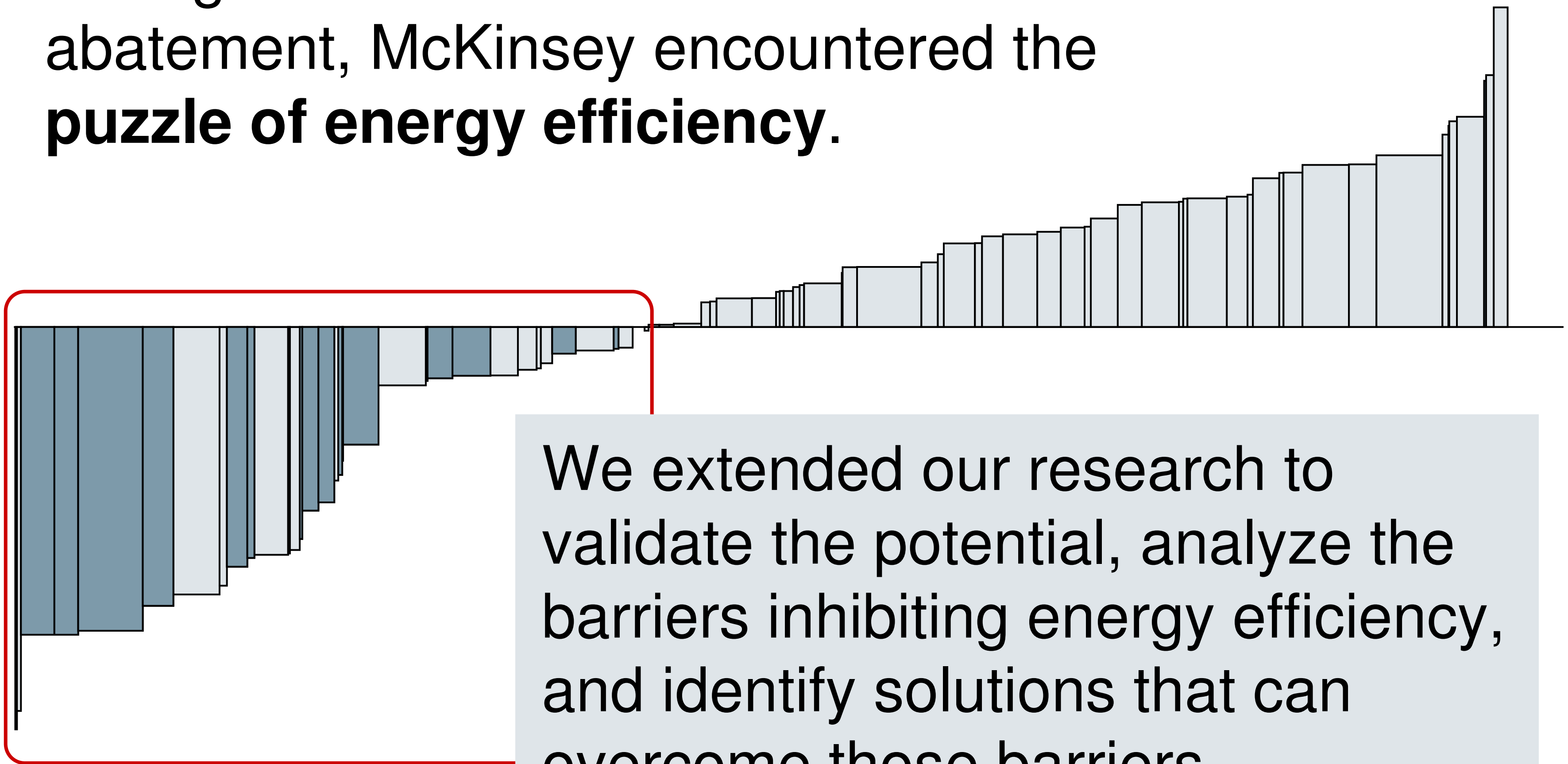
Perspectives on Energy Efficiency

Georgia Tech Clean Energy Speaker Series
January 27th, 2010

McKinsey&Company

Project background

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



We extended our research to validate the potential, analyze the barriers inhibiting energy efficiency, and identify solutions that can overcome those barriers

Our research has been supported by a broad range of leading institutions – both reports are available at McKinsey.com

