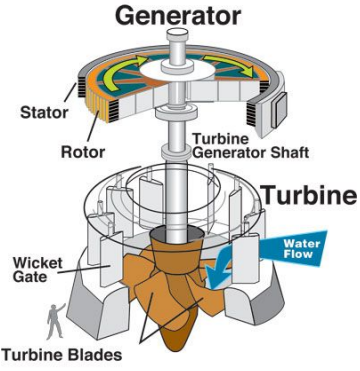
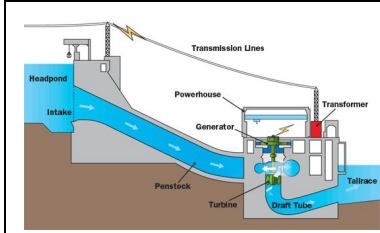


Why Build A House Without Electricity?

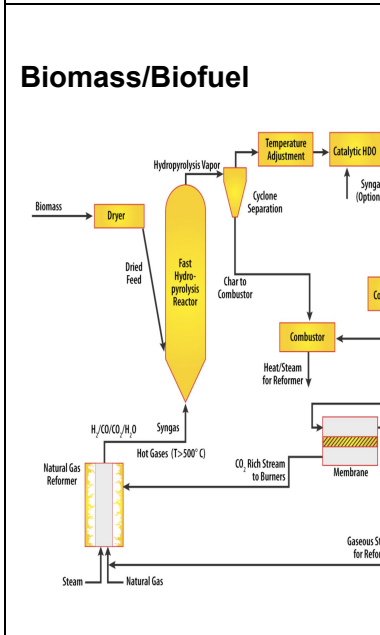
Energy Source	How does it work?	Pros	Cons
<p>Solar Power</p>	<p>Uses either the energy of concentrated solar rays using mirrors to heat fluid or photovoltaics (solar panels) that directly convert light waves into DC power currents</p> <p>https://en.wikipedia.org/wiki/Solar_power</p>	<ul style="list-style-type: none"> -Renewable -sunlight is an abundant source -very sustainable -panels can serve multiple purposes (ex. Shade structures) - Free once installed. 	<ul style="list-style-type: none"> -Less effective in winter/ when there are clouds -Takes up space - larger upfront cost - Needs storage for night
<p>Wind Power</p>	<p>Wind turbines use the flow of air (wind) to produce electric power.</p> <p>Link: https://en.wikipedia.org/wiki/Wind_power</p>	<p>Produces no pollution Renewable Plentiful Relatively cheap</p> <p>Link: http://www.seai.ie/Schools/Post_Primary/Subjects/Geography_JC/Pros_Cons1/</p>	<p>Dangerous to birds Requires constant wind Requires land</p> <p>Link: http://www.seai.ie/Schools/Post_Primary/Subjects/Geography_JC/Pros_Cons1/</p>
<p>Hydro Power:</p> 	<p>In a dam, uses a propeller to turn a metal shaft, using the flow of water, to produce electricity, once the generator converts the energy. It converts the kinetic energy of water into mechanical energy of the turbine, to convert it to electricity.</p> <p>Link(s):</p>	<p>Renewable No Byproducts (Other than construction) Reliable (Few fluctuations in output) Flexible (Easy to adjust flow for conservation or use) Safer (Than fossil fuels and nuclear energy) Recreation - boating</p> <p>Link(s):</p>	<p>Environmental Consequences (changes in habitat), disrupts fish migration patterns Expensive (to build, but low maintenance cost) Droughts (No electricity is generated) Limited Reservoirs Recreation - boating</p> <p>Link(s):</p>



http://www.wvic.com/content/how_hydropower_works.cfm
<https://water.usgs.gov/edu/hyhowworks.html>

<http://energyinformative.org/hydroelectric-energy-pros-and-cons/>

<http://energyinformative.org/hydroelectric-energy-pros-and-cons/>



Energy found under the earth is taken by a generator to convert into electricity.

Link:
<http://www.climatemaster.com/residential/how-geothermal-works/>

No harmful gasses emitted, uses clean energy, very abundant and reusable.

Very expensive, It also uses more fuel. It also requires more land. More effort to take care of.
 If farmers grow crops for electricity, cost of food increases.

Geothermal Energy

Energy found under the earth is taken by a generator to convert into electricity.

