

GEW62-14

202 (New), 604.5 (New)

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Add new definition as follows:

ENERGY STORAGE SYSTEM Equipment that are designed for and capable of receiving, storing and discharging energy. Common examples of energy storage systems include chemical batteries, flywheels, and thermal storage systems.

Add new text as follows:

604.5 Energy storage. Where an energy storage is used as a means to comply with the requirements of this section, Sections 606 or 607, the following information shall be submitted for review to the *code official*:

1. A narrative describing the operation of the energy storage system that identifies, among other things, the building end use loads being supplied by the energy storage system and the storage medium used.
2. A list of energy storage system components.
3. A calculation that shows the maximum charge level (KWh), maximum electric charge rate (KW) and electric or thermal discharge rate (KW) of the system.
4. The name of the utility, ISO, or RTO that will control the energy storage system.
5. Whether the energy storage system is to be dispatched by the serving grid operator, or micro-grid operator for frequency regulation, renewable integration, or grid stabilization purposes.
6. Other information requested by the code official.

Reason: For many years, energy storage has played an important role in the development of safe, reliable electric grids in North America. These traditional roles have included thermal energy space and water heater storage programs by electric utilities to manage power supply and demand while providing affordable – and sometimes even negative –operating costs for consumers.

More recently, however, Energy storage has taken on an even more important role as buildings move toward net-zero energy. Without cost effective energy storage, the development of grid-scale renewable energy is limited. Additionally, electric grid operators are struggling to balance the addition of renewable energy from wind and solar with their customer demands -- often renewable energy production peaks when customer demand is low. Electric grid imbalances caused by the addition of renewable energy during periods of low customer demand threaten grid stability.

For these reasons and others, the U.S. Department of Energy, Federal Energy Regulatory Commission, state public service commissions, ISO's and RTO's and others are giving great attention to energy storage.

This proposal is a baby step towards merging building science with the growing need for energy storage. In effect, this proposal simply states that, if a building is to be used as an energy storage facility, there are a few details that need to be provided to the authority having jurisdiction. The requirements are minimal and are things that are well known in the energy storage community.

It is anticipated that once this section is established it will be modified with more details in future editions of the IGCC but for the moment it would serve as a placeholder for this issue of rapidly growing importance. It would also help to establish the IGCC's *bona fides* as a leader in the green building arena.

Bibliography:

See article at:
<http://www.pjm.com/about-pjm/exploring-tomorrows-grid/electricity-storage.aspx?p=1> for information on the value of ETS in the PJM Interconnection service territory.

See article at

<http://www.sustainablebusinessoregon.com/articles/2012/04/bonneville-power-calls-for-first-wind.html?page=all> for information on Bonneville Power curtailment of wind generation amounting to almost 100,000 MWH's in 2011.

See Kema Consulting report (Commissioned by the U.S. Department of Energy under the supervision of Sandia National Laboratory) noting significant reduction in carbon emissions at <http://prod.sandia.gov/techlib/access-control.cgi/2008/088229.pdf>.

See <http://www.steffes.com/off-peak-heating/ets.html> for more information on utility benefits of WTS, including energy savings associated with thermal storage and frequency regulation.

See Sandia National Laboratory website at <http://www.sandia.gov/ess/> for information on the contributions of energy storage to electric grid stability.

For a detailed description of frequency regulation in North America see Department of Energy / National Energy Technology Laboratory Report Frequency Instability Problems in North American Interconnections, DOE/NETL-2011/1473, Final Report dated May 1, 2011 found at <http://www.netl.doe.gov/energy-analyses/pubs/TransmissionFreqProb.pdf>

Cost Impact: Will not increase the cost of construction.

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