



Energy Data & Modeling

Download this Presentation: [XXXXXX.html](#)

January 29th, 2016

Energy Resources Management Board
Emergency Support Function – 12 Energy Supply
Kentucky Emergency Management Operations Center

Kentucky Energy and Environment Cabinet
Department for Energy Development and Independence

energy.ky.gov

Kentucky Energy Profile

5th Edition • 2015



Kentucky Energy and Environment Cabinet
Department for Energy Development and Independence

energy.ky.gov

Download at:

<http://energy.ky.gov/Pages/Profile.aspx>

Purpose:

Comprehensive Report on Energy Production, Energy Consumption, and Energy Dynamics within the Commonwealth of Kentucky

Contains:

- Energy Commodity Prices and Expenditures
- Energy Production and Consumption
- Energy Consumption, Expenditures, and Intensity by Sector
- Electricity Generation, Consumption, Prices, Generation Infrastructure, Rates, and Service Areas
- Profiles of Electricity Utilities in Kentucky
- Profiles of Coal-Fired Power Plants in Kentucky
- Coal Production and Consumption
- Natural Gas Consumption and Production
- Crude Oil Production and Liquid Fuel Consumption
- Renewable Energy Production, Generation, and Potential

Kentucky Coal Facts

15th Edition • 2015



Produced by the
Kentucky Energy and Environment Cabinet
Department for Energy Development and Independence

In Partnership with the
Kentucky Coal Association

energy.ky.gov
kentuckycoal.com

Download at:

<http://energy.ky.gov/Pages/CoalFacts.aspx>

Purpose:

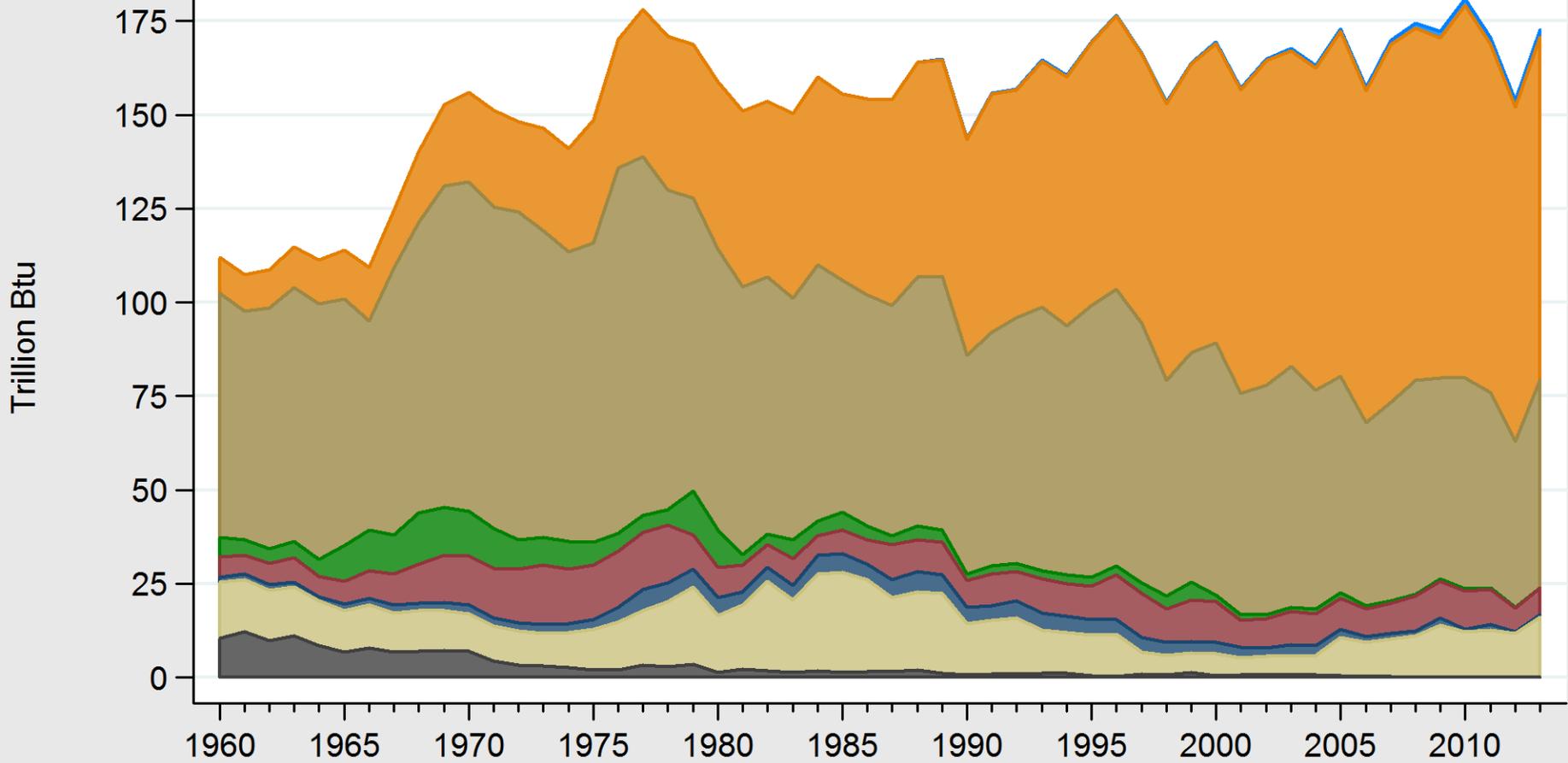
A detailed overview of the coal industry in Kentucky, focusing on mining and production, employment, and the markets for Kentucky coal.

Contains:

- Coal Production
- Mining Employment and Productivity
- Severance Revenue, Coal Prices, and Chemical Properties
- Coal Distribution and Markets
- Electricity Generation, Emissions, and Prices
- History of Coal in Kentucky
- Mine Safety, Licensing, and Reclamation
- County Level Production, Employment, and Markets

Kentucky Residential Energy Consumption by Fuel, 1960-2013

Residential energy consumption has grown little since the late 1970s. Electricity has grown, natural gas has declined.

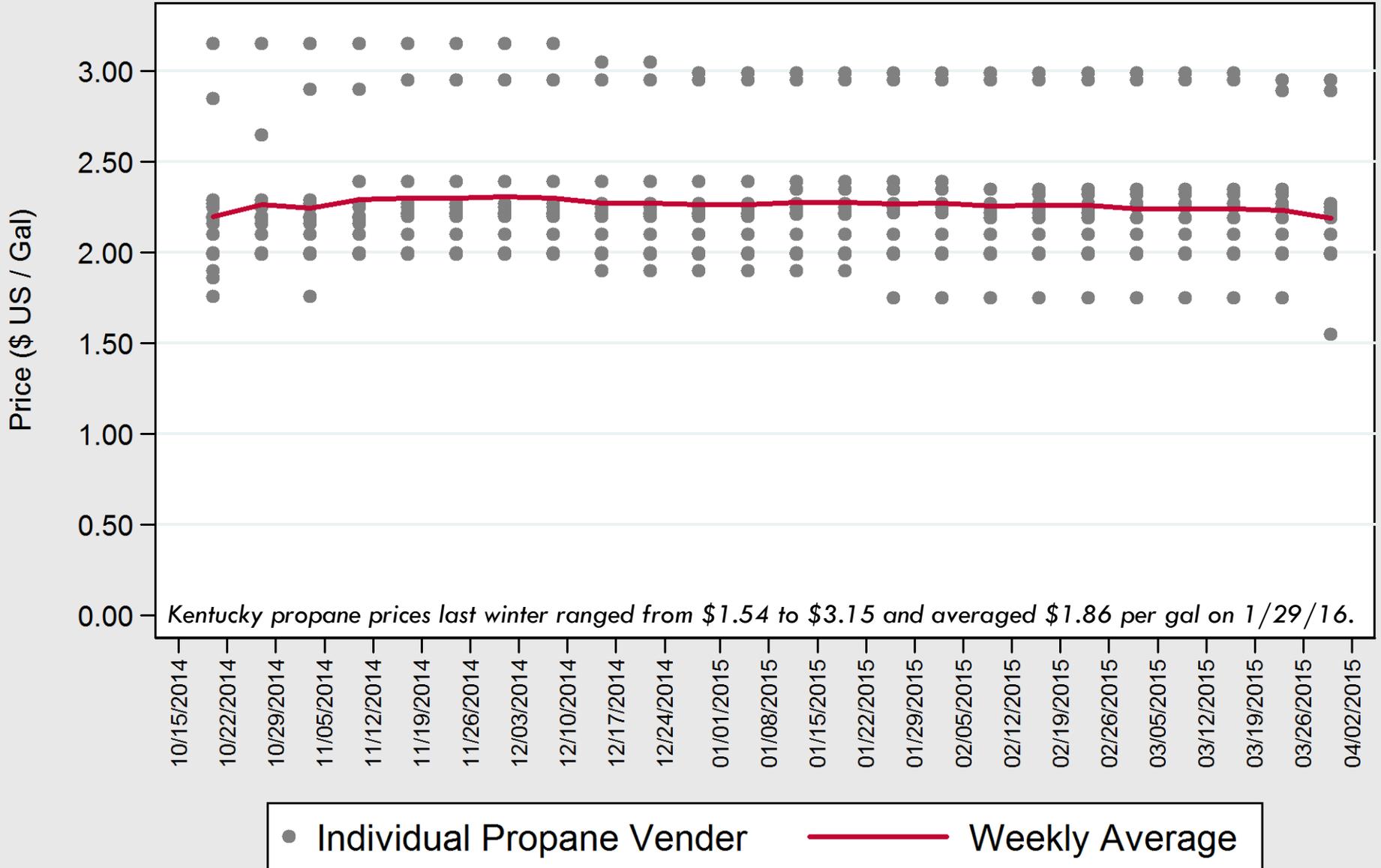


| | | | | | | | |
|----|------------|-----|-------------|-----|-------------|-----|----------|
| 1% | Geothermal | 53% | Electricity | 32% | Natural Gas | <1% | Kerosene |
| 4% | Propane | <1% | Fuel Oil | 9% | Wood | <1% | Coal |

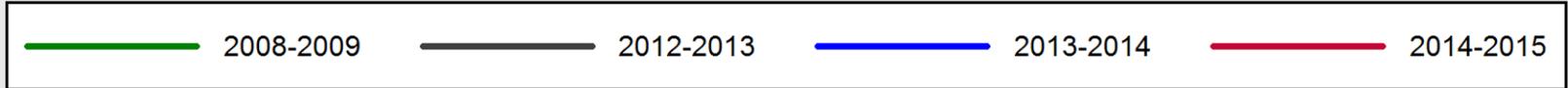
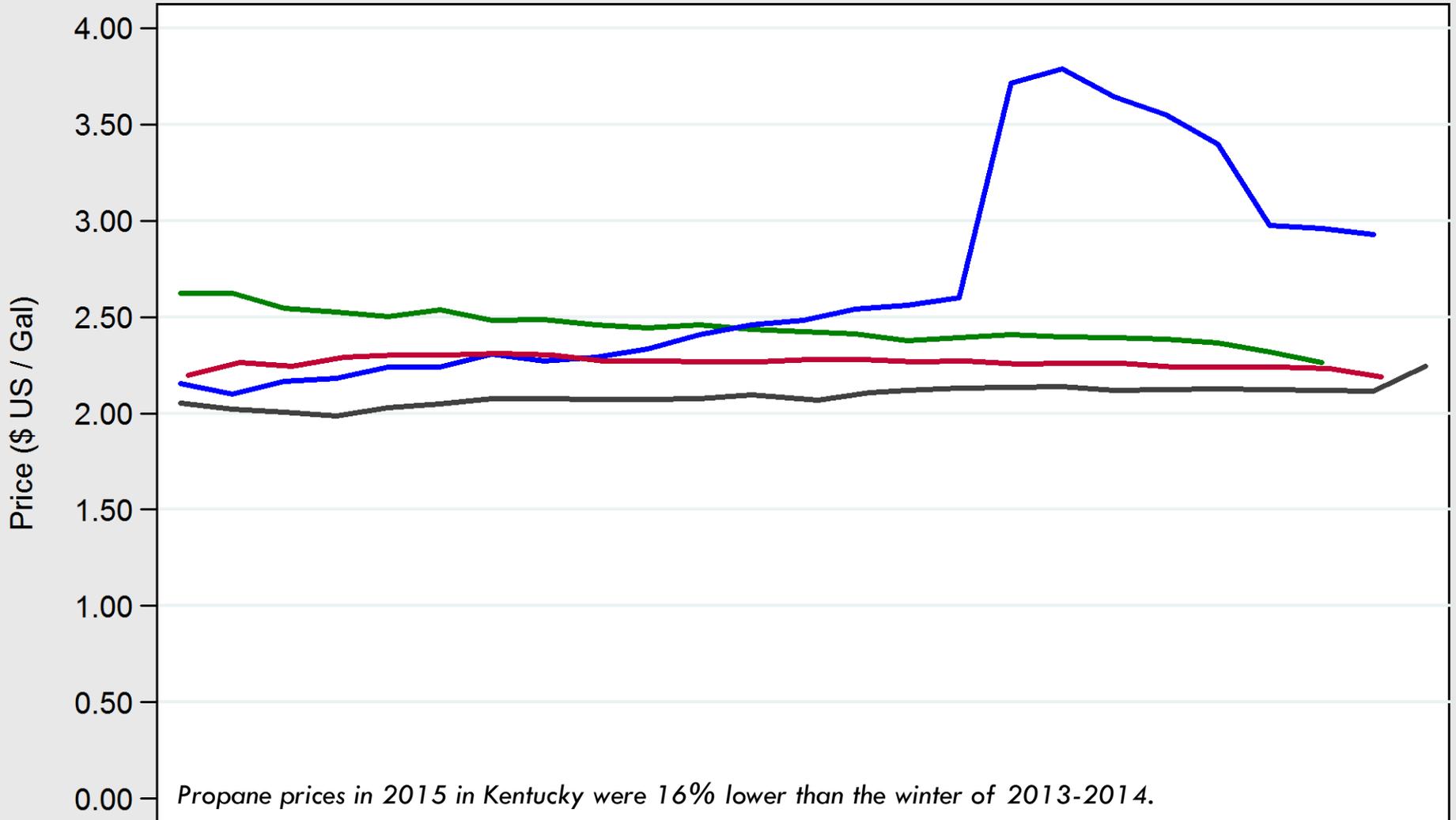
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

