

Clean Hydrogen

The next-generation technology that can accelerate our clean energy transition.

America's power system has made enormous progress in reducing the air pollution that chokes our communities and contributes to our climate crisis. While the nation has made significant progress, other sectors of our economy — such as agriculture, heavy industry, and long-haul transportation — have increased pollution and are negating progress in the power sector. If we are going to solve the climate crisis, our nation and the world desperately need solutions that can be deployed right now to reduce pollution in these hard-to-reach sectors.

Clean hydrogen is an essential piece of the solution.

Thanks to advances in technology, it is now possible to efficiently create hydrogen through a clean process called electrolysis, which uses carbon-free electricity from renewable, nuclear and hydroelectric energy to separate water molecules into hydrogen and oxygen. Unlike fossil fuel processes, electrolysis is pollution-free.

By combining Constellation's nation-leading carbon-free energy resources with electrolysis technologies, Constellation will be able to make abundant carbon-free hydrogen to power our communities.

How we can use clean hydrogen to move toward a clean energy future:

As cleaner fuel for long-haul transportation

Clean hydrogen can be converted into sustainable e-Fuels, such as e-Methane, e-Diesel, and e-gasoline or other carbon-based chemicals to power these vehicles, and we can do it using existing infrastructure starting today.

To make the skies friendlier

Hydrogen is a critical component in the production of biomass-based sustainable aviation fuel (SAF), making it possible to curtail emissions from air travel, which today produces about 2 percent of global carbon emissions and 9-12 percent of all transportation-related emissions.

To make the building blocks of our economy

Making steel requires large amounts of heat from fossil fuels, as well as carbon-intensive coke as a feedstock. Hydrogen can offer a substitute for coke in the steel production process as well as provide a source of process heat.

How we can use clean hydrogen to move toward a clean energy future:

As back-up power for a clean grid

Hydrogen can be blended with natural gas and used to power generators, reducing carbon emissions from fossil electricity resources while maintaining a reliable grid. Hydrogen fuel cells could also be used as an additional back-up source of clean energy when demand is high or to store excess power generated during low-demand seasons.

As a more sustainable way to feed the planet

Over half the world's food supply depends on fertilizer made from ammonia which is made primarily with fossil fuels, producing 27 million tons of carbon emissions in the U.S. annually. However, e-Ammonia can be synthesized from clean hydrogen, producing a sustainable and clean feedstock for fertilizer and other widely used chemicals.

Powering tomorrow's clean hydrogen economy with carbon-free nuclear power.

Most of the hydrogen being used today is generated with fossil fuels. Nuclear power is the most cost-effective choice for creating clean hydrogen at scale around the clock and Constellation's clean energy centers are the perfect solution.



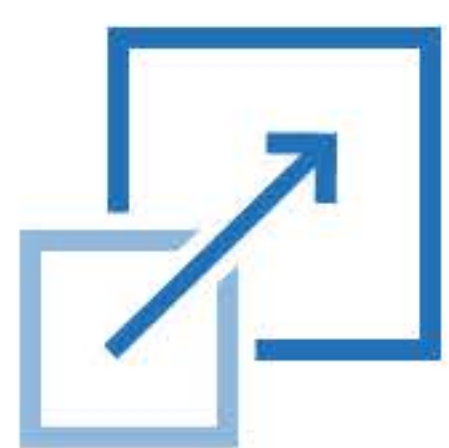
It's always available.

Nuclear power is the nation's largest and most reliable carbon-free energy source. Nuclear plants operate 24/7, generating an abundance of carbon-free electricity that can power electrolyzers and produce carbon-free hydrogen. All nuclear plants already have access to water, which will serve as the feedstock for hydrogen production.



It's primely located.

By their nature, nuclear plants are located close to rail and shipping transportation and are typically sited near major industrial and population centers that depend on large amounts of baseload electricity. That means nuclear facilities are already close to the primary users of hydrogen, reducing transportation costs and logistical challenges.



It's easily scalable.

Hydrogen from nuclear is easily scalable, meaning production can be ramped up quickly by simply adding more electrolyzers as demand for hydrogen accelerates.

Constellation is *leading the way forward.*

Constellation is America's top generator of carbon-free electricity and has the nation's largest nuclear fleet. While zero-carbon nuclear power is the foundation of Constellation's business, our end state is about solutions – not particular technologies. Already we have formed relationships with national labs, makers of hydrogen technology and end users of hydrogen and its many potential fuel and chemical byproducts.

In the future, our nuclear plants will serve not just as nuclear plants, but as clean energy centers capable of delivering clean electricity to the grid and clean hydrogen to end users through pipelines or via truck, rail and water transportation. As the nucleus of a clean energy center, our nuclear plants will serve as a highly valued and essential climate solution well past mid-century, which is the target date for achieving a zero-carbon economy if we are going to avoid a climate catastrophe.