Link:
<http://www.climatemaster.com/residential/how-geothermal-works/>

The efficiency of most geothermal plants lies around 10% to 23%. The amount of energy generated from geothermal plants is very high compared to other renewable sources like wind and solar, it's not as clean however. The higher efficiency compared to solar and some other renewable sources allows you to take advantage of abundant energy source by expending less energy.

link

People digging could hit the underground piping. Works in specific locations. Such as areas that lie near fault lines, volcanoes, or areas where geysers are prevalent. Expensive and hard to access.

link:
http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/how-geothermal-energy-works.html#.WMhiwogrLnA

		https://en.wikipedia.org/wiki/Geothermal_energy	
Oil/Petroleum (fossil fuel)	<p>Oil is drilled from underneath the Earth's surface to be burned and converted into electricity (fossil fuels for machinery, agriculture, pharmaceuticals, etc.) Gasoline for cars.</p> <p>http://www.powerscorecard.org/tech_detail.cfm?resource_id=8</p>	<p>Easy to access in proper conditions found by geologists, rather inexpensive to extract from underground, high specific energy capacity, and long-lasting energy supply. Portable liquid.</p> <p>http://www3.nd.edu/~bbuechle/petroleum.pdf</p>	<p>Non-renewable after being burned, extremely awful for the environment (spills, toxic chemical emission, solid waste, etc.), and expensive for the users to purchase.</p>
Natural Gas (fossil fuel)	<p>Gas is burned and then boils water and turns it into steam, which is then used to power a turbine.</p> <p>https://en.wikipedia.org/wiki/Fossil_fuel_power_station</p>	<p>It is cleaner than coal and oil, And it's also abundant and present in many parts of the world including the US.</p>	<p>Causes air pollution but not nearly as much as normal gas or coal, and also global warming. Method of getting gas is also very harmful (fracking)</p>
Coal (fossil fuel)	<p>Coal is burned and boils water, which is then used to power a turbine</p>	<p>It is very cheap and abundant. Located in the US. We already have coal powerplants.</p>	<p>Air pollution which can cause global warming, respiratory problems, air quality issues.</p>
Nuclear/Uranium	<p>Nuclear energy starts with the splitting of Uranium Atoms. It produces heat which when put in water produces steam, which is used by a turbine to generate electricity.</p>	<p>Nuclear energy is more proficient than fossil fuels. It produces very inexpensive electricity it also doesn't emit carbon dioxide or Methane.</p>	<p>Nuclear energy has radioactive waste, the waste has been causing many health and environmental effects. It is also not a renewable energy.</p>

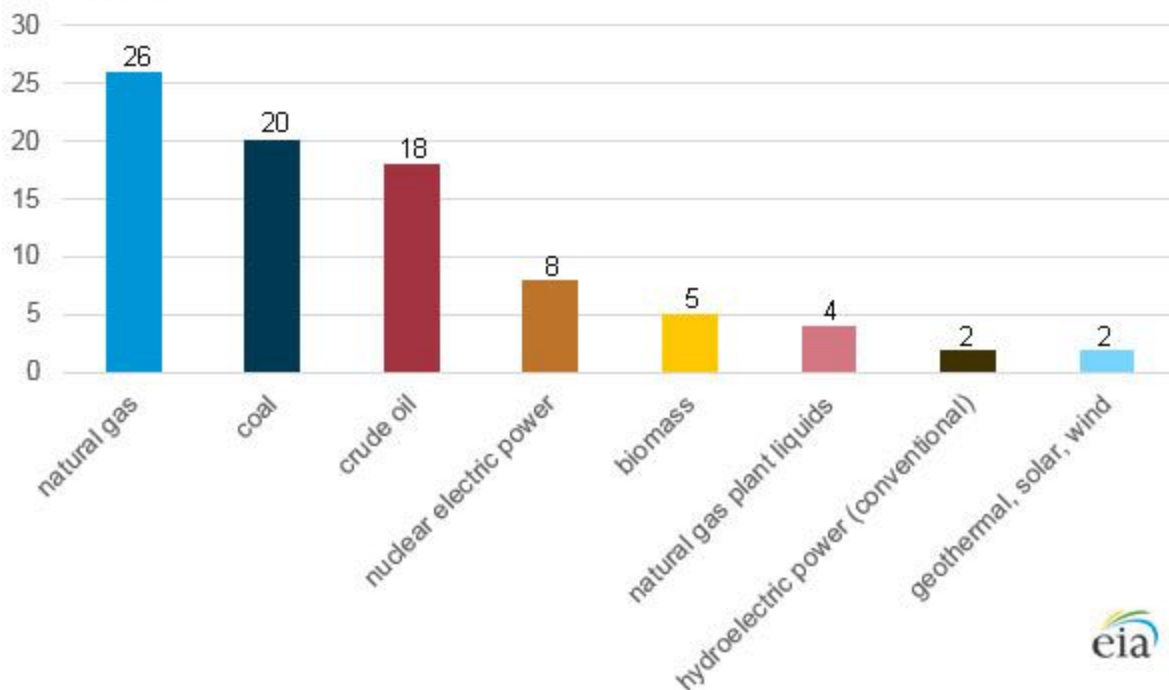
Why build a house without electricity?