U.S. GHG Abatement Cost Curve – December, 2007

- **7 leading institutions joined with McKinsey to co-sponsor**

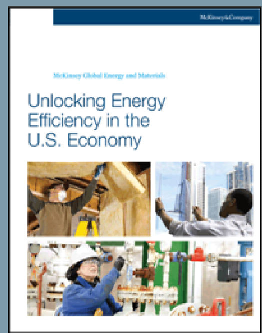
- **Analyzed 250+ abatement opportunities across 7 sectors of the US economy** – buildings, power, transportation, industrial, waste, agriculture and forestry

- Provided comprehensive mapping and fact base of U.S. GHG options
- Highlighted challenge to achieve projected targets
- Published in December 2007

U.S. Energy Efficiency – July, 2009

- **12 leading institutions joined with McKinsey to co-sponsor**

- **Analyzed 675+ energy efficiency opportunities in stationary uses economy-wide (with regional breakdown)**



- Provides granularity behind attractive opportunities
- Explores key implementation barriers and potential solutions
- Published in July 2009

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.*

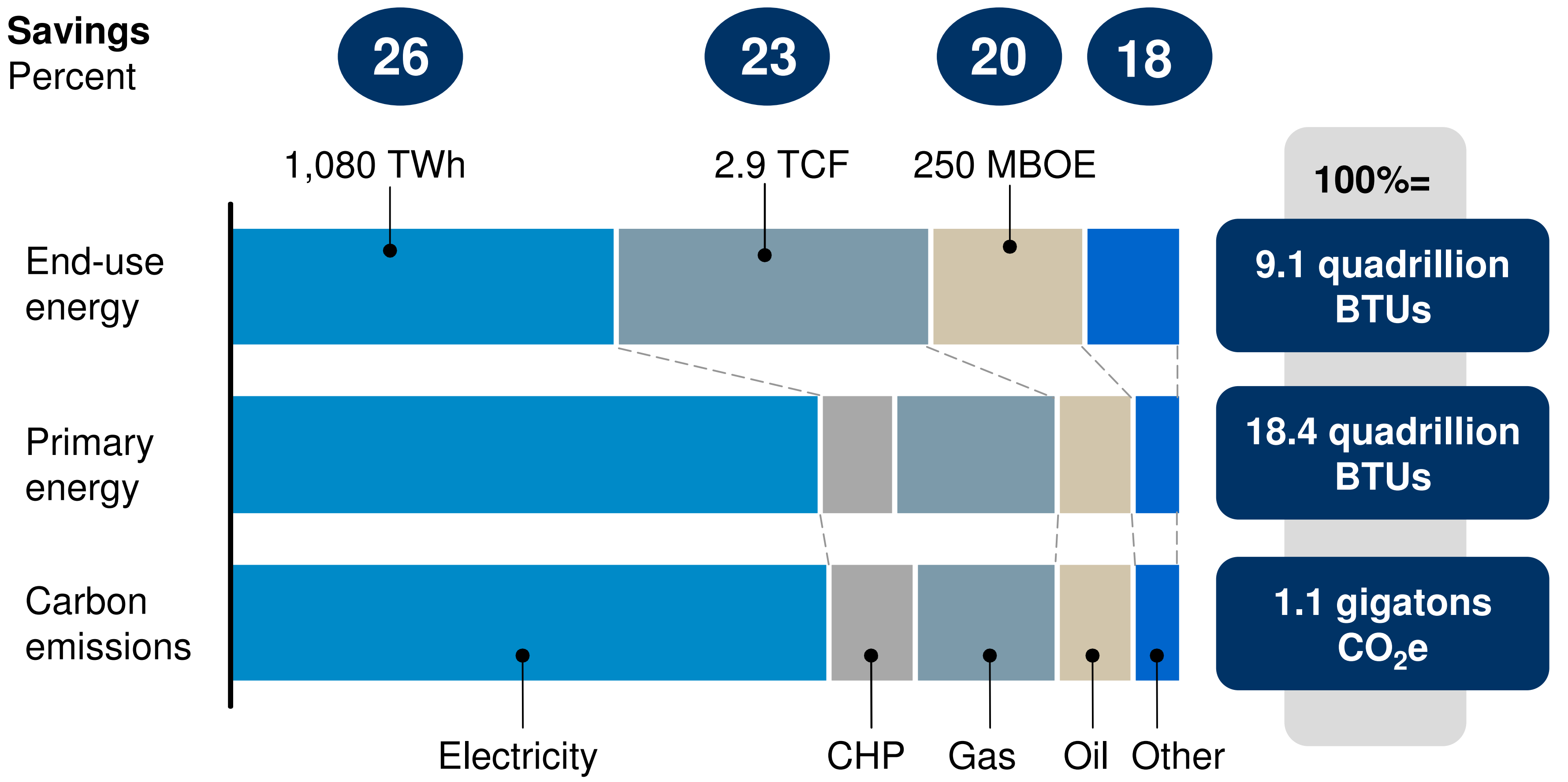
If executed at scale, a holistic approach would yield gross energy ***savings worth more than $1.2 trillion****, well above the* ***$520 billion needed for upfront investment*** *in efficiency measures (not including program costs).*

