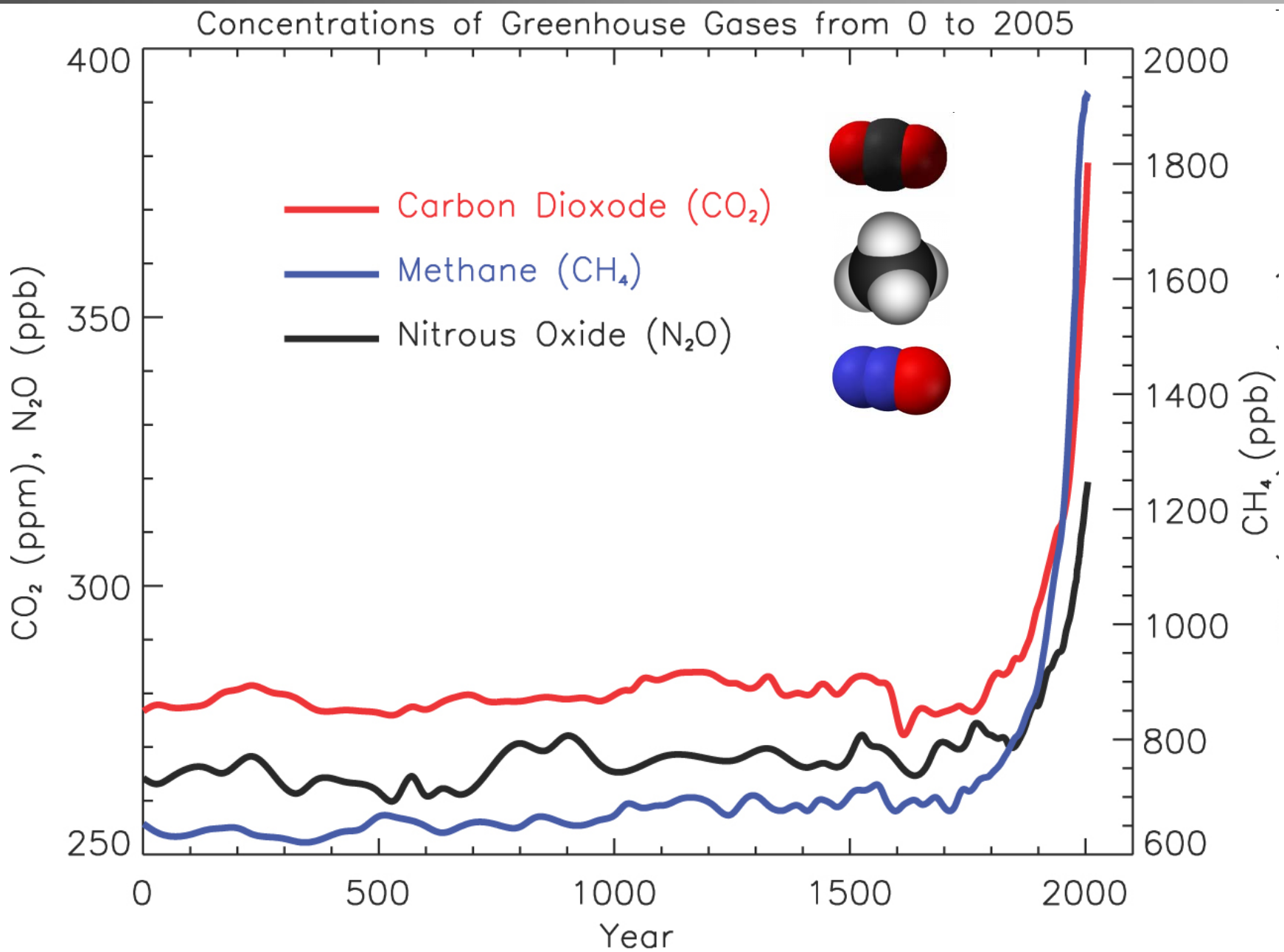
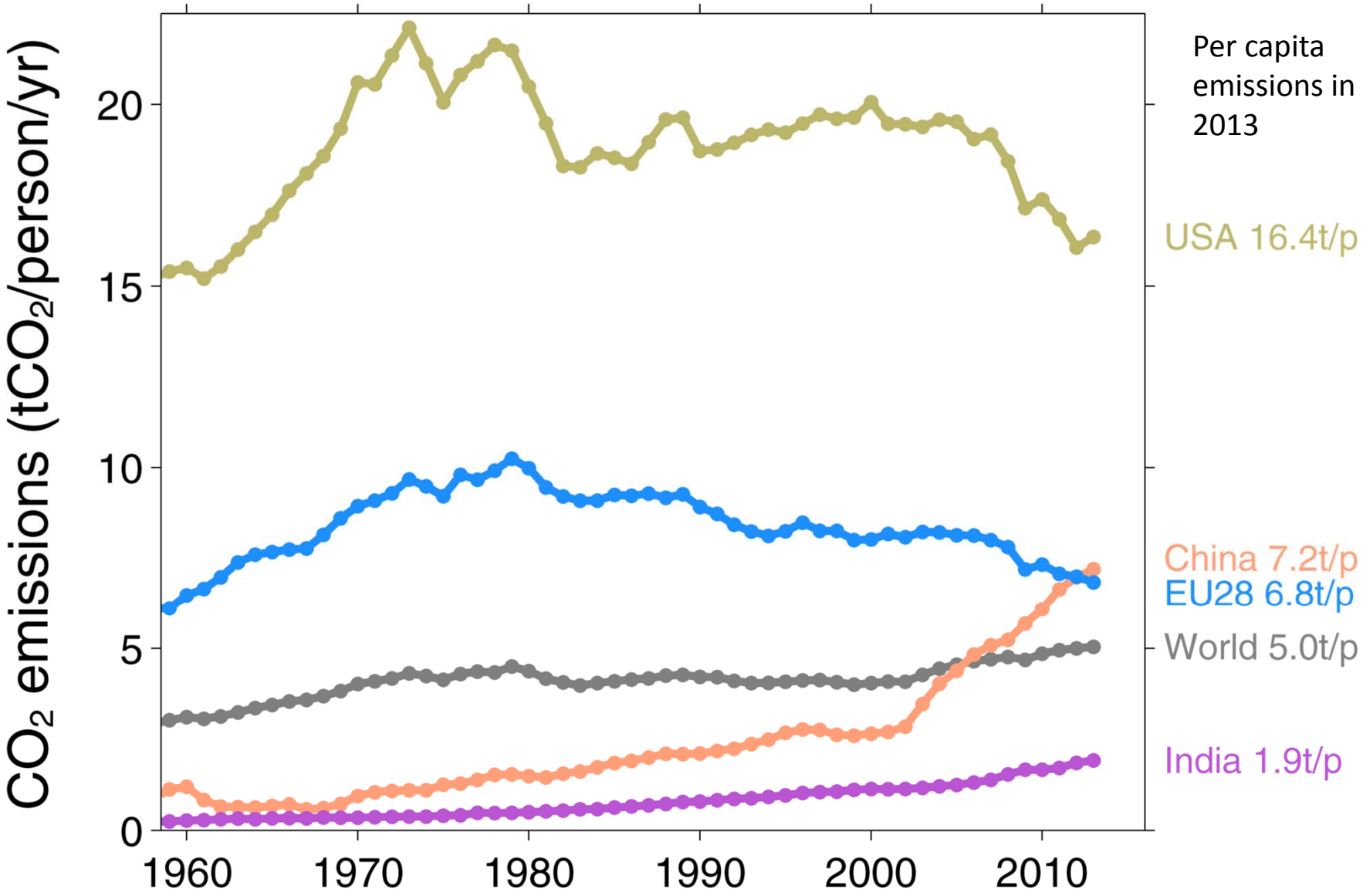
BuildSmart Version 2.0