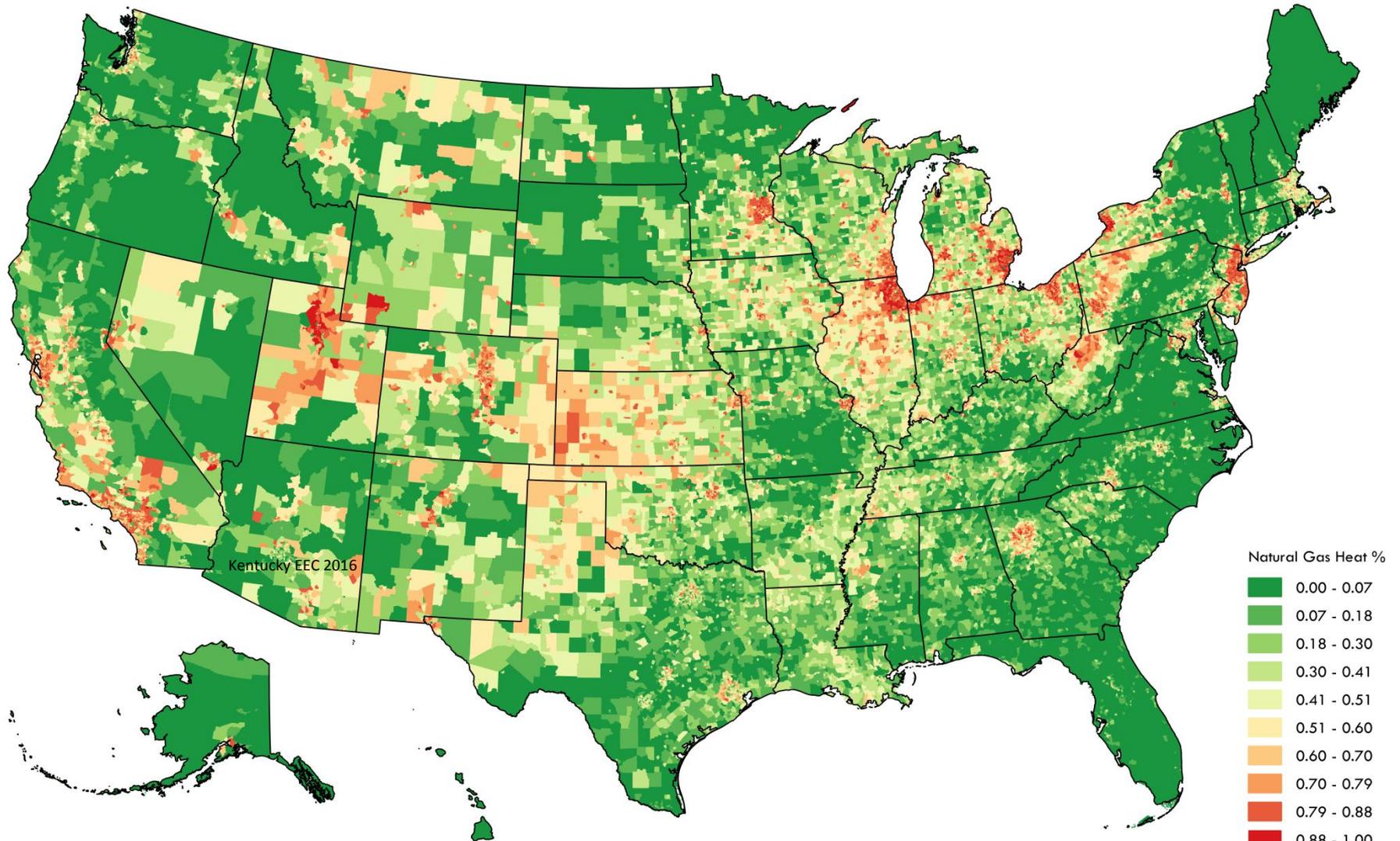
Kentucky Propane Prices, Winter 2014-2015



