Manufacturing Energy and Carbon Footprint
Sector: Machinery (NAICS 333)

Primary Energy Use: 299 TBtu
Total GHG Emissions: 14 MMT CO₂e

Primary Energy, 2018

<table>
<thead>
<tr>
<th>Energy (TBtu = Trillion British Thermal Units)</th>
<th>Greenhouse Gas (GHG) Emissions (MMT CO₂e = Million Metric Tons Carbon Dioxide Equivalent)</th>
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</thead>
<tbody>
<tr>
<td>Offsite</td>
<td></td>
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<tr>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Onsite</td>
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</tbody>
</table>

Electricity generation (excludes 0.2 TBtu renewable, non-combustion electricity output)
- Onsite: 0.7
- Offsite: 0.5

Energy for All Purposes estimated at 302 TBtu
Includes primary energy plus net energy consumed for nonfuel purposes, including feedstock use

Energy use data source: 2018 EIA MECS (with adjustments). For full information on references, definitions, assumptions, and other sectors, visit this webpage

Last Revised: December 2021

Notes:
- Sector-wide aggregate data for year 2018; energy values rounded to nearest whole number
- Offsite generation shown on net basis (purchases, sales, and transfers accounted for) and includes onsite non-combustion renewable output
- * Electricity export refers to sales and transfers offsite of electricity to utilities and other entities
- Feedstock energy excluded from primary, offsite, and onsite energy values and included in Energy for All Purposes
- ^ Excess steam refers to the sales and transfer offsite or purging of surplus steam

Prepared for the U.S. Department of Energy, Advanced Manufacturing Office by Energetics
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Onsite Energy, 2018

Onsite Energy Use: 145 TBtu
Onsite Emissions: 4 MMT CO₂e

Greenhouse Gas (GHG) Emissions (MMT CO₂e = Million Metric Tons Carbon Dioxide Equivalent)

Total Onsite Process

Energy (TBtu = Trillion British Thermal Units)

Fuel
Electricity
Steam
Combined

Losses

Steam Distribution Losses

Fuel Types

Natural Gas 91%
HGL (excl. natural gasoline) 5%
Distillate Fuel Oil 3%
Other Fuels 2%

Onsite Generation

Conventional Boilers 0.3 0.2
CHP/Cogeneration 0.3 0.3
Other Electricity Generation (excludes 0.2 TBtu renewable, non-combustion electricity output) 0.1 0.1

Process Energy

Process Heating 1.7 1.1
Process Cooling and Refrigeration 0.4 0.0
Other Process Uses 0.3 0.2
Electro-Chemical 0.0 0.0

Machine Drive

Pumps 10
Fans 7
Compressed Air 8
Materials Handling 5
Materials Processing 16
Other Systems 2

Nonprocess Energy

Facility HVAC 3.3 1.4
Facility Lighting 1.3 0.0
Other Facility Support 0.5 0.0
Onsite Transportation 0.2 0.1
Other Nonprocess 0.0 0.0

Electricity Export*
Excess Steam*

Energy use data source:
2018 EIA MECS (with adjustments); See webpage for details
Last Revised: December 2021
Notes:
Sector-wide aggregate data for year 2018; energy values and fuel type percentages rounded to nearest whole number
Offsite generation shown on net basis (purchases, sales, and transfers accounted for) and includes onsite non-combustion renewable output
* Refers to sales and transfers of electricity to utilities and other entities
* Refers to sales and transfers of electricity or purging of surplus steam
Feedstock energy excluded

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