



Salem, Oregon  
December 1, 2009

# Buildings & Efficiency

# Buildings & Efficiency

- Using less energy is the easiest & most economical step
- Critical to large-scale deployment of new, clean technologies
- Policies are starting to move rapidly
  - Financing
  - Aggregation
- Not an option for buildings; question is whether or not to be strategic



# US BUILDING STOCK

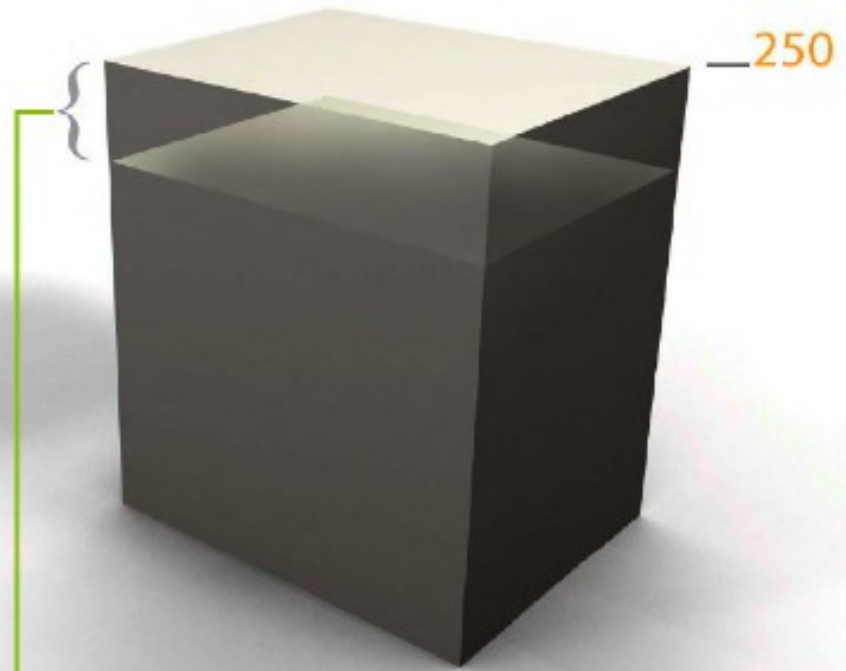
IN BILLION SF



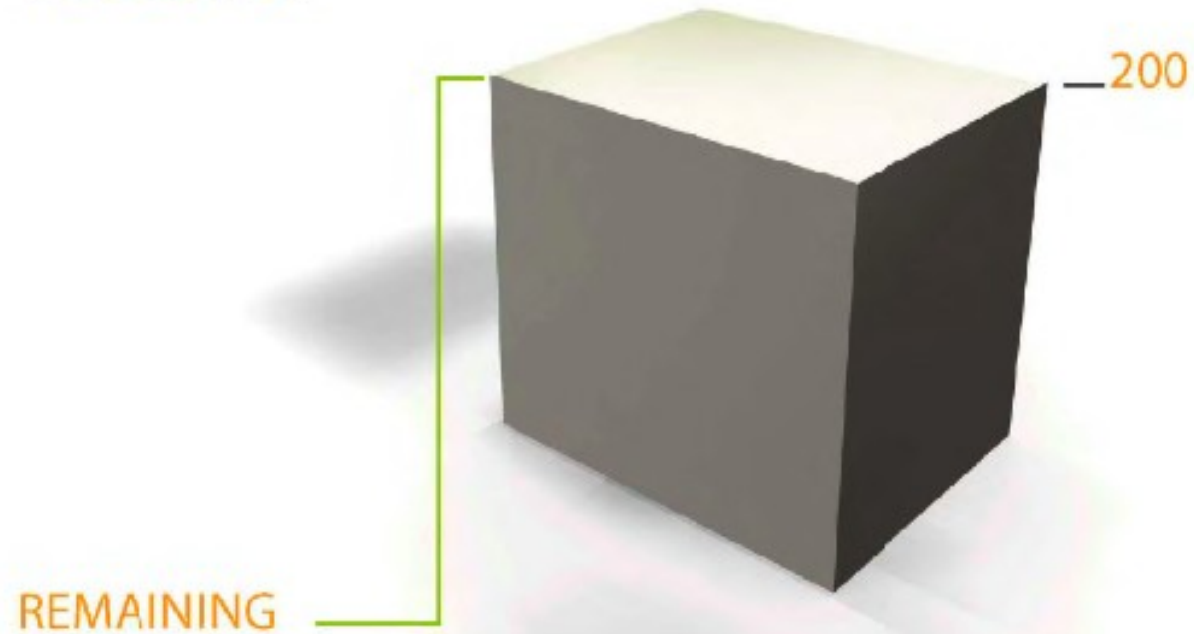
CURRENT BUILDINGS

# US BUILDING STOCK

IN BILLION SF

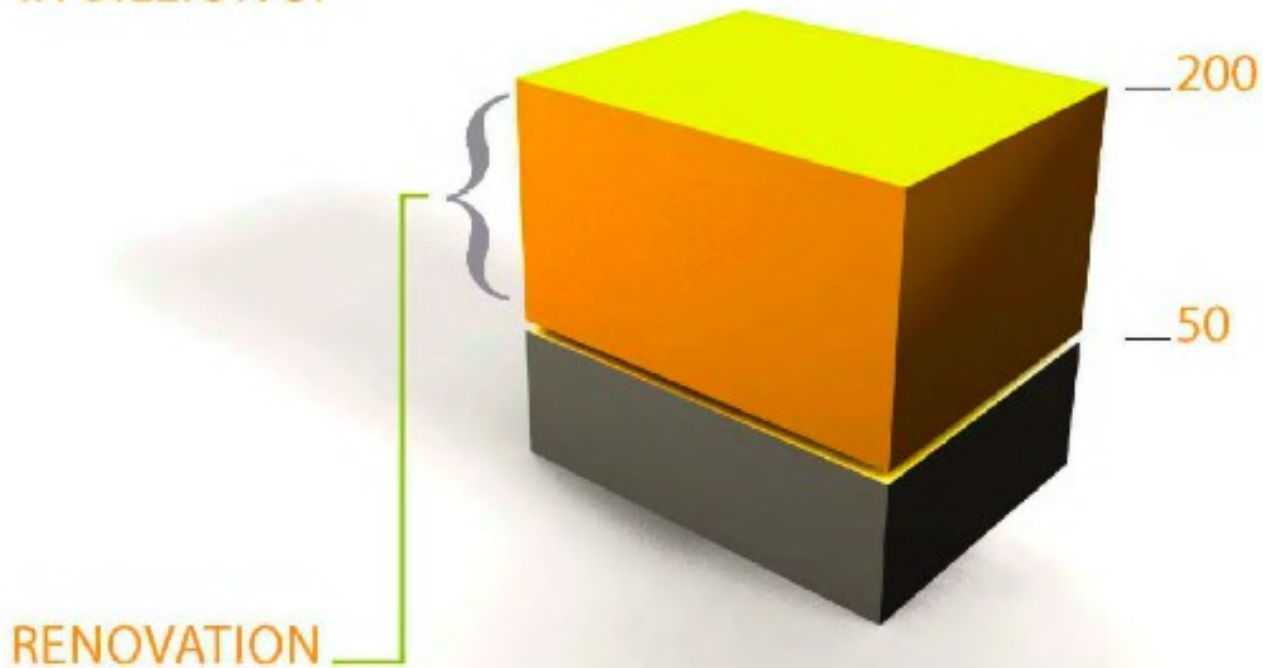


