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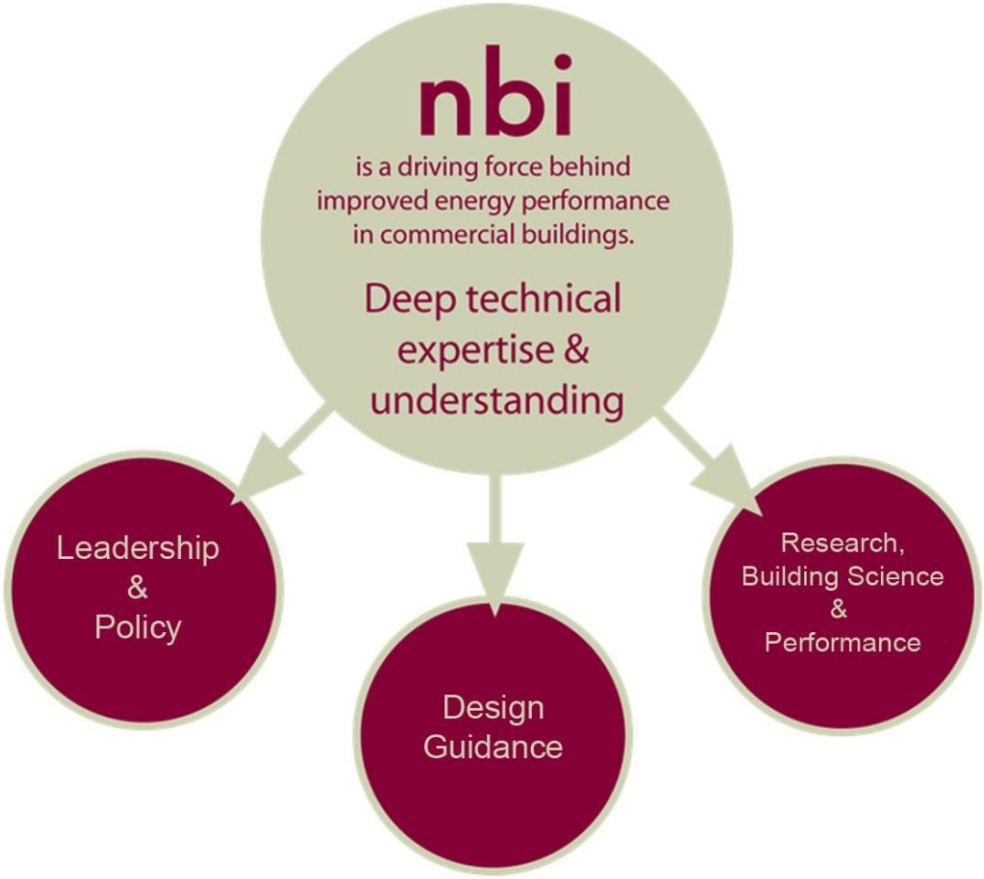
Targeted Energy Outcomes

"Beginning with the end in mind"

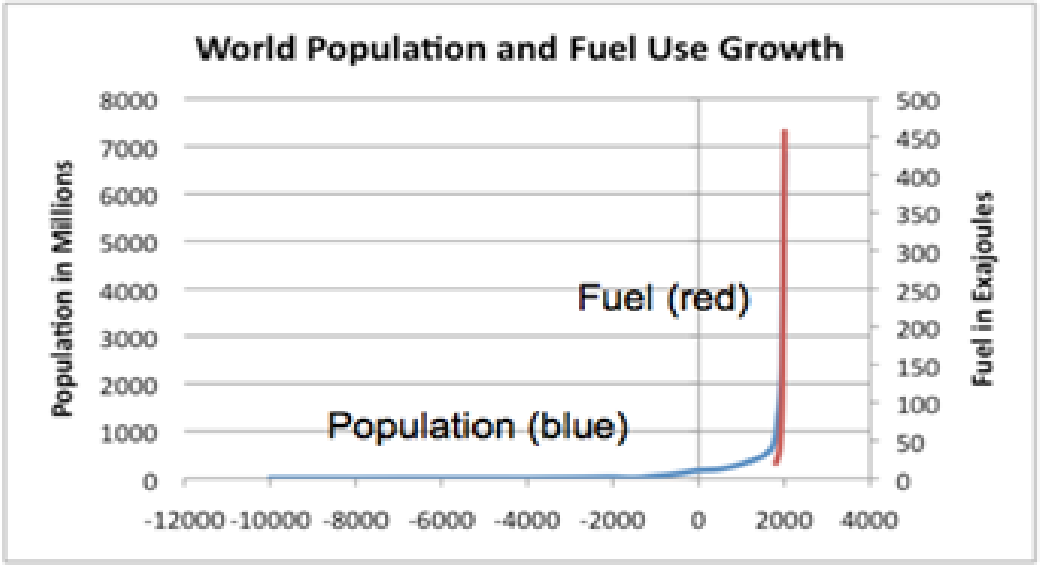
Symposium for Market Transformation

March 25, 2013

New Buildings Institute



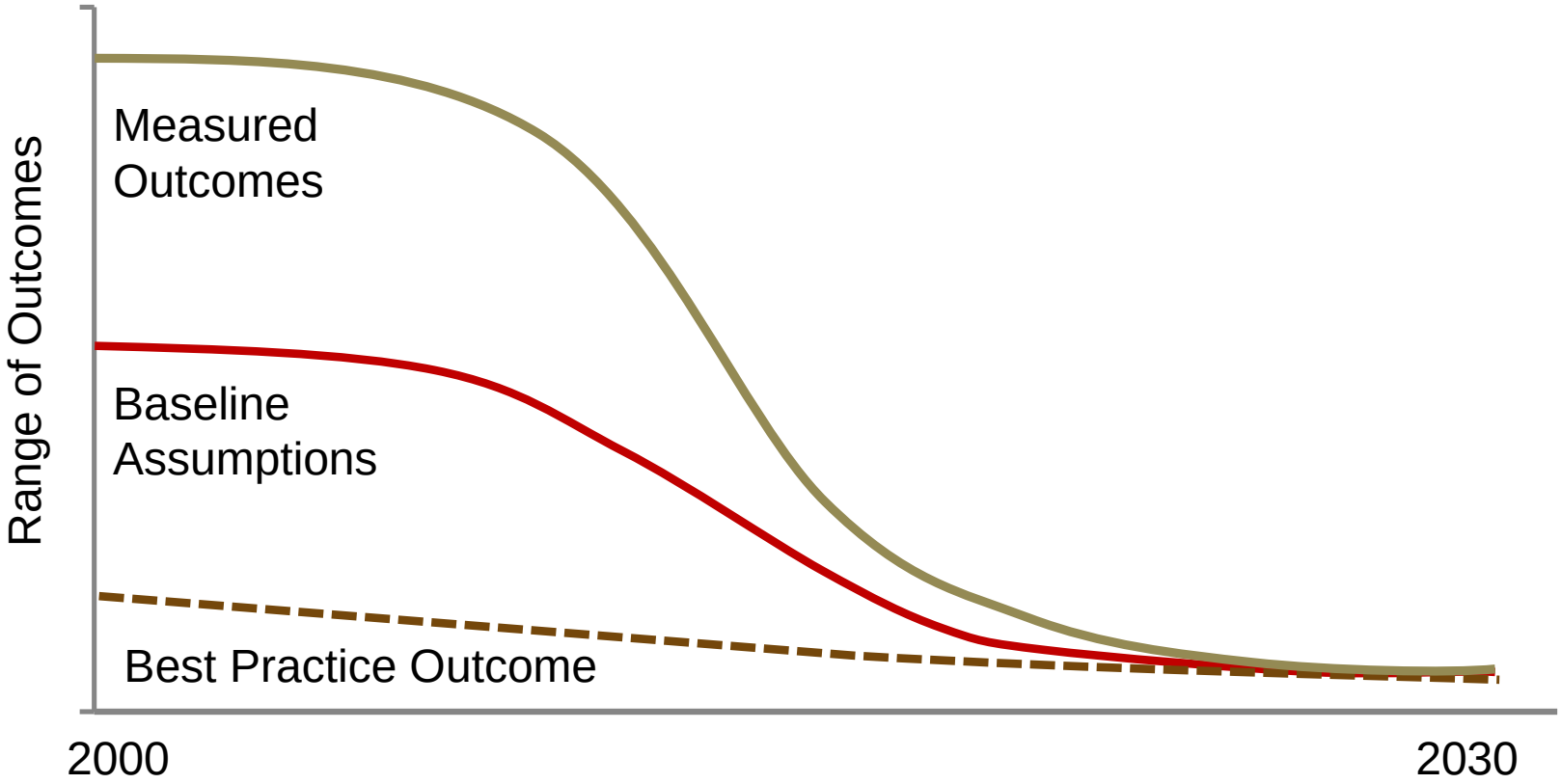
Use of fossil fuels allowed population to expand greatly



