

Building Performance Evaluation



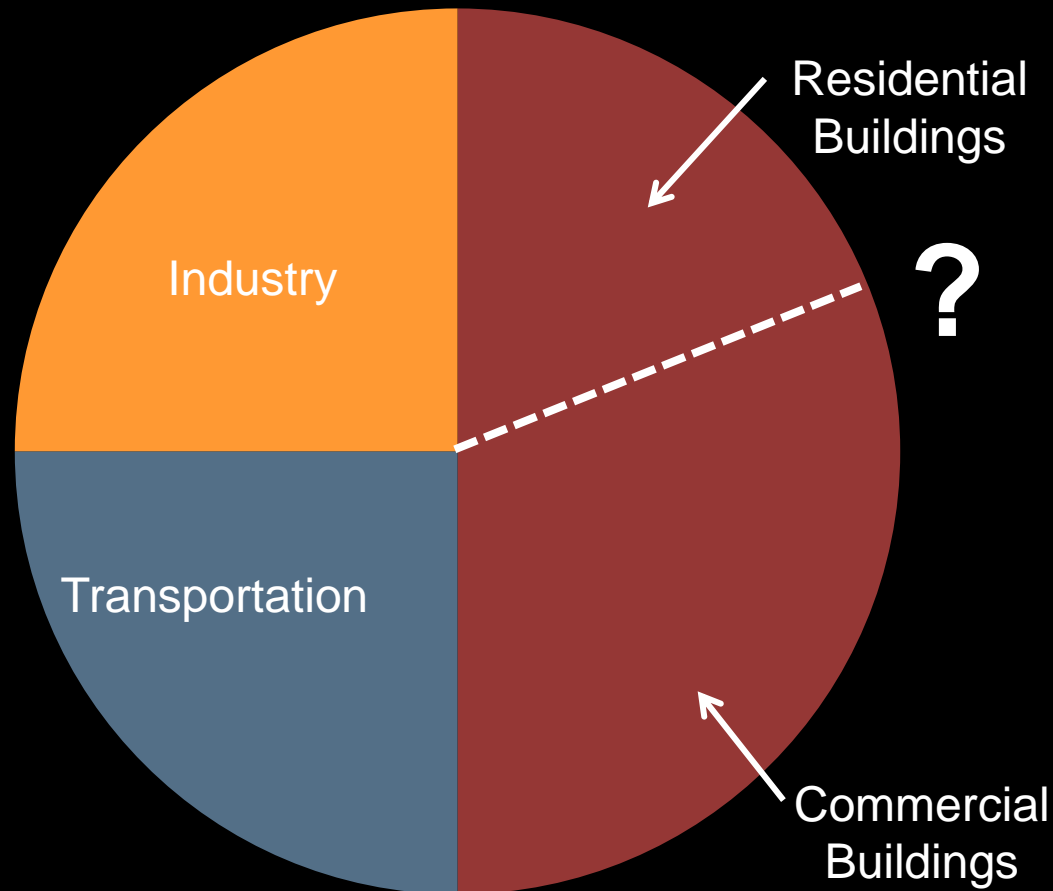
Alicia Daniels Uhlig, NCARB
Director of Sustainability
LEED Accredited Professional BD+C, HOMES
GGLO

Living Future – May 7, 2010

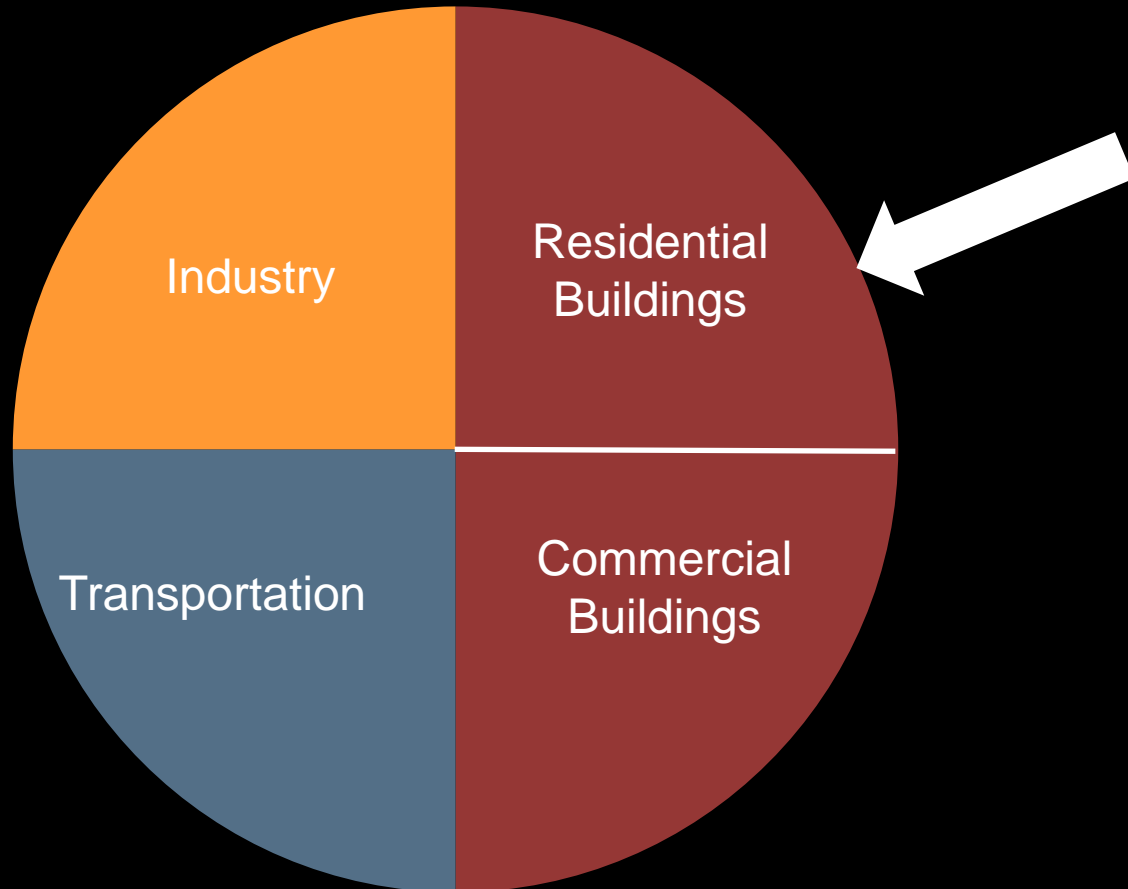
US Energy Consumed

What percent do Residential Buildings consume?

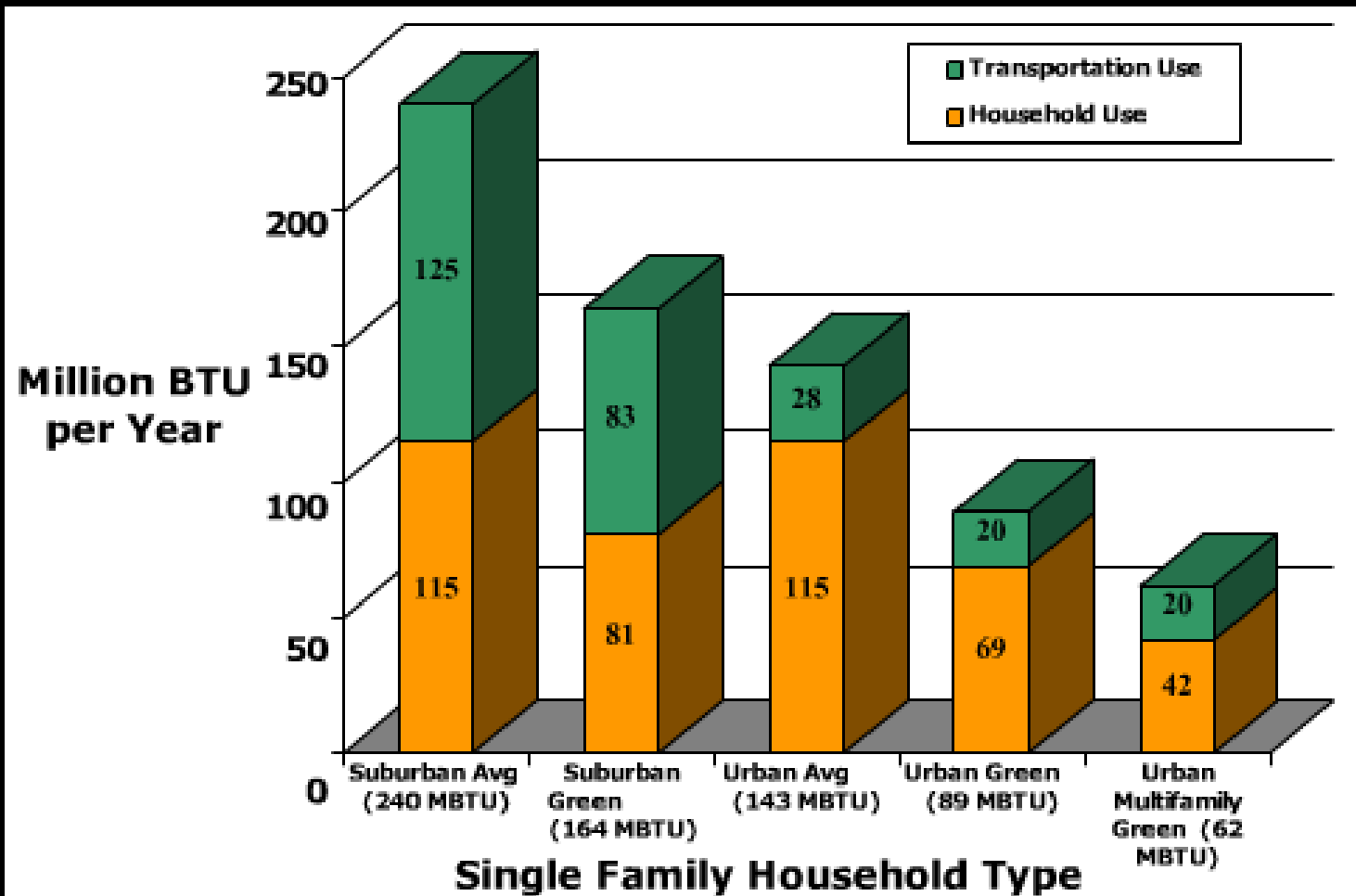
What percent do Commercial Buildings consume?



