

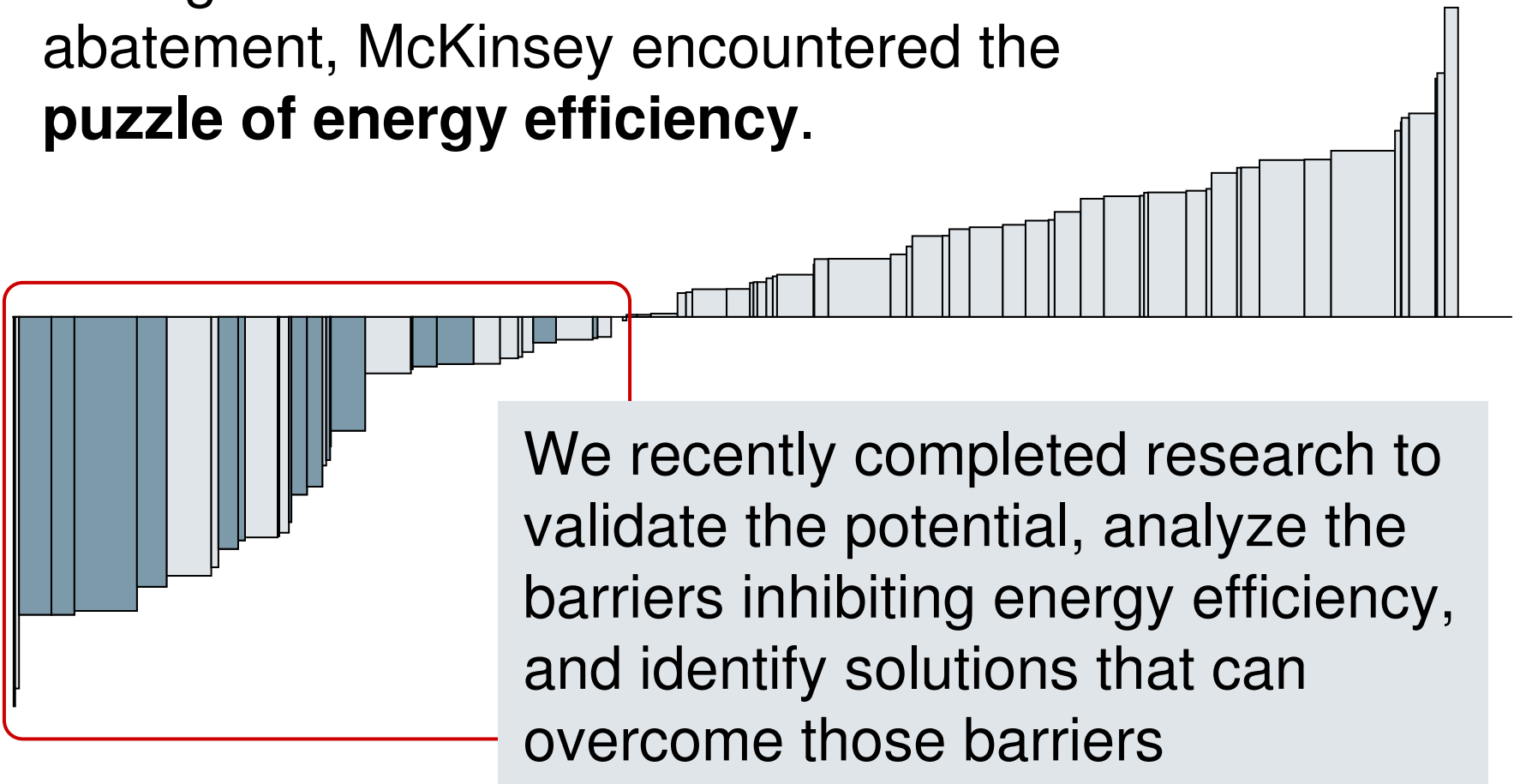


GHG Abatement and the Role of Energy Efficiency

MIT-Nescaum Symposium
August 11, 2009

Project background

During our research on U.S. GHG abatement, McKinsey encountered the **puzzle of energy efficiency**.



