

Performance  
**INNOVATIONS**  
a new era of **positive change**



THIS IS HATCH  
2018





## OUR VISION

We are passionately committed to the pursuit of a better world through positive change.

## OUR MISSION

Together we create unprecedented outcomes for our clients by partnering with them to develop better ideas. Our exceptional, diverse teams combine vast engineering and business knowledge, applying them to the world's toughest challenges. We build practical solutions that are safe, innovative, and sustainable.

## OUR VALUES

We believe in exceptional ideas delivered with exceptional service.

## OUR PERSONALITY

We are entrepreneurs with a technical soul.

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# THE NEW ERA CONTINUES

Two years ago, we embarked on a new era at Hatch. We set out to transform our company into one that was even more aligned with the changing needs of our clients. As part of this, we rededicated ourselves to our clients' business successes, to providing exceptional ideas with exceptional service. Our goal was to continue serving as a relevant partner in your business well into the future.

We began by talking with our people and stakeholders, and particularly with our clients. You told us how you saw your businesses evolving, where you expected them to be in the next few decades, and the plans you had for taking them there. You gave us information and insights that helped us adjust the course of our own organization, modeling it on the idea of working with you on your toughest challenges to create "positive change." With a new plan, now aligned with yours, we created a new mold and began fitting into it.

## **It's working!**

Our Metals clients are revitalized, meeting a renewed global need for commodities. In the past year, Hatch has been a key contributor to every major underground mining project in the world, helping to create economically, environmentally, and socially sustainable mining and metallurgical facilities for the future. Codelco's Chuquibambilla copper mine in Chile. Vale's mine at Voisey's Bay and BHP's Jansen project in Canada. Rio Tinto's Resolution mine in the United States. QSLIC's new magnesium smelter in China. Glencore's Koniombo nickel mine and facility in New Caledonia and Debswana's Jwaneng diamond mine in Botswana. In Peru, MMG Limited's Las Bambas copper mine project ramped-up a record five months ahead of schedule, adding tons to its production numbers and millions of dollars to MMG's bottom line. The design we produced for Glencore's Antapaccay operation, also in Peru, had the plant stable and productive in half the time expected, delivering tens-of-millions of dollars more in realized value.

The sustainability conversion has begun, moving us from an energy mix that was largely carbon-based to one founded mainly on renewables. Along with our clients, Hatch is at the forefront of this transformation. Canada's Bruce Power, the largest operating nuclear power enterprise in the world, has given us another strong vote of confidence. We signed a long-term service agreement in July 2017, having earlier opened an office near the site to better engage our client and the community. We're committed to supporting the utility's ongoing operations and its life-extension program, part of a C\$13-billion refurbishment plan that will keep Bruce Power generating electricity for the next half-century.

In Guatemala, our design for the Oxec II cofferdam delivered exceptional reliability and benefits to the environment. The first of its kind in Guatemala, the results were so impressive that the cofferdam project was recognized with the 2017 Ontario Consulting Engineering award. The design is now the owner's preferred option for projects with a similar scope.

In the developed world, infrastructure needs modernization. In the developing world, work is focused on providing the basis for modern development that is to come. Massive infusions of money, technical know-how, and innovative thinking are needed. Infrastructure has become a bellwether issue, and Hatch is working with our clients to imagine and build the cities of the future. We're part of every large infrastructure project in Canada—Calgary's Green Line LRT, Montréal's city-changing regional rail electrification, the Toronto waterfront redevelopment project and transit hub, Metrolinx's C\$13.5-billion Regional Express Rail project in Southwestern Ontario—and many more in the United States and around the world.

Our decision to be a more active, engaged partner with our clients is taking us in new directions and into new ventures. We're going beyond the core engineering and project management services that have traditionally defined us. A new financing and development arm of Hatch is cultivating fresh, innovative ideas and finding ways to support promising enterprises and technologies that we believe in. As we grow our bench strength in this area, we'll be looking for new ways to broker deals with and between private and public-sector partners to produce the best results possible.

Finally, we have realigned our service offerings to figure digital technology in a big way, both as a complement to what we already do and as a new stand-alone line of business. The possibilities in this area are so expansive, the value it offers so strong and immediate, that we knew our business had to move aggressively in this direction. The digital twins we develop can replicate and even control mining operations from electronic screens thousands of miles away. With interactive models that share data in real time, plans for

new power plants, dams, and electricity grids can be simulated and modified easily, saving time and boosting safety. Digitization lets ideas and strategies for city-building automatically factor-in environmental sustainability. Planners and designers get instant information about everything from stormwater management to rail schedules and commuter traffic patterns, even as their plans are taking shape.

The new era we envisioned two years ago now has a solid foundation. We're excited to be building on it, confident in the paths we've chosen to follow with you, and proud to be a better, stronger contributor to the success in your future.



**John Bianchini**  
Chairman & Chief Executive Officer







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# SAFEGUARDING NATURAL RESOURCES

To flourish sustainably, industries today need clean energy and efficient processing operations. Practices and policies must protect the land, air, and water without compromising profits.







# BETTER MINING PROCESSES LEAVE LESS WASTE



## JOE LOMBARD Metals

This mining and metals veteran has more than 30 years' experience in the development and expansion of metallurgical facilities all over the world. Joe leverages his extensive operating and project experience to lead Hatch's Metals business.

The quest for new, innovative processes in mining is opening up brand new playing fields—ones that everyone wants to join in and improve. But someone has to create the first product, develop the new strategy that sets everything in motion.

Improving mining processes—making them faster, safer, and less wasteful—means being innovative; creating new and exciting ways to produce the raw materials modern society is built on. We need to be constantly surveying the marketplace, trying to understand what the industry needs today and anticipating what it'll need tomorrow and five years from now. Then coming up with new and better solutions, processes, and services to meet those needs. We need to be thinking ahead, watching for that next, best idea or opportunity. Moving the needle on productivity, capital effectiveness, energy efficiency, and mining intensity.

One approach that's been successful has been to take our clients through workshops that identify constraints. Preconceived notions can stymie you. But your own biases can lock you out, too. Fight the tendency to start offering solutions right off the bat. Working through that list of constraints can be

time-consuming. You'll probably need more than one iteration. But once the "Yes, buts" are laid out on the table and acknowledged, it's easier to move past them.

If you want new ideas and new ways of doing things, talk to people who do new things, or do them differently. We constantly pull from our experience and technical know-how in other areas and apply it to mining processes. Draw on other disciplines that can add the most value to what you're trying to accomplish. Don't be afraid to try combining tools, strategies, and expertise in new and unusual ways. See where it takes you.

Our energy experts have shown us how to harness renewable energy more efficiently. With greater electrification, mines can reduce their dependence on diesel fuel. Fewer emissions need less ventilation. That means lower costs, less waste, and improved safety.







We need to be thinking ahead, watching for that next, best idea or opportunity

Batteries are improving dramatically, too. There will inevitably be a multitude of spin-off effects in that area that could let us design a very different kind of mine someday.

Process engineering helps us find new ways to streamline operations. Like smaller pieces of equipment, and maybe fewer of them. That's less capital-intensive. Running them better cuts operating costs.

Environmental sciences can show us how to make our mines more sustainable and legally compliant. We find more efficient ways to extract only the products we want and leave smaller footprints in the communities where we operate.

New tools aren't the answer to every problem. Start by improving and making the most of what the mine has now. Drive out all the potential the existing system can sustain.

Comminution efficiency can save an operation millions of dollars. Reduce energy needs, and the company has those savings forever. Think local. Start small.

Working through constraints opens your options for process improvements in whole new ways. Ones that are less costly. That can save time and enhance safety. That take less from the ground and leave the surroundings more like the way we found them. That can drive innovation and dramatic improvements in production.

The prospect of what's possible is inspiring our engineers. Our clients are all-in, too. It's time to be bold, never forgetting the importance of the fact that ultimately, exceptional results are achieved by teams working together using all the tools, techniques, technology, and processes.

# SMART MINING

Take what we need  
Leave what we don't  
Return all we can

## POTASH

**The Mosaic Company**  
Esterhazy K1, K2, & K3 | CANADA

Mosaic wanted to increase the capacity of two of its holdings and help develop a third installation in Esterhazy, Saskatchewan. And do it all without impacting existing operations. Careful design, planning, and our team's experience were critical. We provided prefeasibility and feasibility studies, and full engineering, procurement, construction management, and commissioning services to complete the K1 and K2 expansion. We then continued on as the EPCM partner at K3, providing detailed design and construction management for two producing shafts, headframes, site infrastructure, and hoisting systems.

In 2017, Mosaic's K3 successfully reached potash at a depth of 3,350 feet, part of the first shaft-sinking in the province of Saskatchewan in nearly 50 years. When complete, this will be the largest, most competitive underground potash mine in the world.



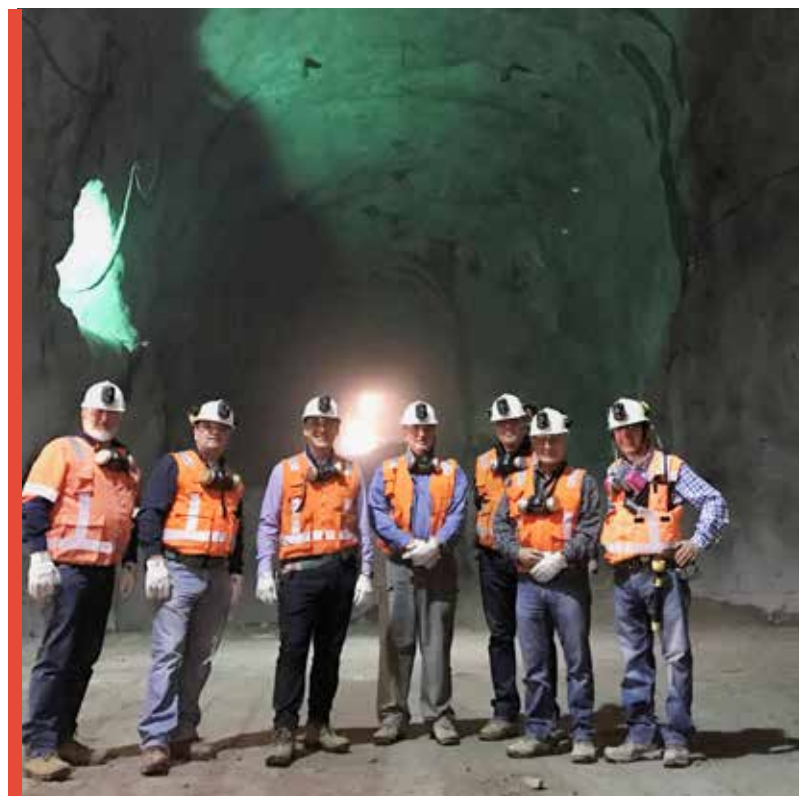
## COPPER

**Codelco**  
Chuquicamata copper mine | CHILE

One of the world's largest open-pit mines is going underground. When it's up and running, it will be one of the largest, safest, most efficient, and advanced in the world.

The feasibility study and basic engineering we provided enabled a smooth transition from an open-pit to a large, underground mine. We provided accurate cost estimates and designs for the communication systems, civil works, and overland conveyor platforms. Our detailed engineering addressed the integration of different designs by other parties and the development of technical specs for future contracts.

