Did you know? Less than 5 nuclear fuel pellets can generate enough energy to power an electric car around the circumference of the earth?

CALCULATION

Assumptions:

1. A 5 gram nuclear fuel pellet consisting of 5% U-235 and 95% U-238.
2. All of the U-235 is consumed (roughly 0.25g in one pellet) based on 5 wt% enrichment limits of LWR fuel.
3. Earth’s circumference is 25,000 miles
4. Each fission event is ~180 MeV **from thermal fission of U-235.**
5. Electric car efficiency is 300 miles for 85kWh
6. Efficiency between energy generation to distribution is 1/3.

0.25g of Uranium 235 = $=\frac{0.25g}{}\*\frac{6.022\*10^{23}atoms}{}\*\frac{atom}{235 g}=6.406E^{20} atoms of Uranium 235 $

$$6.406E^{20} atoms\*180,000,000eV\* \frac{4.451E^{-26}kWh}{1eV}=5,132.36 kWh$$

Distance an Electric Car can travel on 5,132.36kWh is:

$$5132.36 kWh\*\frac{300 miles}{85 kWh}=18,114.2 miles$$

How does that translate to rotations around the earth:

$$18,114.2 miles\*\frac{1 rotation}{25,000 miles}=0.7245 rotations$$

A typical electricity generating power plant can only convert about 1/3 of the energy it creates into usable electricity. This applies to coal, gas and nuclear plants.

$$0.7245 rotations\*0.33=0.239 rotations per fuel pellet$$

$$5 fuel pellets\* \frac{0.239 rotations}{1 pellet}=1.1955 rotations $$

Therefore: **Less** than 5 nuclear fuel pellets can generate enough energy to power an electric car around the circumference of the earth!