Project scope

- Analyzed **stationary** uses of energy across residential, commercial, and industrial sectors, including CHP
- Examined over 675 efficient end-use measures, but only **existing technologies**
- Focused on **productivity**; not on conservation (no changes in lifestyle or behavior)
- Analyzed **NPV-positive** applications of energy efficiency; based on incremental capital, operations, and lifetime energy costs – excluded program costs and indirect benefits – discounted at 7 percent
- Identified the **potential** for energy efficiency, the barriers, and potential solutions – no attempt to declare how much potential will be achieved

Central Conclusion of our work

*Energy efficiency offers a **vast, low-cost energy resource** for the U.S. economy – but only if the nation can craft a comprehensive and innovative approach to unlock it.*

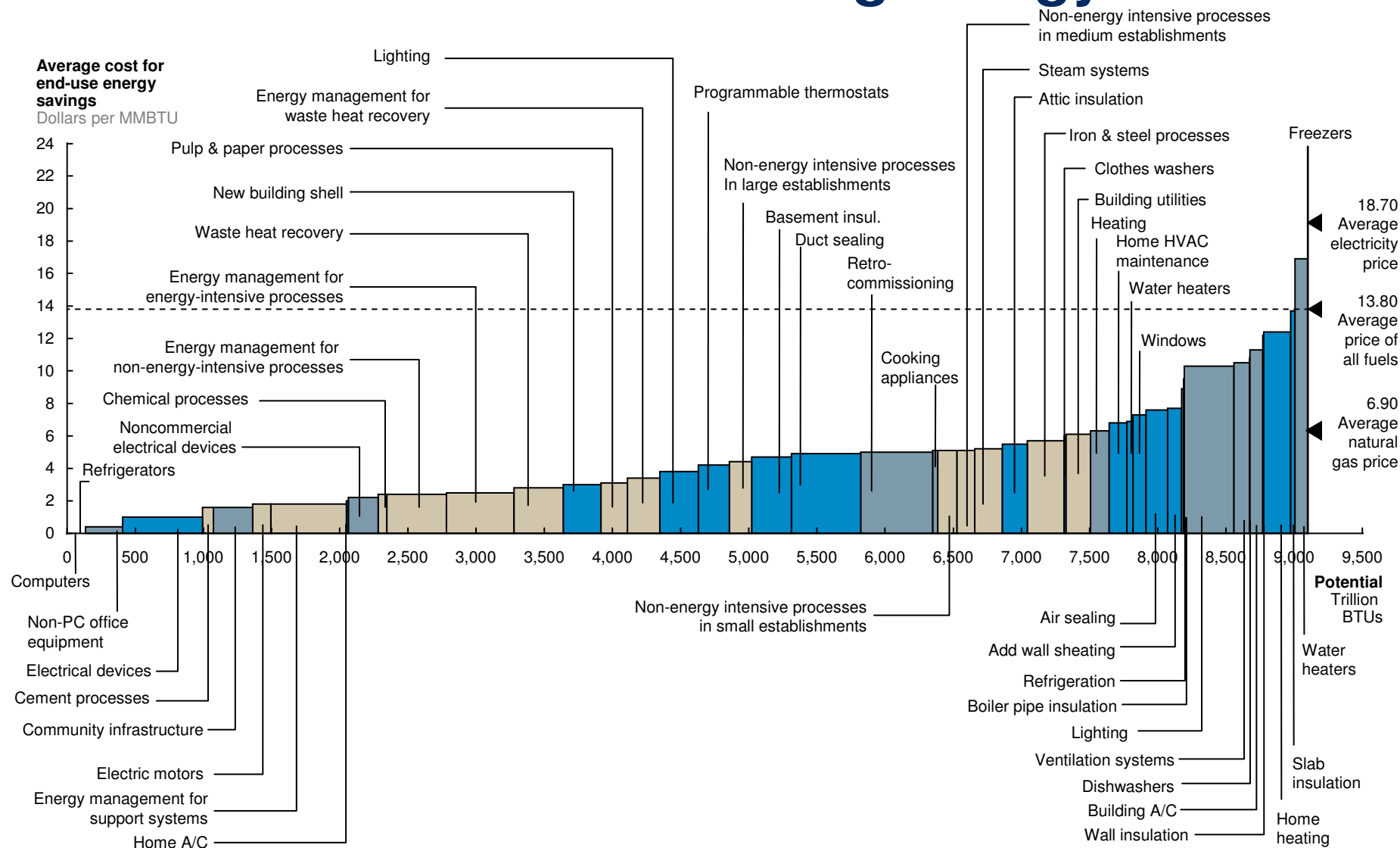
***Significant and persistent barriers will need to be addressed** at multiple levels to stimulate demand for energy efficiency and manage its delivery across more than 100 million buildings and literally billions of devices.*

