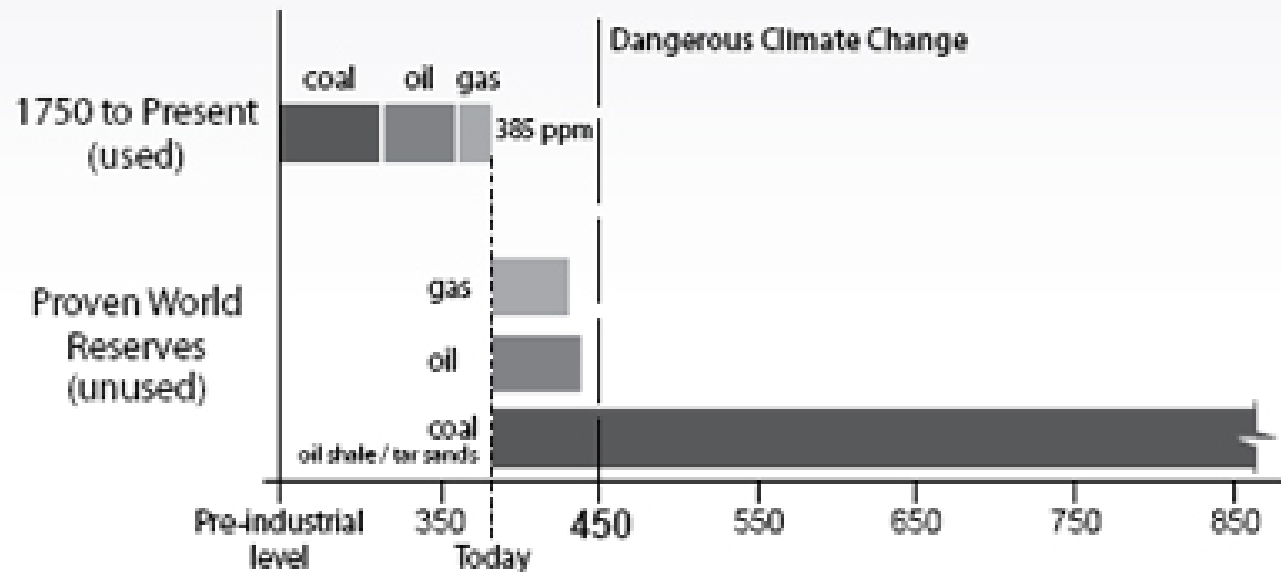


Existing Buildings Climate Impact

Tim Hemsath
College of Architecture



Atmospheric Carbon Dioxide (ppm)
FOSSIL FUEL RESOURCES & CO₂ EMISSIONS

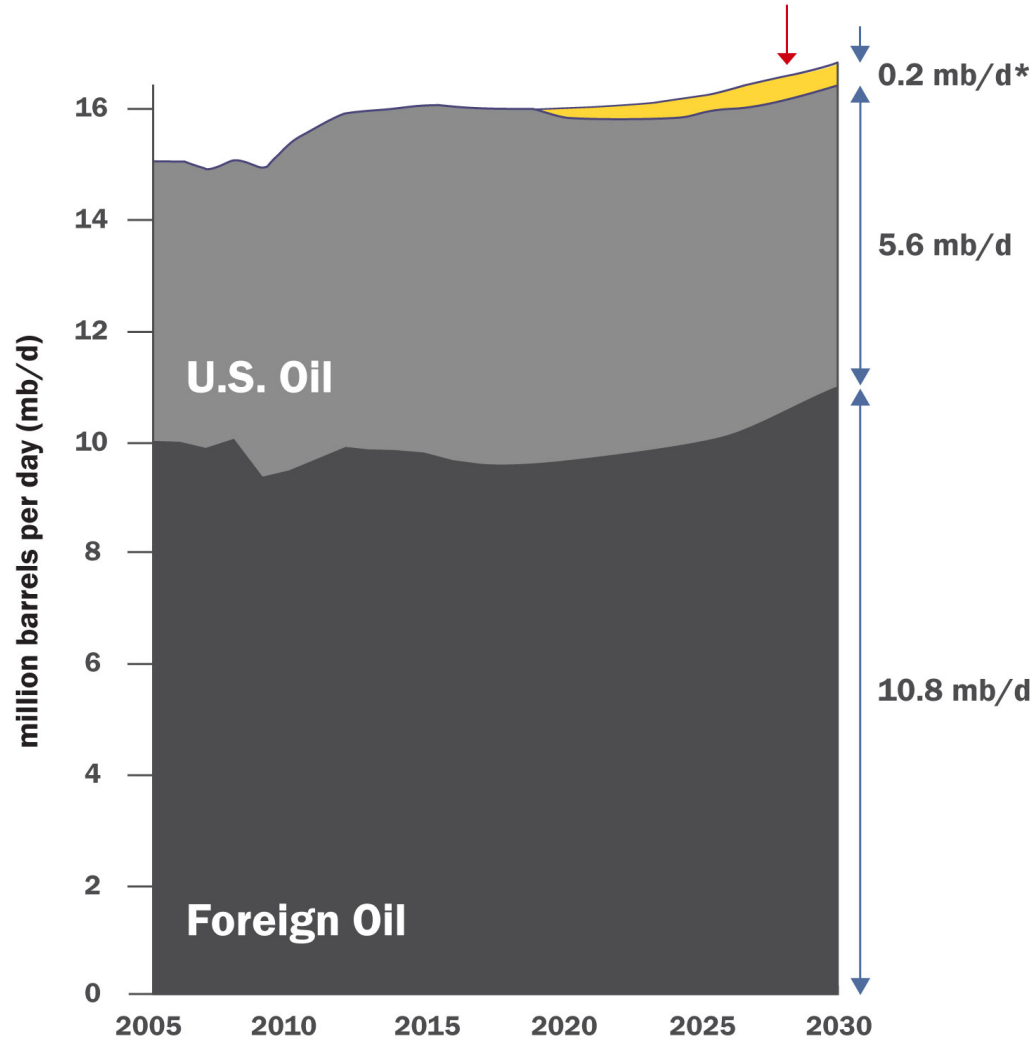
"The comprehensive energy plans proposed by politicians that are centered on oil drilling and nuclear power would supply just 1.8% of total US energy needs - a drop in the bucket."

-Edward Mazria

[Architecture 2030](#)