The new operation will allow Codelco to exploit Chuquicamata's remaining resources for another 30 years. Ore reserves of nearly 1,760 million tons of copper and molybdenum have been quantified for the underground mine—more than 60 percent of what's already been taken from the mine in the last 90 years!







## LITHIUM

### Galaxy Jiangsu Resources Lithium carbonate plant | CHINA

Galaxy was in a race to be first-to-market with a best-in-class product. We began with the test work, providing full EPCM services and commissioning support in a way that allowed us to become a trusted advisor and engineer for the Jiangsu project in China. The detailed design was completed, the facility built and commissioned: a 17,000 tpa lithium-carbonate plant that produces a product with 99.9 percent purity.

Our extensive experience with lithium is flanked by capabilities in hydrometallurgy, mineral processing, and pyrometallurgy. Our specialized engineering and design group delivered the basic design for some of the Jiangsu plant's most critical, long-lead equipment items, like the kiln, coolers, and in-house dryer, having these built in China for easy, time-sensitive deployment. All in, the project moved from prefeasibility study to a constructed, greenfield-site plant in less than 36 months.



## DIAMONDS

### De Beers Canada and Mountain Province Diamonds Gahcho Kué diamond mine | CANADA

Working at this site in the subarctic Northwest Territories, the project team faced extreme winter conditions for more than six months a year. Construction success depended on meticulous logistics and careful contingency plans that saw more than 2,000 truckloads of materials, supplies, and equipment traveling 420 kilometres over frozen lakes and on specially constructed ice roads in some of the deepest, darkest months of winter.

We managed the full EPCM contract for project implementation, designing and developing the processing plant and all support facilities to accommodate 560 personnel at peak construction during the Arctic summer.

Completed on budget and schedule, Gahcho Kué went into production in late 2016. A masterpiece of management, planning, and execution, it received the Project Management Institute's Project of the Year Award in 2016 from the Montréal, Canada, chapter.

# OIL, GAS, AND THE FUTURE OF GTL

The world's demand for dry shale gas will continue to grow. The United States is the big leader in supply and access. But a similar scenario is evolving in Canada and Mexico.



## SANJIV SAVE Oil & Gas

This expert knows the hydrocarbon and energy sector from the ground up...and down. Sanjiv has worked on projects and at installations all over the world, and has numerous high-quality papers, book chapters, and patents to his name.

The latest available estimates from the Energy Information Administration for unproven-but-technically-recoverable shale gas reserves are way up for these places, too.

Not to be outdone by the gas glut, reserves and production of shale oil have also expanded in a big way. Along with the drop we're seeing in the global demand for energy, these reserves are helping keep the oil-to-gas price ratio low—too low for the kind of economics that make gas-to-liquid (GTL) technologies commercially viable.

There's another important difference between shale gas and shale oil: ease of transportation. It takes a sophisticated logistics chain to move natural gas over long distances. In places where pipelines aren't practical or feasible, other solutions must be found. Today, that process begins with cryogenic cooling. It reduces volume, so the gas can be loaded onto specialized ships in a liquefied form. Regasification takes place at the destination port, where the product is directly transferred to terrestrial pipelines that carry it to consumers.

By comparison, oil is relatively easy to transport. And, being an internationally traded commodity, its prices are much more likely—at least, more likely than natural gas prices in North America—

to recover significantly by the time a commercial GTL plant could be up and running. We estimate that to be sometime post-2020. This is supported by an Energy Information Administration forecast, which also suggested that oil prices could recover by more than 40 percent between 2018 and 2021.

It gets worse. Over the next twenty-or-so years, the ratio of crude prices to gas prices is expected to be in the range of 22:1. This, even as some experts anticipate that gas prices could already be increasing by as much as 20 percent in the same period.

It's likely we won't see an end to high fuel prices anytime soon. But every cloud has a silver lining. A high oil-to-gas price ratio is good news for the future of GTL technology in North America. High prices are strong motivators for us to find better—cheaper—ways to do things.

It's time for a commitment. Let's pull together as an industry. Let's find the financing to build the plants and infrastructure, so more premium GTL products can get to consumers who are waiting to buy them and reap the benefits.





# THE HIGH COST OF WATER

Like many process-driven industries, mining operations are major consumers of water resources. As older operations see their yields decline, the quest for metals and minerals moves into dryer areas where water is even harder to find and secure.

Water is one of our most precious commodities, and one with serious natural-resource-preservation issues. Water sourcing, use, treatment of, and discharge—and how to manage it all—has become a critical business risk.

We're beginning to realize that there's a considerable cost to having a reliable and sustainable supply of water, even though the price of the product itself is, ostensibly, free. What we pay for is only the cost of actually delivering water—the infrastructure to carry it, the energy to push it through pipes, and the processing needed to clean it of impurities. Rarely does anyone pay for water itself. At least, not yet.

When we start thinking about how to do without it, we realize how much we take water for granted. So, how can you determine the real value of water to your mining operation? Here are just four things to consider.

**Production shutdowns or slowdowns.** An interruption in the supply of water—because the quantity is not sufficient, the quality is not appropriate for processing, you can't obtain the necessary discharge permits, or there's a lack of storage capacity—can bring your operation to its knees. Losses associated with production shutdowns are significant!

**Environmental fines for non-compliance.** Failing to comply with regulations can be costly. If serious breaches occur—dam failures or harmful contamination—the cost can go well beyond fines and extend to criminal prosecution.

**The cost of water management.** New mines are being developed in locations that are so remote, we wouldn't even have contemplated them a few decades ago. They need more and better water management infrastructure to secure clean water that's necessary to their operations. The cost for treating discharge escalates in these places, too.

**Closure, legacy issues, and liabilities.** Large mining companies are improving their estimates of what it costs to close things down. This is being factored into investment decisions up-front. Designing mines to minimize closure liabilities makes good economic sense. And managing the prudent, expeditious, and safe return of a site to its original condition is one of the best investments you can make in overall goodwill and social license.

If the environmental challenges and damage the world is facing today have taught us anything, it's the merits of fully appreciating, valuing, and protecting the resources we already have. Cure, at any price, will never be a match for prevention. So let's care for the water we've got. We need it to continue flowing, nicely and cleanly. That's our common legacy. Our commitment to the generations to come.



**DAVID MUTOMBO**  
Water

An expert with broad experience in municipal and industrial water-and-wastewater projects in Canada and South Africa, David is passionate about bringing our best tools, expertise, and resources to protecting water resources everywhere.

## Smart cities safeguard natural resources

Waterfront Toronto | Canada

In Canada's largest city, the central waterfront and Port Lands districts form what is the largest continuous urban revitalization area in North America. Upping the livability and usefulness of Toronto's shoreline does more than make the city sustainable and strong. It protects a functional element of its broader environment, reducing flooding and preventing erosion of the natural shoreline.

Waterfront Toronto came to us for help evaluating and rethinking its transportation strategy. Together, we defined what the project will include and how it will maximize the waterfront potential. Transit, foundational road infrastructure, active transportation, and pedestrian and public realms all factor into the plan. So do creative new technologies. Making the best use of the waterfront space means respecting the indigenous environment, flora, and fauna. It can be done, even as the city's transit system, vibrancy, and economic livelihood are boosted at the same time.

# SMALL MODULAR REACTORS: LESS FUEL, SMALLER ECO-FOOTPRINTS



**NATHAN  
TEDFORD**  
Power

His experience with big nuclear at some of Canada's most sophisticated power installations has taught Nathan to see the big picture. His focus is on what the future of energy can be with nuclear technologies such as small modular reactors and fusion reactors.

In places like Canada's Arctic, the Brazilian jungle, and the deserts of the Middle East, nuclear energy is finding its niche. Once wholly dependent on diesel fuel for heat and electricity, remote locations are finding that small modular reactors (SMRs) can offer an economically viable, safe, and carbon-free alternative. The best news? They meet the need with only a minimal impact on the local environment.

Compared to large nuclear, SMRs are less expensive to build and easier to handle. They're transportable, designed as components that can be shipped by sea on barges and assembled on-site. For mining, manufacturing, and other energy-intensive industries that may be too far away to tap into the grid, they can offer a feasible alternative.

As full-scale commercial products, SMRs still have a long way to go. The initial outlay is still considerable—tens-of-millions of dollars. Moreover, user companies don't want to be in the nuclear-power-production business. It's too specialized, too expensive. So the marketplace is ripe for an intermediary, a company willing to supply SMRs to a community, mine, or other remotely located industry that needs a good quantity of clean, reliable electricity. One that will provide all the hardware and sweat equity that goes with it, and turn SMR supply-and-servicing into a going concern.

There's a future for SMRs, and it's coming into better focus. At Hatch, we like to say "we're entrepreneurs with a technical soul." We know how to develop new technology and make it commercially viable. And we've done the homework to define and demonstrate the real benefits this energy producer can offer.

We're standing on the brink. Soon, the right confluence of technological possibility, cost, and real, increasing need for the benefits this kind of small-scale nuclear energy can provide will become too strong to ignore. When it does, we'll be ready.





# HOW SMALL GAINS BECOME BIG WINS FOR WIND TURBINE OWNERS

The electricity that wind turbines generate is green in more ways than one. As an industry, this environmentally friendly technology is maturing. Demand is peaking, and after literally decades of developing and honing the business strategy, wind farm enterprises are finally starting to produce some green for their bank accounts, too.

In North America, the number of wind-harnessing installations has soared in the last decade, second only to China in new builds and megawatts generated. The industry has been ratcheting up to increase revenues for owners, innovating to make turbines more powerful and effective. There has also been pressure to reduce operations-and-maintenance costs to lower overall production expenses.

Once turbines are designed and built, project owners usually focus on operating them at the lowest cost and with the least risk of incurring unexpected expenses. The result is a fleet of turbines that are “online.” But one in which operations are geared to meet availability guarantees and limit the maintenance costs of service providers, not maximize the energy production output for owners.

When one digs in and asks the right questions, some interesting findings emerge. Small adjustments to wind turbines can produce big gains in production and the bottom line. In an operation that’s built to last and generate power for 20 or 30 years, any improvement—even a fraction of a percentage point—can be significant. A small investment in optimizing performance and operations can mean more money in owners’ pockets, and fewer big checks to the operator.

Getting the right information to evaluate is simple. There’s no need to invest in sensors. Wind turbines are equipped with monitors that produce great amounts of valuable data with tremendous granularity. Owners can glean vital stats about speed control/pitch, yaw strategy, start-and-stop policies, and tower foundation dynamics.

Because they’re more focused on the big picture, operators consider how the entire array is performing. They can easily overlook small variations and the suboptimal performance of individual units. By examining short intervals of functioning that most operators wouldn’t consider—maybe a minute or less—different patterns and performance levels between and among units become apparent.

These small measurement windows allow wind engineers to see all kinds of opportunities. But monitoring and evaluating them should be done by an independent assessor, one who stands apart from the opposing objectives of owners and manufacturers/operators.

As turbines reach the ends of their warranty periods, engineers have an important part to play. They need to be advocating for their owner-clients, promoting the role of performance analytics and the value of constantly monitoring their systems’ productivity. By identifying solutions, minor tweaks can sometimes protect and even enhance how the turbines perform, and engineers can uncover substantial, quantifiable returns on investment for their clients.

Owner-developers who invest in these assessments tell us the exercise is worth it. Their wind farms perform better, generating more power and better financial returns. And, as more of them take this next step and reinvest in the performance of the installation they already have, they’re contributing to the knowledge bank of the entire wind turbine industry. That’s a positive contribution that benefits everyone—owners, operators and turbine manufacturers alike.