This draft is a component of 2015 I-Code Adoption

Greenhouse Gases



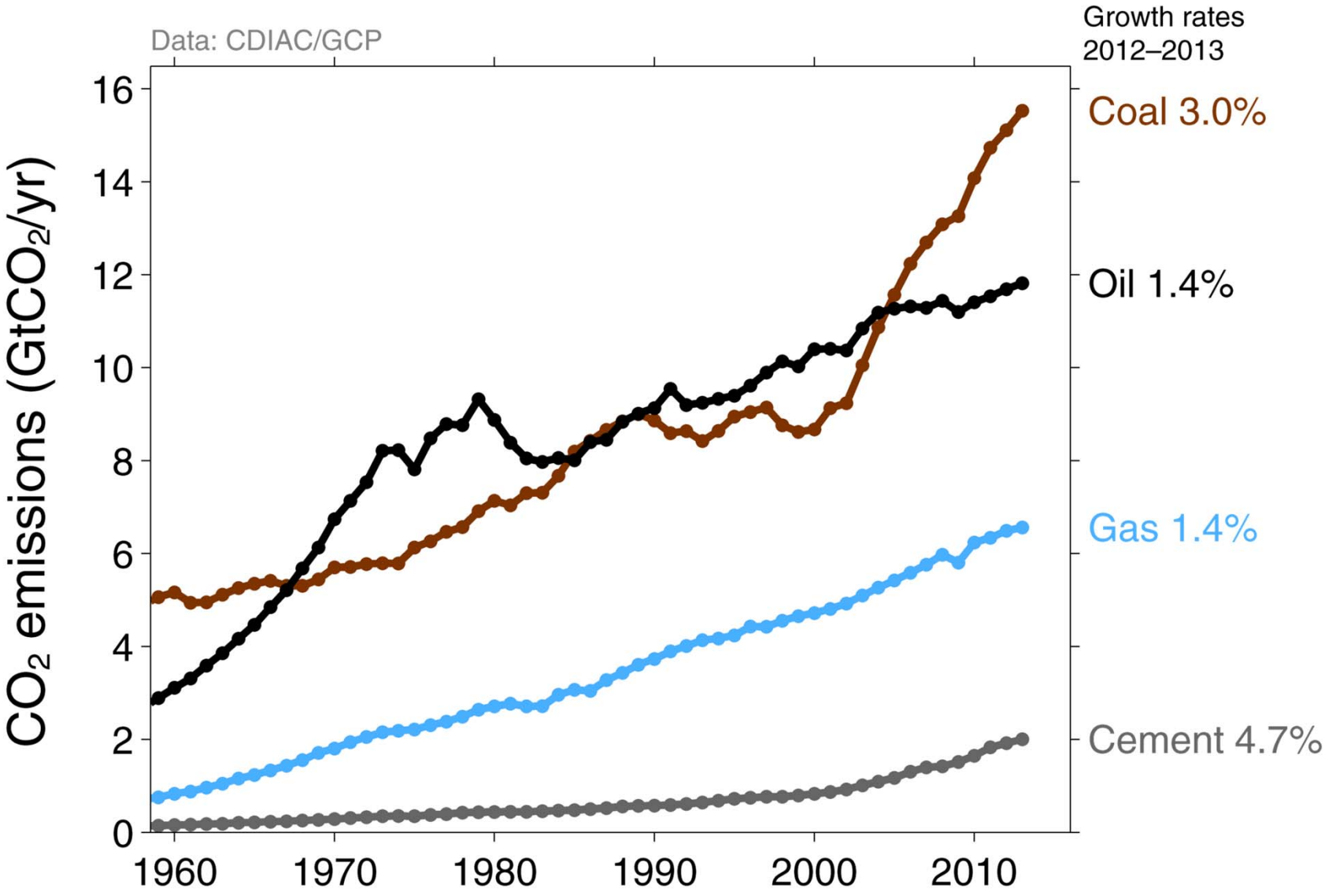
Top Fossil Fuel Emitters (Per Capita)



