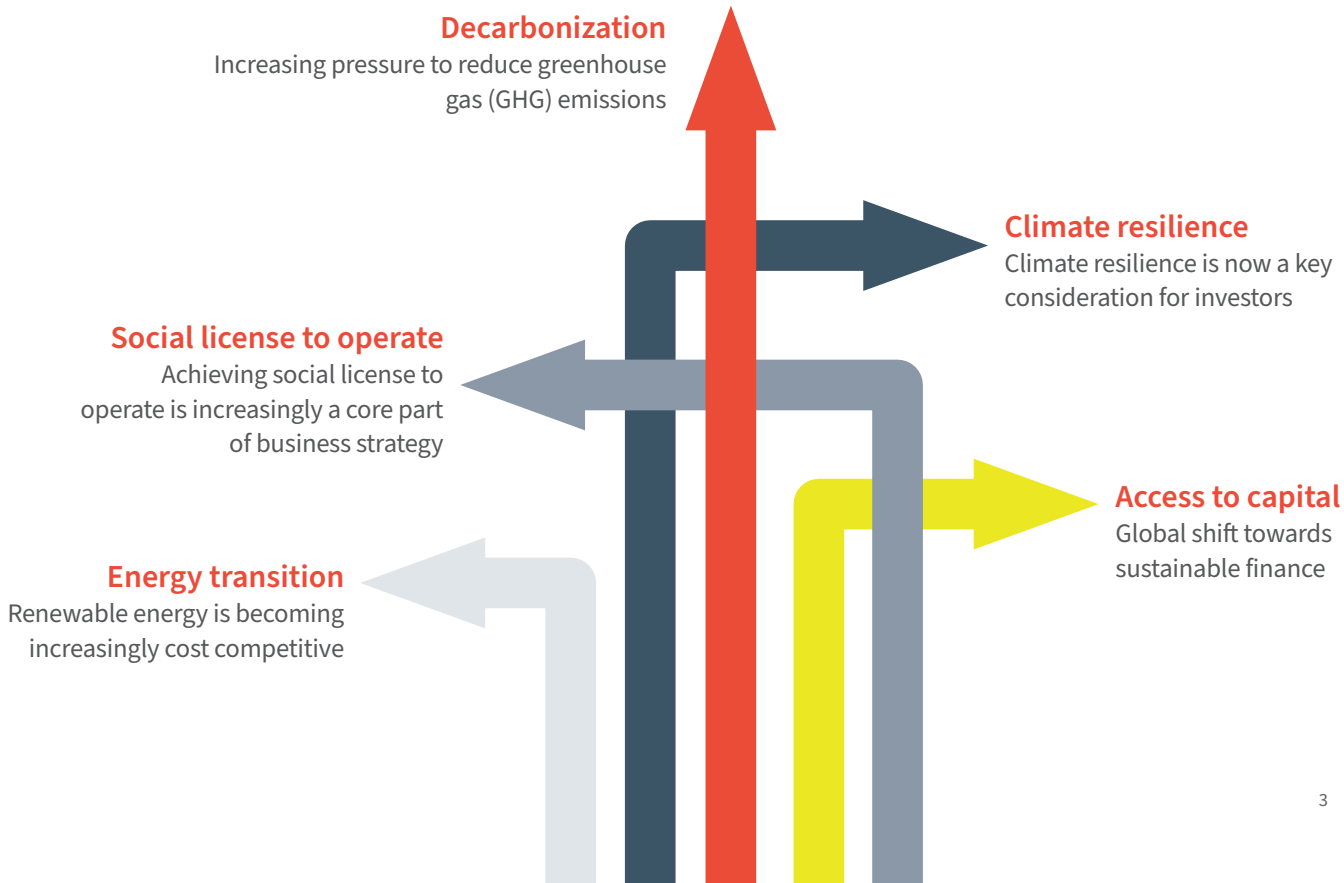
Climate Change

HATCH

The first-of-its kind Raglan Mine wind energy project introduced a utility-scale wind turbine with energy storage integrated with diesel generators at the northern mine.

