# The State of CHP: Kentucky

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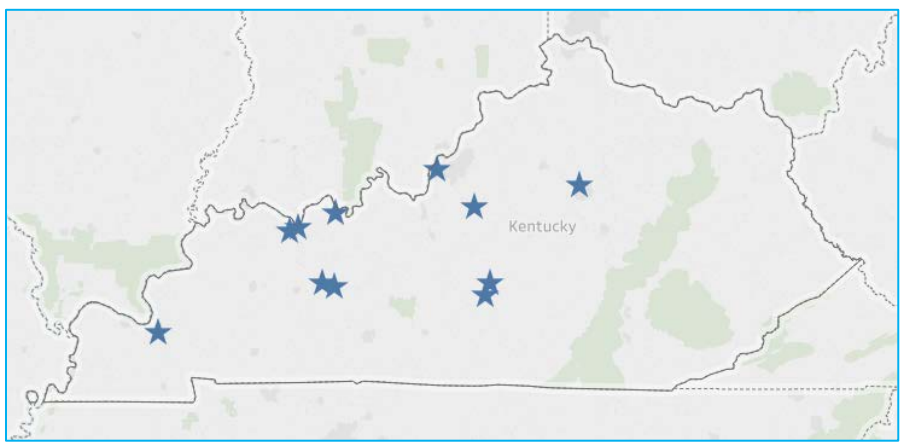
Installed CHP | CHP Technical Potential | CHP Economics | CHP Partners

## Kentucky Installed Base of CHP

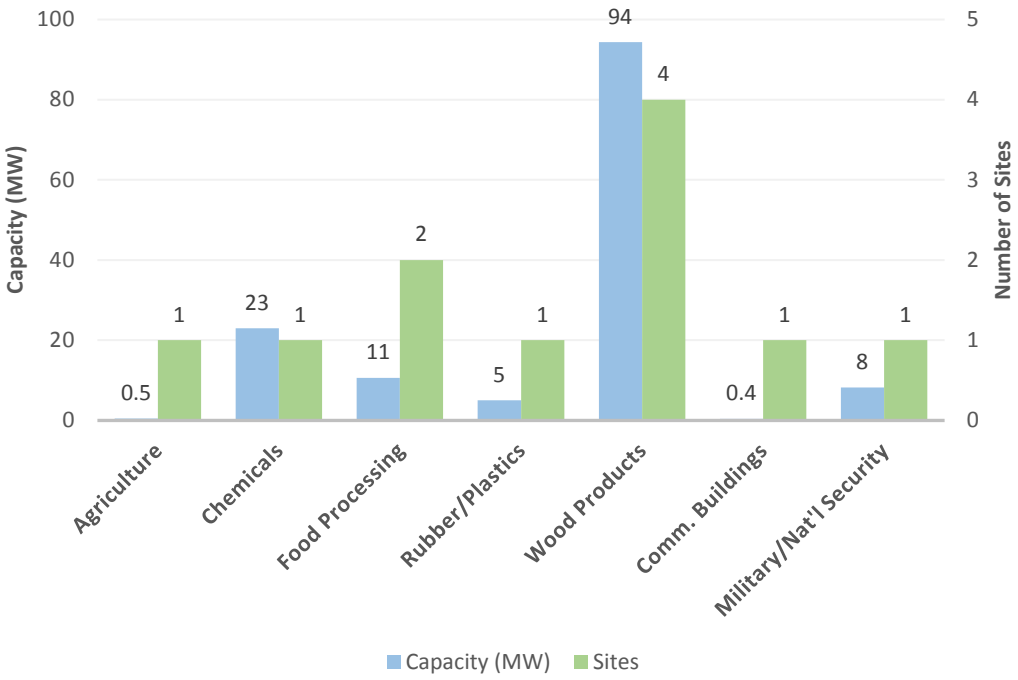
U.S. DOE Combined Heat and Power Installation Database

| *Sector* | *Installations* | *Capacity (MW)* |
|---|---|---|
| **Industrial** | 8 | 133 |
| **Commercial/Institutional** | 2 | 9 |
| **Other** | 1 | 0.5 |
| **Total** | **11** | **142** |

The Southeast CHP Technical Assistance Partnership has compiled information on certain illustrative CHP projects in Kentucky. You can access these by visiting the Department of Energy's CHP Project Profiles Database.