# US BUILDING STOCK IN BILLION SF

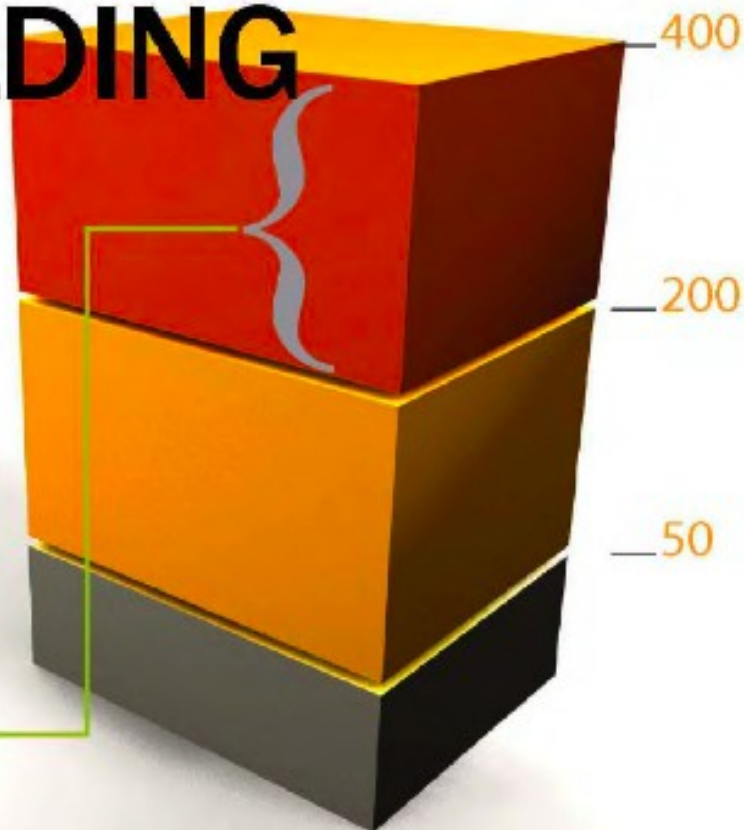


# US BUILDING STOCK

IN BILLION SF



# US BUILDING STOCK IN BILLION SF



NEW

BUILDINGS IN 2030

# WASHINGTON/OREGON



- **25%-30% Code Increase**  
**with *reach code***
- **Performance Based Incentives**
  - **Tax Credits**
  - **Financing Options**



