



# Blue Hydrogen: The Natural Gas Bridge to Decarbonization



BLACK & VEATCH



Decarbonizing our economy is today's moon shot and blue hydrogen, harnessed from abundant, low-cost natural gas, will lead the way forward. At Black & Veatch, we are committed to working with our clients, industry partners and innovators to develop, design and construct decarbonization solutions that will accelerate the hydrogen economy and transform our energy future.

## Alternative Revenue Streams And Natural Gas Uses

Historically, natural gas has been a key component of the global energy mix. Natural gas has been a linchpin of our economy and our communities, playing a role in heating, cooking, power generation and chemical production. Today, we see natural gas as the bridge to a more sustainable, decarbonized future. When it is paired with blue hydrogen, blue ammonia, renewable natural gas and carbon capture, natural gas can create opportunities to reduce and eliminate carbon from traditionally energy-hungry sectors.

### Hydrogen

Hydrogen offers an alternative to batteries for storing renewable energy, while also serving as a power source for hard-to-decarbonize applications. As renewable powered green hydrogen capacity scales, blue hydrogen, produced from natural gas with carbon capture, offers a rapid and economic way to lower carbon intensity where electrification is not viable. Given its energy density and the absence of carbon emissions when burned, hydrogen can be used to store renewable energy, blend into natural gas pipelines, serve industrial purposes and fuel transportation.

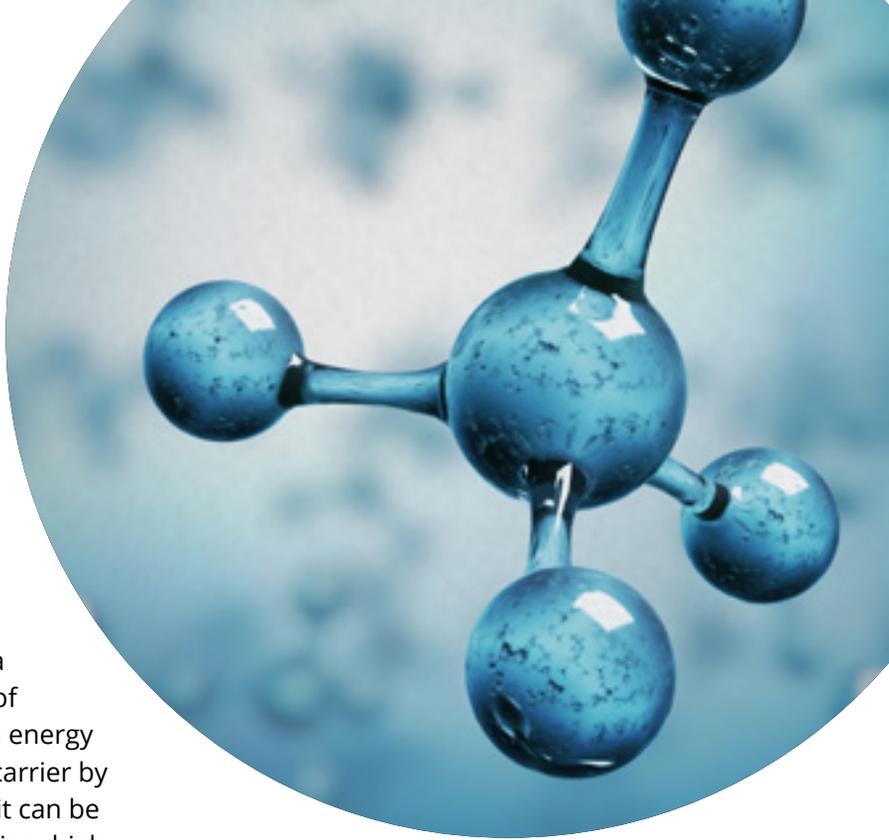
Black & Veatch has decades of experience in the production of and the safe use of hydrogen in different applications. Our patented PRICO® cryogenic technology will have a range of applications in the production and storage of liquid hydrogen.

For further information, view the full [Hydrogen Value Chain in our Hydrogen Qualification and Experience](#) document.