Source: CDIAC; Le Quéré et al 2014; Global Carbon Budget 2014

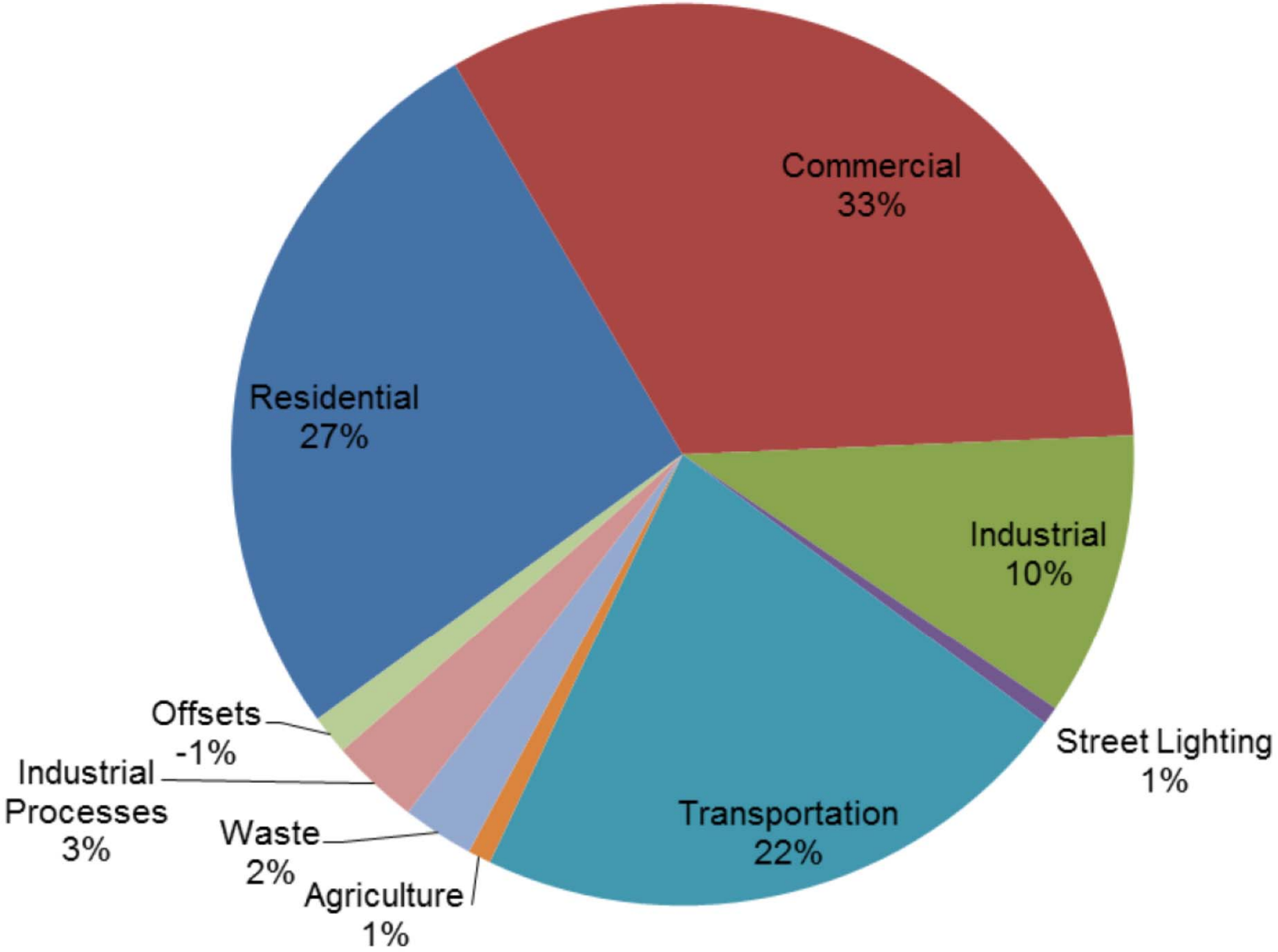
Share of global emissions in 2013

coal (43%), oil (33%), gas (18%), cement (6%), flaring (1%, not shown)