We partner with our clients to navigate the challenges of climate change

Today, companies are facing an evolving market where climate change is at the forefront of decision-making together with financing and economics, environmental stewardship, and corporate responsibility.



Action has begun to realize climate targets

We help our clients to progress their climate change strategies in response to key industry trends and changing stakeholder requirements.

Goal development and definition

With increased stakeholder pressure, companies are developing GHG reduction goals for both the short- and long-term.

Decarbonization strategy and roadmaps

Developing emissions inventories and decarbonization roadmaps to meet GHG emission reduction and sustainability goals.

Process development and optimization

Optimizing process and equipment to minimize GHG emissions and energy consumption without compromising productivity.

Green funding

Identifying economic solutions to maximize the positive social and environmental impacts of your projects and other activities.

Project implementation

Successful projects proceed step-by-step, phase-by-phase. We work with our clients, planning carefully to ensure quality outcomes that minimize the risk of harm to people, places, and things.

Climate resilience

Navigating transition risks such as changing requirements for access to capital, shifting policies, laws, and regulations, and a change in societal expectations that impacts permitting, operations, and brand reputation; and physical risks such as flooding, wildfires, and extreme precipitation.

What we do

Hatch is positioned to assist with your specific needs throughout every stage of climate action, from planning to project execution.

Climate Action Planning

- GHG Accounting & Disclosures
- Decarbonization Planning
- Carbon Pricing
- Climate Policy & Business Drivers
- Climate Risks
- Innovation Management, Climate Technologies
- Funding Support

Technical Expertise

- Carbon Management
- Fuel Switch
- Process Electrification
- Fleet Electrification
- Bioenergy
- Low Carbon Hydrogen (H_2)
- Carbon Capture
- CO_2 Removal

Decarbonization

As you strengthen your commitments to climate action, Hatch can provide specialized expertise from planning and program management to project execution to demonstrate real progress on achieving decarbonization targets. Our ability to integrate exceptional, diverse teams in the pursuit of positive change is one of our primary mission statements.

We have an experienced team with extensive global knowledge in carbon management, energy efficiency and process optimization, alternative and renewable fuels, low carbon and renewable power, electrification, energy and thermal storage, low carbon hydrogen, carbon capture, utilization and storage (CCUS), policy and regulatory engagement, and financial analysis.

We have a proven track record of working with multinational organizations in the development of more than 200 strategic climate change-related programs from scoping and feasibility studies through to execution. For clients, this means the most relevant and current carbon reduction technologies employed globally will be considered in site specific roadmaps.

Our strategy is rooted in building long-standing relationship with clients. Partnering with our clients to leverage these relationships, we can identify meaningful and relevant insights faster that translate into actionable and impactful GHG emissions reduction opportunities.

Our experts in mining and metals, energy, and infrastructure sectors have vast operating experience, with a demonstrated ability to execute the latest process and technology solutions. In an evolving policy and regulatory landscape, new energy paradigms and emerging technologies must be introduced, sustainable practices implemented, and transformational approaches leveraged to benefit our clients' operations and stakeholders.

To date, we have completed decarbonization roadmap studies and climate strategy work for over 200 industrial sites globally. We take today's best practices to the next level, optimizing processes and applying new and emerging technologies to help you achieve your climate change targets while remaining competitive and differentiated.