**MARTIN HAMEL**  
eGRID

The goal is helping green-power producers make the most of what they’ve got. Martin improves the performance of wind turbines and produces feasibility studies for hybrid energy projects, combining wind, solar, diesel, and storage technologies.



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# SUSTAINABLE STRUCTURES & SYSTEMS

Embracing sustainability in our communities, the environment, and the way we conduct our businesses is transforming our world... and our lives. We're putting our best minds to work finding smarter solutions to the challenges you're facing. If the answer doesn't exist today, we'll work with you to create it.





# SHARED PURPOSE, THRIVING ECOSYSTEMS, SUSTAINABLE COMMUNITIES



## HARRY KIM Environmental Services

He believes that industry and a healthy, sustainable environment can coexist. Harry and his team create project development strategies that leave the surrounding area and community as good as—or better than—we found them.

The world changes, and we must adapt. That means working together as advisors, engineers, and project managers to create sustainable business models for every kind of new development—mines, energy, processing operations, infrastructure, and more.

In all the work we do, when and wherever we do it, it's imperative that our Indigenous and local communities get the respect, attention, and support they need and deserve. Positive relationships, established early and in good faith, are the license we need to continue to operate. They're the reason we exist as collaborators and critical contributors to social innovation.

In our sustainability framework, we focus on early exploration and concept studies to hone our vision for the future and the positive changes we want to make. We bring together a wide variety of stakeholders, knowing they can help us to see all the facets of the work ahead with fresh eyes and open minds. The more diverse our pool of input, the better our chances of finding those pioneering, innovative ideas. The more skills and experience we can draw on, the stronger the master plans we can develop that benefit and serve our projects, the natural

environment, and the communities in which we work.

With comprehensive toolkits, workshops, and diligent scenario planning, our methodology captures the synergies between the needs of the project, the capacity of the community, and the protection of the environment. The result we aim for is a roadmap for sustainable economic and social development that bolsters the community without compromising the local landscape or ecosystem.

If they are to be effective, true development partnerships will need a new approach on the part of the clients we serve, too. They cannot do it alone. NGOs, educational institutions, faith-based organizations, government, suppliers—and of course, engineers—all need support.







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It's imperative that our Indigenous and local communities get the respect, attention, and support they need and deserve

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We want to continue giving that support just as we always have. We add value by instilling knowledge, experience, innovative ideas, and technology into many aspects of the work our clients do: the planning process, skills training, business development, and stakeholder engagement. If we do our job well, the results will be seen clearly throughout the construction phases in many of our normal project delivery KPIs. No safety incidents. No environmental incidents. A high level of worker productivity. An adherence to schedule that is not disrupted by community issues and mistrust. And, importantly, projects delivered on time and on budget.

Ultimately, above and beyond the work we do, the goal must always be to leave a lasting philanthropic legacy in the community, one that's greater than the project itself. We

must ensure that the surrounding environment is returned in a condition at least as good or better than we found it.

We want our projects to be catalysts for long-term growth. No matter how far off the end might appear to be, we must always be thinking about the economic evolution the community will be facing in its wake and the promise we make to safeguard the sanctity of the earth, air, and water.

Our commitment is to nurture long-term relationships and make decisions that allow us to live in our communities and their natural environments with integrity.

My aspiration is this: shared purpose, thriving ecosystems, and sustainable communities. At Hatch, this will be our lasting legacy for today and the future's generations.



# DOING THINGS DIFFERENTLY

Green electricity  
Sustainable infrastructure  
Smaller eco-footprint  
Better planet

## BRAZIL

### Enel Green Power Apiacas Hydro Complex

The three power plants that make up this massive complex combine seven 14.5 MW turbines to produce 102 MW of clean electricity. Our design minimized the impact to the environment, reduced waste, and capitalized on the natural soil foundation. CAPEX was reduced and the entire complex optimized with the installation of the largest Kaplan S upstream turbines ever constructed.



## CANADA

### ArcelorMittal Dofasco High-pressure boiler and power generation

With a new 450,000 lb/hr high-pressure boiler that replaces three existing ones, an added water treatment plant, and a 20 MW turbine to produce electricity, this high-volume steel plant in a large, urban area will operate more efficiently, economically, and sustainably. Our team finalized the plant layout, process design, the BOP equipment specs and bid review, handled demolition, and is providing detailed construction engineering in this highly congested brownfield environment. ArcelorMittal Dofasco received our BIM 3D modeling, our 4D construction-planning tools, and automated process-control technologies.







## GUATEMALA

### Energy Resources Capital Oxec II cofferdam

This unique cofferdam design tipped the scales in favor of the environment. Its enclosed structure meant less bank excavation, less fill released into the Cahabón River, and a much smaller environmental footprint. Honored with the 2017 Ontario Consulting Engineering Award, the design we created was the first of its kind to be used this way in Guatemala, and was recognized by stakeholders as a notable achievement. Energy Resources Capital now considers it to be the preferred option for any future projects with a similar scope.



## SOUTH AFRICA

### Kumba Iron Ore Dingleton resettlement

Dingleton is a small town built in the 1950s to accommodate employees of the then Iscor mine, now known as Sishen, owned by Kumba Iron Ore, a business unit of Anglo American. The agreement with the community has always been to extend the mine. This is advantageous to the surrounding communities since Kumba is one of the biggest employers in the area.

About 3,500 residents needed to be relocated to Kathu, 25 kilometres away. We finalized the project execution plan in consultation with Kumba. We then successfully managed implementation of the new township infrastructure: roads, water, stormwater, electricity, sewers, houses, and top structures. Finally, we managed the relocation of the residents.

The identification, evaluation, training, and development of individuals and small contracting entities broadened economic and employment opportunities in the area and set an example of best practice and excellence in sustainability and social cohesion in South Africa.



# NEW MINE-TO-MILL CAPABILITIES



## WALTER VALERY Mining

His holistic approach to process optimization is breaking new ground in resource sectors. With a team that works in partnership with companies around the world, Walter cuts costs, shortens payback periods, and minimizes the effects of big industry on the environment.

Challenging, tighter market conditions are driving the mining industry to improve productivity and reduce costs. With process optimization and the benefits of bulk-ore sorting, we're finding new ways to cut operating expenses. And that's bringing whole new levels of productivity and profits to your operations.

Metal prices are low and new ore deposits have lower grades and are complex and difficult to exploit. We are also facing growing challenges associated with the cost and supply of energy, water, and more stringent legislation. So, we need to think about improving resource efficiency. How to do more with less—that is, maximizing value of the mines with less impact. This focuses on economic savings (ore-resource efficiency) as well as environmental and sustainability benefits (eco-efficiency).

Thus, we consider alternative processes and practices. But every ore body and mining operation is different, so we need to tailor the solutions to suit. Perhaps high-intensity and selective blast designs to improve blast fragmentation and decrease energy consumption and increase throughput in downstream comminution circuits. In-pit crushing and conveying may offer a more cost- and energy-efficient method of removing material from the pit. Preconcentration may be implemented (in-pit or in-plant) to remove

barren material prior to energy-intensive processing. Alternative and more efficient comminution technologies such as high-pressure grinding rolls, vertical roller mills and stirred mills may be applied in novel flowsheet arrangements together with higher efficiency classification (such as fine screens alone or in combination with hydrocyclones). Or perhaps coarser grind sizes may be targeted for the first stages of separation to reduce the amount of material requiring fine grinding. Filtration and dry stacking of tailings could reduce water losses, reduce tailings footprint, and eliminate the risk of tailings dam failure.

In the mining process, the earlier the low-grade deposits can be removed, the better the production. Processing costs drop. Energy and water consumption are reduced. And resources of every kind are used more effectively. All over the world, the bulk-ore sorting technique is being evaluated by our teams to determine its technological capability, orebody suitability, and economic viability.



# POWER DAMS & CLIMATE CHANGE

Climate change and global warming—profound issues for the planet—are once again in the spotlight. If rainfall and water levels increase or decrease more than anticipated, how will this impact the future of our hydroelectric dams, structures that depend on a specific range of water flow to produce power safely and reliably?

In the next hundred years, glacial melt is going to be both a risk and an opportunity for power dams. On one hand, it may substantially increase the amount of water flowing through some key installations. Will they be able to accommodate it, perhaps even exploit it to produce more power?

In some cases, the spillways we design today or have designed in the past may not be able to manage the water flows, especially if glacial melt continues and increases. So we need to monetize the risk of that happening and decide what to do. Designing a dam to be retrofitted easily with a labyrinth weir, for example, might be the economical solution that's needed. Or, with varying turbine capacities or even the appropriate turbine selection, it might be possible to keep operating if there's a significant increase in the amount of water feeding them.

Warmer temperatures could also lead to drought, with water being absorbed into the ground. This could mean less runoff, fewer and smaller floods, and less power production as the amount of water flowing through the dams decreases.

Regardless of how it plays out, climate change has serious implications for the safety and effectiveness of our power dams. The technology that produces these sources of clean, green, renewable energy has stood the test of time. And it's one that every geography and jurisdiction with hydroelectric potential, especially developing regions, wants to take advantage of.

Whatever their risk factors and frailties, hydroelectric dams need to be protected and maintained in shifting climates. With a near-limitless supply of water to power turbines, and

infrastructure that can last for decades—even centuries—they are still the greenest, cleanest, life-cycle source of energy we have on Earth. And, if we're willing to give some thought to the possible effects of climate change and manage the risks through adaptive and innovative design, they probably always will be.



generalfusion®

## A fused partnership for clean energy

A nuclear fusion reactor combines two isotopes of hydrogen—deuterium and tritium—to create helium atoms. The process takes place in a controlled environment, releasing clean, green energy as a by-product.

We're partnering with General Fusion, a Canadian clean-tech company, to advance its magnetized target fusion technology on an industrial scale. Backed by a world-class syndicate of investors and the Government of Canada, we're helping General Fusion design its fusion demonstration plant system—the next step to commercializing this game-changing technology.



**RICHARD DONNELLY**  
Waterpower

Making dams safe, efficient energy producers is a labor of love for Richard. He's published more than a hundred technical papers and received awards for dam engineering, safety, decommissioning, risk-informed safety assessments, and engineering excellence.

# eGRID: A NEW AGE IN ENERGY



**ALEX STICKLER**  
eGRID

In a role that runs the gamut from innovation to technology development to commercialization, Alex is constantly looking for the next great idea and figuring out how to develop it and use it best.

For over 50 years, we've known that clamping down on climate change would mean a lot less greenhouse gas being pumped into the atmosphere. Finding less carbon-intense, more renewable forms of energy that meet our needs is not without its challenges. eGRID may be the solution to one of the biggest.

As both a path forward and a philosophy, eGRID is the way to sustainable power. It's an overlap of energy sources, processes, systems, economics, and decision-making that is allowing hybrid power systems to become realities in many remote communities and commercial operations. All places where previously, clean energy would have been a non-starter.

eGRID will reduce our reliance on fossil fuels. It will affix reliable sources of baseload electricity, and strengthen clean, renewable options—hydro, solar, wind power, geothermal—coupled with energy storage.

eGRID holds a lot of promise for heavy industries like mining. It will enable the smart application of energy technologies, tailored to suit a project's needs and minimize its reliance on fossil fuels.