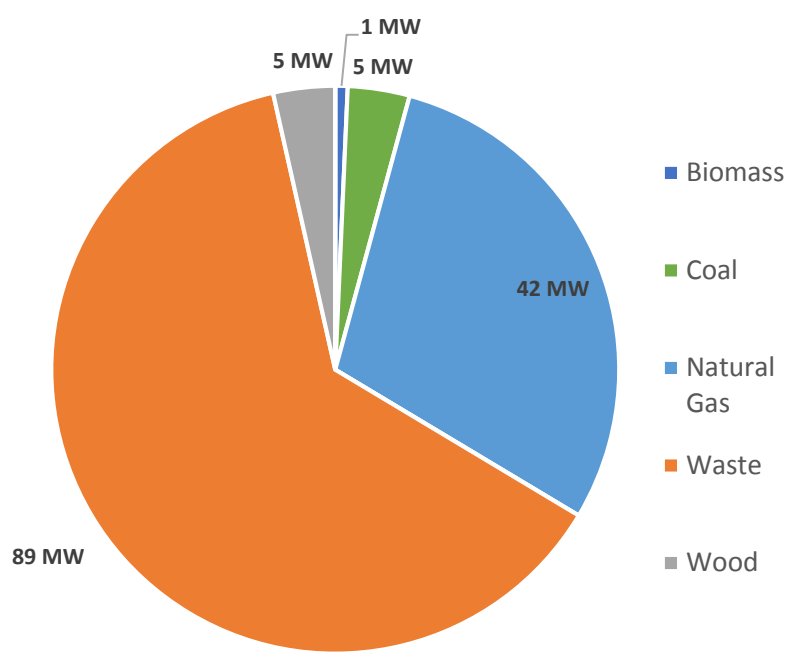



### Kentucky CHP by Application



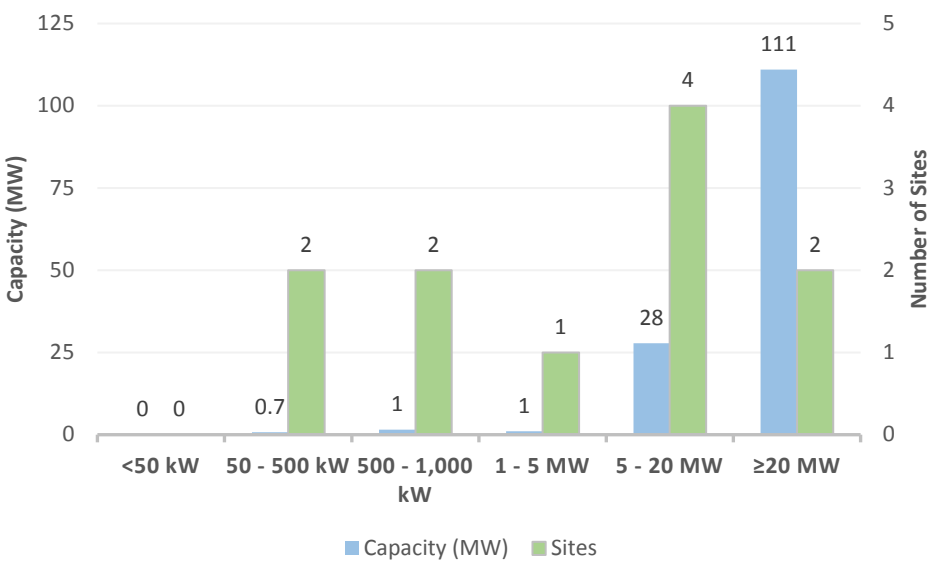

Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

### Kentucky CHP Capacity (MW) by Fuel Type



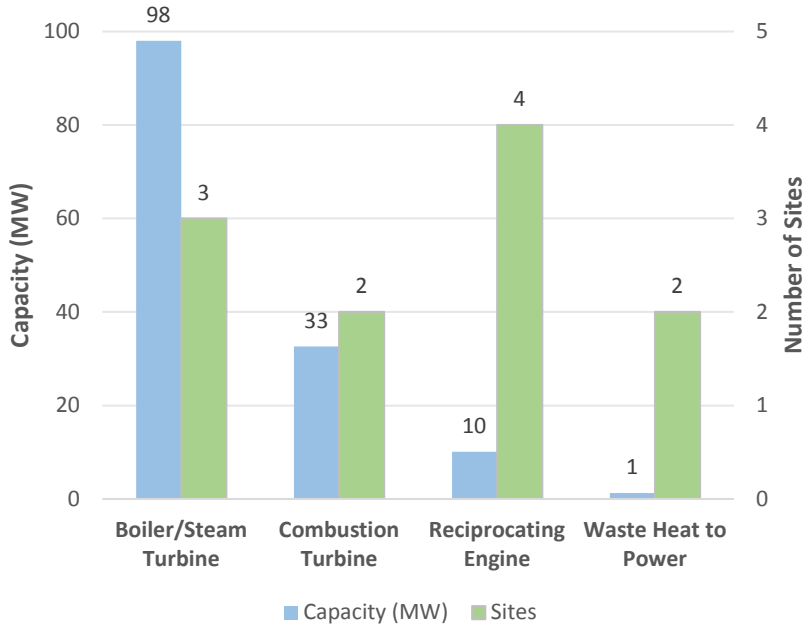

Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

### Kentucky CHP by Size Range




Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

