

Kentucky Energy Outlook

Presentation to the
Kentucky Petroleum Marketers Association
Board of Directors Fall Meeting
September 14th, 2015

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Website: energy.ky.gov

Overview

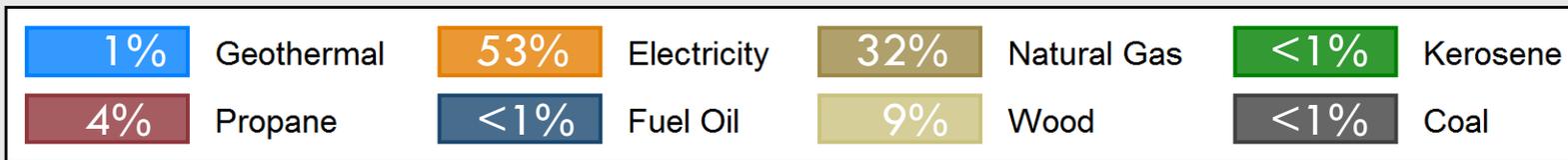
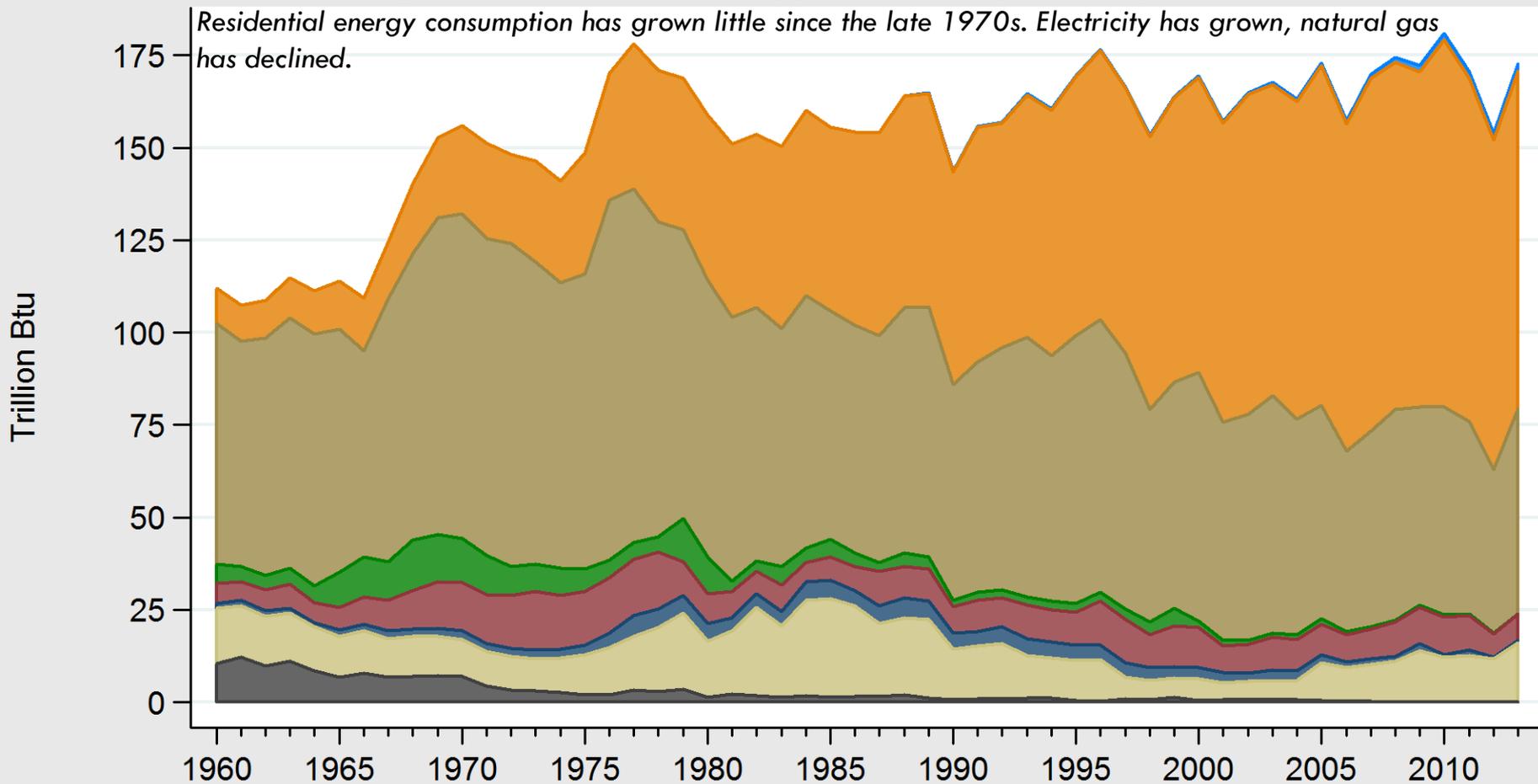
- **Kentucky Home Heating Fuels**
- **Kentucky Energy Consumption**
- **Kentucky Energy Production**
- **Electricity Expenditures and Income**
- **Kentucky's Electricity Portfolio**

Kentucky Home Heating Fuels

More information is available in the Kentucky Energy Profile online at:

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

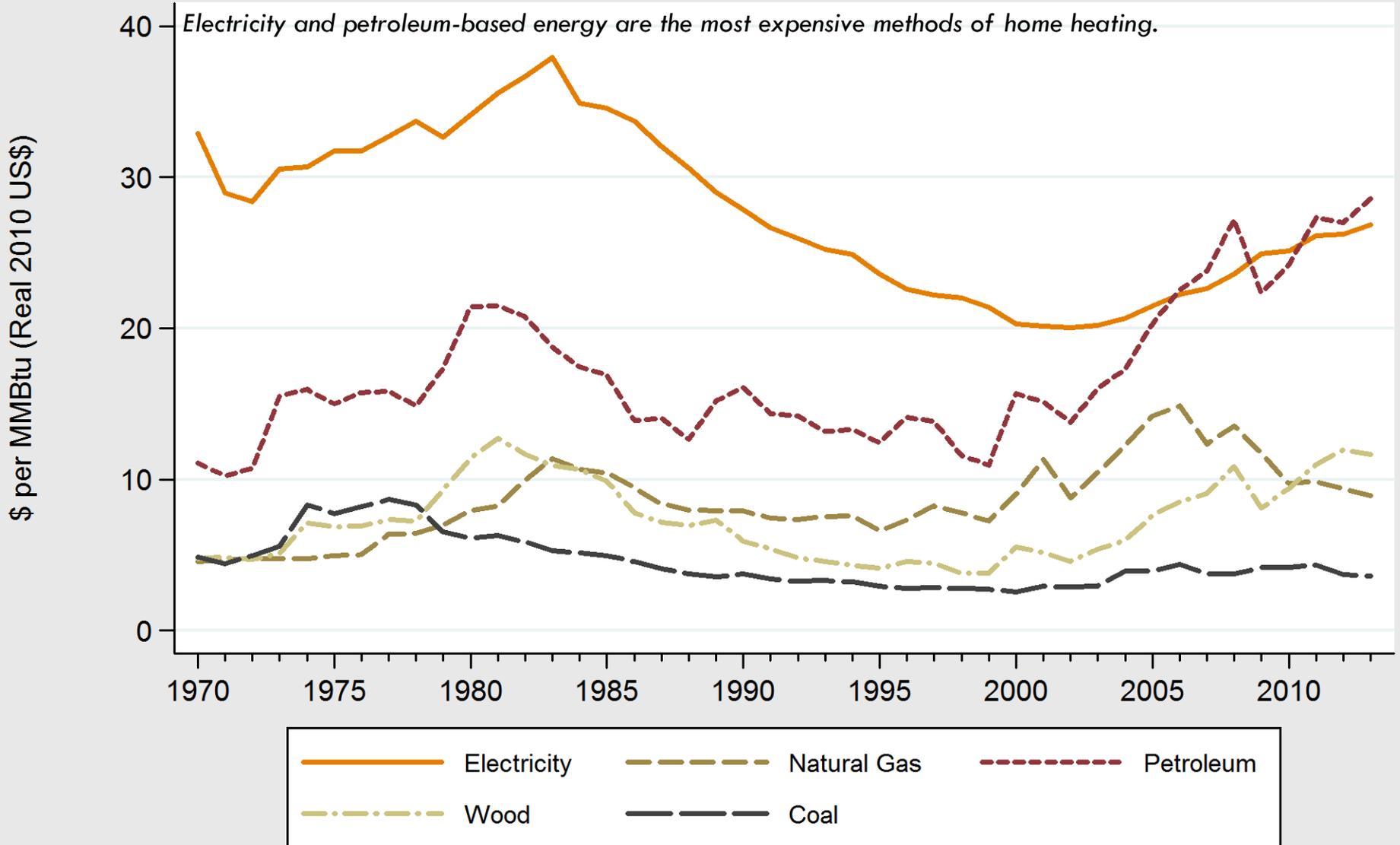
Kentucky Residential Energy Consumption by Fuel, 1960-2013



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

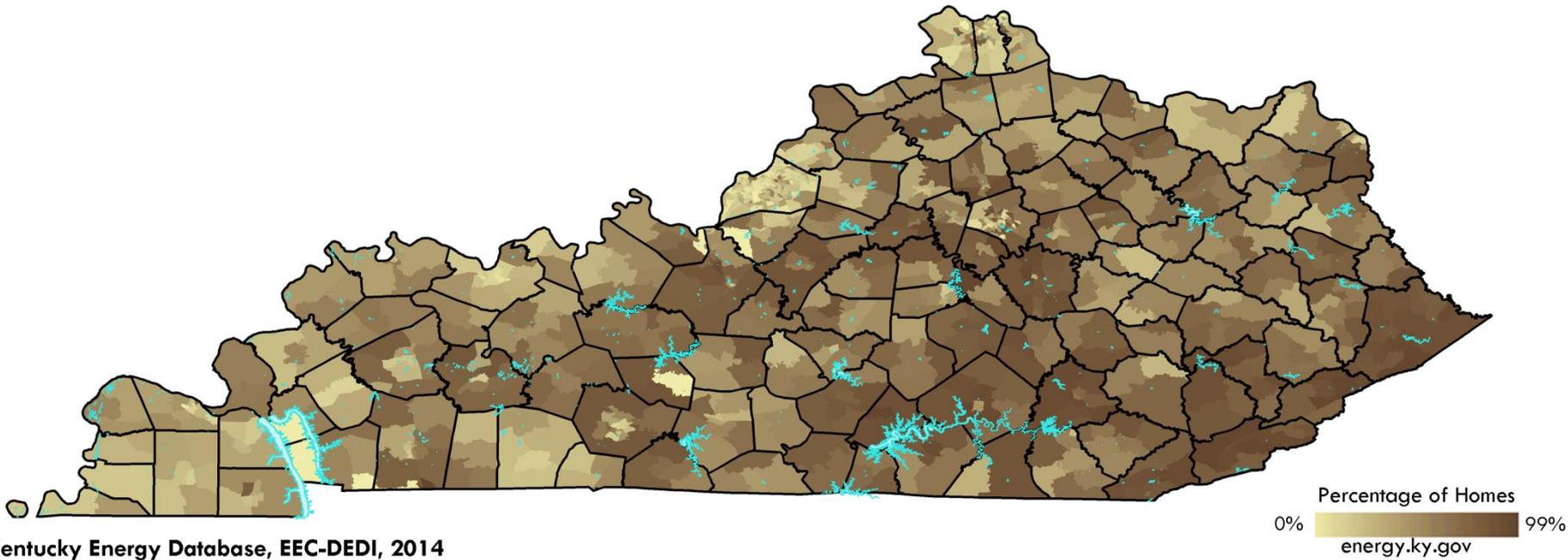
Kentucky Residential Energy Price by Fuel, 1970-2013



Kentucky Energy Database, EEC-DEDI, 2015

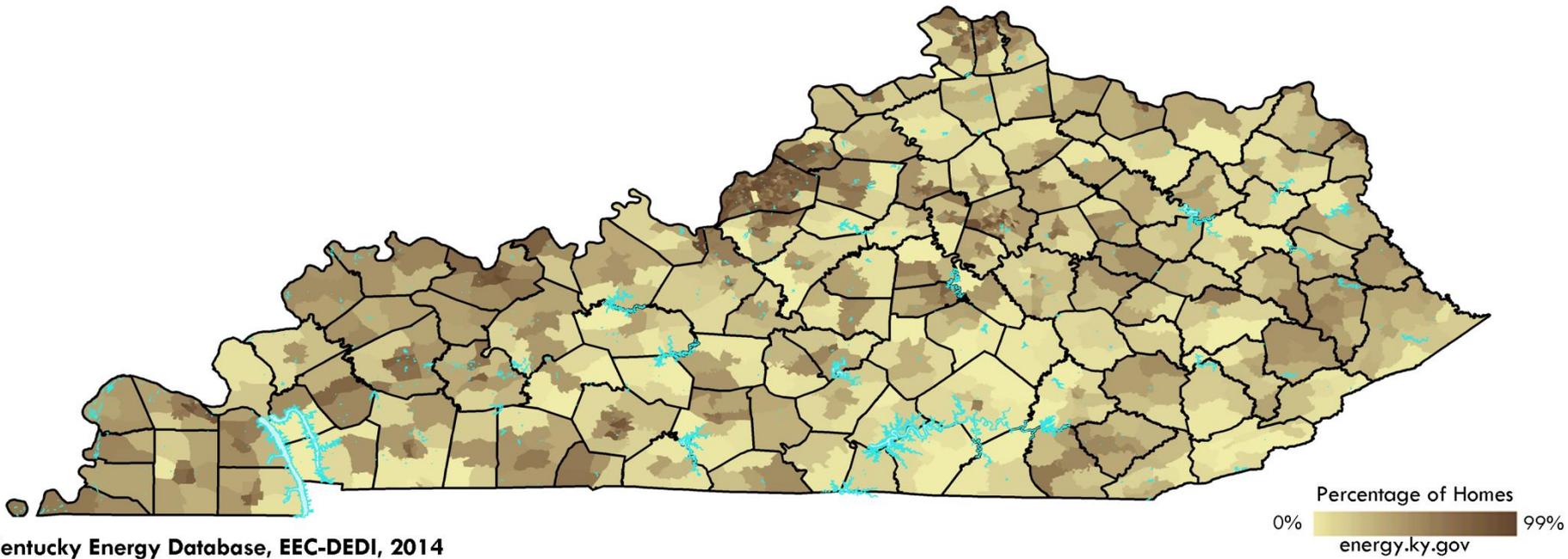
Data Source: EIA-SEDS

Kentucky Households Heating with Electricity, 2012



Electric heat is the primary means of home heating across the Commonwealth—nearly half Kentucky households heat with electricity.

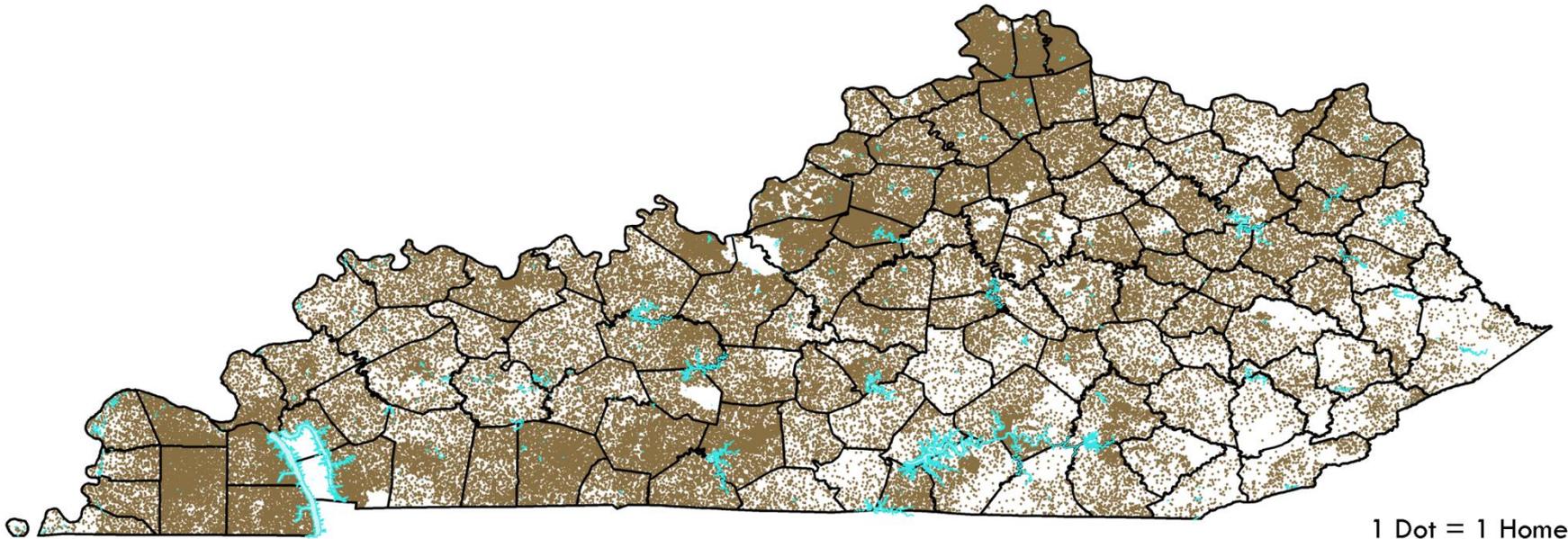
Kentucky Households Heating with Natural Gas, 2012



Kentucky Energy Database, EEC-DEDI, 2014

Utility natural gas serves as the primary method of home heating for nearly 40 percent of Kentucky families. However, these services are generally restricted to urban areas.