*If executed at scale, a holistic approach would yield gross energy **savings worth more than \$1.2 trillion**, well above the **\$520 billion needed for upfront investment** in efficiency measures (not including program costs).*

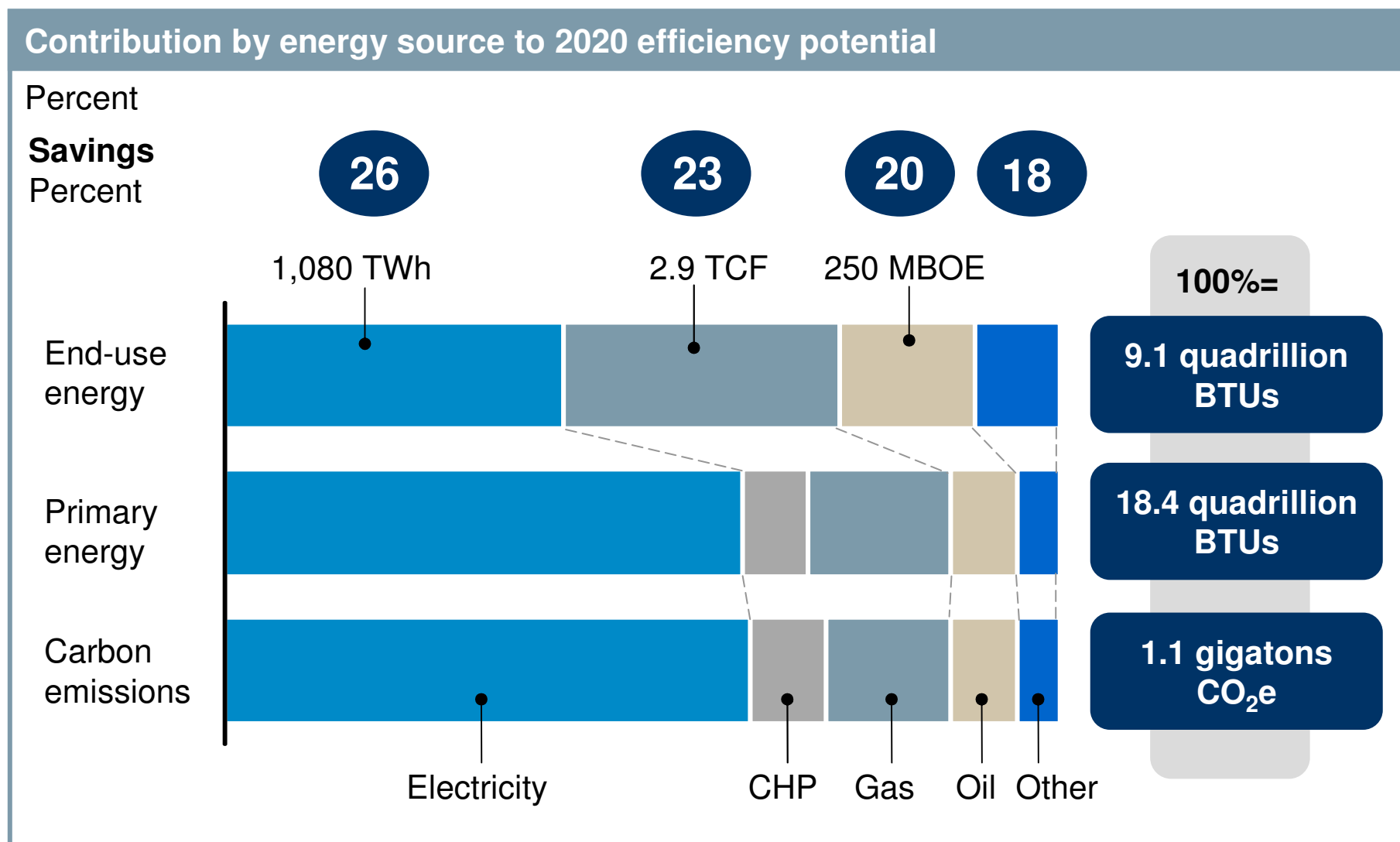
*Such a program is estimated to reduce end-use energy consumption in 2020 by 9.1 quadrillion BTUs, roughly **23 percent of projected demand**, potentially abating up to **1.1 gigatons of greenhouse gases annually**.*

