U.S. Navy Introduces New Technology That Can Turn Seawater into Jet Fuel

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The ability to find new alternatives to oil and petroleum is arguably the number one issue facing all modern nations. The U.S. in particular has been trying to come up with new techniques and sources of renewable energy for decades, and now, the U.S. Navy believes it has just unveiled a way to reduce its own dependence on oil — by converting seawater into jet fuel.

Naval researchers in the United States have announced a major technological breakthrough, saying that they have been able to convert seawater into carbon dioxide and hydrogen. The process has not gone into production just yet, but the U.S. Navy hopes to have operating conversion centers up and running in a relatively short amount of time. This breakthrough in fuel technology could possibly revolutionize the way nations look at how to obtain renewable energy in order to sustain the ever growing society that we live in.

Dr. Heather Willaeur, one of the chief research chemists at the U.S. Naval Research Laboratory (NRL) summed up the development of this technology and the impact it could potentially have in the following way: "In close collaboration with the Office of Naval Research P38 Naval Reserve program, NRL has developed a game changing technology for extracting, simultaneously, CO2 and H2 from seawater… this is the first time technology of this nature has been demonstrated with the potential for transition, from the laboratory, to full-scale commercial implementation."

Exactly how sea water is extracted and transformed into fuel is a complicated but fascinating process. It works by pulling carbon dioxide and hydrogen from water using a catalytic converter. Those gases are turned into a liquid hydrocarbon fuel that could, experts hope, power both planes and ships,. "We don't necessarily go to a gas station to get our fuel," Vice Admiral Philip Cullom said recently. "Our gas station comes to us in terms of an oiler, a replenishment ship. Developing a game-changing technology like this, seawater to fuel, really is something that reinvents a lot of the way we can do business." While this technology is just now being made public, the work and research associated with this has been in development for more than a decade.

In 2003, an inventor named John Kanzius was working on a method of using radio waves to target and destroy cancer cells without affecting nearby healthy skin. A few years later, he discovered that his machine could generate electricity by using the radio waves to zap salt water -- after hitting the water with a concentrated radio wave blast, the water became flammable, igniting off a lit match. The water lost its flammability, however, as soon as the radio waves were stopped. This was the moment when Kanzius first realized the potential of harnessing this kind of energy and applying it to sea water.

One of the tricks to harnessing energy in general -- not just igniting salt water -- is to make sure the process can capture more energy than it takes to operate all the required machinery to extract the energy. Otherwise, the energy generation will be operating at a net loss, which would make conducting such an operation pointless as it would not be sustainable. It is actually a little more complicated equation than simply measuring energy expended vs. energy generated. There's also the environmental aspect -- how much pollution occurred to create and operate the machinery, and is the newly captured energy clean enough to be worth it? Are the resources gone for good, or are they renewable? And what about the ongoing costs of operation; how much of an undertaking is it to maintain this and the human involvement required? These are the kinks that researchers in the U.S. Navy are now trying to work out as they prepare for a first generation rollout of this technology.

This technology is not just being explored in the United States. In February 2012, a Japanese firm called Furukawa Battery announced that it was working on a fuel cell using similar technology. The company expects the fuel cells, when ready for prime time, will cost about half as much as a comparable, conventional battery. Furukawa Battery envisions its technology being used as a source of backup power in homes, with eventual expansion into healthcare and technology applications. Regardless, this innovation involving the use of seawater is proving viable as more and more research institutions the world over are beginning to adopt it.

Whether this is an example of an overblown and over-hyped piece of technology that will end up not being able to do the things it claims it can remains to be seen. Many observers and technology gurus have been skeptical of this putative wonder process of converting ocean water (of which we as a planet have an abundance of) into jet fuel. Regardless, the process has been identified and the thought of commercially viable fuel made in this regard could soon revolutionize the massive and incalculably important energy industry all over the world.

Sources

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