Manufacturing Energy and Carbon Footprint
Sector: Petrochemicals (NAICS 325110)

Primary Energy Use: 629 TBtu
Total GHG Emissions: 55 MMT CO₂e

Primary Energy, 2018

Offsite Energy
- Fuel 501
- Electricity Generation 229
- Steam Generation 16
- Total 570

Onsite Energy
- Electricity and Steam Generation Losses 52
- Steam Distribution Losses 42
- Total 476

Process Energy
- Total 450
- Process Losses 152

Nonprocess Energy
- Total 26
- Nonprocess Losses 99

Total Emissions = Offsite Emissions + Onsite (Combustion + Process) Emissions

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

Last Revised: October 2022

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

Energy for All Purposes estimated at 1,520 TBtu
Includes primary energy plus net energy consumed for nonfuel purposes, including feedstock use

Prepared for the U.S. Department of Energy, Advanced Manufacturing Office by Energetics
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Onsite Energy Use: 570 TBtu
Onsite Emissions: 48 MMT CO₂e

Onsite Energy, 2018

**Onsite Generation**
- Conventional Boilers: 94 TBtu (5.7%)
- CHP/ cogeneration: 135 TBtu (7.7%)
- Other Electricity Generation: 13.4 TBtu (5.7%)

**Process Energy**
- Process Heating: 14.8 MMT CO₂e (12.5%)
- Process Cooling and Refrigeration: 1.0 MMT CO₂e (0.4%)
- Other Process Uses: 1.9 MMT CO₂e (1.6%)
- Electro-Chemical: 0.0 MMT CO₂e (0.0%)

**Nonprocess Energy**
- Facility HVAC: 0.5 MMT CO₂e (0.1%)
- Facility Lighting: 0.0 MMT CO₂e (0.0%)
- Other Facility Support: 0.0 MMT CO₂e (0.0%)
- Onsite Transportation: 0.2 MMT CO₂e (0.1%)
- Other Nonprocess: 0.7 MMT CO₂e (0.2%)

**Greenhouse Emissions (GHG) Emissions**
- Total: 40.7 MMT CO₂e
- Onsite: 34.8 MMT CO₂e
- Process: 19.4 MMT CO₂e

**Fuel Types**
- Natural Gas: 61%
- Waste Gas (byproduct fuel): 31%
- Distillate Fuel Oil: <1%
- HGL (excl. natural gasoline): <1%
- Pulping liquor or black liquor: <1%
- Other Fuels: 7%

**Energy (TBtu = Trillion British Thermal Units)**
- Fuel
- Electricity
- Steam
- Combined

**Losses**
- Onsite Combustion Emissions
- Process Emissions
- Other Systems

**Steam Distribution Losses**
- 42

**Excess Steam**
- 3

Energy use data source:
2018 EIA MECS (with adjustments); See webpage for details
Last Revised: October 2022

Notes:
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- Offsite generation shown on net basis (purchases, sales, and transfers accounted for) and includes onsite non-combustion renewable output
- * Refers to sales and transfers offsite of electricity to utilities and other entities
- **Refers to sales and transfers offsite or purging of surplus steam
- Feedstock energy excluded
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Fuel and GHG Emissions, 2018

Offsite Generation
- Electricity Generation
- Steam Generation
- Conventional Boilers
- CHP/Cogeneration
- Other Electricity Generation

Onsite Generation
- Process Heating
- Process Cooling and Refrigeration
- Other Process Uses
- Electro-Chemical
- Machine Drive
  - Pumps, Fans, Compressed Air, Materials Handling, Materials Processing, Other Systems

Nonprocess Energy
- Facility HVAC
- Facility Lighting
- Other Facility Support
- Onsite Transportation
- Other Nonprocess

Energy use data source: 2018 EIA MECS (with adjustments)
See webpage for details
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Notes:
- Sector-wide aggregate data for year 2018; energy values rounded to nearest whole number; emissions values rounded to nearest tenth