Energy efficiency offers the most affordable means of delivering energy

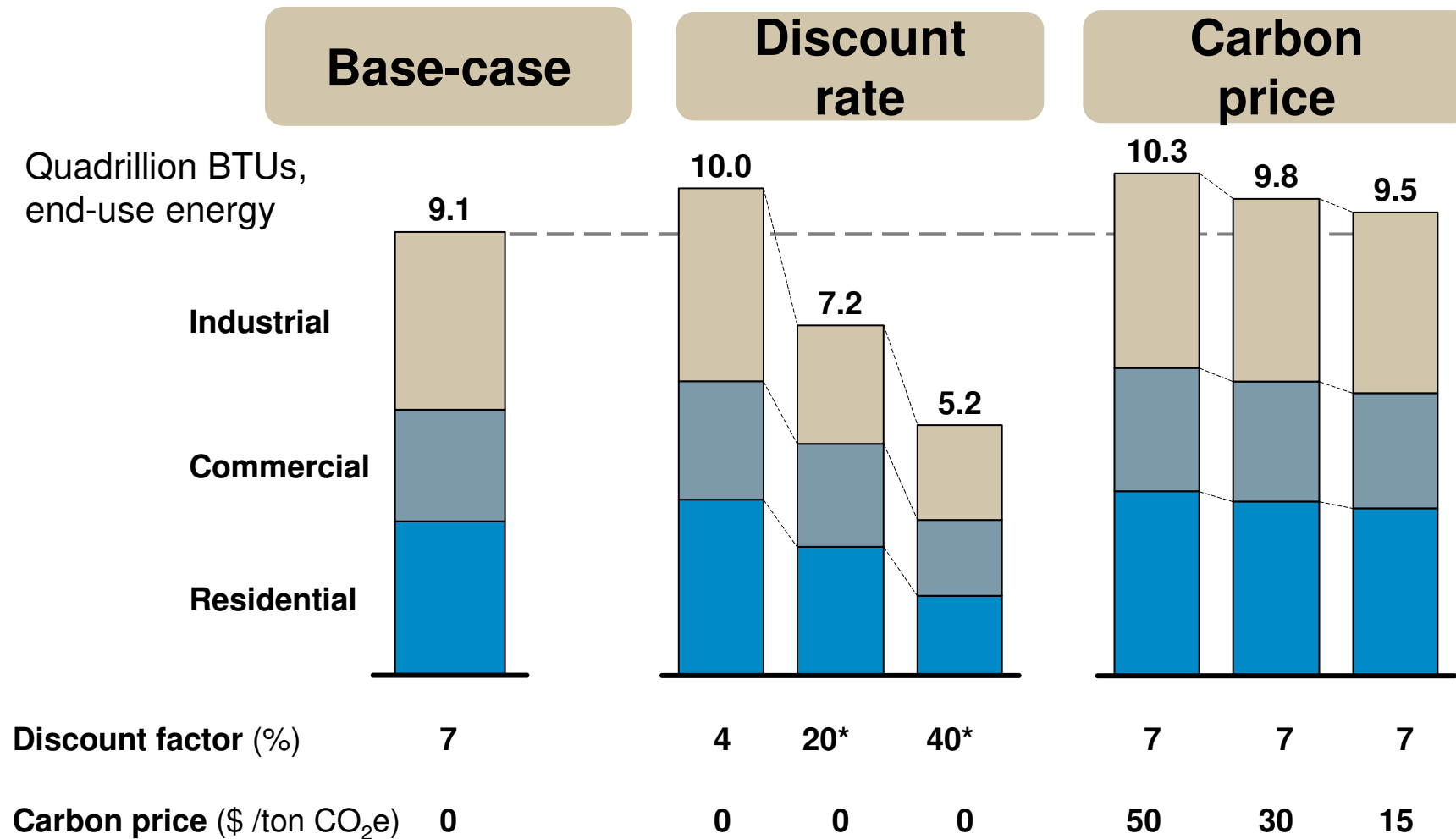
Residential
Commercial
Industrial



Significant efficiency potential across fuel types



