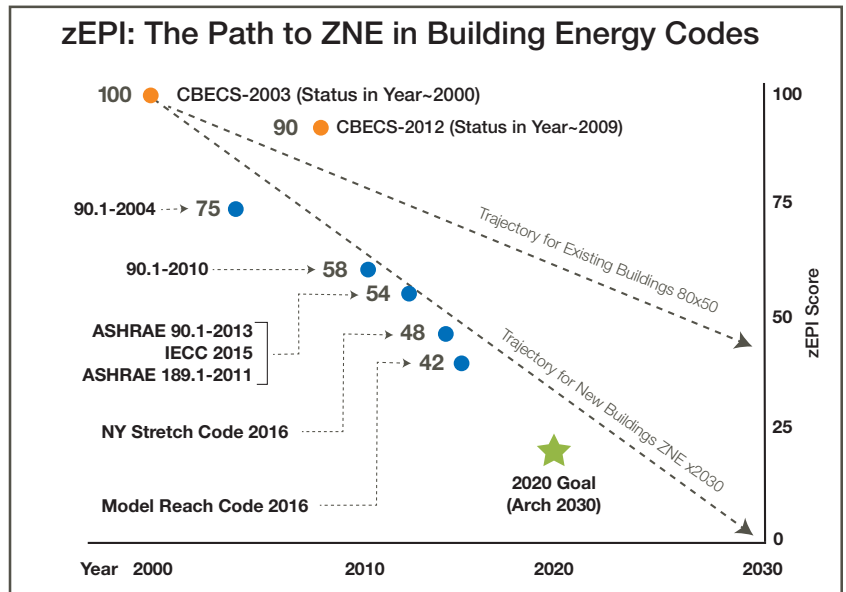




Methodology used to Calculate zEPI Jurisdictional Score Values

Cities and states adopt energy codes in a variety of ways and from a variety of sources, and according to a wide range of statutory requirements. However, a few general sources known as model codes serve as the foundation for most of the codes, with variations of the model codes frequently applied in individual jurisdictions. The purpose of calculating “zEPI Jurisdictional Scores” is to provide a stable scalar on which city and state energy code policies can be compared in their relation to Zero Net Energy. This document describes the methodology by which that zEPI scalar is applied for this purpose.



Summary of methodology steps:

1. Gather 90.1-2004 (Commercial) and IECC 2006 (Residential) site energy use intensity baselines for each state, as modeled by Pacific Northwest National Laboratory (PNNL).
2. Document current code adoption for each state. For states without a state-wide adopted code (“Home Rule” States), gather jurisdictional level code adoption (city, county, etc.).
3. For home rule states, calculate the weighted average state level EUI based on the percentage of state population covered by each level of adopted code. (e.g. 40% of population under IECC 2015, 20% under 90.1-2004, etc.).
4. States with stretch code rules and/or measurable local adoptions are credited with a 0.5-1.5% reduction in overall state level EUI (commercial only), depending on population percentages covered by a stretch code.
5. Calculate the zEPI score as: $(\text{State EUI for current code} / \text{Baseline State EUI}) * 75$.

Part 1

This step simply refers to the modeling work performed by PNNL which estimates the state-by-state overall site EUI for various ASHRAE 90.1 commercial code levels and IECC residential code levels.

Part 2

Several sources keep track of state commercial and residential code adoption. The primary source for this methodology is the Department of Energy (energycodes.gov/adoption). Based on the adopted code, each state is assigned a “Current EUI” corresponding to the published PNNL modeling calculations.

Part 3

For “Home Rule” states that either do not have a state-wide adopted code, or who have a state-specific code (e.g. California T24), a custom calculation is needed to estimate the current EUI.

In the case of states without an adopted code, we estimate the overall EUI based on jurisdictional level code adoption at the city, county, or other level. After an accounting of the code adoption for each city or county (and therefore modeled EUI) and the population for each city or county, we calculate an average EUI for the state weighted by population. Areas with no adopted code are scored at zEPI 100 levels. If there is not sufficient city or county level information available, the state receives no zEPI score.

States with specific codes that differ substantially from national model codes are estimated with the help of determination studies to determine the difference of a state EUI relative to a national model code. A weighted average EUI calculation then takes into account the climate zone distribution for that state.

Part 4

States with enabling rules for a stretch code that have limited or no adoptions are given a credit of 0.5%. States with measurable population shares covered by stretch codes are given a credit to their current EUI. The credit is a reduction of either 1.0% or 1.5%, depending on the share of the covered population.

Part 5

Commercial: The methodology defines a zEPI 75 score by ASHRAE 90.1-2004 site EUI levels, based on previous research (1). The zEPI calculation for a state is therefore a ratio of the current EUI to the 90.1-2004 EUI by state, multiplied by 75, as follows:

$$zEPI_{\text{Commercial}} = \left(\frac{\text{Current State EUI}}{\text{State EUI}_{90.1-2004}} \right) * 75$$

Residential: The methodology defines a zEPI 75 score by IECC 2006 site EUI levels. This provides the same relationship in residential to a 2006 IECC baseline recognized by HERS that the commercial calculation provides relative to ASRAE 90.1-2004 baseline now recognized by Appendix g in 90.1. The zEPI calculation for a state is therefore a ratio of the current EUI to the IECC 2006 EUI by state, multiplied by 75, as follows:

$$zEPI_{\text{Residential}} = \left(\frac{\text{Current State EUI}}{\text{State EUI}_{\text{IECC 2006}}} \right) * 75$$

About NBI

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