Kentucky Propane Prices, Winters 2008-2015



United States Natural Gas Use for Home Heating, 2014

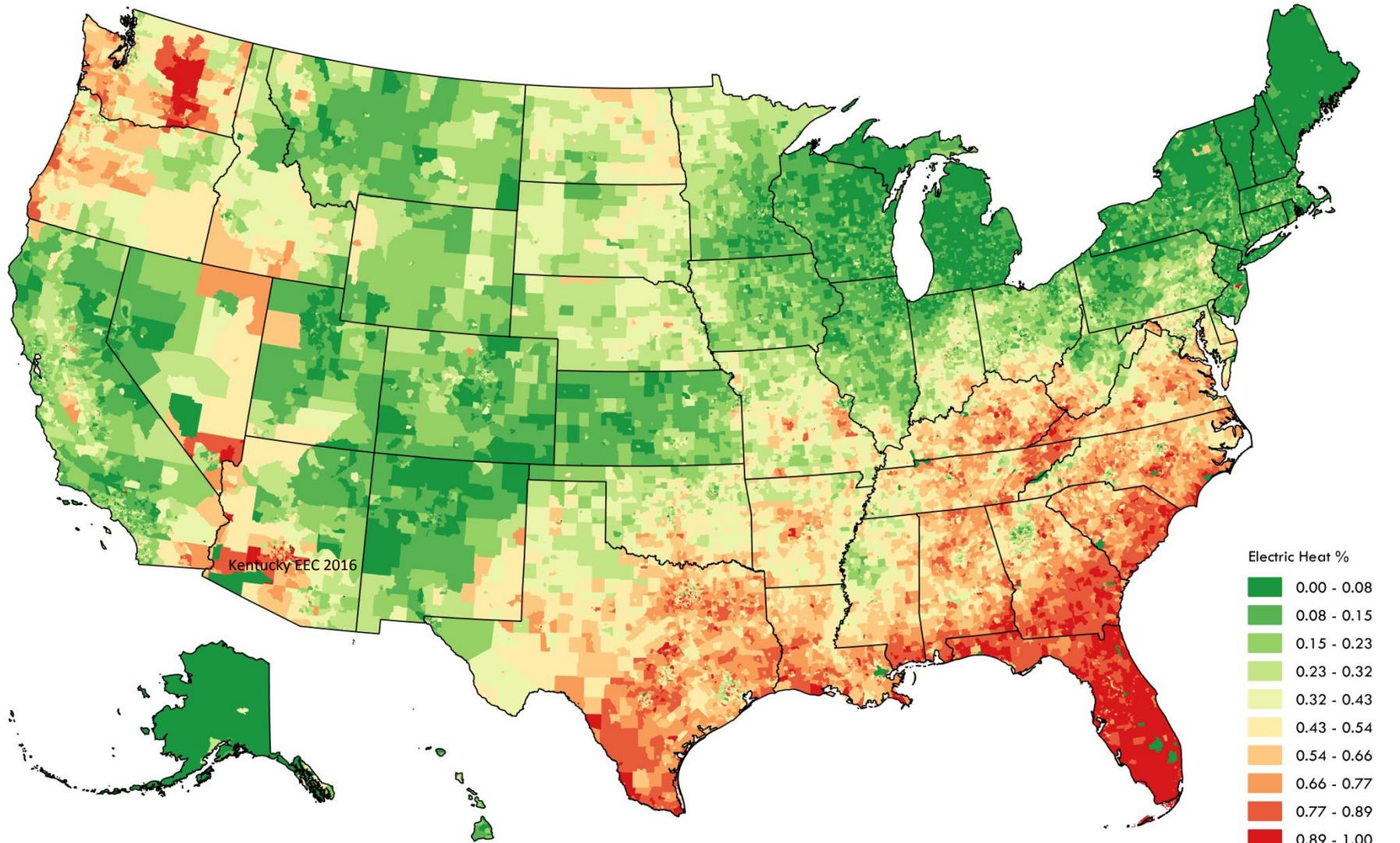


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

56.8 Million (49%) of American Families Heat with Natural Gas

United States Electricity Use for Home Heating, 2014

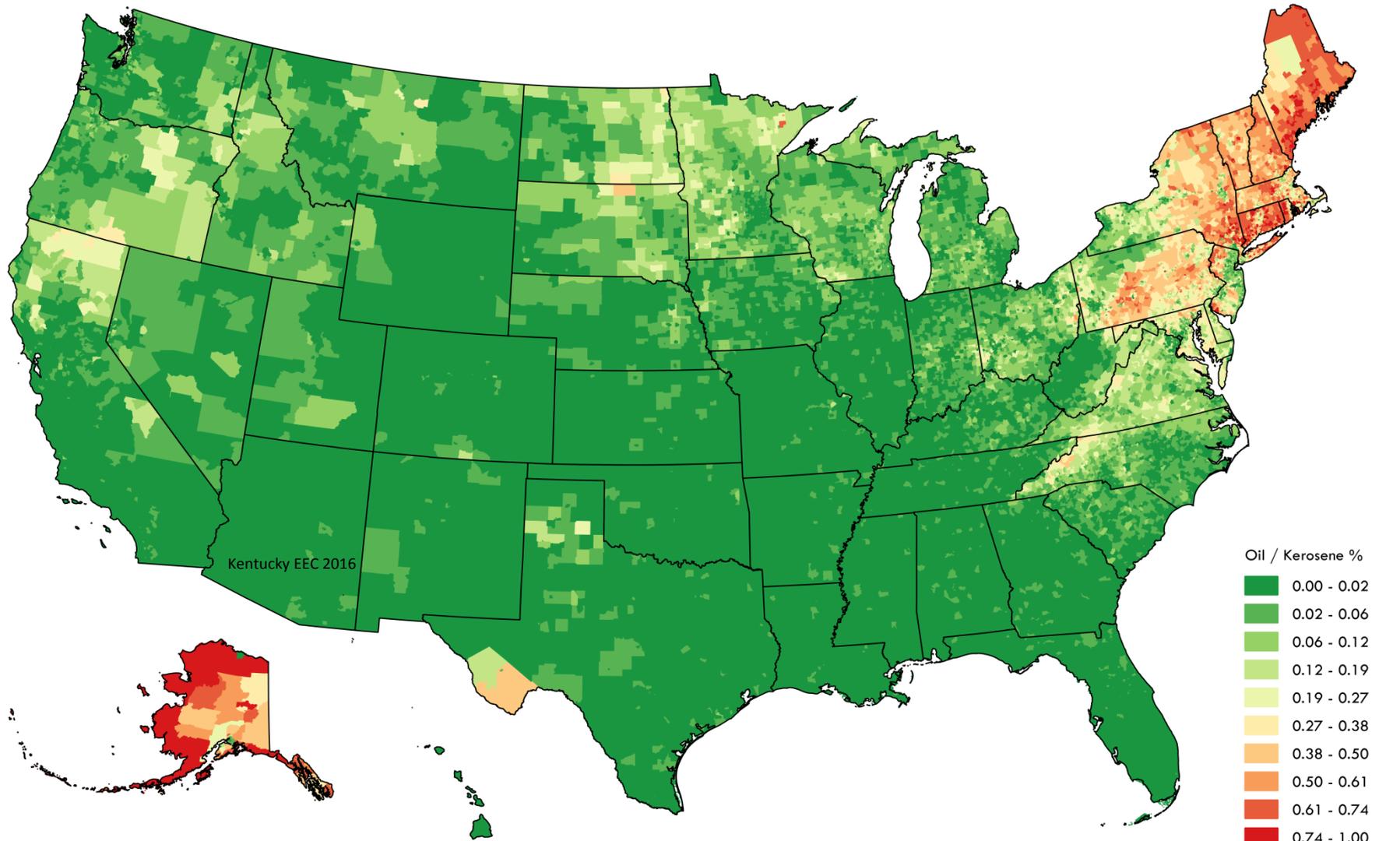


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

42.6 Million (37%) of American Families Heat with Natural Gas

United States Fuel Oil & Kerosene Use for Home Heating, 2014

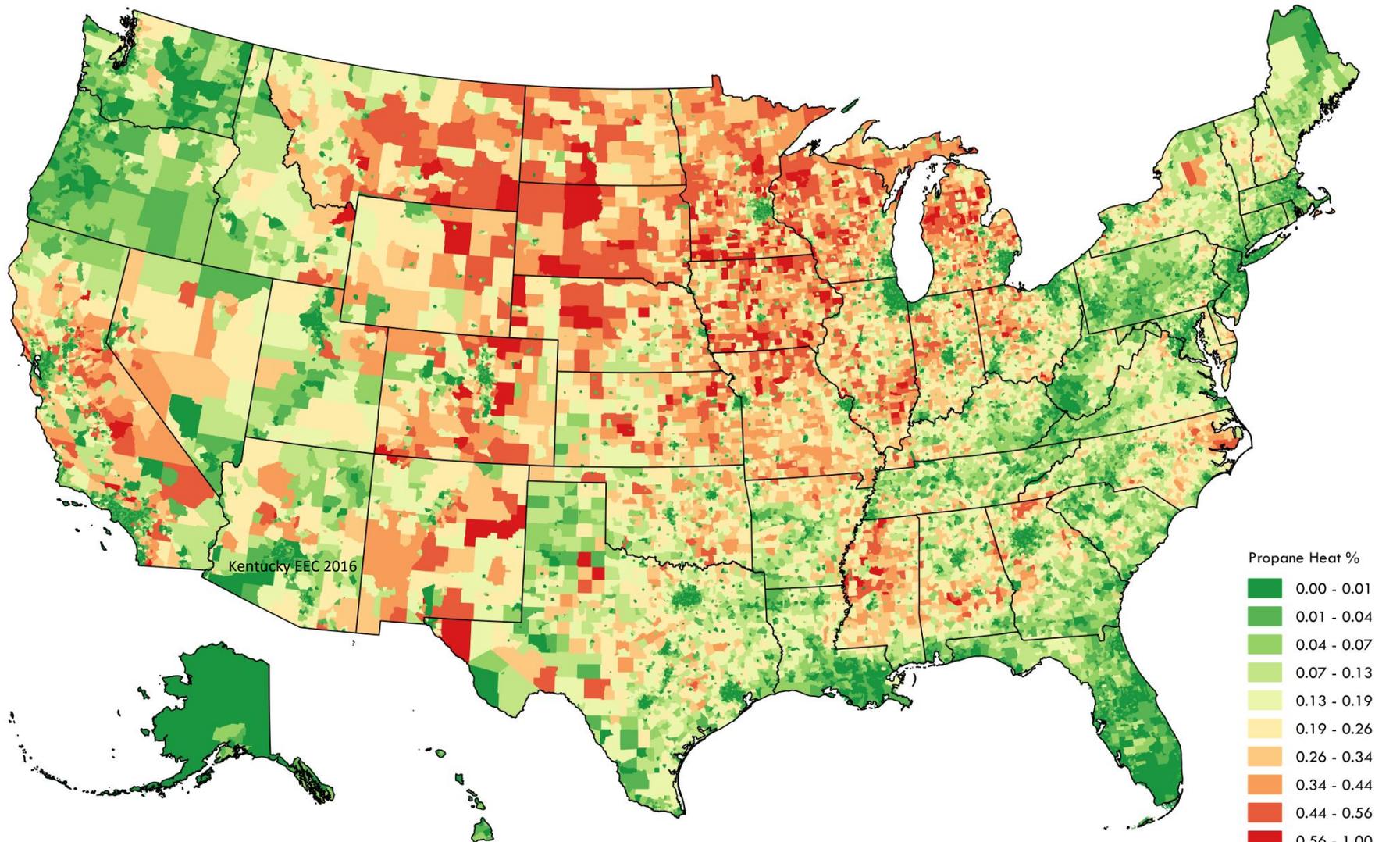


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

6.8 Million (6%) of American Families Heat with Fuel Oil or Kerosene

United States Propane Use for Home Heating, 2014

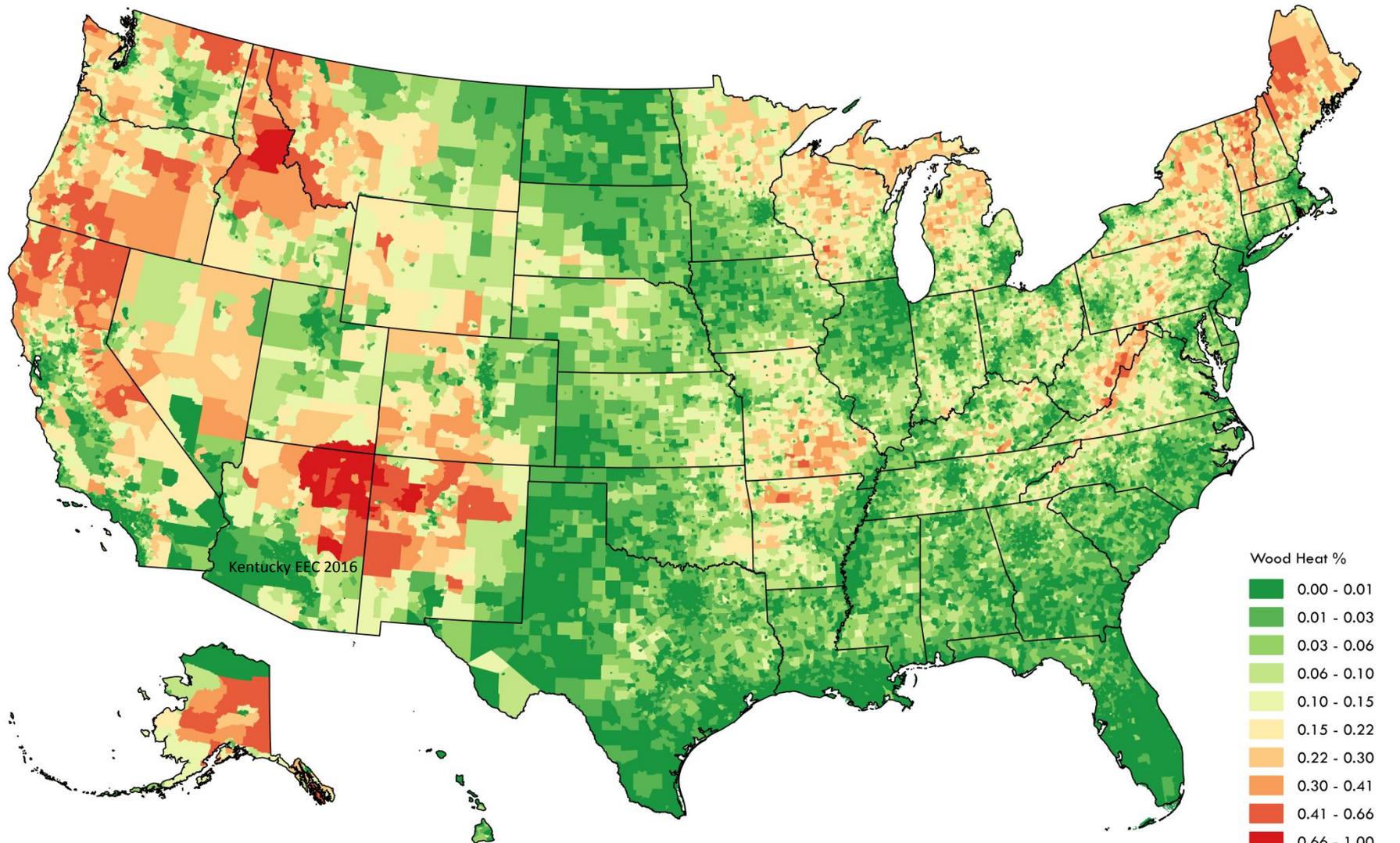


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