Note: Population from US Census Bureau website; fuel use from Energy Transitions: History, Requirements, Prospects, Appendix A by Vaclav Smil; Praeger, 2010.


Accelerated Energy
Savings

A Convergence to Low Energy



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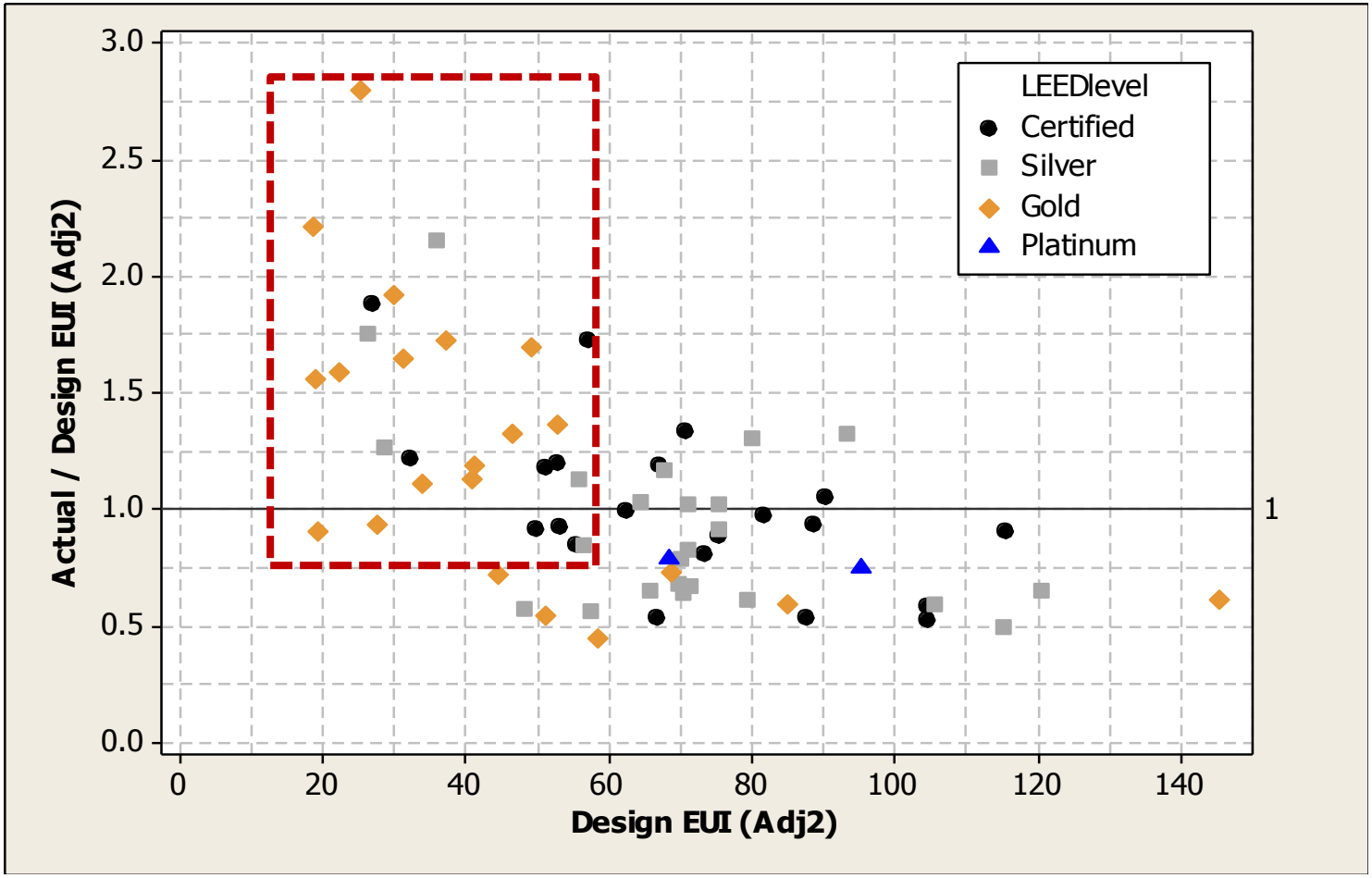
A Range of Outcomes



