Why nuclear energy is not the answer to Climate Change

Contributed by Ben Williams
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It's funny. People really believe that nuclear power is emissions free. Powering cities with nuclear, they propound, is the panacea to climate change. And yet, if you really take a look at the fuel cycle, it is obvious nuclear energy is, in fact, emissions intensive.

First off the ore needs to be mined. This involves drilling, explosions, heavy equipment. Even at the EPA standard of 15 grams of carbon per break horsepower engine hour, this translates to a lot of carbon. Then the ore needs to be shipped to a processing facility, or mill.

Here, twenty-four hours a day, heavy equipment loads the ore into a hopper, the intake into the semi-autogenous grinding mill. This grinding mill uses electricity (coal) to turn an enormous steel drum filled with metal tumbling balls. Additionally, tons -- yes tons -- of concentrated sulfuric acid are needed to help leach the uranium from the ore, among quantities of other highly caustic chemicals, all of which must be prepared on industrial scales and shipped to the facility.

After a number of other mechanical operations, all of them energy intensive, the ore must be dried in an oven, where, twenty-four hours a day, countless kilo-watt hours are burned heating the rock to temperature.

Finally, the processed ore, now 'yellow cake', has to be boxed up, sealed in steel drums (refined and produced industrially), and then shipped to market.

Then, of course, it needs to be reacted with hexaflourine, or some other chemical, to be refined and turned into the uranium rods that are used in the reactor core. Only now can the power be said to be emissions free: once the rods are installed and operational, powering generators with their nuclear heat.

Of course, after a few months the rods are spent. They then need to be safely disposed of -- or, more accurately, buried somewhere where no one will notice them, contained for 1,000 years, after which they become someone else's problem (probably the DOE or EPA). They must be safely interred for over four billion years. Yes, they need to be baby-sat for an amount of time that exceeds the current age of the Earth.

Because a nuclear core demands fresh, refined uranium, there is a constant use-cycle -- an unstoppable appetite -- that, ultimately pollutes in manifold ways:

- The diesel burned in extracting the ore produces CO2, CO, NOX, SOX, dioxins, VOCs among the other expected particulates from incomplete combustion of fossil fuels.

- The dust produced from mining becomes airborne and settles on downwind communities, increasing the cancer rate noticeably.

- The diesel burnt in shipping the heavy rock to processing produces the same slew of pollutants as the heavy mining machinery, while trailing radioactive dust along the way.

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The mill itself burns up millions of KWh every year, KWh generated, in this day and age, almost exclusively from burning coal -- high SO2, H2SO3 and H2SO4 meet heavy metals like Hg with the clouds of greenhouse gases.

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The mill must vent many toxic gases as it processes the ore. It must store radioactive slurry in the ground, hoping it will evaporate so the tailings can be capped. Groundwater and runoff pollution occurs. Once capped, the tailings are radioactive for billions of years. Future contamination becomes a certainty. (Just, the mill operators hope, not in their lifetime.)

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Shipping the yellow cake to market. There are only two enrichment plants in the Northern United States, and one of them is in Canada. Long trips equal large emissions. Much of the yellow cake will be shipped overseas, adding emissions from large container vessels and potential maritime spills to the list.

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The enrichment facility then vents toxic gases from the reagents used in reducing the yellow cake to weapons-grade uranium.

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The rods are shipped to power plants, necessitating the fourth round of distribution-related emissions.

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The rods are used, then spent, sealed up, and transported to a nuclear waste dump -- more emissions, more radioactive decay along public roads and waterways.

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Countless emissions result from policing the waste site.

Of course, none of this includes the emissions from the industrial-scale production of the reagents needed by the uranium refining cycle. Not to mention their weekly delivery to processing mills and enrichment facilities.

Nor does it take into account the 'depleted' uranium used as munitions (which, despite what you might infer from its name, is actually enriched -- it is depleted of the less radioactive isotopes). That causes enough pollution to contaminate our armed-forces personnel before it's even fired! Let alone the land where it is unleashed.

The whole thing is utterly non-sustainable. And no model on which to base future, responsible energy production. So why all the hoo-ha? Simple. Uranium allows, not so much for clean energy, but centralized energy production. Centralized energy production -- aside from being grossly inefficient from the distribution angle, losing more than 7% of all energy generated -- means centralized profits. Same, boring story we're all tired of hearing about. Corporate profits should no longer trump the public right to choose viable, alternative energy. Making the right choice means sharing the benefits of energy production: Not letting a small group of corporate elitists eat the whole pie while pushing the future costs (which approach infinity) onto every subsequent generation of human beings, ever.

Wake up. This is madness. And it won't stop until we hold CORPORATE GREED accountable. Haven't you had enough of this yet?

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