

# Kentucky

## Energy Geography: Electricity

Is there anyone here today that does not use electricity?

I thought so. We all have something in common; we use electricity every day. As daily consumers of electricity, there are some important questions that we should all be able to answer:

Who **generates your electricity**, and how does it get to you?

Furthermore, how is your electricity made?

Many of you already have the answers to these questions; however, there is a great deal more involved than what you can read off of an electricity bill.

Let me ask some different questions:

What are the different **forms of energy**, and how can they be converted to make electricity?

What are the different **sources of energy**, and how are they used as fuel to make electricity?

**What do coal and water have to do with electricity?**

Who **delivers your electricity** to you?

Can we check our electric bill to find out?

Does the company that generates your electricity deliver it?

Will we need to shop for our electricity in the future (i.e., long distance phone service)?

And now ...

In what geographic region (physical region) do you live?

In what county (political area) do you live?

Can you find the closest electric power plant to where you live?

Does it generate your electricity? (Does electricity come from an inter-connected power grid?)

Then why does most of your electricity come from **one** electric power generating **company** with several generating units and/or plants?)

Are all electric generating power plants in Kentucky located near a river?

Careful!

Why do **most** require water while others do not?

Could it involve the **transfer of energy** using “steam”?

That’s a lot of questions, and it may seem as if you’ll never find all the answers! However, you will find that they are all connected, and in the process of answering one, you will find the answers to several others. While you will need many different reference sources to find the answers, we hope the **Energy Geography: Electricity Map** will help you get started. Good luck!

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This **lump of coal** that I have in my hand, is what?

- A) Is it a **fuel source** used to make electricity?
- B) Is it stored **chemical energy**?
- C) Did it come from decaying plant materials through a process called **coalification**?
- D) Did the energy in this lump of coal start as energy released from “**nuclear fusion**” at the sun?
- E) How did the initial energy contained in this lump of coal arrive on earth? Was it through light and other rays traveling in waves called “**Radiant Energy**”?
- F) Has this lump of coal been mined? Could we burn this lump of coal to transfer the **Chemical Energy** to **Thermal Energy**?
- G) Could the **Thermal Energy** then be transferred to **Mechanical Energy** by heating water to steam under pressure to turn a turbine? Would that explain why coal-fired “steam” electric generating plants are located near a river?
- H) Could the **Mechanical Energy** then be transferred to **Electrical Energy** by turning a large coil within a magnetic field (i.e., generator)?
- I) Do we need to continue improving upon the transfer of **Chemical Energy-to-Thermal Energy** process? Absolutely! Can we burn coal cleaner now than in the past? Has technology allowed us to cut most electric power plant air emissions in half?
- J) Do we need to continue improving upon the transfer of **Thermal Energy** – to – **Mechanical Energy** – to – **Electrical Energy**? Does this improvement in the **Transfer of Energy** make the electric power plants more efficient?
- K) Why don’t we just switch all older power plants to new, cleaner, and more efficient plants **today**? Could you afford to just discard your existing house, car, or school **today** and switch to a newer one? Don’t we need to make sure that all of our new coal-fired power plants being built today are **higher-tech, cleaner, and more efficient** than any we now have? Absolutely!
- L) Does the **cost of electricity (cents/kWh)** affect the quality of our life and that of the elderly and the poor?
- M) Is it important to keep electricity **clean, efficient, abundant, and affordable**? Then, is technology important in keeping **Kentucky coal** as our fuel to make our electricity?