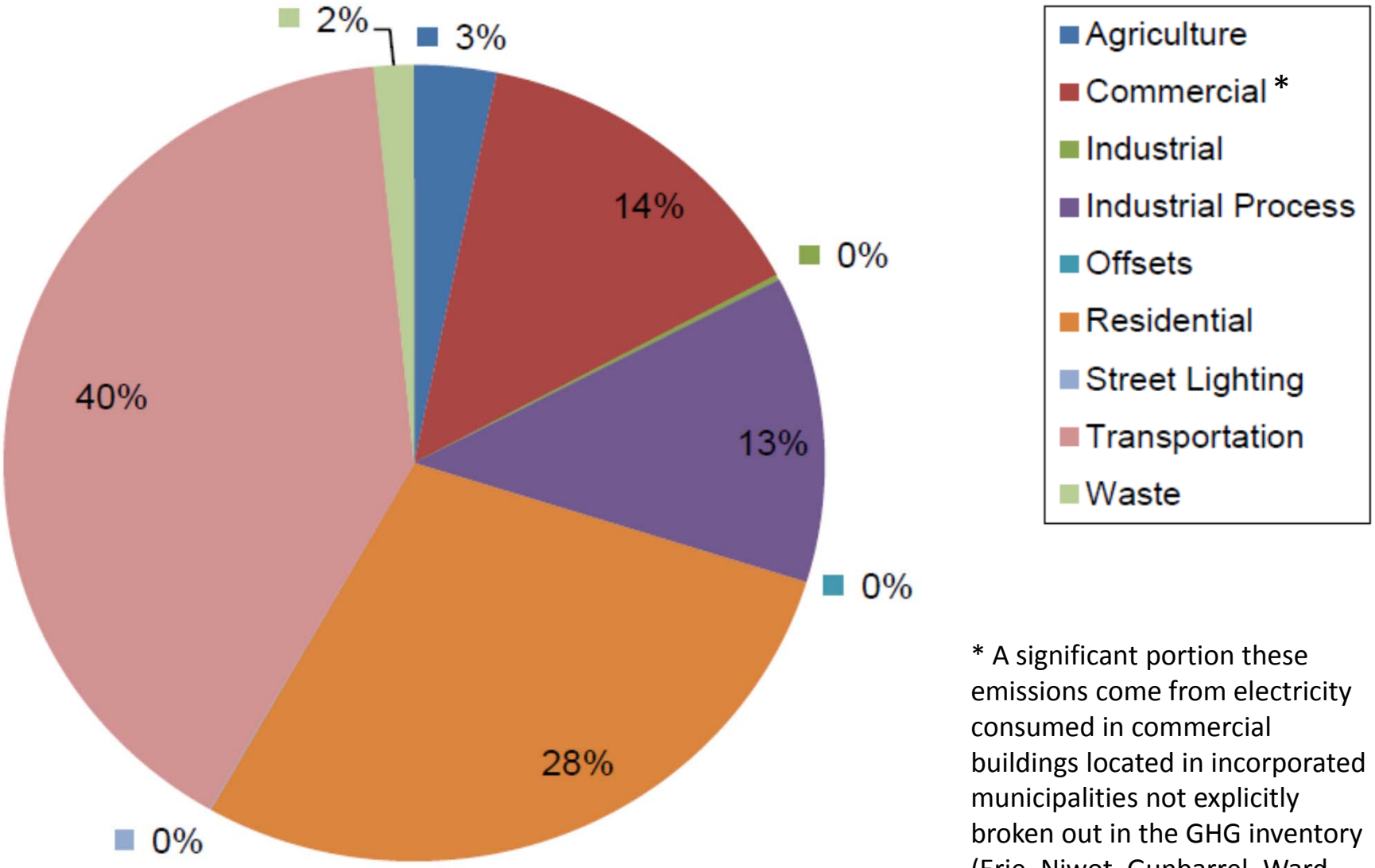


Source: CDIAC; Le Quéré et al 2014; Global Carbon Budget 2014

All of Boulder County - Emissions by Economic Sector (2011 data)

