







A Quick guide to energy sources

Type % of U.S. energy 2009	How much does it cost?	How does it get here?	How does it affect health & environment?	What about climate altering gases?	Is it Renewable?
Biofuels 1.6% 	Expensive to produce, though costs are reduced because of extensive tax credits and incentives.	Some imported. Varies by source. Can be stored, some sources can be home prepared. May compete with food crops, especially internationally.	Some studies show disproportionate carbon dioxide emissions due to forest displacement. Fuel preparation and burning may produce harmful chemicals, depending.	carbon dioxide, nitrous oxides, airborne particulate (amount dependent on sourcing)	Yes
Biomass 0.48% 	Expensive to produce, though costs are reduced because of extensive tax credits and incentives.	Domestic sources. Can be stored. Sources are varied, from grasses and agriculture waste to landfill and industrial wastes.	May reduce landfill/waste. Some sources emit toxics.	carbon dioxide, nitrous oxides, airborne particulates, methane (depends on fuel type)	Yes
Coal 21% 	Historically one of the cheapest fuels, though cost increasing from air quality requirements (scrubbers on smokestacks) and increasing price of coal.	Domestically produced. Highly established system of sourcing & transport, and low cost have lead to coal's widespread use for electricity. Can be stored.	Major contributor to smog, acid rain. Emits mercury, lead, & arsenic. Mountain top removal in mining. Mine accidents. Asthma & pulmonary issues from airborne particulate.	carbon dioxide, nitrous oxides, carbon monoxide sulfur oxides VOCs* airborne particulates	No
Ethanol (see also biofuels) 	Expensive to produce, though costs are reduced because of extensive tax credits and incentives, plus agricultural subsidy for corn.	Domestic and imported. May compete with food crops for animal feed. Can be stored.	Some studies show large carbon dioxide emissions due to rainforest/forest displacement. Reduces gasoline efficiency. VOCs & methanol (in production).	carbon dioxide, nitrous oxides, increases VOCs* from autos when used as additive	Yes
Geo thermal 0.4% 	Initial plant investment high but fuel free.	Few locations available, many areas in protected national park lands. Easy to build.	Low gas emissions.	Low amounts of methane, other gas emissions.	Yes
Hydro electric 2.8% 	Initial investment high, fuel free.	Depends on rainfall. Energy can be stored through pumped storage, but is affected by drought. Permitting new large dams unlikely.	Affects wildlife & natural water systems. Huge dams cause earthquakes, displace people, can be catastrophic if they fail.	Not during generation	Yes
Natural Gas 25% 	Fuel cost more than coal, less than oil. New plant construction expensive if used for electricity.	Domestically produced. Established sourcing & transport. Can be stored, piped to homes and industries directly.	Can produce less carbon dioxide per watt than coal. Cleanest fossil fuel. One mode of drilling, "hydrofracking," is in dispute: may pollute water, trigger earthquakes.	carbon dioxide, nitrous oxides, carbon monoxide sulfur oxides VOCs* airborne particulates	No (except some natural methane production)

<p>Nuclear fission 9%</p> 	<p>Fuel inexpensive. Operating costs high. Permitting, siting new plants difficult. Costs for spent fuel storage, security.</p>	<p>Domestically produced. Established sourcing & transport. Fuel can be stored.</p>	<p>Spent fuel storage is unresolved. On average nuclear emissions and accidents less deadly, less cancer-causing than coal or gas, but meltdown has lead to land loss, cancer.</p>	<p>Not during generation</p>	<p>No</p>
<p>Oil 37%</p> 	<p>Expensive compared to other fossil fuels. Markets subsidized, taxed.</p>	<p>Established sourcing, transport. No national standard for refining. Can be stored. 50% U.S. supply imported.</p>	<p>Gas flaring during drilling emits extra carbon dioxide. Significant airborne particulate, carcinogens. Oil spills. Foreign wars. Lead in gasoline present in some aircraft fuels.</p>	<p>carbon dioxide, nitrous oxides, carbon monoxide sulfur oxides VOCs* airborne particulates</p>	<p>No</p>
<p>Solar photovoltaic <0.1%</p> 	<p>Initial costs very high, highest of all sources perhaps. No large plants in existence. Remote locales add cost for transmission. Tax incentives available.</p>	<p>Can be implemented on a small scale but large farms remote. Fuel cannot be stored, energy not produced at night. Most units imported from Asia.</p>	<p>Toxics used to produce solar cells, which depend on type of cells. Use of desert lands may be controversial. Advantage: doesn't require water for generation.</p>	<p>Not during generation</p>	<p>Yes</p>
<p>Solar thermal <0.1%</p> 	<p>Initial costs very high. Remote locales add cost for transmission. Tax incentives and credits available.</p>	<p>Can be implemented on a small scale but large farms remote. Fuel cannot be stored, energy not produced at night.</p>	<p>Turbines require water which can be contentious if desert location. Requires a lot of land.</p>	<p>Not during generation</p>	<p>Yes</p>
<p>Wind 0.7%</p> 	<p>Turbine are expensive - offshore even higher. However, incentives & tax credits have made wind competitive with fossil, according to some projections.</p>	<p>Can be installed on a small, distributed scale, but large farms remote, requiring transmission investment. Fuel cannot be stored.</p>	<p>Requires a lot of land. Kills some bats, birds, though new designs are slower & less deadly. Advantage: doesn't require water for generation.</p>	<p>Not during generation</p>	<p>Yes</p>

