Hydrogen

Capability statement

HATCH

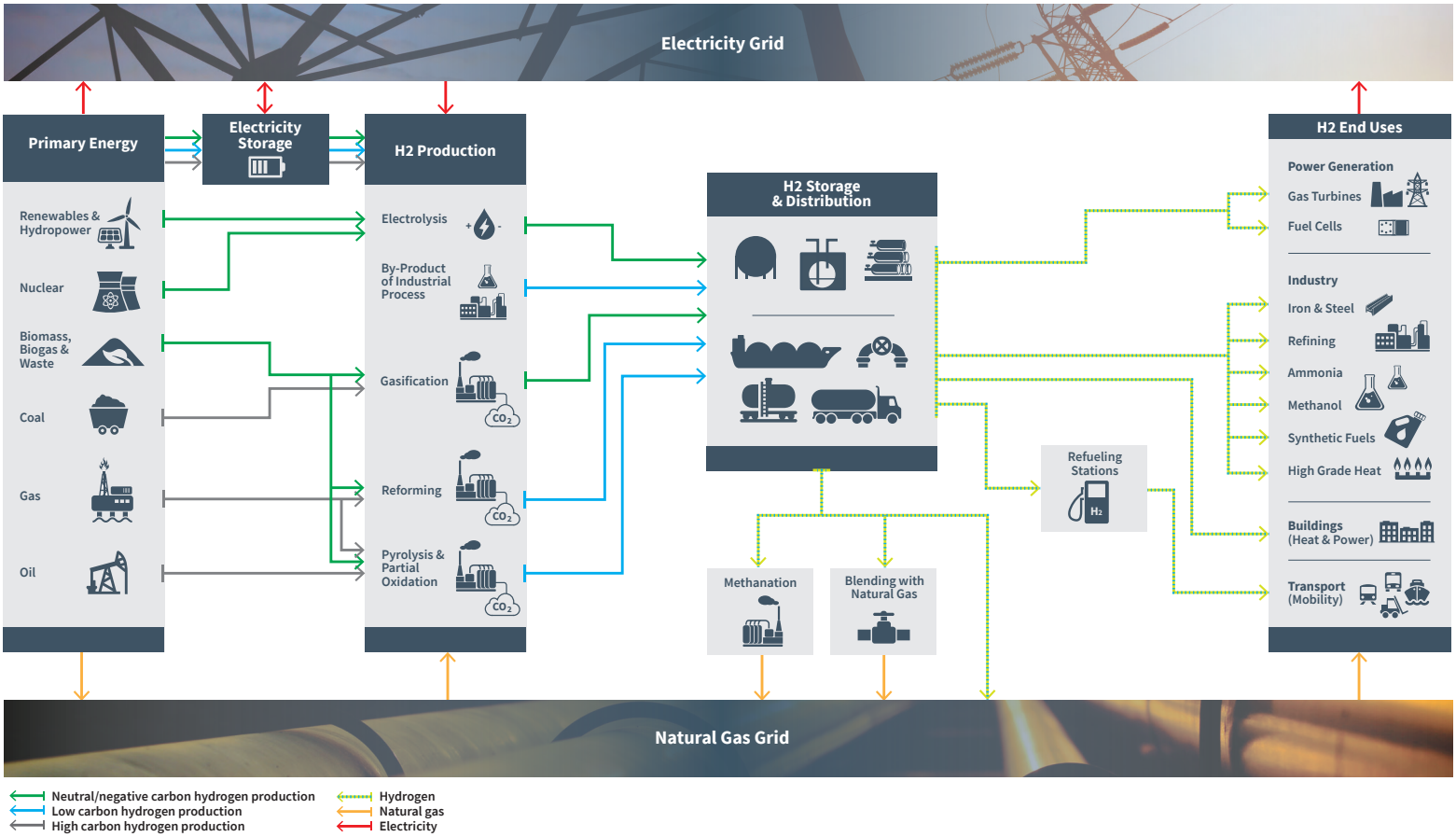
Hatch is privileged to govern the Green Hydrogen Consortium, a mining-focused partnership between Hatch, Anglo American, BHP, and Fortescue, aiming to collectively encourage the adoption of clean hydrogen technologies, such as hydrogen-powered mine haul trucks.

The demand for hydrogen

To achieve our global goal of a low carbon future, hydrogen will be a necessary energy carrier and one that is experiencing unprecedented attention today.

Hydrogen has the highest energy density by weight of any fuel and is versatile in its applications. It also provides clean combustion, enabling us to reach the most hard-to-abate sectors. Its expanding use cases range from fuel cells, powering transport, and utility-scale storage to its role in petroleum refining, chemical synthesis, and as fuel and reductant in steelmaking. A future with hydrogen will allow for largely separate energy systems—electricity and natural gas—to become an integrated and complementary energy network.