### Kentucky CHP by Technology




Source: DOE CHP Installation Database (U.S. installations as of Dec. 31, 2016)

**Combined Heat and Power (CHP)** – sometimes referred to as cogeneration – is an efficient and clean approach to generating on-site electric power and useful thermal energy from a single fuel source.

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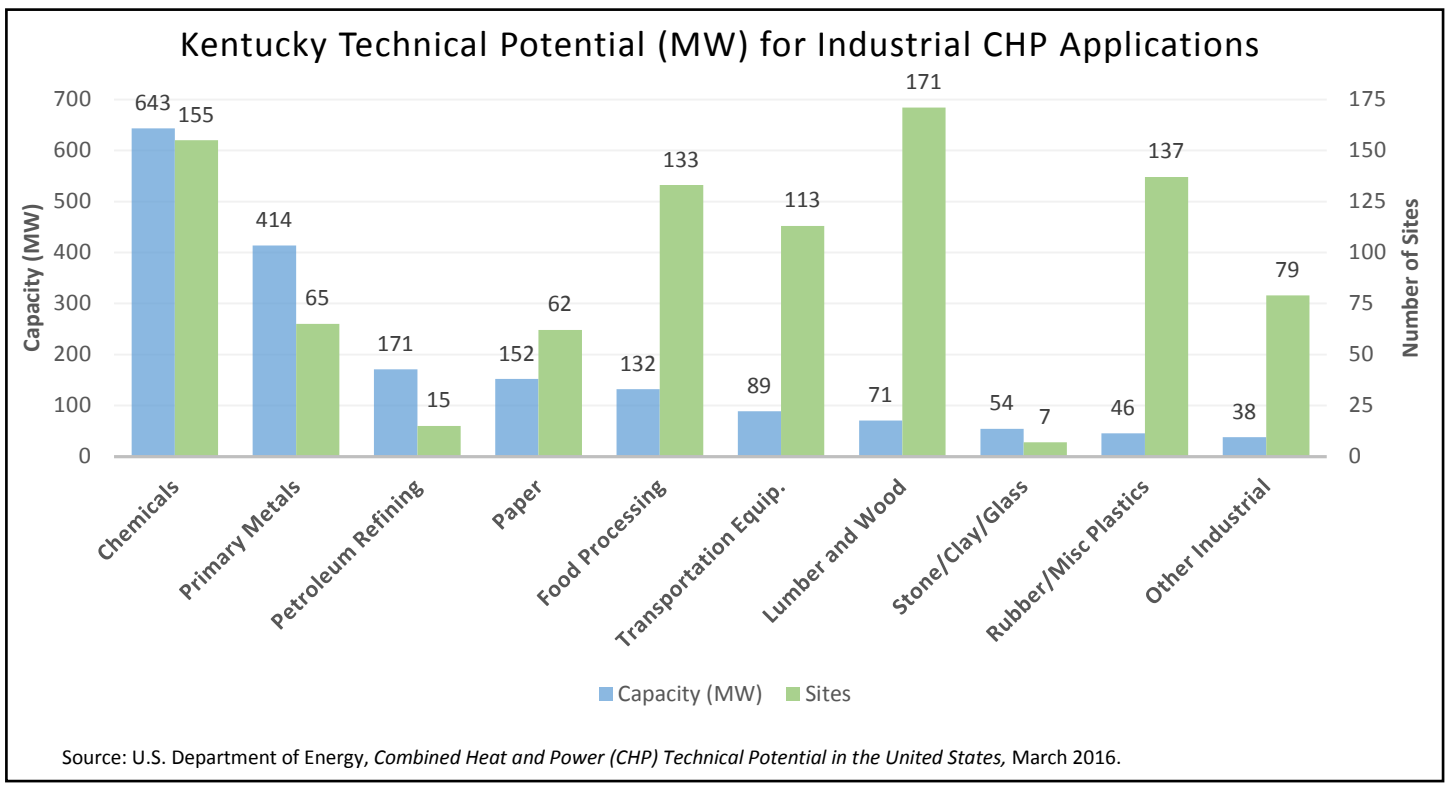
## Kentucky Technical Potential for New CHP Installations