Kentucky Households Heating with Propane, 2012

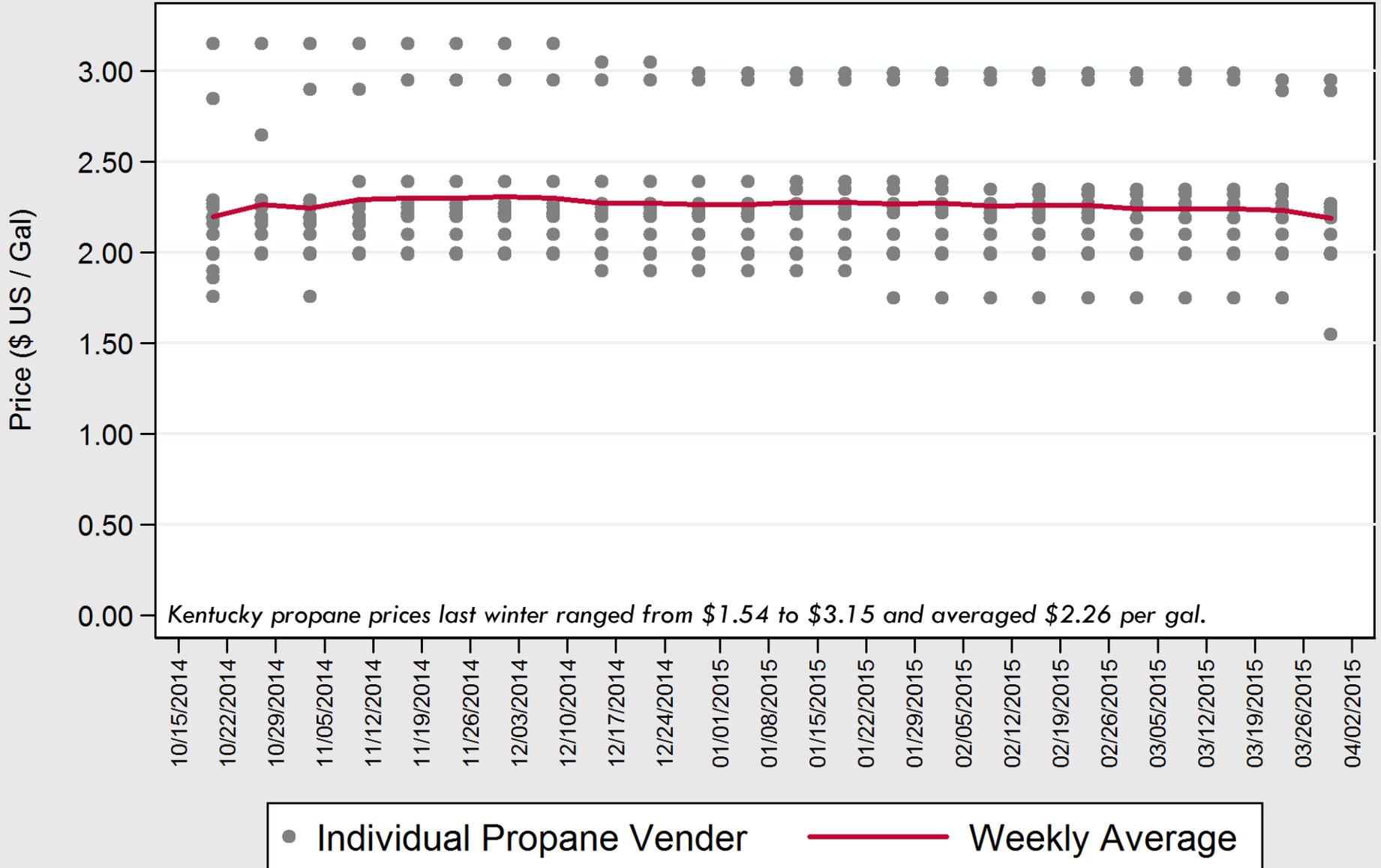


Kentucky Energy Database, EEC-DEDI, 2014

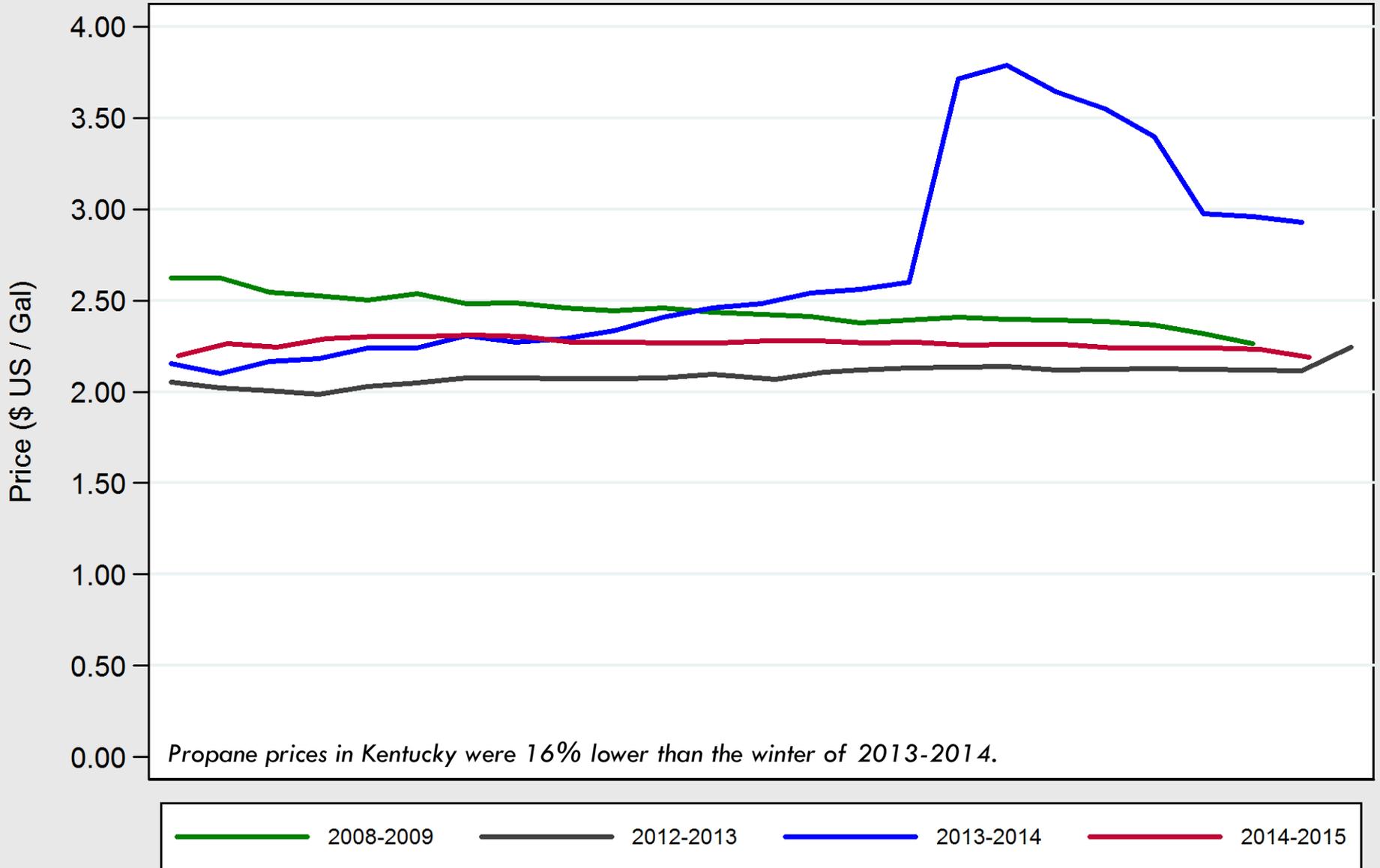
1 Dot = 1 Home
energy.ky.gov

6.8 percent of Kentucky families, or 115,000 homes heat with propane.

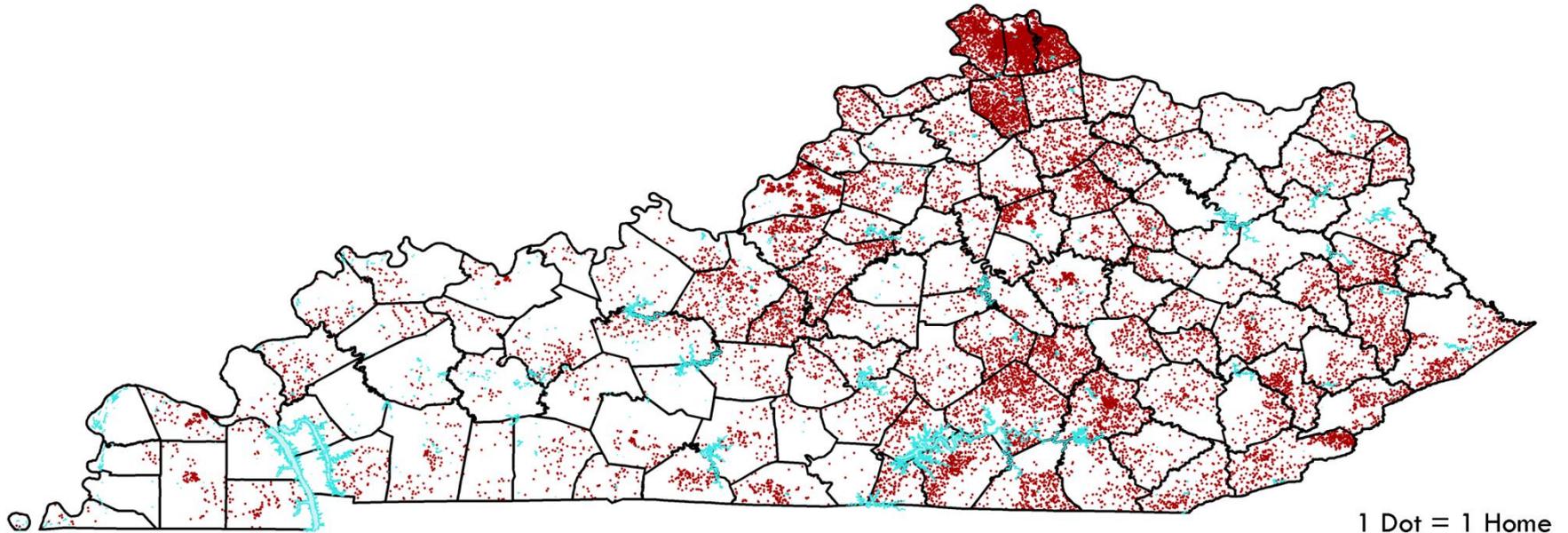
Kentucky Propane Prices, Winter 2014-2015



Kentucky Propane Prices, Winters 2008-2015



Kentucky Households Heating with Fuel Oil or Kerosene, 2012

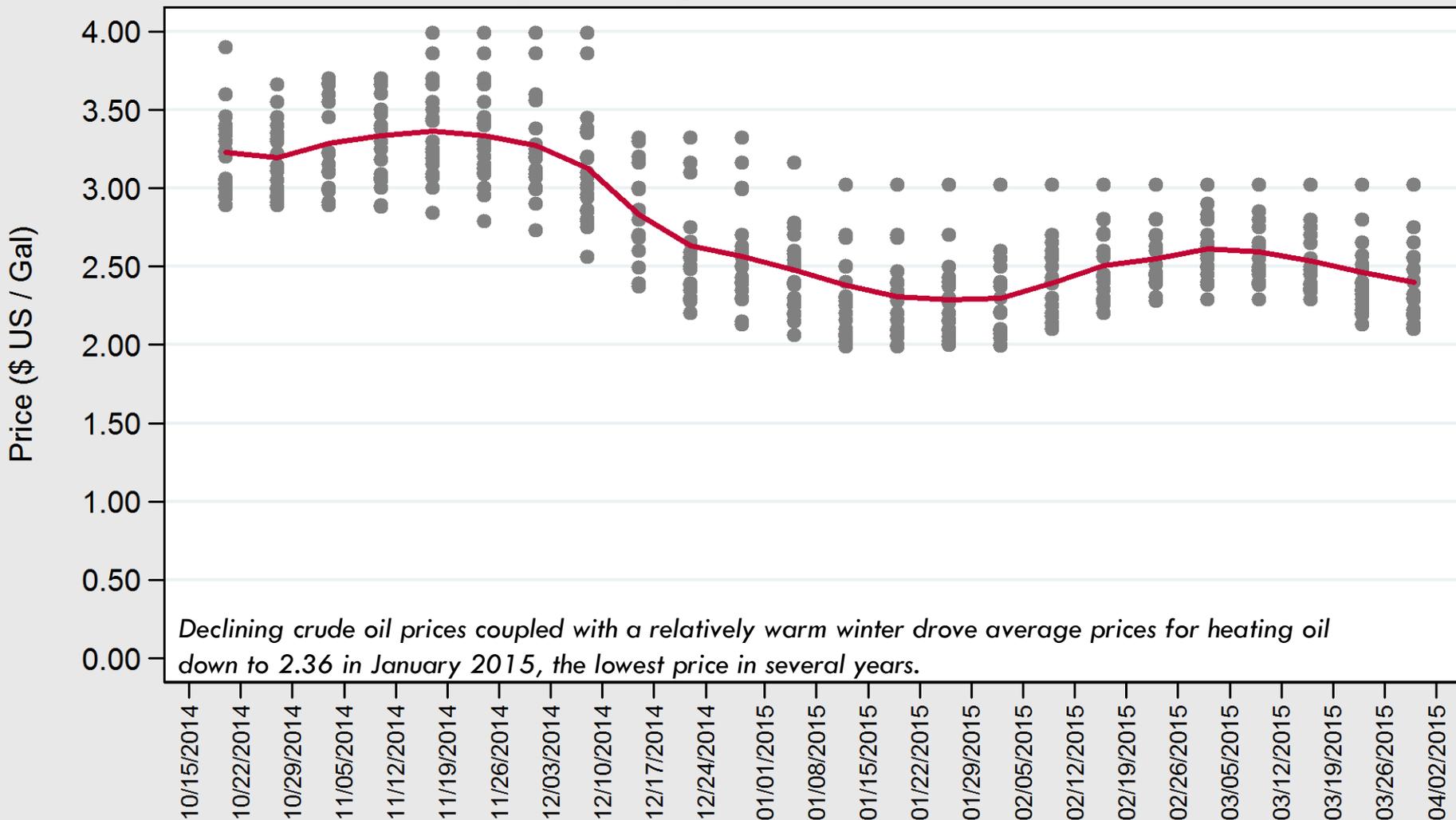


Kentucky Energy Database, EEC-DEDI, 2014

1 Dot = 1 Home
energy.ky.gov

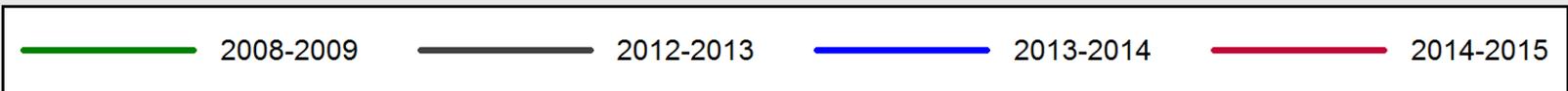
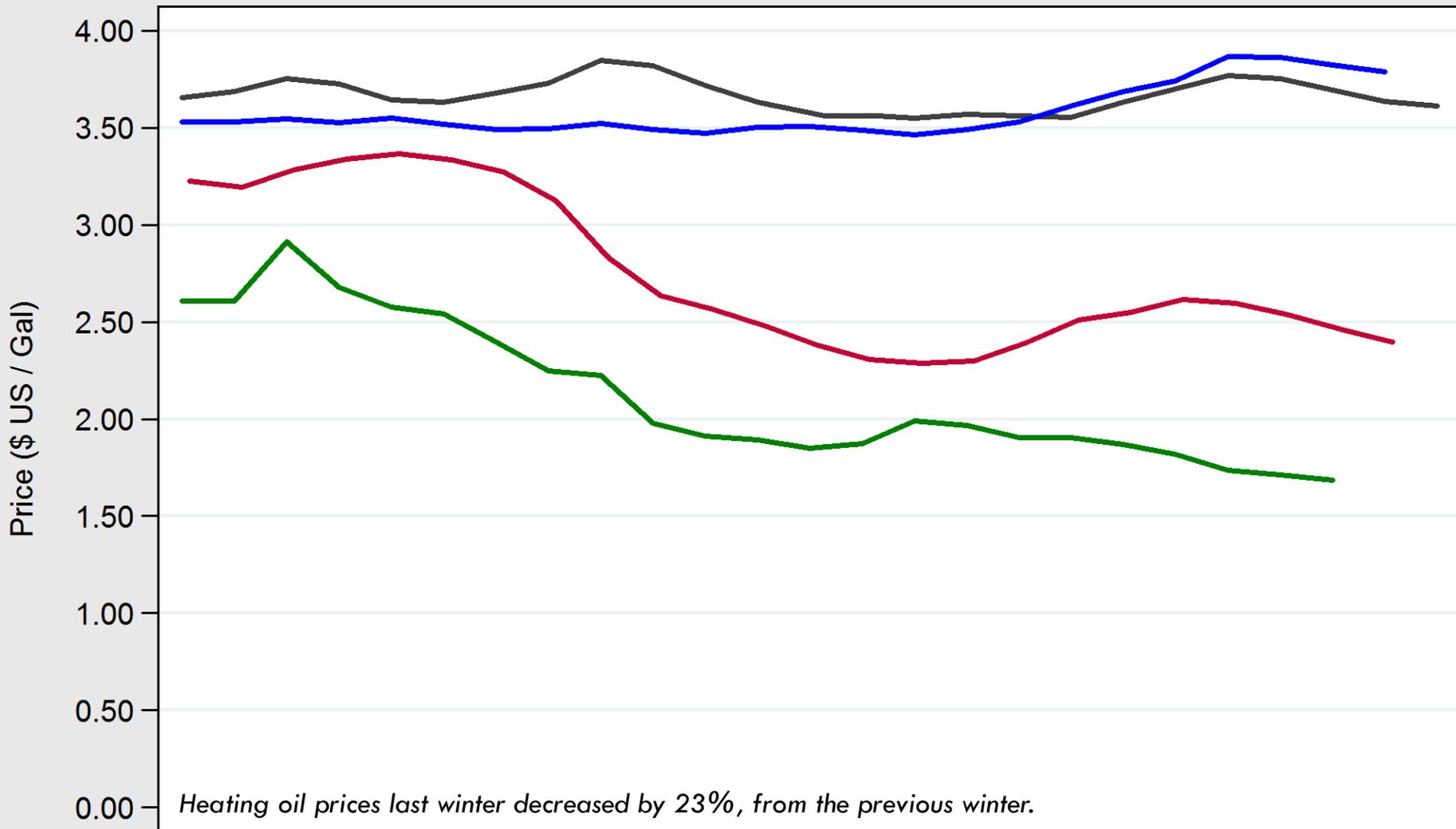
1.2 percent of Kentucky families, or 22,000 homes heat with propane, primarily in Northern Kentucky.

Kentucky Heating Oil Prices, Winter 2014-2015

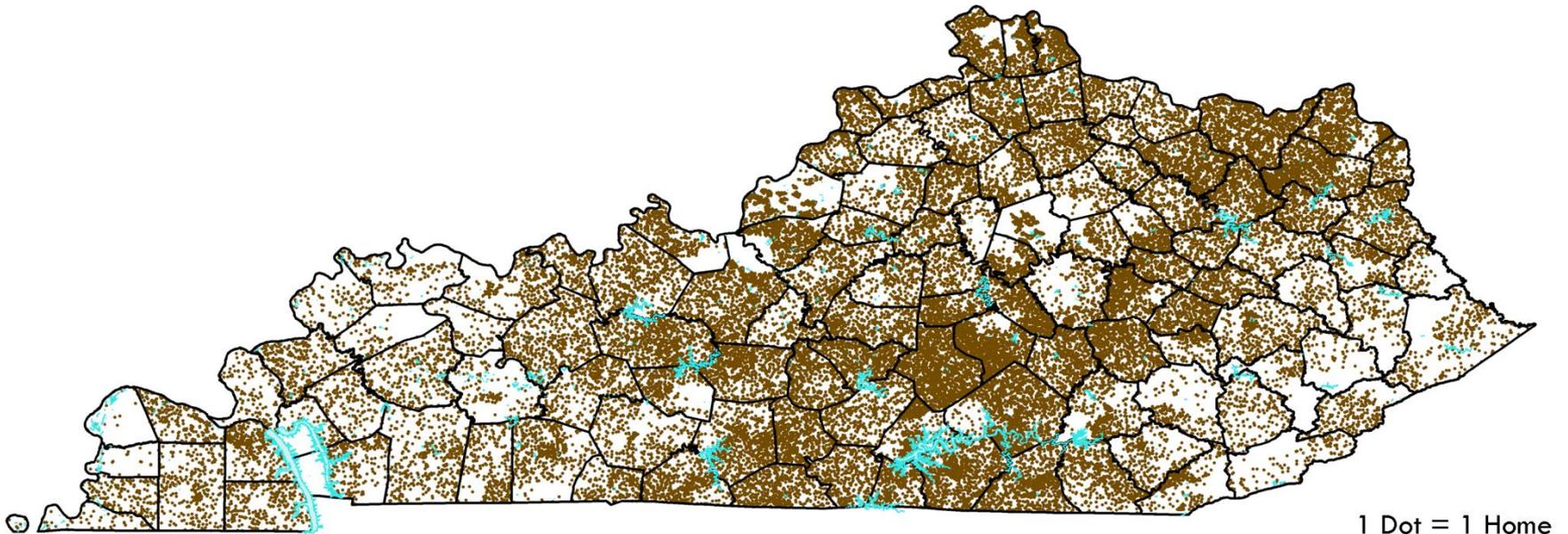


● Individual Heating Oil Vender — Weekly Average

Kentucky Heating Oil Prices, Winters 2008-2015



Kentucky Households Heating with Wood, 2012

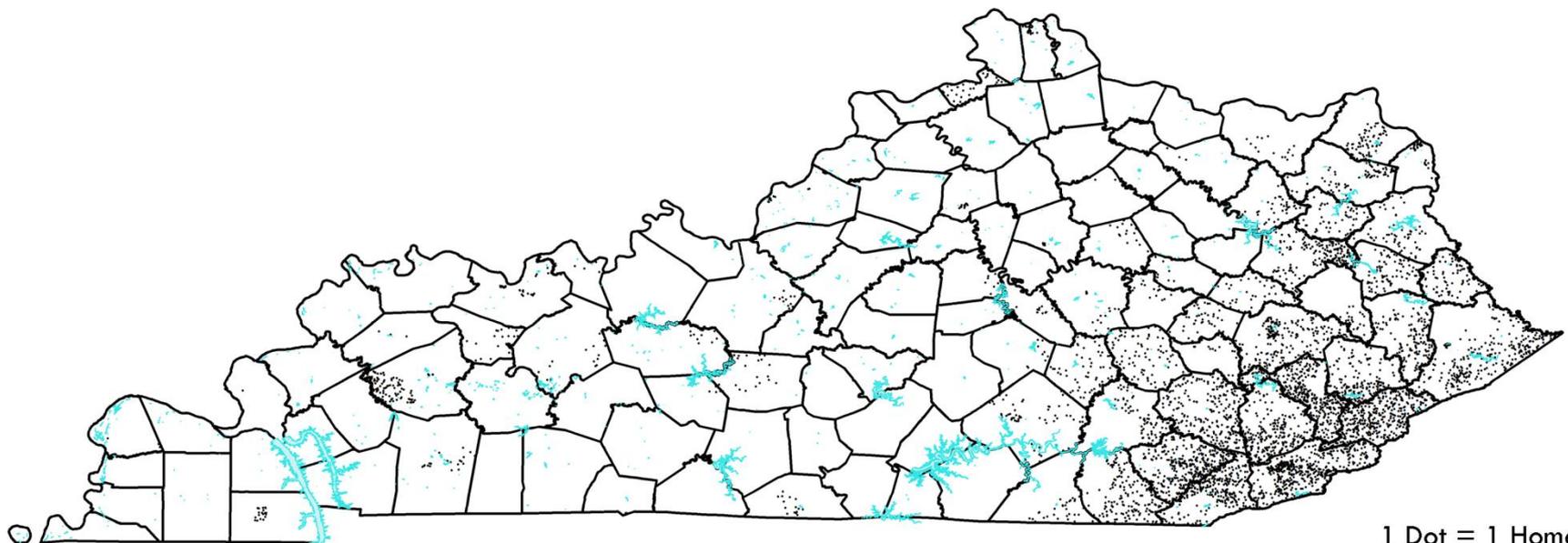


Kentucky Energy Database, EEC-DEDI, 2014

1 Dot = 1 Home
energy.ky.gov

Wood is the oldest source of home heating and has been burned for heat since the beginning of human history. While many, if not most, homes in Kentucky have a wood-burning fireplace—even if only for aesthetic reasons—more than 47,000 homes, or 2.8 percent, burn wood as their primary source of heat. Many of these homes are concentrated in the Daniel Boone National Forest of eastern Kentucky. In more than 18 Kentucky counties, homes that heat with wood represent more than 10 percent of total households. More than 20 percent of homes in Lewis and Casey counties heat with wood.