US Energy Consumed



Multifamily and Sustainability

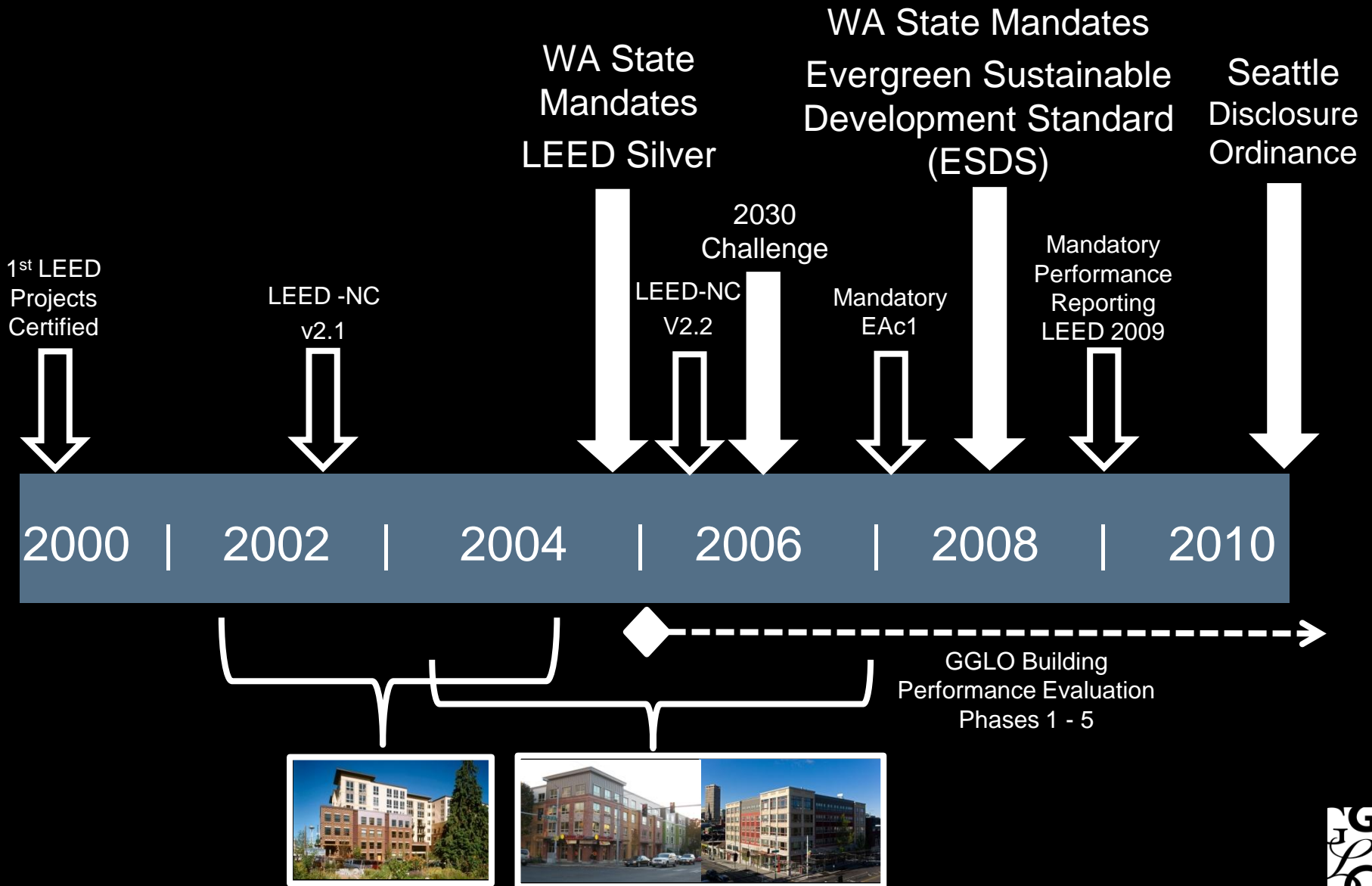


© Jonathan Rose Companies, LLC

Source: Jonathan Rose Companies



Multifamily and Sustainability



Participants



Capitol Hill Housing



Unico Properties LLC



Harbor Properties / Vulcan Inc



Housing Resources Group



King County Housing Authority



Low Income Housing Institute

Data Collected

- Water usage
- Electricity usage
- Natural Gas usage



- Analysis of Utility Consumption Includes:
 - Common Areas, Units & Parking
 - Exclude Retail Uses

Data Collected

Total Energy Use

(Units, Corridors, Common, Parking)

No Retail Energy Use

Heated Floor Area

(No Garage Area)

