

Electrical Power: A Quantitative and Qualitative Comparison of Energy Resources

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Synopsis

This two-week unit was written to tie together units on Conservation of Energy and Electricity in my high school Physics curriculum. It addresses several Next Generation Science Standards of Scientific and Engineering Practices and Disciplinary Core Ideas of “Matter and Its Interactions” and “Energy.” In this unit, students will learn how energy from fossil fuels, nuclear fission, solar radiation, flowing water, geothermal sources, and wind is transferred and transformed to generate electricity. They will learn about electrical power plants – thermal, hydroelectric, and solar – that supply electricity to their homes and schools. Students will research and compare these energy resources based on factors such as location (for storage of raw material and transmission distances), negative by-products, consistency/reliability, efficiency (energy per kilogram of material), safety, and power density (power generated per square meter of land area) in order to form an opinion about the best resource for generating electricity in their community. Finally, students will review data from their own and neighboring states to determine the relative amounts of electrical power resources in order to create a model that illustrates how much electricity is consumed from various resources in each of the states.