Potential remains attractive even under significant changes in assumptions

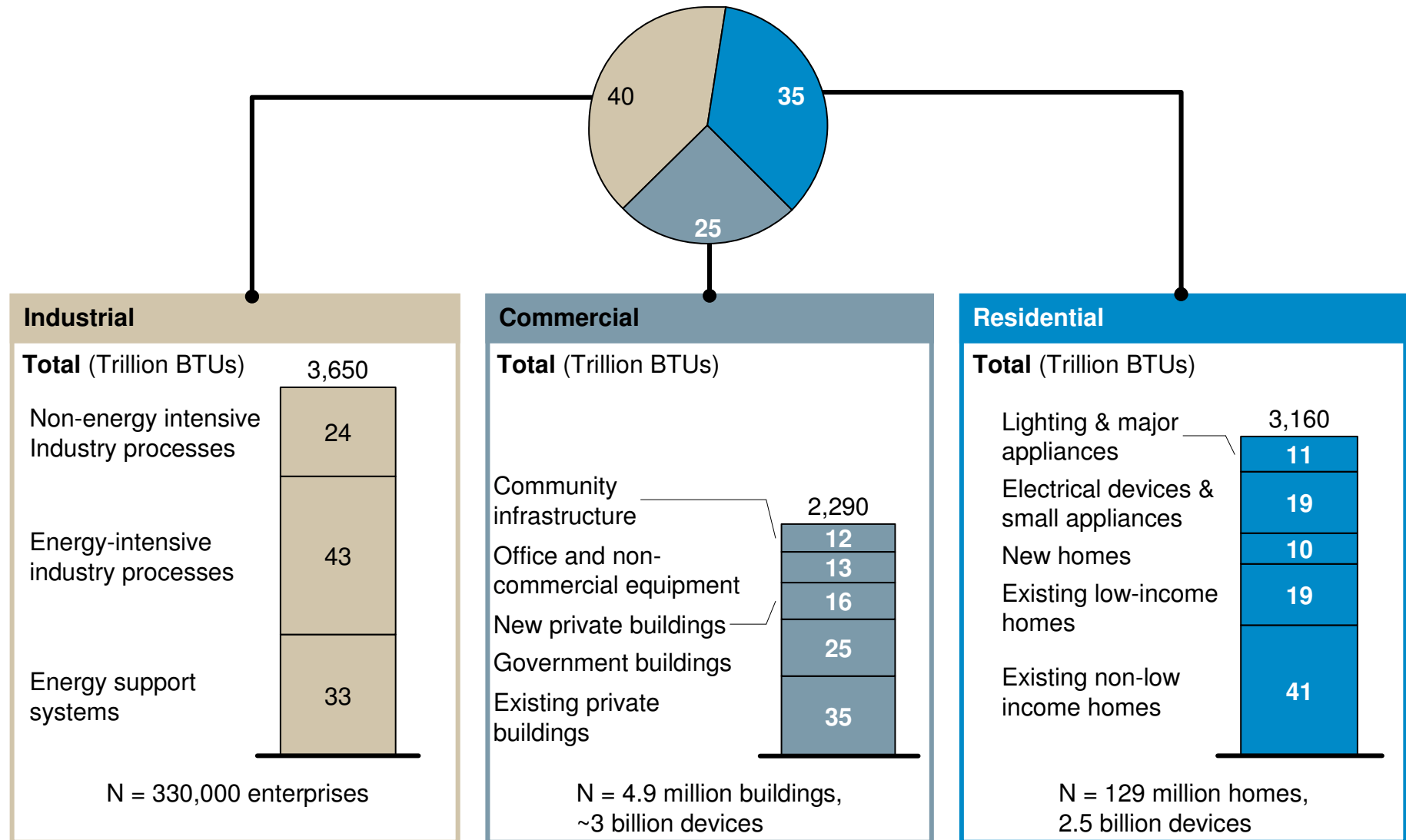


* Utilizes retail rates (vs. lower “avoided cost” rate proxy of industrial rates)