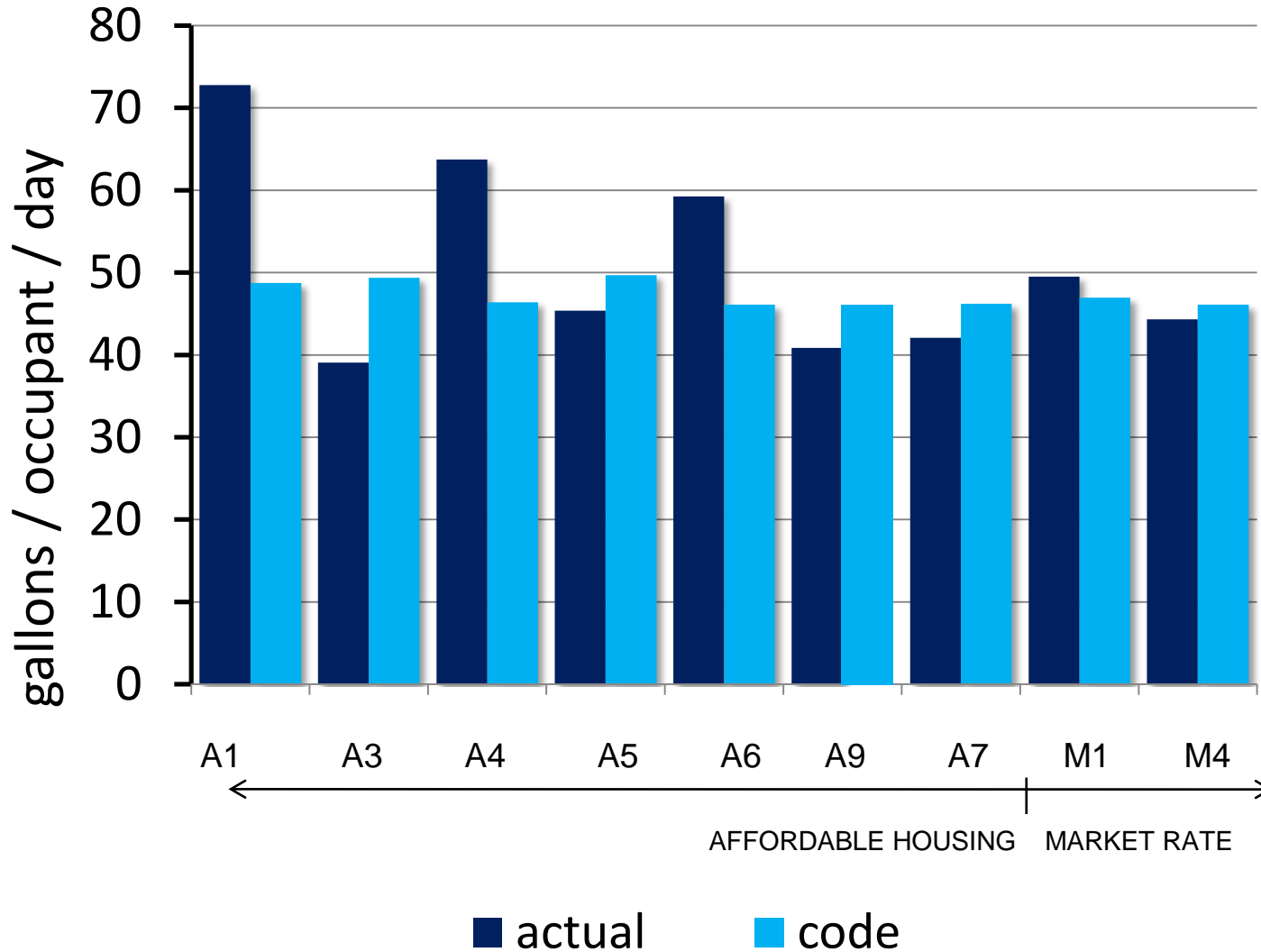
EUI

kBbtu / sf / yr

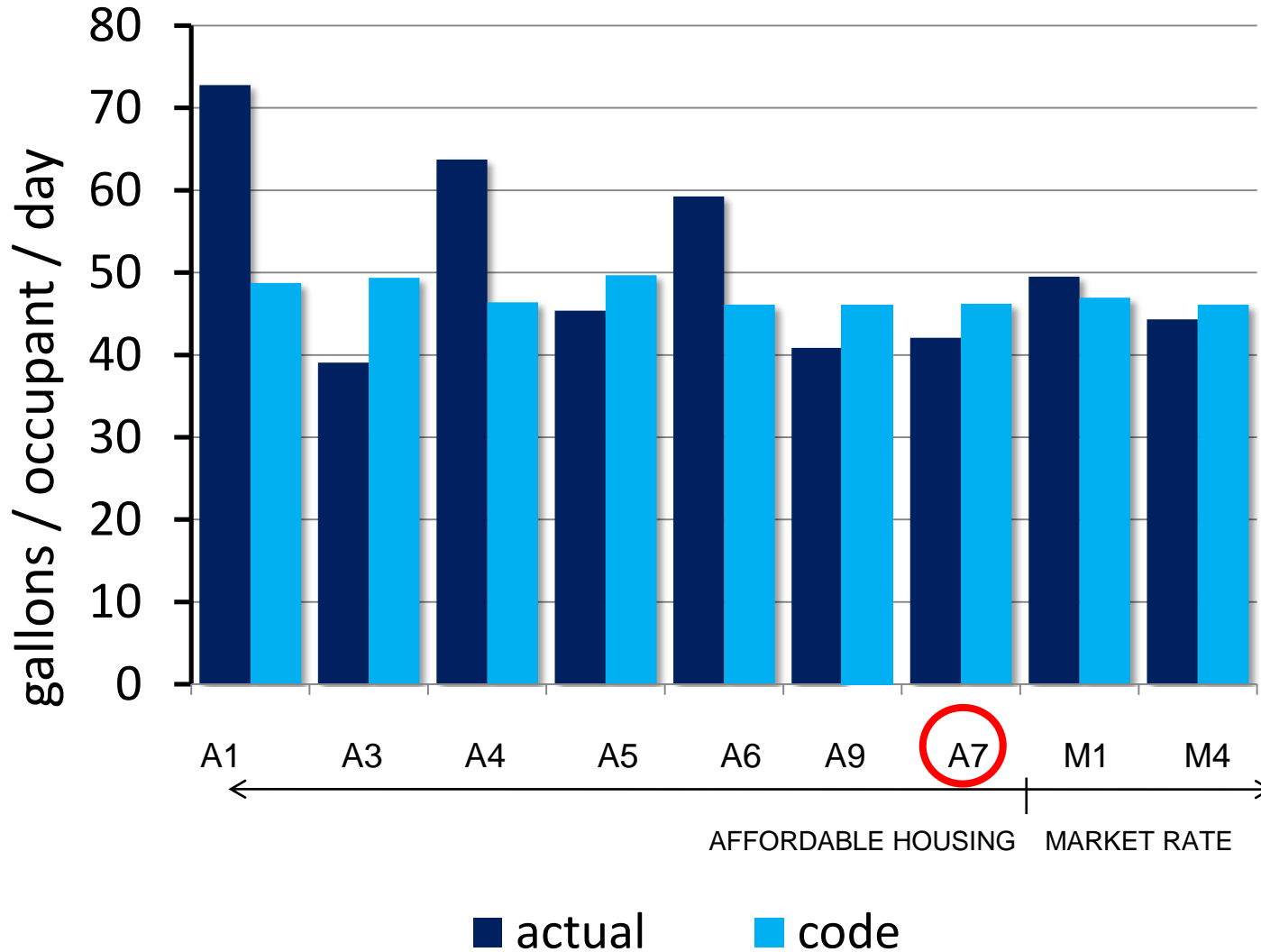
- Analysis of Utility Consumption Includes:
 - Common Areas, Units & Parking
 - Exclude Retail Uses