U.S. DOE Analysis: Combined Heat and Power (CHP) Technical Potential in the United States

| *Sector* | *Potential Sites* | *Potential Capacity (MW)* |
|---|---|---|
| **Industrial** | 937 | 1,809 |
| **Commercial/Institutional** | 3,093 | 911 |
| **Total** | **4,030** | **2,721** |

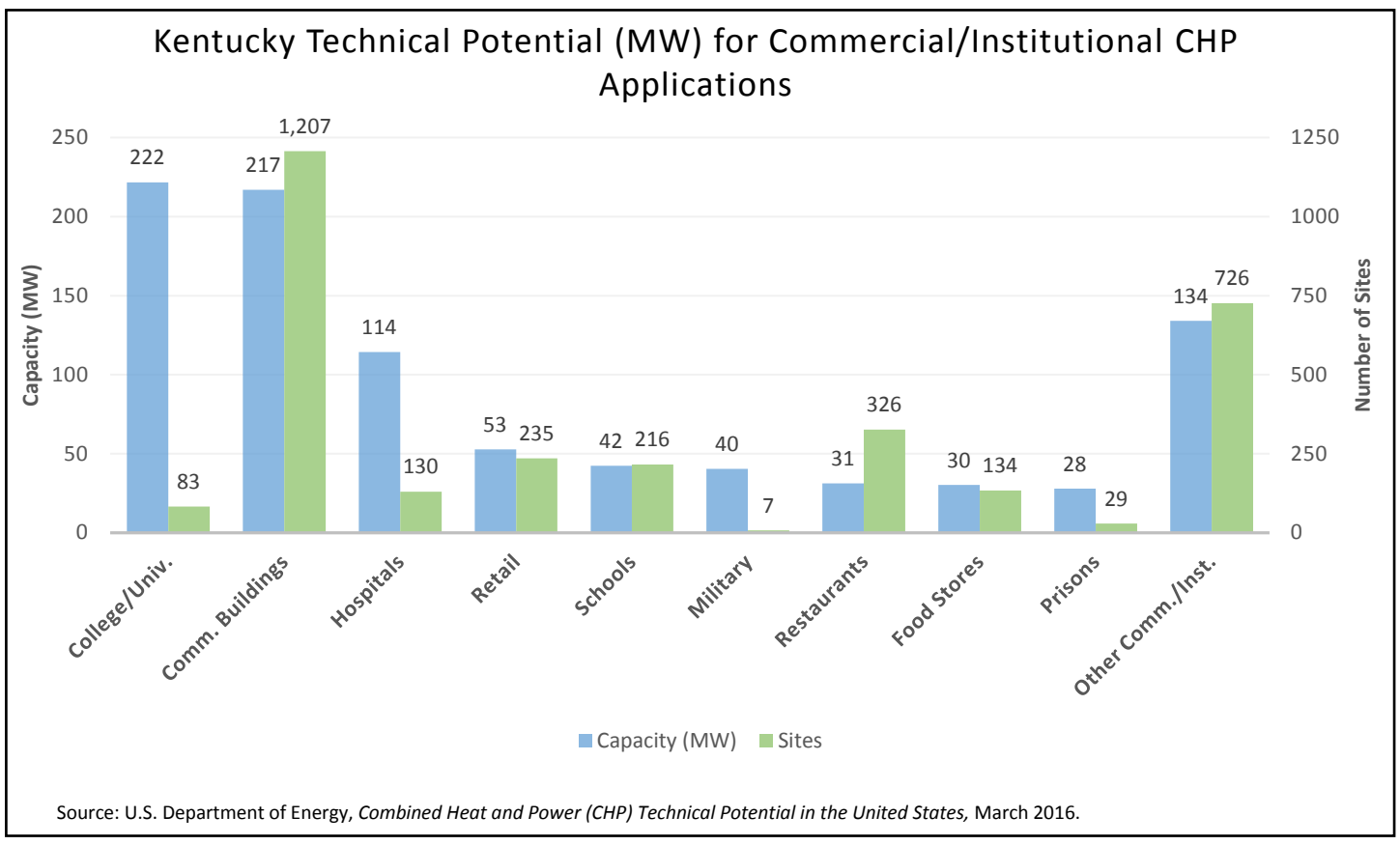



Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

### Technical Potential by CHP Size Range for Top Five Industrial Sectors

| | 50-500 kW | | 0.5 - 1 MW | | 1 - 5 MW | | 5 - 20 MW | | >20 MW | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Application** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Total Sites** | **Total MW** |
| **Chemicals** | 62 | 12 | 22 | 16 | 37 | 89 | 27 | 265 | 7 | 261 | 155 | 643 |
| **Primary Metals** | 27 | 7 | 9 | 6 | 8 | 18 | 14 | 157 | 7 | 225 | 65 | 414 |
| **Petroleum Refining** | 2 | 0.5 | 5 | 4 | 6 | 11 | 0 | 0 | 2 | 157 | 15 | 171 |
| **Paper** | 37 | 11 | 4 | 2 | 14 | 27 | 6 | 59 | 1 | 53 | 62 | 152 |
| **Food Processing** | 73 | 15 | 19 | 14 | 35 | 64 | 6 | 40 | 0 | 0 | 133 | 132 |
| **Other Industrial** | 373 | 70 | 72 | 52 | 54 | 100 | 8 | 76 | 0 | 0 | 507 | 297 |
| **Total** | 574 | 115 | 131 | 94 | 154 | 307 | 61 | 597 | 17 | 696 | 937 | 1,809 |

Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.




Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