Remote communities will have whole new options for using solar and wind energy, reducing their dependence on diesel fuel, too. In some regions, people will no doubt have access to affordable electricity for the first time ever.

We're getting the ball rolling. We have the resources and relationships to parse the technology, maximize the power production, and move forward. We're planning to bring clean, affordable, reliable electricity to the world with eGRID.





# LITHIUM POWER

Mature technology? Check. Power density that's sufficiently high? Check. Lithium-ion batteries have been the pacesetter, driving the evolution of electric vehicles and mass power storage. Smaller, rechargeable lithium batteries have also earned their place at the table, powering computers, cell phones, and other portable electronic devices.

The lithium chemicals used in batteries must be extremely pure to prevent failure or fires. Large quantities of hazardous chemicals are needed to convert hard rock or lithium brines to usable chemicals. In places where lithium is mined or produced, the plant and the supply-and-product chain must be carefully designed to protect the neighboring community and the environment.

To meet what will surely be a continued, escalating demand for lithium, we are positioning ourselves to be a dominant player in the world market. Our clients' business drivers determine how we align our services. So we're instigating global strategies to consolidate and elevate our lithium chemicals capability, ensuring that we stay at the forefront of developments in this exciting and growing field.

We have increased our focus on the quality of the product required for both lithium-ion battery cathode and electrolyte markets. Well connected to lithium battery development teams, we clearly understand the financial impact that the success of such technological advances can have.

Our leading-edge technology is very evident in the lithium-carbonate plant we recently designed and built for Galaxy Resources. Galaxy wanted to be first to get a high-quality product to market, so we fast-tracked the project. In just three years, we completed all the test work and detailed design, and then built and commissioned a 17,000 tpa, 99.9 percent-purity lithium-carbonate plant in Jiangsu, China—the only facility in the world able to produce lithium carbonate this pure at significant tonnages. This project made Galaxy the world's fourth-largest lithium-carbonate producer and the largest in Australasia.



**GREG SHEEHAN**  
Lithium & Rare  
Earth Metals

This leading expert in project development and delivery sees a bright future for lithium power. From a base in Australia, Greg's team conducts project studies and provides consulting services all over the world.



# TOMORROW'S TECHNOLOGIES TODAY

Cleaner oil extraction  
Better batteries  
Repurposed carbon waste  
Restored and sustainable environments

## Nsolv®

Hatch is a founding member of the Nsolv® Corporation. Working with our partners, we have developed this patented, warm-solvent process to extract heavy oil in situ. Nsolv® makes it possible to access hard-to-reach reservoirs for a fraction of the traditional cost. Moreover, it uses far less energy for production and absolutely no water, cutting greenhouse gas emissions by three-quarters compared to conventional methods. The entire process occurs underground, leaving the surface environment and surrounding area undisturbed.

Beyond the revolutionary technology, we provided the architecture for an enterprise-level information-and-control system that provides robust, responsive, remote support and data access. By eliminating the need for on-site system support, we cut costs and allowed Nsolv® to enter data-sharing agreements with its clients.

The Nsolv® team was honored with a Canada Clean 50 and 2016 Clean16 Award, recognizing this significant contribution to advancing the cause of sustainability in Canada. The pilot plant in Fort McMurray, Alberta, Canada, has produced over 125,000 barrels of oil with no carbon emissions. Better quality oil for a fraction of the cost—a huge step toward a cleaner future.

## Powering a new age in mining

Diesel has historically been the fuel of choice in underground mining. Along with energy, diesel combustion produces particulates, hazardous gases, noise, and heat. These issues and the associated costs to mitigate them have been a continuous challenge for mines everywhere.

Our work and research show that when battery power replaces diesel fuel, vehicle heat into the workplace is reduced by approximately 55 percent, energy consumption can be cut by 40 to 60 percent, and greenhouse gas emissions can drop by as much as 100 percent.

At Glencore Sudbury Integrated Nickel Operations in Canada, our experts are part of an integrated team that's looking at adopting an all-battery electric mobile fleet at the main Onaping Depth mining area. It's a solution that will require less ventilation and reduce the heat generated underground, creating a healthier, less hazardous work environment. As well as project management, engineering management, project controls, and services, we're also engineering selected infrastructure areas of ventilation, cooling, ore/waste handling, and mine systems.





## Cutting CO<sub>2</sub> emissions

### Valorisation Carbone Québec (VCQ)

We're a proud partner in Valorisation Carbone Québec, a world-leading carbon-capture-and-utilization project led by CO<sub>2</sub> Solutions. There are two components to the project: capture and utilization. Capture uses CO<sub>2</sub> Solutions' proprietary, enzymatic, post-combustion technology to trap emissions from things like smokestacks and produce pure, cost-effective CO<sub>2</sub> in an environmentally friendly, sustainable way. The utilization component feeds this same CO<sub>2</sub> to other reuse-technology partners in the VCQ consortium. They use it to produce products such as methanol, dimethyl ether, acetic acid, and protein for animals.

The number of VCQ partners continues to grow, drawing from industry, universities, and governments, such as France's Total S.A. and Université Laval in Canada. The goal is to develop and demonstrate carbon-capture-and-utilization processes for large-scale commercialization that will reduce CO<sub>2</sub> emissions at the same time. This C\$20-million project will be completed in 2019.

## HBET

As part of a new joint venture known as Hatch Beijing Environment & Technology Co. Ltd. (HBET), we're building sustainable solutions to some of China's most serious environmental challenges. Zhongshe Baiqi Joint Investment Development Co. Ltd. is adding its financial bench strength to our decades of environmental experience. Together, we're developing clean technologies for state-of-the-art environmental remediation and management programs.



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# AUTOMATING INTELLIGENCE

Self-driving cars. Smart phones and tablets. Drones, simulators, and processing operations being controlled safely and reliably from a world away. It's the 21<sup>st</sup> century. Welcome to a brave new digital world.



# GET AN EXPERIENCED GUIDE TO THE DIGITAL ECOSYSTEM



**CARLO CRISTOFARI**  
Digital

He believes that used wisely, technology can be the path to better answers. Carlo draws on our diverse, differentiated skills and technologies to create better business-driven outcomes and solutions to our clients' problems.

No two businesses or operations do things the same way. So, any process, tool, or system must be able to evolve and adjust to be effective. To reap the full benefits you're looking for, it can be helpful to think of digitization as an ecosystem.

In this sense, the ecosystem we're talking about is a group of complementary organizations or companies, all of which are dedicated to getting their clients what they need and helping them reach their goals. To find the best solutions, we often pull in research organizations—universities, laboratories, and centers of excellence—and involve original equipment manufacturers (OEMs), technology companies, large asset producers, and even government support. The secret to making all these ingredients blend together optimally is the experience and industry knowledge that a true integrator brings to the recipe—the ability to parse all the options, select the best pieces for the needs of the specific company we're working with, and get the whole concoction cooking.

We've learned a few things about how organizations can prepare themselves for success on the digital journey.

**Clearly identify the outcome you want to drive.** Without a clear destination, you risk a digital transformation effort that won't deliver value. A company can spend millions and have only a minimal outcome to show for it.

**Create a roadmap.** Then find the right technology to help you follow it. These massive, sweeping changes take time. So adapt your measurements and adjust your expectations to allow new processes to become integrated. But if you find you're clocking years with no appreciable improvement, something isn't working.

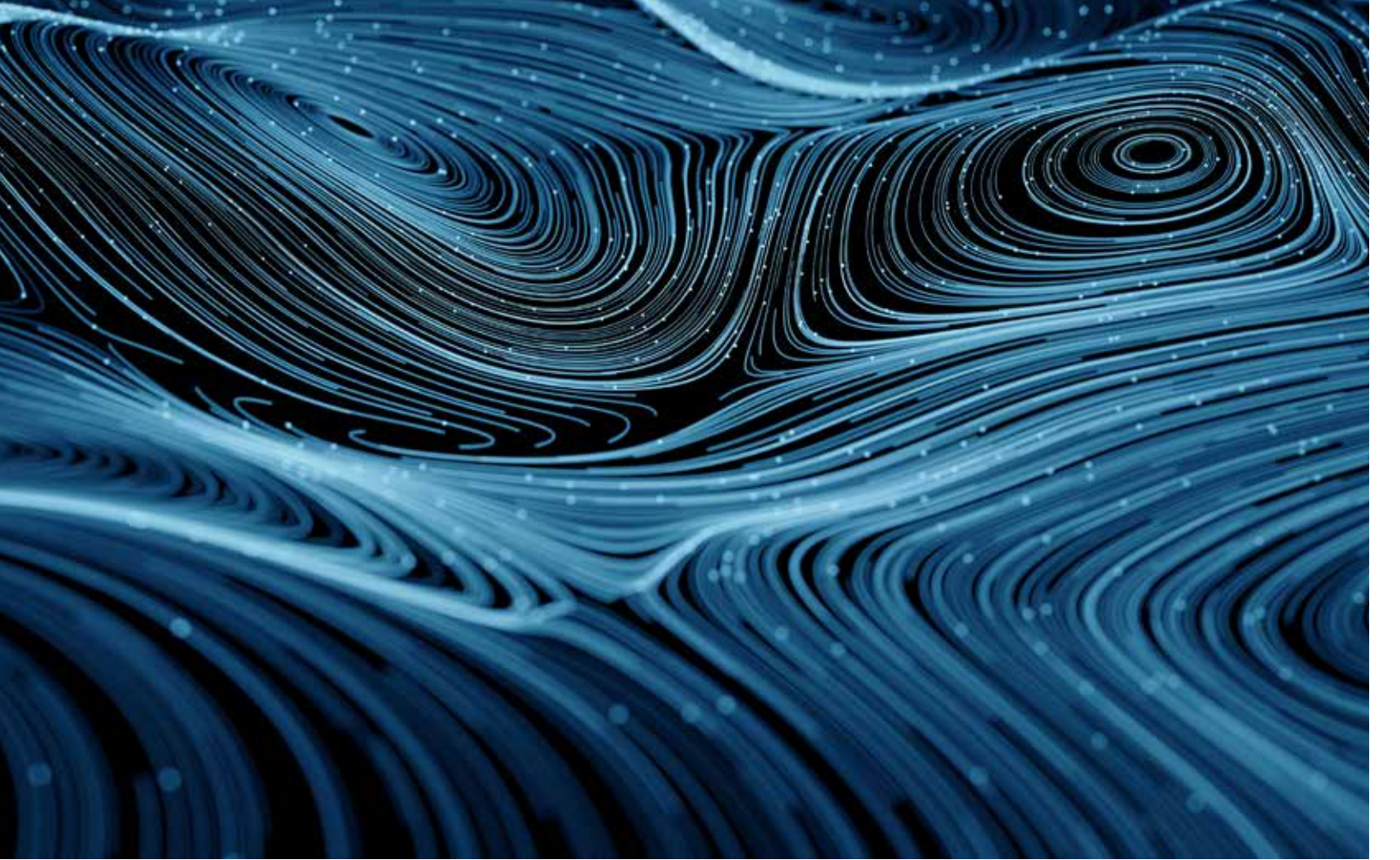
**Start where you are now.** Look at the landscape of technology and partners you're already working with. Can you rejig what you already have and start moving in the right direction, rather than roll the dice on new technology or a new OEM? Or is it better to begin with another partner, one with the right experience and knowledge to guide your transition successfully?

