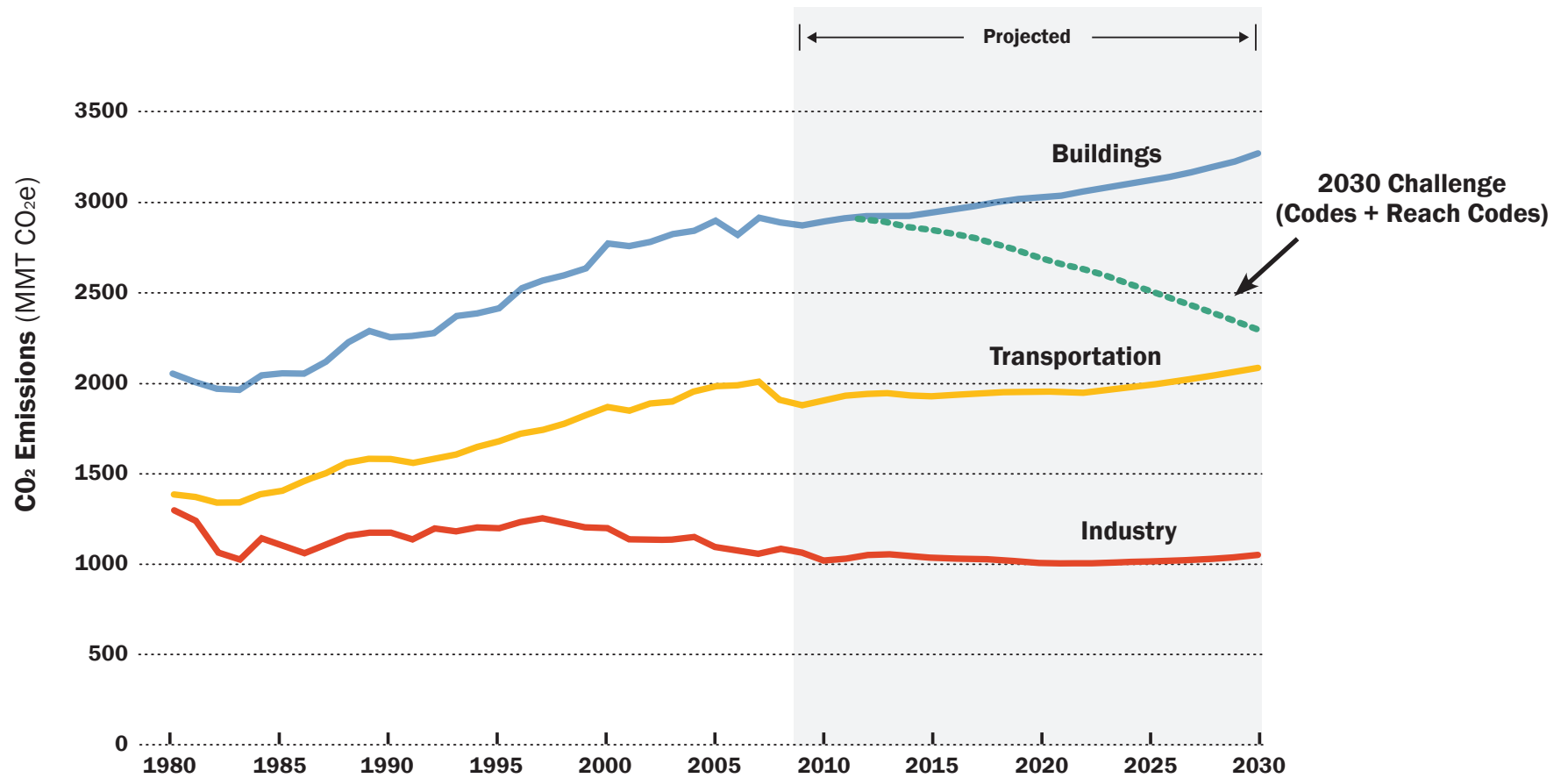


# U.S. CO<sub>2</sub> Emissions by Sector

(Historic / Projected)

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# Notes

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## **BUILDING SECTOR ASSUMPTION**

To create a U.S. Building Sector, the Residential buildings (operations) sector, Commercial buildings (operations) sector, Industrial sector - building operations estimate and the Industrial sector - annual building construction and materials embodied energy estimate were combined.

## **U.S. CO<sub>2</sub> EMISSIONS BY SECTOR**

### **Notes:**

6.2% of Industry goes to Buildings for Industrial Building Operations (HVAC and Lighting). Based on the 2004 Building Energy Databook: Summary Table 6.

8% of Total U.S. Energy goes to Buildings for the annual embodied energy of buildings. Based on assumptions from the study, "Energy and Building Construction", in Richard Stein's book, "Architecture and Energy", and embodied energy defined as 20% of the 50 year operational energy of a building.

### **Assumptions:**

Assumes a direct relationship between energy consumption and CO<sub>2</sub> emissions.

Assumes that new codes become effective as follows (year codes come into effect - percent better than code):

2010 - 30%      2016 - 50%      2022 - 75%      2028 - carbon neutral

Assumes 25% of all new buildings meet the new code the first year it becomes effective; that 50% of all new buildings meet the new code the year after; and that 100% of all new buildings meet the new code every following year until a new base code is adopted.

Assumes the amount of existing building square footage renovated annually is equal to the square footage built new. Also assumes that of this square footage, 25% of renovations meet the new code the first year it becomes effective; that 50% of renovations meet the new code the year after; and that 100% of all renovations meet the new code every following year until a new code is adopted.

Assumes aggressive Reach Code implementation and incentives.

### **Sources:**

U.S. Energy Information Administration, Annual Energy Review (AER), Table 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-2006; <http://www.eia.doe.gov/emeu/aer/envir.html>.

U.S. Energy Information Administration, Annual Energy Outlook 2009 Early Release, Table 18 Carbon Dioxide Emissions by Sector and Source; [http://www.eia.doe.gov/oiaf/aeo/aeoref\\_tab.html](http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html).

U.S. Energy Information Administration, Annual Energy Outlook 2009 Early Release, Tables 4 and 5; [http://www.eia.doe.gov/oiaf/aeo/aeoref\\_tab.html](http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html).

