



The Future Energy Codes

Stable Baseline and
Outcomes Based Codes

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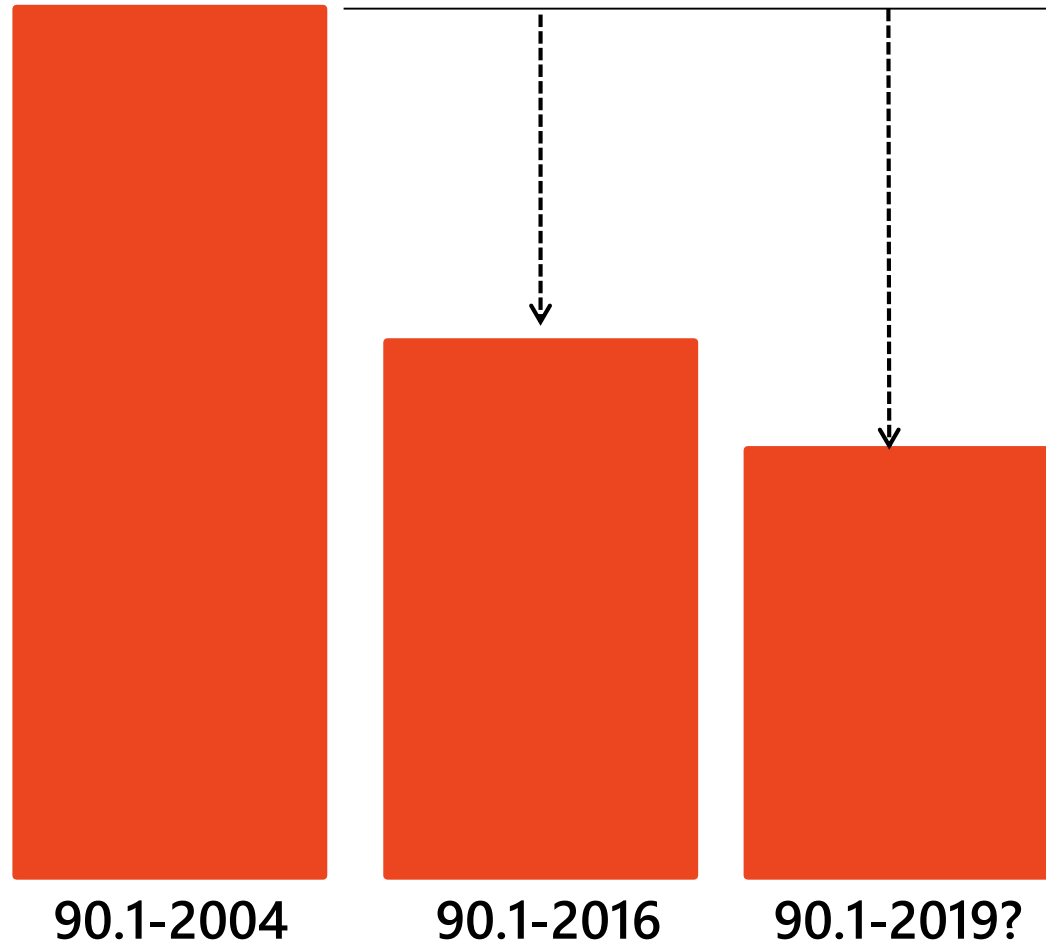


the energy practice of EYP Inc.



Stable Baseline

ASHRAE 90.1-2016 and IECC-2018



- Addendum BM to 90.1-2013
- Sets an energy cost allowance based on a percent reduction from 90.1-2004
- Code development can focus on refinement and clarification
- Simpler for automating baseline generation and describing to design teams





Sample Calculations - Definitions

$$PCI = PBP/BBP$$

Performance Cost Index (PCI)

Proposed Building Performance (PBP)

Baseline Building Performance (BBP)

$$PCIt = (BBUEC + (BPF \times BBREC)) / BBP$$

Performance Cost Index Target (PCIt)

Baseline Building Unregulated Energy Cost (BBUEC)

Baseline Building Regulated Energy Cost (BBREC)

Building Performance Factor (BPF)