Kentucky Households Heating with Coal, 2012



Kentucky Energy Database, EEC-DEDI, 2014

1 Dot = 1 Home
energy.ky.gov

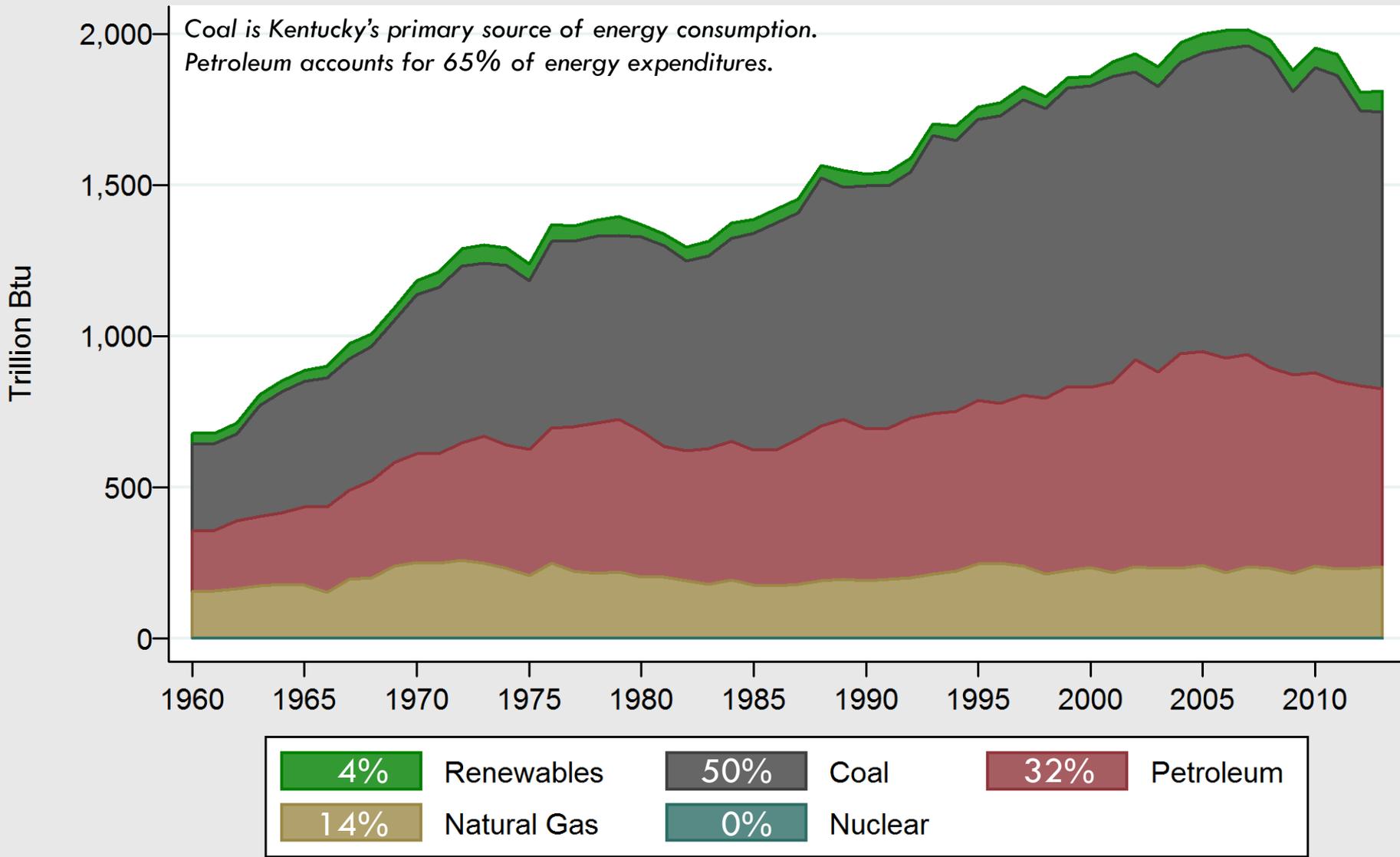
The second-oldest source of home heating is coal and more than 5,000 Kentucky families heated their homes in 2012 by burning coal. Homes that heat with coal are concentrated in coal-producing counties in the eastern and western Kentucky coalfields. In Leslie County, 5.7 percent of homes heat with coal. In Harlan, Letcher, Morgan, Breathitt, Clay, Perry, Knott, Bell, Knox, Elliot, and Martin counties, more than 2 percent of homes burn coal for their primary method of home heating.

Kentucky Energy Consumption

More information is available in the Kentucky Energy Profile online at:

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

Kentucky Energy Consumption by Fuel, 1960-2013

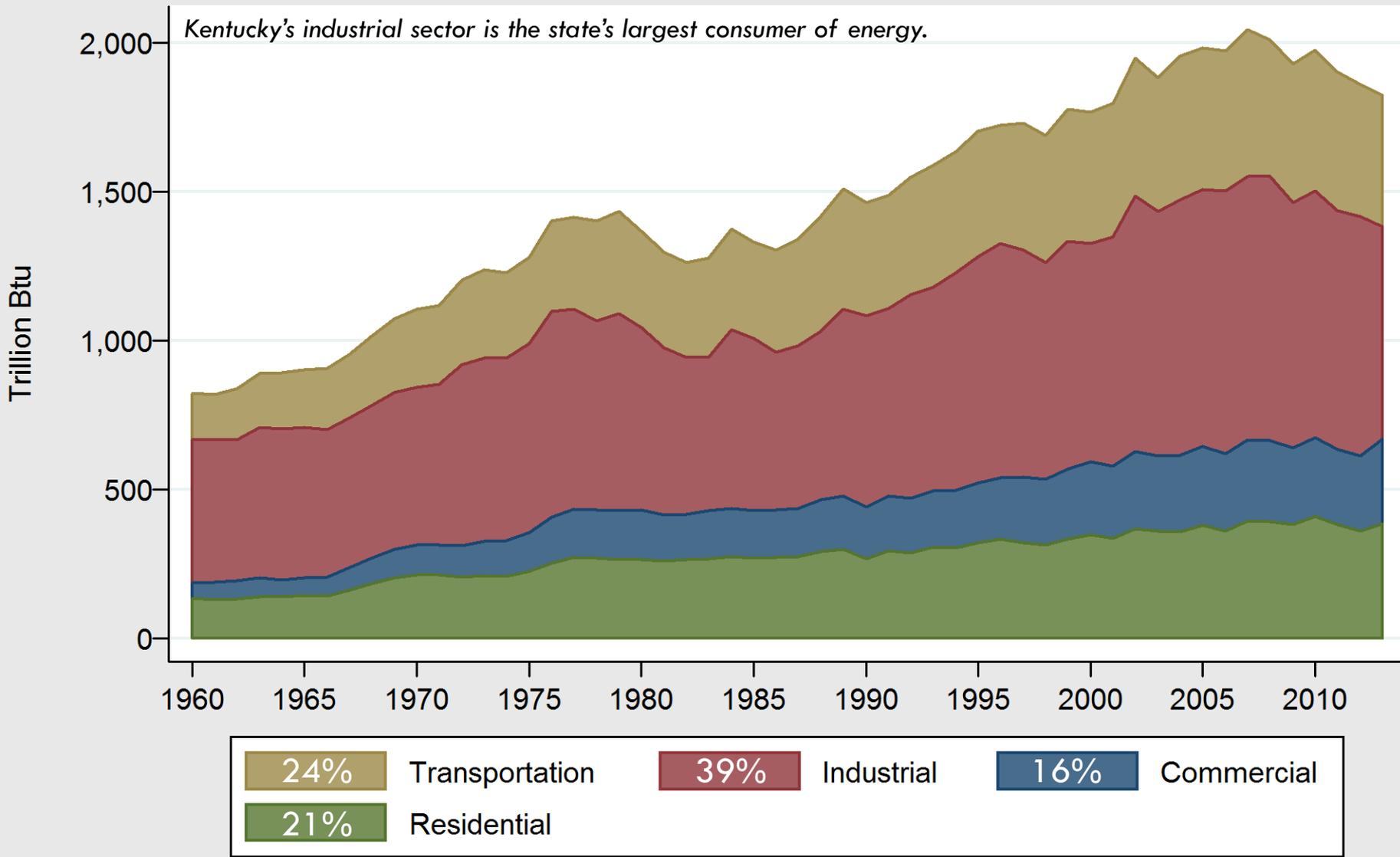


Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

*2013 values labeled

Kentucky Energy Consumption by Sector, 1960-2013



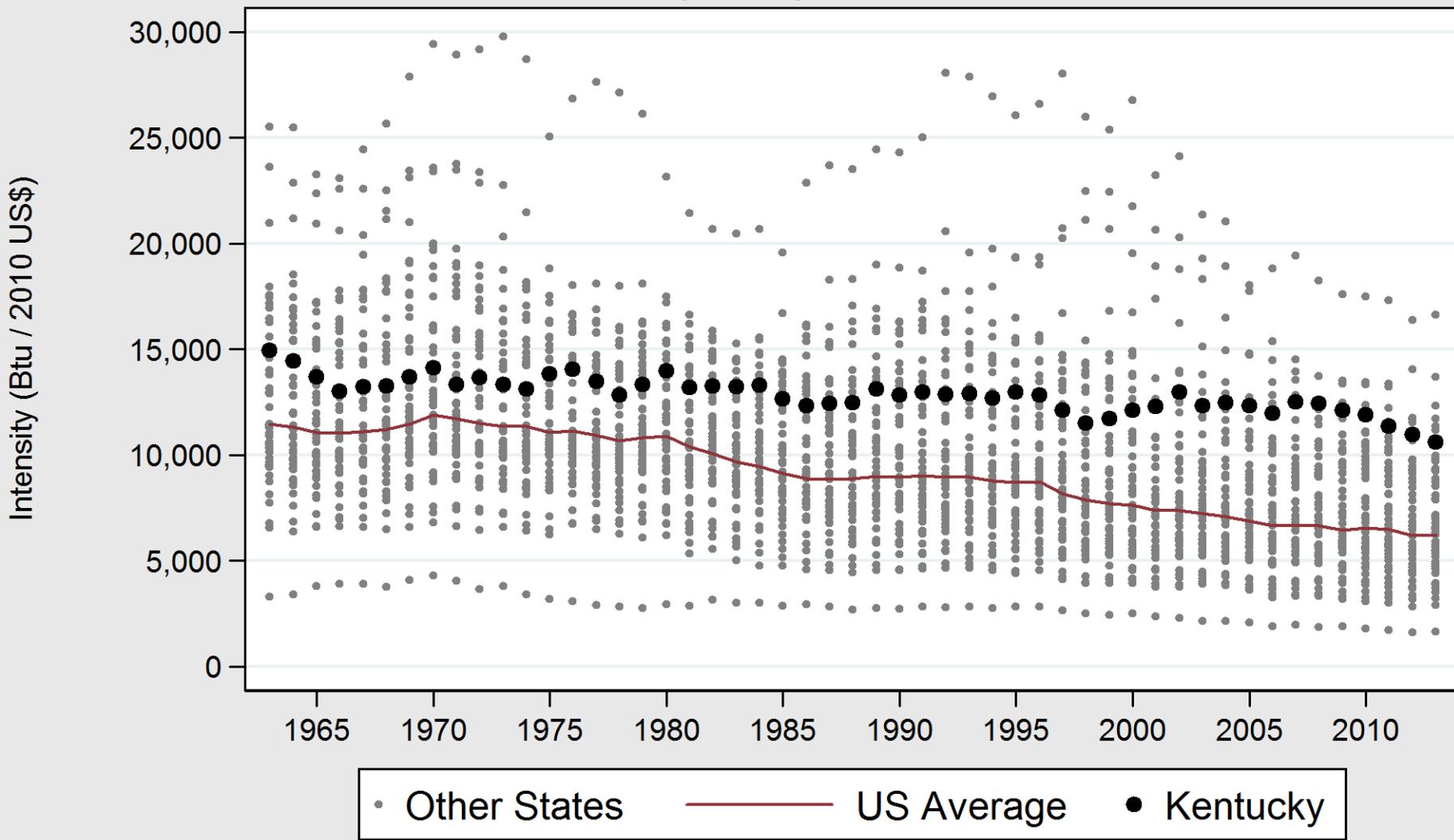
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

*2013 values labeled

Energy Consumption per State GDP Dollar, 1963-2013

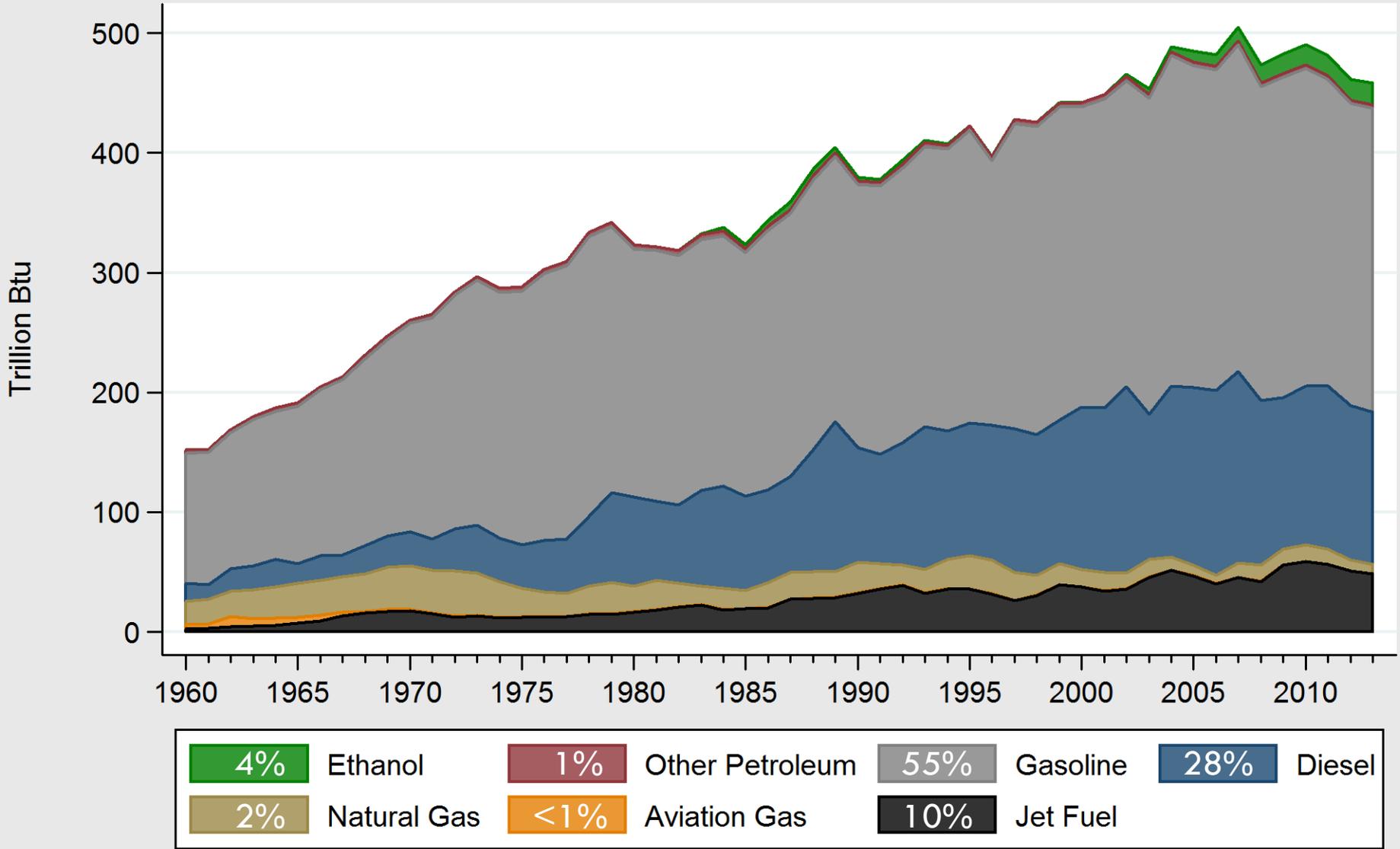
Kentucky Compared to Other States



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS & BEA

Kentucky Transportation Energy Consumption by Fuel, 1960-2013



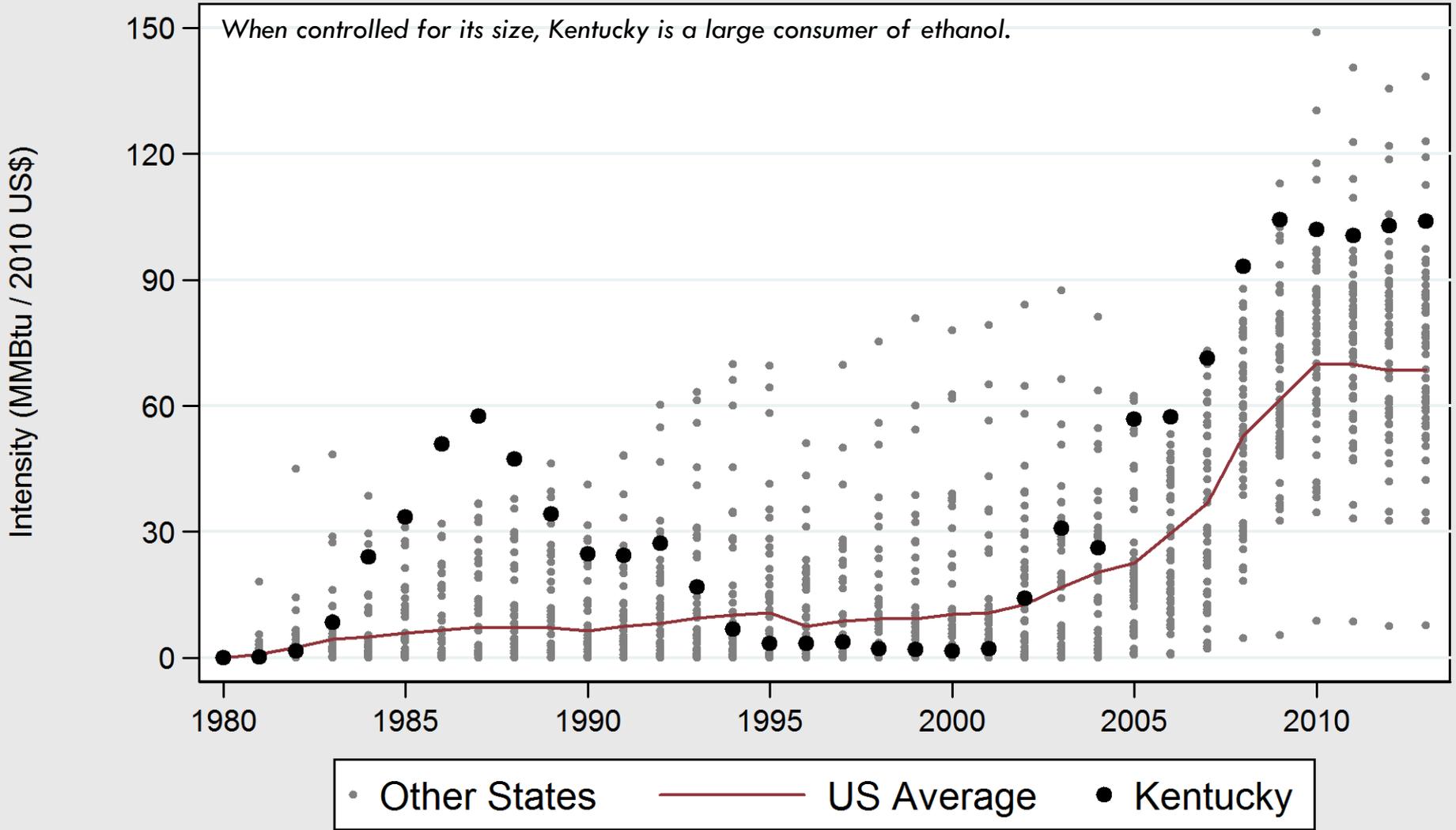
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