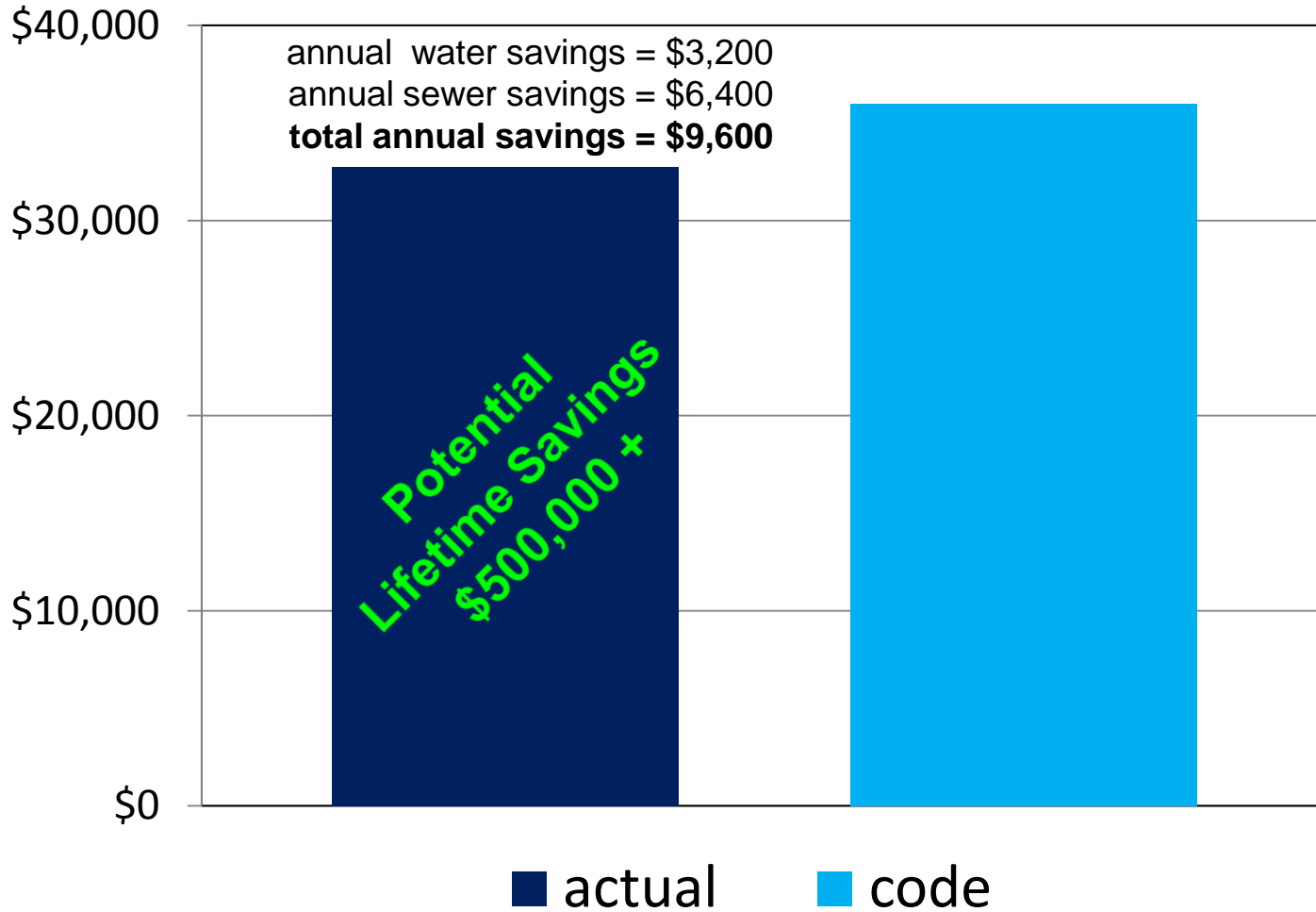
Water Use Per Occupant



Water Use Per Occupant



Annual Water Cost: A7

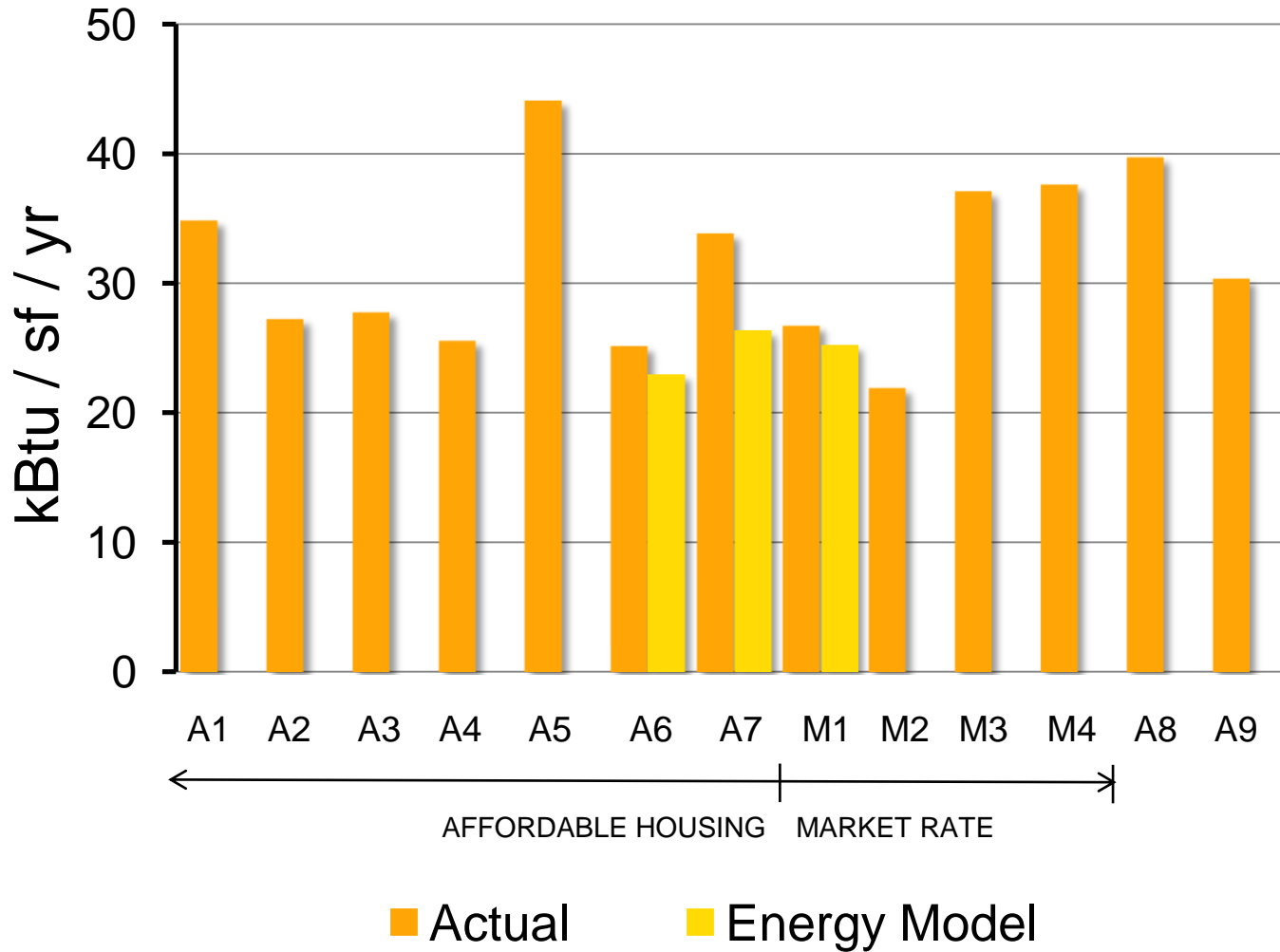


Water Data Trends

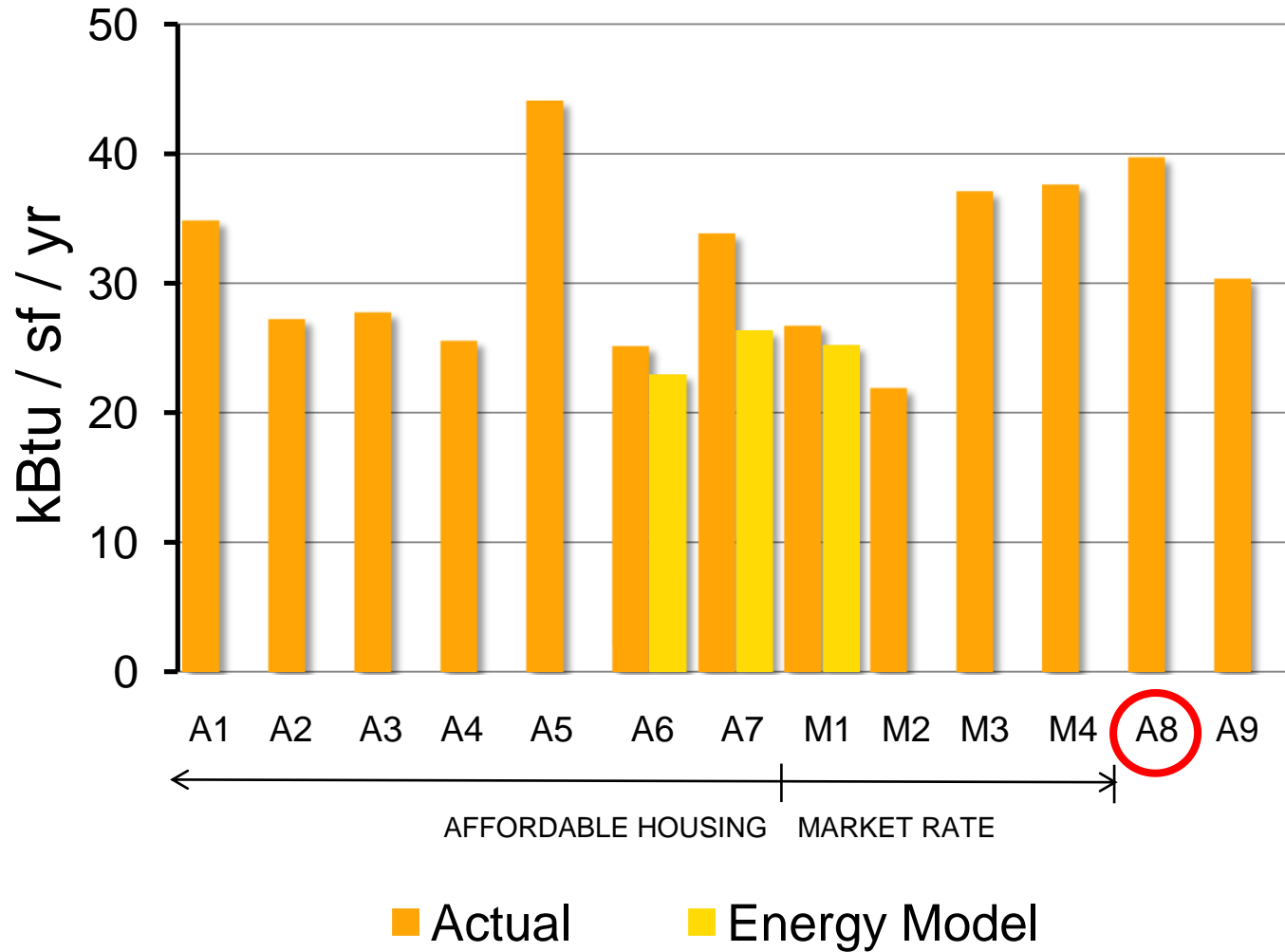


- No Combined Metering
- Water Saving Fixtures
- Short Term Payback
- Tenant Education