**Try new things.** Without alienating your current operations, test and try new ideas and technologies. Eventually, some of these promising concepts could have a significant impact on your business. Keep an open mind.

**Set a baseline for the business.** Identify bottlenecks and potential points of failure. Consider a "fitness assessment" to determine how to get your operation running at its full potential.







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## Digitalization is the wave of the future, and Hatch is in it for the long run

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**Get serious about adoption management.** Be sure to consult and involve those who will be impacted by the changes a new digital environment will create. Resistance is normal, so frame it as an opportunity for both the company and its workers to reinvent themselves. Build engagement and support from the top down. Without the commitment of people and a proper, well-planned roll-out, the project is doomed to fail.

**Pick the right partner.** Choose one who offers you depth and breadth of experience in working the digital ecosystem. Work with people you trust, who understand your industry, how pervasive the impact of disruptive technology can be, and how completely it can change the way work is done in your organization.

**Collaboration is king.** Having the right players is only half the battle. They need to know how to come together in the

space available, how to work together to create exceptional outcomes. People need to know their strengths. Roles and responsibilities need to be clear and carefully assigned.

**Hedge your bets.** Look carefully at other industries' experiences and benchmarking information. Estimate what can be reasonably attained and then watch for incremental gains in dollars or business impact.

**Look for the minimal viable product.** Think big, but focus on delivering small, carefully appointed improvements. Make sure they are consistent with the plans you've made and that your expectations are reasonable.

With the right partner to help you navigate the landscape and work the digital ecosystem, the process can be far less painful. And the results just might exceed your expectations.



# THINK DIGITAL

Less carbon-based fuel  
Smaller energy costs  
Greater safety  
Better lives

## POWER

### Bruce Power | ONTARIO, CANADA

It's on a mission to meet 30 percent of the energy needs of Canada's most populous province with safe, clean, affordable, nuclear power. To do it, Bruce Power, the world's largest operating nuclear facility, is making a C\$13-billion investment in refurbishing six of its nuclear units, replacing major components and upgrading. We're fully committed to this massive undertaking, ready to help develop and deliver the tools and systems this energy colossus needs.

Hatch was the prime consultant for the conceptual design, detailed design, and construction of the new protected area office complex. Our team was also the prime consultant for a feasibility study and conceptual design of the decontamination facility. Hatch has opened a local office near the site and signed a long-term service agreement that cements our 20-plus year relationship with Bruce Power and its community.



## METALS

### Glencore Operational Management System ONTARIO, CANADA

Digital tools and technology are smoothing operations and boosting production at Glencore's Onaping Depth mine. Digital systems are helping plan shift-level tasks, monitor task progression, and track delays and equipment availability. The objective is less operational variability and better productivity using an integrated people-process-technology approach.

Shift-level production varies for any number of reasons: task organization and scheduling, in-shift communications, equipment availability, and others. Without the visibility that digital monitoring makes possible, there is no window into the sources of variation. Underground digitalization brings a robust data-and-voice communications network to the mine face. An underground tracking system monitors people and equipment, improving safety and reducing delays. A repository for operational metrics can be created, and a real-time, mobile-based, work-management system delivers short-interval control and drives continuous improvement.







## METALS

### Vale's Voisey's Bay NEWFOUNDLAND AND LABRADOR, CANADA

Effective project implementation. Efficient, reliable, day-to-day operations. Vale is making the most of today's digital tools and technology at its remote Voisey's Bay mine expansion project on the Labrador Sea in the North Atlantic Ocean. We're bringing our experience in mining operations and up-to-date digital tools and technology to help the crew integrate information systems that will take its data management and operational decision-making to a whole new level.

Better safety, procurement, process optimization, fuel savings, and production are just the beginning. Vale's digital mine of the future is under construction. Today.



## ENERGY MANAGEMENT

### Yukon Energy | YUKON TERRITORY, CANADA

In Arctic environments, safe, reliable energy can't be compromised by cold temperatures and bad weather. So Canada's Yukon territory is counting on the future of technology, setting its sights on better, less-greenhouse-gas-emitting sources of power. Like wind and solar.

Yukon Energy is looking at a business-improvement initiative through an ISO 55000 lens. The target is its infrastructure life cycle. Starting with data-intensive analytics, expert reviews, and careful evaluations, this northern energy provider gets software and support that will help it determine how effectively its assets perform today; what mechanisms, processes, and equipment it will need five years from now; and the best way to get from here to there. Safely and cost-effectively.



# DIGITAL TECHNIQUES AND MINING AS A SERVICE



**CRAIG THORNTON**  
Digital

There's no shortage of opportunities. Craig focuses on those that digital technology now makes possible. His many years of automation, robotics, and digital-technology-development experience help industrial companies get all the advantages information technology can offer.

The mining sector has been slow to digitalize. That's changing. Today, the industry is focused on creating value any way it can. The first all-important step is to transform from a people-intensive operation to an information-intensive one. That means modernizing methods of data gathering, processing, and analysis in areas that are still largely paper-based.

The whole sector is ripe for a well-conceived, open platform designed for mining-centric applications, one that will drive productivity and efficiency. What's needed now is an "app store" for mining—an open platform and set of applications specifically designed to break down data silos and easily aggregate information from any number and type of applications.

We're making progress. New digital technologies, like cognitive computing and machine-learning predictive algorithms, are emerging. At the same time, we're seeing exponential growth in the use of sensors that connect everything, all the time, through the Internet of Things. This directional shift is being supported by almost unlimited computing power and storage capacity made possible by cloud computing. Taken together, properly applied and implemented, these three things—modern digital technology, the Internet of Things, and cloud computing—can enable step-change performance improvements across most industries. In fact, the possibilities this convergence creates are prompting some industries to completely reinvent themselves, rendering former competitors obsolete.

Today, we have an opportunity to help the mining sector reimagine what it has to offer its clients and stakeholders. By embracing the power of digital technology, miners can transform and optimize their businesses across the entire value chain, positioning their operations to be not just commodity producers, but services to their own and other industries as well. We can create environments that fuse and democratize data at any point in the process and share it with partners, suppliers, and collaborators. Never has mining seen such possibilities for optimizing business processes and creating new business models in quite the same way.

The digital transformation journey positions data to become the currency of the new digital age, enabling completely new sources of value for businesses and industries. This is the power of "and"; integrating people, software, infrastructure, and business processes on demand.

It's a new era in mining. This model is giving the entire industry plug-in, modular, scalable, and consumption-based services. With the promise of more agile, robust, and cost-effective business services, it's an idea whose time has come.

↑ **20 PLUS**  
YEARS

of delivering digital solutions

↑ **20 PLUS**  
YEARS

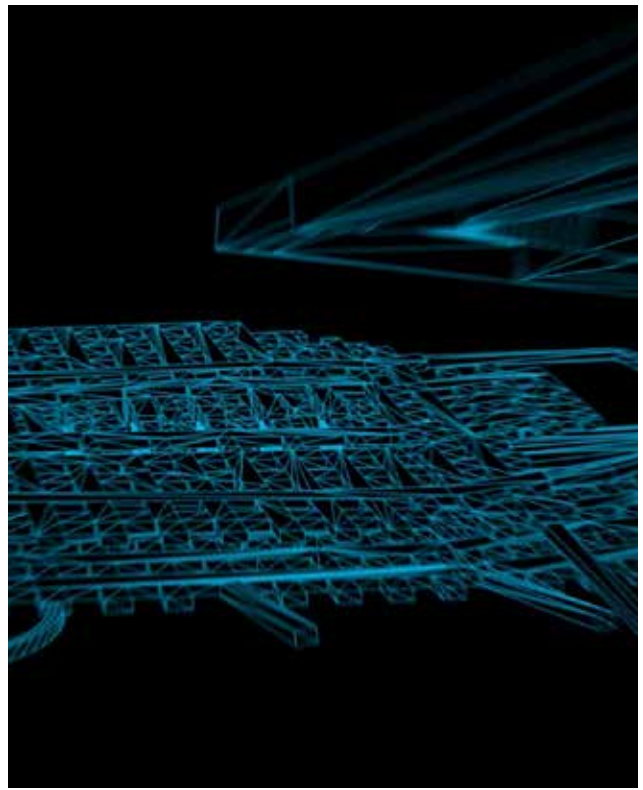
delivering advisory services, business improvements

↑ **40 PLUS**  
YEARS

delivering control, automation, and electrical solutions

↑ **60 PLUS**  
YEARS

of technologies and innovation



## Digital and drones

It was just a matter of time. Unmanned aircraft systems—UAS or “drones”—are making big changes in the way we work. Good ones, thanks to what digital technology makes possible.

Drones are flying mini-laboratories. They can collect water samples from flooded pits and tailings ponds, places that would be high-risk areas for workers. Their digital components work with all kinds of systems, connecting back to the operator’s hand-held device and on from there to any number of applications.

Drones are versatile. They can be fitted with a wide range of accessories, payloads, and sensors. They easily take hundreds of high-quality images that can be converted into accurate 3D models for design work thousands of miles away. Inspections that need scaffolding and man-lifts? No longer.

Digital technology makes it possible for drones to perform site and equipment inspections. Control remains always with the operator, who can safely and effectively manage the process from distances that get longer and longer as drones become more sophisticated and advanced. Greater distance, better safety.

## Like looking in the mirror: the digital twin

Information technology lets us create digitals of physicals—accurate, electronic representations of things like mines and operating facilities.

They’re called digital twins. Once built, we can use them and share them. To test ideas. To operate. To improve performance.

The digital twin evolves. It’s maintained over the life cycle of a project or operation, just like its physical counterpart. It gives us different, layered levels of detail, from individual pieces of equipment and how they interconnect, to process areas, to the whole value chain...from ore body to finished product.

The digital twin incorporates all kinds of data, combining live data streams from sensors, 3D models, and production and maintenance data. It factors in weather, product demand, inventory, and the location of equipment and people. It provides a platform for advanced analytics to mimic, simulate, predict, and optimize a facility’s processes and operating environment, typically consisting of no one single product or data repository. It may even be spread across on-premises and cloud environments.



A futuristic, high-speed train tunnel with blue lighting and motion blur. The train is moving rapidly, creating a sense of speed and motion. The tunnel walls are illuminated with blue lights, and the tracks are visible in the foreground. The overall atmosphere is one of modern technology and urban infrastructure.

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# BUILDING THE FUTURE

Our 21<sup>st</sup> century world is decidedly urban. Within 30 years, as much as 70 percent of the Earth's population will be living in cities, needing infrastructure, transit, systems, and services.







# SMART CITIES NEED A LONG-TERM VIEW



## **BOB PELL** Urban Development Solutions

With his team of urban experts, Bob examines and reinvents cities all over the world. Pulling all the pieces together—transit, housing, amenities, and sustainable, green-friendly environments—he's helping them meet today's needs and those of the next 50 years.

Never believe small steps can't have big impacts. Many of the problems plaguing today's urban centers can be addressed with some relatively simple optimization strategies.

We often see communities that have lost confidence in their infrastructure, usually with good reason. There's been underinvestment, poor performance, spotty delivery, and a lack of information. These are fundamental failures. So, if we can make inroads by addressing these things with careful planning—by delivering good, well-performing infrastructure at a lower, or at least a reasonable capital cost—then communities will start regaining the confidence they need to do more.