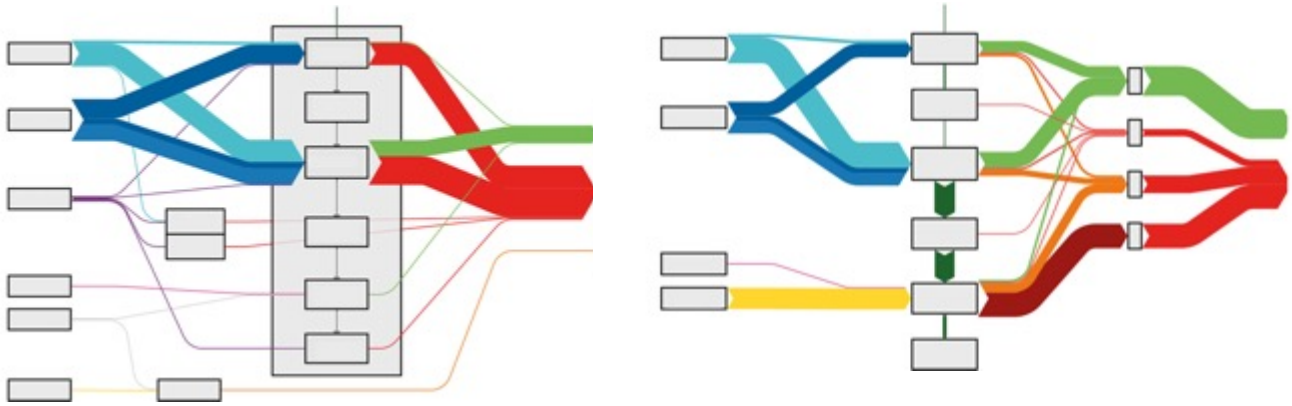
150+
$MtCO_{2e}$ assessed

200+
Sites evaluated

50+
Countries

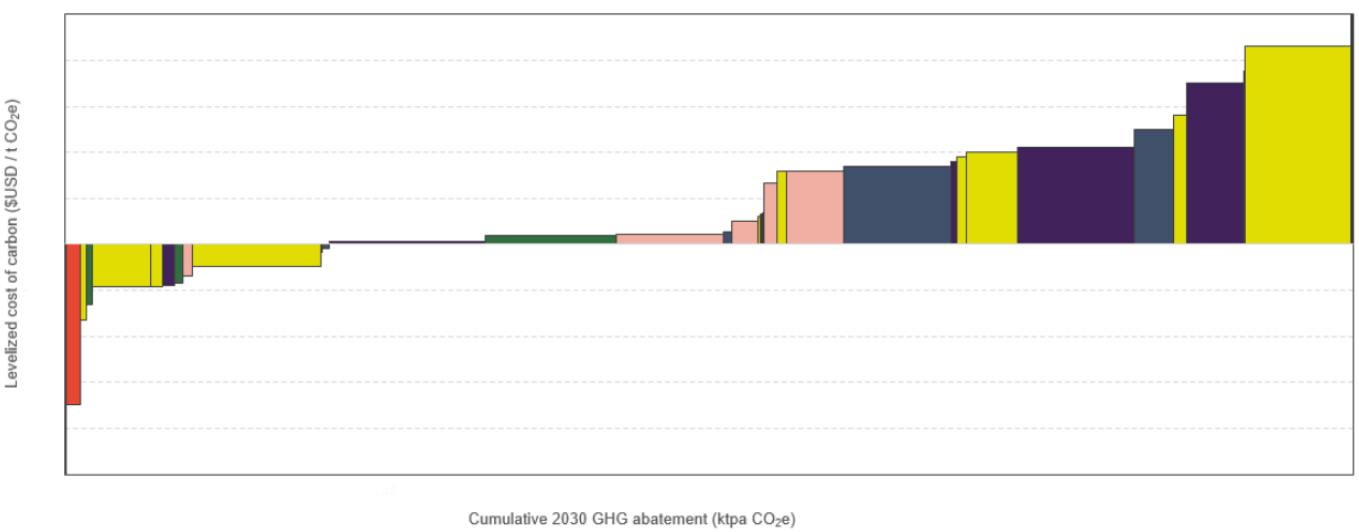
Carbon and Energy Sankey Diagrams

We analyze site emissions down to the equipment level to properly understand the GHG drivers, abatement opportunities, and implementation challenges.