5.6 Million (4.9%) of American Families Heat with Propane

United States Wood Use for Home Heating, 2014

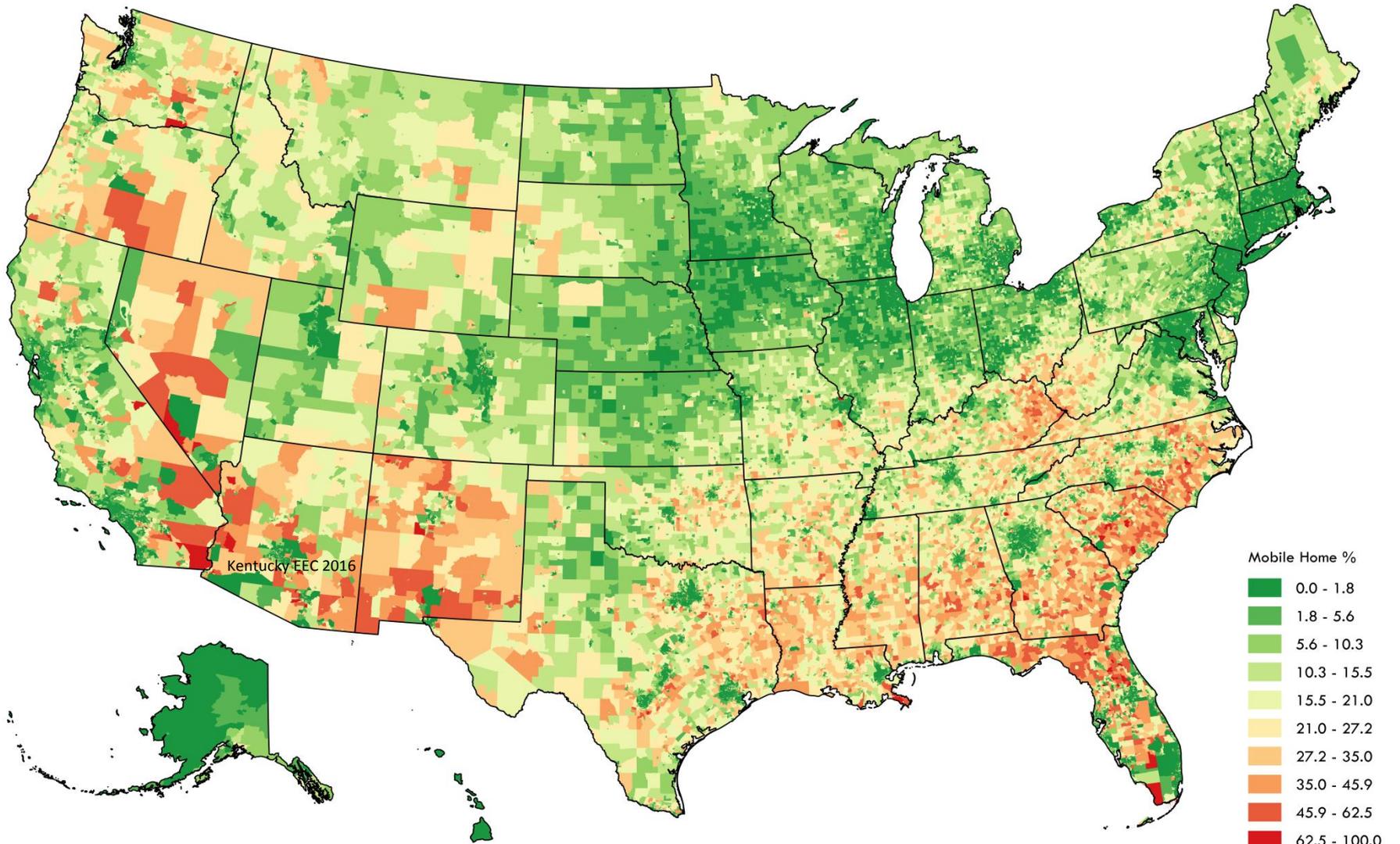


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

2.5 Million (2.1%) of American Families Heat with Propane

United States Mobile Home, 2014



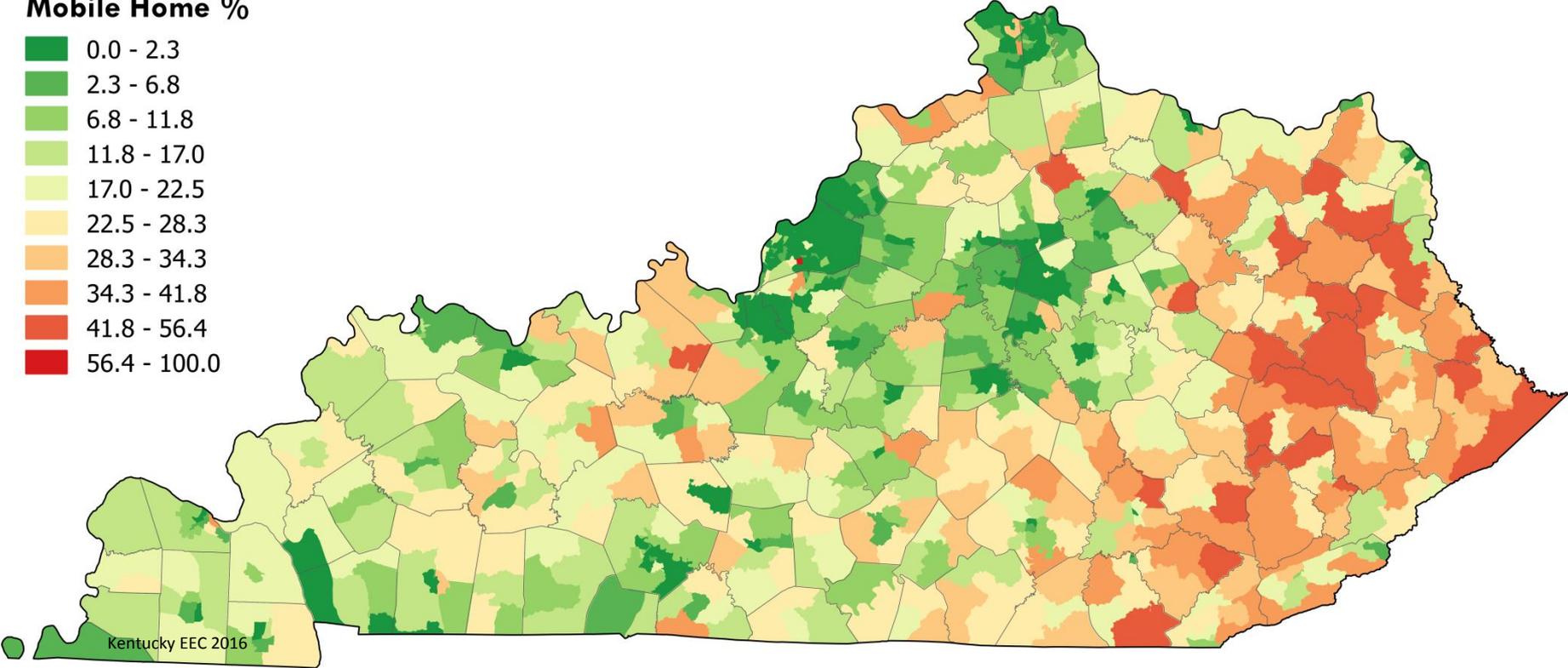
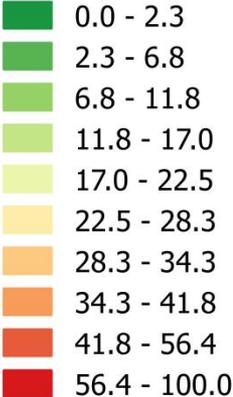
Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

8.1 Million (7%) of American Families Live in Mobile Homes

Kentucky Mobile Homes, 2014

Mobile Home %

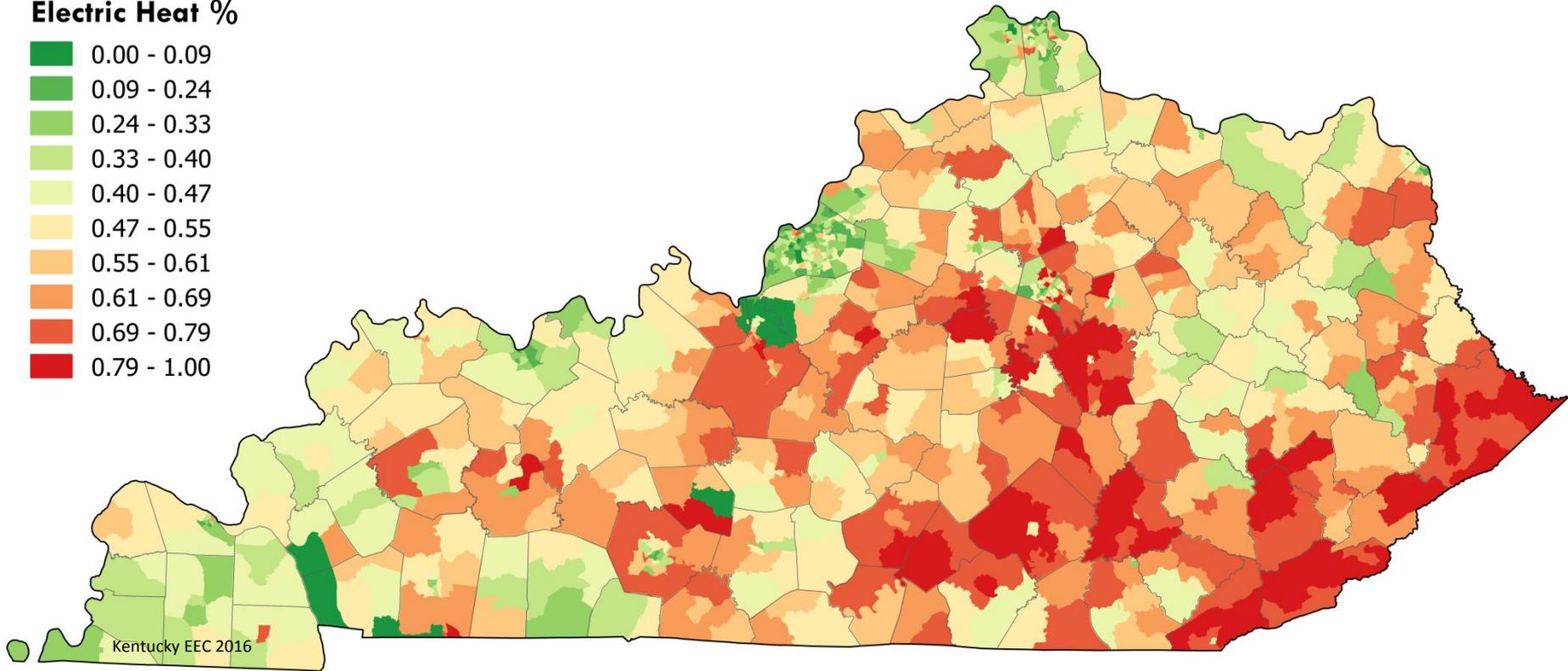
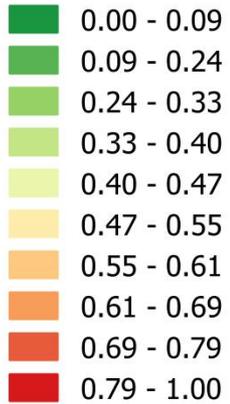


Kentucky Energy Database, EEC-DEDI, 2016

251,753 (13%) of Kentucky Families Live in Mobile Homes

Kentucky Homes Heating with Electricity, 2014

Electric Heat %

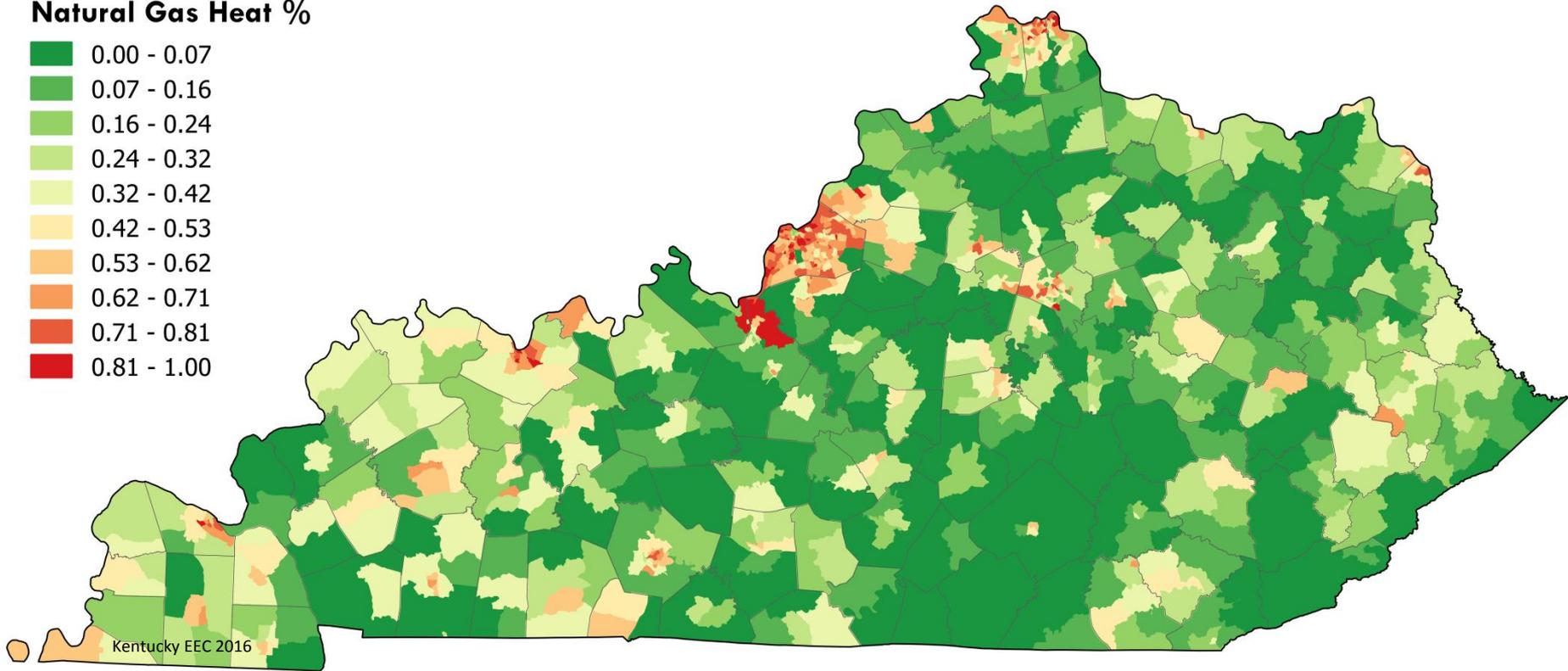
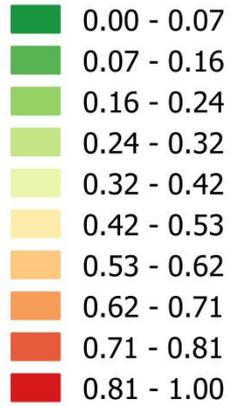