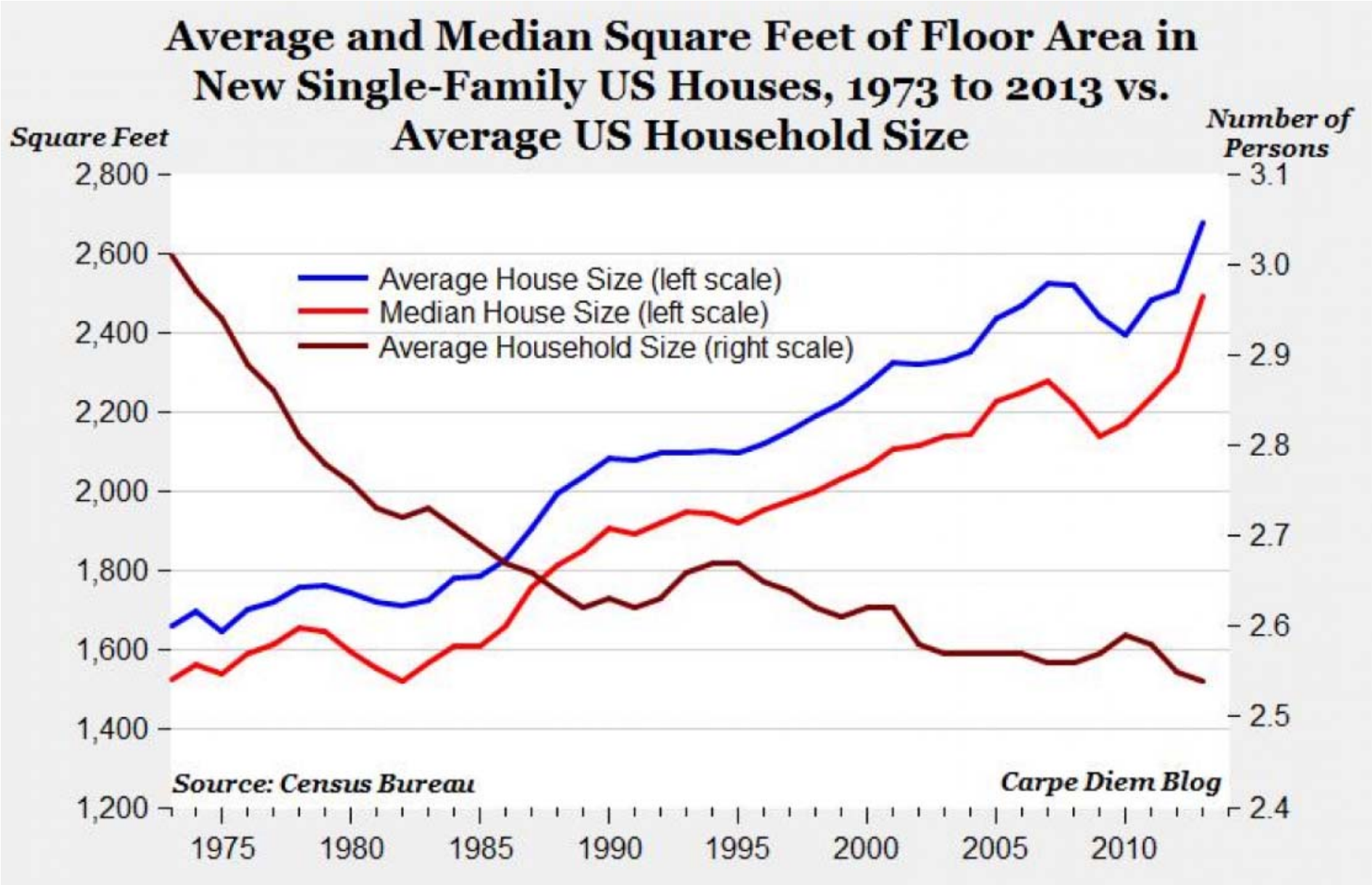


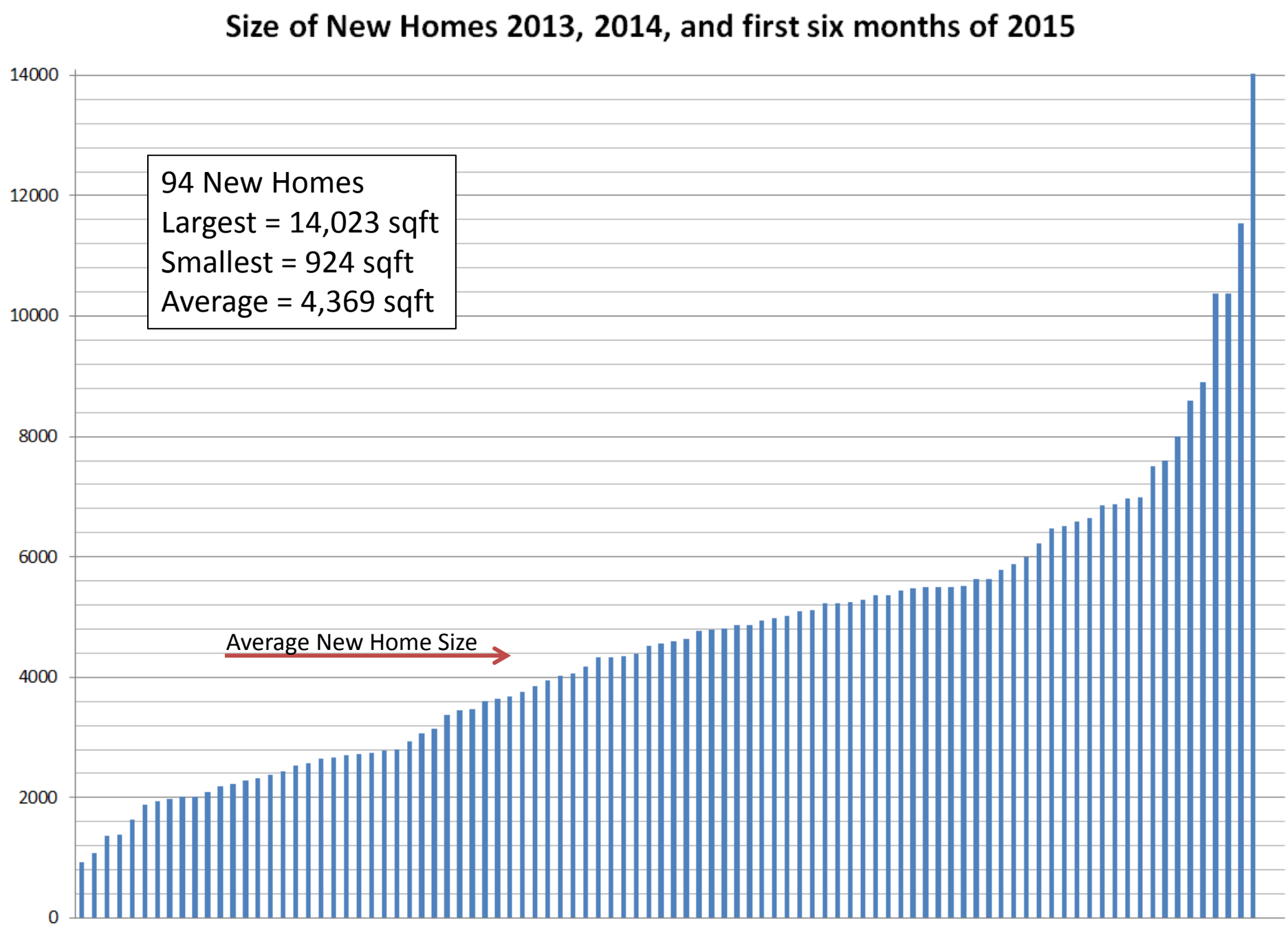
Unincorporated Boulder County - Emissions by Economic Sector (2011 data)



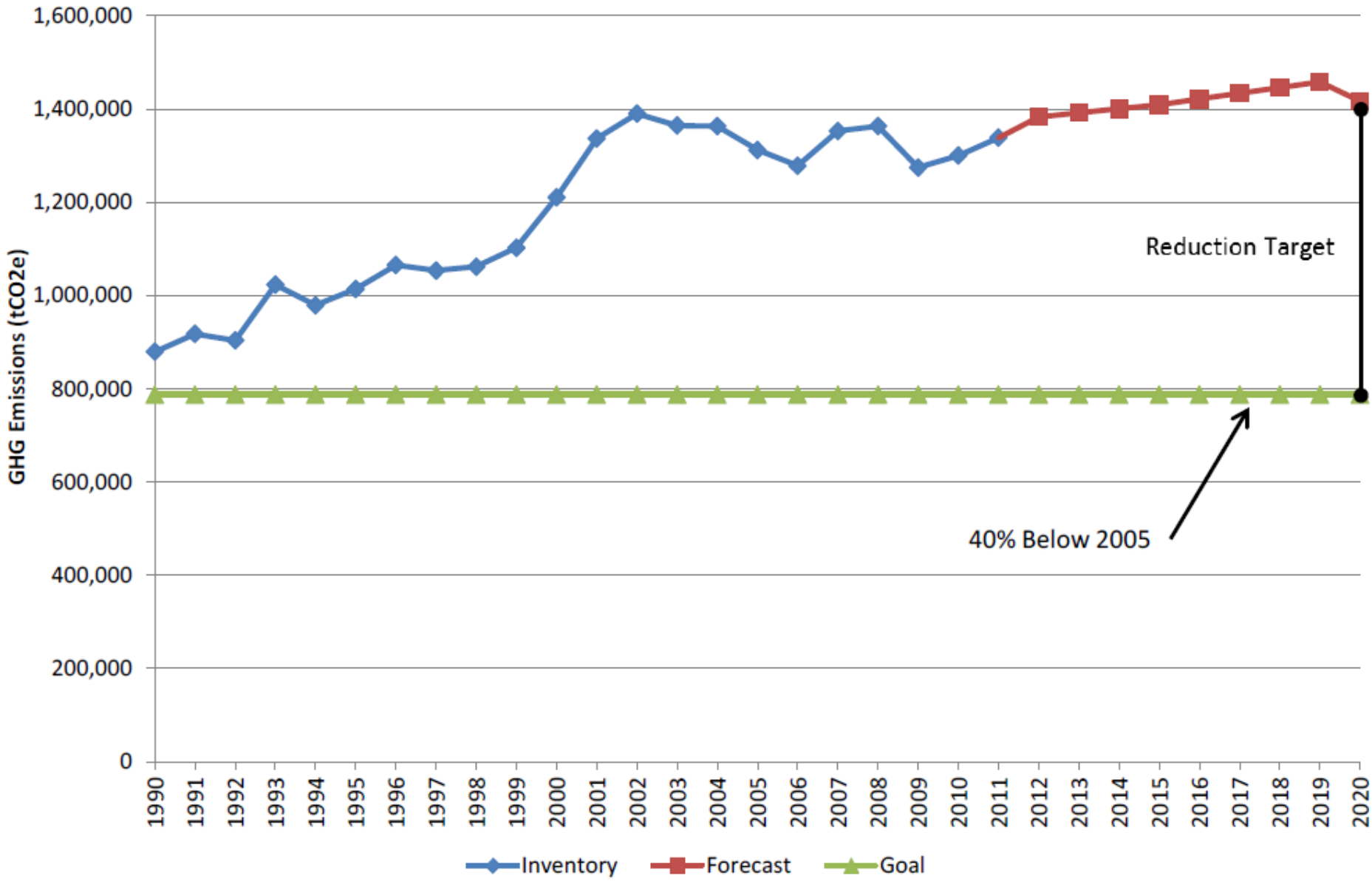
* A significant portion these emissions come from electricity consumed in commercial buildings located in incorporated municipalities not explicitly broken out in the GHG inventory (Erie, Niwot, Gunbarrel, Ward, and others).

