* devices installed in compliance with Sections 603.3 and 603.4 shall be connected to a data acquisition and management system capable of storing not less than 36 months worth of data collected by all meters and other *approved* devices and transferring the data in real time to a display as required in Section 603.6.~~

~~**603.5.1 Annual emissions.** The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section 602.2.3.~~

~~**603.6 Energy display** A permanent, readily accessible and visible display shall be provided adjacent to the main building entrance or on a publicly available Internet web site. The display shall be capable of providing all of the following:~~

- ~~1. The current energy demand for the whole building level measurements, updated for each fuel type at the intervals specified in Section 603.3.~~
- ~~2. The average and peak demands for the previous day and the same day the previous year.~~
- ~~3. The total energy usage for the previous 18 months.~~

Reason: The section was overly complex. This proposal simplifies the provisions.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

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