GHG Abatement Cost Curve

We identify and quantify your GHG reduction opportunities through financial and carbon modelling to compare and prioritize discrete opportunities and combine them into roadmaps to achieve your targets.



Climate Resilience

The visible impacts of climate change around the world demonstrate that the need for building resilience is critical.

We assess the physical impacts of climate change and how to build resilience while achieving business objectives. We work with teams like yours to navigate climate change transition risks such as changing requirements for access to capital, shifting policies, laws, and regulations, product positioning, and a change in societal expectations that impact permitting, operations, and brand reputation.

As our clients strive to improve their facilities' resilience, they are investing, building, operating, and maintaining these assets using new criteria and methodologies.

Our global multidisciplinary team includes engineers and architects licensed in multiple jurisdictions with experience in conducting adaptation studies, risk assessments and project implementation as well as climate change policy specialists, risk management specialists, biologists, geologists, and hydrologists.

We partner with clients to assess enterprise-wide and/or site-specific climate-related physical risks, develop adaptation strategies, implement resiliency improvements, ensure our solutions optimize environmental protection and economic prosperity, and facilitate climate change event preparedness measures.

We offer:

- Climate risk assessments and management
- Facility modifications studies, costs, conceptual, feasibility and detail design studies
- Structural utilization for code requirements and historical peak climate-related loads
- Adaptation measures economic analysis
- Related corporate policy and finance strategy
- Stakeholder engagement
- Data acquisition and management for resilience monitoring
- Disaster emergency response and recovery
- Architectural design, including Leadership in Energy and Environmental Design (LEED), Envision and the Resilience Action List (RELi)

The Wintering Hills wind power project supplied 88 MW of renewable power to the Alberta, Canada electrical grid. Hatch provided full EPCM services for the project.

Hatch understands your unique needs and provides a comprehensive range of services that deliver value by identifying and capitalizing on low-carbon policy incentives and green financing opportunities.

Supporting the City of Calgary's Green Line development, the scope of work included a Climate Lens assessment to quantify GHG emissions and identify climate change risks and mitigation options.

Comprehensive services, customized solutions

We offer a comprehensive array of technical services to meet your engineering, consulting, maintenance and operational support, and project and construction management needs.

Hydrogen

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

Our technical and advisory expertise spans the entire value chain, from sourcing renewable power, transportation, and storage to hydrogen use cases.

Biomass and bioenergy

Biomass has been recognized as an alternative to fossil reductant and to provide sustainable and reliable energy generation, with the ability to deliver power on demand, filling the generation gap created when the sun stops shining and the wind stops blowing.

Our team will work with you to develop strategies and programs that optimize the reliability and efficiency of your facility, while minimizing costs and risks at the same time.

Carbon capture, utilization, and storage (CCUS)

CCUS can be an important pathway to meet net-zero targets, particularly in hard-to-abate sectors.

The intricate details of your processes, plant layouts with complex ducting networks, and pretreatment requirements—and how they connect with and affect CCUS—are well within our wheelhouse of expertise and capabilities.

Renewable power and electrification

Industrial decarbonization relies on the production, deployment, and use of low- and net-zero emissions electricity.

Identifying the optimal electrification and energy storage technology and configuration for your project can be challenging.

We help you understand the financial and technical risks when evaluating electrification options, and review the technical assumptions going into the financial models underpinning your investment.