Background


Average and Median Square Feet of Floor Area in New Single-Family US Houses, 1973 to 2013 vs. Average US Household Size
Square Feet
Number of Persons
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
3.1
3.0
2.9
2.8
2.7
2.6
2.5
2.4
Average House Size (left scale)
Median House Size (left scale)
Average Household Size (right scale)
Source: Census Bureau
Carpe Diem Blog
1975
1980
1985
1990
1995
2000
2005
2010


Size of New Homes 2013, 2014, and first six months of 2015
14000
12000
10000
8000
6000
4000
2000
0
94 New Homes
Largest = 14,023 sqft
Smallest = 924 sqft
Average = 4,369 sqft
Average New Home Size

All of Boulder County: Residential Sector – Target and Outlook



BuildSmart 2.0

Up to 3500 sqft (choose 1)

- IRC Chapter 11 (as modified) "Prescriptive Path"
- IRC "ERI" path (as modified by Table 1)

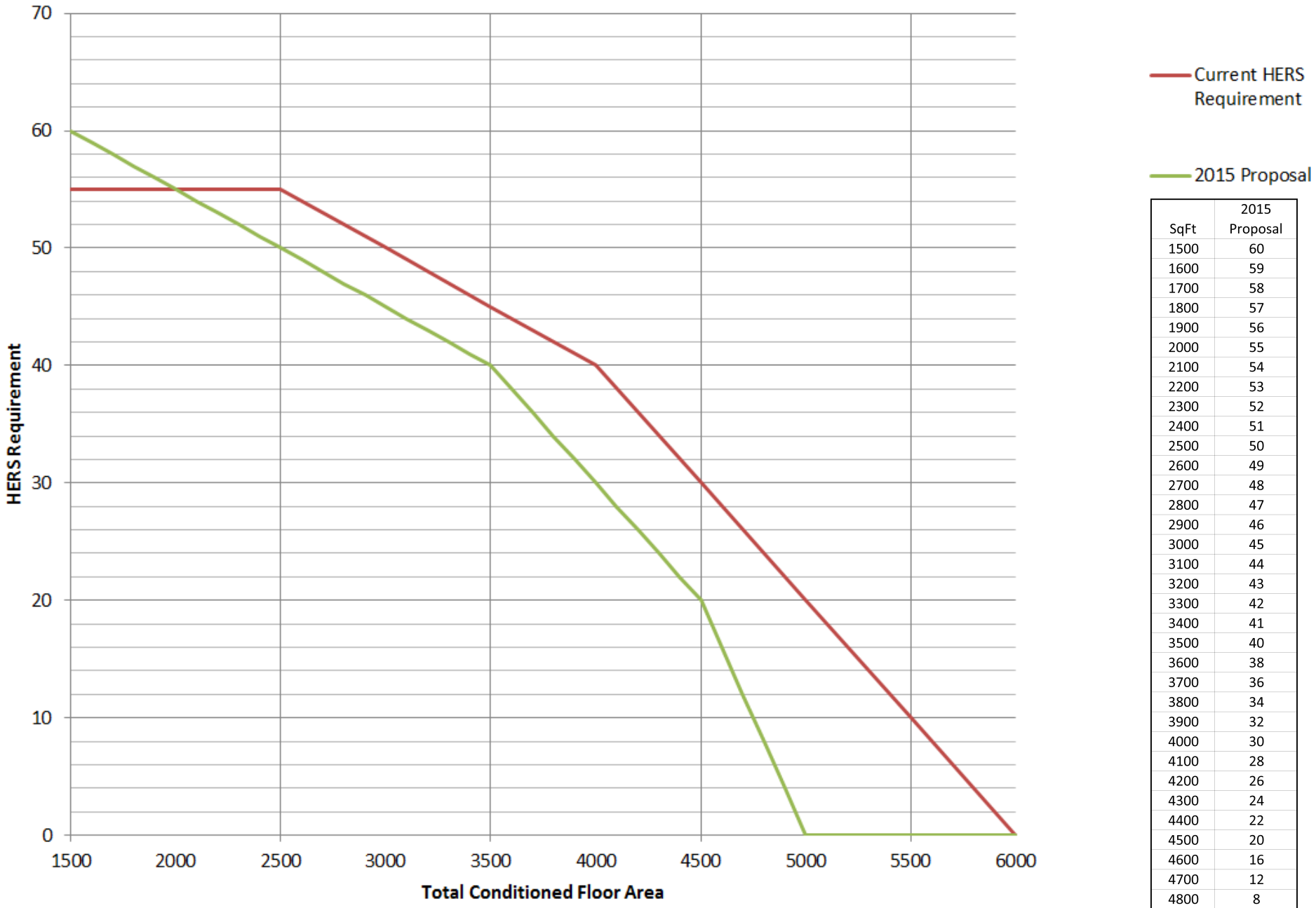
Over 3500 sqft (Choose 2)