There are always opportunities for the right kind of new development. We need to find more of them, and take a longer-term view. In South Africa, a team is developing a master plan for the Durban Aerotropolis. This area is earmarked for the city's major extension to the north. Timing is key. Right now, with the development planned for the international airport, there are one-time-only opportunities to be taken advantage of. They won't come again.

There needs to be planning. In Gauteng province in South Africa, for instance, there is an integrated infrastructure master plan being prepared. It's taking a twenty-year view, assessing the needs of current and future populations, as well as the changes that are planned for the economic structure of the region. Major investments are required. Priorities need to be established and agreed to by key stakeholders. When all is said and done, the plan has the potential to optimize population movement, enable economic growth, and improve the sustainability of the resources available.

Many of our cities are ready and willing to be reshaped. Calgary, Canada, is reviewing zoning and land development around key transit hubs on its Green Line light rail transit system. There, and around the world, transit-oriented development is enabling metropolitan areas to use their infrastructure more effectively, increasing density and reducing the per-capita





“Smart” means integrating those choices with designs we can conceptualize, operationalize, and deliver well

cost of serving new populations. With forethought and the right plans, we’ll be seeing new city shapes emerge, primed and ready for the future.

Finally, we have to do more to “technologize.” Communications, control systems, and big data offer huge potential for global mobility, connecting people and information. Technology will be the enabler. Big data collects information from your city and lets us compare it to other parts of the world that may have the qualities you’re looking to develop. Benchmarking presents best practices, and that gives us a range of choices.

“Smart” means integrating those choices with designs we can conceptualize, operationalize, and deliver well. So, the smart city is the one that achieves its objectives with good, fluent use of technology. It doesn’t necessarily have to be the most advanced. But it has to be used well and done cost-efficiently.



# URBAN OUTCOMES

Purpose built  
Mixed use  
Vibrant  
Accessible  
Livable

## SOUTH AFRICA

### Durban Aerotropolis | DURBAN

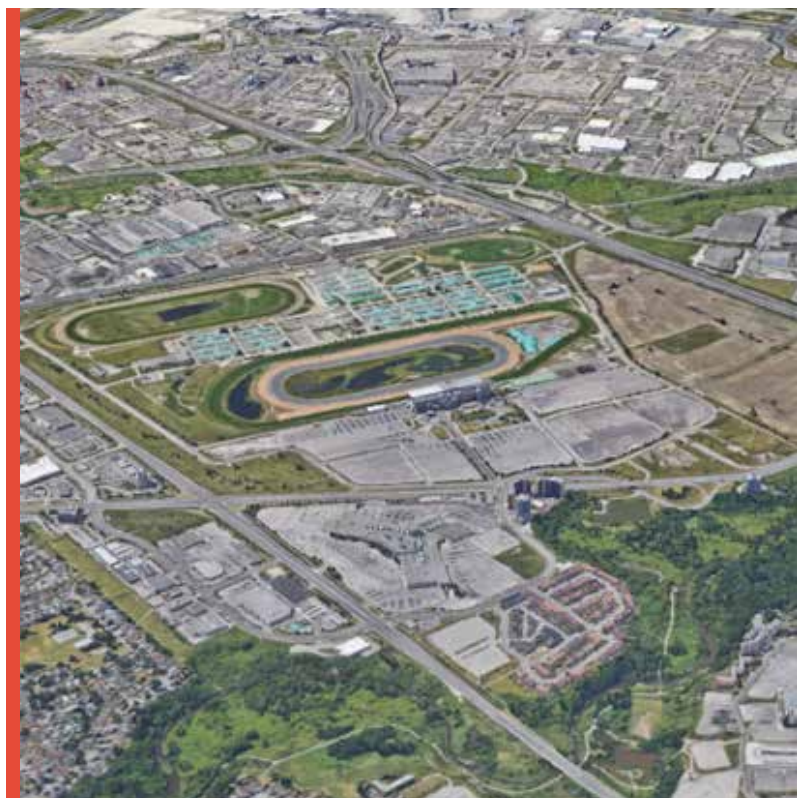
This entire region is being shaped by an airport, with a purpose-built city that's providing an investment framework in one of Africa's premier trade and business hubs. We're a key partner in the 50-year master plan. Our experts are incorporating smart city guidelines and physical and digital infrastructures. Urban and national competitiveness are bound to follow, shaping this exciting development and igniting the economy of an area that is home to 10 million people.



## CANADA

### Woodbine Entertainment complex | TORONTO

Refresh. Reuse. Repurpose. Woodbine Entertainment's flagship location is undergoing a major redevelopment. The project will create a city-within-a-city, tying significant mixed-use development—recreation, education, residential living, walkable spaces—and an innovative, site-specific transportation system to this already vibrant entertainment complex. The analysis we did for Woodbine will help it develop specific plans to optimize, fund, and implement transportation solutions. Our recommendations will help Woodbine become a much more connected place, greatly increasing access, presenting a compelling business case to government for regional transit upgrades, and optimizing density, value per square foot, and the number of jobs.





## MALAYSIA

### Constellation City | BANDAR

Our economic analysis and development strategy is helping shape a master plan that will revitalize 200 hectares in central Kuala Lumpur. This accessible public space will feature an underground city, natural spaces within walking distance, and eventually, a live-work-play community and terminus for the Malaysia-Singapore high-speed rail service. The final plan calls for mixed-use, high-rise developments and major transport interchanges including light rail transit, metro transit, and new highway and road facilities.



## MEXICO

### Cerro Norte Master Plan | LEÓN

A consortium of experts is preparing a 60-hectare mixed-use master plan for Mexico's fourth-largest municipality, with an estimated build out of 1.2 million square metres. We contributed a long-term vision and development plan for a hillside area inside the city, recommending phasing, amenities, and the overall development program. The team analyzed potential risks, considered external factors, and how to manage them. The underlying must-haves are a modern, vibrant urban area and a project that delivers significant economic and social returns.





# HOW WE'LL TRAVEL

**Our world is increasingly mobile. Lives revolve around mass transit, super highways, and busy airports. Global trade routes are interconnected webs—modern, effective transport, terminals, and networks. Intricate systems that move people and goods from continent to continent, by land, sea, and air.**

## East Harbour Transit Hub

First Gulf | ONTARIO, CANADA

A new train station and transit hub will be a gateway to East Harbour, the largest commercial development under way in Canada at 13 million square feet. Office, retail, and public realm structures will seamlessly combine with what will be the second-busiest train station in Ontario after Union Station. Light rail, cycling and pedestrian connections, and high frequency GO Regional Express Rail will give this new urban region a whole new commuting experience. The Greater Golden Horseshoe mega-city-region will be connected to East Harbour, a new precinct several kilometres east of downtown Toronto, by sustainable and high-capacity transit. Our scope of work includes financial advisory, urban development and stakeholder engagement strategy, and engineering services to First Gulf.





## Port Authority of New York and New Jersey

**New York and New Jersey | UNITED STATES**

To help it develop its 30-year master plan, we're providing the Port Authority of New York and New Jersey (PANYNJ) with integrated planning, technical, and strategic advice. We're identifying areas for improved operations, alternative revenue streams, and the optimization of PANYNJ-owned land. The goal? To promote sustainability that will align with revenue streams for perhaps the next half-century.

Efficiencies and asset holdings that are specific to the port's operations are being evaluated and rationalized. When all the pieces come together, the entire framework will help PANYNJ address questions about how useful its current operation and structures really are, and how best to position and develop them to meet the needs of the future.

## Calgary Green Line LRT

**The City of Calgary | ALBERTA, CANADA**

We're offering strategic and technical advice to the Green Line Light Rail Transit Project, helping to address the challenges of a growing population and fulfill both current and future demand for transit. Hatch is leading the project's planning, functional design, preliminary design, and program management, and providing advisory services for risk management, program delivery, contract procurement, business case development, stakeholder engagement, and support for funding application processes. In addition, we're providing technical engineering and design services for all multidisciplinary infrastructure components. We've been instrumental in developing and implementing a layered approach to maximize the benefits of the project: transit infrastructure; facilitating connections into communities; optimization of transit-oriented development; and city-shaping that contributes to well-connected, healthy, and vibrant communities.

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# ALIGNING BUSINESS TO TOMORROW

Future-focused companies want smart, strategic partnerships and new ways to deploy capital. We're putting our resources, intellectual property, and sometimes funding into the mix, finding new opportunities and making better contributions to our clients' businesses.





# INVESTING IN THE FUTURE



## ANDREW DUNN Investments

A true visionary with strong strategic instincts, Andrew has spent over 30 years advising and leading mergers, acquisitions, restructurings, and divestitures.

Throughout our history, Hatch has been backing the development of new technologies, using our deep pool of technical insight and our own creativity to realize new intellectual properties and opportunities.

We have invested the necessary capital and the time of our team members, and it's paid off. We've brought literally dozens of transformative and industry-leading technologies to fruition.

Now, we're listening to feedback from our clients. We believe there is both a demand and an opportunity to expand the reach of our investment activities. We're ready to grow the concept, to leverage our deep, technical insight beyond our traditional investment efforts. We want to identify chances that others sometimes miss—like times when financial investors overweight technical and execution risks.

When risks are overweighted this way, projects simply don't proceed. In many cases, the decision is appropriate. However, in certain industries and processes, we have the experience and expertise to reach a different risk assessment. Sometimes we can redesign

the effort to produce a more commercially attractive model that's able to achieve superior risk-adjusted returns. To capitalize on these missed opportunities, we'll be taking steps to build, own, and operate specialized projects in spaces like power generation, water supply and treatment, specialized processing, and infrastructure development.

We develop early and close relationships with our clients in the design of projects. That puts us in an ideal position to identify those with the strongest risk-adjusted returns, the ones that can add the most value to our clients' businesses. By making an informed and thoughtful assessment of the risks and opportunities, we can help move projects forward that might otherwise be stalled. Obviously, this is good for our clients. And it can generate a strong risk-adjusted return for our company and others who invest alongside us, too.







We develop early and close relationships with our clients in the design of projects

To drive this initiative, Hatch has made an investment in Canadian Shield Capital. This boutique private equity firm organizes and prioritizes our new investment program. The team is a small group of investment professionals—most with engineering backgrounds—who will work with experts in the relevant Hatch business units to filter investment options, evaluate, and prioritize this pipeline of possibilities.

Canadian Shield and Hatch are well aligned in their investment philosophies. The intended ownership horizon is longer than it would be for traditional private equity. Businesses acquired

under this program will maintain a continuing collaborative relationship with us. Together, we can drive continuous, data-driven, incremental step-process and efficiency improvements that will reduce costs and increase operating efficiency and profitability.

# ALLIANCE IS THE THING

Your goals are our goals  
Safety—first and foremost  
Your capital, treated like our own

Our Alliance program is about creating true partnerships with our clients. We're blurring the boundaries, letting strict definitions of client and service-provider roles flex and flow. To get results that are outstanding, we're willing to sacrifice the acceptable.

## ROLLED ALUMINIUM PRODUCTS

**Constellium Rolled Products | UNITED STATES**

An integrated Constellium-Hatch team installed a new 800 Kt ingot pusher furnace in this US\$35-million project at the Ravenswood, West Virginia plant, one of the largest facilities for manufacturing rolled aluminium products in the world. A new building extension and the demolition of an existing furnace on a complex brownfield site meant the team worked more than 120,000 hours over 18 months without a lost-time incident.