Source: EIA AEO 2008, McKinsey analysis

Clusters of opportunity emerge

Percent, 100% = 9,100 trillion BTUs of end-use energy efficiency potential



The fundamental nature of energy efficiency creates challenges

FUNDAMENTAL ATTRIBUTES OF ENERGY EFFICIENCY

Requires outlay

Full capture would require upfront outlay of about \$50 billion per year, plus program costs

Fragmented

Potential is spread across more than 100 million locations and billions of devices

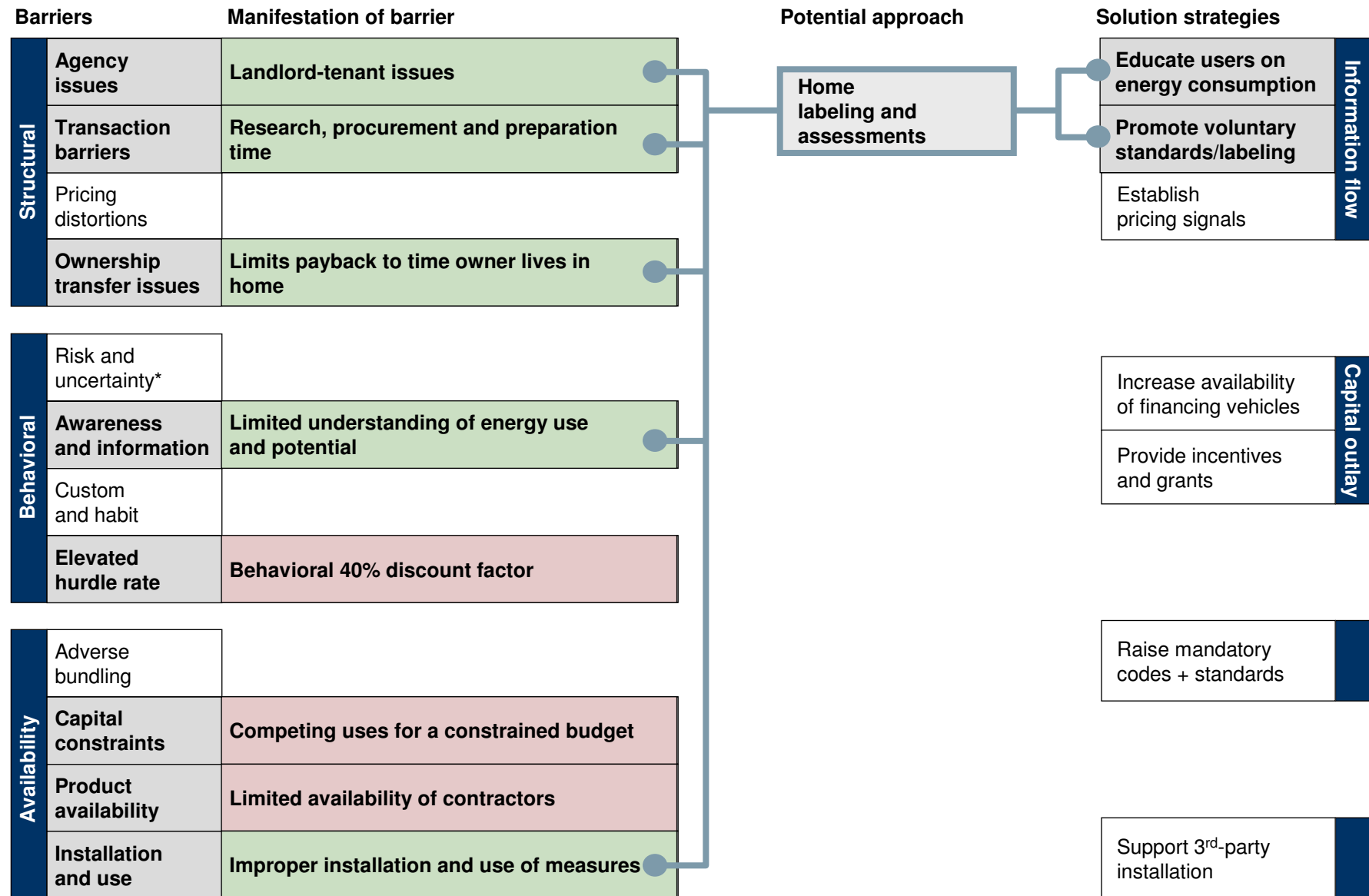
Low mind-share

Improving efficiency is rarely the primary focus of any in the economy

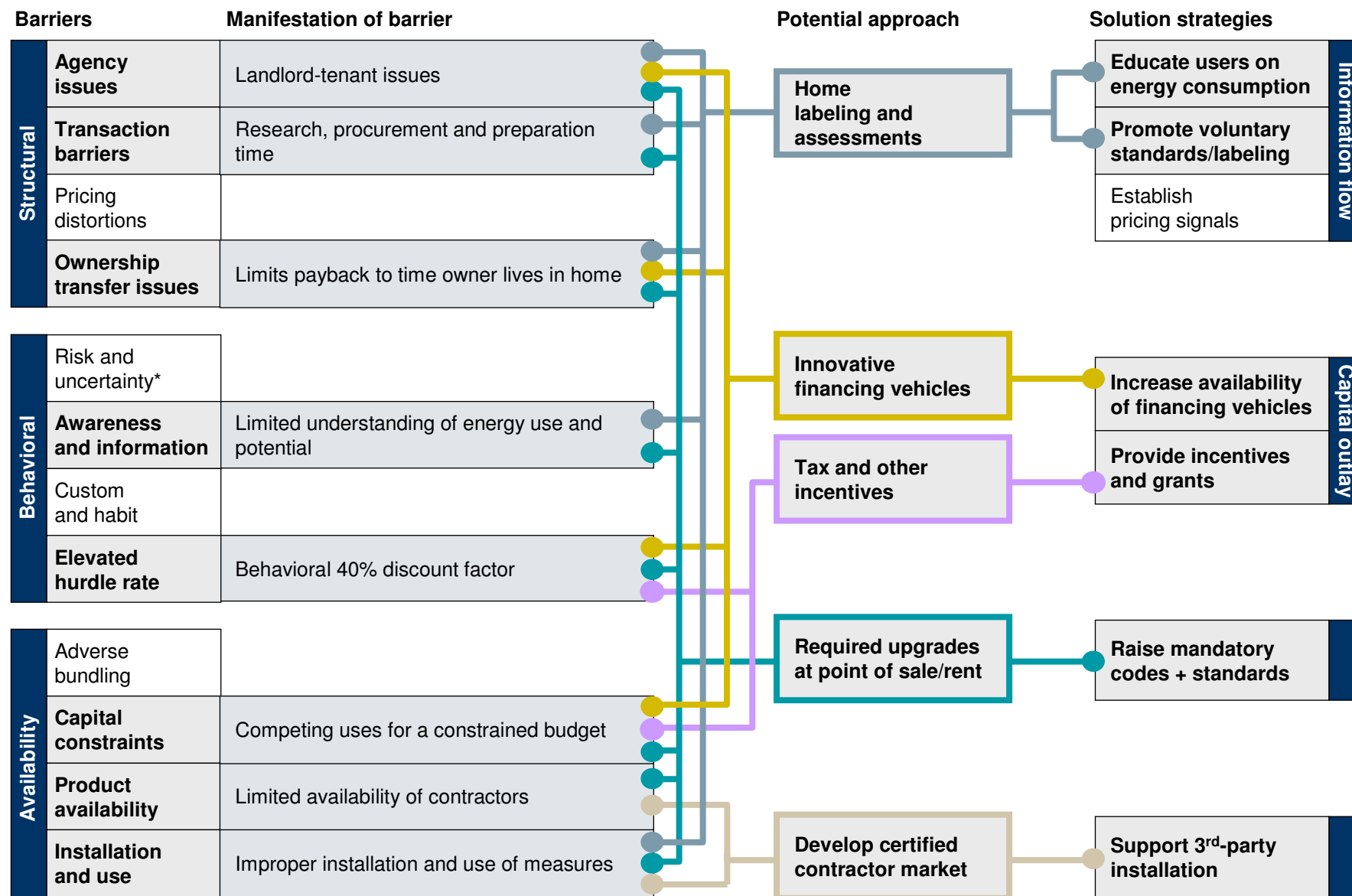
Difficult to measure

Evaluating, measuring and verifying savings, is more difficult than measuring consumption