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.***

Significant efficiency potential across fuel types

Contribution by energy source to 2020 efficiency potential

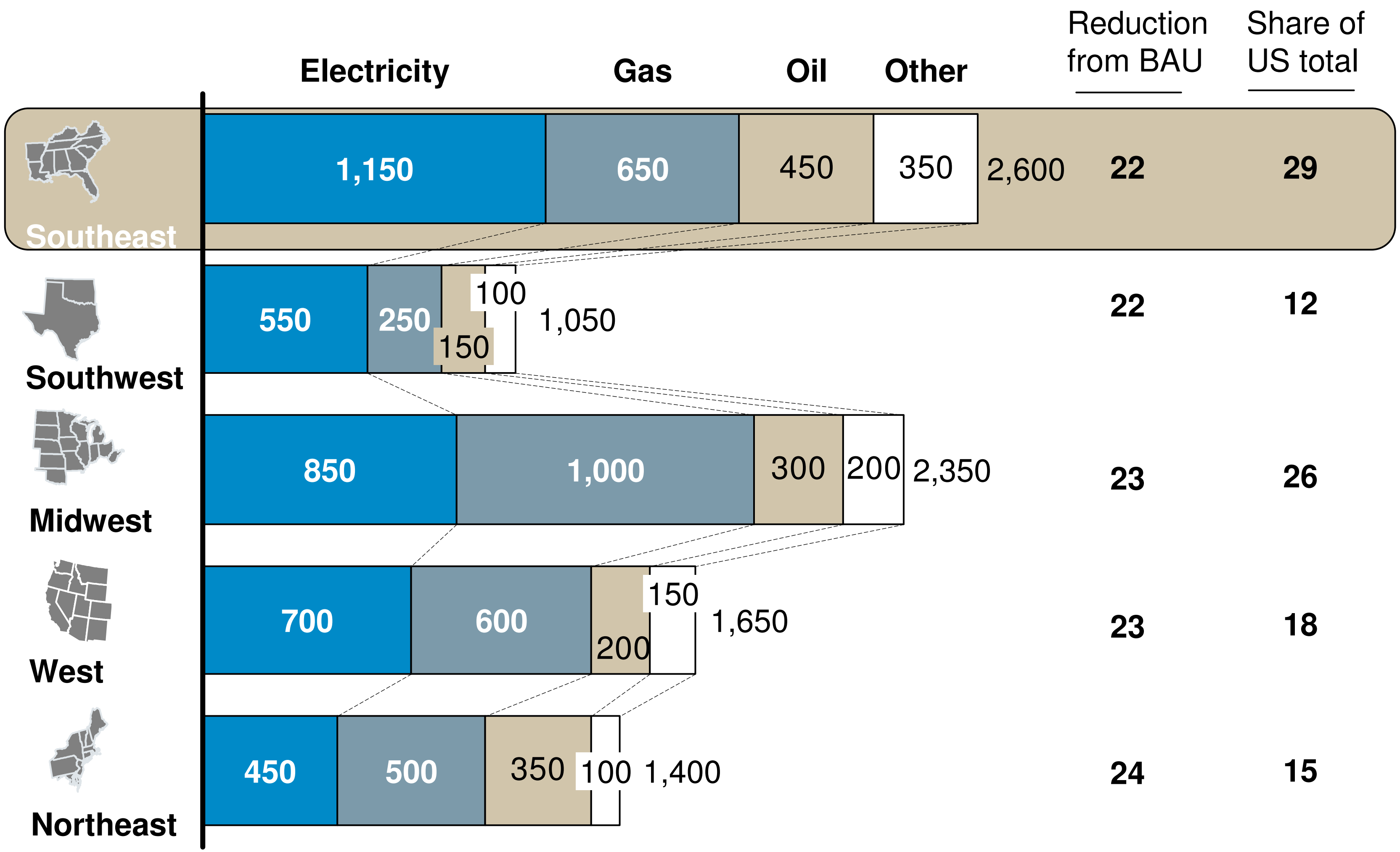
Percent



The southeast accounts for the largest share of US EE potential but has similar reduction levels from BAU

Trillion BTUs in 2020*

Savings (Percent)

