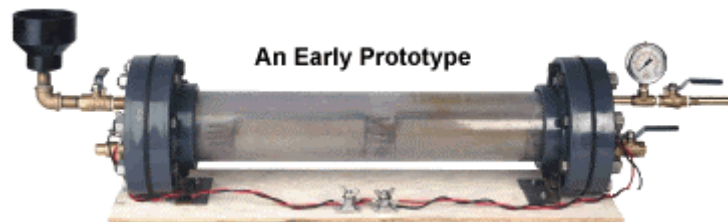


The dream – on-site, on-demand hydrogen generation

The Xogen process is the only process currently known that can take natural water as its feedstock and deliver hydrogen on demand to a burner tip, combustion chamber, or fuel cell, without external pressurization or storage, while consuming modest amounts of electrical current.



Pipeline upgrades, liquid-hydrogen storage at service stations everywhere, mass conversions of equipment - these are the very real economic factors that make centralized production and distribution of hydrogen gas impractical.

Every engineer in the field understands that an ideal system would be a fuel tank full of plain tap water, which is [two parts hydrogen and one part oxygen](#), and a mechanism to extract the hydrogen on demand, right at the point where it is to be consumed, using a minimum of electrical current.

Such a process would make it possible for furnaces, internal-combustion engines, and many industrial processes to operate at high efficiency with zero hydrocarbon emissions.

It is clear that the use of hydrogen as a gaseous fuel for internal-combustion engines is an attractive alternative if it can be provided to the combustion chamber, on demand, without special storage tanks (the generator pictured to the right is an early prototype).

The economic benefits of hydrogen conversion are great – 40% efficiency compared to 14% for gasoline, according to the U.S. Department of Energy.

Modifying a gasoline engine to operate on hydrogen is no more complicated than modifying it for propane or LNG (liquefied natural gas). This makes on-demand hydrogen fuel economically attractive for another reason — today's automotive infrastructure, with its multi-billion-dollar investments in designs, plant, distribution systems, and fuel distribution networks, could adapt to the new fuel source with only modest investments in minor upgrades. Individuals could switch to non-polluting hydrogen fuel without modifying their expectations of vehicle performance or changing their transportation habits.

Conventional electrolysis cannot fulfill the dream. Researchers



agree that powering a car with the hydrogen electrolyzed on-board, using an onboard battery and conventional electrolysis, is wildly uneconomical. High current consumption rates make trickle-charging by solar cells impractical. Researchers have shown that using the battery directly to power an electric motor would be much less expensive. In contrast, the Xogen process makes it feasible to design trickle-charge systems that will provide useful range. Of all the known methods of powering vehicles with hydrogen, only the Xogen process, with its low electrical input, appears capable of making onboard hydrogen generation from water, in the kinds of vehicles in ordinary use today, an economical reality.