Lecture

• $CO_2$ Release per Unit Energy
CO2 Released per Unit Energy

Natural gas: 1.0
Oil: 1.4
Coal: 1.8
Half our electricity comes from Coal yet 83% of our electrical $CO_2$ comes from Coal.
Why is Coal Such a Problem

• IS CHEAP

• IS ABUNDANT

• Approximate Costs of Producing Energy (in cents per kilowat-hour):
  - Natural Gas: 5.4
  - Wind Power: 5.6
  - Nuclear: 5.9
  - Solar (PV): 35
  - Solar Thermal: 12
  - Coal: ~2

Are you willing to pay more for electricity?
An example of an externality is

a) Dumping greenhouse gases into the atmosphere at no cost
b) Carbon offset taxing
c) Forced reduction of greenhouse gas emissions
d) Geoengineering to reduce global warming
e) Fossil fuel divestment
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Which of the following is not a primary energy supply
a) Coal
b) Natural Gas
c) Nuclear Energy
d) Electricity
e) Geothermal
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ICLICKER QUESTION QUIZ

Previous “global warming” periods in the Earth’s history have been caused by
a) Methane bubbling up from the ocean bottom
b) Peat and coal fires
c) Thawing Permafrost
d) All of the above
e) None of the above
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Group Activity
(One Per Table)

• Table1: http://solazymeindustrials.com
• Table2: https://www.energy.gov/eere/buildings/downloads/magnetocaloric-refrigeratorfreezer
• Table3: http://newworldwind.com
• Table4: https://impossiblefoods.com
• Table5: https://www.radiatorlabs.com
• Table6: http://www.ecowavepower.com