

**Review of Comments Submitted to SECO on
Chapter 11, 2012 IRC & 2012 IECC
ATTACHMENT D**

**Summary of the Laboratory’s Stringency Comparison Analysis:
TBEPS (based on Chapter 11, 2009 IRC & 2009 IECC) Vs. 2012 Codes**

The Energy Systems Laboratory performed a detailed technical analysis that compared the stringency of the Texas Building Energy Performance Standards (TBEPS) for single-family residential construction, based on Chapter 11 of the 2009 International Residential Code (IRC), to Chapter 11 of the 2012 IRC. This analysis used the relevant 2009 IECC residential provisions (Chapters 1-4), which is one of the two paths to comply with the 2009 IRC per Section N1101.2 of the code. In the 2012 code editions, Chapter 11 of the 2012 IRC is identical to the 2012 IECC residential provisions (Chapters 1-4), so the analysis used both code editions.

The analysis determined that the residential provisions of the 2012 IECC and the 2012 IRC are more stringent than the Texas Building Energy Performance Standards (TBEPS). See the tables below for details: Table C-1 for a performance path comparison and Table C-2 for a prescriptive path comparison.

Table D-1: 2009 IECC Performance Path vs. 2012 IRC and 2012 IECC Performance Path

County	2012 IRC and 2012 IECC Climate Zones	Total Annual Source Energy Savings of the 2012 IRC/2012 IECC Performance Path compared to the 2009 IECC (%) ^{1,2}	
		Gas Heating, Domestic Hot Water (DHW)	Heat Pump Heating, Electric Domestic Hot Water (DHW)
Houston (HAR)	2	19.4%	18.4%
Dallas (TAR)	3	21.4%	20.9%
Amarillo (POT)	4	18.3%	16.3%

¹**Base-Case Simulation Assumptions:** Analysis used a single-family house, 2,325 ft², single-story, four bedrooms, slab-on-grade, ducts in the unconditioned vented attic, window-to-floor ratio: 15%, windows equally distributed (N, E, S, W), and no exterior shading. Air exchange rate: 0.00036 SLA for 2009 IECC; for 2012 IRC/2012 IECC, air leakage simulated using 5 ACH50 (i.e., 0.00025 SLA) for Climate Zones 2 and 3 ACH50 (i.e., 0.00015 SLA) for Climate Zones 3 and 4 in addition to the mechanical ventilation of 61 CFM. Annual mechanical ventilation fan energy use: 239 kWh/yr for both 2009 IECC and 2012 IRC/2012 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 2012 IRC/2012 IECC, simulated using R6 insulation for supply and return ducts and total duct leakage of 4% to outdoor. Internal heat gains adjusted to include 75% of high-efficacy lamps for 2012 IRC/2012 IECC. All other building envelope and system parameters set as per 2009 IECC and 2012 IRC/2012 IECC for county shown (IC3 ver. 4.01.09).

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.

Table D-2: 2009 IECC Prescriptive Path vs. 2012 IRC and 2012 IECC Prescriptive Path

County	2012 IRC and 2012 IECC Climate Zones	Total Annual Source Energy Savings of the 2012 IRC/2012 IECC Prescriptive Path compared to the 2009 IECC (%) ^{1,2}	
		Gas Heating, DHW	Heat Pump Heating, Electric DHW
Houston (HAR)	2	16.7%	14.3%
Dallas (TAR)	3	20.1%	17.9%
Amarillo (POT)	4	19.3%	16.1%

¹**Base-Case Simulation Assumptions:** Analysis used a single-family house, 2,325 ft², single-story, four bedrooms, slab-on-grade, ducts in the unconditioned vented attic, window-to-floor ratio: 15%, windows equally distributed (N, E, S, W), and no exterior shading. Air exchange rate: 7 ACH50 (i.e., 0.00036 SLA) in addition to the mechanical ventilation of 61 CFM for 2009 IECC; for 2012 IRC/2012 IECC, air leakage simulated using 5 ACH50 (i.e., 0.00025 SLA) for Climate Zone 2 and 3 ACH50 (i.e., 0.00015 SLA) for Climate Zone 3 and 4 in addition to the mechanical ventilation of 61 CFM. Annual mechanical ventilation fan energy use: 239 kWh/yr for both 2009 IECC and 2012 IRC/2012 IECC. HVAC distribution efficiency simulated using R8 insulation for supply, R6 for return ducts and total duct leakage of 11% to outdoor for 2009 IECC; for 2012 IRC/2012 IECC, simulated using R8 insulation for supply, R6 for return ducts and total duct leakage of 4% to outdoor. Internal heat gains adjusted to include 50% of high-efficacy lamps for 2009 IECC; and 75% of high-efficacy lamps for 2012 IRC/2012 IECC. Hot water pipe R-3 insulation provision unevaluated. All other building envelope and system parameters set as per 2009 IECC and 2012 IRC/2012 IECC for county shown (IC3 ver. 4.01.09).

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.