

STATE OF OREGON

INTEROFFICE MEMO

BUILDING CODES DIVISION

JULY 6, 2010

To: Reach Code Development Committee

From: Green Building Policy and Technical Staff

Subject: Staff recommendations

Staff Objectives for the Reach Code:

The charging legislation (SB 79) requires the Reach Code to be a method of increasing energy efficiency in buildings. The division has communicated benefits of the code as a way of officially sanctioning new construction methods; an educational tool to bring builders and building officials up to speed; and as a testing ground for new methods and technology. One component of the Reach Code is that it is part of the statutorily mandated process for the division continually increasing the energy efficiency of buildings in the state. The eventual goal of the statute is that new buildings be net-zero energy users. The Reach Code is both an opportunity to test new methods and technology and have them “price evaluated”. If the techniques are effective and efficient then the Reach Code will act to “preview” what will eventually become routine construction methods.

In order to meet these objects it is important that the Reach Code truly reach beyond the traditional methods of construction. It is not cost effective to continually pick away at minor items to achieve greater efficiency. The 2010 Oregon Energy Efficiency Specialty Code (OEESC) addressed the “low hanging fruit” for energy efficiency in traditional construction. We have reached a point in the development of the codes where incremental increases will yield little new energy savings at greatly increased costs.

Staff believes that the performance based path for larger buildings, as set out in the IGCC, is the most simple, cost effective way to increase energy efficiency in buildings. Including under the performance path particular prescriptive items will generally give us the best of both worlds. Once users of the Reach Code have had time to utilize the performance path, the division will have more data on specific types of techniques that have been demonstrated to cost effectively increase energy efficiency. These items would then become the most likely candidates for the prescriptive pieces of the next OEESC. Staff feels this is the most effective way to make meaningful progress toward the 2030 goals.

Performance vs Prescriptive:

The IGCC includes a prescriptive path for buildings under 25,000 square feet. For buildings beyond that threshold, the IGCC recognizes that prescriptive elements can be detrimental to energy savings. Buildings larger than 25,000 Square feet then, are required to meet a specific energy target. That target would be a matter of discussion for the committee. Staff believes that relying on prescriptive measures will not achieve significant energy savings in a cost effective manner.

The efficiency increases in the OEESC effectively left no room for prescriptive improvements in HVAC efficiencies and envelope requirements. While there may be some

efficiencies to be gained in lighting, much of that is reliant on new technologies coming on-line. Even with the new technologies there is not a serious improvement that can be made in overall energy savings.

Additionally, prescriptive items cannot be cost justified. Any single “measure” can be argued against. Whereas a holistic, performance approach allows one “expense” to be offset by “savings” elsewhere in the building. Lower lighting density can save on the peak HVAC cost, since there is less heat being generated at peak cooling times. Requiring particular prescriptive measures can be detrimental to the use of another energy saving measure (such as windows, and chiller plants). Neither the IGCC nor ASHRAE are fully prescriptive codes for just these reasons. Those codes have about 5-10 pages of “new mandatory/prescriptive” items relating to the building materials/methods (with some extra control/operation methods).

The only way to really improve energy efficiency is to go with a holistic, encompassing, energy performance. Integrated design has long been recognized as the only way to cost effectively build energy efficient buildings.

Nor are prescriptive measures more enforceable than performance measures. The majority of 2010 OEESC prescriptive mechanical provisions are control sequences/control items that cannot be enforced, verified, or field measured. Without major requirements for commissioning, these measures will not work or will be overridden by the owners soon after occupancy. Economizers, for example, have been shown to actually use more energy than they save due to poor operation, set-up, overrides, and the like, causing them to over-ventilate or under-utilize the economizer cycle.

Staff recommendation regarding the creation of an Appendix E.

The intent of the proponents in recommending development of an Appendix E is to ensure that the OEESC is used as the base energy code for the Reach Code. However, this will be the case regardless of the inclusion of an Appendix. The IGCC incorporates by reference a number of I-codes. For the energy provisions users of the IGCC are directed to utilize the IECC. In Oregon’s case, we would necessarily change those citations to the OEESC. The IGCC simply adds a few new simple items for reaching higher levels of energy efficiency over the IECC. Some of the items added by the IGCC were already incorporated into the OEESC.