Kentucky Energy Database, EEC-DEDI, 2016

859,587 (50.5%) of Kentucky Families Heat with Electricity

Kentucky Homes Heating with Natural Gas, 2014

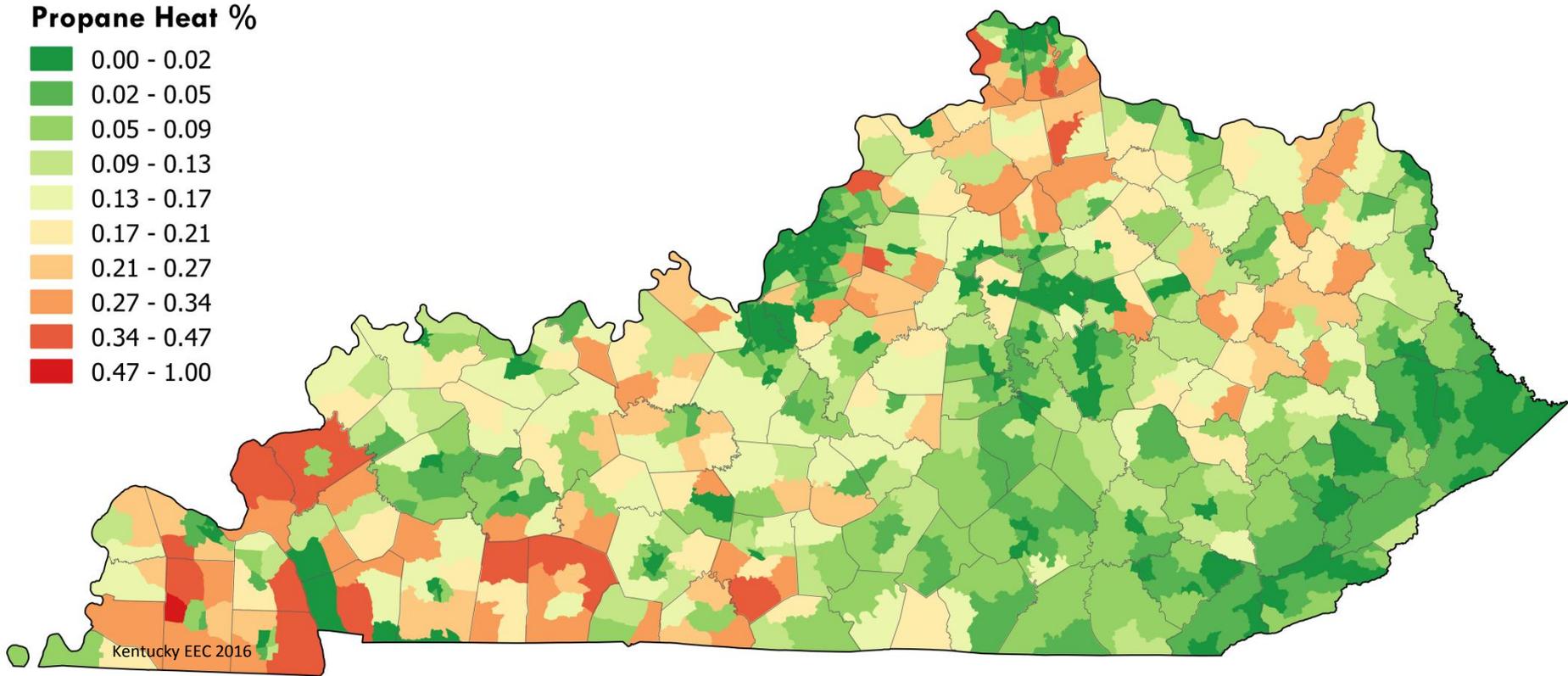
Natural Gas Heat %



Kentucky Energy Database, EEC-DEDI, 2016

650,672 (38%) of Kentucky Families Heat with Natural Gas

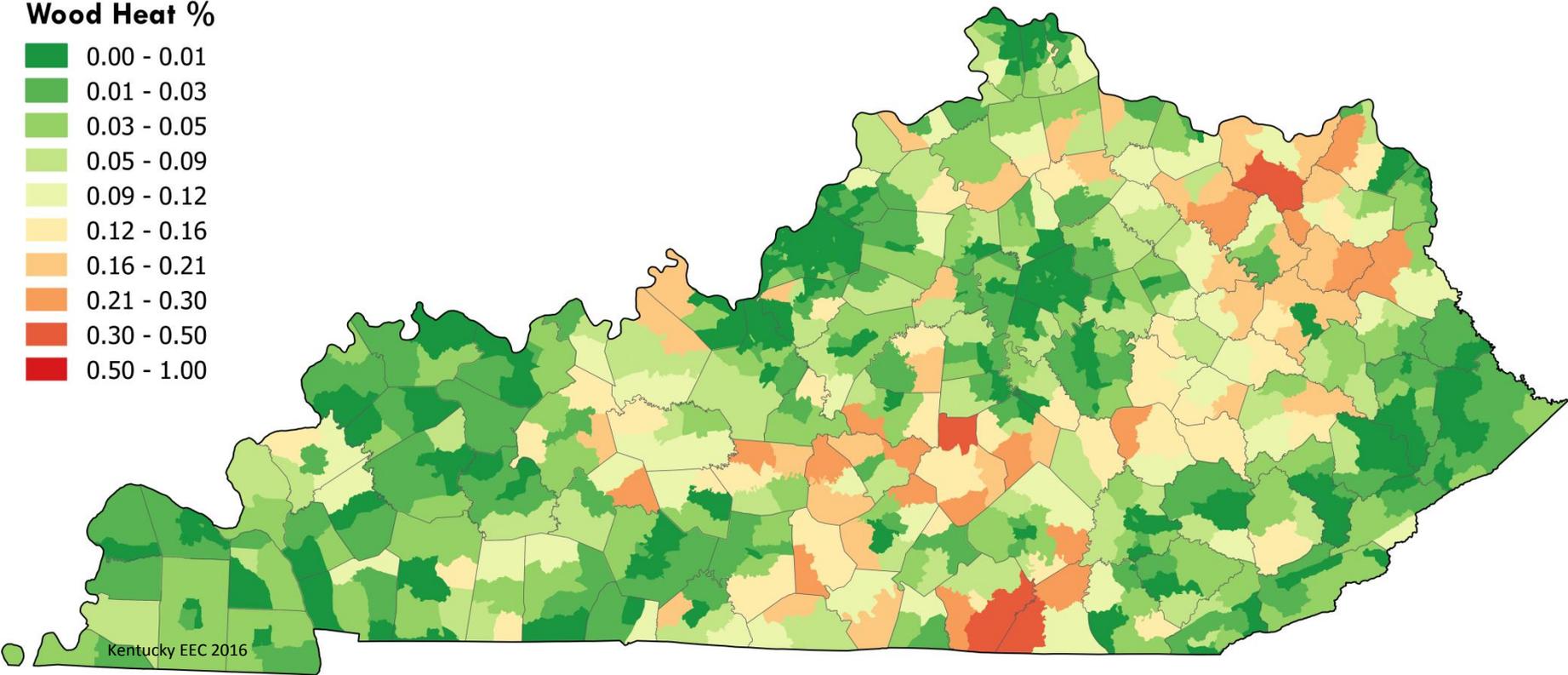
Kentucky Homes Heating with Propane, 2014



Kentucky Energy Database, EEC-DEDI, 2016

50,270 (6.5%) of Kentucky Families Heat with Propane

Kentucky Homes Heating with Wood, 2014

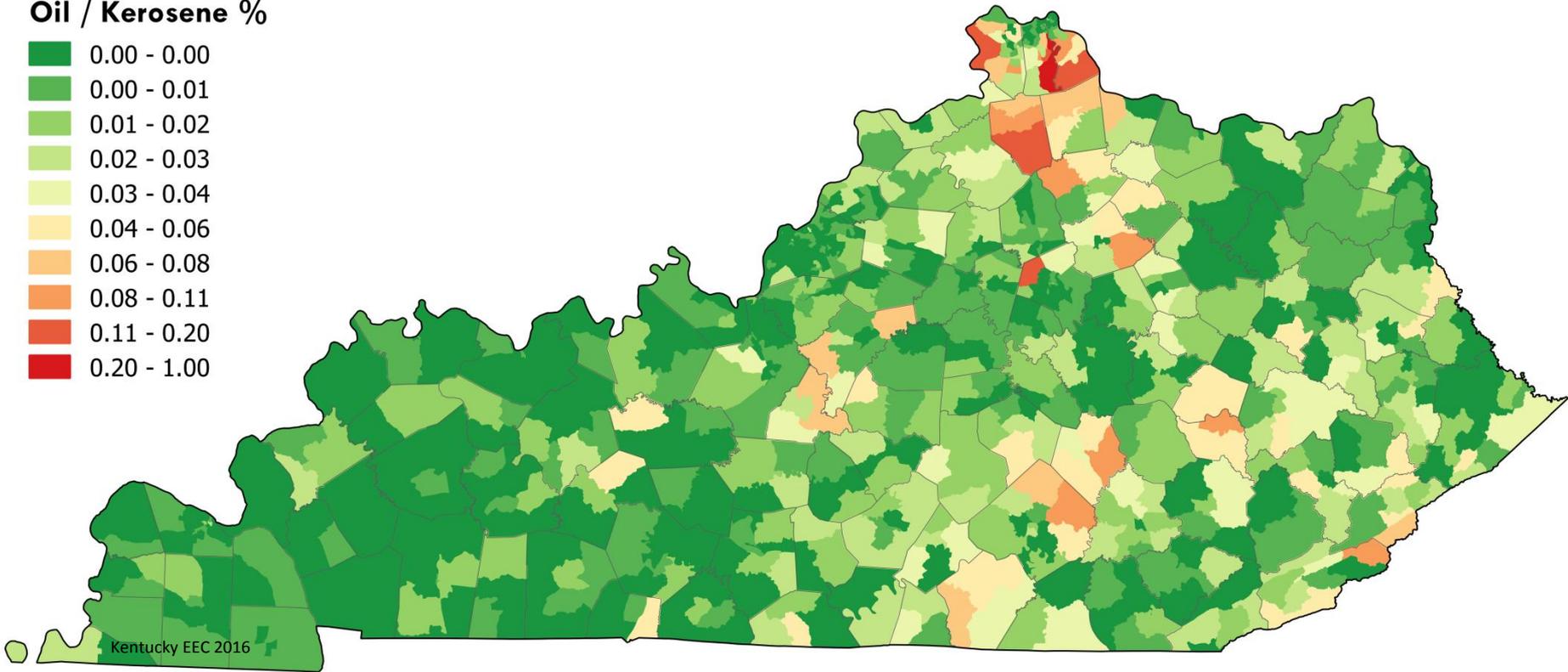
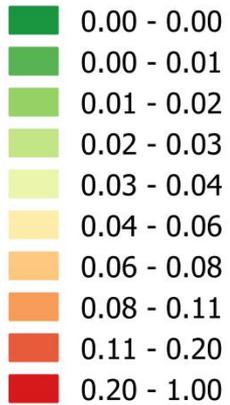