1. How much energy do humans use? In what forms? Do different countries have different ratios?

Humans use about 18 terawatts per day. Some common sources are fossil fuels (coal, oil, natural gas), solar, wind, nuclear, etc. The energy consumption in the US per capita is around 13,000 kWh compared to 5,000 in Russia and 3,000 in the United Kingdom.

U.S. primary energy production by major source, 2015

quadrillion Btu



Source: U.S. Energy Information Administration, *Monthly Energy Review* (April 2016), preliminary data

2. Cost/Economics of electricity: How much money is spent on electricity generation? In different parts of the country? In other countries?

[Institute for Energy Research](#): “[The] cost of wind totals 15.1 cents per kilowatt-hour if natural gas is used as the back-up power and 19.2 cents per kilowatt-hour if coal is used as the back-up power.”

[Energy Information Administration](#): Besides California and half of New England, the US has about the same cost for energy generation (~10 cents per kWh). Alaska and Hawaii also have higher prices, likely due to the remoteness of them compared to the rest of the country.

[World Atlas](#): The US has a relatively low electricity price when compared to 18 of the most developed countries in the world. Italy and Germany had the highest prices.

3. Climate change - how does it happen?(greenhouse effect, carbon cycle, use of sun's energy?)

Greenhouse gases are released from the Human population into the atmosphere. They reflect the heat from the Sun and trap it on the Earth's surface. Therefore, heating up the Earth. If these greenhouse gases were not present, only some of the heat would stay and the rest would escape back out into space.

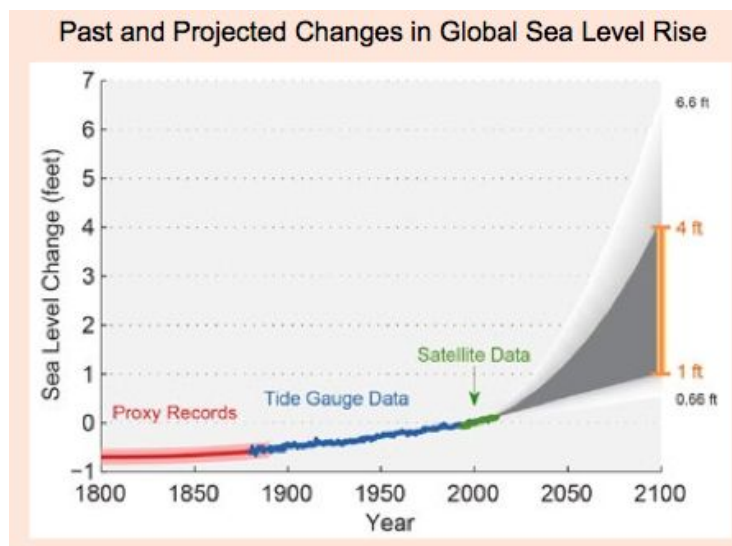
4. Consequences of Climate Change- what could happen? Best case and worst case scenarios?

Overall, for the near future (20-30 years) the climate will gradually warm. There will be more rain, but a hotter and drier climate in between rains. There will be more flooding and worst hurricanes and typhoons.

There are several outcomes of this process. One of the better cases is that plants and animals adapt more readily than we have seen, and our society quickly adapts new technology and policy to limit emissions and reign in climate change. However, this is not extremely likely. The lowest estimate for 2100 is a 0.5 degrees F (EPA).

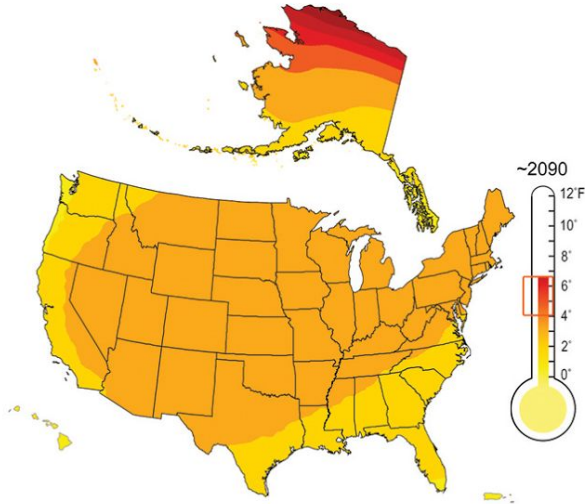
The general consensus among scientist is that the Earth is rather sensitive to temperature change. A major problem is the food production chain that we have in place, which is vulnerable to climate changes. Coastal cities is also are in extreme danger in regards to climate change, as rising waters could lead to “the loss of trillions of dollars worth of property and other assets” (NYT). The seas, if all the polar ice sheets melted, would rise by over 160 feet (NYT). The high estimate for 2100 is a rise of 8.6 degrees F (EPA).