Total Electrical EUI

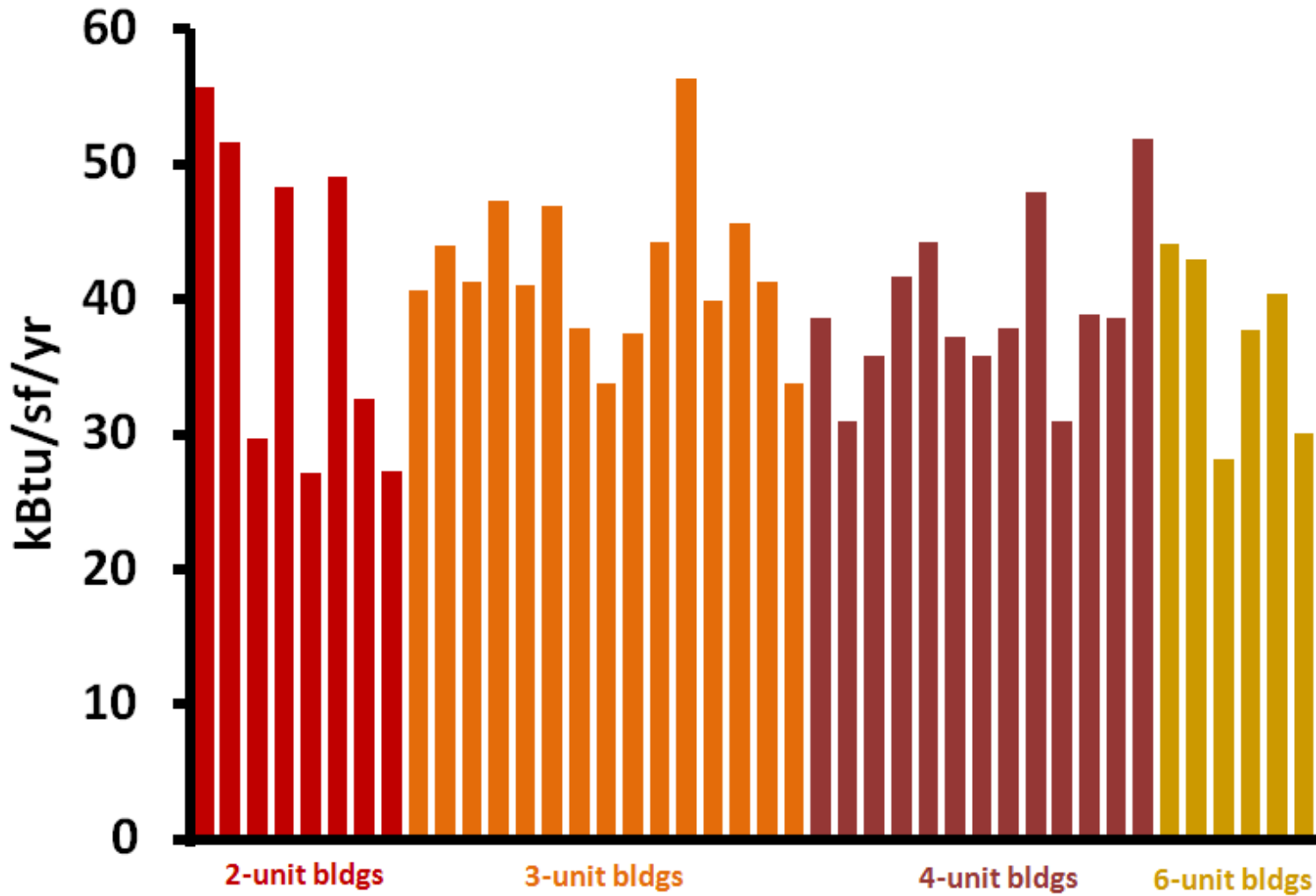


Total Electrical EUI



Total Electrical EUI

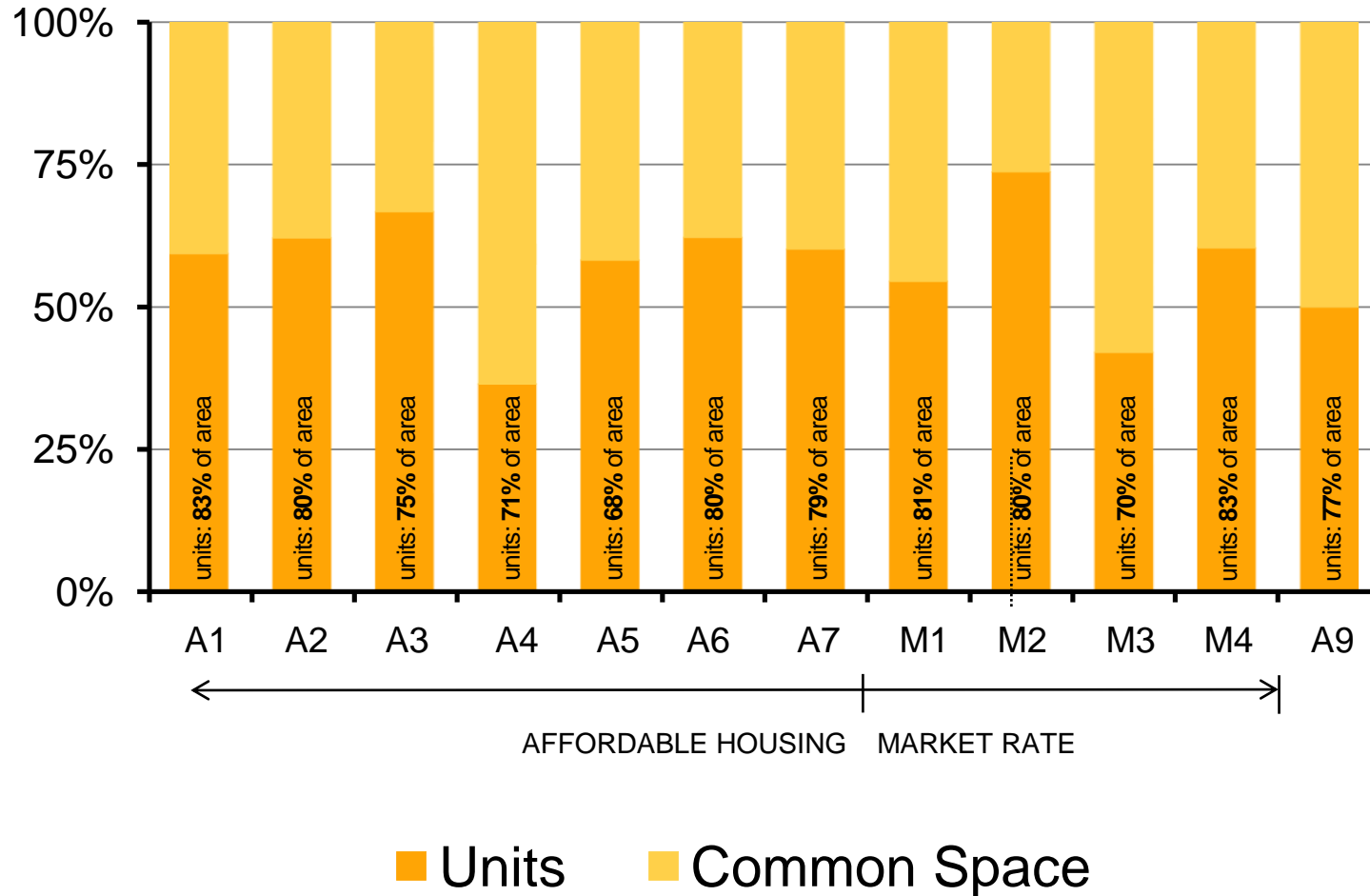
A8



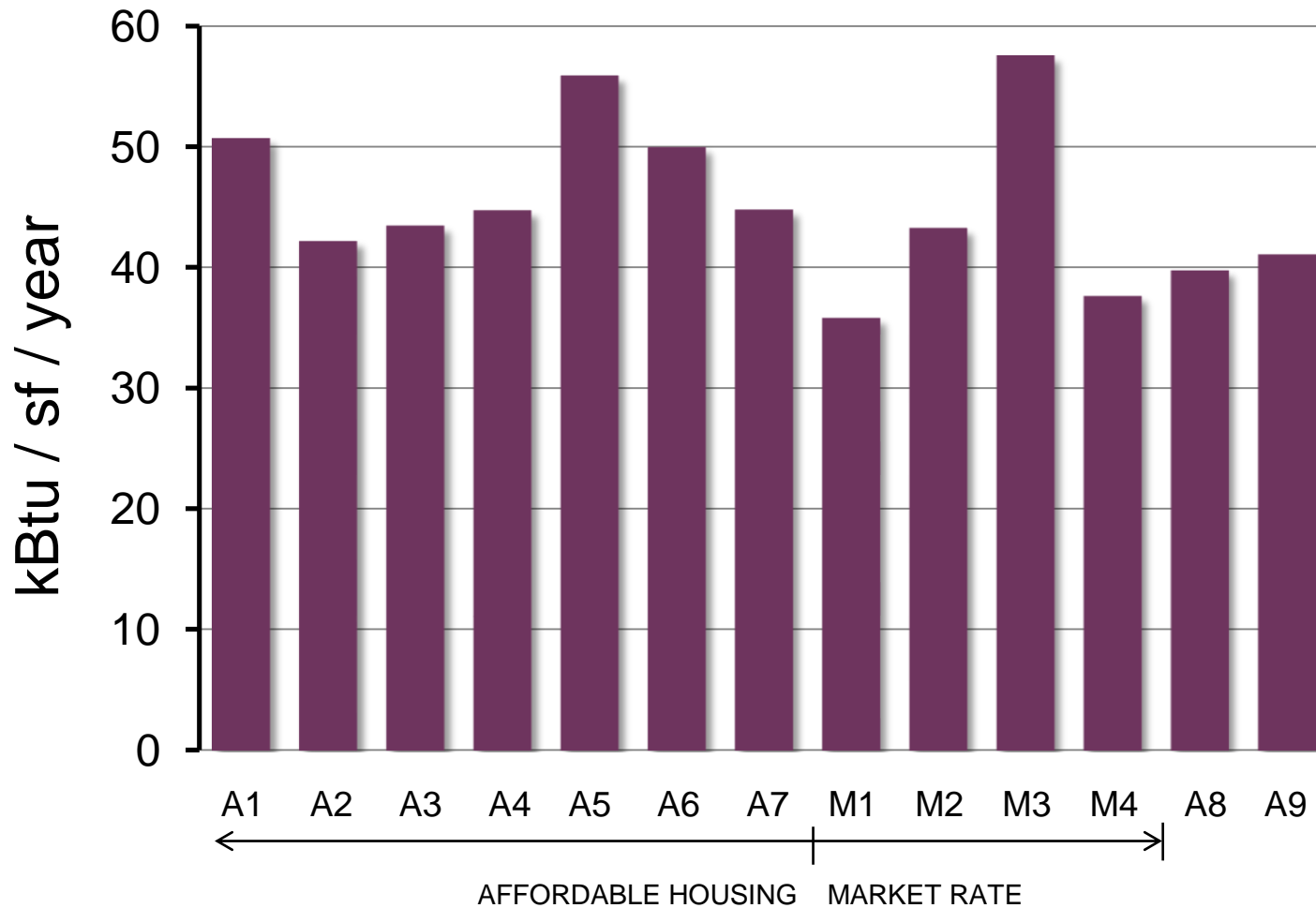
Units and Common Space



Fraction of Electrical Consumption



Total Energy Use Intensity



Energy Data Trends

- Building Envelope Important
 - Residential space heating is <15% of total energy
- Common Areas Significant
 - Ventilation system design – heat exchangers
- Hot Water (Heat & DHW)
 - Submetering
 - Insulating Water Lines
 - Boiler Efficiency
- Compare Buildings
- Re-Commission Regularly
- User Education



Project Data Sheet
[Project Name]

[Address]

Owner ?