Kentucky Energy Database, EEC-DEDI, 2016

50,270 (2.9%) of Kentucky Families Heat with Wood

Kentucky Homes Heating with Fuel Oil or Kerosene, 2014

Oil / Kerosene %

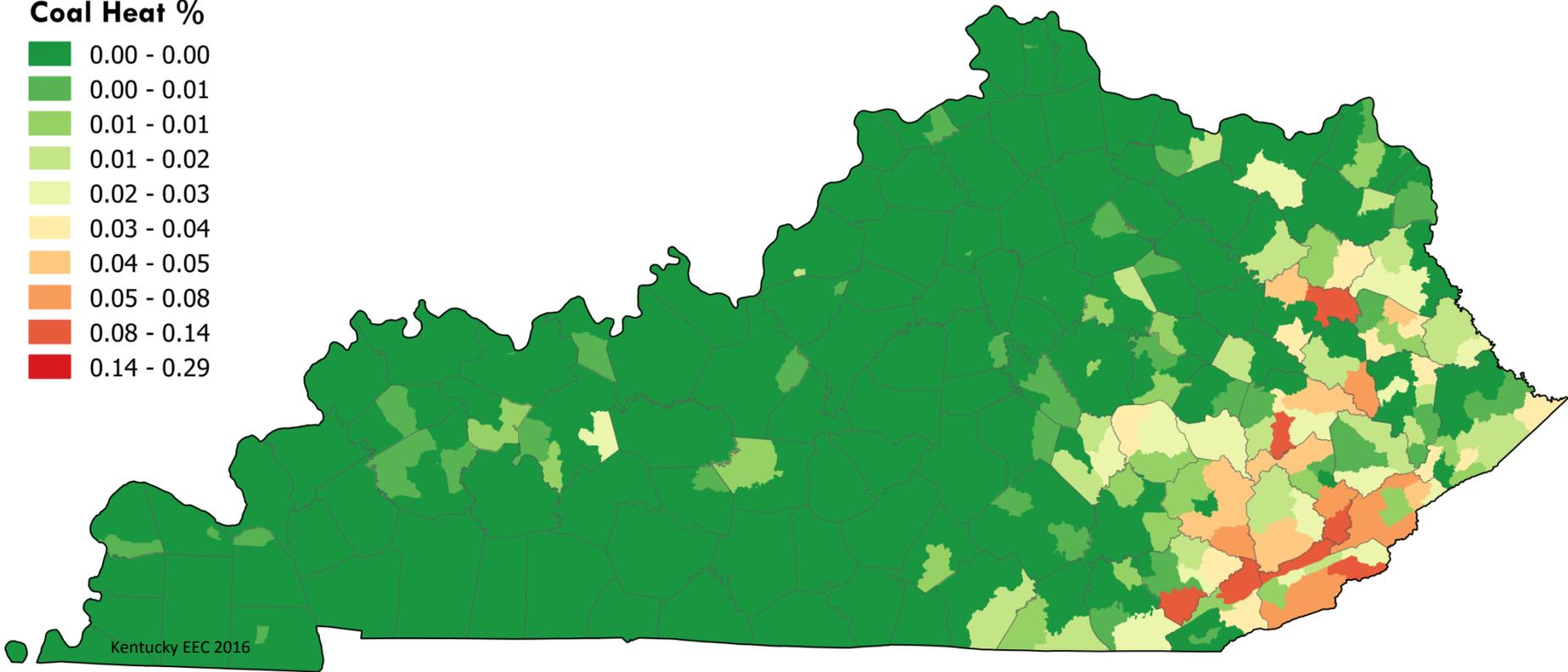
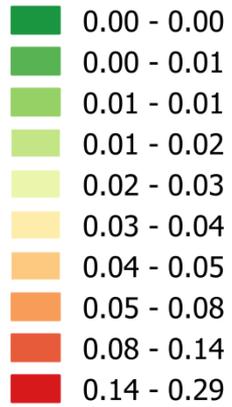


Kentucky Energy Database, EEC-DEDI, 2016

17,504 (1%) of Kentucky Families Heat with Fuel Oil or Kerosene

Kentucky Homes Heating with Coal, 2014

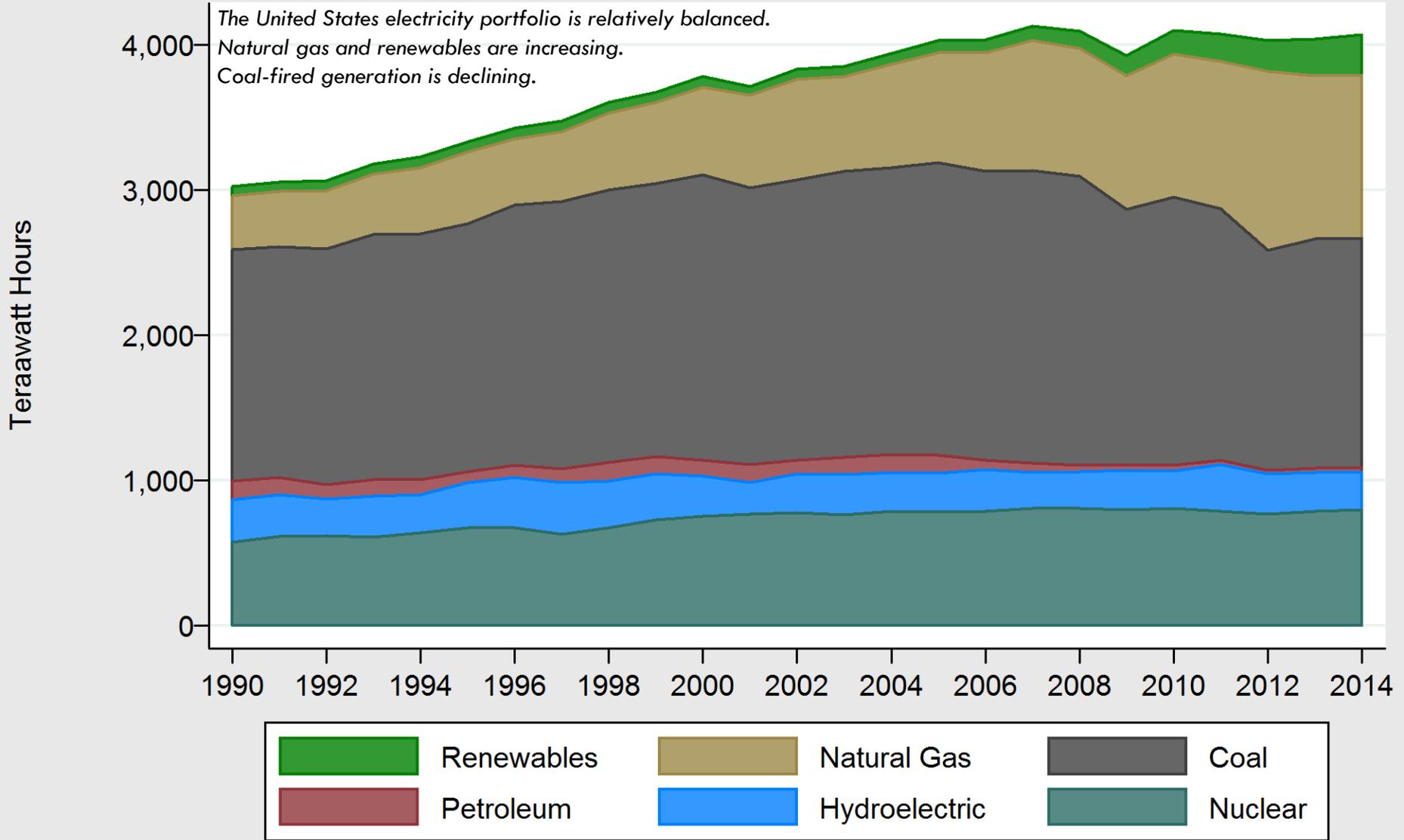
Coal Heat %



Kentucky Energy Database, EEC-DEDI, 2016

4,317 (0.3%) of Kentucky Families Heat with Coal

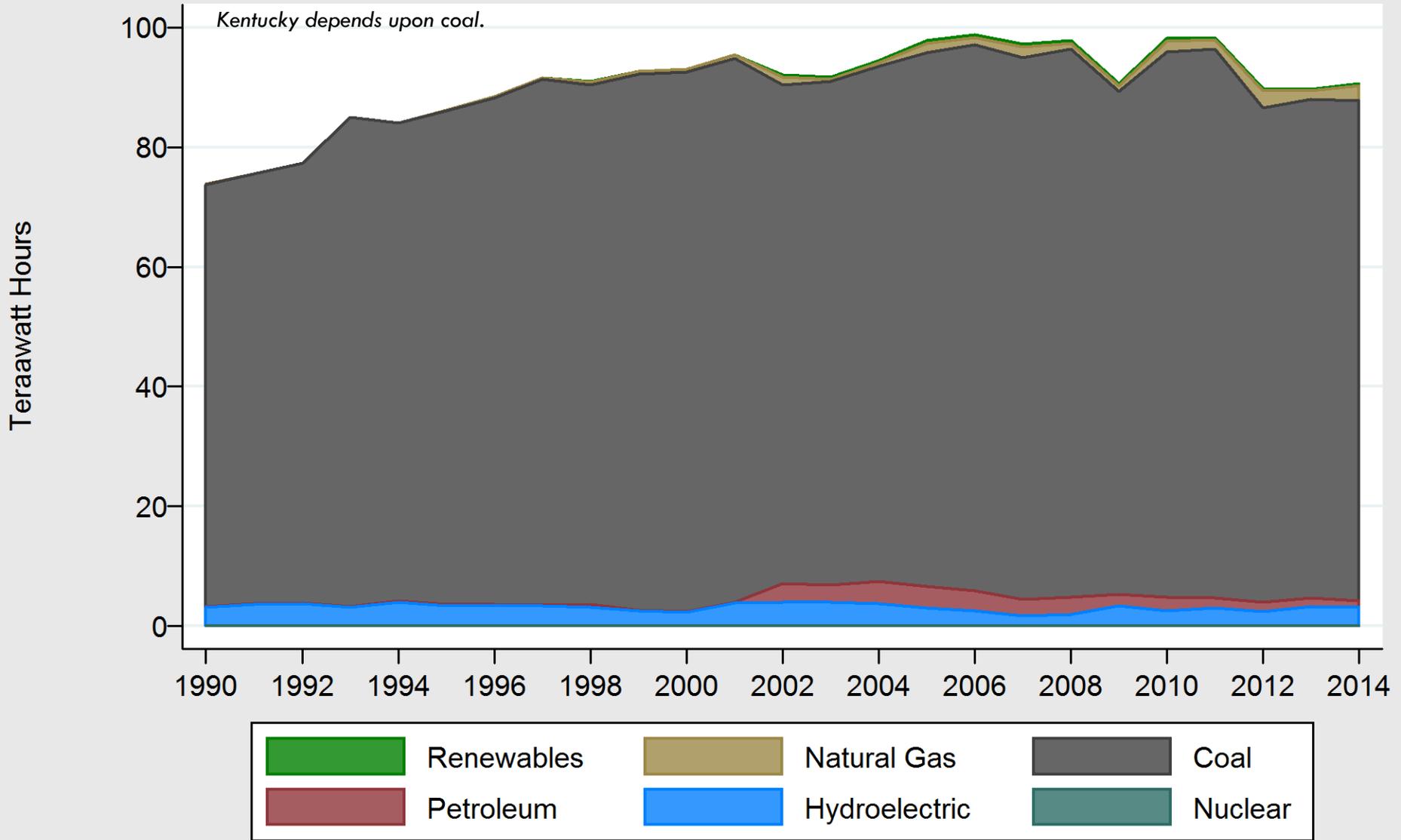
United States Electricity Generation by Fuel, 1990-2014



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Electric Power Annual

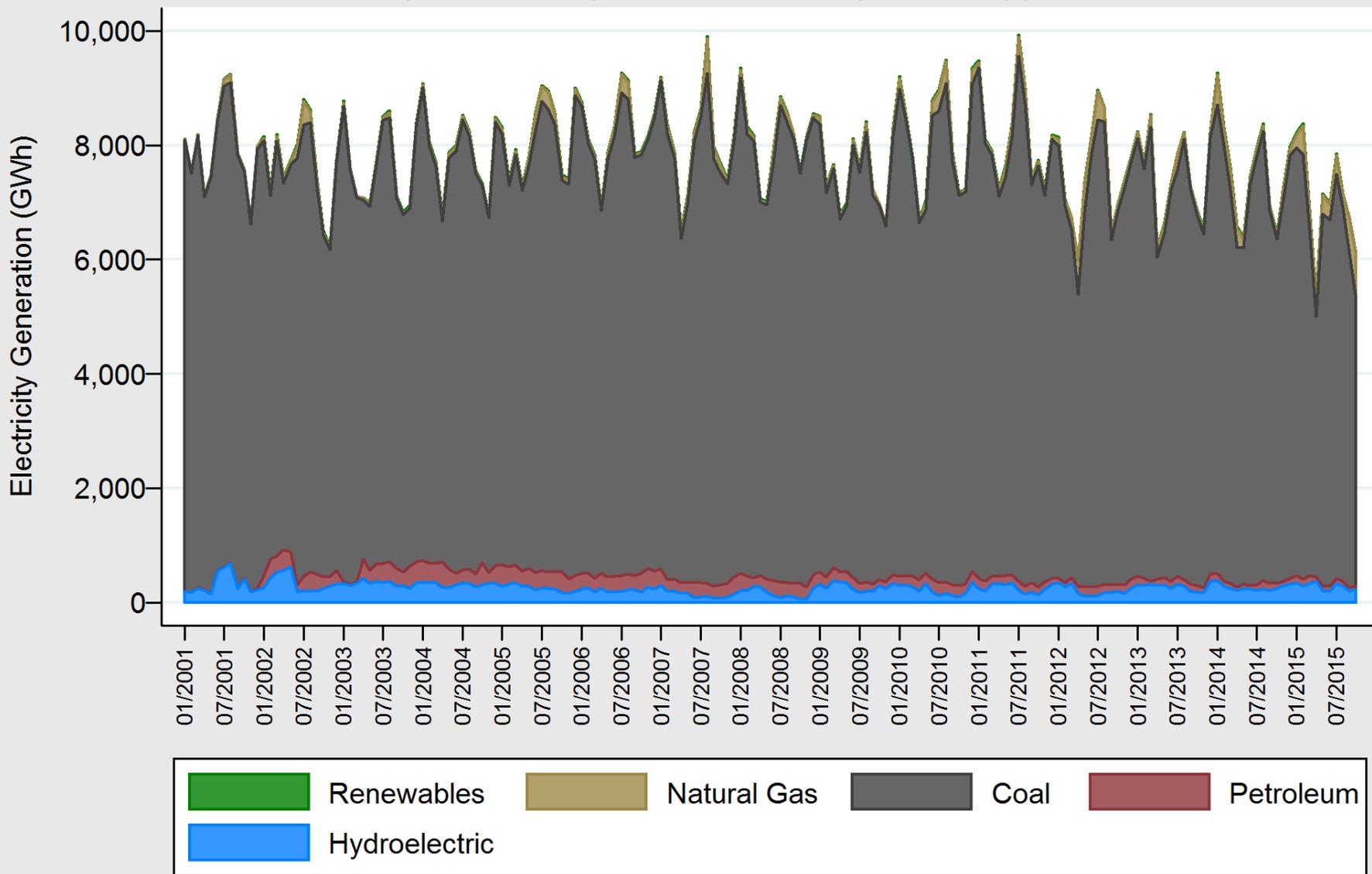
Kentucky Electricity Generation by Fuel, 1990-2014



