

Hydrogen: Why it Matters

Hydrogen gas is readily available and has applications ranging across multiple industries. H₂ gas can be used to:

- Fuel automobiles
- Aid in heating homes
- Electricity generation and storage
- Make fertilizer

Such a versatile gas has gone under-utilized in our modern world. Hydrogen gas is relatively cheap to produce as well, costing only the price of the energy used to extract it.

Hydrogen has advantages over other fuel sources:

- Non-Toxic Gas
- Availability
- Green! Zero Emissions
- Low production cost

Benefits:

- Cleaner air for future generations
- Investment in growing industry
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PROJECT MOBIUS

REVIVING THE
SPIRIT OF THE '74
WORLD'S FAIR

HYDROGEN POWER
TO GAS SYSTEM



THE MOBIUS
PROJECT
WASHINGTON STATE UNIVERSITY

QUESTIONS?

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The generated Hydrogen will initially inject into the natural gas pipelines nearby to provide cleaner and more efficient natural gas to residents and businesses throughout Spokane but will slowly transition to filling up tube trailers as hydrogen becomes more popular in fuel cell vehicles. Plug Power is the current technological leader in the hydrogen and fuel cell industry and has recently made a \$70 million deal with Amazon for hydrogen powered forklifts, with another \$600 million being spent over the next couple of years.

Spirit of the '74 World's Fair

In 1974 Spokane was host to the first environmental themed worlds fair. This marked a landmark movement by the United States and the world to make a switch to more sustainable energy sources. The fair was hosted in riverfront park, where the PTG system is located.

Sustainability is at the heart of hydrogen technologies. This power to gas system will be the first of its kind in Washington. Spokane is building upon its legacy of environmental awareness.

Safety

When designing a power to gas system, safety is the number one concern. To ensure the system is operating normally, there are extensive safety controls in place which are constantly monitoring namely the pressure and temperature. This guarantees that if anything is happening out of the ordinary, production is immediately stopped, and an operator is notified.

In many ways, hydrogen is safer than the fuels commonly used today. It is non-toxic, non-polluting, and may be safely vented into the atmosphere in the case of a leak. When compared to fuels widely used today, hydrogen is more safely created, stored, and transported, and is consumed with virtually no impact to the environment.

How it works

How Hydrogen Gas is Made:

Hydrogen makes up a huge percentage of all matter in the universe. The largest source of hydrogen on earth is in water. Through a process called electrolysis hydrogen is separated from oxygen in water, and hydrogen gas is created. To make electrolysis work both a membrane and electricity are required.

Electricity and Power

Power for the system is generated by a nearby hydroelectric generator. This generator is usually only used during peak flow seasons and therefore goes underutilized. By attaching the P2G system to the generator we can make use of the water that is naturally flowing.

Gas Transportation

To make use of the gas it must be trucked off to locations that require hydrogen. A semi-truck equipped with a large storage tank can haul 280kg of hydrogen anywhere in Washington. To get put into the truck hydrogen must be compressed. There is a compressor attached to the hydrogen producing electrolyzer which compresses the gas to 200 bar, which is nearly 200 times normal atmospheric pressure.