Hydrogen value chain



Hydrogen as a solution

Hydrogen is a solution that integrates with and strengthens your existing business beyond decarbonization.

Although the need to distance ourselves from carbon-based fuels is the strongest driver for hydrogen adoption, through our projects, the potential of hydrogen is becoming evident in more than one way.

Hydrogen application	Benefit
Power generation (intermittent renewable power, load-levelling, energy storage)	✓ energy independence/resilience ✓ asset flexibility and diversification ✓ accessing remote sites
Industrial fuel and high-grade heat (steelmaking, alumina refining)	✓ energy independence/resilience ✓ increased product value
Fuel for heavy-duty transport (fuel cell vehicles, locomotives)	✓ asset modernization ✓ electrification ✓ accessing remote sites
Chemical processes and feedstock (oil and gas, biomass)	✓ asset diversification and modernization

Our expertise behind the solution

Hatch possesses world-class engineering capabilities across the full hydrogen landscape. Our key differentiators make us a valuable partner in your sustainable solutions.

We understand hydrogen

- Our technical and advisory expertise spans the entire value chain, from sourcing renewable power to hydrogen application.

We understand the specifics of your processes and operations

- Hydrogen is often part of a bigger picture, and we design with all the considerations required when integrating new elements into established operations.

We create positive change and implement it

- From pilot-scale to grid-scale, we are actively involved in the development of the hydrogen economy and are continuously growing our portfolio of built projects.

We have a holistic approach to decarbonization

- From carbon capture and utilization to direct electrification and improving energy efficiency, we pursue all paths to decarbonization. Although hydrogen can play a role in all of them, our breadth of knowledge allows us to tailor the most optimal solution.

We are innovative

- Our engineering experience gives first-of-a-kind projects their best chance at success. We work with technology manufacturers and research partners to constantly pursue state-of-the-art solutions in the hydrogen industry.

What we do

We offer a multidisciplinary, comprehensive array of strategic and technical services in hydrogen, including engineering, consulting, maintenance and operation support, and project and construction management.

Business and engineering consulting

We leverage seasoned professionals worldwide to provide business and engineering consulting services to our clients. Our focus is to identify the hidden value embedded in assets, organizations, and technology; to unlock the enablers required to unleash the full value potential. This includes:

- business planning
- market and economic trends
- roadmaps and strategies for climate change, decarbonization, and technology investment
- end-to-end value chain coordination
- due diligence
- owner's engineering

Technology development

Hatch has a portfolio of over forty unique solutions in the Energy, Mining, and Infrastructure sectors, and over thirty active development projects, giving us a proven track record of successfully implementing new technologies around the globe. These include:

- process research and development
- pilot plant and bench scale trials
- technology development, scale-up, and commercialization
- custom equipment design, packaging, and supply
- partnerships with researchers, government, funding organizations, and end users

Project delivery

From hydrogen generation, conditioning, and preparation to conversion, distribution, and end-use applications, Hatch's in-house engineering can support the full project life cycle. We work with our clients to establish the right use cases to deliver optimal designs. This includes:

- conceptual design
- technology evaluations and trade-off studies
- feasibility studies, FEED, and EPCM
- project management and controls
- construction and commissioning management
- system design and plant integration
- safety assessments (HAZIDs, HAZOPs, etc.), permitting, and regulatory compliance

Operational support

We provide full operational support services to sustain capital and engineering projects in alignment with your objectives. Our focus is on developing long-term partnerships to allow for continually maximized value from the asset portfolio. This includes:

- operational readiness
- asset management
- performance enhancement and de-bottlenecking
- digitization
- on-going engineering support

Selected project experience

Tugliq Hybrid Energy Storage Project

Canada

Hatch completed the conception, engineering, commissioning, and operation monitoring of a wind-storage system at Glencore's Raglan nickel mine in northern Québec. The project demonstrates the use of various types of storage and Hatch's fast response microgrid control system to maximize the use of wind and has allowed the mine to reduce its reliance on diesel fuel by 2.4 million liters per year. The project included a 3-MW wind turbine and energy storage system (battery, flywheel, and hydrogen system—consisting of a 315-kW electrolyzer, a 200-kW fuel cell, and 300 kg of gaseous storage capacity).