Plug loads to 2030

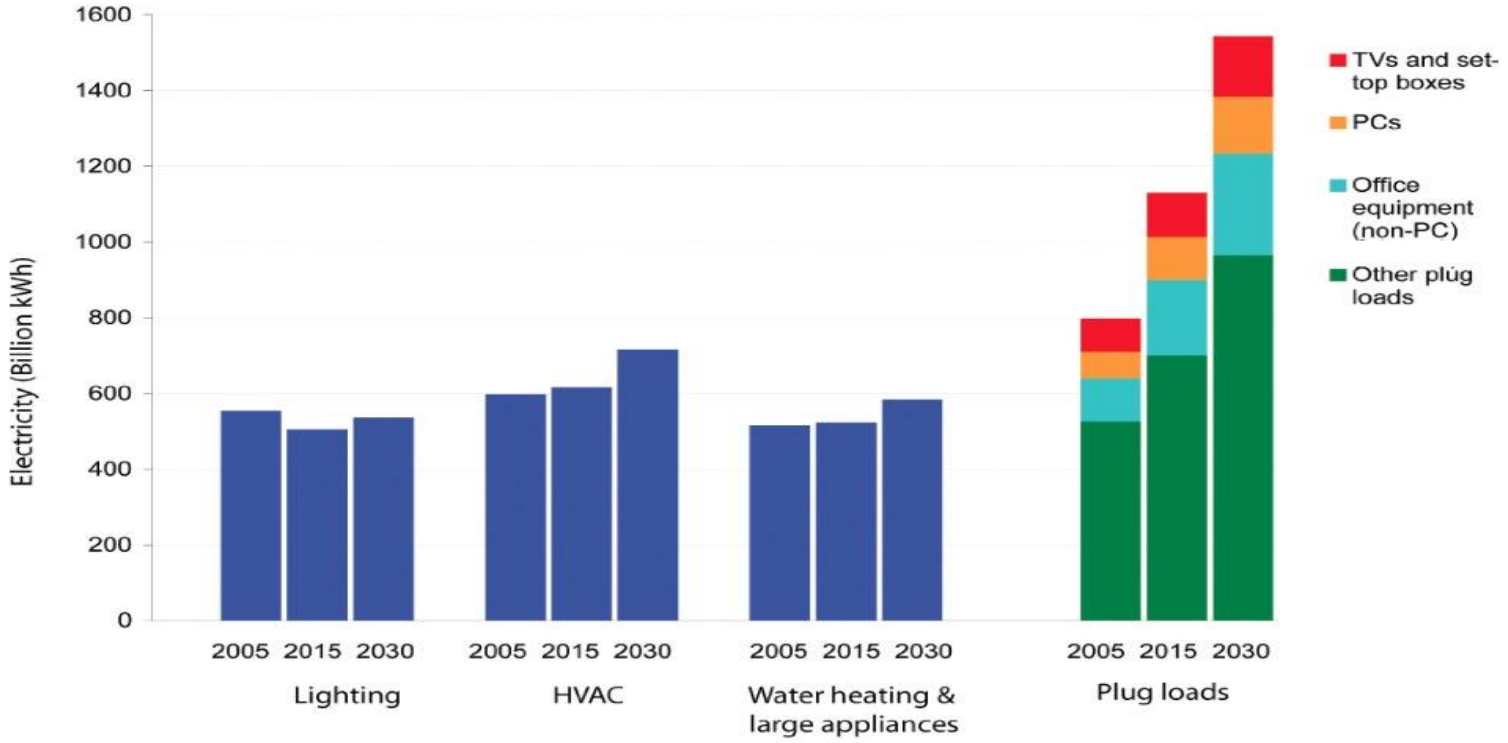


Figure 3: Change in Energy Use by System

Source: Graph created by Ecova with data from EIA 2008 Annual Energy Outlook

Why Whole-Building, Absolute Energy Targets?

(credit to Mike Leach, PNNL, ACEEE Summer Study, 2012)

Definition: target that represents total, as-operated energy use

- Clear goals without room for interpretation
  - No interpretation of codes or standards or assumptions of typical design and use are required
- Directly measureable
  - Encourages and facilitates goal verification
  - Enables contractual inclusion of energy goals
- Capture whole-building energy performance
  - Encourages design team to carefully consider aspects of building performance that may be overlooked by codes or standards
- Place focus on low-energy design
  - Project resources are applied to improving low-energy design
  - Allows for design flexibility and encourages innovative, cost effective, integrated design strategies

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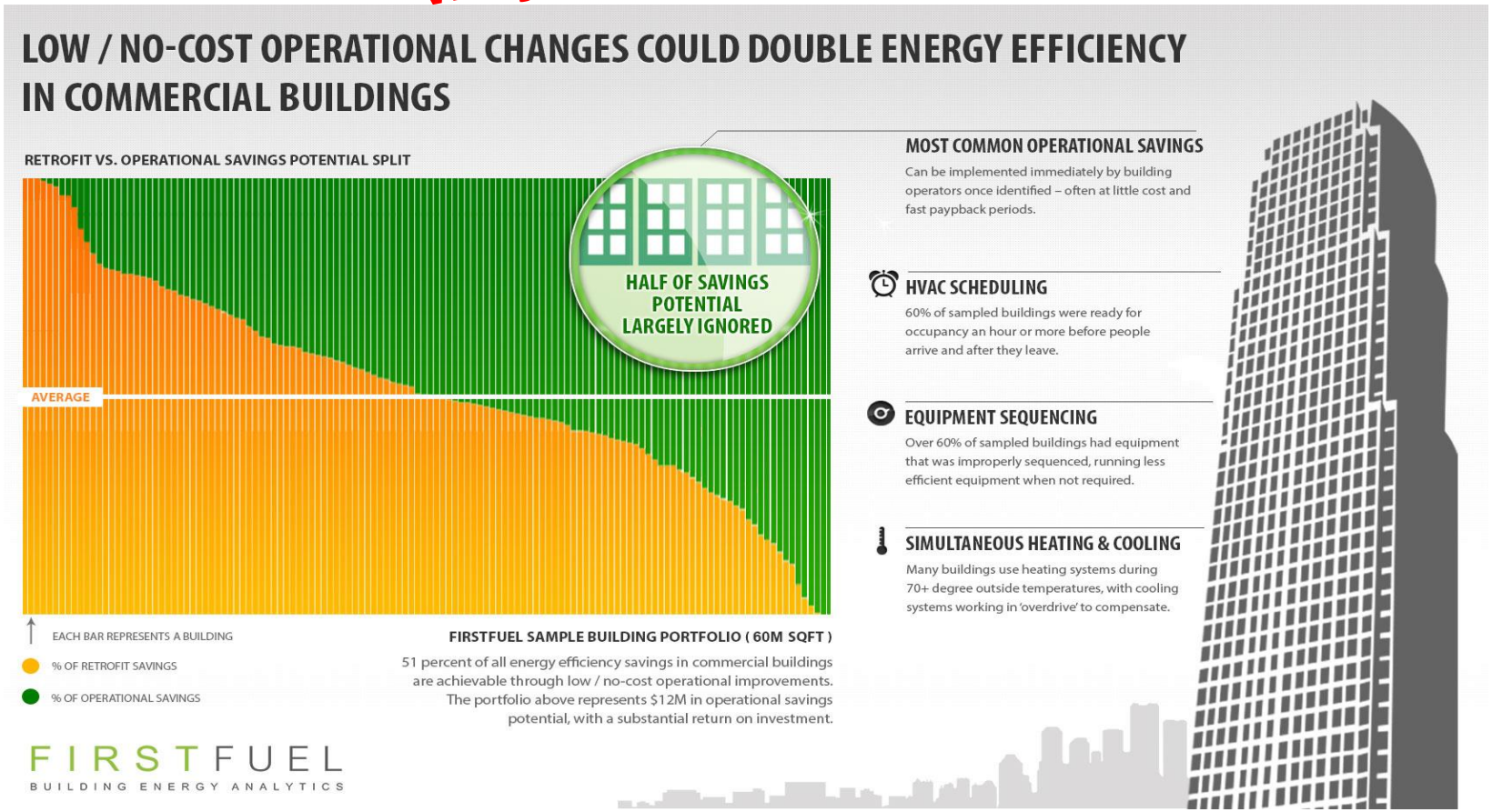
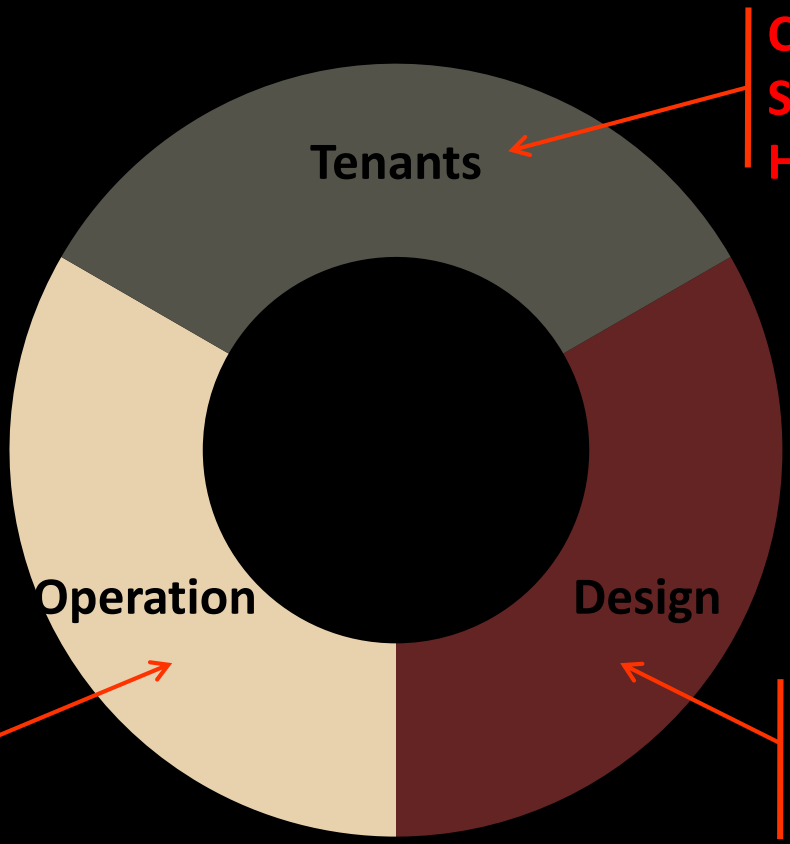
why energy targets ?