### Technical Potential by CHP Size Range for Top Five Commercial/Institutional Sectors

| | 50-500 kW | | 0.5 - 1 MW | | 1 - 5 MW | | 5 - 20 MW | | >20 MW | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Application** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Sites** | **MW** | **Total Sites** | **Total MW** |
| **College/Univ.** | 45 | 10 | 3 | 2 | 27 | 67 | 5 | 61 | 3 | 82 | 83 | 222 |
| **Commercial Buildings** | 805 | 40 | 322 | 129 | 80 | 48 | 0 | 0 | 0 | 0 | 1,207 | 217 |
| **Hospitals** | 62 | 16 | 29 | 21 | 39 | 78 | 0 | 0 | 0 | 0 | 130 | 114 |
| **Retail** | 208 | 33 | 24 | 15 | 3 | 6 | 0 | 0 | 0 | 0 | 235 | 53 |
| **Military** | 4 | 1 | 0 | 0 | 0 | 0 | 3 | 40 | 0 | 0 | 7 | 40 |
| **Other Comm./Inst.** | 1,146 | 133 | 42 | 26 | 28 | 44 | 6 | 60 | 0 | 0 | 1,222 | 263 |
| **Total** | 2,479 | 273 | 423 | 194 | 177 | 242 | 11 | 121 | 3 | 82 | 3,093 | 911 |

Source: U.S. Department of Energy, *Combined Heat and Power (CHP) Technical Potential in the United States,* March 2016.

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## Kentucky CHP Economics

The most important indicators for CHP economics are electricity and gas prices. For most potential CHP installations, natural gas and electricity rates for host facilities will fall within the range of average commercial and industrial prices. Lower energy prices may be possible for large CHP applications.