*2013 values labeled

Ethanol Energy Consumption per State GDP Dollar, 1980-2013

Kentucky Compared to Other States

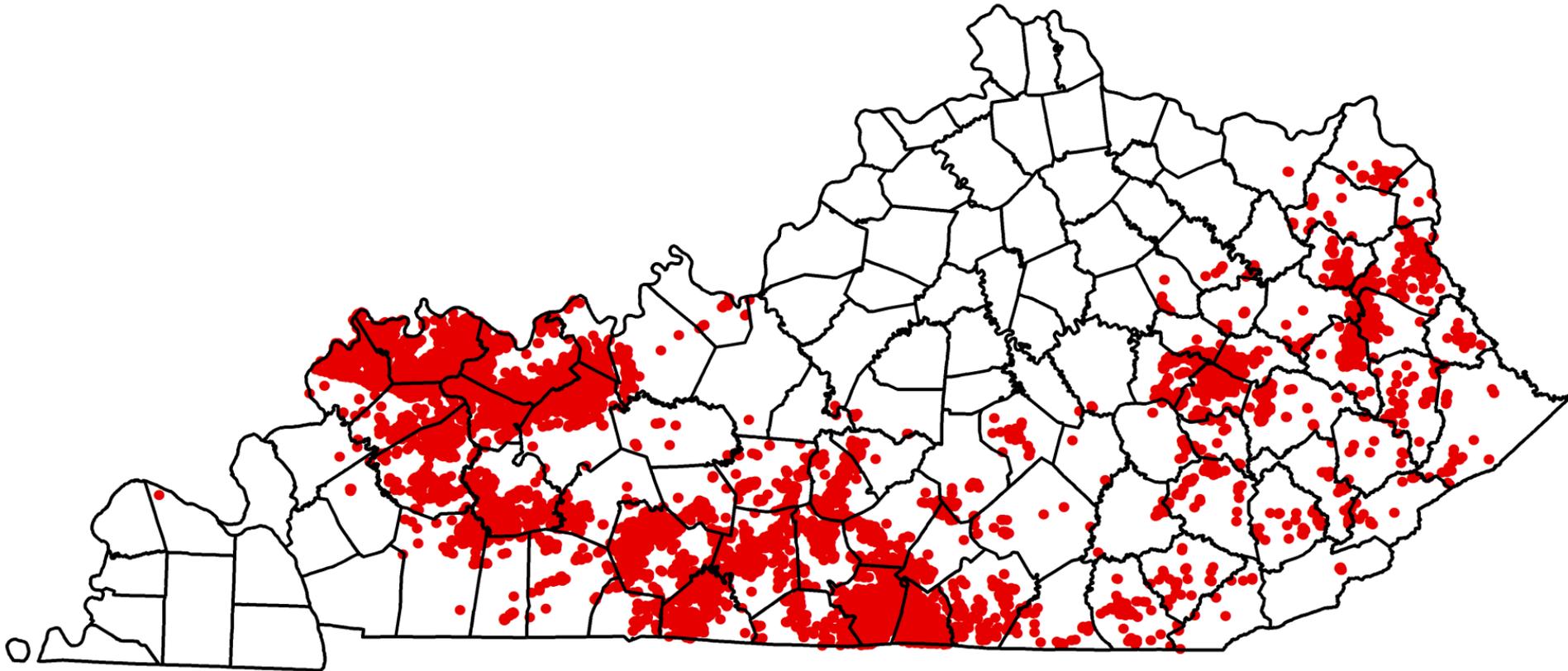


Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS & BEA

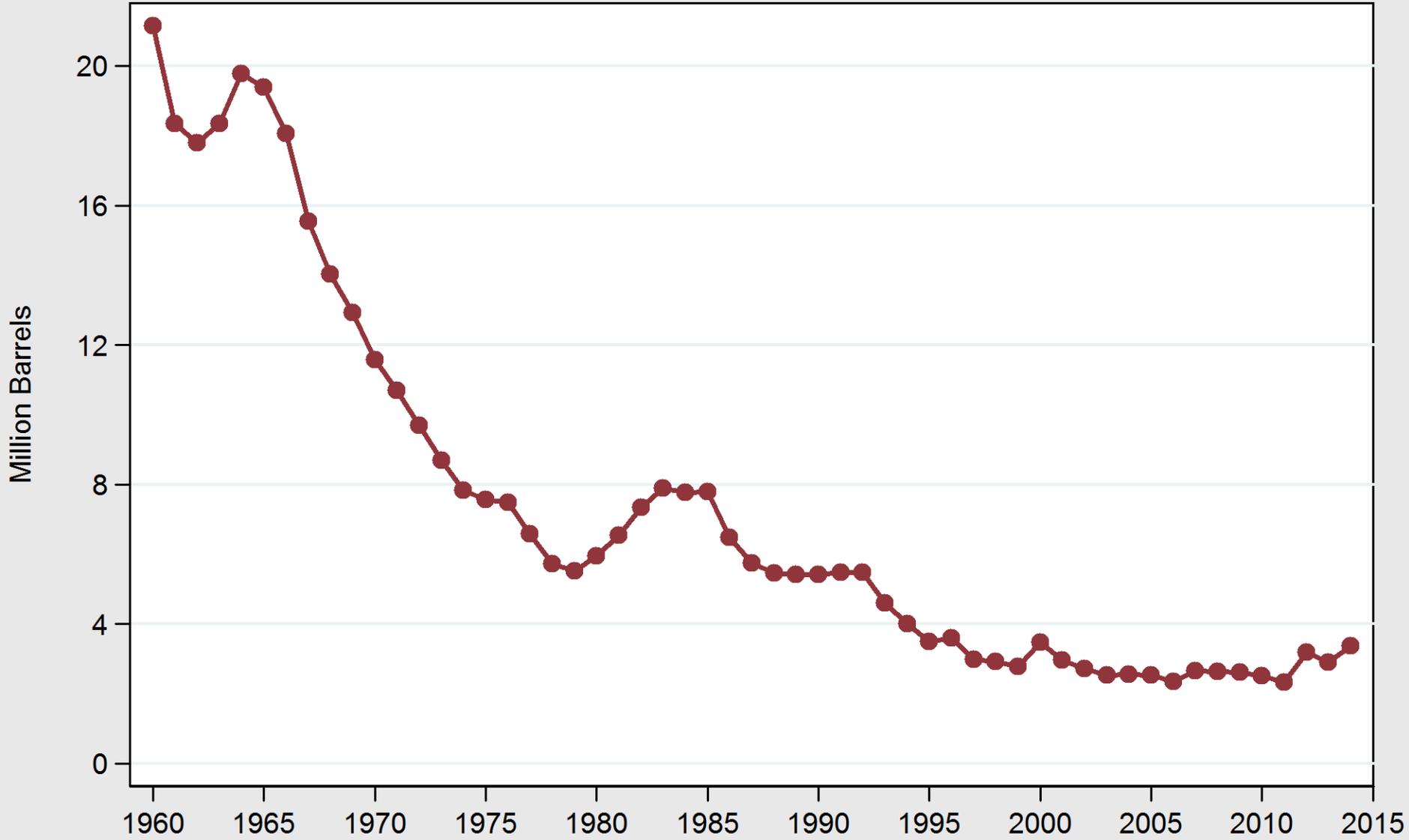
Kentucky Energy Production

Kentucky Oil Wells, 2013



Kentucky oil production has increased recently with the adoption of horizontal fracturing practices, but produces just 1% of total United States production.

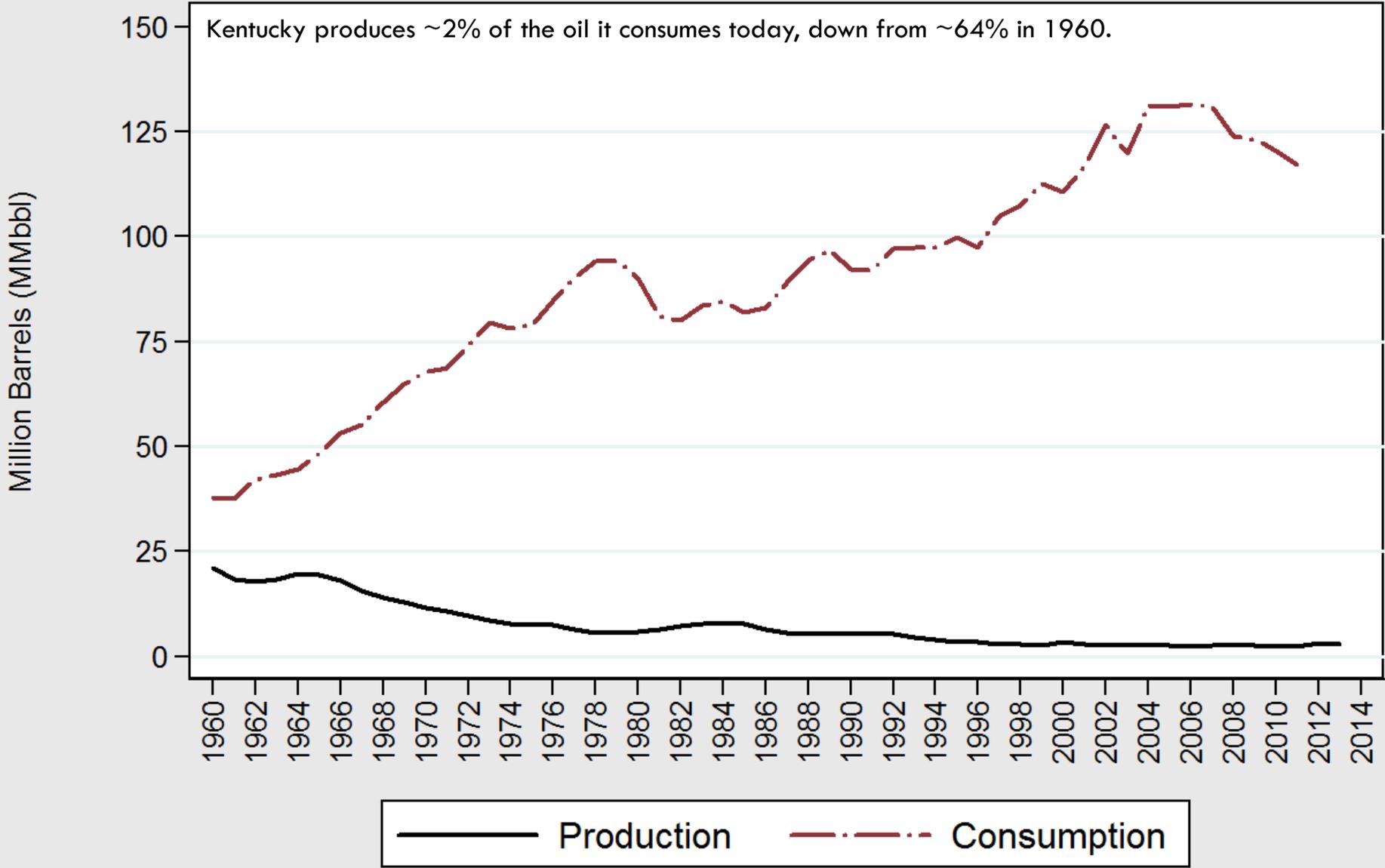
Kentucky Crude Oil Production, 1960-2014



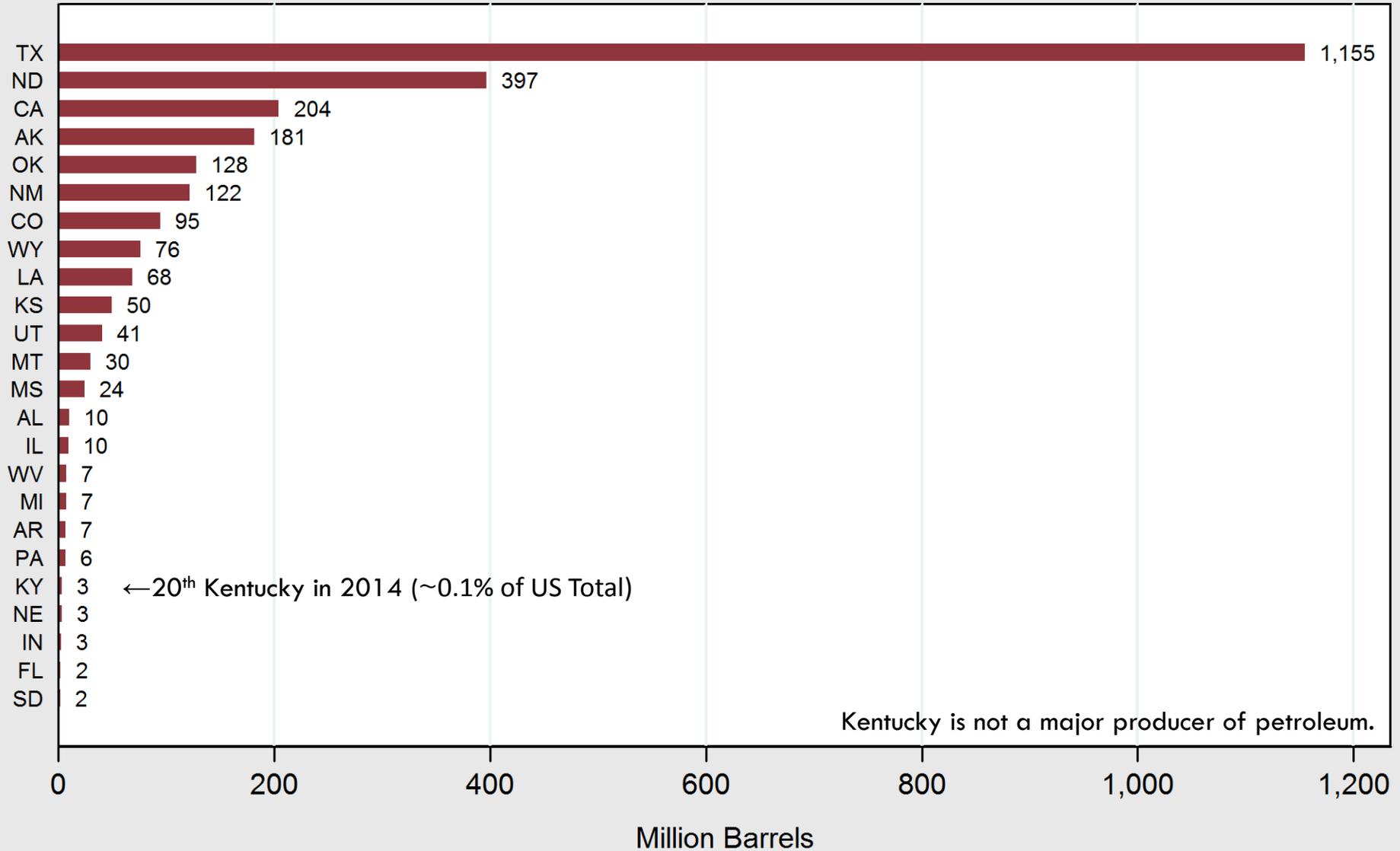
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

Kentucky Crude Oil Production & Consumption, 1960-2013



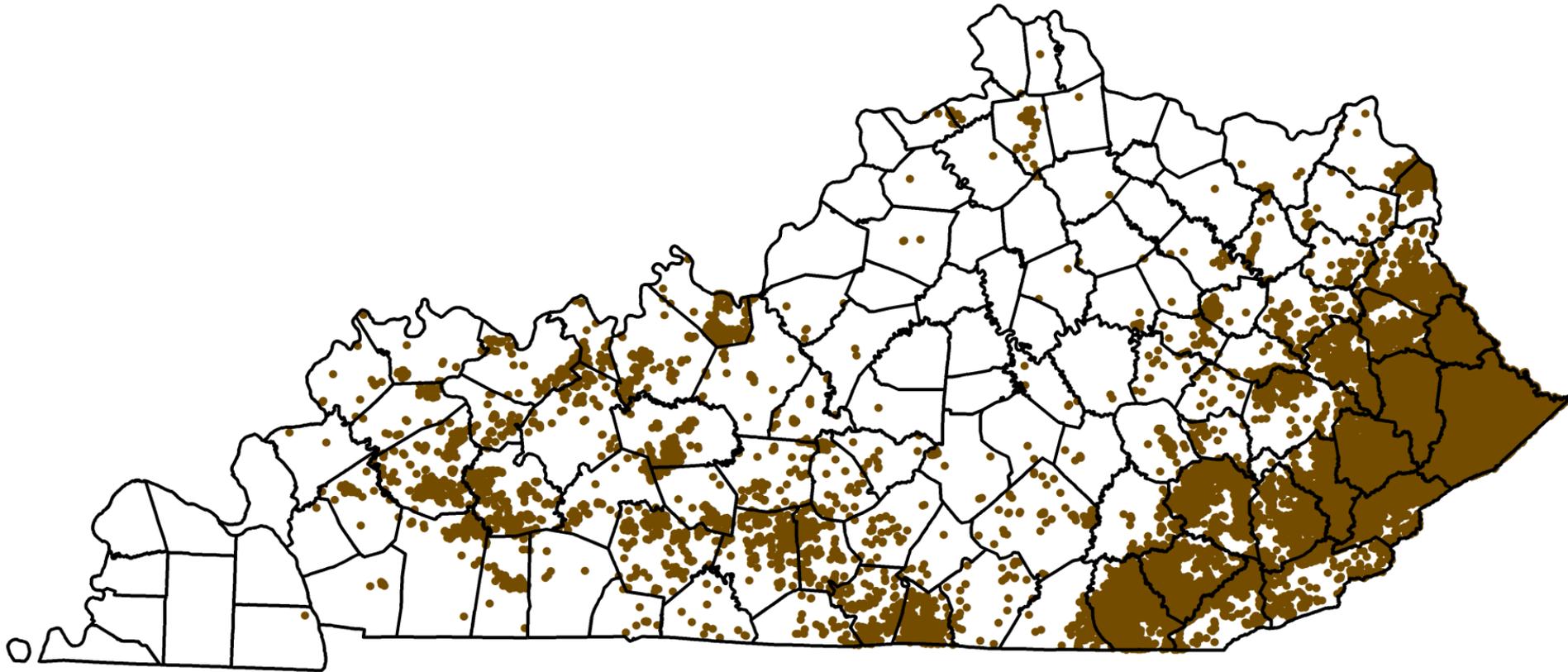
Crude Oil Production by Producing States, 2014