Different Actors Affect Building Performance



Computers and Equipr
Schedule
Habits

Staffing
Controls
Maintenance
Commissioning

Layout
Integration
Installation
Components and Fe

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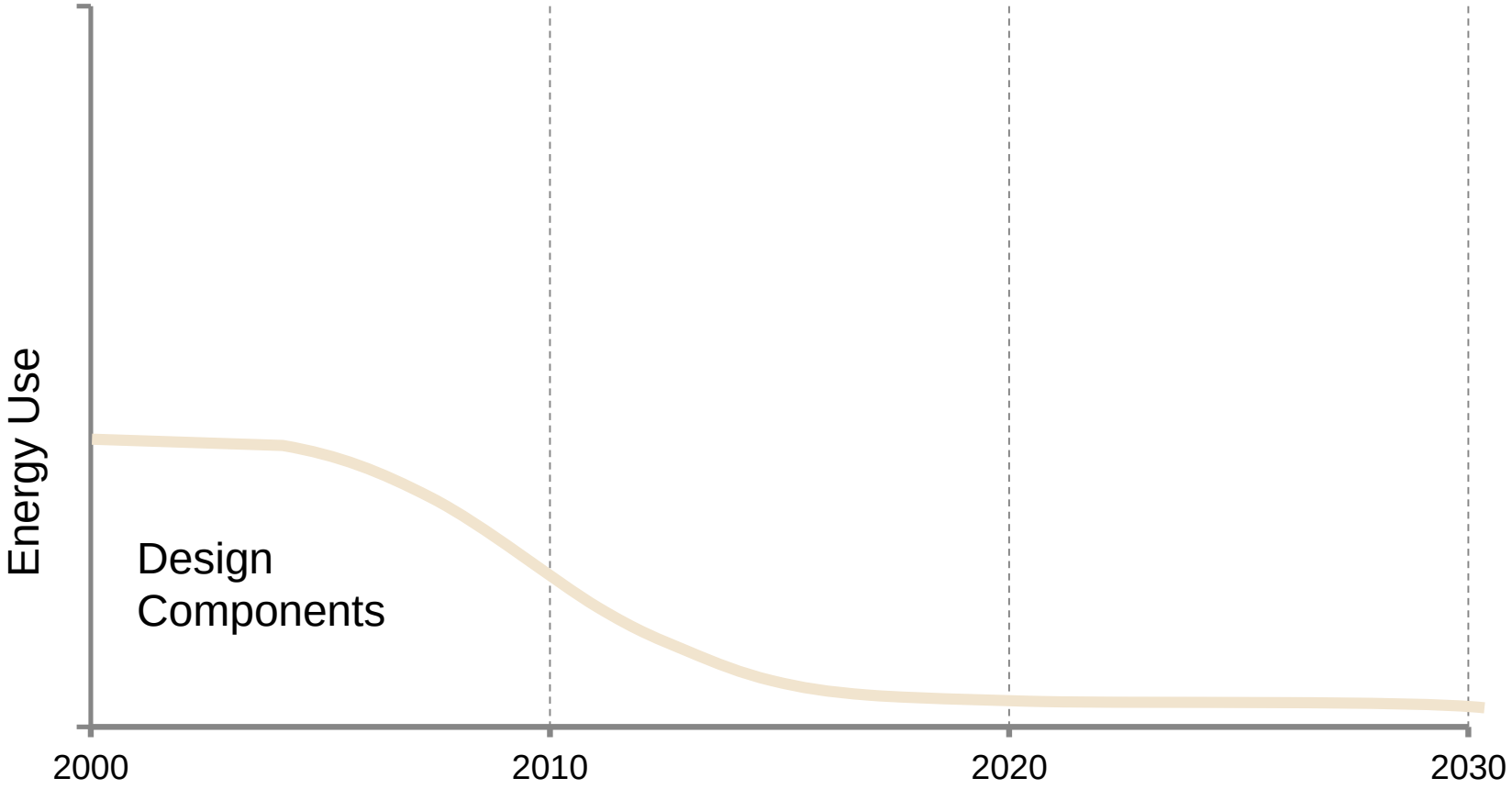
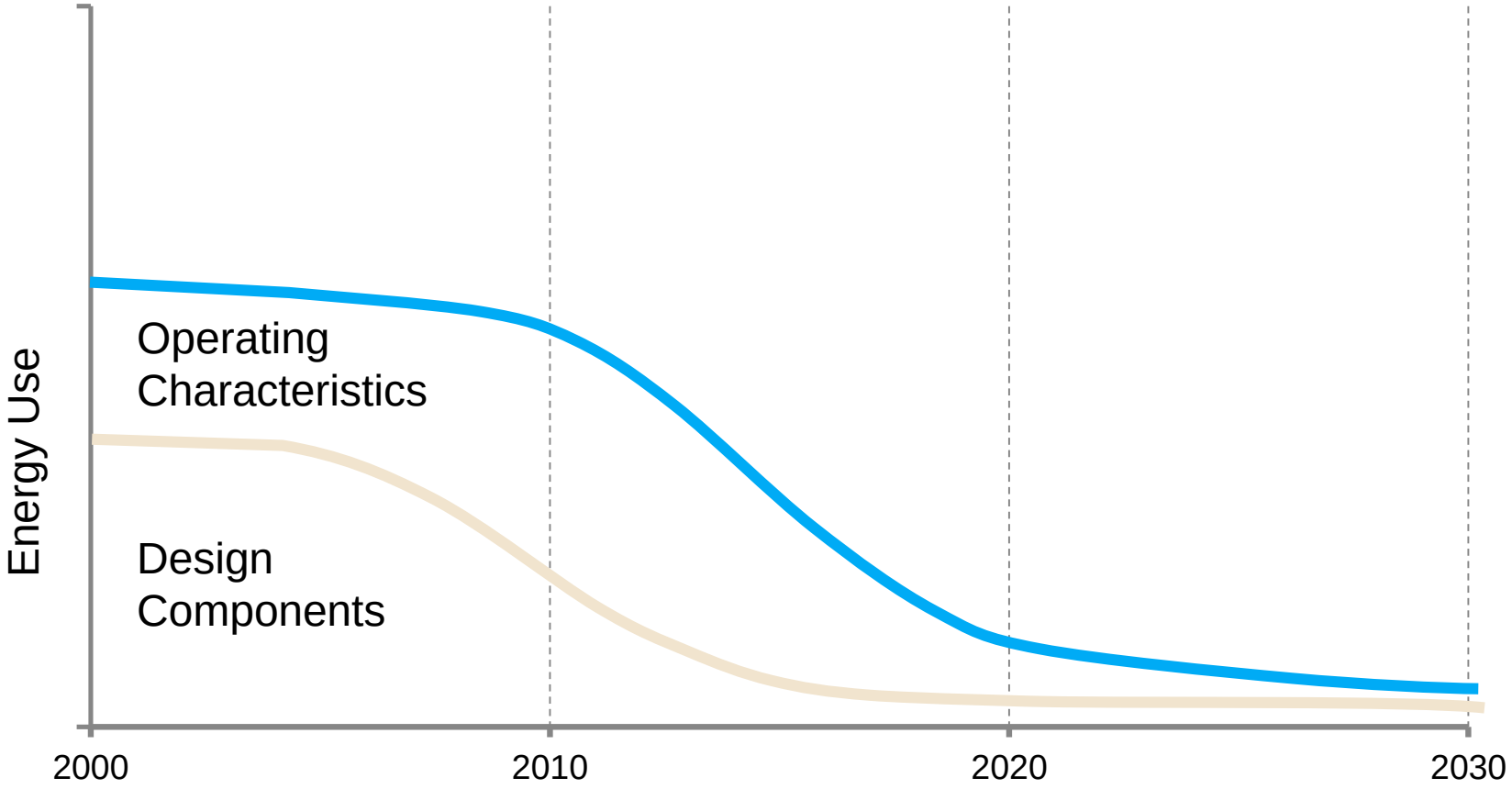
Components of energy outcomes



