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Hydrogen at Davis-Besse, Portsmouth and Beyond

Taxpayer Subsidies for Nuclear Power and Natural Gas

JANUARY 2020: the Idaho National Laboratory announced that Ohio's Davis-Besse nuclear power plant would be the site of a $10 million project to research hydrogen production at a commercial nuclear reactor. No Environmental Impact Statement was required on the dangers of a hydrogen explosion next to a nuclear plant. The project will be funded by the U.S. Department of Energy (DOE) using taxpayer dollars. **There is nothing green or clean about using nuclear power or natural gas to obtain hydrogen.**

Hydrogen is not a source of energy. It is a means of energy storage. Large-scale hydrogen increases greenhouse gasses and wastes energy. It is designed to create markets for nuclear power and natural gas.

Making hydrogen using waste heat from dirty, unsustainable industries – like nuclear power in the Davis-Besse project – serves to prop them up when they should be phased out. There is a big dollar as well as carbon cost for building and operating the thermoelectric facilities needed to capture waste heat.

Making hydrogen by electrolysis of water is another way the nuclear industry is subsidized and promoted. Electrolysis – using electricity to split water (H_20) to get hydrogen – has limited applications. In most cases it is more efficient to use the electricity directly. Any form of power can be used to split water.

Implying that nuclear power is "green" or useful because it can be used to create hydrogen for "clean power generation" defies logic on several levels:

- ***Powering electrolysis with wind or solar*** is more efficient than using a nuclear reactor. The greenest way to make hydrogen is not in a process that creates deadly radioactive waste.
- ***How green is a proposed specialized pipeline network*** needed to carry "nuclear hydrogen" around the nation? The dollar cost of large-scale piping to properly contain compressed hydrogen would be astronomical – not to mention the use of energy and materials in construction and maintenance. Hydrogen, the **tiniest of all molecules**, can escape through the most minuscule pipeline gaps. Leaks aren't easily detected and constitute a fire hazard, while the loss of hydrogen will not be accounted for.
- ***Building full-scale thermoelectric and/or electrolysis plants*** will have a high energy and dollar cost. Are taxpayers going to be asked to foot those bills, too? Major innovations in electrolysis technology **are still needed** to further reduce its costs and make it market-ready at industrial levels.
- ***The technology will never "be there" for the large-scale burning of hydrogen.*** This is because burning uses three times as much hydrogen as the ingenious fuel cell to produce the same amount of power. Hydrogen technology is green only for local production and use. Period.
- ***The Department of Energy's stated goal is hydrogen production for industrial uses.*** Hydrogen's main industrial uses are in refining petroleum and making ammonia for fertilizer. Both these practices are unsustainable and should be reduced and eliminated.
- ***By defining this as research,*** the Davis-Besse project doesn't have to show any useful results or cost savings.

Davis-Besse is on Lake Erie east of Toledo, Ohio

MAY 2022: A **hydrogen plant is proposed** for the **Portsmouth Nuclear Site** in Piketon, Ohio. "*The Southern Ohio Diversification Initiative, working with Ohio University and Newpoint Gas, hopes the project will produce* ***clean energy from natural gas*** *and wants to get the facility online by 2027.*" This facility will remove hydrogen from natural gas to "*provide hydrogen needed to manufacture products like cement and ammonia, which have a* ***carbon-heavy production process***." Natural gas now becomes clean, since hydrogen (for dirty industries) can be obtained (using more energy) from it. Global initiatives have similar false claims, see below.

SEPTEMBER 2022: Energy Harbor, the University of Toledo, industries, and DOE national labs launched the "*Great Lakes Clean Hydrogen Coalition*". **The announcement** said the coalition aims to produce "clean hydrogen" using nuclear power from Davis-Besse and to produce this "carbon-free hydrogen" through electrolysis. Thermochemical and hybrid processes will also be researched. The Davis-Besse hydrogen project announced in 2020 would research making hydrogen in a different way, using waste heat from the reactor. Confusing as this is, none of it is clean, green, or carbon free. Taxpayers will foot the bill to keep Davis-Besse and Energy Harbor afloat. In October 2021 DOE **announced $20 million in funding** to demonstrate "clean" hydrogen at the Palo Verde nuclear station in Arizona.

WORLDWIDE: In July 2022 more than 40 organizations representing industry, government, nonprofit and academia **formed the Nuclear Hydrogen Initiative** (NHI) to advance nuclear hydrogen. NHI claims that hydrogen from nuclear energy is "green" or "clean" in the same way as hydrogen produced from renewable energy, because nuclear energy is a "zero-carbon source of electricity and heat". Presto, nuclear hydrogen becomes green. In May 2022 the **first global definition of green hydrogen** was drawn. Nuclear does not qualify and is listed as pink.

Giant global initiatives are not about making hydrogen using solar or wind. They are about using natural gas or nuclear power and unabashedly labeling these dirty energies as clean, green, safe, or even emissions-free. **The definition of green hydrogen is hydrogen made by electrolysis of water using solar or wind.** These falsely-labeled green hydrogen industries are about:

1) using nuclear power for the electrolysis of water;
2) using waste heat from dirty industries, including nuclear power, for the electrolysis of water; and
3) maintaining that hydrogen obtained from natural gas is clean energy, as at the Portsmouth Nuclear Site.

Intimate connection between nuclear power and weapons: Funding, education, technology, infrastructure, labor force, and much more overlap. The Bulletin of the Atomic Scientists has explained how nuclear weapons systems are **funded by electricity customers outside of defense budgets** and off the public books, threatening democracy. As civilian nuclear plants close, this military cash cow is threatened. In 2020 French President Macron wrote a long dissertation on **why civilian nuclear is necessary for military nuclear** and vice versa.

The Department of Energy's hydrogen research projects are one of many ways that the military-industrial-nuclear complex is attempting to keep the dying nuclear power industry afloat. The vast majority of the DOE's budget is for nuclear technology. Jobs are hyped, but the public will be paying for them.

Proposals for hydrogen and CO2 pipelines abound*.** Industries using or making hydrogen want both hydrogen ***and carbon dioxide (CO2) pipelines. Attempts to sequester CO2 underground are false solutions because building pipelines creates more CO2, damages the earth and is incredibly expensive – none of which is green. Gas under pressure underground is bound to escape at some point. Industries are now proposing and building pipelines to carry their CO2 pollution to fracking sites. ***Could fracking with carbon dioxide instead of water be greener?*** The answer is no. This is greenwashing, increasing gas production, and getting public subsidies.

The most efficient use of hydrogen is in fuel cells. **Fuel cells work by combining hydrogen with oxygen** from the air to produce electricity, with water being the only "waste." Fuel cells are clean, renewable, and useful for small on-site applications, such as a single home or a stand-alone fueling station for a bus or car. Nearly all parts of fuel cells are reusable or recyclable. Technology continues to improve and costs are lowering. ***The argument should not be "batteries vs. fuel cells."*** It's where fuel cells contribute uniquely to green infrastructure. It's about finding the greenest and least costly energy. In 2012 Cleveland demonstrated a **hydrogen fueling station and a fuel cell bus.**

See the Sierra Club report: ***Hydrogen: Future of Clean Energy or False Solution?***

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