2019 Pennsylvania Electric Power Generation Mix

- Nuclear – 36.8%
- Natural Gas – 42.6%
- Coal – 16.7%
- Petroleum – 0.1%
- Hydro – 1.5%
- Non-hydro Renewables (e.g., biomass, wind, utility-scale solar) – 2.1%

Environmental Impacts of Traditional Generation Sources

- Bituminous coal produces 205 pounds (lbs.) of carbon dioxide (CO_2) per million British thermal units (Btu) of energy.[1] Coal combustion produces high levels of sulfur dioxide, nitrogen oxides, particulate matter, mercury, and residuals including ash.[2]
- Residual fuel oil produces 174 lbs. of CO_2 per million Btu of energy.[3] Oil-fired generation, especially with heavier grades, results in excessive levels of nitrogen oxides, carbon monoxide, sulfur dioxide, and particulate matter (power plants burning distillate fuels will emit less CO_2 and criteria pollutants).[4][5]
- Natural gas produces 117 lbs. of CO_2 per million Btu of energy.[6] However, when fugitive natural gas (which is primarily methane) is released into the atmosphere due to leaks in faulty or aging infrastructure, it has a global warming potential (GWP) far greater than CO_2.
    - Methane's 20-year GWP is 84 times more powerful than carbon dioxide.[7]
    - Methane's 100-year GWP is 28 times more powerful than carbon dioxide.[8]
- While hydroelectric and nuclear power are carbon friendly, both carry baggage. The former can adversely impact flora, fauna, and alter the water's natural temperature and flow characteristics;[9] the latter produces spent fuel containing harmful levels of radiation that requires safe, secure storage.[10]
- Pumped-storage hydropower plants possess the same negative environmental features (e.g., ecological damage) associated with traditional dams and are net energy consumers (i.e., they consume more energy than they actually produce).[11]

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[1] https://www.eia.gov/tools/faqs/faq.php?id=73&t=11

[2] https://www.eia.gov/energyexplained/?page=coal_environment

[3] https://www.eia.gov/electricity/annual/html/epa_a_03.html

[4] https://www.iso-ne.com/static-assets/documents/2018/01/envtlupdate_20180130.pdf

[5] https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf

[6] https://www.eia.gov/tools/faqs/faq.php?id=73&t=11

[7] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#Learn%20why

[8] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

[9] https://www.eia.gov/energyexplained/index.php?page=hydropower_environment

[10] https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/radwaste.html#stor

[11] https://energyeducation.ca/encyclopedia/Pumped_storage