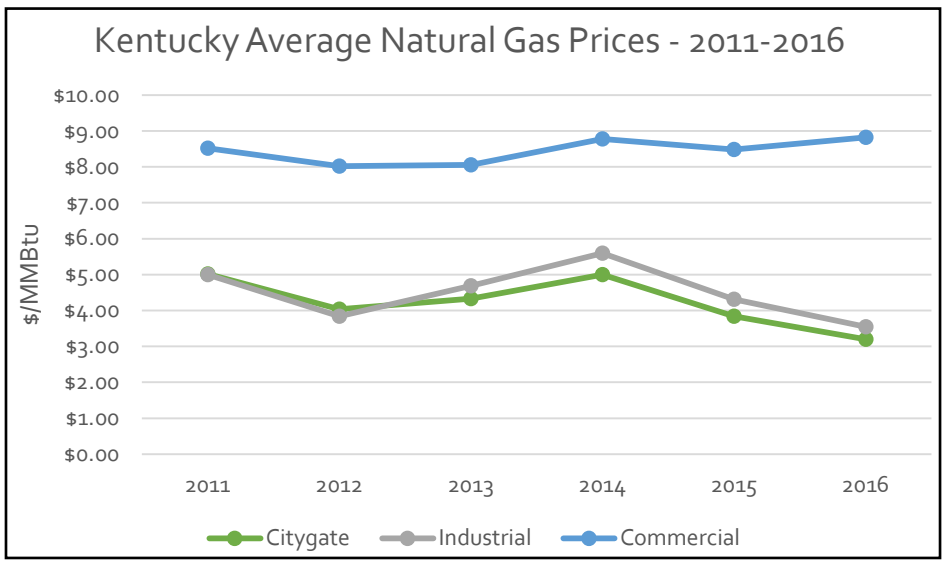
### Kentucky Natural Gas Prices

**Kentucky Average Gas Prices - 2016**

| *Sector* | *KY Price ($/MMBtu)* | *U.S. Price ($/MMBtu)* |
|---|---|---|
| **Citygate*** | 3.20 | 3.75 |
| **Industrial** | 3.55 | 3.39 |
| **Commercial** | 8.82 | 7.22 |

Source: U.S. Energy Information Administration, "Natural Gas Prices", https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SKY_a.htm

The EIA industrial natural gas price is a full tariff rate, and most large consumers are purchasing gas commodities from marketers at a lower rate.



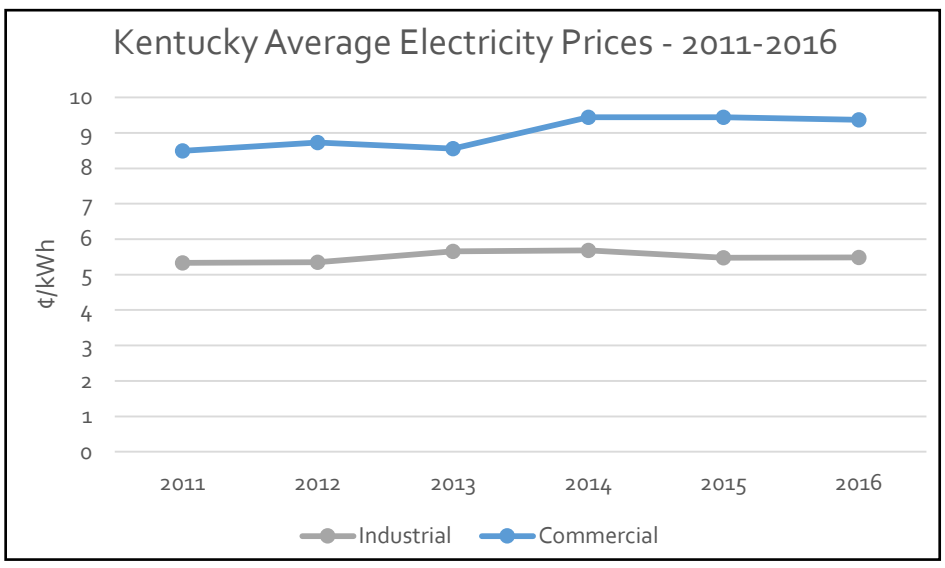

### Kentucky Electricity Prices

**Kentucky Average Electricity Prices - 2016**

| *Sector* | *KY Price (¢/kWh)* | *U.S. Price (¢/kWh)* |
|---|---|---|
| **Industrial** | 5.49 | 6.75 |
| **Commercial** | 9.37 | 10.37 |

Source: U.S. Energy Information Administration, "Electricity Data Browser", https://www.eia.gov/electricity/data.cfm

