

The 2015 IgCC—an Opportunity for Incorporating Demand Response into Commercial Buildings

Three proposed modifications to the International Green Construction Code (IGCC) – proposals numbered GEW 54-14, GEW 55-14 and GEW 58-14 – would increase the effectiveness of the IGCC’s existing demand response provisions and lead to more buildings with demand-response capabilities, benefitting both building owners and the grid. GEW 54-14 proposes to comprehensively revise the demand response provisions in the IgCC to reflect language in other codes and standards, and GEW 55-14 and GEW 58-14 would expand the scope of demand response applicability to more code jurisdictions. Each of these proposals will be considered separately in the current cycle of ICC proceedings. Information about participating in the IgCC is found at the end of this factsheet.

Benefits of Demand Response

Demand response (DR) refers to the ability to adjust energy use in response to a price or information signal from a grid operator or other automated source. Demand response enables energy efficiency to be dynamically dispatched, thus lowering costs and increasing reliability, particularly during peak demand periods. Demand response in buildings is becoming an increasingly important tool for grid operators to manage the flow of electricity and integrate variable energy resources. It also offers owners and customers a new option for managing their energy use. Most recently, demand response played a critical role in preventing power outages during the extreme cold temperatures in January 2014. Demand response capabilities are easiest and cheapest to integrate into a building when it is first constructed and building systems and their controls are first installed. Building systems that can be enabled for automated demand response (Auto-DR) include lighting, HVAC, and Water Cooling and Heating.



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Demand Response Requirements in the 2012 IgCC

Section 406 of the current IgCC requires buildings located in jurisdictions where the utility or independent system operator (ISO) has a demand response program to include certain demand response capabilities. To comply with Section 604, a building must be capable of reducing its HVAC demand by at least 10 percent automatically on the receipt of a DR signal from the utility or ISO. Group B office spaces must also be able to reduce their lighting load by 15

percent (with some exceptions, such as emergency lighting) upon receipt of the DR signal. Jurisdictions can elect to require Section 604 of the IgCC at the time of adoption. DR provisions are an IgCC “jurisdictional elective” and only take effect upon a jurisdiction’s positive election.

Proposed Modifications

GEW 54-14. The revised Section 604 language proposed for the 2015 IgCC supports greater DR participation by **simplifying** and **standardizing** the Auto-DR application in HVAC systems by describing three distinct situations:

- Energy Management Systems
- Direct Digital Control
- Smart Thermostats

The systems communicate the changes such that the building owner or operator can be compensated for responding to the price signal or demand response period.

The proposed Section 604 language requires that occupants can override system settings and includes exceptions for certain types of mission-critical equipment and sensitive or critical environments. Section 604.3.1 also ensures that the Auto-DR technology slowly return systems to normal operations in order to avoid rebound peaks and includes an occupant-controlled thermostat option for the first time.

One proposed exception addresses areas where passive load reductions can delay the need for more aggressive demand reduction strategies while at the same time reducing overall building energy use on an ongoing basis. The new exception language would provide an alternate approach to projects that would encourage the adoption of meaningful passive design strategies while also contributing to long-term grid stability. Features and systems that may allow buildings to qualify for this exemption include:

- Actively controlled interior daylighting systems
- Thermal mass used actively to manage building internal temperatures as part of a night-ventilation control strategy
- Buildings designed to prevent direct solar penetration in cooling dominated climates
- Other building systems reviewed and approved by the Authority Housing Jurisdiction (AHJ)

The rebound avoidance language is unchanged from the 2012 IgCC-DR Section. The *lighting systems* DR provisions are unchanged, but the scope extends beyond just office spaces. At the same time, the size threshold is increased to buildings over 10,000. These adjustments better reflect actual market installations. New commissioning and functional testing requirements for Auto-DR lighting reduction controls are added to the IgCC to make it consistent with the testing requirements for HVAC Auto-DR-Controls already in the IgCC.

While the market will continue to incorporate Auto-DR technology and



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communications into buildings, it is critical that the proposed language be incorporated into the IgCC to facilitate faster and more cost-effective adoption of DR. With this proposal's standardized DR language in the IgCC, there will be more rapid adoption and accelerated cost decreases for these technologies, thus benefitting building owners directly and all users of the grid indirectly.

GEW 58-14. This proposal would remove the current exception to the Auto-DR infrastructure requirement for buildings located where the utility or regional ISO or Regional Transmission Operator (RTO) do not yet offer a demand response program. Many utilities, ISOs and RTOs already offer demand response programs, and the number of programs and the need for demand response continues to increase. Even if a demand response program does not exist at the time of construction, it is likely one will be developed over the life of the building, as traditional energy efficiency and dynamic demand response approaches begin to be blended in building applications. Furthermore, integrating demand response infrastructure into buildings provides a demand response resource which will facilitate the creation of demand response programs. Given the benefits of, and relative ease and low cost of integrating these capabilities at the time of construction, this proposal removes the exception for buildings located in an area without a current DR program.

GEW 55-14. This proposal would make the Auto-DR infrastructure requirement applicable to all jurisdictions. As discussed for GEW 58-14, given the benefits and relative ease and low cost of integrating these capabilities at the time of construction, this proposal makes the Auto-DR infrastructure requirement applicable in all jurisdictions that adopt the IgCC.

What is the International Green Construction Code?

Many communities, building owners and designers are motivated to construct high performance, green buildings but need a regulatory structure for doing so. The IgCC is a green model overlay code in the ICC's suite of International Codes ("I-Codes") that provides a regulatory structure allowing motivated communities, architects, engineers and building owners to employ advanced design strategies and technologies that offer higher efficiencies than today's common practice.

As an "overlay" code, the IgCC works in combination with the entire family of underlying I-Codes, including the International Energy Conservation Code (IECC). The IgCC includes requirements for a wide range of topics pertinent to sustainability, including a substantial portion dedicated to energy efficiency.

Details for participating in code development at the International Code Council:

The code monograph for the first set of hearings was released March 10, 2014. Participation, testimony and attendance at ICC hearing is open to the public. At the final hearings, the final voting will be determined by government officials registered with the ICC. The schedule and link for general information and rules for participation in the IgCC code development cycle are shown below:

<http://www.iccsafe.org/cs/codes/Pages/default.aspx>

| Proposed Changes | To be posted: March 10, 2014 |
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| Committee Action Hearings (CAH) | Memphis Cook Convention Center, Memphis, TN |
| Webcast | April 27–May 4, 2014 |
| Updated Hearing Order and Results | Updated daily (April 27–May 4, 2014) |
| Committee Action Hearing Results | To be posted: Approx. May 9, 2014 |
| Online CAH Assembly Floor Motion Voting period | Approx. May 12–23, 2014 |
| Report of Committee Action Hearings (CAH) | To be posted: June 6, 2014 |
| Online public comment submittal | Public Comment deadline: July 16, 2014 |
| Public Comment Hearing (PCH) Schedule | To be posted: Approx. August 1, 2014 |
| Public Comment Agenda | To be posted: August 27, 2014 |
| Public Comment Hearings (PCH) | October 17, 2014 Greater Fort Lauderdale Broward County Convention Center, Fort Lauderdale, FL |