Architect: ?

Contractor: ?

Completion Date: ?

Green Rating: ?

General Project Description:
[description]

Area	Count	Occupancy	Assumed Occupancy
Total Unit Count	0		0
# studio (inc. studio plus)	0		
# 1 br	0		
# 2 br	0		
# 3 br	0		
# 4 br	0		
Unit SF	1		
Common SF	1		
Residential SF (Units + Common)	2		
Retail SF	1		
Parking SF	1		
Other SF	1		
Total SF	5		

Systems

Domestic Hot Water Efficiency: Elect / Gas / Other (Describe) (Condensing Boiler etc?)

Space Heating Units: Elect / Gas / Other (Describe)

Heating System Type - Corridors: Elect / Gas / Other (Describe)

A/C: Y / N / Partial (Describe)

Alternate Energy: Y / N / Partial (Describe)

Other: ?

Fixtures

Low Flow Plumbing: Shower / Toilet / Sink / Lav (Describe)

High Efficiency Toilet: Y / N

Energy Star Appliances: Clothes Washer / DW / Ref / Range / Other

Central Laundry: Y / N / Partial

Energy Star Lighting: Y / N / Partial

Lighting Drawings Attached: Y / N / Partial

Metering Drawings Attached: Y / N / Partial

Mechanical Schedules Attached: Y/N

Envelope

Stories: ?

Framing: Wood / Steel / Concrete / Other

Wall Insulation: ?

Roof Insulation: ?

Floor Insulation: ?

Glazing %: ?

Window U Value: ?



2030 Challenge

- What is the residential target?
 - EIA - Energy Information Administration
 - RECS - Residential Energy Consumption Survey



2030 CHALLENGE Targets: U.S. Residential Regional Averages

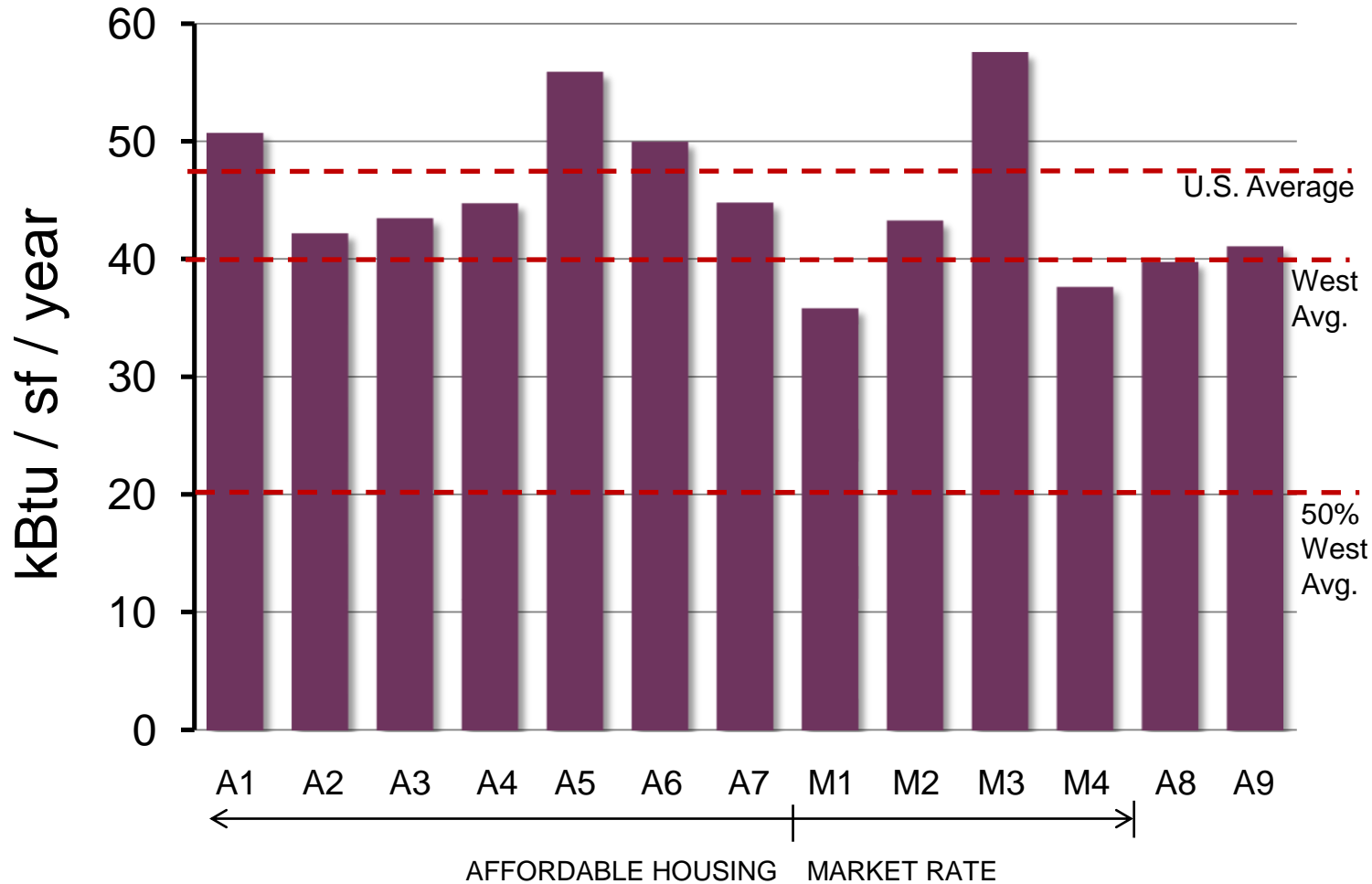


U.S. Regional Averages for Site Energy Use and 2030 Challenge Energy Reduction Targets by Residential Space/Building Type (RECS 2001)¹
 From the Environmental Protection Agency (EPA): Use this chart to find the site fossil-fuel energy targets.

Residential Space/Building Type ²	Average Source EUI ^{3,4} (kBtu/Sq.Ft./Yr)	Average Site EUI ^{3,5} (kBtu/Sq.Ft./Yr)	2030 Challenge Site EUI Targets (kBtu/Sq.Ft./Yr)				
			50% Target	60% Target	70% Target	80% Target	90% Target
West							
Single-Family Detached	67.2	38.4	19.2	15.4	11.5	7.7	3.8
Single-Family Attached	63.2	38.8	19.4	15.5	11.6	7.8	3.9
Multi-Family, 2 to 4 units	87.3	47.6	23.8	19.1	14.3	9.5	4.8
Multi-Family, 5 or more units	81.7	40.0	20.0	16.0	12.0	8.0	4.0
Mobile Homes	128.2	65.8	37.0	26.3	19.7	13.2	6.6