✓ Remote site
✓ Energy independence

Hybrid energy storage system at the Glencore Raglan mine

Electrolyzer installation inside the Air Liquide Bécancour Hydrogen Complex

Bécancour Hydrogen Plant Expansion

Canada

Hatch supported Air Liquide's installation of 20-MW of proton exchange membrane (PEM) electrolyzers at their existing plant in Bécancour, Québec to form the largest operational PEM plant in the world. Hatch provided civil, structural, and architectural engineering for the main process plant building and supporting systems, enabling the reduction of carbon dioxide emissions for the region by nearly 27,000 tonnes per year and increased production capacity at the plant by 50%.

✓ Decarbonization
✓ Asset modernization

Digital rendering of an Atura Power electrolysis plant, including compression, distribution, and balance-of-plant systems

Ontario Hydrogen Feasibility Studies

Canada

Hatch completed feasibility studies for Atura Power allowing them to harness low-cost, off-peak electricity from Ontario's low-carbon grid to produce hydrogen. The hydrogen generated will be blended with existing natural gas networks to offset carbon emissions. These projects will become the largest green hydrogen installations in Ontario once built, bringing Atura and Ontario Power Generation one step closer to achieving net-zero emissions while supporting their vision to be an energy catalyst and leader in Ontario.

✓ Decarbonization
✓ Asset flexibility
✓ Asset diversification

Douglas County Electrolyzer Production and Distribution Plant

USA

Hatch completed detailed engineering for the balance of plant of a 5-MW PEM electrolysis module for Douglas County Public Utility District (DC PUD). The plant is designed with the ability to scale up to 20-MW and includes high-pressure compression, storage, and vehicle refueling, the first facility in the Northwest United States to produce clean fuel from renewable energy.

✓ Asset diversification
✓ Asset flexibility

Biomass to hydrogen simulation development

USA

Arbor Renewable Gas engaged Hatch and SunGas Renewables to develop a study assessing the techno-economic potential of producing hydrogen from a woody biomass. Hatch provided input for the overall hydrogen production flow scheme to integrate with SunGas' gasification technology and achieving negative GHG emissions.

✓ Asset diversification
✓ Asset modernization

Technology development and optimization for gasifier burner design

Canada

Hatch was engaged by Northwest Redwater Partnership (NWRP) to resolve gasifier burner performance challenges for Sturgeon Refinery, the first greenfield refinery in North America in 40 years. The updated design has prolonged the campaign life of each burner and enabled capture of CO2 from the gasifier syngas.

✓ Decarbonization
✓ Asset modernization

Hydrogen fuel cell highway haul truck study

Canada

To reduce diesel consumption, Newmont engaged Hatch to build a business case for the implementation of hydrogen fuel cell-powered trucks to transport ore from the extraction point to their processing plant 100 km away. Hatch created simulations to model truck performance, capacity, autonomy, fuel cell and battery lifetime, and recharging times, along with the design of the electrolysis plant that would meet the hydrogen requirements. Hydrogen can revolutionize long-haul and heavy-load transportation where battery capacities are limited.

✓ Decarbonization
✓ Electrification
✓ Remote sites

Northwest Redwater Partnership (NWRP) Sturgeon Refinery

Grange Resources, Port Latta pelletizing facility

Pelletizing furnace fuel switch and economic study

Australia

Hatch is completed a conceptual study for Grange Resources in Tasmania who looking to perform a 100% fuel switch from natural gas to hydrogen in their induration furnaces. The project looks at the full scope of the process from hydrogen production via electrolysis up to 100-MW and a secondary option for a 200km hydrogen pipeline connecting to future hydrogen hubs in the area.

✓ Decarbonization
✓ Energy independence/resilience
✓ Increased product value

Fuel switching at an industrial complex

Australia

Hatch completed a conceptual study for a confidential metals client to support the evaluation of combusting low-carbon hydrogen to fuel an industrial process. Hatch performed an order of magnitude study that included developing an understanding of the critical project risks, developing preliminary engineering deliverables such as a process flow diagram (PFD), equipment layout and lists, and a capital cost estimate. The study investigated a potential technology that can contribute to the decarbonization of the metals industry, not only in Australia, but also internationally.

✓ Decarbonization
✓ Increased product value

Hatch's Climate Change practice

Our green hydrogen team resides within Hatch's Climate Change practice, which focuses on decarbonization and sustainability through process efficiency and energy optimization, carbon capture, utilization, and storage (CCUS), electrification, fuel switching, and emission/carbon reduction and financing strategies. We create long-term relationships with our clients, helping them build strategies to reduce GHG emissions from their operations and those of their partners. We can support you in identifying and prioritizing the right solutions, looking to 2030, 2050, and beyond.

About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly.

We respond quickly with solutions that are smarter, more efficient, and innovative. We draw upon our 9,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

Key contacts

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