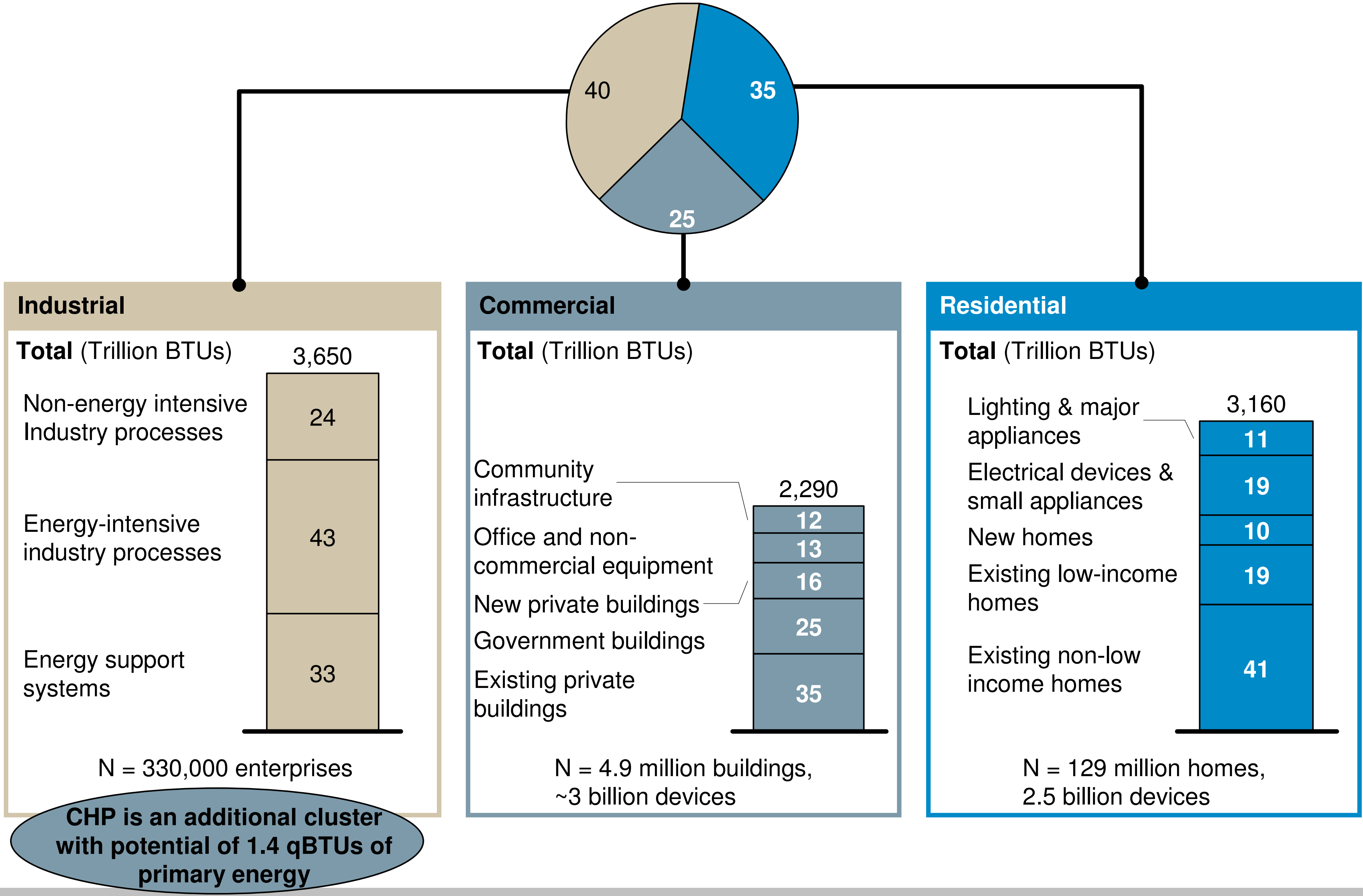


The fundamental nature of energy efficiency creates challenges

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

Opportunities group into actionable clusters

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



Addressing barriers in non-low income homes

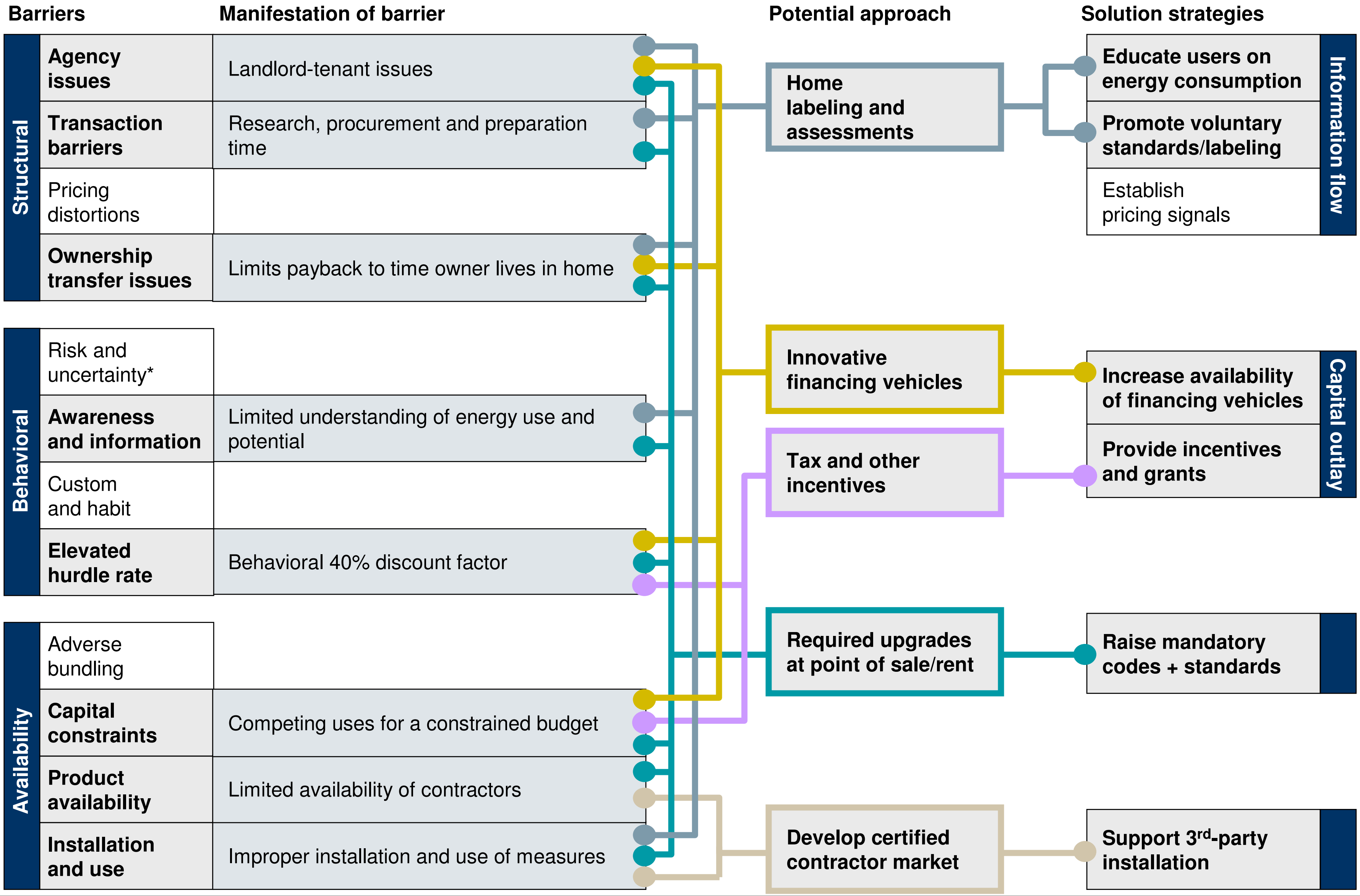
	Barriers	Manifestation of barrier
Structural	**Agency issues**	**Landlord-tenant issues**
	Transaction barriers	**Research, procurement and preparation time**
	Pricing distortions	
	Ownership transfer issues	**Limits payback to time owner lives in home**
Behavioral	Risk and uncertainty*	
	Awareness and information	**Limited understanding of energy use and potential**
	Custom and habit	
	Elevated hurdle rate	**Behavioral 40% discount factor**
Availability	Adverse bundling	
	Capital constraints	**Competing uses for a constrained budget**
	Product availability	**Limited availability of contractors**
	Installation and use	**Improper installation and use of measures**

Potential approach

Home labeling and assessments

Solution strategies	
Educate users on energy consumption	Information flow
Promote voluntary standards/labeling	
Establish pricing signals	
Increase availability of financing vehicles	Capital outlay
Provide incentives and grants	
Raise mandatory codes + standards	
Support 3rd-party installation	

Addressing barriers in non-low income homes



Building blocks of a comprehensive energy efficiency strategy