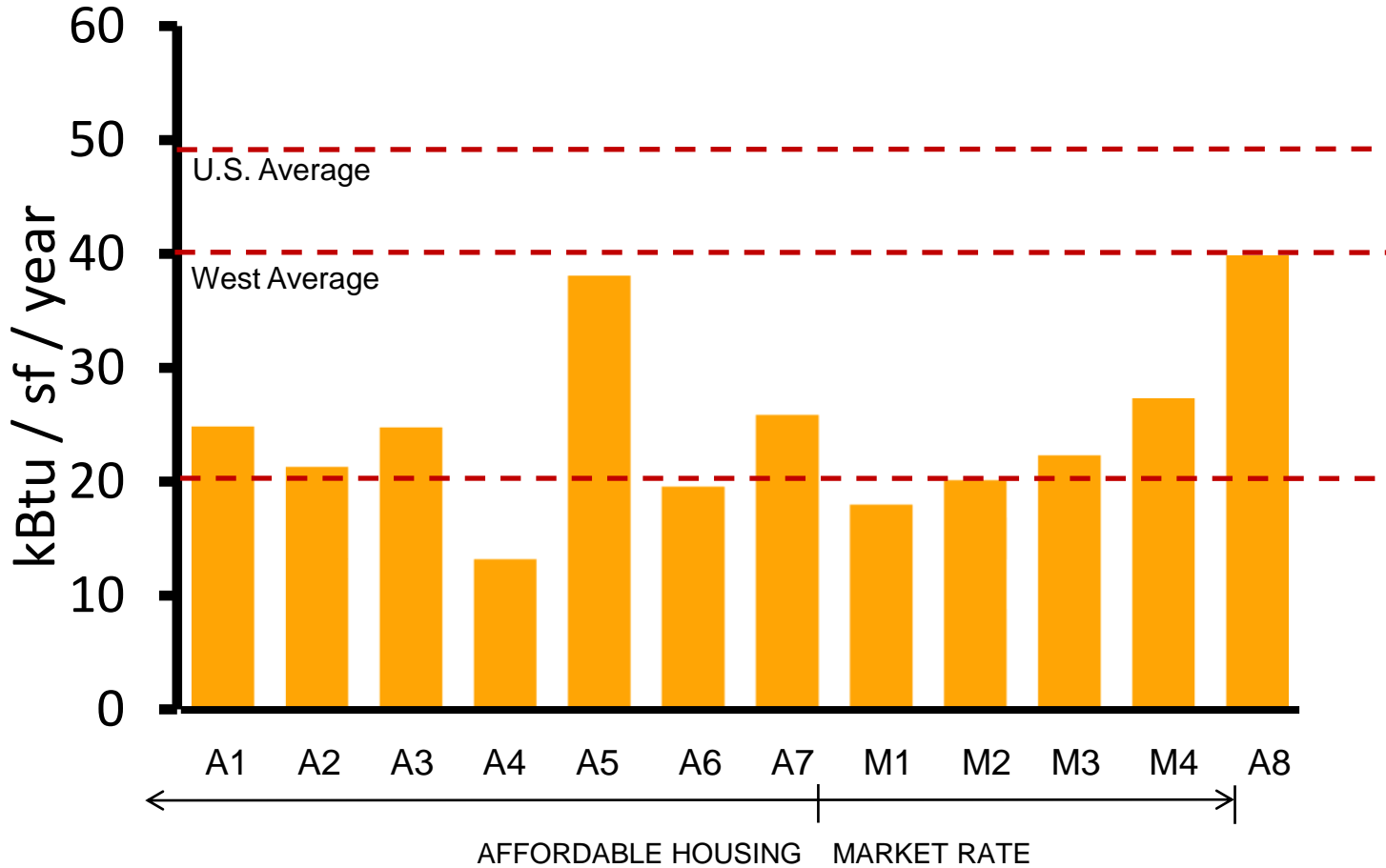


Total Energy Use Intensity



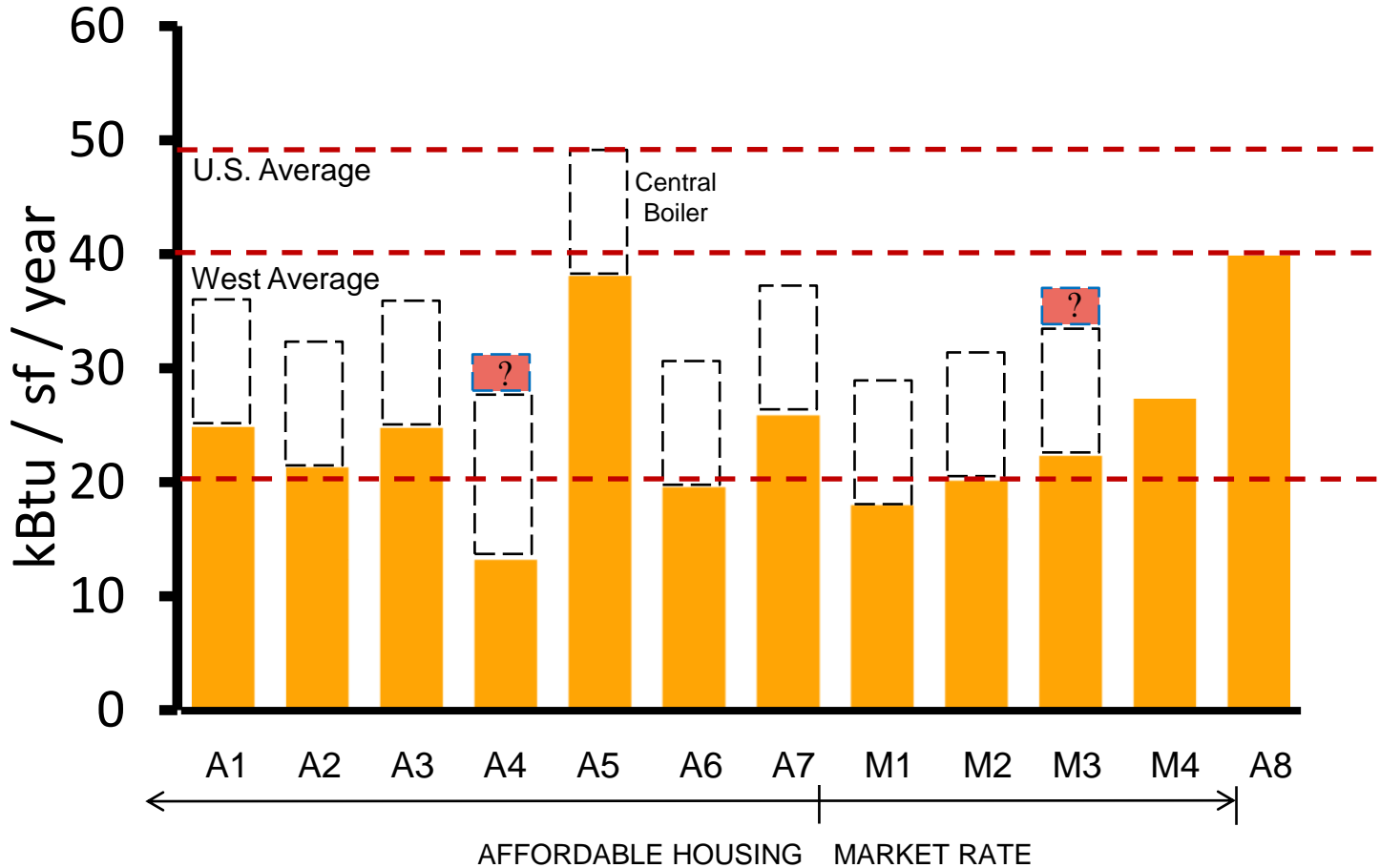
Elec. Energy Use Intensity

Units Only



Elec. Energy Use Intensity

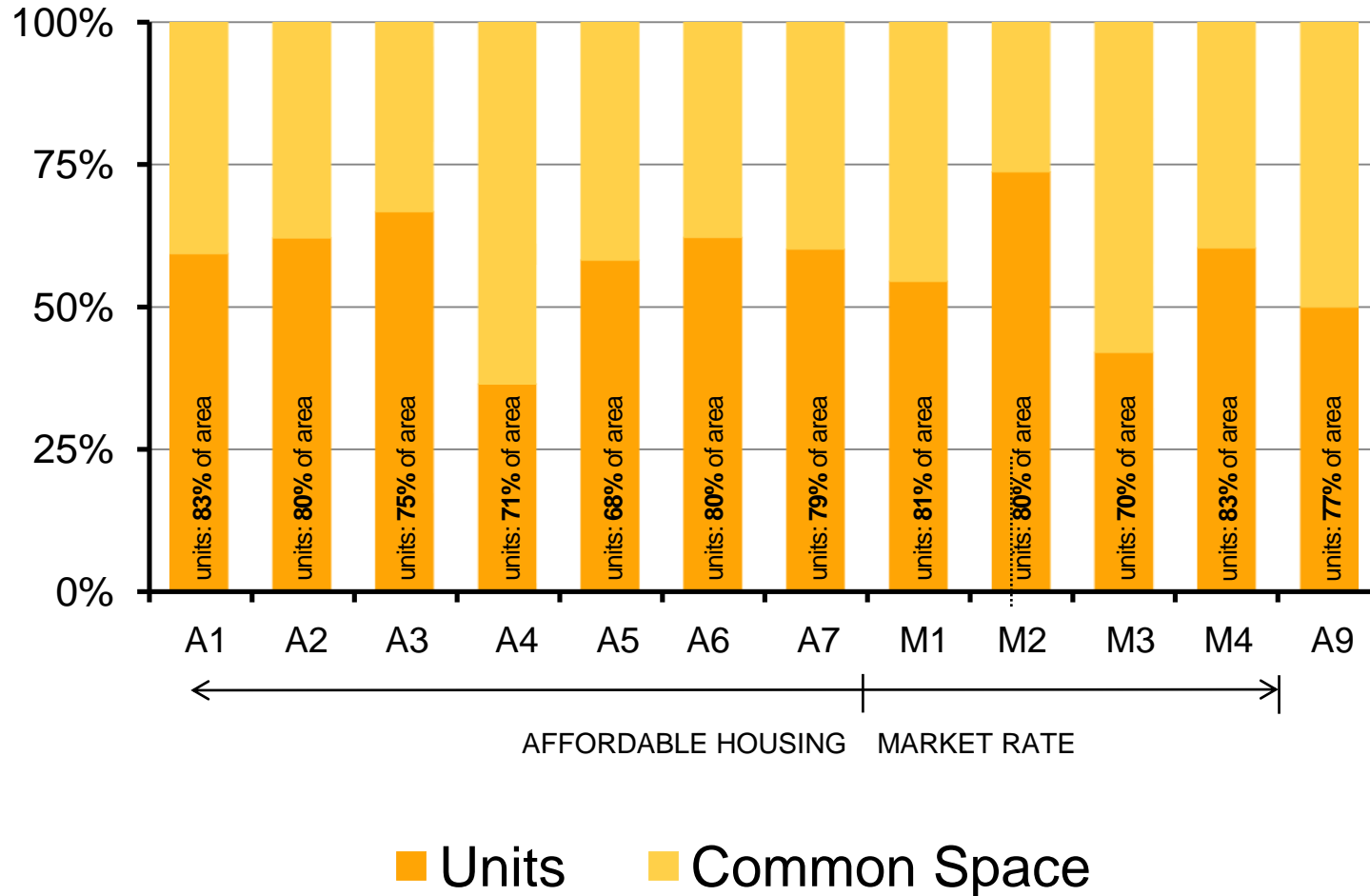
Units Only



Units and Common Space