Components of energy outcomes



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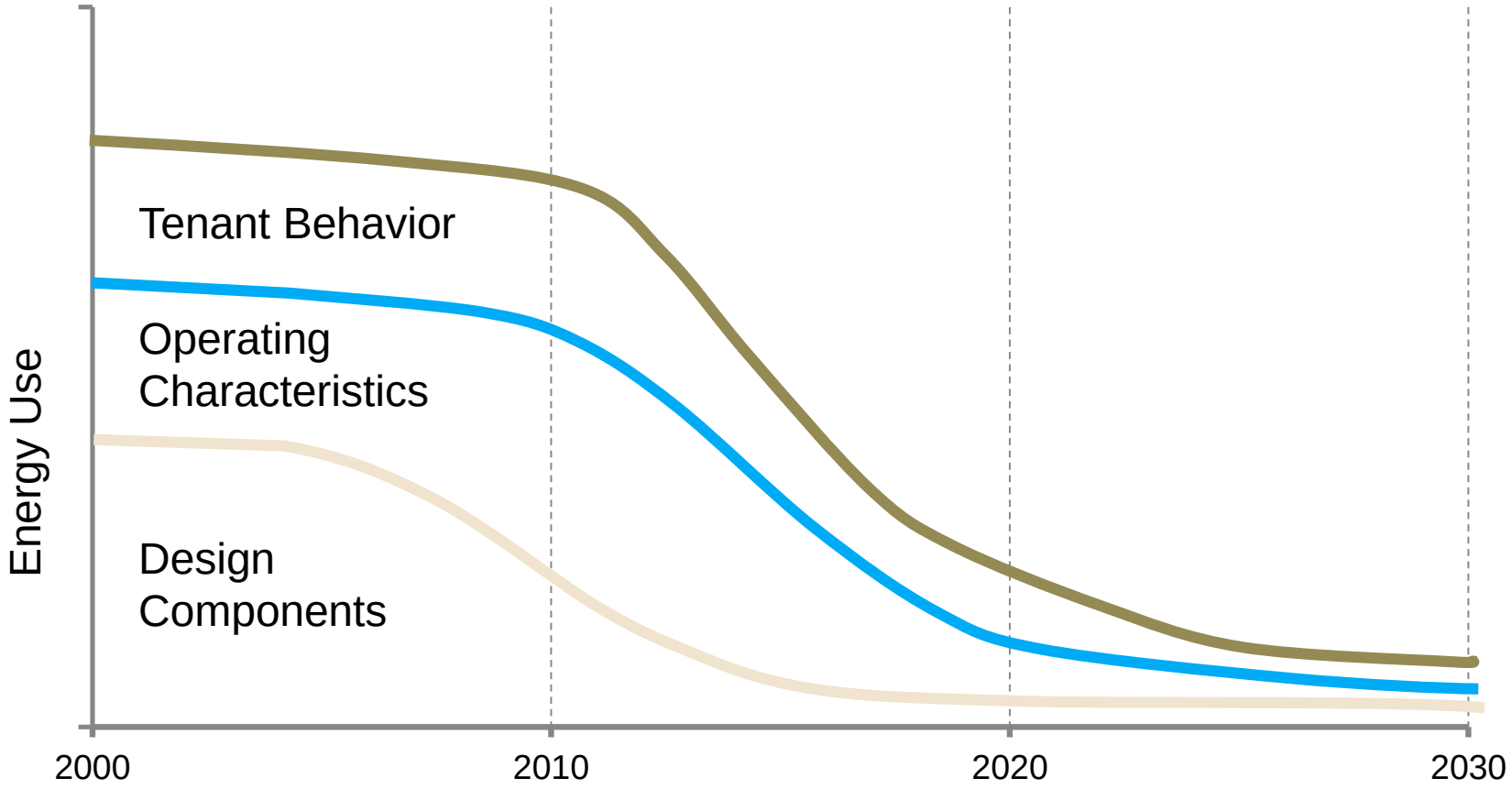
Components of energy outcomes