## IRON & TITANIUM

**Rio Tinto Fer et Titane (RTFT) | CANADA**

Our alliance with RTFT goes back more than 60 years, when it was one of the first clients our founder, Gerry Hatch, worked with. Over the decades, our best people have applied their skills and know-how to ongoing operations and major projects with RTFT, ones that sustain capital and give rise to unique technologies that no one can emulate. At any time, we have a core team of as many as 50 people on-site there. They are supported sometimes by hundreds more in our local office across from the plant and our facilities in Montréal and Mississauga.

We know RTFT's plant like it was our own. We've been trusted with knowledge preservation, planning, and forecasting, and managing some of its biggest challenges, like shutdown planning. A true partnership, we provide cost-savings strategies, and cost-avoidance ideas and advice. Once implemented, those ideas typically save 20 percent over the annual capital plan.







## ALUMINIUM

**Emirates Global Aluminium (EGA)**  
**UNITED ARAB EMIRATES**

Recognized for our business management experience in the aluminium space, EGA has relied on us for its operations at Emirates Aluminium (EMAL) and Dubai Aluminium (DUBAL). With experts in a broad range of business and development disciplines, we provide the link between the developer-operator and the lending group, meeting some of the most stringent technical completion requirements ever undertaken by an aluminium smelter.



## NICKEL

**Vale | CANADA**

Our long-standing relationship with Vale is one of our strongest alliances, one that has expanded to locations all over the world. To speed Long Harbour's race to become operational, we organized and incorporated close to one terabyte of existing data, including 43,800 engineering and vendor deliverables from over 350 vendor packages. The project became a model for how modern digital tools can save time and money, expediting processes accurately and reliably.



## ALUMINIUM

**Alcoa | CANADA, UNITED STATES**

Since the year 2000, we have been Alcoa's EPCM partner in the Northeast region, allowing it to focus on what it does best—produce aluminium—while we deliver the projects. During this period, we've successfully completed over 1,600 projects with a total installed cost of approximately C\$1 billion. With rigorous application and monitoring of both individual project KPIs and those of overall programs, this alliance has delivered outstanding outcomes: industry-leading safety record with over six-million hours worked; greater than 95 percent of our projects delivered below Alcoa-approved budgets; 90 percent of project milestones met; and consistently, 95 percent client-satisfaction levels attained.

Today, the Alcoa-Hatch Alliance includes Aluminerie de Deschambault, Aluminerie de Baie Comeau, and Aluminerie de Bécancour Inc., in Québec, Canada, and the Lake Charles plant in Louisiana in the United States. Our collaboration continues to develop and deliver best practices in sustaining brownfield-site projects, maintaining the same high standards of quality, health, and safety.

# THE DEVELOPMENT PARTNER INSTITUTE



*DPI is creating broad, collaborative leadership in the mining sector, encouraging operations to become developmental hubs that will leave positive contributions to local societies, economies, and the environment.*

—John Bianchini,  
Chairman & CEO, Hatch

*Together we're on a mission to fundamentally change the mining industry's extractive business model from insular and reactive to integrated and proactive, ultimately delivering economic, environmental, and social shared purpose to the communities where we live and work.*

—Peter Bryant,  
Board Chair of DPI

## Global prosperity through innovation

We're at the dawn of a new age in mining. The challenges we face are too big to be solved by any one organization or sector element. We need something bigger—a neutral, multistakeholder forum where we can come together to discuss issues and the best ways to address them.

The Development Partner Institute (DPI) is that forum. Hatch has become a convening member of this focused partnership whose members and supporters are our key mining clients, supporting organizations, not-for-profit, and educational institutions.

Corporate responsibility is an enabler of investment. But there's much more to it than that. We want to be a positive influence and change agent for the communities in which our projects are located. We want to be able to live and work in these communities with integrity. For that to happen, we need to nurture long-term relationships and

make decisions as though these developments were taking place in our own backyards.

Mining companies can contribute to society for generations, significantly and positively. But we can also have a disproportionate impact on the communities where our operations are located. These are often small and isolated, among the least able to cope with the changes our developments bring.

All stakeholders—mining companies, authorities, regulators, academics—have a moral obligation to work together and create broad-based prosperity in the areas where we mine. To nurture and protect an overall livable, sustainable planet.

It's an obligation we accept. We're prepared to work hard to meet it.



### **The DPI Mission:**

- Advance and extend innovative thinking
- Build bridges with groups that have a stake in mining
- Engage the mining ecosystem



### **DPI's key functions:**

- Convene
- Catalyze and incubate
- Advocate
- Research
- Educate



# PUBLIC-PRIVATE PARTNERSHIPS

## How to create better conversations between governments and investors

Wherever you find governments enthusiastic about exploring public-private partnerships (P3s), it's a safe bet that their primary interests are finding new sources of funding. They face rising costs to maintain their existing assets. They're reluctant to use revenue tools to source new capital, and they want to believe that the private sector will see value in investing in new infrastructure projects. Not always.

There are a few important considerations to bear in mind.

First, many governments fail to appreciate how the private-sector components of P3s deliver real, tangible benefits with their design-build-finance-and-maintain models. The most important way is by letting government transfer the big risks of construction and maintenance to them. These risks—construction and maintenance—are the essential elements that invariably lead to huge cost and schedule overruns when governments deliver the projects themselves.

Second, P3s force groups of talented designers, builders, financiers, and maintainers to come together to respond to RFPs, creating competitive tension both between and within the consortia. This reliably translates into bids that have lower costs. Further, this pool of talented private-sector partners delivers design, financial, and scheduling innovations. This ultimately results in assets that are more efficient and more effective.

Third, P3 project agreements force governments to be disciplined and specific about the design, construction, operations, and maintenance outcomes they're trying to achieve. The typical P3 procurement process also allows governments to triangulate the cost of their desired outcomes and specifications by collating feedback from multiple bidders to a single common draft project agreement.

Finally, the arrangements have fiscal profiles that are beneficial to political leaders. Rather than paying costs as they come up, governments can rationalize them over a longer period of time. In all cases, substantial completion payments (which typically represent a considerable portion of the costs) are only paid once a government is satisfied that the assets have been built to its satisfaction.

For P3s that meet these criteria, there is a robust community of investors more than willing to fund these projects for government. Since the inception of the program in Ontario, Canada, close to C\$3-billion worth of infrastructure projects have been financed by P3s. Half of this money has come from investment funds, 31 percent from insurance companies, 12 percent from banks, and 7 percent from pension funds. But even where governments make full use of P3s to fund projects, the need for private capital remains acute. Governments simply don't have the money to deal with infrastructure deficits.

Private investors are looking for a combination of three things when they're deciding where to invest: cash flow certainty, a track record of positive performance, and a sizable equity investment.

Hatch's diverse skill set positions us to meaningfully impact the P3 space. We understand the mechanics of infrastructure construction. We know about the risks involved in building transit systems, ports, airports, and water and wires infrastructure. We have deep, long-standing experience evaluating the financial, social, and environmental parameters of infrastructure projects all over the world. We also know how to structure financial deals between governments, industry, financiers, and local stakeholders. We can prepare to cover off all the contingencies and drive better, more results-oriented and productive conversations between government and business. We have the ability to structure and deliver better projects to end users, and by doing so, bring about positive change.



**CHETAK SHAW**  
Infrastructure  
Planning  
& Advisory

Companies considering large infrastructure investments turn to Chet for strategy and vision. He helps them evaluate investment rationale and objectives, and guides them in translating these goals into actionable plans.



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## EMPOWERING PEOPLE

Responsible, successful companies are like the people they serve. Good citizens, leaving the communities they work in better than they found them. Tangible, meaningful benefits today. A legacy of positive change for tomorrow.





# SUSTAINABLE BUSINESSES EARN THEIR KEEP



## OLIVIA GAMACHE Environment and Social Responsibility

Olivia sees the human side of industrial development projects. She makes sure communities in those areas get their share of benefits, like local employment, business development, training and capacity building, stakeholder engagement, and thorough, genuine consultation.

Social license means leaving a place better than we found it.

It's been said that the best reward for work well-done is the opportunity to do more. We need to earn those chances by gaining the respect of the communities where our operations are located. That means leaving a community better off than we found it—creating positive change with diversified economic development, employment, education for children and youth, and environmental well-being.

In the past, big companies have sometimes been seen to have a self-serving attitude. This has left a tragic legacy of mistrust. Gone are the days when a company's project team could arrive in a community, set the terms under which they would operate, take what they need, and leave. Today, there's an emphasis on the intangible and unquantifiable aspects of industry operations—honesty, integrity, and positive intentions. Delivering on these is often the hardest thing to do well.

Communities that are being asked to host projects are understandably reluctant. So we have to earn our

way in and build trust. How? With partnership and sharing. Reconciliation. Compromise. Fairness.

**Develop relationships early.** Don't assume that communities will oppose any development. That isn't necessarily the case. Our vision is to be a trusted partner, not only with our clients, but with the communities where our projects are located. Early engagement, if done correctly and respectfully, can benefit the development immensely and give sustainability goals a boost. Have meaningful discussions with the people. And do it long—years, even—before shovels break the ground. Be sure that planning and partnership efforts are clearly demonstrated in the construction and operation phases of the development, too.

**Keep an open mind.** Be prepared to listen, not talk. Leave engagement plans behind, along with the here's-what-we're-going-to-do-for-you attitude. Commit to transparency. Any plans for mitigation or accommodation must be about the community's vision for







## A social license to operate must mean economic viability, profitability, and sustainability

itself, not yours for them. Start there, where they are, and bridge the gap of understanding.

**Recognize that each community is unique.** Each area or community has its own priorities and ideas about its own potential. Building social license means taking their individual inputs seriously—hopes, dreams, and aspirations for the future—and tying those to benefits that the project can deliver. Let their ideas be the guide, and demonstrate how your plans can overlap with their goals. As you take something, leave something of value behind, like social programs, training, or employment opportunities.

**Make connections with infrastructure.** Development partners can be catalysts for long-term growth. It's the physical things—the roads, buildings, transportation, and infrastructure—that can give a community a quantum leap in the direction it wants to go. But their culture,

traditions, and values need to be respected and nurtured if we're going to win the trust and confidence that make those developments happen in the first place.

**Don't underestimate the cost of conflict.** Loss of social license and the ensuing cost of conflict have very real financial implications. But there can be more than capital at stake when our integrity is put on the line and we fail to follow through.

A social license to operate must mean economic viability, profitability, and sustainability. Not just for the company doing the developing. Be willing and able to enhance people's quality of life. Build a community that not only survives, but diversifies and flourishes. Do this now, and do it right. You'll leave behind the kind of gift that keeps on giving. One that will have residents inviting and welcoming you back for generations to come.

# PEOPLE FIRST

Think long-term sustainability  
Build partnerships on trust  
Share the wealth

## SOUTH AFRICA

### Better health care, higher learning | KWAZULU NATAL

More positive practice environments. Greater job satisfaction for primary health-care clinic nurses. The new nurses' residence we helped to build just extends the relationship we already have with the people of KwaZulu Natal. Earlier, we connected McMaster University in Hamilton, Canada, and the University of KwaZulu Natal. These two institutions of higher learning, thousands of kilometres apart, have come together to create educational and research collaborations that will spawn the next generation of innovators and problem-solvers.