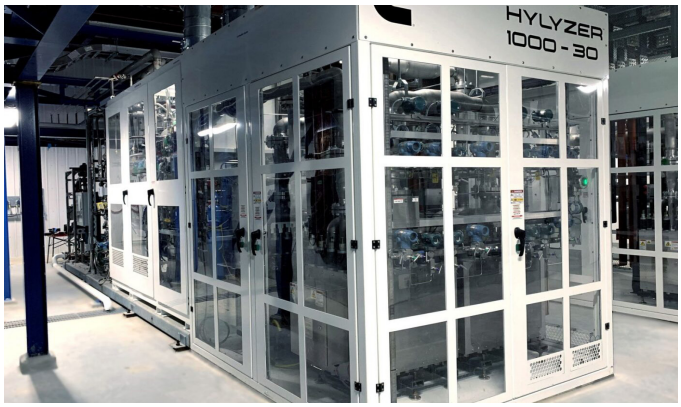
Selected Project Experience

Low Carbon Program Support, Vale

Global

Vale engaged Hatch to develop a low-carbon transition strategy for their base metal operations, across 13 sites globally. The first phase of work included the interrogation of GHG emissions data, modeling of carbon-intensive processes, and engaging with operations to identify carbon abatement opportunities.

The second phase of work focused on validating abatement opportunities, evaluating abatement scenarios, and developing an emissions-reduction roadmap to meet near-term and long-term targets for each asset in Vale's base metals portfolio. The work prompted engineering studies that Hatch completed to further advance priority initiatives.

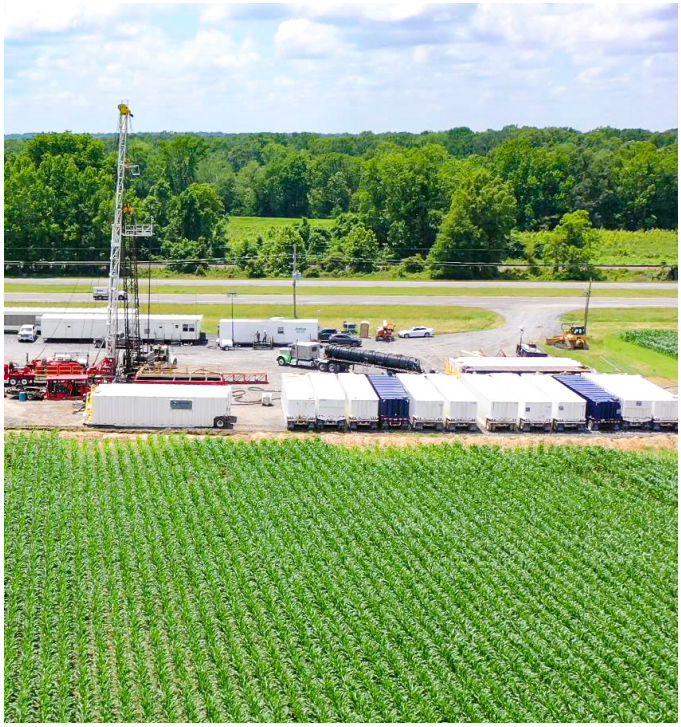


Bécancour Hydrogen Plant Expansion, Air Liquide

Canada

Air Liquide installed 20 MW of proton exchange membrane (PEM) electrolysers at its existing hydrogen production plant in Bécancour, Québec to form the largest plant of its kind in the world operational since 2021.

The project increased production capacity at the plant by 50%, while simultaneously reducing carbon dioxide emissions for the region by nearly 27,000 tonnes per year. Hatch provided civil, structural, and architectural engineering for the main process plant building, electrical room and water treatment area, pipe rack and cooling towers, HVAC, construction management and site preparation, health and safety management, project management, and project controls.



Louisiana Green Fuels, Strategic Biofuels

USA

Hatch completed a comprehensive prefeasibility, feasibility and early FEED program for a proposed integrated biomass-to-renewable diesel facility in Louisiana, USA.

As the lead for the project, Hatch is responsible for overall project management and technology licensor engagement as well as the provision discipline-specific deliverables and the development of capital and operating cost estimates for the core process and supporting offsites and utilities.

Yarwun Hydrogen Calcination Pilot Project, Rio Tinto

Australia

Hatch is currently completing the execution of a hydrogen compression, storage, high pressure let-down, and reticulation facility for a brownfield project involving the integration of a hydrogen electrolyser and hydrogen handling facility.