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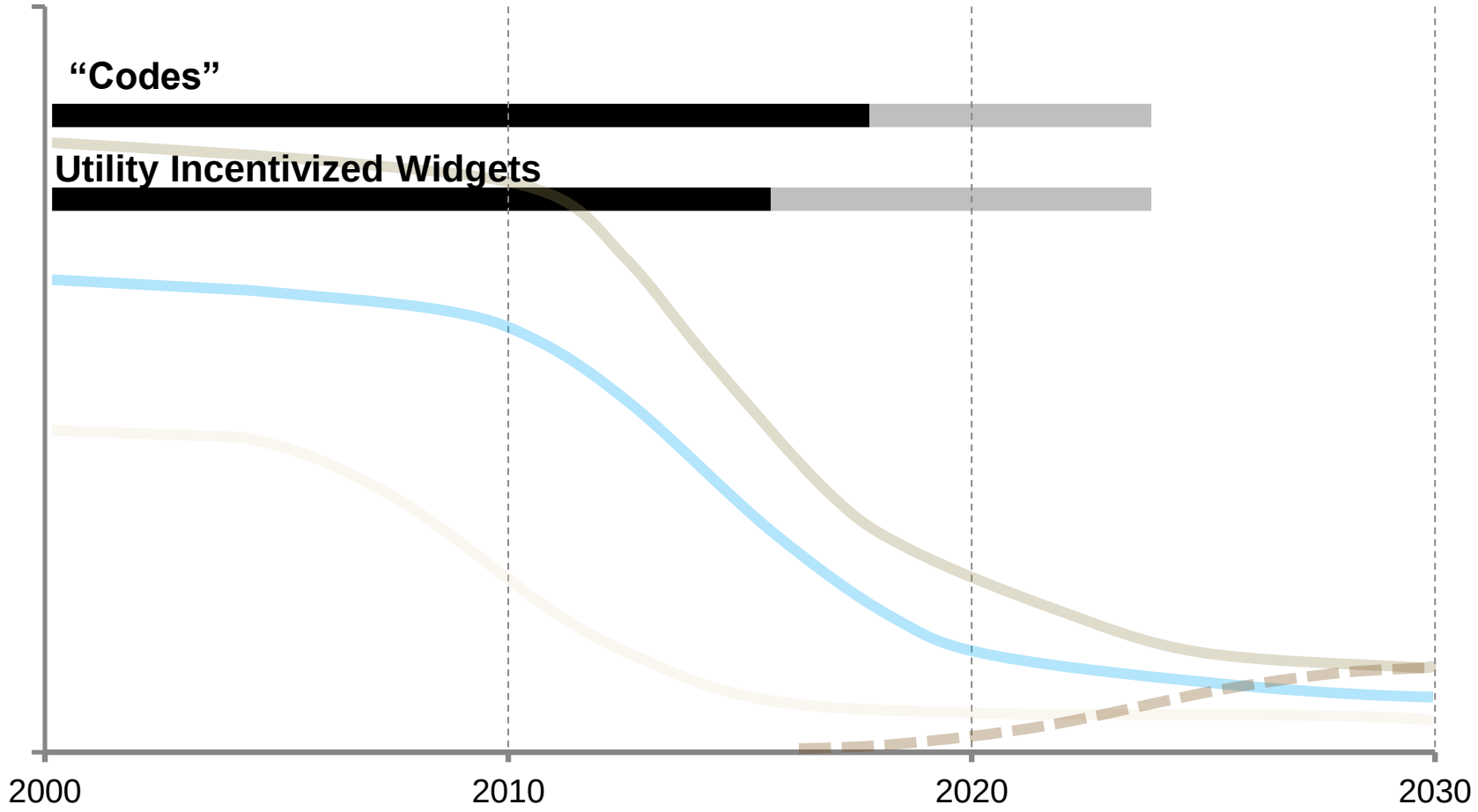
Timing of Policies and Tools



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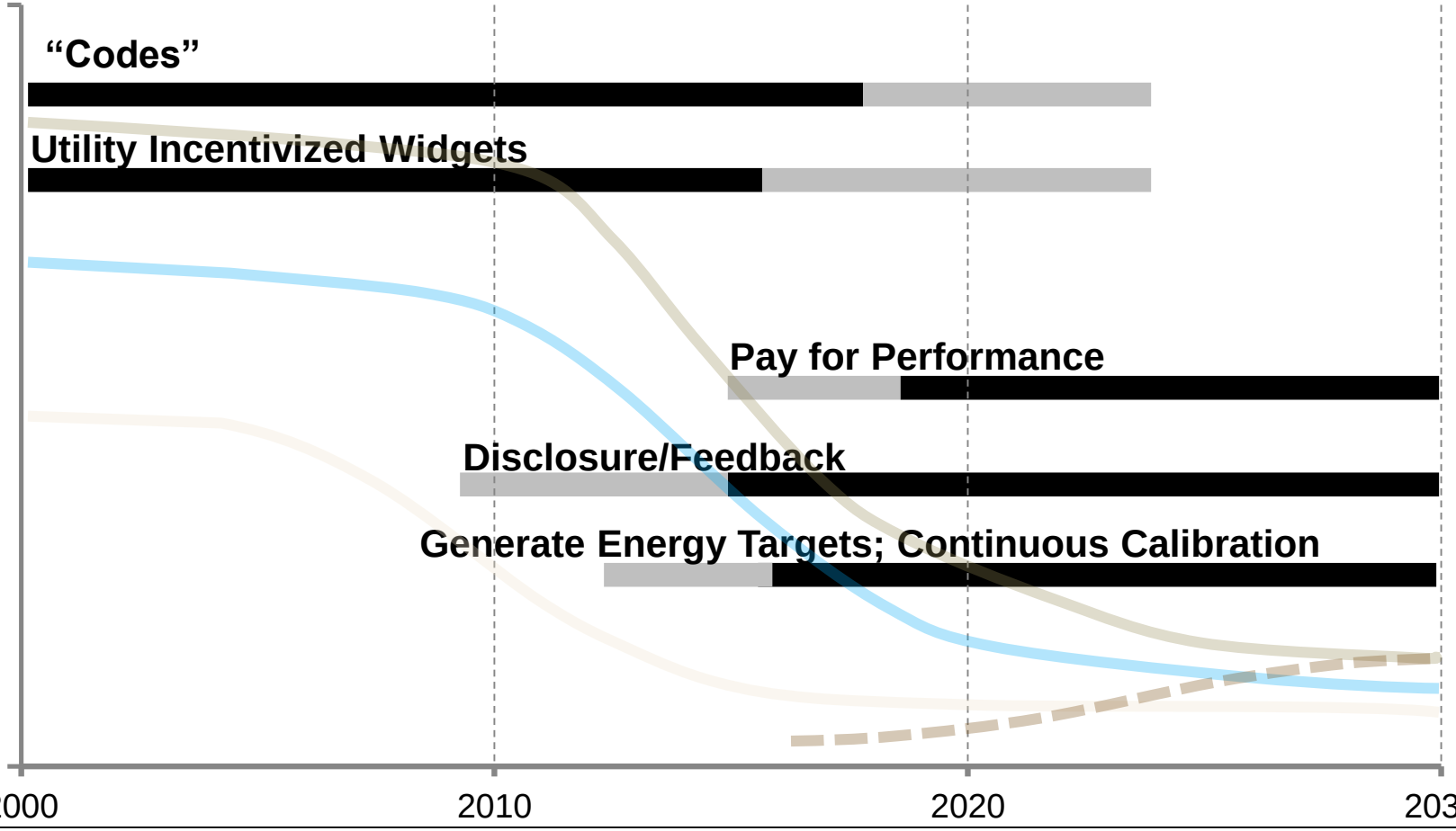