Kentucky Energy Database, EEC-DEDI, 2015

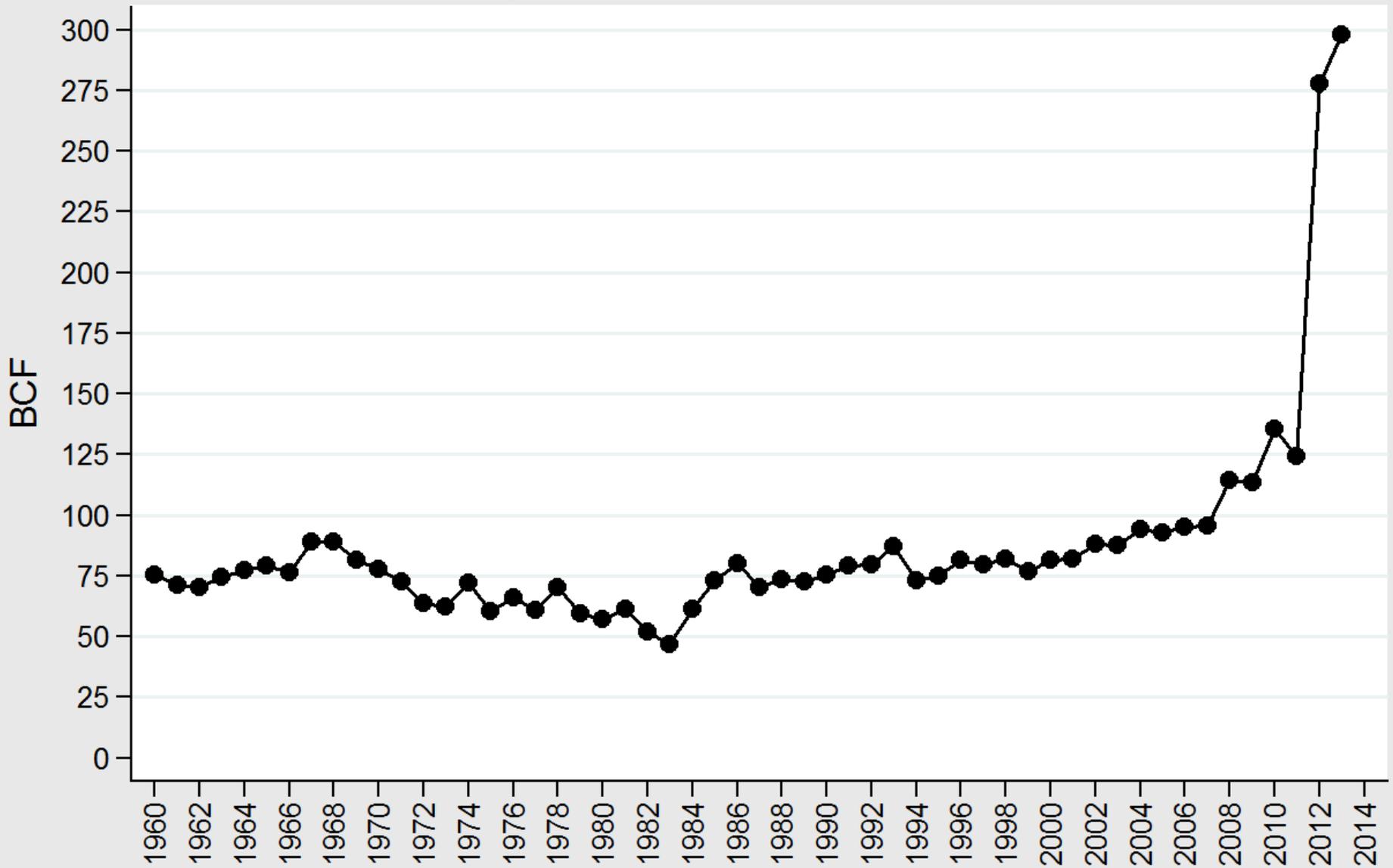
Data Source: EIA-SEDS

Kentucky Natural Gas Wells, 2013



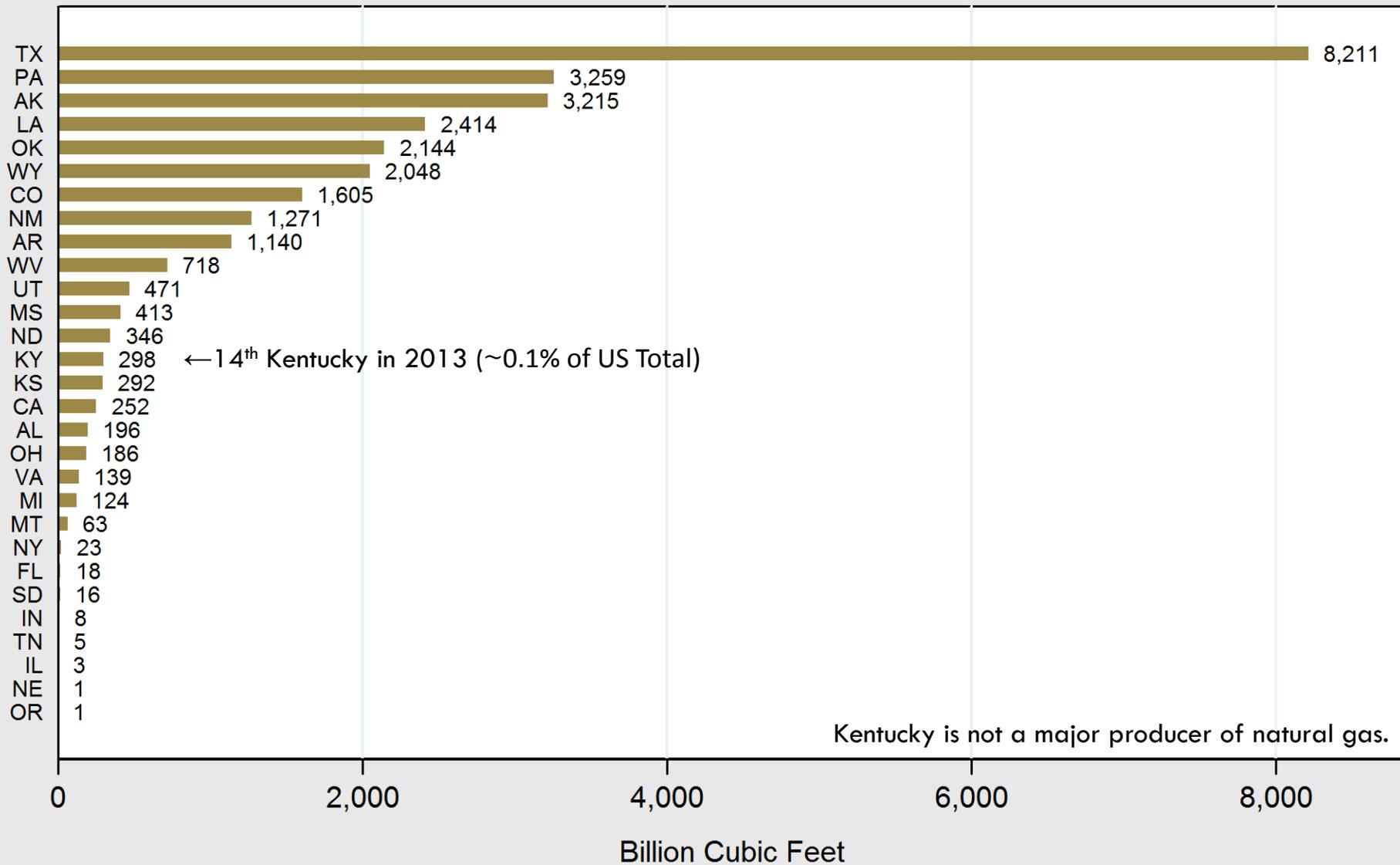
Natural Gas production is primarily in Eastern Kentucky.

Kentucky Natural Gas Production, 1960-2013



Kentucky Energy Database, EEC-DEDI, 2014

Annual Marketed Natural Gas Production by Producing States, 2013



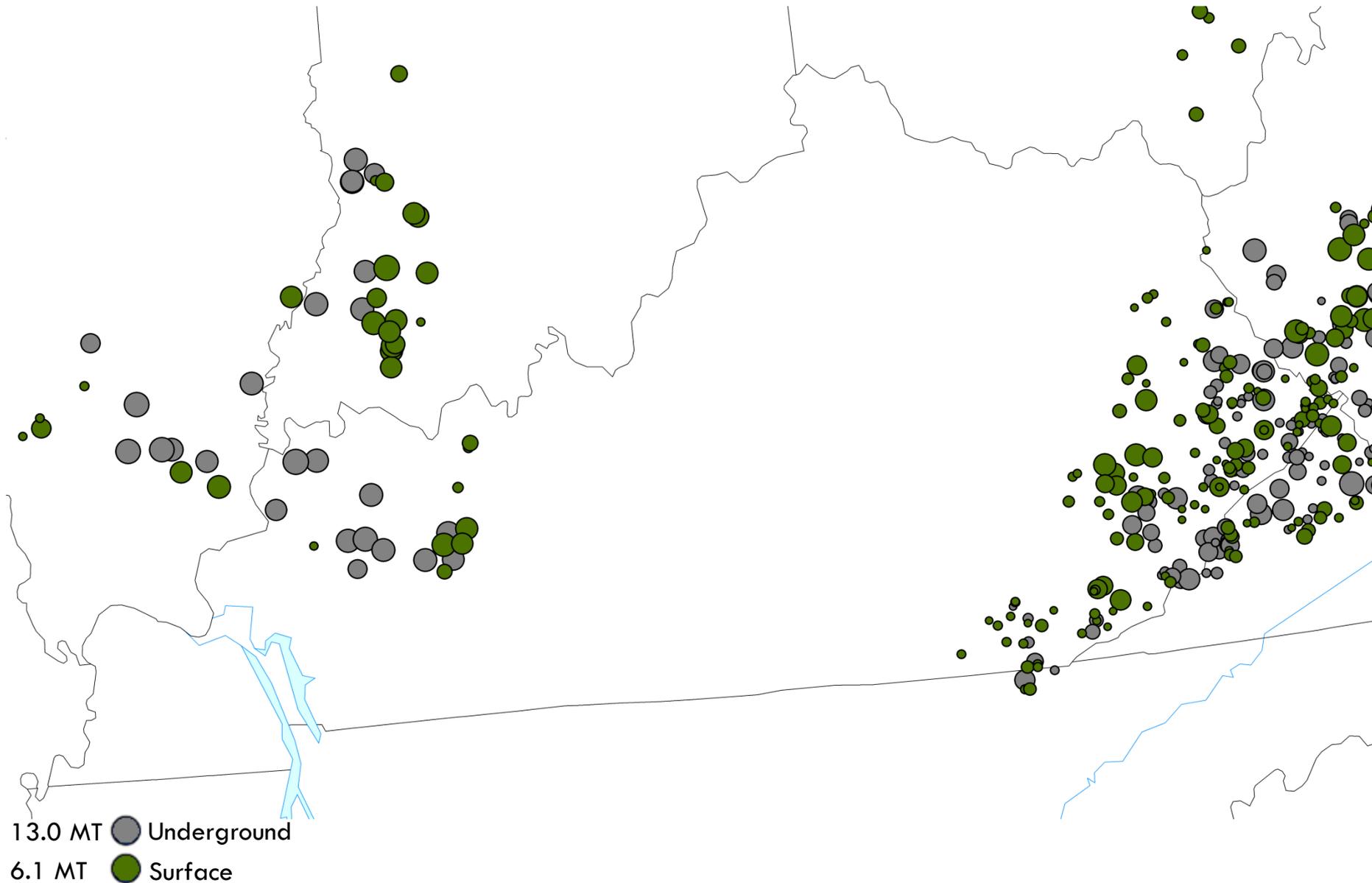
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS

Aron and Adam inside Warrior Coal Mine
~900 feet below Madisonville, Kentucky

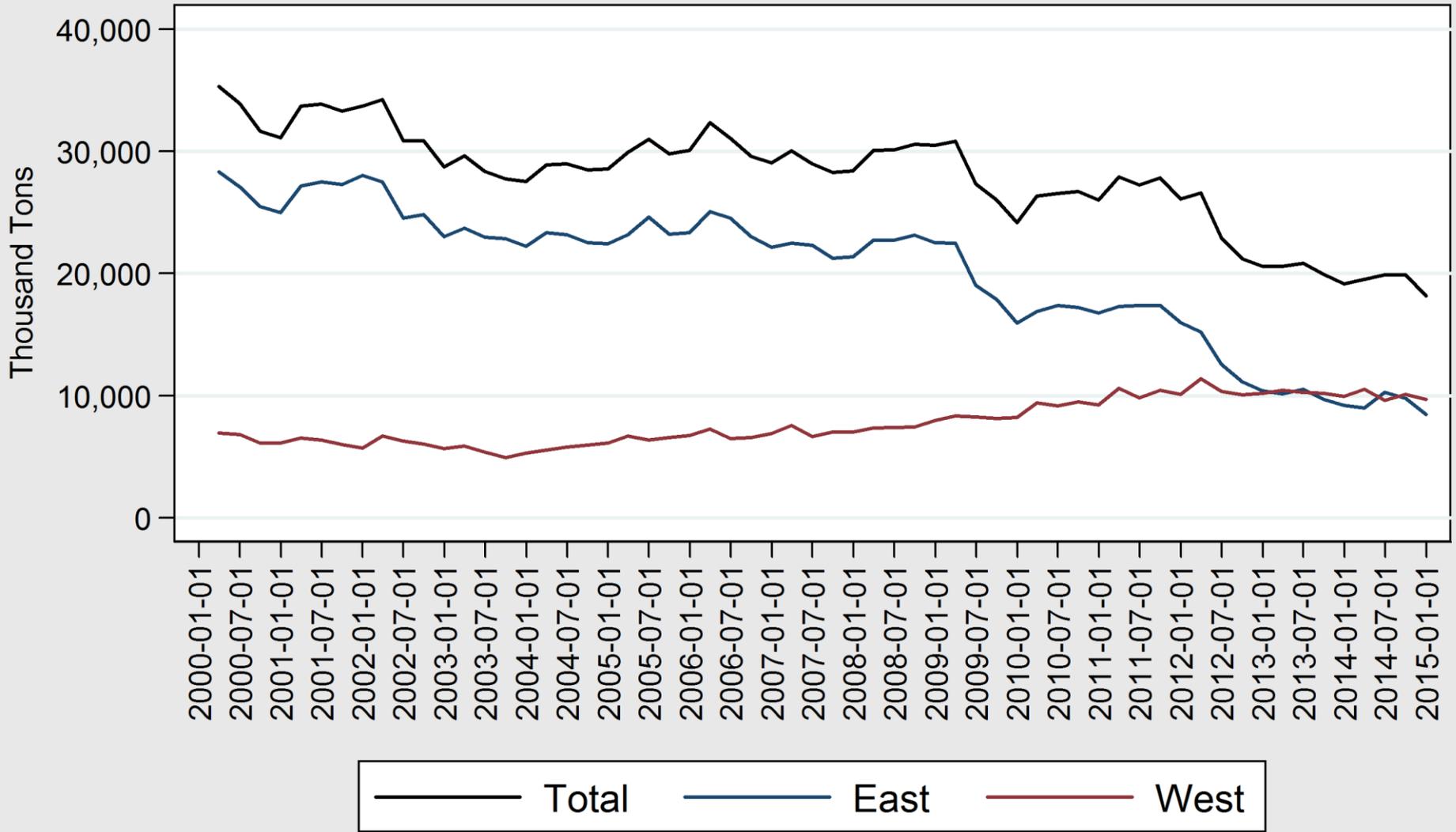


Kentucky Coal Production, Q4-2013



Kentucky Quarterly Coal Production, 2000-2014

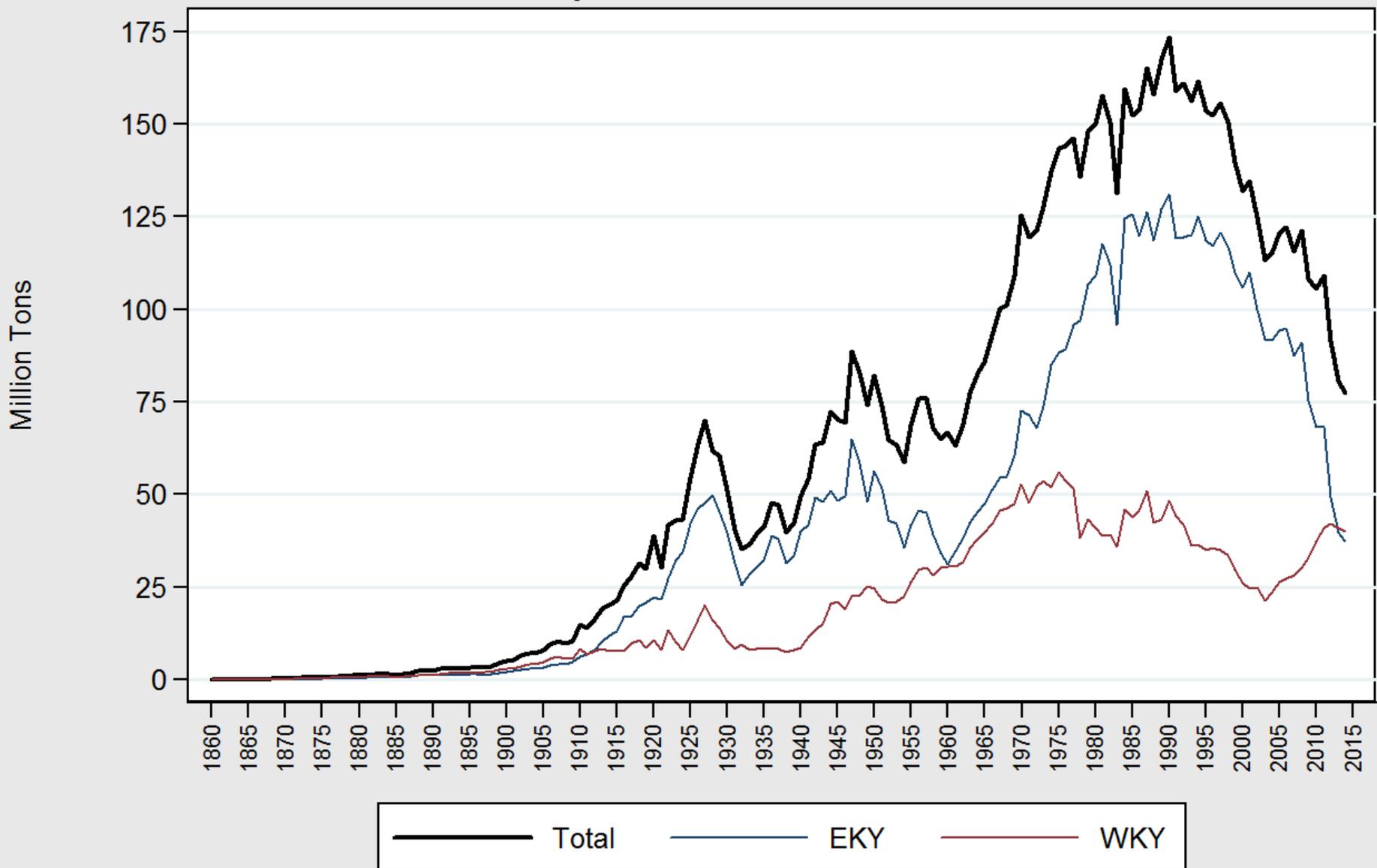
Eastern Kentucky vs. Western Kentucky



Kentucky Energy Database, EEC-DEDI, 2015

Microdata Source: MSHA-MDRS Queried on: 2 Feb 2015

Kentucky Coal Production, 1860-2014



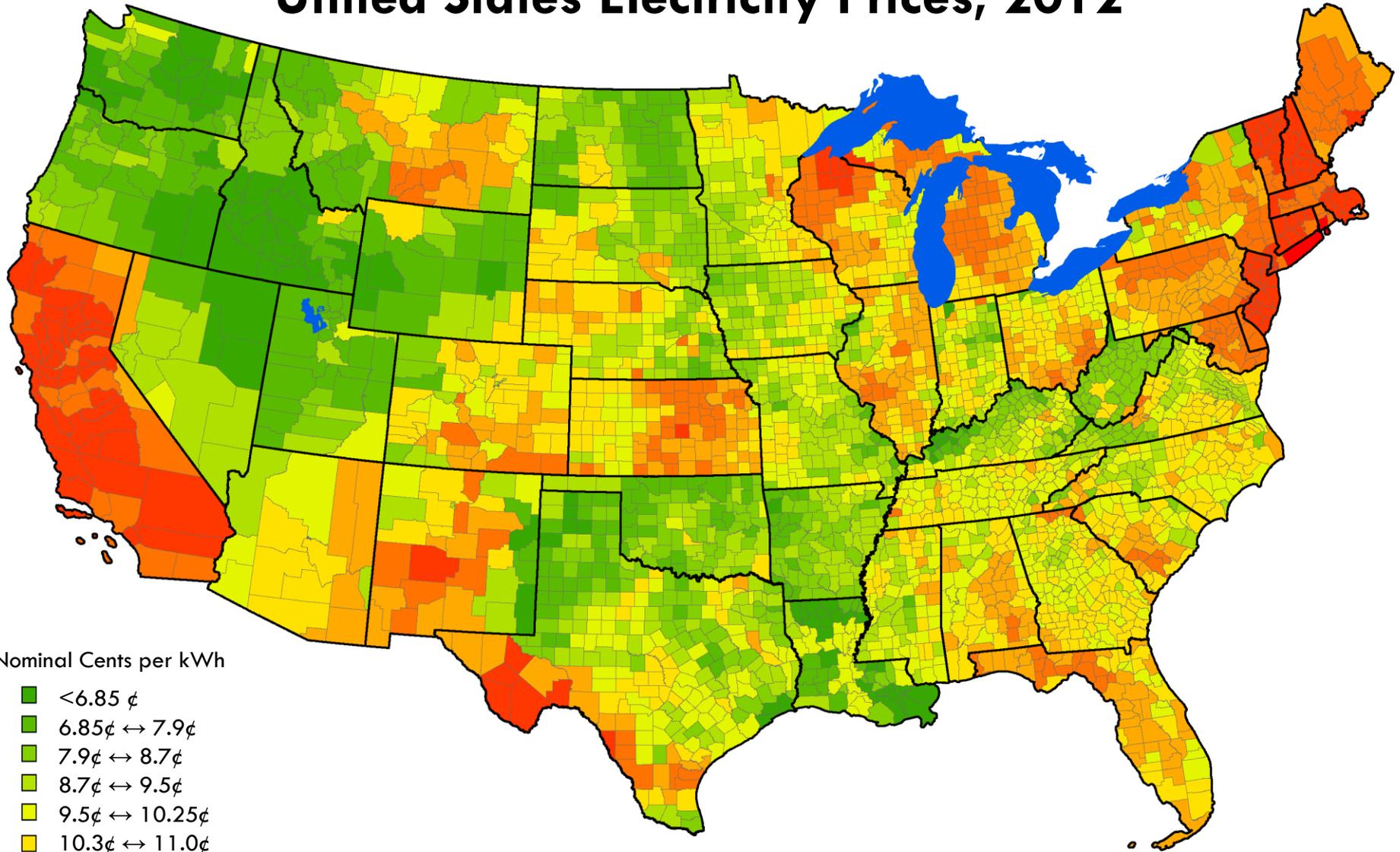
Kentucky Energy Database, EEC-DEDI, 2015

Electricity Expenditures as a Percentage of Household Income

Animated versions of these maps are online at:

<https://www.youtube.com/watch?v=mG11DKJCaSA>

United States Electricity Prices, 2012



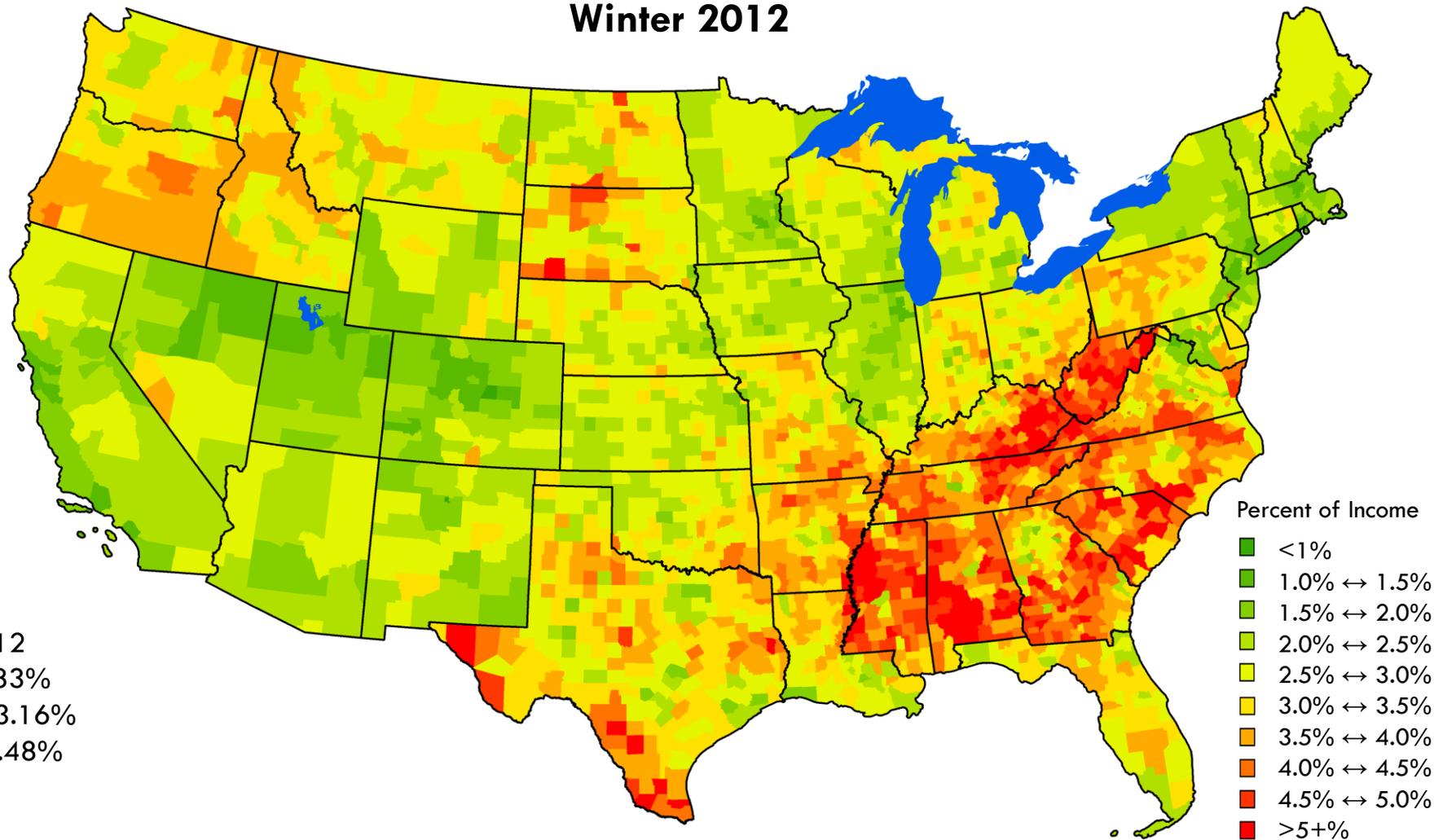
Nominal Cents per kWh

- <6.85 ¢
- 6.85¢ ↔ 7.9¢
- 7.9¢ ↔ 8.7¢
- 8.7¢ ↔ 9.5¢
- 9.5¢ ↔ 10.25¢
- 10.3¢ ↔ 11.0¢
- 11.0¢ ↔ 12.0¢
- 12.0¢ ↔ 14.0¢
- 14.0¢ ↔ 25.0¢
- 25.0¢ ↔ 55.0¢

Animated versions of these maps are online at:

<https://www.youtube.com/watch?v=QExe0zRFzfE>

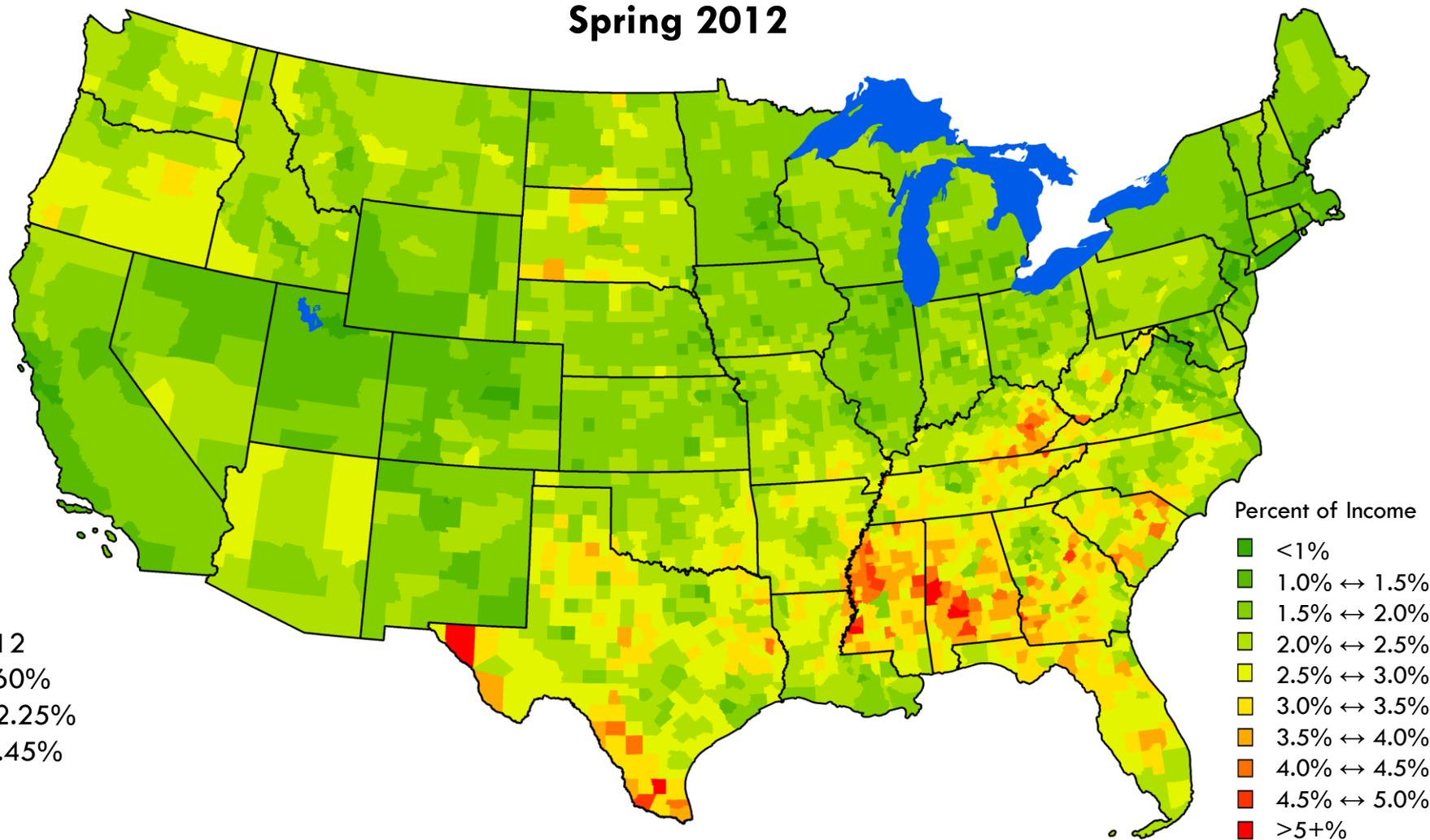
United States Household Electricity Expenditures as a Percentage of Income Winter 2012



01/2012
Min: 0.83%
Mean: 3.16%
Max: 7.48%

Electricity expenditure data collected by electric service provider by the Energy Information Administration in Form EIA-826 and EIA-861, median household income data collected by the United States Census Bureau American Community Survey. Residential electricity bills vary by household and month not only with electricity prices, but also weather, housing quality, home size, occupancy, personal usage, and method of home heating. Household expenditures for direct heating with fossil fuels such as natural gas, propane, or fuel oil are not reflected in these data.

United States Household Electricity Expenditures as a Percentage of Income Spring 2012



04/2012

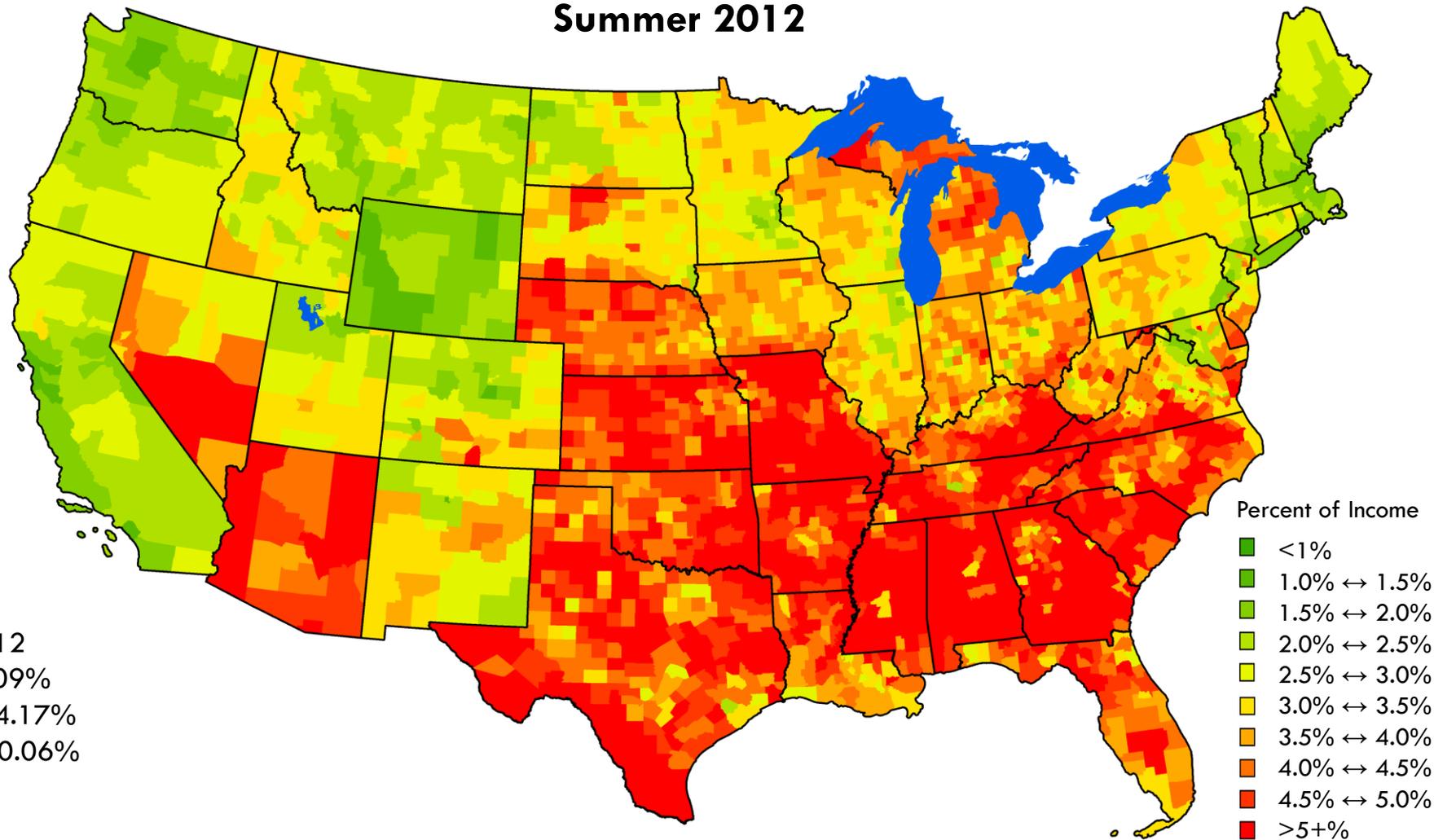
Min: 0.60%

Mean: 2.25%

Max: 5.45%

Electricity expenditure data collected by electric service provider by the Energy Information Administration in Form EIA-826 and EIA-861, median household income data collected by the United States Census Bureau American Community Survey. Residential electricity bills vary by household and month not only with electricity prices, but also weather, housing quality, home size, occupancy, personal usage, and method of home heating. Household expenditures for direct heating with fossil fuels such as natural gas, propane, or fuel oil are not reflected in these data.

United States Household Electricity Expenditures as a Percentage of Income Summer 2012



07/2012

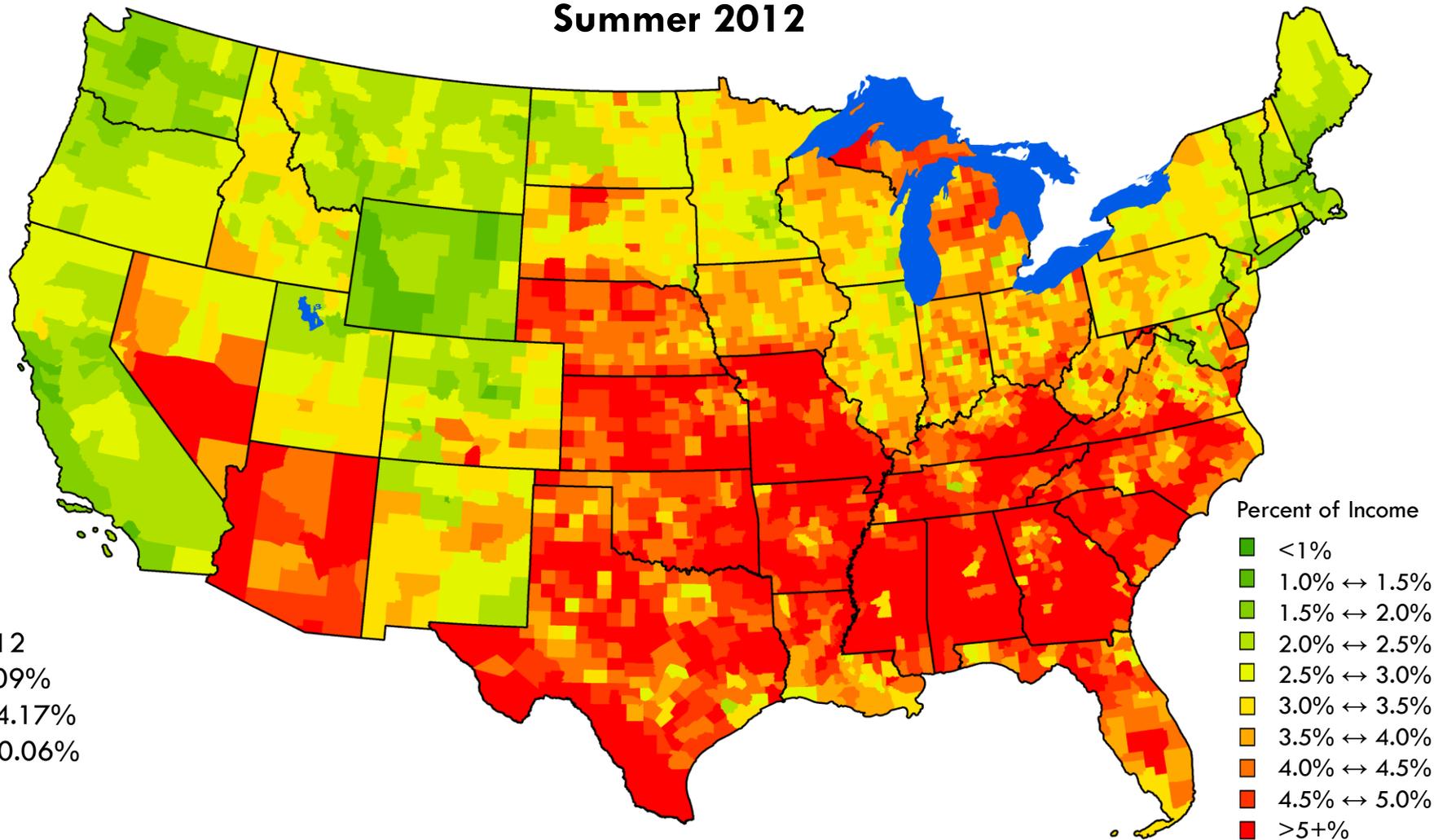
Min: 1.09%

Mean: 4.17%

Max: 10.06%

Electricity expenditure data collected by electric service provider by the Energy Information Administration in Form EIA-826 and EIA-861, median household income data collected by the United States Census Bureau American Community Survey. Residential electricity bills vary by household and month not only with electricity prices, but also weather, housing quality, home size, occupancy, personal usage, and method of home heating. Household expenditures for direct heating with fossil fuels such as natural gas, propane, or fuel oil are not reflected in these data.

United States Household Electricity Expenditures as a Percentage of Income Summer 2012



07/2012

Min: 1.09%

Mean: 4.17%

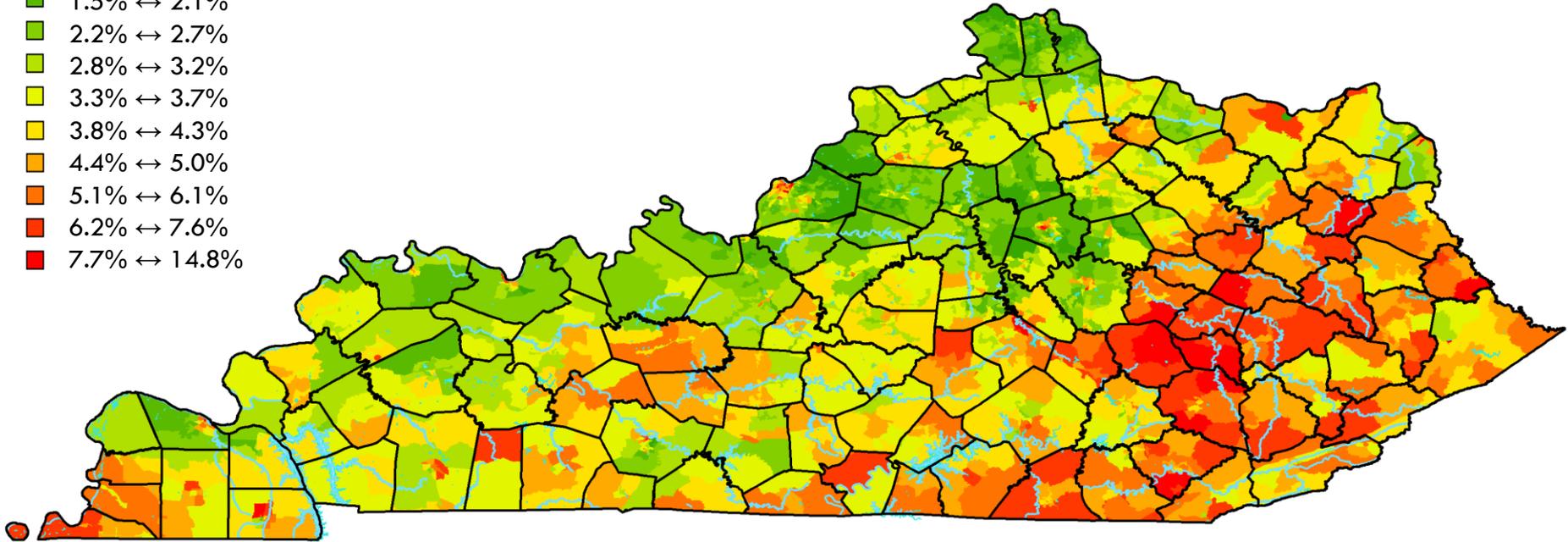
Max: 10.06%

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Kentucky Household Electricity Expenditures as a Percentage of Income 2012

Percent of Income

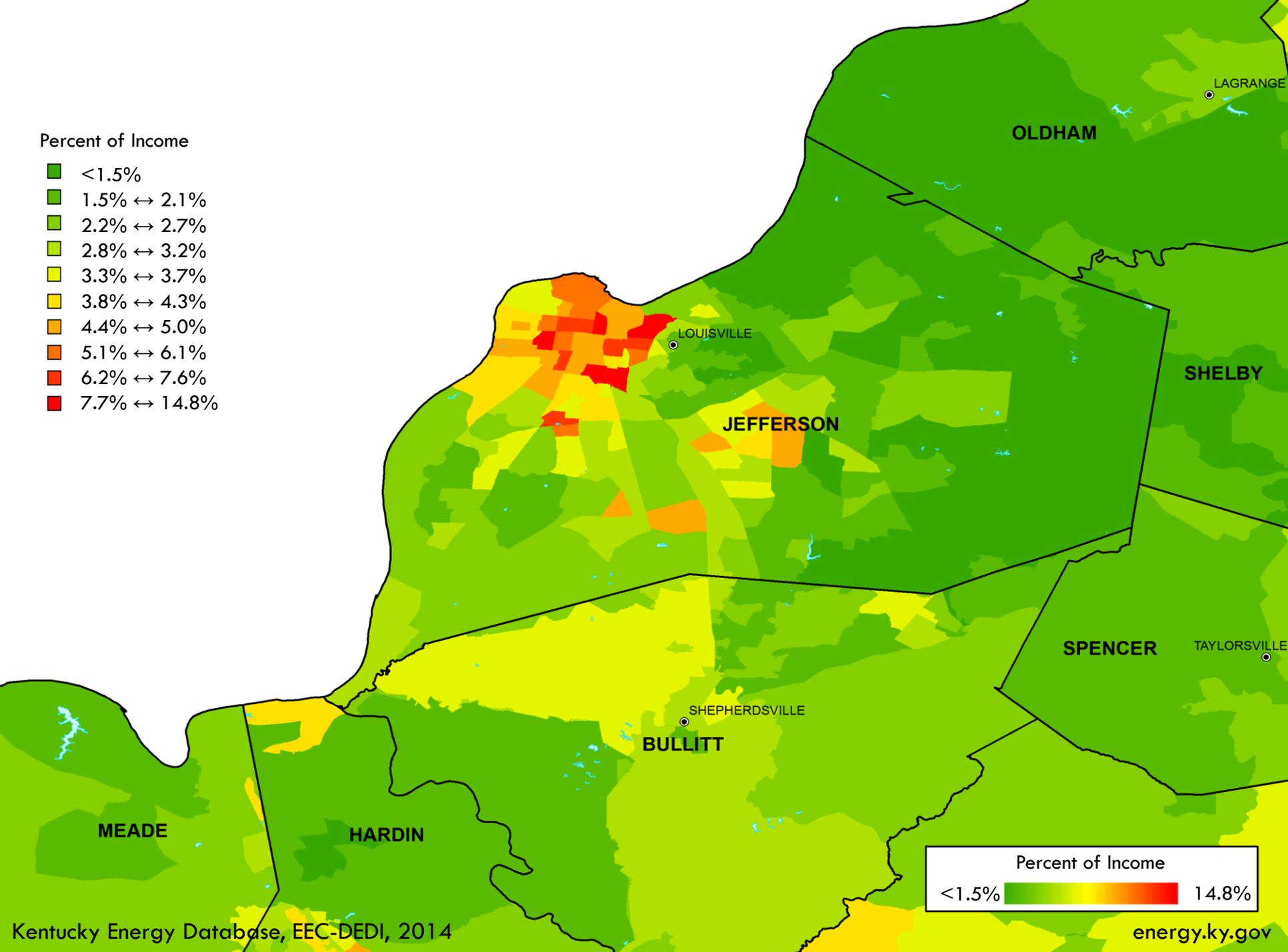
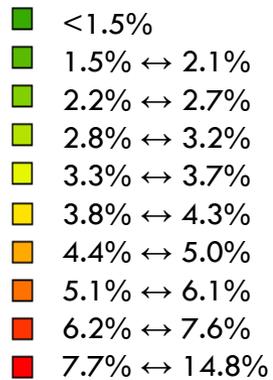
- <1.5%
- 1.5% ↔ 2.1%
- 2.2% ↔ 2.7%
- 2.8% ↔ 3.2%
- 3.3% ↔ 3.7%
- 3.8% ↔ 4.3%
- 4.4% ↔ 5.0%
- 5.1% ↔ 6.1%
- 6.2% ↔ 7.6%
- 7.7% ↔ 14.8%