# **CALIFORNIA**

**Title 24 (State Energy Code) to  
require NET ZERO Buildings;**

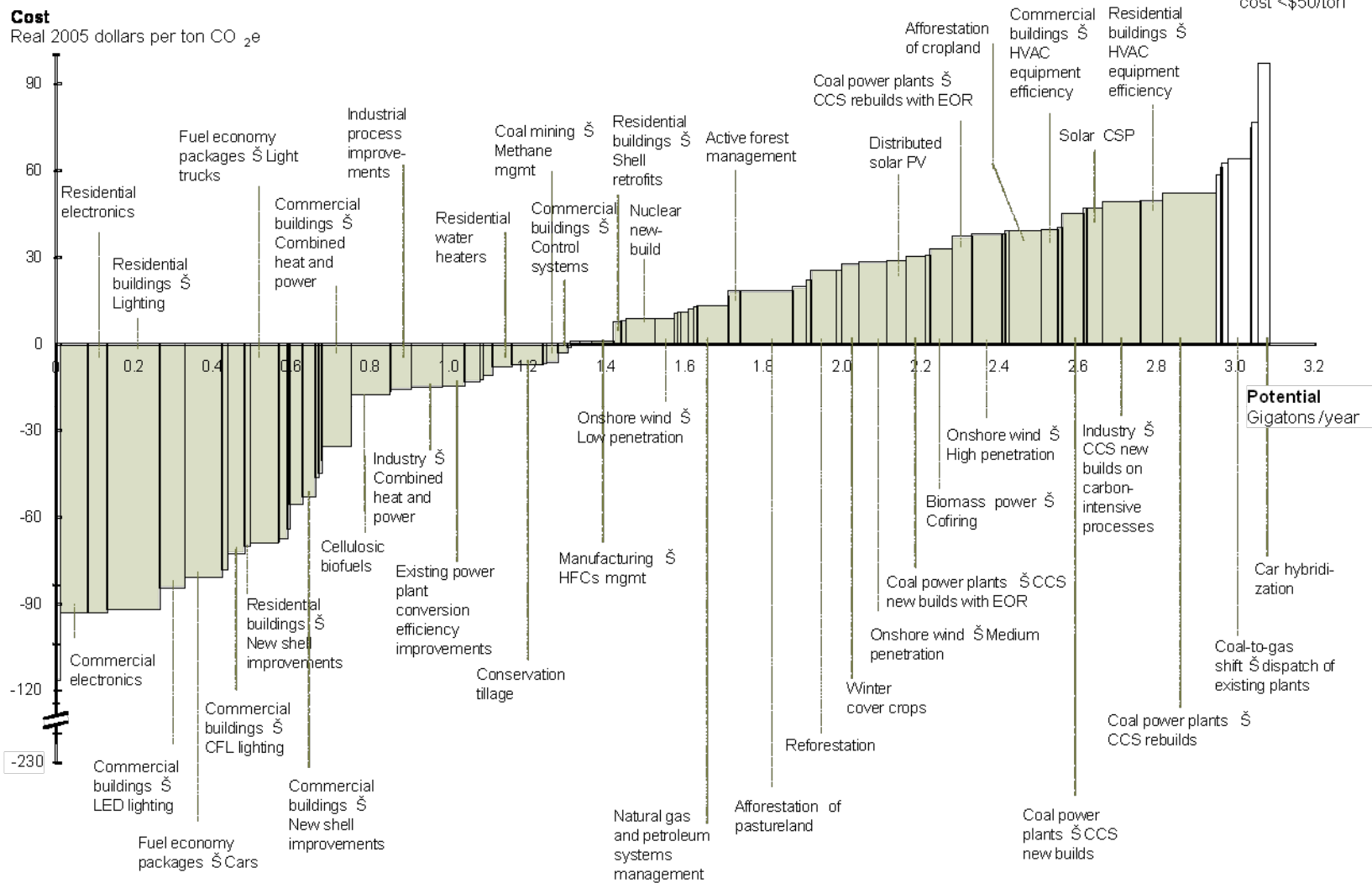
**Residential by 2020**

**Commercial by 2030**

# Oregon Legislation 2009

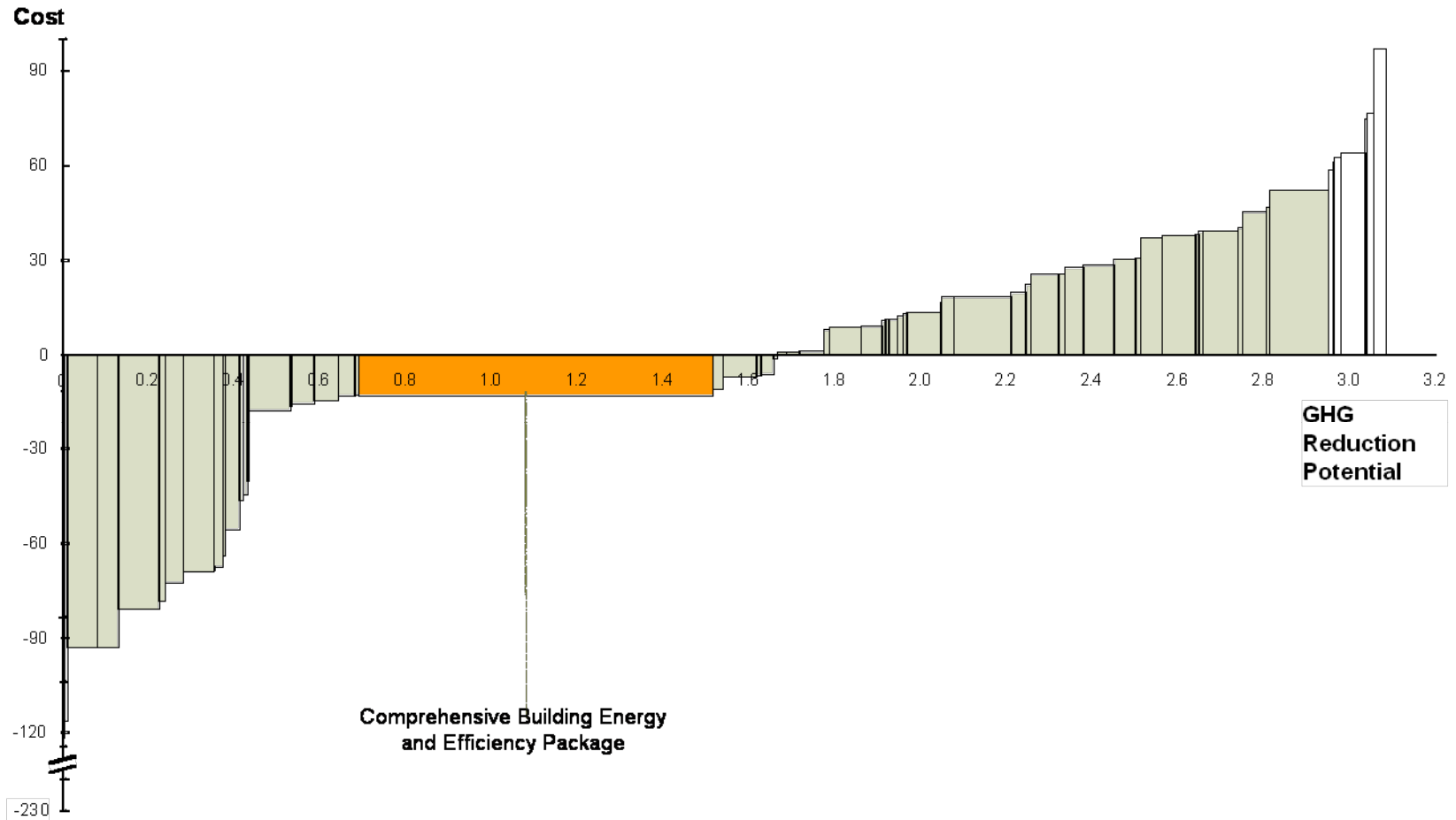
- EEAST (Energy Efficiency and Sustainable Technology) provides long-term low interest loans to residents to install energy efficiency and renewable energy components in their homes or businesses
- “Reach” voluntary building code: optional standards to increase energy efficiency in newly constructed or renovated buildings
- Directs the state to consider Architecture 2030 targets for new buildings and major renovations to be carbon neutral by 2030 (i.e. using no fossil fuel GHG emitting energy to operate)