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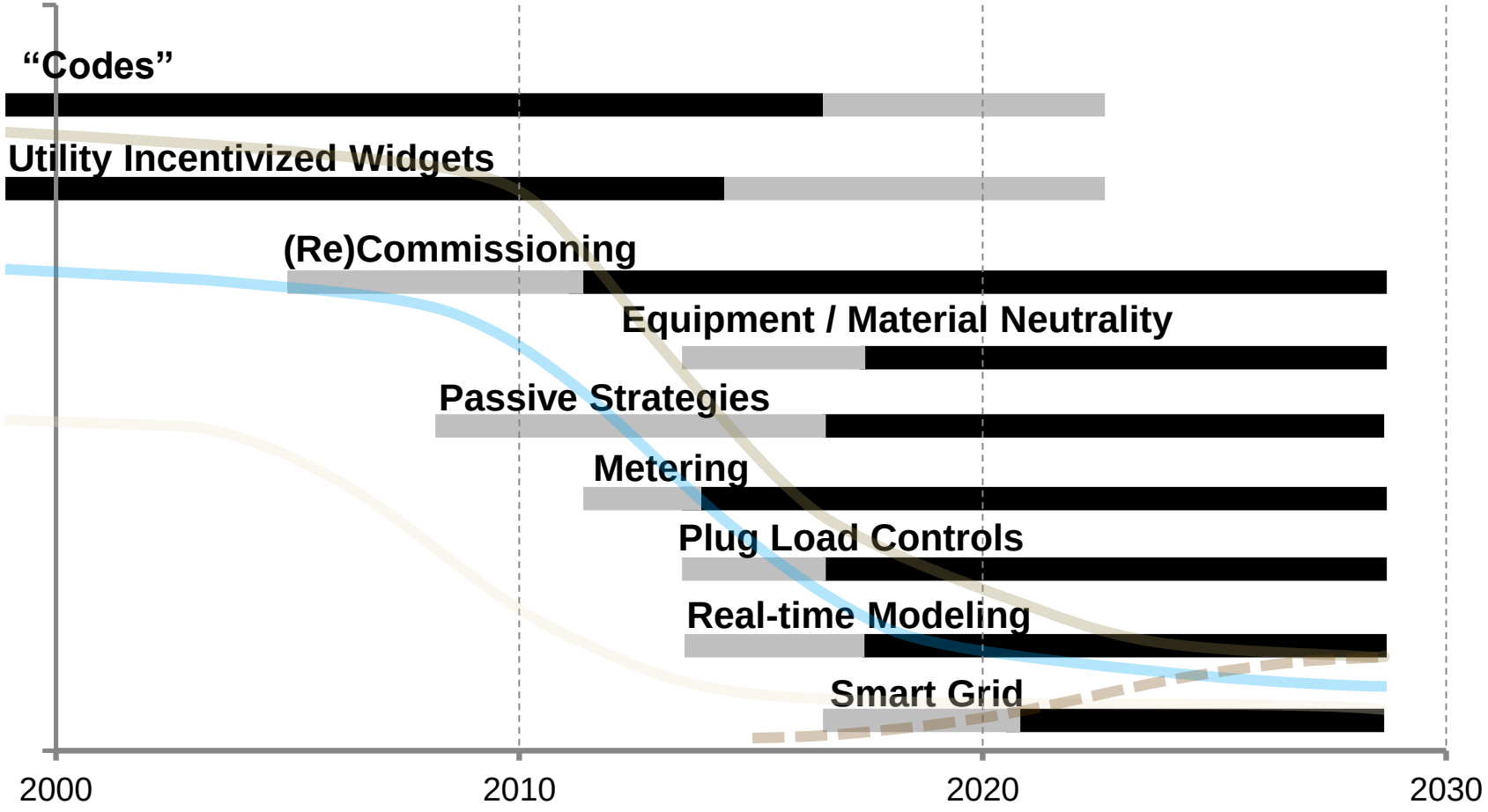
Timing of Policies and Tools