Stable Baselines

Pros and Cons

Pros

Continuity over time

Focus on improving clarity and newly regulated loads

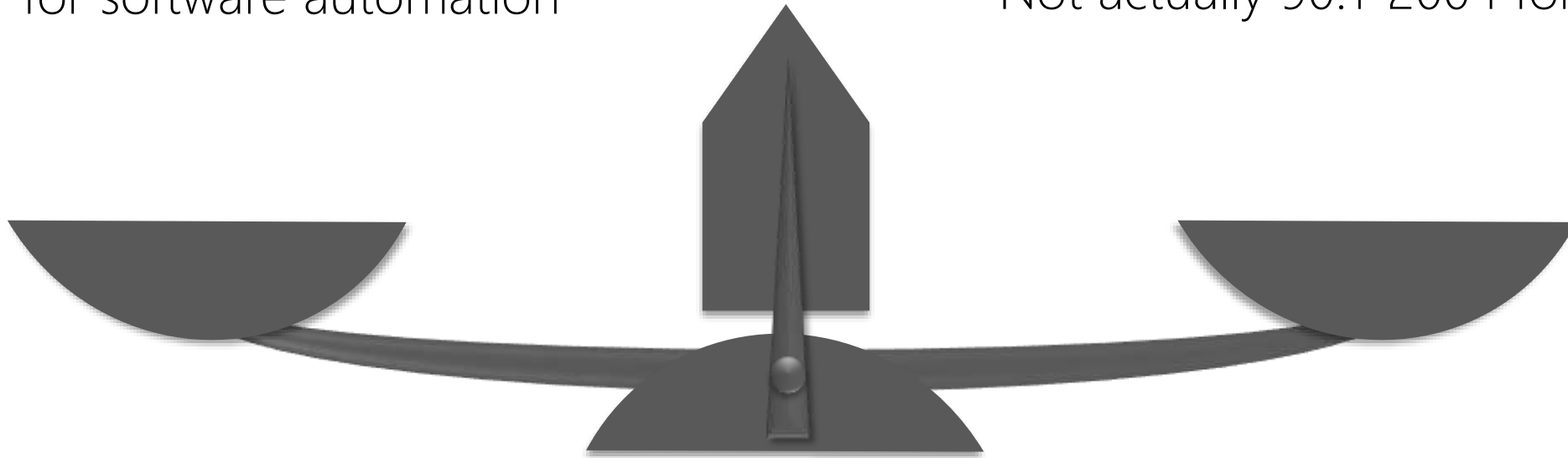
Easier for software automation

Cons

Unclear fuel switching implication

Multipliers vary by climate and building type

Not actually 90.1-2004 for baseline





Outcomes Based Codes

IGCC 2015

- New compliance path beyond prescriptive or performance
- Sets an EUI goal for 8 building types for each climate zone times a multiplier for reductions
- Compliance is demonstrated by actual energy consumption
- Likely will migrate into future energy codes

TABLE 612.1 REFERENCE ANNUAL ENERGY USE INDEX (EUI_r)

CLIMATE ZONE	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	6A	6B	7	8
Use and Occupancy ^a	Reference EUI _r , skBtu/st/yr														
Business (B)															
Office	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282
Bank	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282
Medical office (non-diagnostic)	115	118	115	113	104	102	125	108	114	134	116	148	131	156	210
Storage (S-2)															
Distribution/Shipping Center	105	67	69	66	64	55	75	70	66	87	81	104	95	119	186
Mercantile (M)															
Grocery/Food Store	448	476	452	484	450	473	522	479	514	554	511	592	561	633	758
Assembly (A)															
Library (A-3)	234	232	224	230	217	209	254	228	235	275	246	304	277	327	434
Educational (E)															
Elementary/Middle School	140	139	134	134	128	124	149	132	132	160	141	182	161	193	274
Institutional (I-2)															
Hospital/Inpatient Health	417	422	397	408	388	407	425	366	398	425	374	439	394	446	532

a. Use and occupancy as determined by Chapter 3 of the *International Building Code*.

Source: IGCC 2015





Outcomes Based Codes

Pros and Cons

Pros

Compliance is actual energy performance

Allows maximum flexibility and creativity, lower costs to comply?

Cons

Responsibility for non-compliance

Limited building types and adjustment factors