What STAFF will recommend:

Reject RC11com-17: Proposes utilizing ASHRAE 189.1 rather than IGCC as basis for the Reach Code. The documents are similar. True, the IGCC is still in draft stage, but the division has noticed IGCC as the base code and is tracking revisions at the national level.

601. Revise 601.1 Scope. ~~The provisions of this chapter are designed to reduce energy consumption of buildings.~~ **This chapter shall regulate the design, construction, commissioning and operation of commercial buildings and building sites for the effective use of energy.**

601.2 Intent. ~~This chapter shall regulate the design, construction, and commissioning of buildings for the effective use of energy.~~ **The intent of this code is to ensure the effective use of energy by buildings and building sites.** This chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the

effective use of energy. **For historic buildings and historic building sites, input from the code official shall be sought.**

- Based on submissions by the USDOE and the Advisory Council on Historic Preservation, to the ICC.

602.2 Revise and renumber. **601.3 Minimum requirements.**

Buildings and **building sites** shall comply with Sections 502.4, 503.2, 504 and 505 of the **Oregon Energy Efficiency Specialty Code.**

- Based on submissions by the USDOE to the ICC and changing citations to the appropriate Oregon code.

602.3 Staff recommends: Maintain compliance path for buildings over 25,000 square feet. Staff would recommend maintaining the performance path for larger buildings and including specific prescriptive requirements that are shown to increase energy efficiency in all building types.

Reject rc11com-04: proposal to delete 602: Asks to delete the Performance Method

Neutral as to RC 11-com03: Asks to reduce the “trigger” for performance path compliance from 25KSF down to 15KSF. Contrary to rc11com-04.

Reject RC11 res-05/rc11-com-05: as it relates to deleting prescriptive requirements for all buildings. **Neutral** as to retaining passive house standard for performance path. Contrary to rc11com-04.

602.3 Request more information RC11 com-02: Requests, in addition to performance (relative to baseline), a set prescriptive target energy use per square foot (EUI) as a goal for specific building types (offices, lodging, religious, retail, warehouse; no other types listed). Must have consensus method for determining an EUI that is enforceable, accurate, accommodates varying schedules/internal uses, etc. Comparing energy use of a code baseline to a proposed design (performance) avoids this problem. And added benefit of being one of the first green energy rating systems that uses energy (not cost) of the building (BCD’s jurisdiction) as the measuring stick.

603.Accept rc11com-04: proposal to delete Carbon method contained in 603 as outside scope.

Consider RC11com-21: Comments submitted to ICC on IGCC version 1.0. Housekeeping items regarding plug loads and renewable energy system “commissioning”.

604.Reject RC11com-06: Major modifications to change the Metering and Monitoring. Rearranges sections. 4 pages of grammatical revisions and eliminates a few items. Before proceeding should get clarification on each of the revisions and why the system metering was deleted.

Staff Recommends: Chilled Water Plant Metering: Require measurement of total chiller plant energy use and require ability to sub-meter all parts.

- a. Delete the endless list of chiller plant “measures”. These can be contradictory or cause additional energy use. The most efficient operation of a chiller plant cannot be dictated with continuous prescriptive measures.

- b. Require metering of the overall incoming plant energy (pumps, chillers, towers, and heat recovery). Require ability for sub-metering the different uses and Include ability to measure flows and temperature difference measurement, as well as outdoor temperature and humidity/dew point.

Chiller plants are complex and to use the least amount of energy (and/or tune a chiller plant to operate most efficiently), you have to monitor the energy used by all of the parts, the demands for chilled water and heat recovery water, etc. then match it to the most efficient operating points of the pumps, chillers, and cooling towers for those particular instances (and outdoor conditions).

605.

Reject RC11com-07: as it relates to deleting 605 to move to different section.