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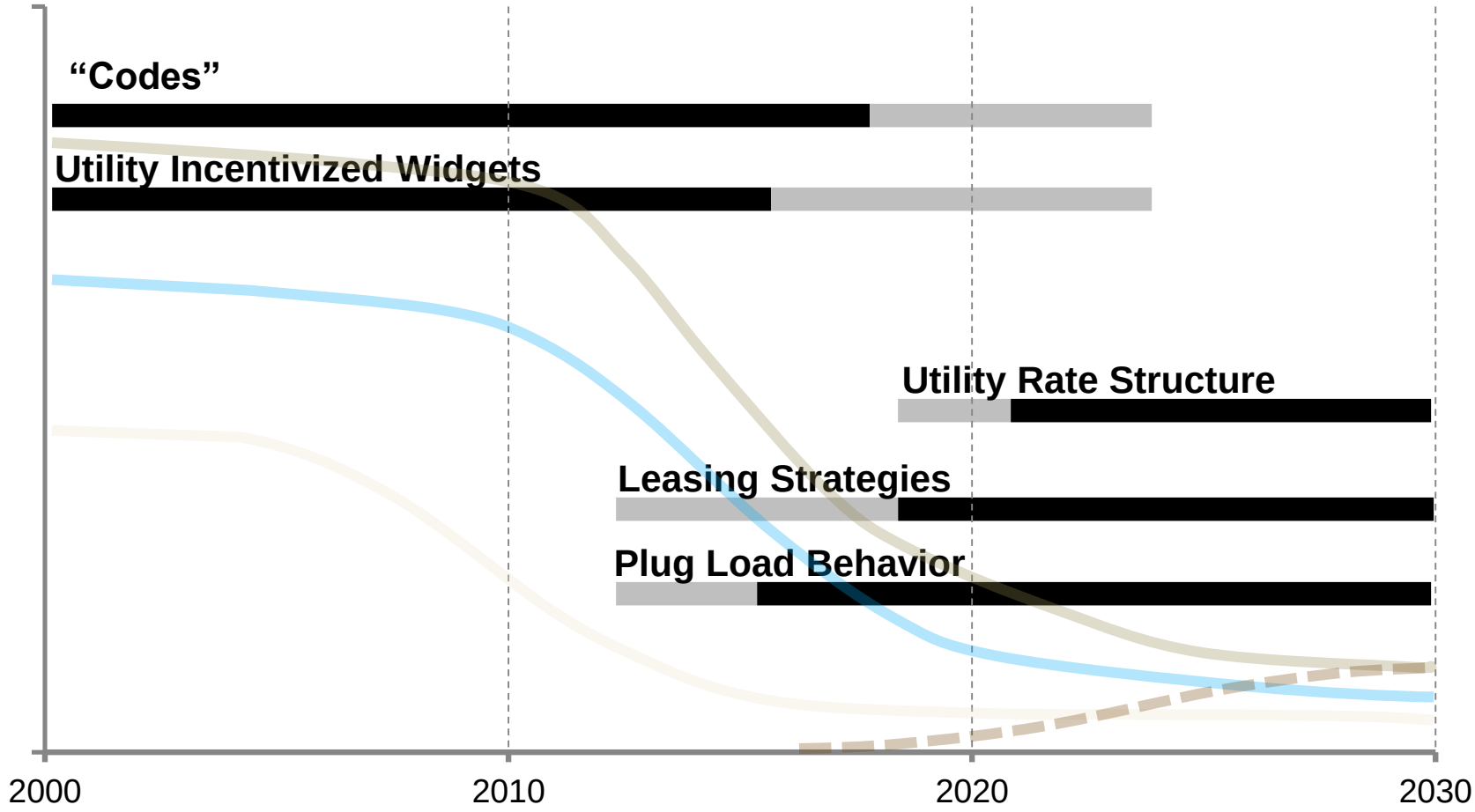
Timing of Policies and Tools



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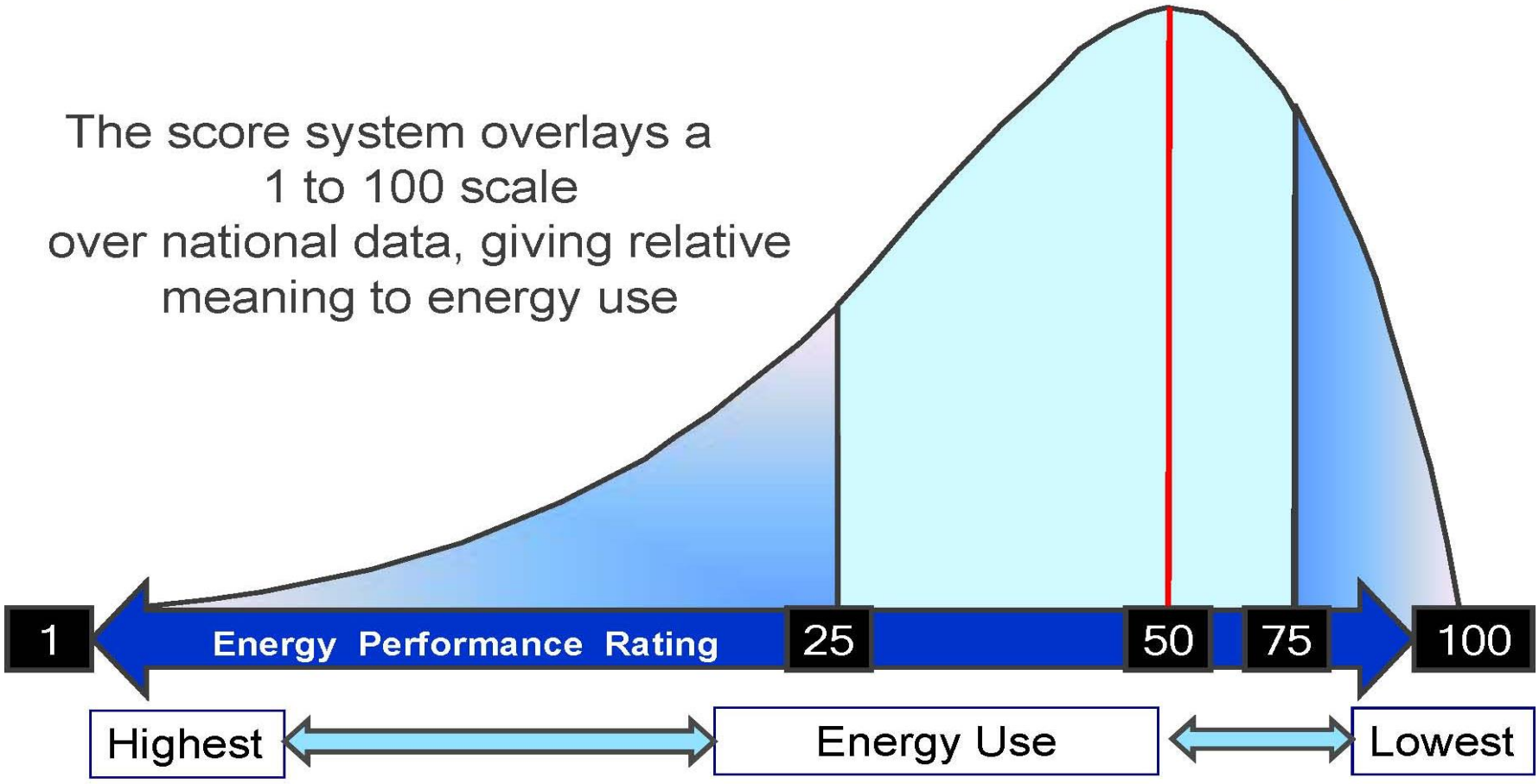
EUI TARGETS ARE A COMMON CURRENCY

- Energy Star
- Seattle 2030 District (5 more to come)
- Minnesota Public Buildings - B3
- Massachusetts Stretch Code (draft)
- Better Buildings Challenge
- Proposals to the ICCPC, IEBC, and IPMC
- Existing Buildings

EPA's National Energy Performance Score System

The score system overlays a 1 to 100 scale over national data, giving relative meaning to energy use



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One application for Energy Targets: Outcome-Based Energy Codes


Enforcing
Outcomes

Enforcement Mechanisms

- Performance/Surety Bond
- Tax Structure
- Utility Rate Structure
- Public Pillory/Accolades
- Mandatory RcX
- Litigation

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DIMENSIONS OF TRANSFORMATION

Market Transformation	Prescriptive Codes/Programs	Energy Targets
Works for Moving Markets Permanently	**yes**	**yes**
Sends signals of upcoming trend	**no**	**yes**
Continuous improvement – deploy technology	**maybe**	**yes**
Can be aligned with utility programs	**maybe**	**yes**

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Targeted Energy Outcomes

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