New Offshore Drilling

*0.2 mb/d (200,000 barrels per day)
produces approximately 0.5 QBtu/yr

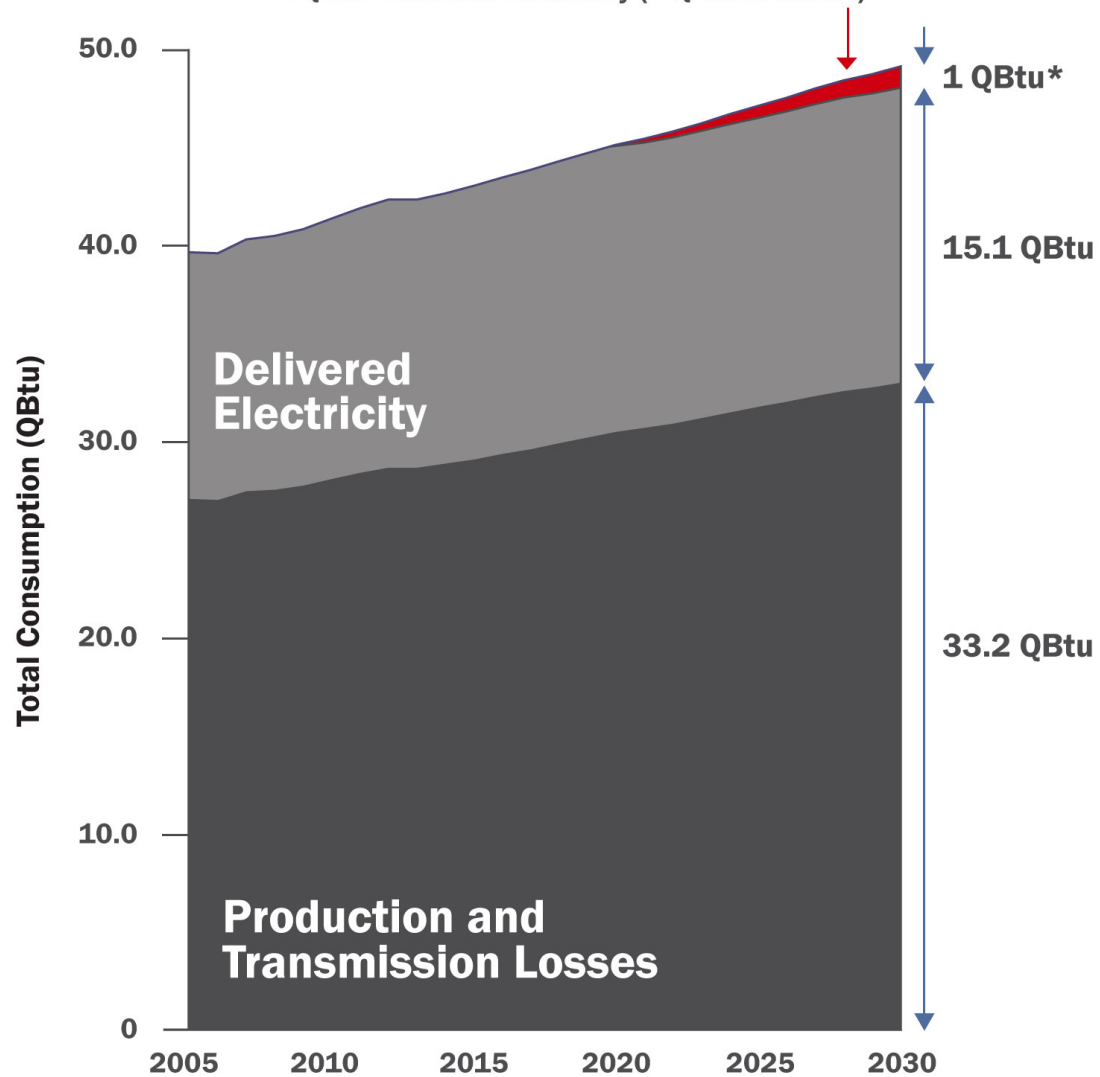


US CRUDE OIL CONSUMPTION

Note: Total annual US petroleum consumption (crude oil, refined oil imports, gas plant liquids, ethanol, etc.) is currently 20.7 mb/d. Petroleum consumption is projected to increase to 22.9 mb/d in 2030. Drilling in the OCS, at maximum production in 2030, would produce 0.9% of total petroleum consumption.

45 New Nuclear Power Plants

*3 QBtu Primary Electricity equals approximately 1 QBtu Delivered Electricity (2 QBtu in losses)