- IRC "ERI" path (as modified by Table 1)
- Energy Star Version 3 certification
- Passive House, LEED Platinum, or Living Building Challenge

Over 5000 sqft (Choose 2)

- IRC "ERI" path (as modified by Table 1)
  HERS 50 (Before PV)
  HERS = 0 with PV
- DOE Zero Energy Ready Home Certification
- Passive House, LEED Platinum, or Living Building Challenge

Table 1 – New Construction



SqFt	2015 Proposal
1500	60
1600	59
1700	58
1800	57
1900	56
2000	55
2100	54
2200	53
2300	52
2400	51
2500	50
2600	49
2700	48
2800	47
2900	46
3000	45
3100	44
3200	43
3300	42
3400	41
3500	40
3600	38
3700	36
3800	34
3900	32
4000	30
4100	28
4200	26
4300	24
4400	22
4500	20
4600	16
4700	12
4800	8
4900	4
5000	0

Remodels and Renovations

Work that exposes thermal envelope cavities

- Exposed Cavities must be airsealed and filled with insulation

Kitchen Remodels (Choose 2)

- EnergySmart Advising
- Vented Range Hood
- Choose 1 "Retrofit Measure"

Finishing Basement (Choose 2 + Radon)

- Energy Smart Audit and Advising
- Insulate Basement Walls per precriptive table
- Blower door directed Air Sealing of basement before insulation

Work with material costs greater than $60,000 (choose 2)

- EnergySmart Audit and Advising
- HERS 70 or Lower
- Choose 5 "Retrofit Measures"

"Retrofit Measures"

Replace Furnace with Condensing Appliance

Replace Water Heater with Condensing Appliance

Air sealing (must achieve 5 ach @ 50pa)

Provide blower door test results by a credentialed third party indicating the building has achieved 5 ACH @ 50 pa or lower. Alternatively, demonstrate verified reduction of 60% or greater.

Electric Vehicle Charging receptacle

Provide at least one Level 2 (240-volt) electric vehicle charging receptacle outlet

Balanced Mechanical Ventilation

Must be sized to achieve compliance with ASHRAE 62.2. Must be Balanced (no supply ony or exhaust only)

Water efficiency retrofits

WaterSense labeled plumbing fixtures (choose 1):

- All Toilets, Bathroom Faucets, and Showerheads (Tamper resistant aerators are acceptable)
- Energy Star certified clothes washer and dishwasher

Radon System (Required if conditioned crawlspace or finishing basement)

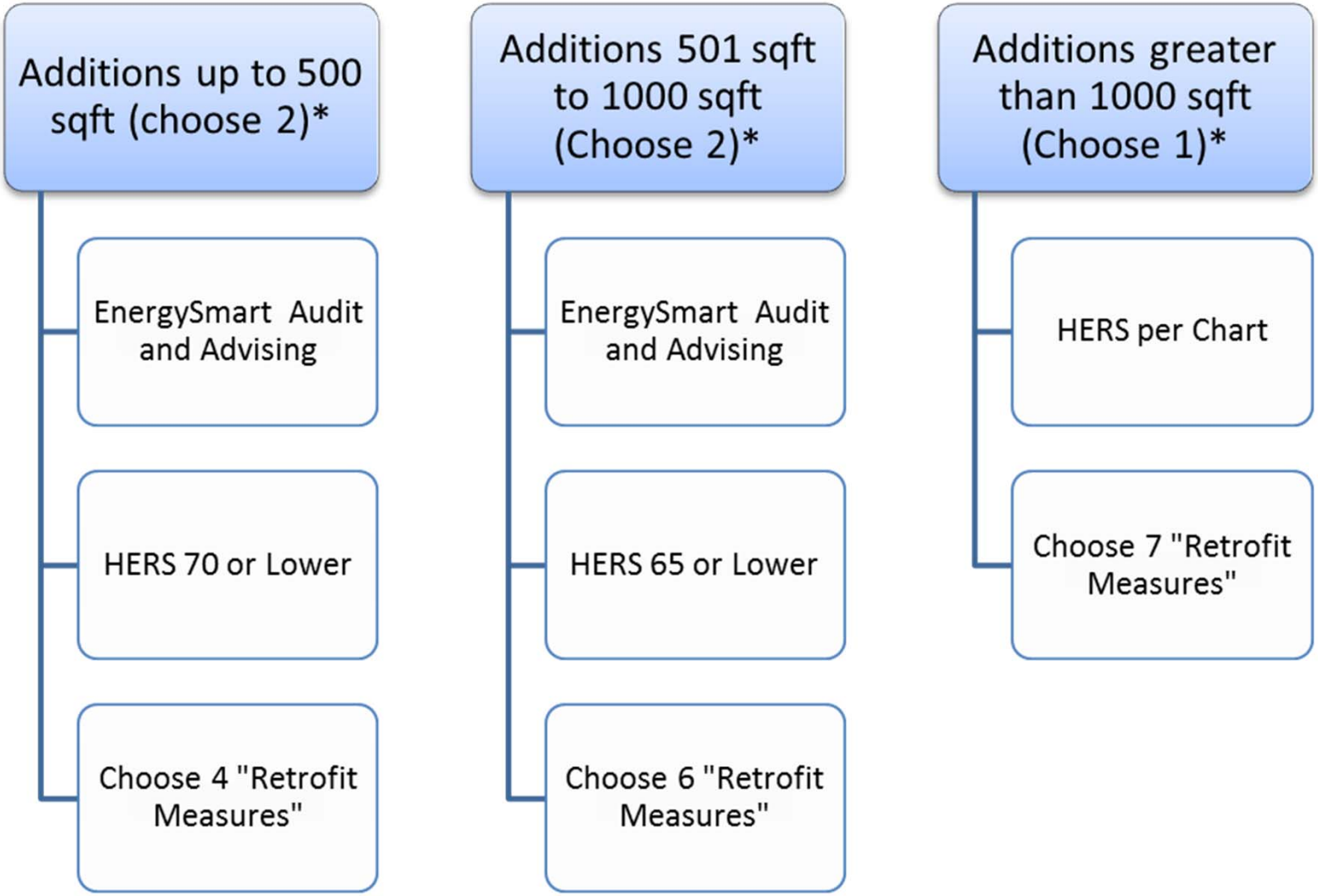
Active System, or passive system with fan location prewire