# U.S. mid-range abatement curve \$ 2030

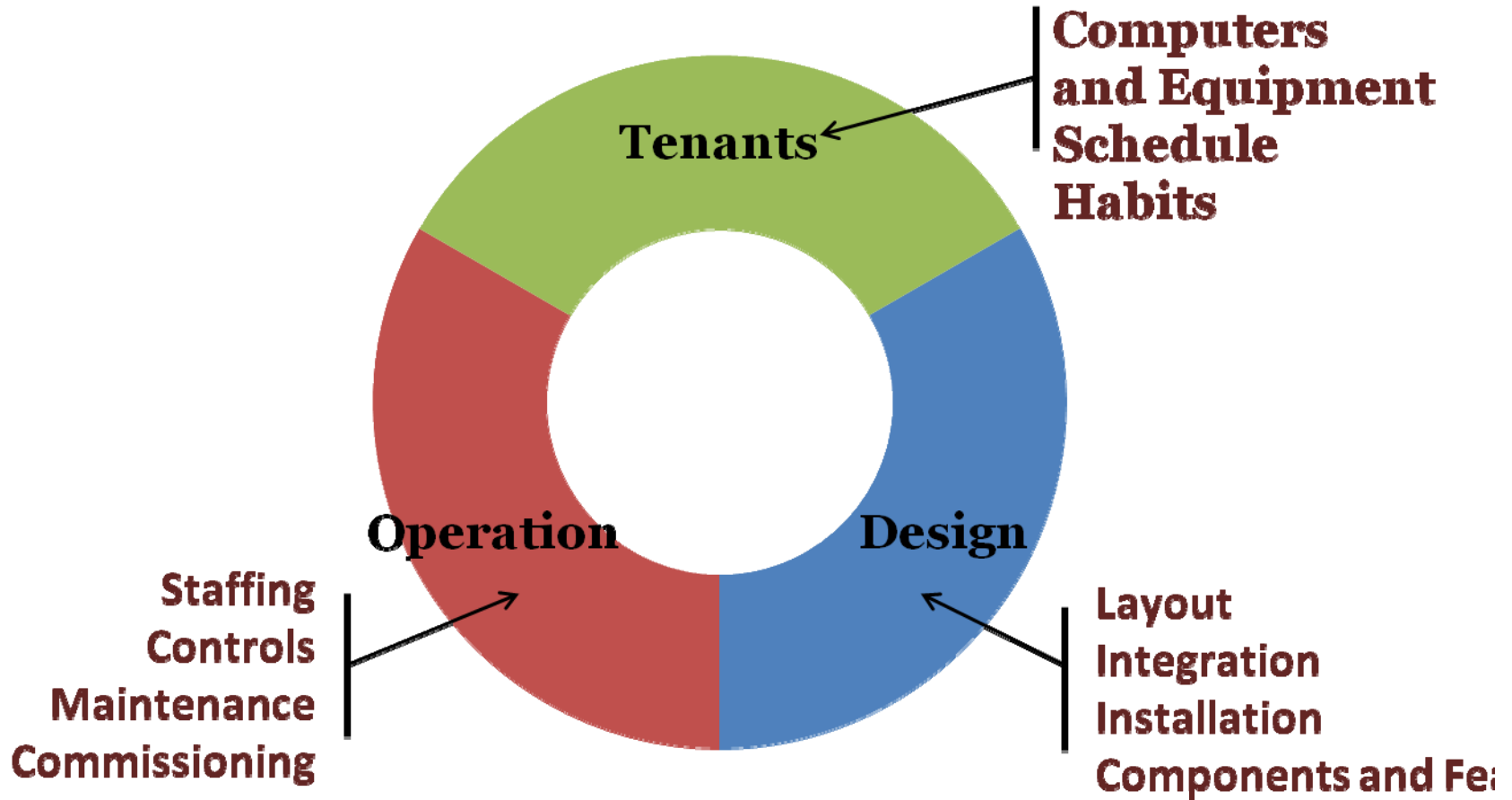




# U.S. mid-range abatement curve \$ 2030



# What Drives Building Performance?




# Feedback to Building Occupants



# Real-Time Performance Information



# Energy Certificate

Building Energy Performance >		As built:	In use:
Certificate type	FULL	<b>Asset Rating</b>	<b>Operational Rating</b>
Building Type	Office		
Whole or part of building	Whole building		
Very energy efficient			
A			
B			
C			
D			
E			
F			
G			
Not energy efficient			
Asset rating method:	UK National Standard 2004	Calculated	Actual
Operational rating method:	UK Office Tailored Benchmarks 2002	<b>48</b>	<b>83</b>
Units used:	kg CO <sub>2</sub> per sq m of net area per annum >		
Occupancy level	Square metres net lettable area per person	14	12
Equipment heat gain level	Watts per square metre net	12	12
Weekly occupancy hours	Hours per week	55	58
Heating performance ratings		ABCDEFG	ABCDEFG
HVAC performance ratings (cooling, fans and pumps)		ABCDEFG	ABCDEFG
Lighting performance ratings		ABCDEFG	ABCDEFG
Management rating (for in-use performance only)			ABCDEF G
Internal Environmental Quality			Not assessed
Risk level			Not assessed
Further information can be found in the Energy Log Book			
<b>GB 2004</b>		 Directive 2002/91/EC	



Building Labeling