US ELECTRICITY CONSUMPTION

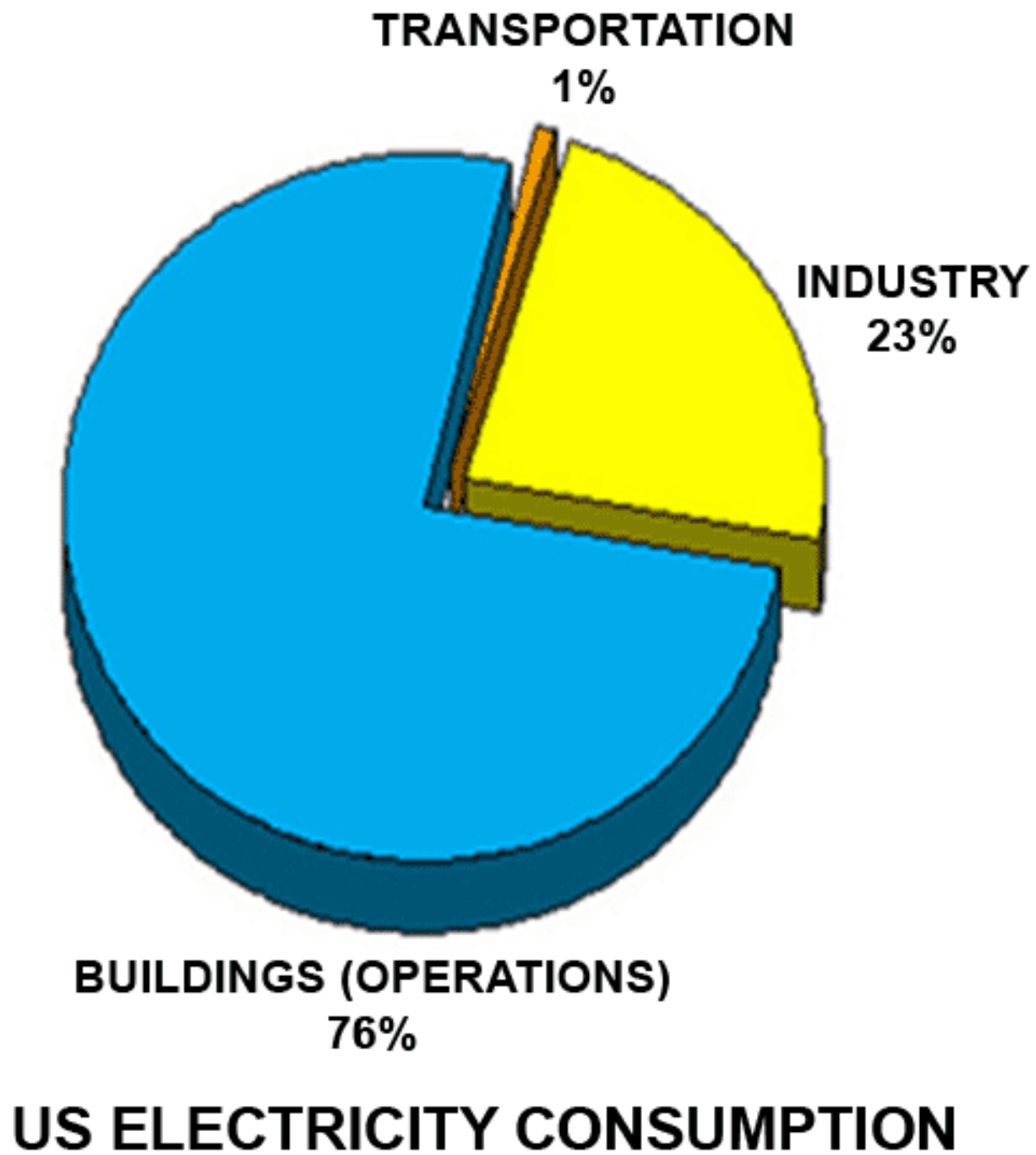
Note: Projections are based on an average nuclear plant capacity of 820 MW.

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Data Source: US Energy Information Administration

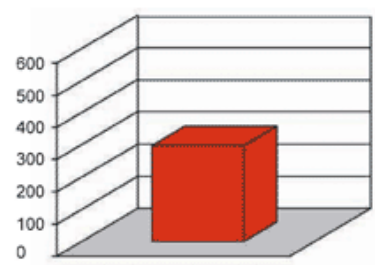
Without an increased demand for electrical energy, there is no need for additional coal-fired power plants.

- As the single largest contributor to global warming, buildings account for approx. 48% of total annual US energy consumption (40% for building operations, 8% for building construction). Globally, the percentage is even greater.
- Building operations (heating, cooling, ventilation, hot water, etc.) account for 43% of total annual US GHG emissions [12].
- 76% of all the electricity produced at power plants in the US goes to operate buildings.
- Buildings have a lifespan of 50 to 100 years, throughout which they consume energy and produce emissions. Over the next 30 years, the United States will add 33 million buildings that will not only consume electricity produced at a central power plant, but will also directly burn oil, natural gas and/or propane in boilers, furnaces and hot water heaters.