PV system

Minimum size is 30% of annual electrical consumption

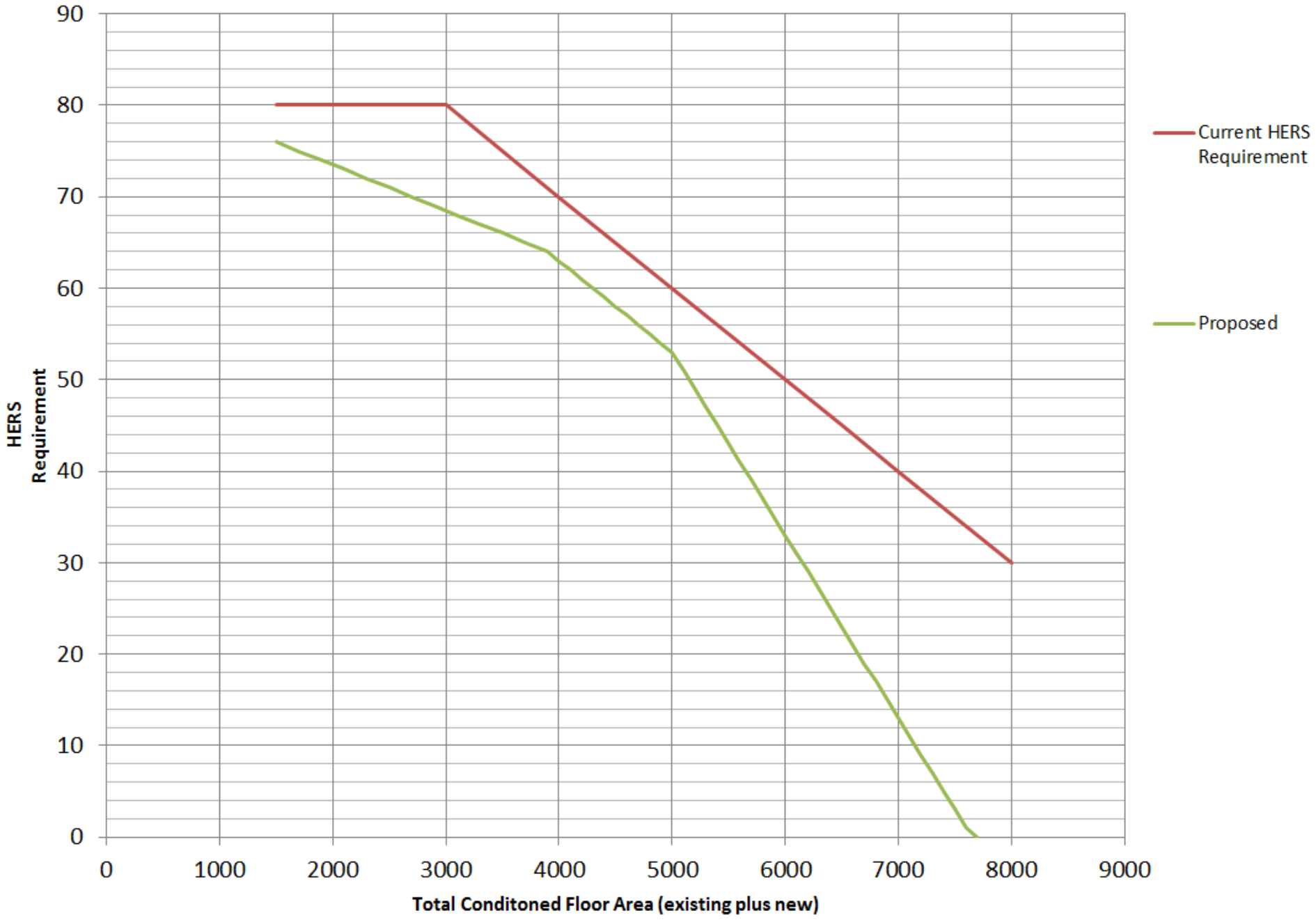
Conditioned Crawlspace

New Conditioned Floor Area



*For additions greater than 200 sqft: Homes larger than 3500 conditioned floor area (existing plus proposed) must use HERS pathway.

Table 2 – Additions



Additional Notes

- Glazing to floor area ratios that exceed 18% may not use prescriptive path (passive solar designs in which more than 50% of the total glazing faces South excepted).
- All exterior fossil fuel consuming devices must have energy offsets (except cooking devices).
- One Level 2 electric vehicle charging receptacle is required in all new garages that have electricity.
- Energy requirements of BuildSmart are exempted for buildings with an annual space conditioning requirement of less than 5kBtu/sqft/year.
- When converting Unconditioned Space to Conditioned Space, treat as an addition.
- All fire sprinkler systems must be located entirely inside the thermal envelope (Exterior systems excepted).
- All new heat pumps must meet Energy Star Requirements.

Commercial Construction

Commercial Construction:

- 2015 IECC
- Require offsets for exterior fuel consuming devices
- EV charging station requirements for parking lots
- IGCC for larger projects