The hydrogen will be delivered to Rio Tinto's existing industrial facility as a substituted fuel source. Commissioning is anticipated in 2025.

Raglan Mine Integrated Wind-Storage Diesel Energy, Glencore and Tugliq Energie Co.

Canada

Glencore's Raglan nickel mine in northern Québec has been installing a wind-storage system to reduce the high cost of diesel-based power generation. The project demonstrates the use of various types of storage and fast response control systems to maximize the use of wind while minimizing grid disturbances due to wind variability.

Phase 1 included a 3 MW wind turbine and energy storage system (battery, flywheel, and hydrogen system) with a microgrid controller, offsetting diesel fuel consumption by 2.4 million liters per year. Phase 2 added 3 MW of wind power and a 3 MW/1.5 MWh of energy storage.

Hatch has been involved in the conception, engineering, commissioning, and operation monitoring of both project phases. We have analyzed and evaluated high penetration of renewable power scenario combining wind power and hydro pump storage and various energy storage technologies as a decarbonization road map for the mine.

Power Link Project, Sun Cable

Australia, Asia

Hatch is involved in the global expert team to deliver the Australia-Asia PowerLink Project. One of the world's largest renewable energy infrastructure projects, the AUD30+ Billion Australia-Asia PowerLink (AAPowerLink) will supply renewable electricity to Darwin and Singapore.

The project will integrate a range of technologies and infrastructure to develop one of the world's largest solar farms, to be located in the Northern Territory, Australia (17-20 GWp); the world's largest battery (36-42 GWh); and the world's longest undersea High Voltage Direct Current (HVDC) cable system from Darwin to Singapore (approx. 4,200 km).

The AAPowerLink will be a high-capacity solar generation, storage, and transmission system that will transmit reliable, dispatchable renewable electricity.

Weyburn CO_2 Enhanced Oil Recovery, Encana

Canada

Hatch provided EPCM services for the installation of all surface facilities for the original Weyburn CO_2 miscible flood. Field facilities included all production/injection satellites and production/injection pipelines.

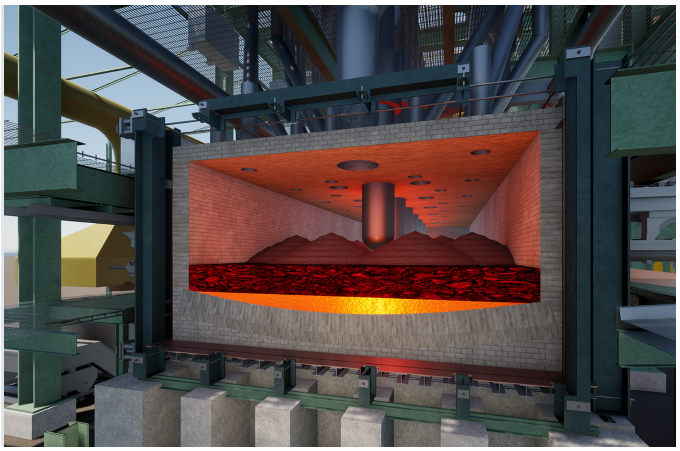
Since 2000, more than 30 million tonnes of CO_2 have been stored 1.5 km underground in Weyburn; it is anticipated that over 40 million tonnes of CO_2 will be stored over its lifetime.

Yabulu Extension Project, QNI

Australia

As part of the BHPB Yabulu Extension Project (YEP), a CO_2 recovery plant was designed, constructed and commissioned to increase production of CO_2. At Yabulu, the CO_2 is required in various areas of the refinery as both reagent and purge gas for the production of ammonium carbonate, leaching liquid, and inert gas purging on the nickel reduction furnace.