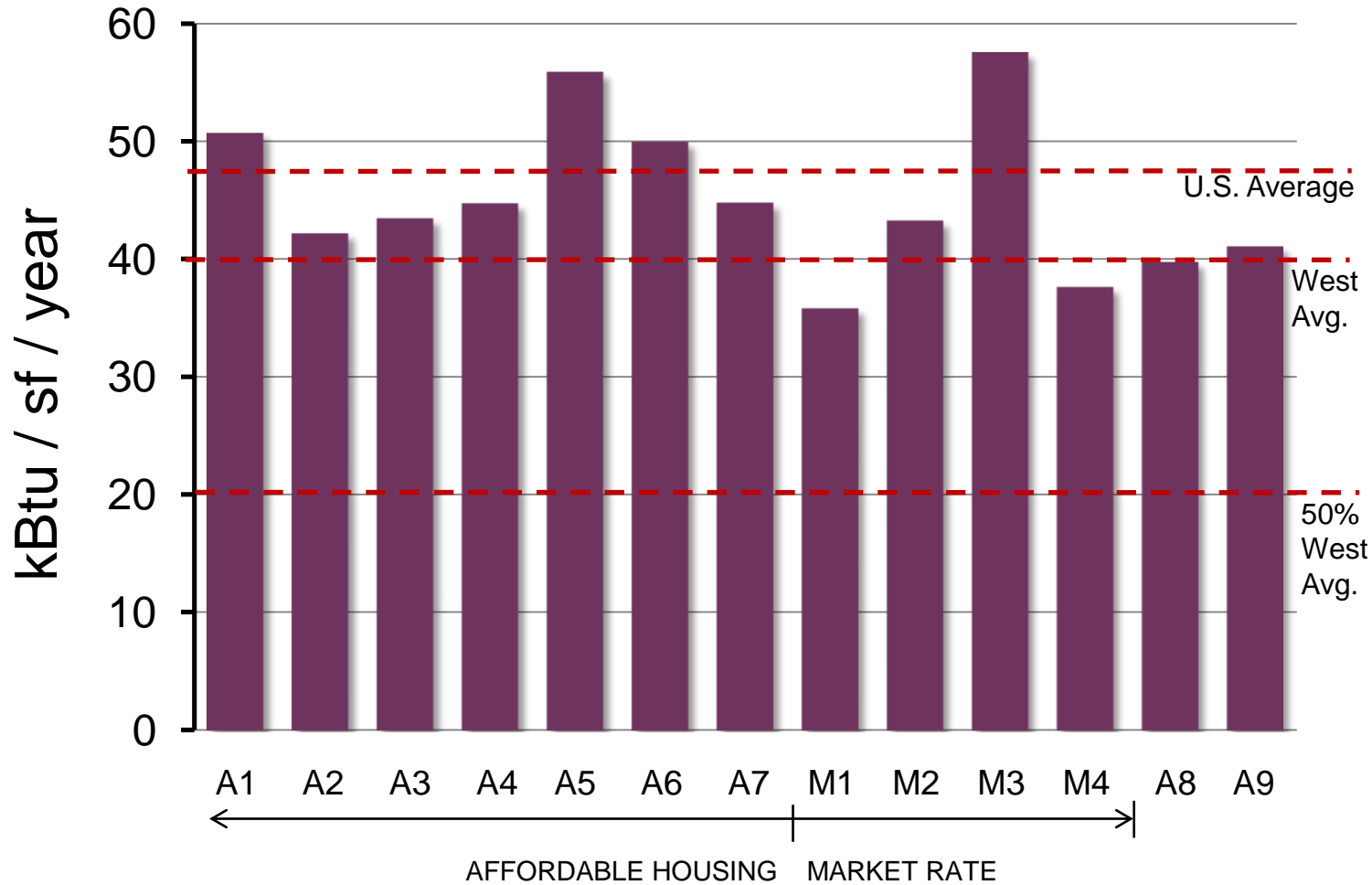


Fraction of Electrical Consumption

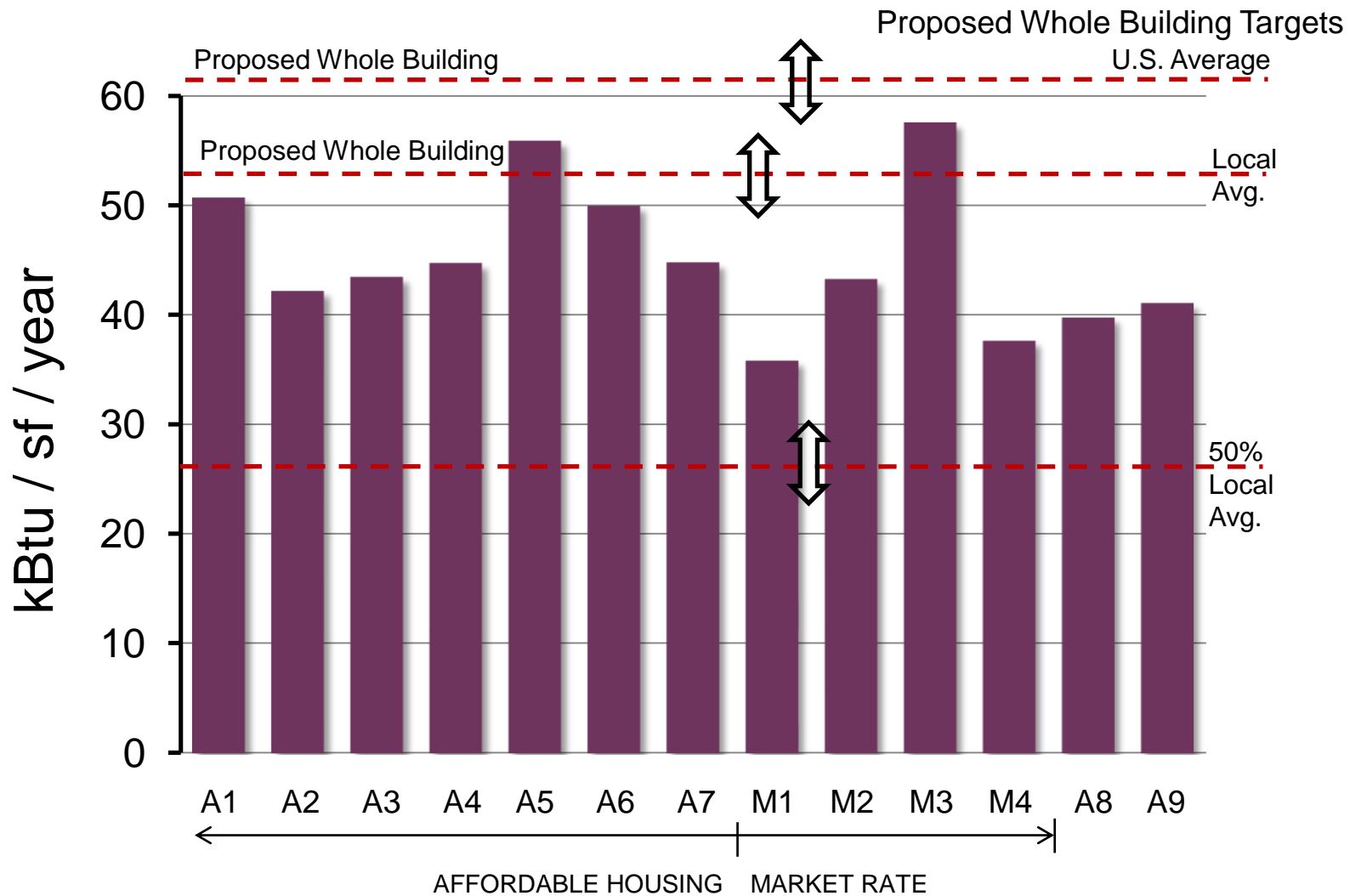


Total Energy Use Intensity

RECS Unit Targets



Total Energy Use Intensity



2030 Challenge Targets

- AIA 2030 Commitment Roundtable
- www.gglo.com/insight