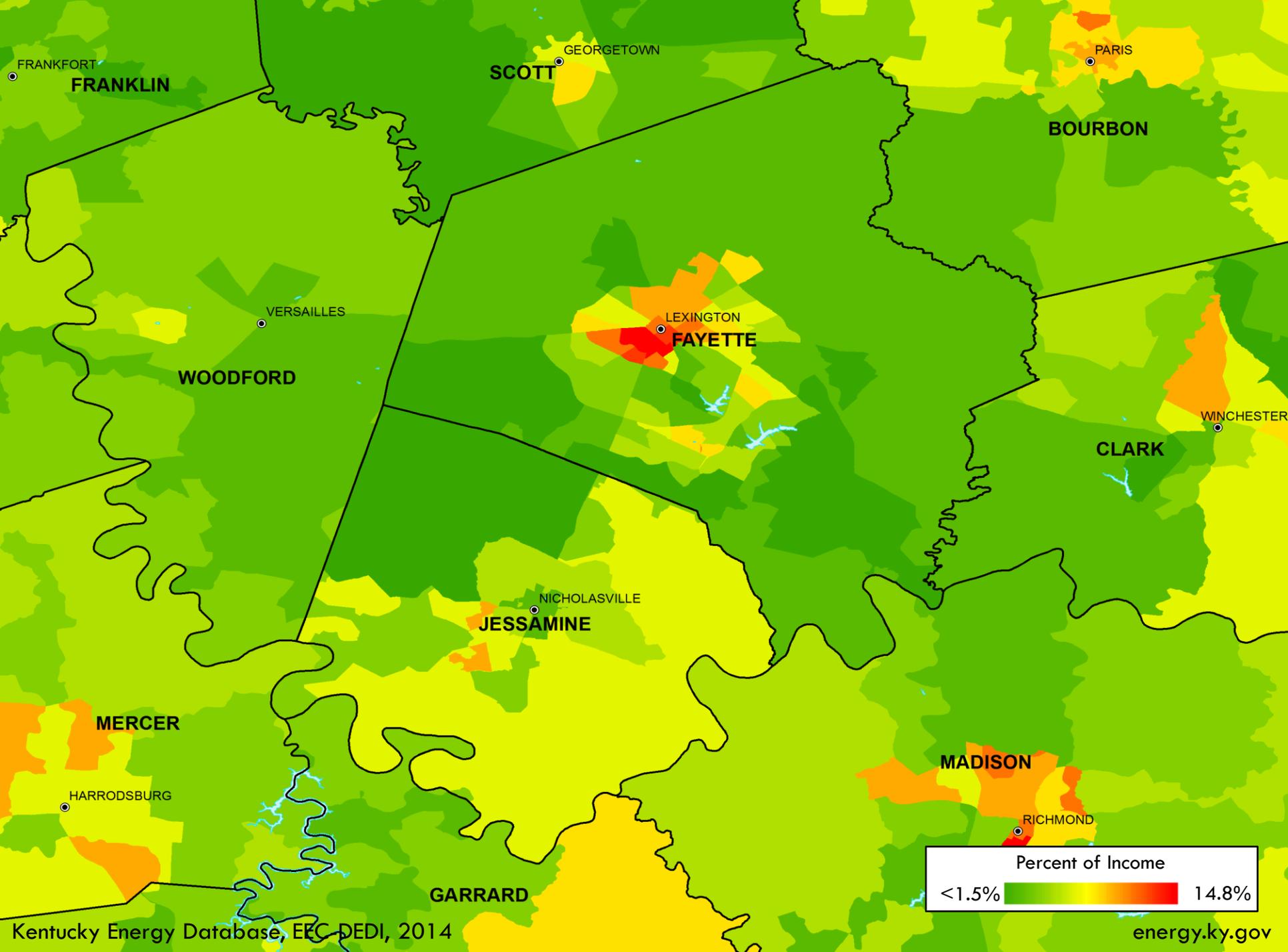


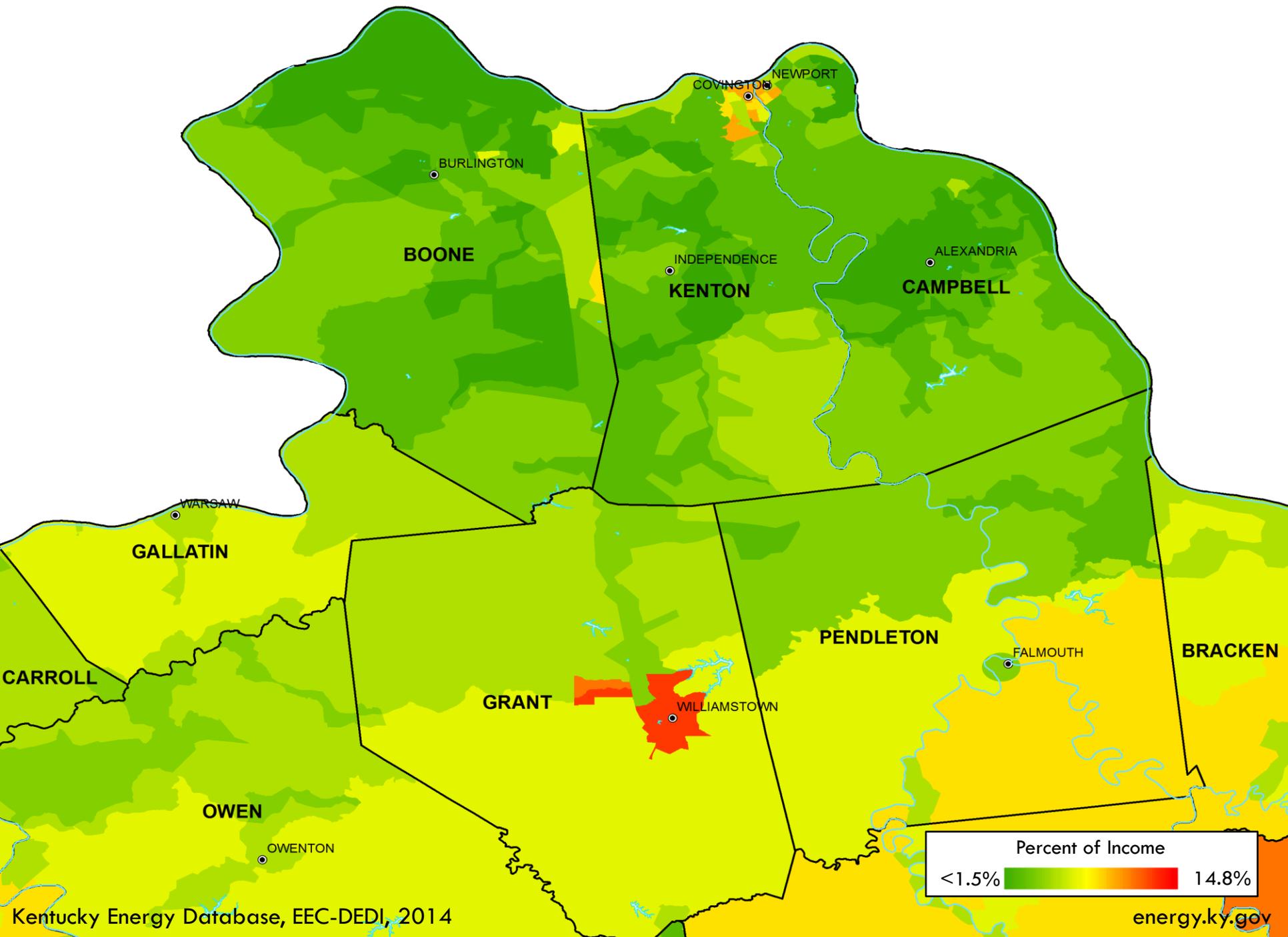
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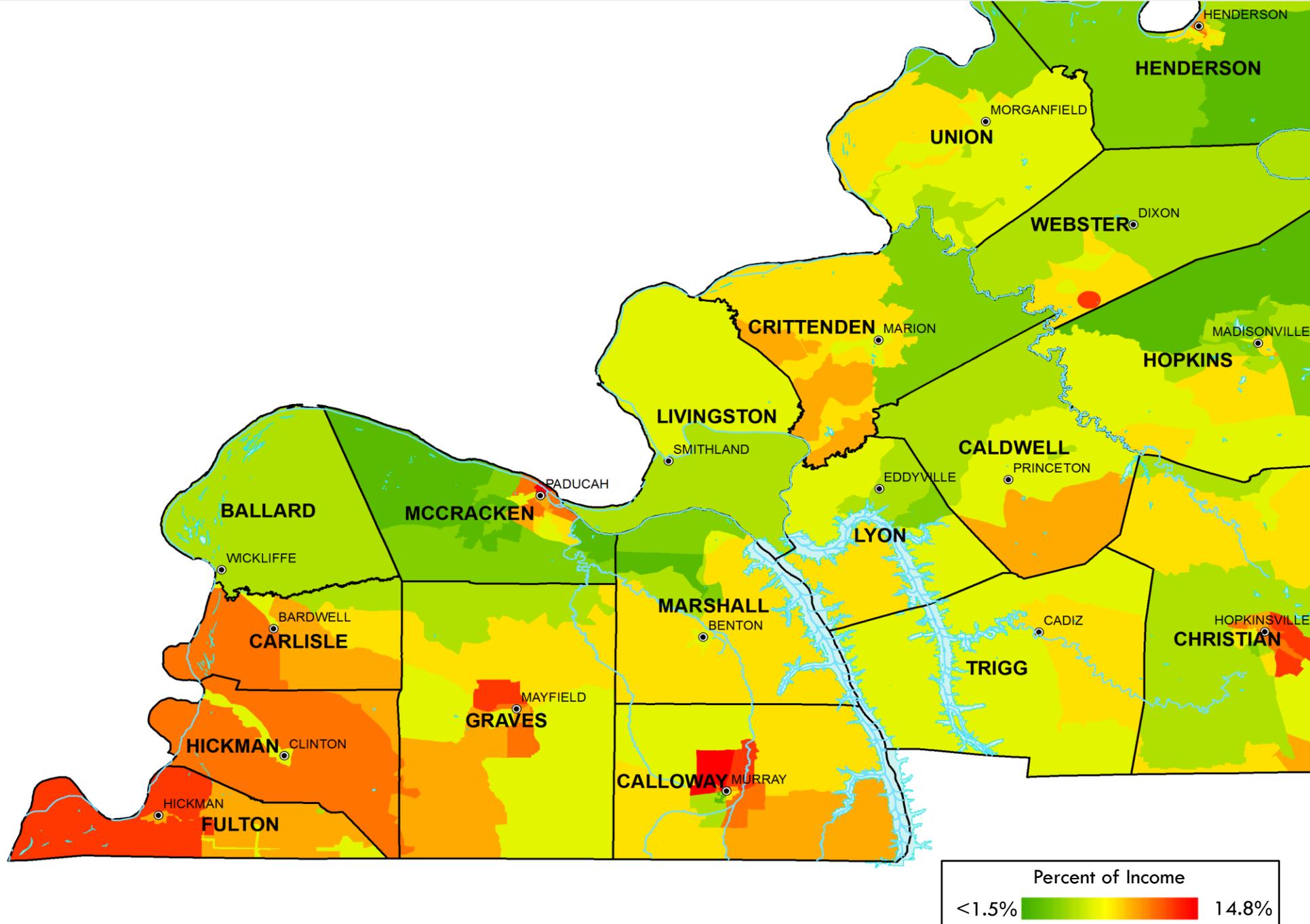


Percent of Income





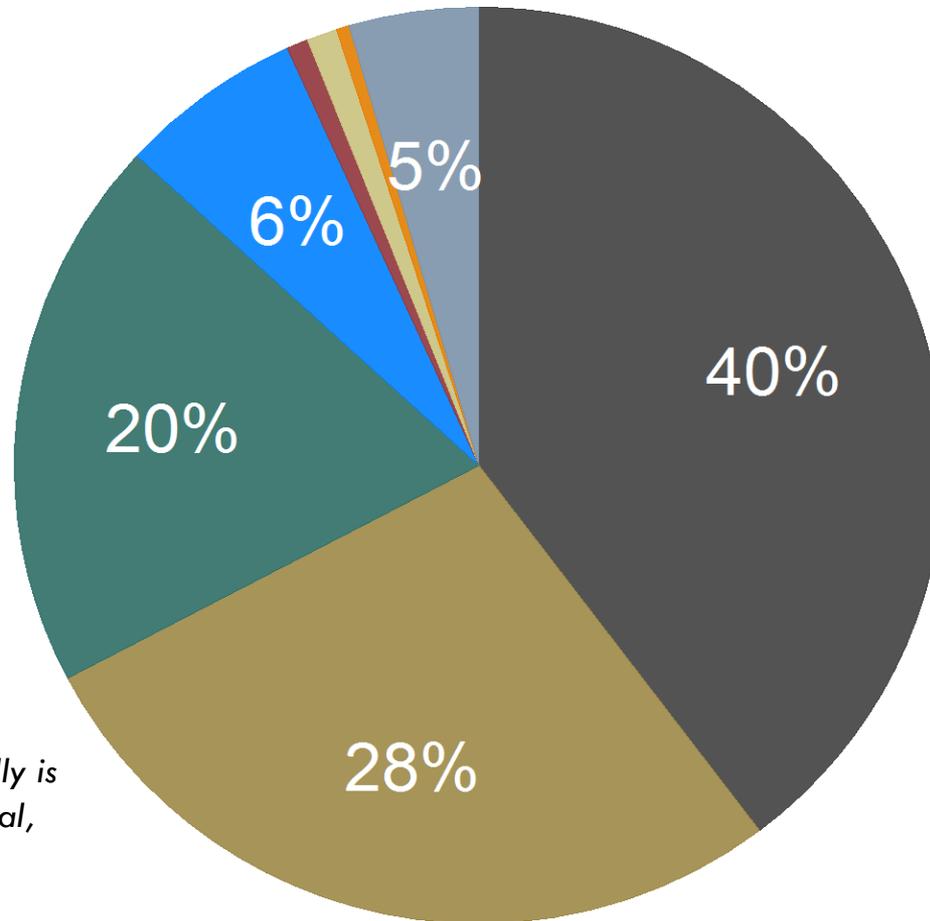




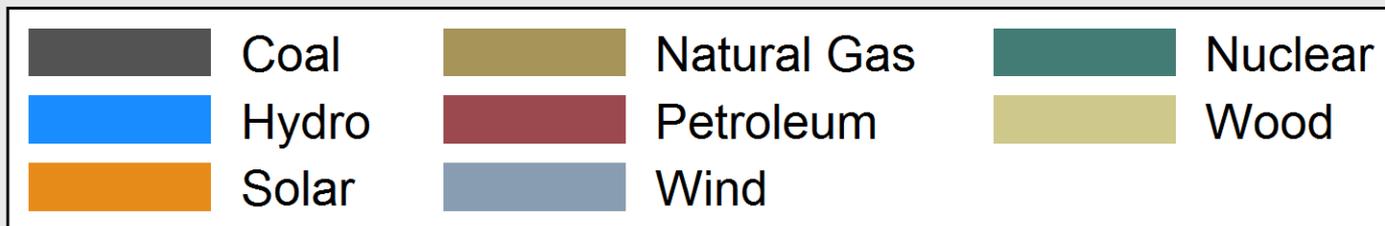
A Quick Introduction to

Kentucky's Electricity Portfolio

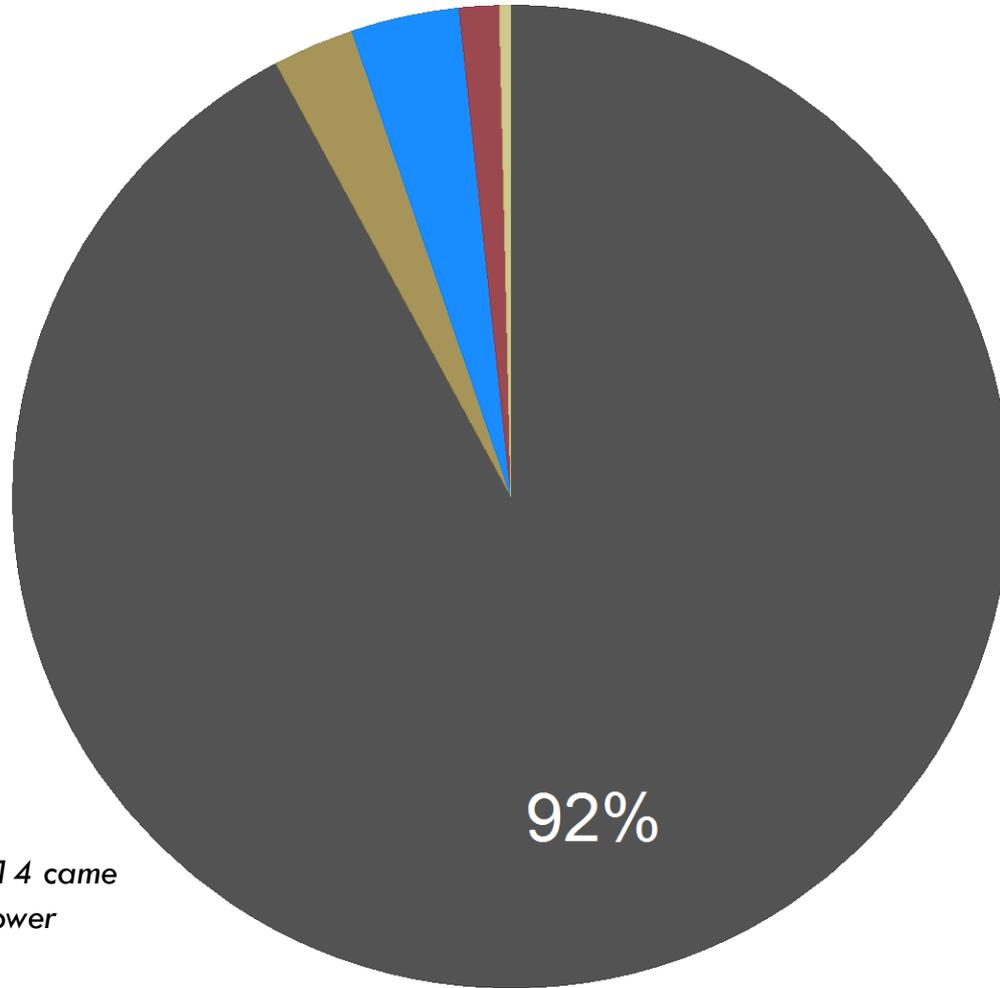
United States Electricity Generation by Fuel Type, 2014



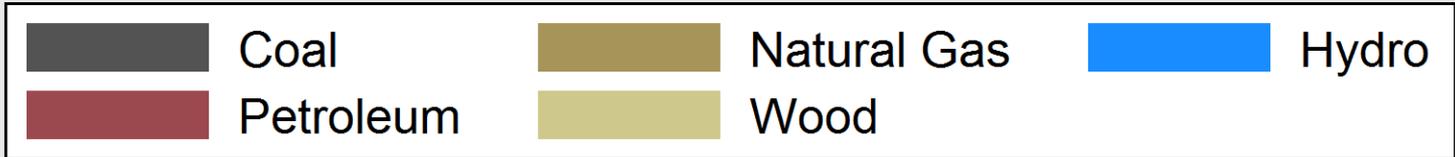
Electricity consumption nationally is relatively balanced between coal, natural gas, nuclear power, hydroelectric, and wind.