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Electric Power Annual

Kentucky Electricity Generation by Fuel Type, 2001-2015



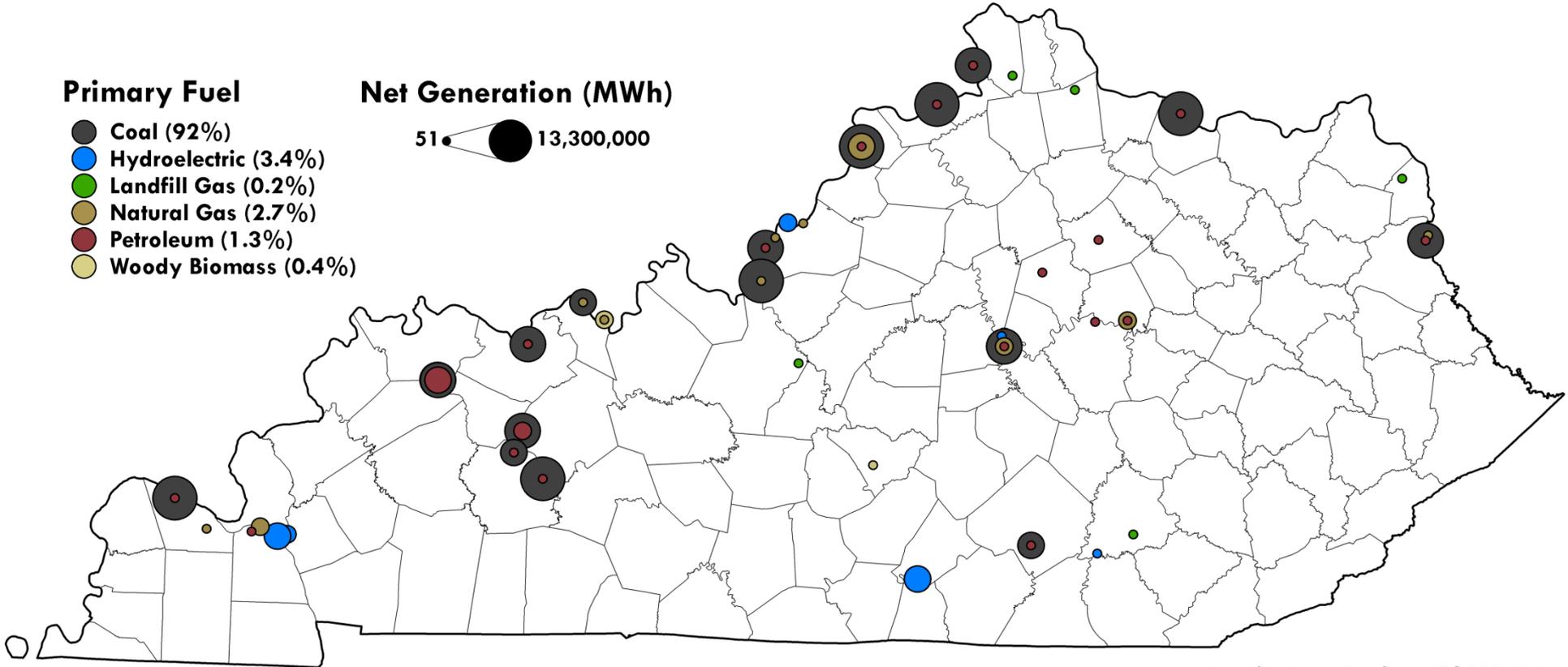
Kentucky Energy Database, EEC-DEDI, January 2016

Power Plants in Kentucky, 2014

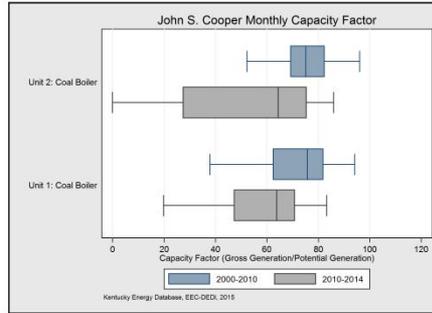
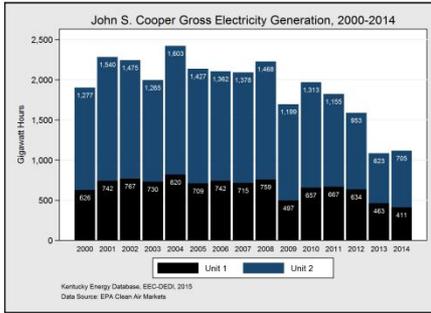
Primary Fuel

- Coal (92%)
- Hydroelectric (3.4%)
- Landfill Gas (0.2%)
- Natural Gas (2.7%)
- Petroleum (1.3%)
- Woody Biomass (0.4%)

Net Generation (MWh)



John S. Cooper Power Station



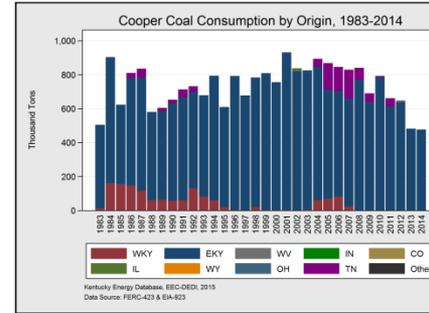
| Unit Number | Online Year | Retire Year | Fuel | Capacity (MW) | Capacity Factor* (%) | Gross Generation* (GWh) | Net Generation* (GWh) | CO ₂ Rate* (lbs./MWh) | SO ₂ Rate* (lbs./MWh) | NO _x Rate* (lbs./MWh) |
|-------------|-------------|-------------|------|---------------|----------------------|-------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|
| Plant 1 | 1965 | | Coal | 341 | 37% | 1,116 | 1,030 | 1,777 | 7.75 | 1.55 |
| 1 | 1965 | | Coal | 116 | 40% | 411 | 381 | 1,787 | 13.04 | 2.27 |
| 2 | 1969 | | Coal | 225 | 36% | 705 | 649 | 1,772 | 4.66 | 1.12 |

The John Sherman Cooper Power Station, located in Pulaski County, is 50 years old and consists of two coal-fired electricity generating units. The units came online in 1965 and 1969, respectively. The plant has a total nameplate capacity of 341 MW. In 2014, the plant generated 1.1 GWh of electricity and had a plant-wide capacity factor of 37 percent. A scrubber was installed on unit 2 in 2012 to lower sulfur dioxide emissions and a baghouse. Unit 1 is in the process of being tied into the Unit 2 controls. Cooper sourced all of its coal from eastern Kentucky in 2014 from Perry, Leslie, Bell, Estill, Rockcastle, and Knox counties. John S. Cooper Power Station is owned and operated by [East Kentucky Power Cooperative](#). Photo courtesy of EKPC.

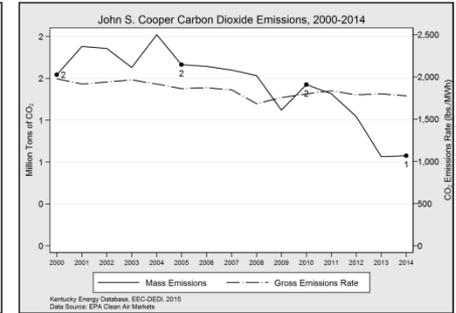
*2014



John S. Cooper Power Station

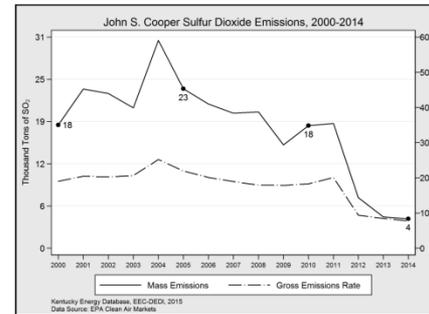


| State | 2014 Tons | Percentage |
|------------------|-----------|------------|
| Total | 477,513 | 100% |
| Eastern Kentucky | 477,513 | 100% |



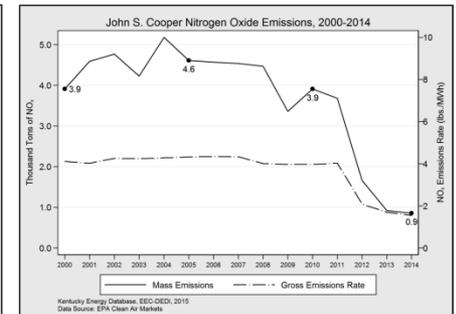
| Carbon Dioxide | 2014 Value | Since 2000 |
|---------------------|------------|------------|
| Emissions (Tonnage) | 991,943 | -47% |
| Rate (lbs./MWh) | 1,777 | -10% |

The John S. Cooper Power Station emitted 992 thousand tons of CO₂ in 2014, a decrease of 47 percent from 2000 levels. The rate of CO₂ emissions decreased by 10 percent during that period and is the lowest of all Kentucky coal plants.



| Sulfur Dioxide | 2014 Value | Since 2000 |
|---------------------|------------|------------|
| Emissions (Tonnage) | 4,324 | -76% |
| Rate (lbs./MWh) | 7.75 | -59% |