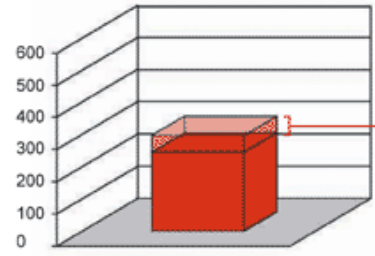


US ELECTRICITY CONSUMPTION

Billion Square Feet (sf)
Source: Energy Information Administration

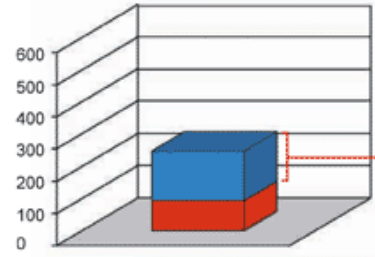


Currently the US building stock is approx. 300 billion sf.

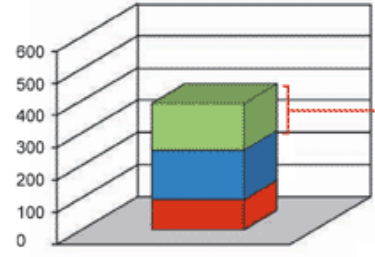


Over the next 30 years:

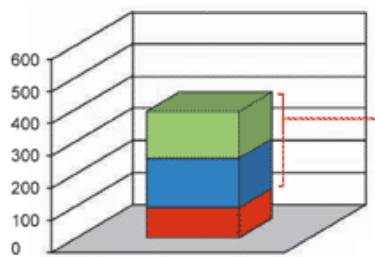
52 billion sf will be demolished



150 billion sf will be remodeled



150 billion sf will be new construction



Therefore, by the year 2035, three-quarters of the building stock will be new or renovated

DOE moves forward with Zero-Net Energy Commercial Buildings Initiative

DOE requested proposals from its National Labs and private sector companies to achieve cost-effective savings of 50 percent above the standard set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers for new commercial building designs, and a savings of 30 percent for retrofits to existing buildings.

[US Department of Energy \(DOE\)](#)

California Public Utilities Commission (CPUC) Adopts Long Term Energy Efficiency Strategic Plan

The CPUC has adopted a new plan, which includes two "Big Bold" strategies in line with the 2030 Challenge: to have all residential buildings achieve zero net energy use by 2020, and to have all commercial buildings achieve zero net energy use by 2030.

[California Public Utilities Commission \(CPUC\)](#)

Energy Efficiency in the Building Sector is Crucial

The American Physical Society (APS) released Energy Future: Think Efficiency, a new report that states that "the technological potential for reducing energy consumption and carbon emissions in the buildings sector is considerable."

[American Physical Society \(APS\)](#)

Aspen, Colorado is on its way to adopting the 2030 Challenge

On September 15, the Aspen City Council directed its environmental staff to move forward on developing a plan that will tighten building codes so that, by 2030, all buildings constructed in the city will be carbon-neutral.

[The Aspen Times](#)

Governments Going Green

Various LEED initiatives including legislation, executive orders, resolutions, ordinances, policies, and incentives are found in **44** states, including **163** localities (**107** cities, **29** counties, and **27** towns), **31** state governments, **12** federal agencies or departments, **15** public school jurisdictions and **39** institutions of higher education across the United States. (10/01/08)

[U.S. Green Building Council](#)

College of Architecture

- Collaborating on Zero Net Energy Test Home in Omaha
- Partnership with Neighborworks to build low-income energy efficient homes
- Designing a LEED Platinum home in Greensburg Kansas
- Students founded the UNL student organization Emerging Green Builders
- Faculty serve on professional and community groups to impact Nebraska