## NEPAL

### World Bank and the Federal Democratic Republic of Nepal | NEPAL

After a major earthquake devastated Nepal in 2015, the World Bank and the Nepalese government retained our experts to establish state-of-the-art dam safety regulations and guidelines. But we didn't stop there.

Critical to Nepal's ongoing safety and development was preparing its engineers to manage the new, updated facilities and familiarize them with best-practice risk-management strategies. Our team hosted two workshops to share information and expertise. The first explored the probable failure-modes analysis methodology used to evaluate the risks associated with one of the earthquake-damaged facilities. Participants included experts from Total Management Services (our local sub-consultant) and observers from the government of Nepal. The second session covered best practices in dam safety with a focus on risk-informed decision-making. Members of the local engineering community, the assistant dean of engineering from the University of Kathmandu, and government officials were all in attendance.







## UNITED STATES

### Blueprint Columbus | OHIO

This urban-environmental strategy will serve as the “blueprint” for the Ohio capital’s wet-weather program, and Hatch was selected to work on designing sustainable solutions for the City’s Kent/Fairwood neighborhoods. The plan incorporates proven green infrastructure techniques while greatly reducing the inflow and infiltration that contributes to sanitary system overflow, improving water quality, and mitigating flooding.

Beyond the conventional “grey” stormwater solutions, the Blueprint mandate calls for multiple green spaces that will beautify neighborhoods, improve ecosystem function, and serve as catalysts for local businesses, employment, and economic development. We’re working with the City and its stakeholders to develop regional and localized strategies that treat stormwater through bioretention and porous paving systems. These green best-management practices will be located within existing street right-of-ways, city parkland, and vacant land-bank parcels.



## UNITED STATES

### The Braille Trail, Massachusetts Department of Conservation and Recreation | MASSACHUSETTS

Watertown Riverfront Park on the Charles River in Massachusetts provides a critical link for the state’s Charles River Reservation system. After years of use and neglected maintenance, the state Department of Conservation and Recreation hired Hatch and our subconsultants to provide sustainable solutions for the restoration of the 1.5-mile-long swath of parkland.

The sustainable landscape management plan included bank restoration utilizing bioengineering techniques, the selective removal of invasive species, and the restoration of native plants to improve habitat and promote biodiversity. Site improvements were highlighted by the inclusion of a Braille Trail and “Sensory Garden” to serve the students of the adjacent Perkins School for the Blind, the oldest school for the blind in the country. The Braille Trail is a quarter-mile loop around a “Sensory Garden” that uses a guide wire and wooden beads to allow the visually impaired to navigate independently through the park. The trail design emphasizes touch, hearing, and smell, and includes interpretive braille elements highlighting historic and natural features of the region.

# PARTNERSHIPS WITH NATIVE PEOPLES

Successful projects need more than engineering know-how and technical expertise. We commit to having a positive, lasting effect on area communities and the lives of local inhabitants. Education. Health care. Good, safe, well-paying jobs and business development opportunities.

**We promise. We deliver.**

Canadian Council for Aboriginal Business's Progressive Aboriginal Relations (PAR) program

#### Canada

Our participation in this sustainable-business-relations organization has strengthened our Aboriginal relations and solidified our commitment to Indigenous communities in Canada and worldwide.

Chiefs of Ontario Mining and Environmental Assessment Workshops

#### Canada

We're helping to develop and deliver mining-and-environmental-assessment workshops that target the Ring of Fire mineral belt in Northern Ontario, Canada. The local Matawa Tribal Council will then be better able to contribute to discussions about sharing in the benefits of the area's development.



**Outreach Award**  
from the Canadian  
Consulting Engineering  
Awards program



**Workplace System  
Leadership Award**  
from the Aboriginal  
Human Resource  
Council



# TRAINING TOMORROW'S INNOVATORS

At schools in Australia and Canada, we're helping pave the path to learning for young people. By partnering with universities to provide opportunities, Indigenous students get the knowledge and skills that today's well-paying jobs in business and engineering demand. By feeding the education pipeline, we're developing the skills and technical excellence our next generation of engineering professionals will need.



## Australia

### **Hatch Indigenous Scholarship for Postgraduate Coursework**

An annual scholarship provides financial assistance for an Indigenous student, preferably from Western Australia, to pursue the Master of Professional Engineering program at The University of Western Australia.

### **Hatch Indigenous Engineering Scholarship**

This endowment supports Indigenous students who have chosen to study engineering at Curtin University. It is awarded based on academic merit to a deserving student enrolled in their second year of the program.



## Canada

### **Northern Communities Outreach Initiative**

Established in 2013, this program inspires youth to pursue a career in engineering and builds a pipeline of Aboriginal talent for engineering work and projects in British Columbia, Canada. This outreach initiative has brought real-life engineering challenges and hands-on classroom experiences to more than 950 students in Grades 8 to 12 in remote northern communities.

### **Aboriginal Mentorship Program**

Developed by Lakehead University, this program identifies science students as mentors and then partners them with Aboriginal high-school students from across Northwestern Ontario. Our donations have supported the Science Aboriginal Mentorship Program and Engineering Aboriginal Mentorship Program.

### **Saskatoon School Board and the Bedford Road Collegiate**

Our Aboriginal Engagement committee is working with these institutions to promote Indigenous students' engagement in education. Plans are to expand the program to the grade-school level, focusing on inner-city schools with high numbers of Aboriginal students.

### **The Saskatchewan Indian Institute of Technologies**

A computer-aided design/computer-aided manufacturing program is now being developed that will focus exclusively on Indigenous students.

### **Indigenous Peoples Industry Partnership Program (IPIPP)**

Through this program, we provide summer employment and financial support to Indigenous students, including a grant during the school year.

### **Undergraduate engineering scholarships for Aboriginal students**

University of Toronto, Queen's University, McMaster University, and most recently, the University of British Columbia all receive our financial support to assist Aboriginal students. Recipients are invited to work as interns at Hatch offices over the summer months to gain practical experience to complement their academic studies.

*We believe in building relationships with Aboriginal groups in order to broaden our understanding, to learn, and to work together to build stronger communities.*

—John Bianchini, Chairman & CEO, Hatch  
First Peoples Engagement Strategy

# COMMITMENT TO OUR COMMUNITIES



## The Oakville Trafalgar Hospital solar array

The Town of Oakville, a community adjacent to our corporate headquarters in Mississauga, Ontario, Canada, was relocating and rebuilding its general hospital. Hatch donated a 500-kilowatt solar array to generate power, sustainably and cost-effectively. The electricity produced will provide the Oakville Hospital Foundation with revenue of C\$6.35 million over a 20-year period. We're proud to have contributed innovative, leading-edge technology with minimal operation and maintenance costs to this important community health facility.



## Innovators—the next generation

Hatch teams up with several technology companies and North American high-school students to design, build, and program...robots!

FIRST Robotics—a registered charity and volunteer-run organization—facilitates the mentorship and learning of youth in North America, inspiring careers in science, technology, and engineering fields.

*For decades, we have inspired innovation and encouraged an entrepreneurial spirit in the industry. Part of this is understanding the importance of mentorship and the impact it has on helping to develop tomorrow's innovators and leaders.*

—Joe Lombard, Member of FIRST Robotics Advisory Board



# A workplace for everyone Who we are Who we choose to be

Every day, we operate all over the world in a spirit of collaboration, crossing geographical boundaries, languages, and cultures. It's what makes us a truly differentiated, global company. Our exceptional, diverse teams combine vast engineering and business knowledge, applying them to the world's toughest challenges.

Diversity and inclusion are integral elements of our identity. We know their value and are committed to living, breathing, and respecting them. We understand that in a successful organization, people with different backgrounds and varied perspectives spark innovation and drive great ideas. Increasing their representation is not only the right thing to do from a social perspective. It's the right thing to do for our business.

Each of our global regions has a diversity and inclusion committee that oversees programs and initiatives to ensure a fair, tolerant, and welcoming workplace for everyone. A pilot program that focuses on inclusive leadership training has been launched in the Eastern North American region, to be followed by one in South America, and then each of the other regions. Future plans include strategies to address the underrepresentation of women at senior levels of the organization by examining the corporate pipeline and how it can be improved to bolster their access.



## Learning to achieve no harm

Safety is a core value, woven seamlessly but deliberately into everything we do. Each of us has a role to play in improving our safety culture and performance. Our new, rejuvenated safety model does more than establish a global safety standard. It recommits us to global safety excellence.

Hatch pledges to achieve no harm—in our facilities and on our project sites. From the use of hand-rails for safety on stairs to wide-ranging measures in a mining or construction site, we want to mitigate risks before incidents or accidents occur.

Because everyone should be able to return home safely at the end of the work day.



# AN HONORABLE MAN

Hatch's Bert Wasmund joins  
*The Order of Canada*

*Bert's vast, varied contributions have been instrumental in solving some of the industry's most complex engineering challenges over the last 50 years. But he himself has impacted the many engineers who have followed him—including me—for generations now. We are proud to celebrate his passion and leadership as he receives one of Canada's highest honors.*

—John Bianchini, Chairman & CEO, Hatch





## Congratulations Bert. We're proud to salute—and celebrate—you.

Established by Queen Elizabeth II in 1967, it is one of Canada's highest civilian honors, awarded to only a few special individuals each year. Membership in the Order of Canada is recognition of outstanding achievements, but of a special kind. The award transcends geography, backgrounds, and industries. Still, all who receive it share one important hallmark: They have enriched the lives of others and had a significant impact on the entire country.

Dr. Bert Wasmund, now in his 51<sup>st</sup> year of service at Hatch, joins our founder, Dr. Gerry Hatch, in the elite Order-of-Canada company. Gerry received his insignia—a six-point snowflake with a red annulus containing a stylized maple leaf—in 1997. Now, twenty years later, Bert was one of 99 individuals invested into the order in 2017, part of Canada's 150<sup>th</sup> anniversary celebration.

It was in the mid-1960s that Bert joined Hatch—then a small, dynamic engineering firm in the mining and metallurgical industry. He soon became known for his technical acumen and innovative approaches to solving long-standing industrial problems. Bert's breakthrough contributions to many metals operations in Canada and abroad have improved productivity, cost-effectiveness, and energy efficiency as well as environmental and workplace safety performance.

Throughout his career, Bert has received worldwide recognition for the productive, innovative technologies he has created. Many of his seminal works for specialized metallurgical reactors have been patented. And, as the Order of Canada's criteria for recipients stipulate, his contributions to others and the country go beyond engineering, mining, and metals.

Bert has served on advisory boards for applied science and engineering at Canada's Queen's University and the University of Toronto. He has personally supported and helped develop endowments and scholarships. In 2011, he created the Wasmund Family Aboriginal Scholars Award to provide funding for worthy students to receive honorary four-year degrees and achieve the highest levels of academic accomplishment and achievement.

Other organizations have acknowledged Bert's contributions with their own accolades. He received the Noranda Airey Award in 1998, was inducted into the Canadian Mining Hall of Fame in 2011, and Ontario Professional Engineers presented him with its prestigious Gold Medal in 2012. Bert was also granted honorary doctorate degrees from Queen's University and the University of Toronto.

At the Order of Canada announcement ceremony, his Excellency the Right Honourable David Johnston, Governor General of Canada, said, "The individuals on today's list...are truly inspiring as they have helped to build the smarter, more caring nation that we, as Canadians, are all so proud to call 'home'. Let us celebrate these remarkable individuals today and every day!"





## About Us

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.

[hatch.com](http://hatch.com)

