Review of Comments Submitted to SECO on Chapter 11, 2015 IRC & 2015 IECC during July 4-Auguat 4, 2014 Period

ATTACHMENT D

Summary of the Laboratory's Stringency Comparison Analysis for Residential Provisions: TBEPS (based on Chapter 11, 2009 IRC & 2009 IECC) Vs. 2015 Codes

The Energy Systems Laboratory performed a two-stage analysis to compare the stringency of the residential provisions[1] in the 2015 International Energy Conservation Code (IECC), to the corresponding provisions of the Texas Building Energy Performance Standards (TBEPS).

The first stage focused on comparing the stringency of the residential provisions in the 2015 International Energy Conservation Code (IECC), to corresponding provisions of the 2012 IECC[2]. The study concluded that for mandatory, prescriptive and performance residential provisions, the 2015 IECC is as stringent as the 2012 IECC.

The second stage focused on the comparison of the 2015 IECC residential provisions with TBEPS, based on Chapter 11 of the 2009 International Residential Code (IRC) and its equivalent 2009 IECC residential provisions. Based on the results of the first stage of analysis and from a previous study conducted at the laboratory that compared the residential provisions of the 2012 IECC with the corresponding provisions of the TBEPS[3], it was concluded that for mandatory, prescriptive and performance residential provisions, the 2015 IECC is more stringent than the 2009 IECC.

Table D-1 summarizes the results of the performance path comparison of the 2015 IECC with the Texas Building Energy Performance Standards (TBEPS) for single-family residential construction.

Table D-1: 2009 IECC Performance Path vs. 2015 IRC and 2015 IECC Performance Path

County	TBEPS Climate Zones	Total Annual Source Energy Savings of the 2015 IRC/2015 IECC Performance Path compared to the 2009 IECC (%)[1,2]	
		Gas Space Heating, Gas DHW	Heat-Pump Space Heating, Electric DHW
Harris	2	12%	10%
Tarrant	3	20%	18%
Potter	4	23%	21%

[1] Residential buildings include detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.
[2] Mukhopadhyay J, JC Baltazar, JS Haberl, S Ellis, and BL Yazdani. 2014. Comparing the Residential Provisions of the 2015 IECC with the Corresponding Provisions of the 2012 IECC for Single-Family Residential Construction in Texas. ESL-ITR-14-08-02. August 2014.
[3] Kim H, JC Baltazar, JS Haberl, and BL Yazdani. 2011. A Comparison of Building Energy Code Stringency: 2009 IRC versus 2012 IRC for Single Family Residences in Texas. ESL-TR-11-12-05. December 2011, revised August 2012.

[1]***Base-Case Simulation Assumptions:*** Analysis used a single-family house, 2,500 ft^2, single-story, three bedrooms, slab-on-grade, ducts in the unconditioned vented attic, window-to-wall ratio: 15%, windows equally distributed (N, E, S, W), and no exterior shading. Air exchange rate: 0.00036 SLA for 2009 IECC; for 2015 IRC/2015 IECC, air leakage simulated using 5 ACH_{50} for Climate Zone 2 and 3 ACH_{50} for Climate Zones 3 and 4 in addition to the supply-only mechanical ventilation of 55 CFM modeled as operating continuously. Annual mechanical ventilation fan energy use: 217 kWh/yr for 2015 IRC/2015 IECC. HVAC distribution efficiency simulated using R6 insulation for supply and return ducts and total duct leakage of 11% to outdoor for 2009 IECC; for 2015 IRC/2015 IECC, simulated using R8 insulation for supply and return ducts and total duct leakage of 6% to outdoor. All other building envelope and system parameters set as per 2009 IECC and 2015 IRC/2015 IECC for counties shown.

[2]***Source Energy Consumption:*** A factor of 3.16 was used to calculate the source electricity consumption. A factor of 1.1 was used to calculate source gas energy consumption.