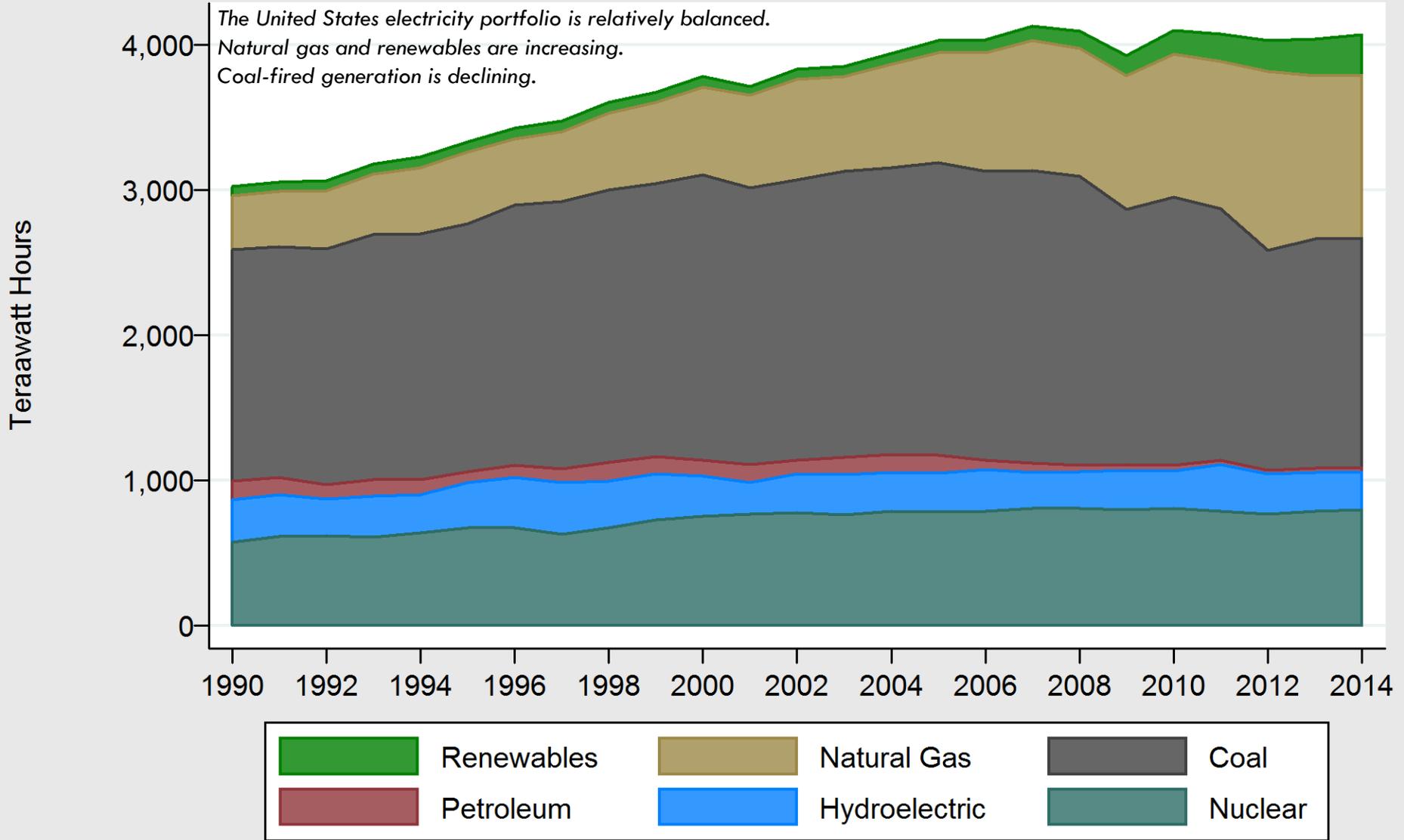
Kentucky Electricity Generation by Fuel Type, 2014



Over 92% of the electricity generated in Kentucky in 2014 came from Kentucky's coal-fired power plants.



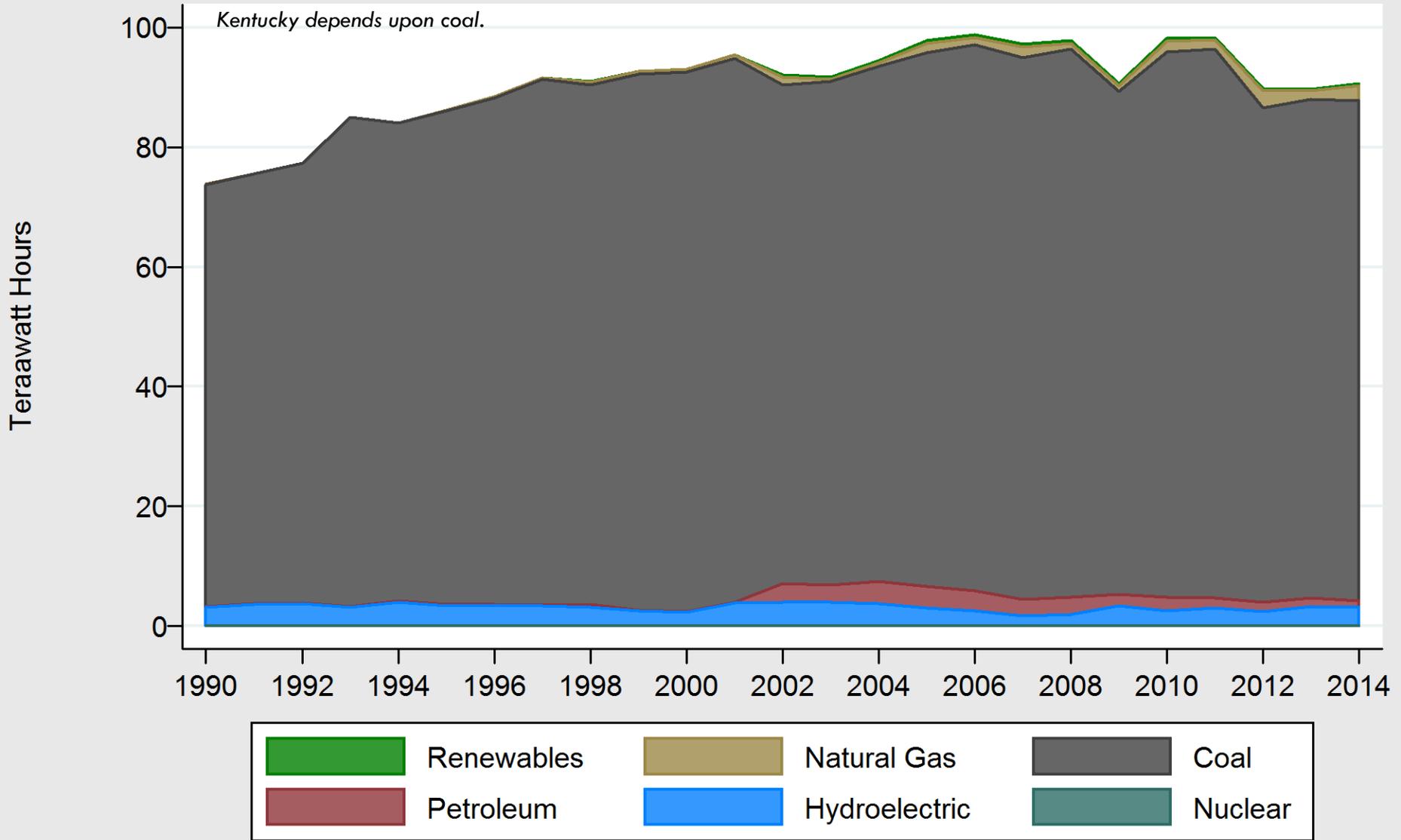
United States Electricity Generation by Fuel, 1990-2014



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Electric Power Annual

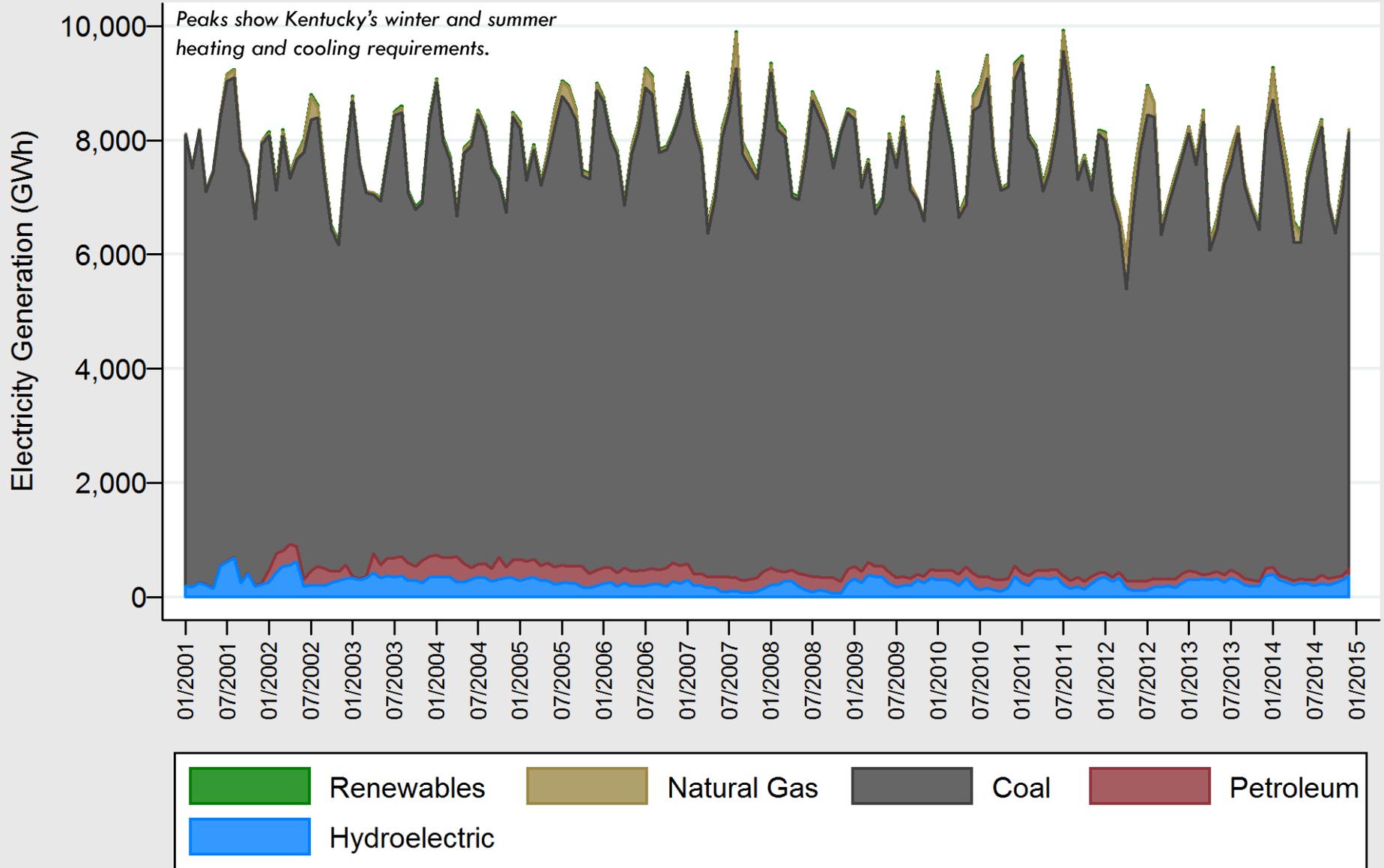
Kentucky Electricity Generation by Fuel, 1990-2014



Kentucky Energy Database, EEC-DEDI, 2015

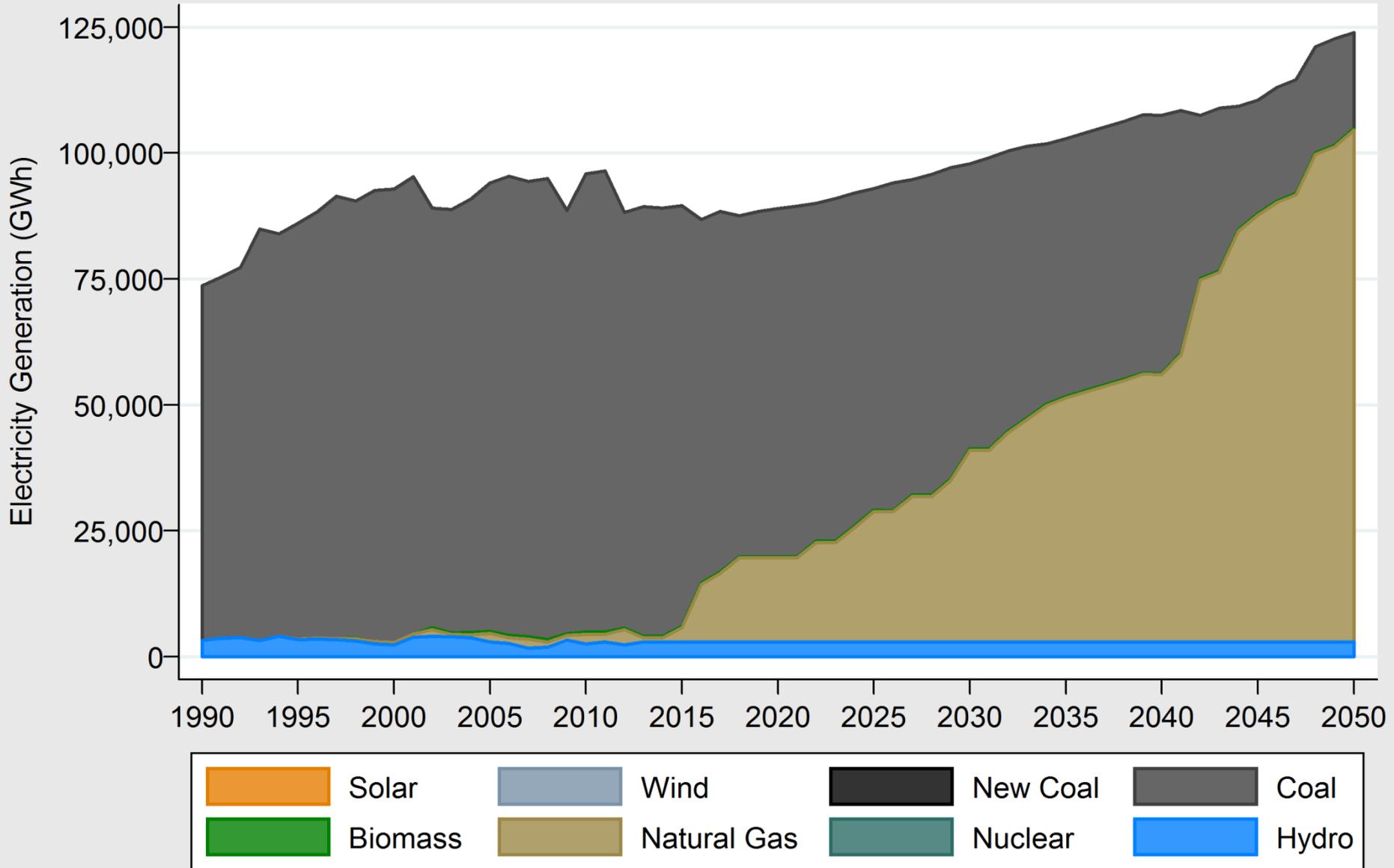
Data Source: EIA Electric Power Annual

Kentucky Electricity Generation by Fuel Type, 2001-2014



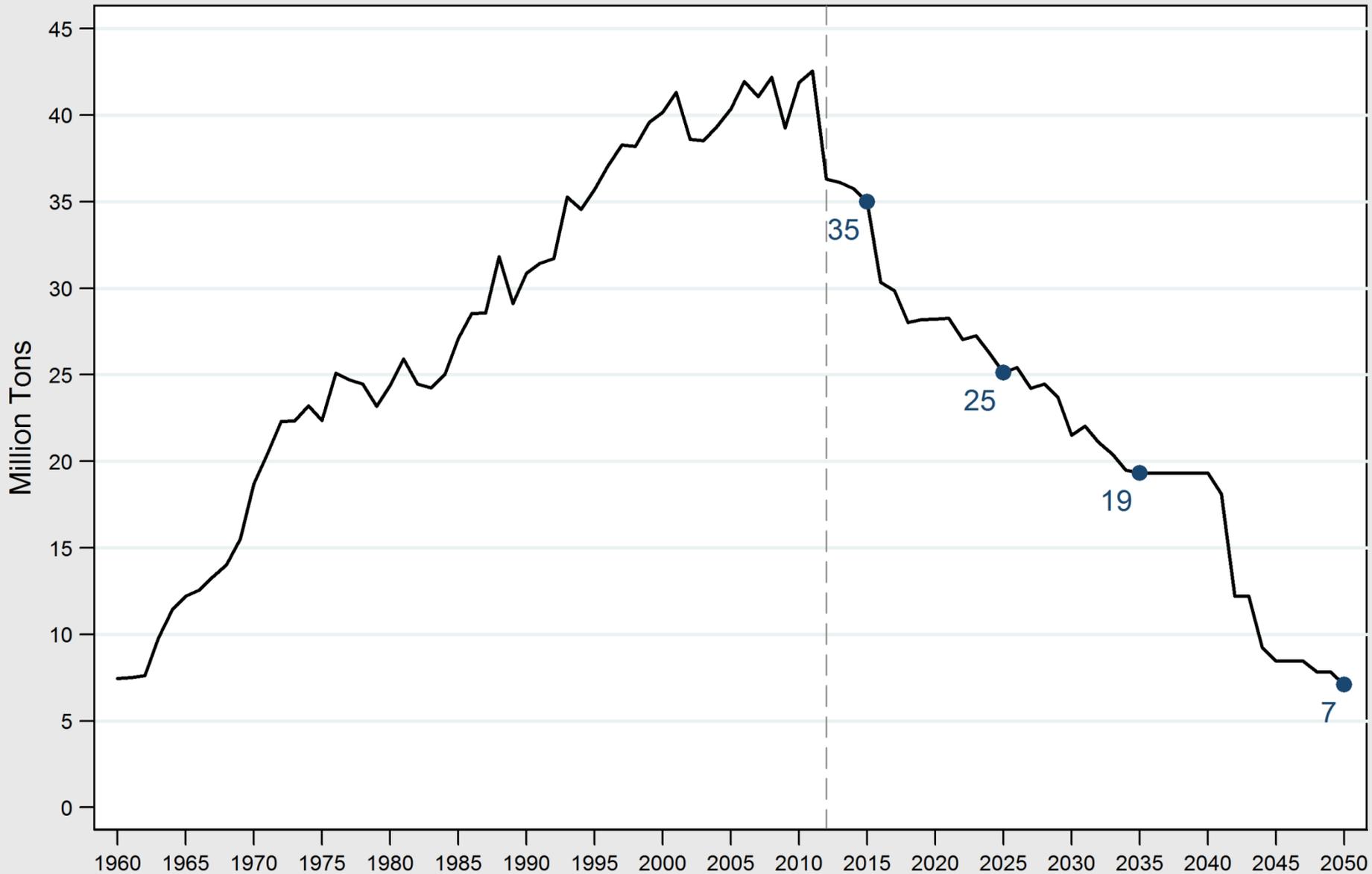
Kentucky Energy Database, EEC-DEDI, February 2015

Kentucky Electricity Generation 1990-2050



Kentucky Electricity Portfolio Model, EEC-DEDI, 17 Nov 2013 Scenario:1

Kentucky Coal Consumption for Electricity Generation, 1960-2050



Kentucky Electricity Portfolio Model, EEC-DEDI, 17 Nov 2013 Scenario: 1

Kentucky Carbon Dioxide Emissions from Electricity Generation, 2000-2050



Kentucky Electricity Portfolio Model, EEC-DEDI, 17 Nov 2013 Scenario: 1



**Board of Directors Fall Meeting
Belterra Casino Resort, Indiana
September 14, 2015**

AGENDA

11:00 AM	Seminar: Kentucky's Energy Outlook (<i>Cedar Room</i>) Aron Patrick, Assistant Director - Kentucky Department of Energy	
11:30 AM	KPMA Luncheon (<i>Buckeye Room</i>) Sen. Whitney Westerfield (R): Candidate for KY Attorney General	
12:30 PM	Break	
1:00 PM	KPMA Board of Directors Meeting (<i>Cedar Room</i>) Welcome and Call to Order J. Hall Acknowledgment of KPMA Antitrust and Conflict of Interest Policies Approval of March 24 meeting minutes Consent Agenda	
1:05 PM	Cyber Security	Austin Bond, Federated
1:15 PM	HR Watch: Exempt vs Non-Exempt	Eric Kenoyer, HR Director Associations International
1:30 PM	Insurance Partners Update	Austin Bond, Federated Mike Tolly, Hartfield
1:45 PM	Executive Director's Report	Brian Clark
2:00 PM	Andy Beshear (D) – Candidate for KY Attorney General	
2:15 PM	KPM PAC Report Treasurer's Report Committee Reports	Gary Emmick Michael Hardy
	Finance	Michael Hardy
	Audit	Gary Logan
	Gov. Affairs	Tom Eveland, Mike Helton
	RTAC	Mark Sweet
	Marketing	Richard Johnson
	Membership	Alex Fassas
	Retail	Steve Estepp
4:00 PM	Adjourn	
5:00 PM	Reception featuring <i>The Fuel Brothers</i> , presented by Federated Insurance	