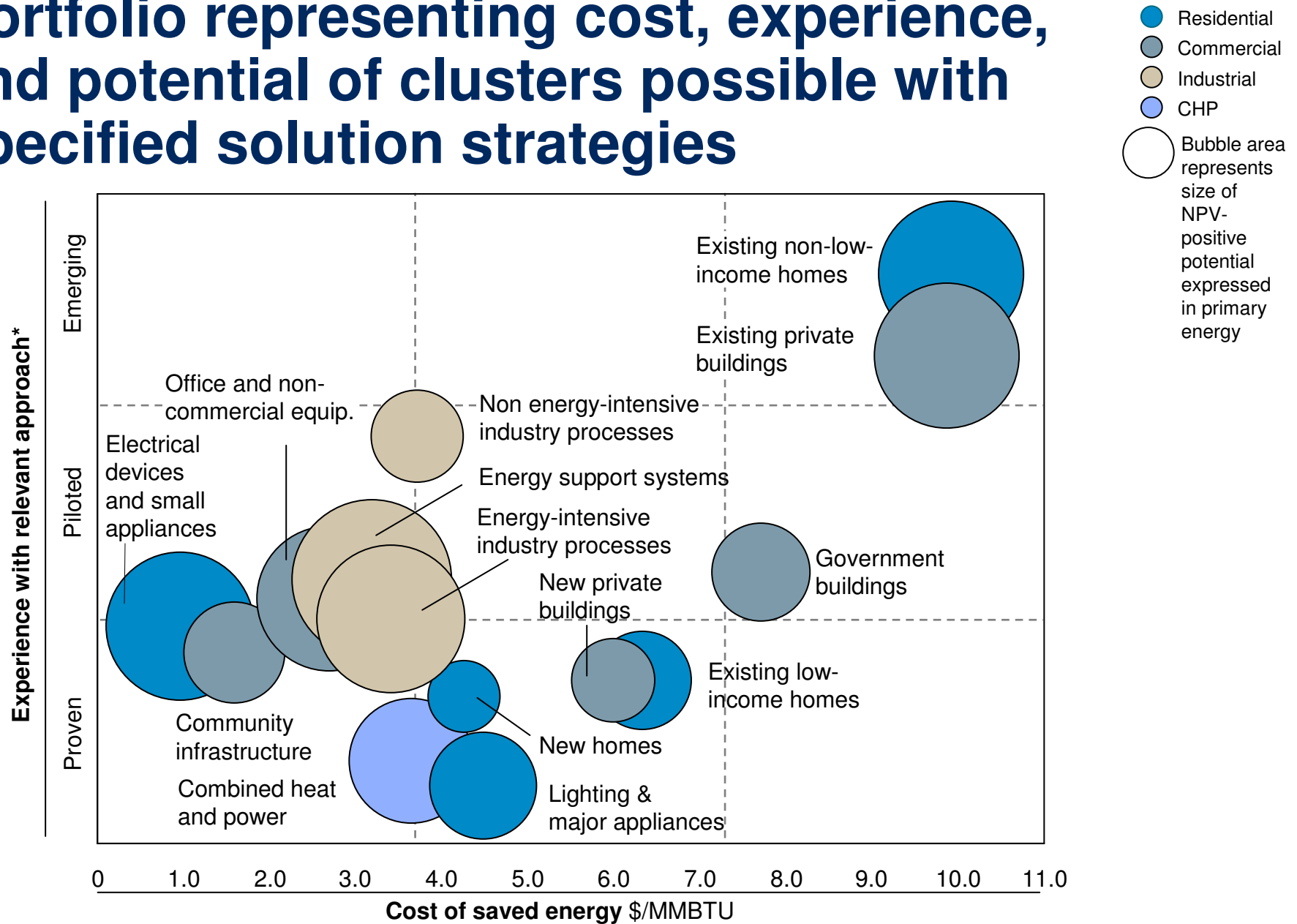
Addressing barriers in non-low income homes



Addressing barriers in non-low income homes



Portfolio representing cost, experience, and potential of clusters possible with specified solution strategies



Important observations

- **Recognize energy efficiency as an important energy resource** while the nation concurrently develops new energy sources
- **Launch an integrated portfolio** of proven, piloted, and emerging approaches
- Identify methods to **provide upfront funding**
- **Forge greater alignment** among stakeholders
- **Foster development** of next-generation energy efficient technologies