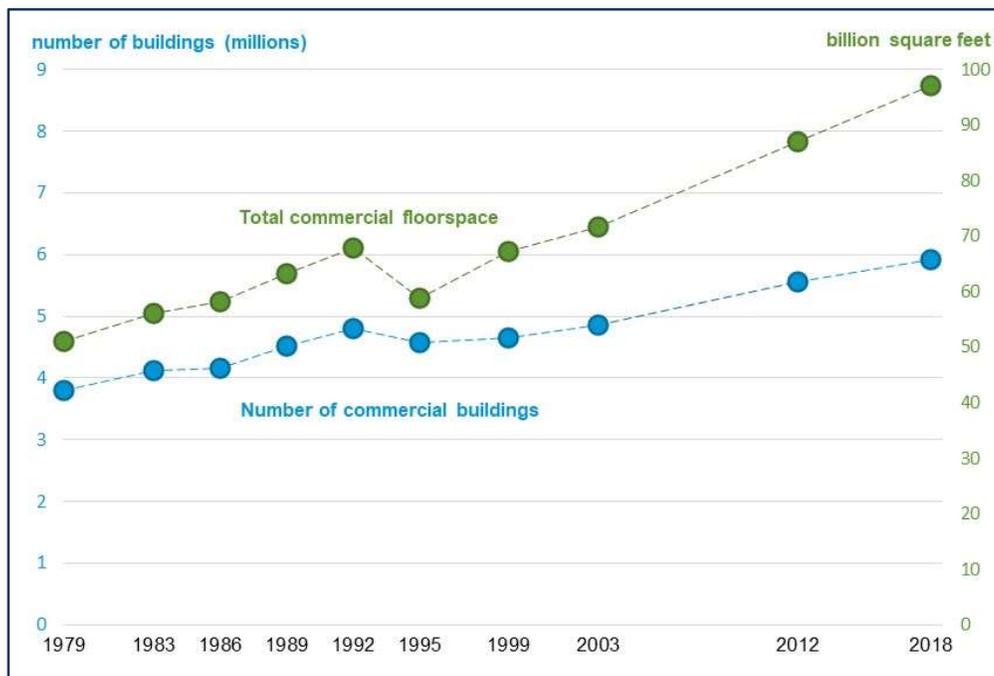


# CBECS vs EPMI Floor Area Estimates

1986 – 2018

The Energy Information Administration (EIA) has conducted the Commercial Building Energy Consumption Survey (CBECS) periodically since 1979, as required by Congress. The 2018 CBECS is the 11th iteration, and preliminary building and characteristics data estimates were just released November 2020.

The CBECS estimates the total number of buildings has increased 6% from 2012 to 2018, and total floorspace increased 11%. From the first CBECS in 1979 to the 2018 CBECS, the number of buildings has increased from 3.8 million to 5.9 million (55%), and the amount of commercial floorspace has increased from 51 billion square feet to 97 billion square feet (90%), as seen in the EIA CBECS figure below.



This brief technical note presents EPMI and CBECS commercial sector floor area values over time. EPMI has discussed issues with CBECS floor area data extensively, although much has been learned over the years about how to deal with some of the floor area issues.<sup>1</sup> Of interest here are the differences between EPMI “adjusted” floor area values estimated for the entire commercial sector, and CBECS estimates, which historically have not covered the entire sector.<sup>1</sup>

<sup>1</sup> Extensive discussion can be found in: *Understanding Commercial and Service Sector Energy Use*, EPMI 2016. <https://epminst.us/commercial/Understanding%20commercial%20and%20service%20sector%20energy%20use.pdf>

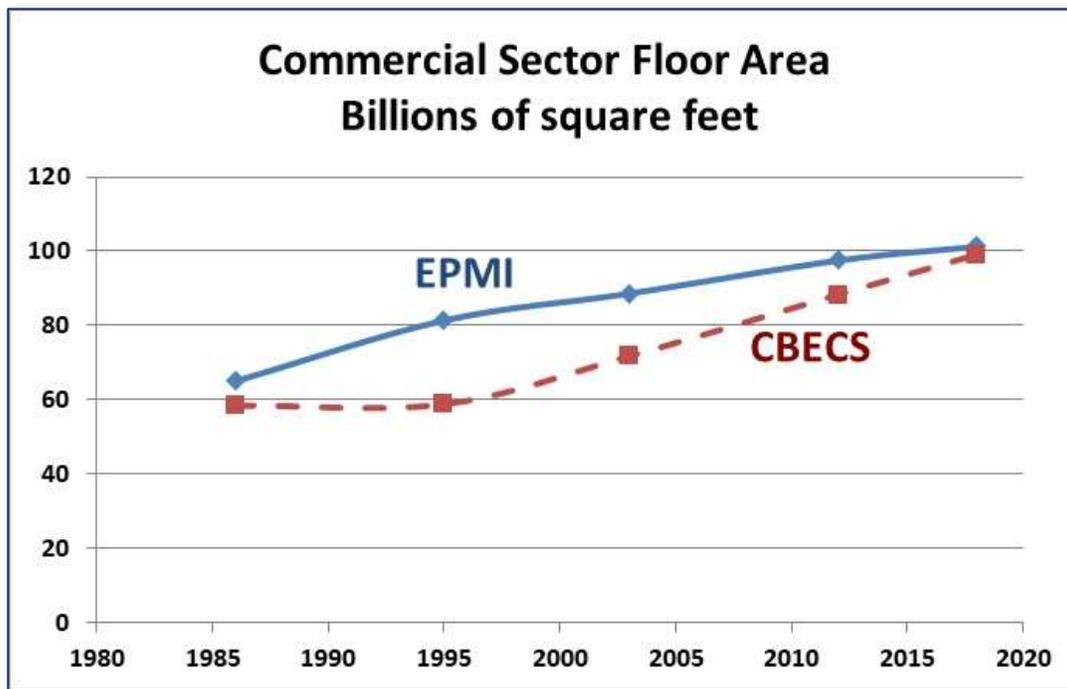
EPMI developed an adjustment process<sup>1</sup> to calculate total commercial sector floor area as:

$$SEDS^2 \text{ commercial source energy divided by CBECS bulk sum ratio source EUI}$$

The bulk sum ratio *source* energy EUI, CBECS-derived source energy use total for the sector divided by the CBECS total floor area, has been found to be more reliable than an average EUI determined using survey weights and sample data.

The 2012 US national CBECS total for commercial sector *delivered* energy (latest available CBECS energy data) is 84% of the SEDS commercial sector total for the year 2012, and for electricity, the 2012 CBECS national total is 94% of the SEDS total. These percentages have varied over time, but SEDS estimates focus on “total” energy for end-use sectors, while CBECS has focused more on details of buildings, energy-using equipment, and building-specific energy use. Survey weighting factors must be determined to allow scaling up CBECS sample data to national or regional totals. Thus, CBECS national total quantities depend on the ability of the weighting factors to represent the entire sector.

In 1986 and 2012, CBECS floor area sectoral totals were 90% of the EPMI values. The preliminary 2018 results are at 98%, as shown in the next figure. The figure displays commercial sector floor area national totals for CBECS and EPMI “adjusted” values from 1986–2018. For 2018 the difference is about equal to the expected floor area for buildings < 1,000 square feet in size, which are not covered by CBECS historically. This convergence suggests potentially interesting results for all the 2018 CBECS results as they are released.



<sup>2</sup> SEDS, The State Energy Data System, <https://www.eia.gov/state/seds/>