Overall the US is expected to experience a 3-12 degree F rise by 2100. (National Research Council) This will lead to record high temperatures, as well as an “increase in the number of the strongest (Category 4 and 5) hurricanes” (EPA). The seas are expected to rise by 1-4 feet by 2100, with a low of 0.66 feet and high of 6.6 feet.

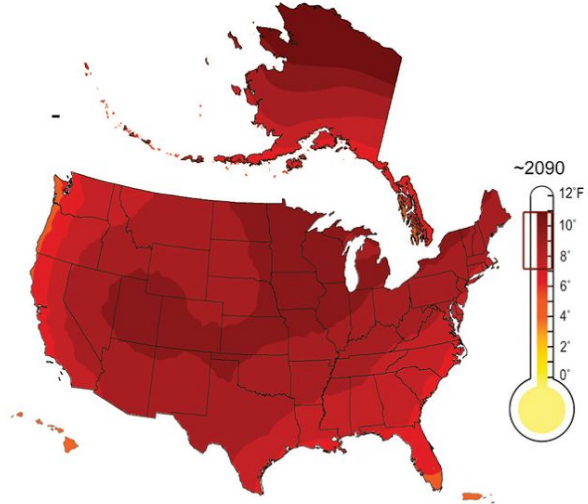


Higher Emissions Scenario - Projected Temperature Change (°F)
From 1961-1979 Baseline

Mid-Century (2040-2059 average)

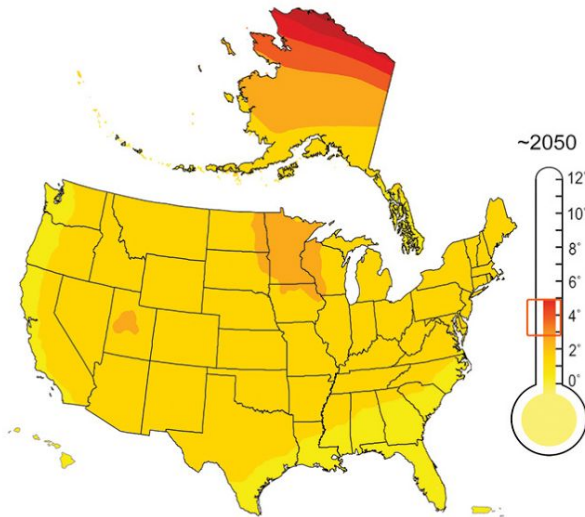


End-of-Century (2080-2099 average)

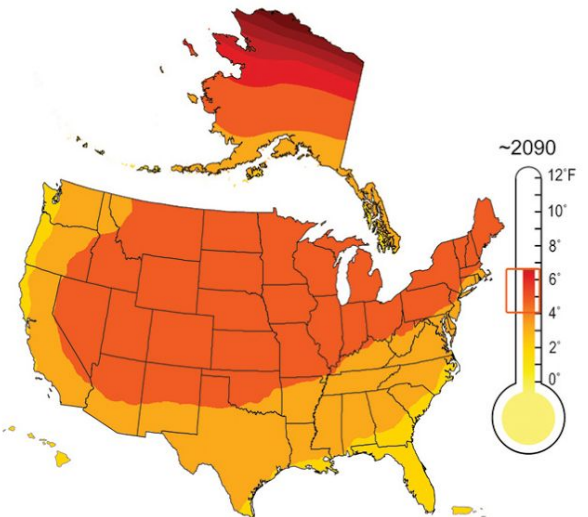


Lower Emissions Scenario - Projected Temperature Change (°F)
From 1961-1979 Baseline

Mid-Century (2040-2059 average)



End-of-Century (2080-2099 average)



All Maps
CMIP3-C

<https://www.epa.gov/climate-change-science/future-climate-change#ref1>
<https://earthobservatory.nasa.gov/Features/CarbonCycle/>

<https://www.nytimes.com/interactive/2015/11/28/science/what-is-climate-change.html>