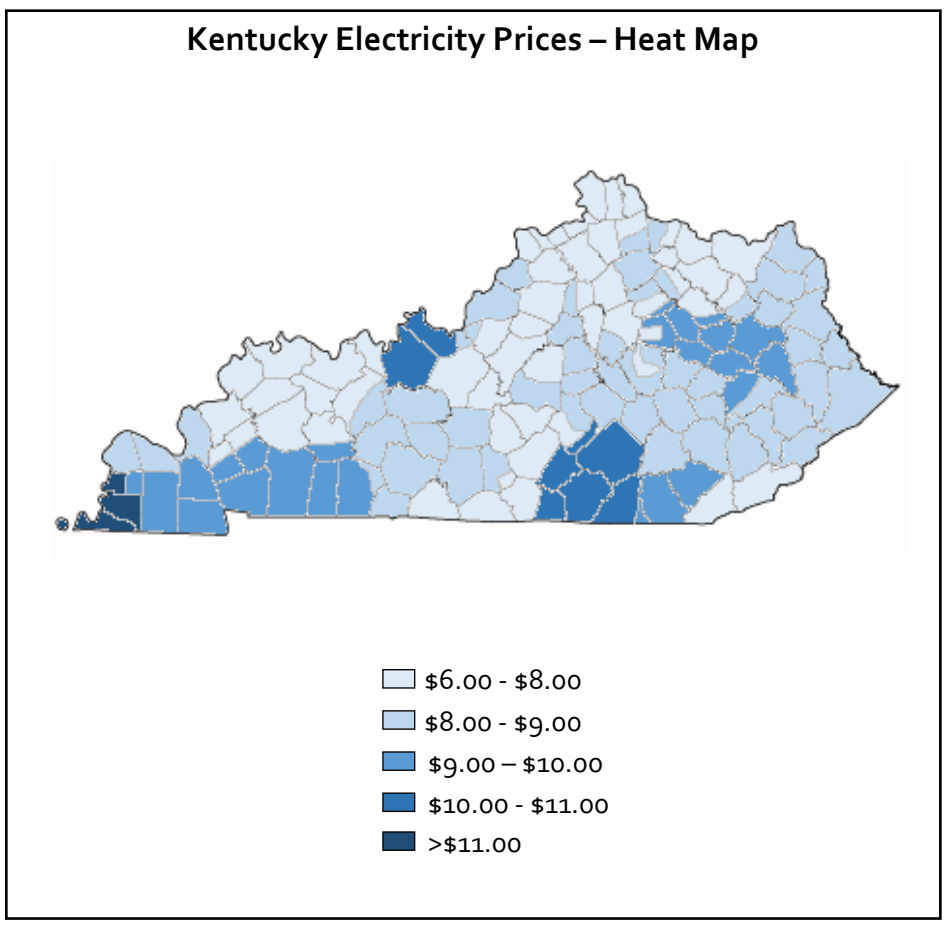
Electricity rates can vary greatly by utility and facility size range. The rates below from EIA represent general averages; individual facility rates may vary.




**Kentucky Average Delivered Electricity Prices by Utility**

| *Utility* | *Industrial Price (¢/kWh)* | *Commercial Price (¢/kWh)* | *Average Price** (¢/kWh)* |
|---|---|---|---|
| Hickman-Fulton Counties | 8.37 | 16.79 | 12.58 |
| Meade County Rural ECC | - | 10.49 | 10.49 |
| South Kentucky Rural ECC | 8.11 | 12.26 | 10.19 |
| State municipal average | 7.65 | 10.33 | 9.28 |
| State coop average | 6.90 | 10.46 | 8.76 |
| Kentucky Power Co | 6.16 | 10.74 | 8.45 |
| Louisville Gas & Electric | 6.82 | 9.40 | 8.11 |
| Kentucky Utilities Co | 6.08 | 9.17 | 7.63 |
| Duke Energy | 6.53 | 7.57 | 7.05 |

Source: U.S. Energy Information Administration, "Annual retail price of electricity by utility", https://www.eia.gov/electricity/data.cfm




*Citygate is a point or measuring station at which a distributing gas utility receives gas from a NG pipeline company or transmission system.

**Average of commercial and industrial electricity prices as reported by EIA.

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## Department of Energy CHP Partnerships

### Southeast CHP Technical Assistance Partnership

U.S. Department of Energy
**CHP Technical Assistance Partnerships**
SOUTHEAST

Southeast CHP TAP Director: Isaac Panzarella
Phone: 919-515-0354
Email: ipanzarella@ncsu.edu

### CHP for Resiliency Accelerator

The U.S. DOE is collaborating with a group of cities, states, and utilities who are actively pursuing CHP as a consideration in resiliency planning for critical infrastructure in their jurisdictions. This has included defining resiliency, identifying critical infrastructure, and assessing CHP opportunities. This process is being documented in a Resiliency Planning Tool. For more information: CHP for Resiliency Accelerator Website.

- Currently, there are no CHP for Resiliency Accelerator partners in Kentucky.

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