The CO_2 recovery plant extracts carbon dioxide from the flue gas generated by boiler #3 to produce a purified 99.9% CO_2 gas stream. The production design capacity of the recovery plant was 150t/day of CO_2. The carbon dioxide plant was supplied as a vendor package which interfaced to a tie in point on the boiler exhaust stack.



Tata Green Steel, Tata Steel

Netherlands

Tata Steel has announced that Hatch will be part of the team to deliver the hydrogen route to make green steel at its IJmuiden plant in the Netherlands. Hatch has been selected to provide the engineering for the reducing electric furnace (REF) package, which, when coupled with a direct reduced iron (DRI) plant, will enable the production of green steel using hydrogen.

Battery Locomotive Study, New Jersey Transit

USA

Hatch was selected by New Jersey Transit (NJT) to evaluate the feasibility of a battery powered locomotive and a multiple unit on the limited sections of NJT's non-electrified territory to achieve zero-emission rail service, which would improve the environmental sustainability of NJT operations.

Hatch's support included the evaluation of propulsion concepts on NJT's retired ALP-44 locomotives, and existing fleet ALP-45DP locomotives and ML-III multiple units.

Onaping Depth Mine, Glencore

Canada

Through the application of new, clean technologies, Onaping Depth holds the promise of becoming one of the most advanced and safest underground mines in the world. The mine is designed to support an entire battery-powered underground mining fleet—the first of its kind. The electrification of the mine has resulted in several significant positive impacts including reduced operating costs, less ventilation, and less heat generation, along with reduced airborne contaminants and noise.

As part of an integrated team with Glencore, Hatch is providing EPCM services in the execution of the project as well as engineering selected infrastructure areas of ventilation, cooling, ore/waste handling, automation, and communications infrastructure, and mine systems.

The estimated total energy savings over the construction period and operating life of the mine (from 2017 to 2035) are C$24 million. The diesel-to-battery conversion opportunity would contribute an additional C$5.6 million in annual energy savings.

Detailed Service Offering

Greenhouse Gas Inventories

- GHG reporting
- Life-cycle assessment
- Product carbon footprint
- Environmental Product Declarations (EPDs)

Scope 3

- Scope 3 emissions inventory
- Supply chain analysis
- Scope 3 emission reduction

