Buildings sector delivered energy consumption

Buildings delivered energy consumption
AEO2021 Reference case
quadrillion British thermal units

- 2020
- 2020

- total buildings sector delivered energy consumption
- residential buildings
- commercial buildings

Residential and commercial buildings energy consumption

Residential sector delivered energy consumption
AEO2021 Reference case
quadrillion British thermal units

2020
history | projections

2000 2010 2020 2030 2040 2050

Commercial sector delivered energy consumption
AEO2021 Reference case
quadrillion British thermal units

2020
history | projections

2000 2010 2020 2030 2040 2050

electricity
natural gas
petroleum
and other liquids
other

www.eia.gov/aeo

Change in population and residential housing stocks

Residential housing unit and population changes by region and type in 2020 and 2050
AEO2021 Reference case
millions, residential housing units
millions, U.S. population

www.eia.gov/aeo
Commercial buildings floorspace growth

Commercial floorspace in 2020 and growth in floorspace from 2020 to 2050

AEO2021 Reference case

Percentage growth

- Office: 0.8%
- Mercantile/service: 0.9%
- Warehouse: 1.2%
- Education: 0.9%
- Assembly: 0.6%
- Other: 1.3%
- Lodging: 1.1%
- Food sales/service: 0.9%
- Health care: 1.1%


Population-weighted heating and cooling degree days

Population-weighted heating degree days by census division

AEO2021 Reference case

Population-weighted cooling degree days by census division

AEO2021 Reference case

Residential and commercial electricity and natural gas prices

Electricity prices in the residential and commercial sectors
AEO2021 Reference case
2020 cents per kilowatthour

Natural gas prices in the residential and commercial sectors
AEO2021 Reference case
2020 dollars per thousand cubic feet


Residential and commercial energy intensity

Indexed residential delivered energy intensity
AEO2021 Reference case
indexed annual energy use per household
2019 = 1.0

Indexed commercial delivered energy intensity
AEO2021 Reference case
indexed annual energy use per square foot
2019 = 1.0

Residential and commercial overall energy intensity by end use

Residential energy intensity by end use
AEO2021 Reference case
- space heating
- other uses
- water heating
- space cooling
- refrigeration and freezing
- laundry and dishwashing
- televisions, computers
- lighting
- cooking

2020
2050

million British thermal units per household

Commercial energy intensity by end use
AEO2021 Reference case
- space heating
- other uses
- water heating
- space cooling
- refrigeration
- ventilation
- computers, office equipment
- lighting
- cooking

2020
2050

thousand British thermal units per square foot

Note: Intensities reflect all energy sources consumed, including both purchased electricity and electricity produced onsite for own use.


Residential and commercial electricity intensity by end use

Residential electricity intensity by end use
AEO2021 Reference case
- space heating
- other uses
- water heating
- space cooling
- refrigeration and freezing
- laundry and dishwashing
- televisions, computers
- lighting
- cooking

2020
2050

kilowatthours per household

Commercial electricity intensity by end use
AEO2021 Reference case
- space heating
- other uses
- water heating
- space cooling
- refrigeration
- ventilation
- computers, office equipment
- lighting
- cooking

2020
2050

kilowatthours per square foot

Note: Intensities reflect both purchased electricity and electricity produced onsite for own use.

Commercial building end-use intensities
Indexed commercial service provided per square foot of floorspace
AEO2021 Reference case

2020 = 1.0

2020 2030 2040 2050

0.60 0.70 0.80 0.90 1.00

ventilation cooking lighting space cooling space heating

Residential and commercial onsite generation versus purchased electricity

Residential sector electricity consumption
AEO2021 Reference case
quadrillion British thermal units

2020 2030 2040 2050

0 1 2 3 4 5 6 7

onsite generation for own use purchased electricity

Commercial sector electricity consumption
AEO2021 Reference case
quadrillion British thermal units

2020 2030 2040 2050

0 1 2 3 4 5 6 7

onsite generation for own use purchased electricity

Residential consumption of onsite generation versus purchased electricity

Electricity consumed to meet residential end-use demand
AEO2021 Reference case
quadrillion British thermal units

Onsite generation and purchased electricity consumed to meet residential end-use demand
AEO2021 Reference case
quadrillion British thermal units

Note: Onsite generation projections are not attributed to any particular end use.


Commercial consumption of onsite generation versus purchased electricity

Electricity consumed to meet commercial end-use demand
AEO2021 Reference case
quadrillion British thermal units

Onsite generation and purchased electricity consumed to meet commercial end-use demand
AEO2021 Reference case
quadrillion British thermal units

Note: Onsite generation projections are not attributed to any particular end use.

Residential and commercial solar photovoltaic generation capacity

Residential solar distributed generation capacity
AEO2021 Reference case
gigawatts direct current

<table>
<thead>
<tr>
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<th>2020</th>
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<td>Projections</td>
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<td>90</td>
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Low Renewables Cost
Low Oil and Gas Supply
Reference
High Oil and Gas Supply
High Renewables Cost

Commercial solar distributed generation capacity
AEO2021 Reference case
gigawatts direct current

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<tr>
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Commercial distributed generation capacity

Commercial distributed generation capacity
AEO2021 Reference case
gigawatts direct current

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<tr>
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<td>Natural gas-fired turbines</td>
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<td>Municipal solid waste/other wind</td>
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</table>

Residential and commercial lighting consumption and lighting shares

Electricity consumed to meet lighting demand
AEO2021 Reference case
quadrillion British thermal units

Lighting shares by type
AEO2021 Reference case
residential sector
percentage

Note: Includes both purchased electricity and onsite generation for own use