

“Radiation that looks like a great evil in basically a design problem. Nuclear provides a clean base load electricity that produces waste just a size of a coke can as compared to a coal fired plant that belches out 16,000 tons/year of CO2..”~ Stewart Brand

Nuclear Power PROS

- ‘No’ greenhouse gas emissions
- Fuel is cheap
- High energy density (1 ton U = 16,000 tons of coal to produce same amount of electricity)
- Natural abundance of U (48th among the most abundant elements found in natural crustal rocks)

Coal Power PROS

- Cheap
- Easy to attain (Russia and US)
- Infrastructure and technology well known makes it one of the least capital intensive ways to provide for energy needs

Nuclear Power CONS

- High capital cost due to meeting safety requirements, storage of radioactive waste (1-5 Billion Dollars for construction)
- No plan for long term storage of waste
- Potential proliferation issue
- Accident!** Whether in storage, at a uranium conversion facility (1986), during transportation, or in a meltdown (Cesium and Iodine)

Fear: (release of UF₆ uranium hexafluoride reacting with moisture in air creates the immediate danger of HF hydrogen fluoride if inhaled-respiratory irritation or even death depending on exposure level) & solid uranyl fluoride (UO₂F₂) also is formed, which is a particulate that can be dispersed and easily absorbed into the bloodstream causing kidney damage

-**Storage:** cement cylinders on site (workers are exposed to low levels of radiation UF₄)

Historically less than 200 mrem annually, much less than the regulatory limit of 5,000 mrem/yr

-**Conversion:** pipe leaks, cylinder spills, earthquakes, ruptured tanks spilling toxic chemicals (anhydrous HF or ammonia; hydrofluoric acid is also used in the conversion process)

-**CO₂ emissions involved in mining/transporting U!**

Questions-

- How are we going to meet our expanding energy needs, particularly if there is a movement towards electric cars?
- What if the high capital costs of a nuclear power plant were invested in renewable energies instead?

Coal Power CONS

-Greenhouse gases / acid rain: emits Hg, CO₂, CO, SO_x, NO_x

(there are pollution controls on SO_x and Hg which makes it more expensive, but for good reason)

-Extensive transportation

-Large scale land disturbance, 6x larger mines than U

Dr. James Hansen, Director at NASA Goddard Institute of Space studies, proposes that renewable energy is still very expensive and doesn't provide consistent base load energy. The current second generation nuclear plants have technical problems that third and fourth generation reactor designs can overcome...