Sales and Marketing

- Competitor benchmarking
- Product positioning strategy

Decarbonization Implementation

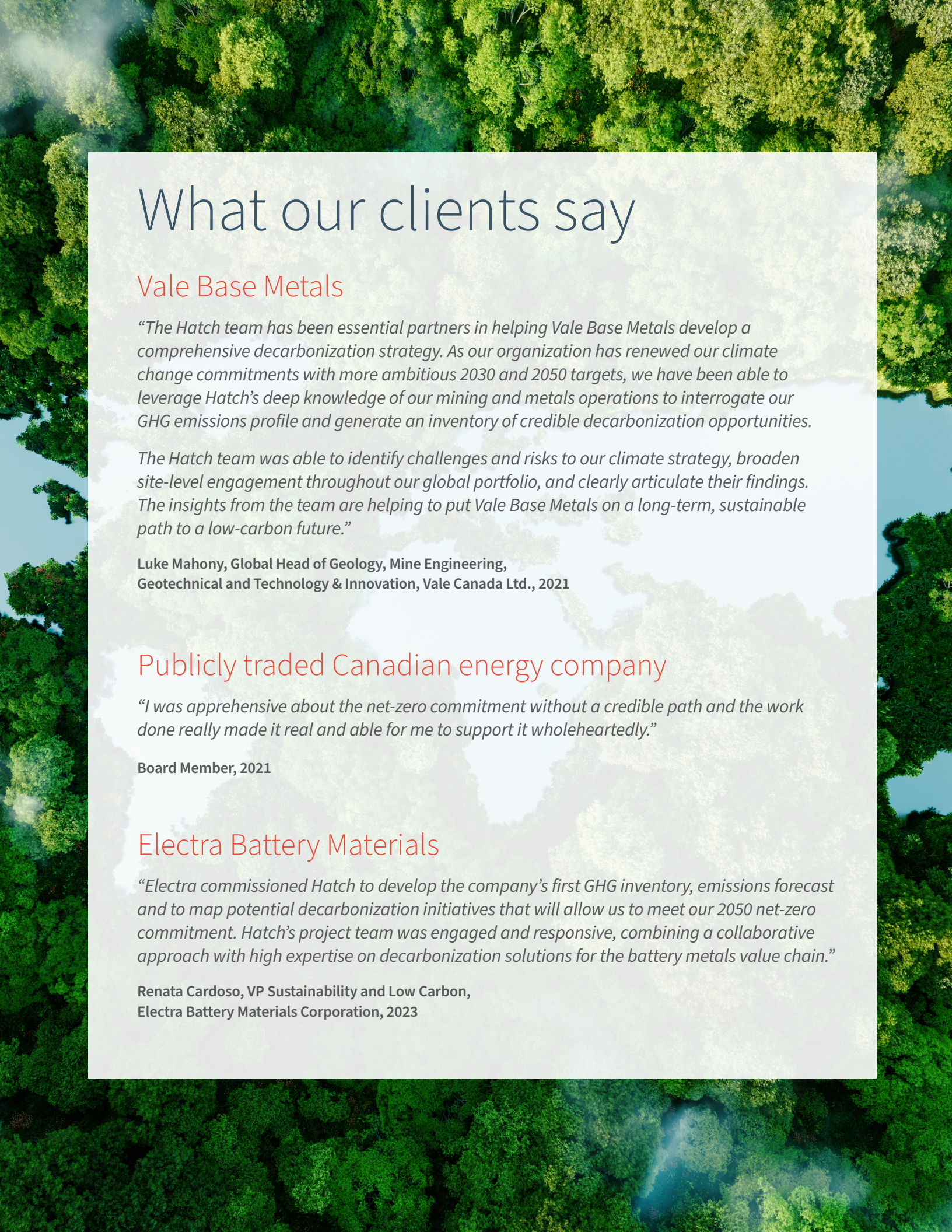
- Decarbonization strategy and roadmaps
- Process optimization and energy efficiency programs
- Program management support
- Engineering studies
- Techno-economic assessments

Technology and Innovation

- Technology investment strategy
- Due diligence
- Commercialization
- Research and development projects

Climate-Related Risk

- Internal carbon pricing strategy
- Transition risk assessment
- Physical risk assessment



What our clients say

Vale Base Metals

"The Hatch team has been essential partners in helping Vale Base Metals develop a comprehensive decarbonization strategy. As our organization has renewed our climate change commitments with more ambitious 2030 and 2050 targets, we have been able to leverage Hatch's deep knowledge of our mining and metals operations to interrogate our GHG emissions profile and generate an inventory of credible decarbonization opportunities.

The Hatch team was able to identify challenges and risks to our climate strategy, broaden site-level engagement throughout our global portfolio, and clearly articulate their findings. The insights from the team are helping to put Vale Base Metals on a long-term, sustainable path to a low-carbon future."

Luke Mahony, Global Head of Geology, Mine Engineering, Geotechnical and Technology & Innovation, Vale Canada Ltd., 2021

Publicly traded Canadian energy company

"I was apprehensive about the net-zero commitment without a credible path and the work done really made it real and able for me to support it wholeheartedly."

Board Member, 2021

Electra Battery Materials

"Electra commissioned Hatch to develop the company's first GHG inventory, emissions forecast and to map potential decarbonization initiatives that will allow us to meet our 2050 net-zero commitment. Hatch's project team was engaged and responsive, combining a collaborative approach with high expertise on decarbonization solutions for the battery metals value chain."

Renata Cardoso, VP Sustainability and Low Carbon, Electra Battery Materials Corporation, 2023

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 10,000 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.

hatch.com

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