

Dear energy and Natural Resources committee members. please recognize the attached and pasted witness form for Wednesday mornings testimony.

When we think of "Green Energy Sources" we consider four criteria.

1. Renewable energy: resupplied in abundance in a short period of time (in relation to human life span).
2. Sustainable energy with minimum, environmental impact. Essentially inexhaustible with little or no environmental or social negative side-effects
3. Carbon Free. Little or no fossil fuels used in energy production or processing which release climate disrupting carbon dioxide.
4. Efficient production process. The most efficient production of energy is

Simple and cost effective with a minimum number of steps. This is because each energy transformation is a waste of energy.

Conventional Nuclear Energy fails on all four criteria to be Green Energy. Let me explain each item.

1. Nuclear fuel is not Renewable. Nowhere on Earth is Uranium being produced. The most concentrated form is in ancient granite formations which are dated at 4 billion years in pre-Cambrian rock. All extraction of Uranium is from a limited source. By any standard except the life-span of stars, is Uranium NOT a renewable source of energy.

3. Nuclear energy is not Sustainable.

At the present rate of Uranium extraction, the know supplies of Uranium will be used up in 80 years. Estimates vary on the unknown reserves, but all sources agree that the cost of future mining will continue to exponentially increase, as the sources become lower and lower in concentrations of Uranium.

Mining Uranium has devastating environmental impacts on forest ecosystems. Forests are eliminated and toxic tailings are cast in huge heaps across the landscape.

Lack of storage of spent fuels poses radioactive risks for 10's of thousands of years, since the half life of U235 is 10,000 years. Even if storage seems secure for us, there is no assurance that civilizations thousands of years from now will have the wisdom or technology or laws to keep these radioactive substances safe.

There have been 11 major nuclear disasters in the 70 years Nuclear Power production. That means one every 7 years. This is not sustainable or safe.

4. Nuclear is not Carbon Free.

An argument for Nuclear power states that there are no carbon emissions from a cooling tower of a Nuclear facility although this is true, the real carbon picture, we must include the fossil fuel consumption in mining with diesel equipment, processing at a 10 to 1 ratio the extraction of Uranium, transportation of fuel: truck, rail, boat are all driven by fossil fuel sources, construction of power plants, decommissioning of power plants after 30-40 years, maintenance of centralized power source

(transformers and power infrastructure) and materials sourcing. .. none of these activities are carbon-free.

University of Michigan fact sheet center sustainable systems:

Nuclear power plant carbon use:

Total 55 grams

Total rate for solar is 41 grams.

5. Nuclear is not efficient. Although the industry boasts a 33% efficiency rate, these figures do not represent the total energy used. The main reason is a basic law of the Physics of thermodynamics: with every energy transformation there is a loss of energy. Energy waste is extensive in the nuclear industry because there are 8 steps of energy transformations compared to solar, 2 steps, and wind, 2 steps. These 8 steps are: Mining and milling, transportation, processing into pellets, supply to facilities and loading in cylinders (refuel down-time), fission that heats water, steam turns turbines, generators “create” electricity. Each step wastes 40 to 80% of the energy. This translates into increased cost per kilowatt. The cost per Kilowatt hour is now the highest in the industry and rising. This is not energy efficient.

Nuclear energy production fails to meet even all four criteria of green energy. Based on the science presented above, I oppose HR 308.