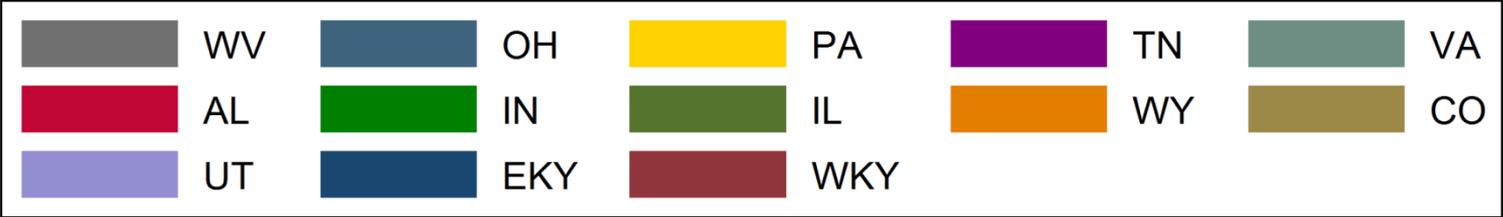
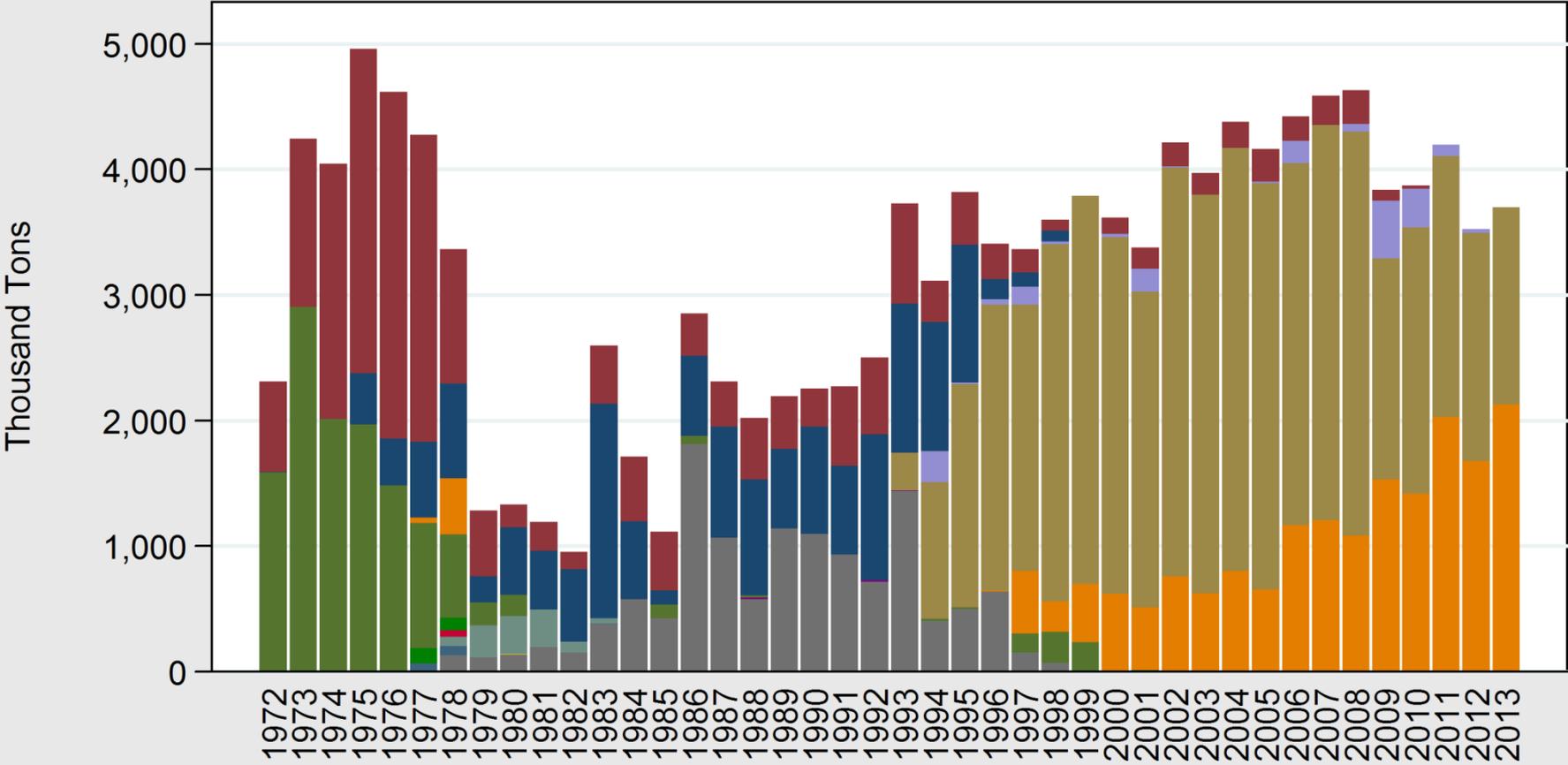
The John S. Cooper Power Station emitted 4,324 tons of SO₂ in 2014, a decrease of 76 percent since 2000. The rate of SO₂ emissions reduced by 59 percent during that period.



| Nitrogen Dioxide | 2014 Value | Since 2000 |
|---------------------|------------|------------|
| Emissions (Tonnage) | 863 | -78% |
| Rate (lbs./MWh) | 1.55 | -62% |

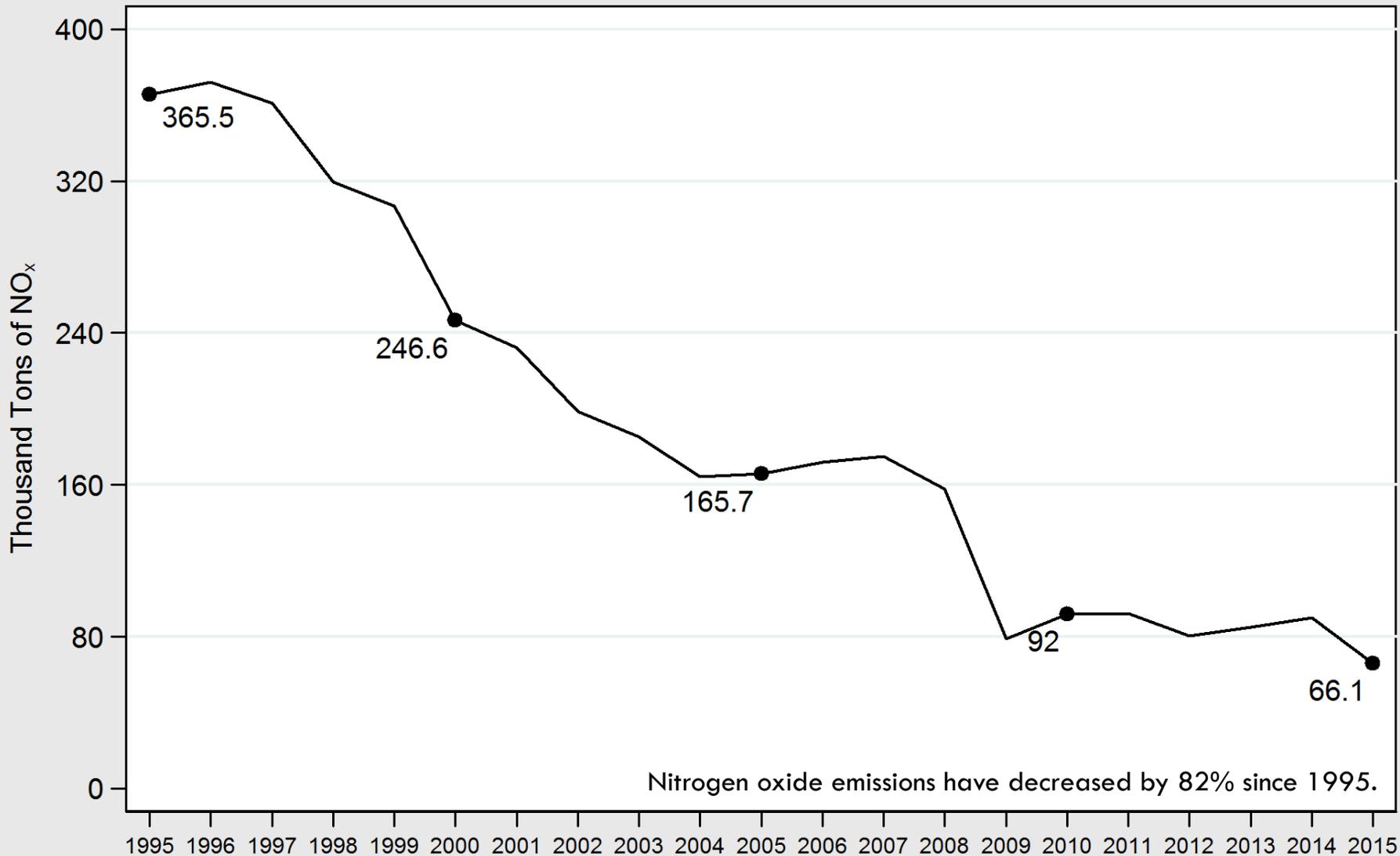
The John S. Cooper Power Station emitted 863 tons of NO_x in 2014, a reduction of 78 percent since 2000. The rate of NO_x emissions decreased by 62 percent during that period.

Shawnee Coal Consumption by Origin, 1972-2013



Kentucky Energy Database, EEC-DEDI, 2015

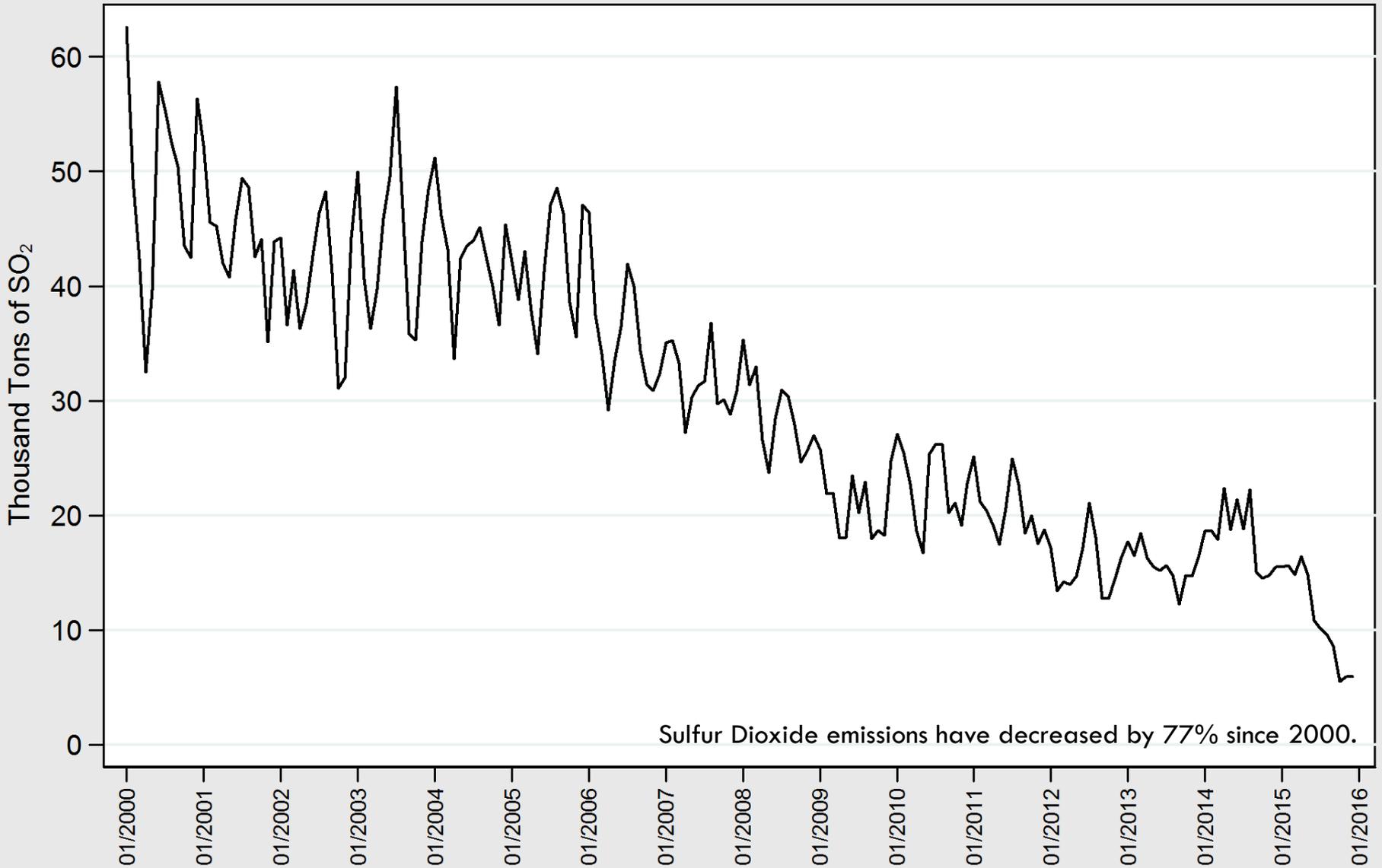
Kentucky NO_x Emissions from Electricity Generation, 1995-2015



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EPA Clean Air Markets

Kentucky SO₂ Emissions from Fossil Generation, 2000-2015



Kentucky Energy Database, EEC-DEDI, 2016

Contact Information

Aron Patrick

Assistant Director

Aron.Patrick@ky.gov

Adam Blandford

Energy Analyst

Adam.Blandford@ky.gov

Kentucky Energy and Environment Cabinet
Department for Energy Development & Independence
502-564-7192

Twitter: [@KYDEDI](https://twitter.com/KYDEDI)

Facebook: facebook.com/KentuckyDEDI

Website: energy.ky.gov