**At Black & Veatch, we recognize that a greener, sustainable future is our responsibility; this drives us to work in new ways to deliver green energy solutions to our clients and the industries we serve.**

Hoe Wai Cheong  
President of Oil & Gas





## Ammonia

Ammonia has a long history as a fuel and benefits from abundant existing infrastructure in key markets. As a critical element of the hydrogen economy, ammonia provides a highly functional means of storing and transporting low-carbon energy at scale. It can serve as a hydrogen carrier by being cracked back to hydrogen, or it can be used directly as a fuel in transportation, high-energy intensity industries or in electric power production. Storage of liquefied ammonia shows promise as an alternative to liquified natural gas (LNG) for peak-shaving applications.

Ammonia is a core area of expertise at Black & Veatch. We have more than 300 professionals with ammonia experience. For further information, view our [qualifications and experience in ammonia](#).

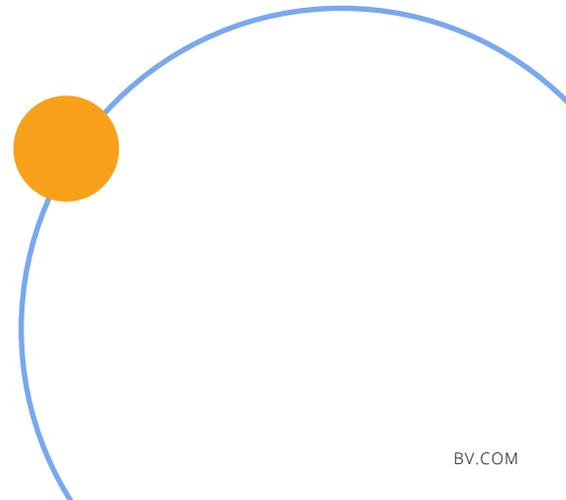
## Carbon Capture & Utilization

When natural gas is converted to ammonia using steam-methane reforming (SMR), CO<sub>2</sub> is produced and regularly captured to produce urea. In both natural gas processing and LNG facilities, CO<sub>2</sub> is removed from the source gas. Similar carbon capture technology can be used to remove CO<sub>2</sub> from other product streams, such as in the production of blue hydrogen or ammonia or from flue gas stacks in power generation facilities. Carbon that is captured can be either sequestered or utilized and sold as a possible additional revenue stream.

For further information, [view Black & Veatch's complete qualifications and experience](#) in carbon capture and utilization. Renewable Natural Gas

## Renewable Natural Gas

Replacing natural gas with renewable natural gas (RNG) creates another opportunity to lower carbon intensity. RNG can be commercially produced from biomass feedstock using either gasification or anaerobic digestion. RNG can also be produced from captured carbon and green hydrogen. Once produced, RNG has the same properties as natural gas and can be used in all natural gas applications and existing infrastructure. For example, RNG could replace fossil fuel-based compressed natural gas (CNG) or LNG.



## An Experienced Partner

Black & Veatch is on the forefront of developing, designing and constructing decarbonization solutions. We are collaborating with other engineering leaders, technology integrators, investors, activists, regulators and safety organizations to advance technologies and integrate hydrogen into the global economy. We can help scale solutions, navigate complex regulations and meet ROI expectations.

Black & Veatch works with our clients to lay the foundation for their bespoke decarbonization roadmap with a focus on aligning priorities with capital expenditures budgets. We understand budget restraints and recommend a phased approach to solutions, which keeps momentum on the project while being conscious of the capital outlay. Black & Veatch believes that data should drive decisions. This culminates in a financial model for that bespoke roadmap.

## Commitment To Sustainability

Sustainability has long been embedded in our culture and values, our strategy and our work with clients. Mitigating and adapting to climate change, decarbonizing supply chains, and protecting our water are just some of the challenges we are committed to addressing head-on.

Today, like never before, Black & Veatch influences and impacts sustainable development through our work, and by how we govern our own businesses and operations around the globe.



### About Black & Veatch

Black & Veatch is an employee-owned, global leader in building critical human infrastructure. For more than 100 years, we have helped our clients improve the lives of people in over 100 countries through consulting, engineering, construction, operations and program management. We are characterized by curiosity, a trait that helps us find solutions to our clients' most complex challenges.

For more information on our Hydrogen Solutions, please visit [bv.com](https://bv.com). Please contact us: Gary Martin, at [MartinG2@bv.com](mailto:MartinG2@bv.com).