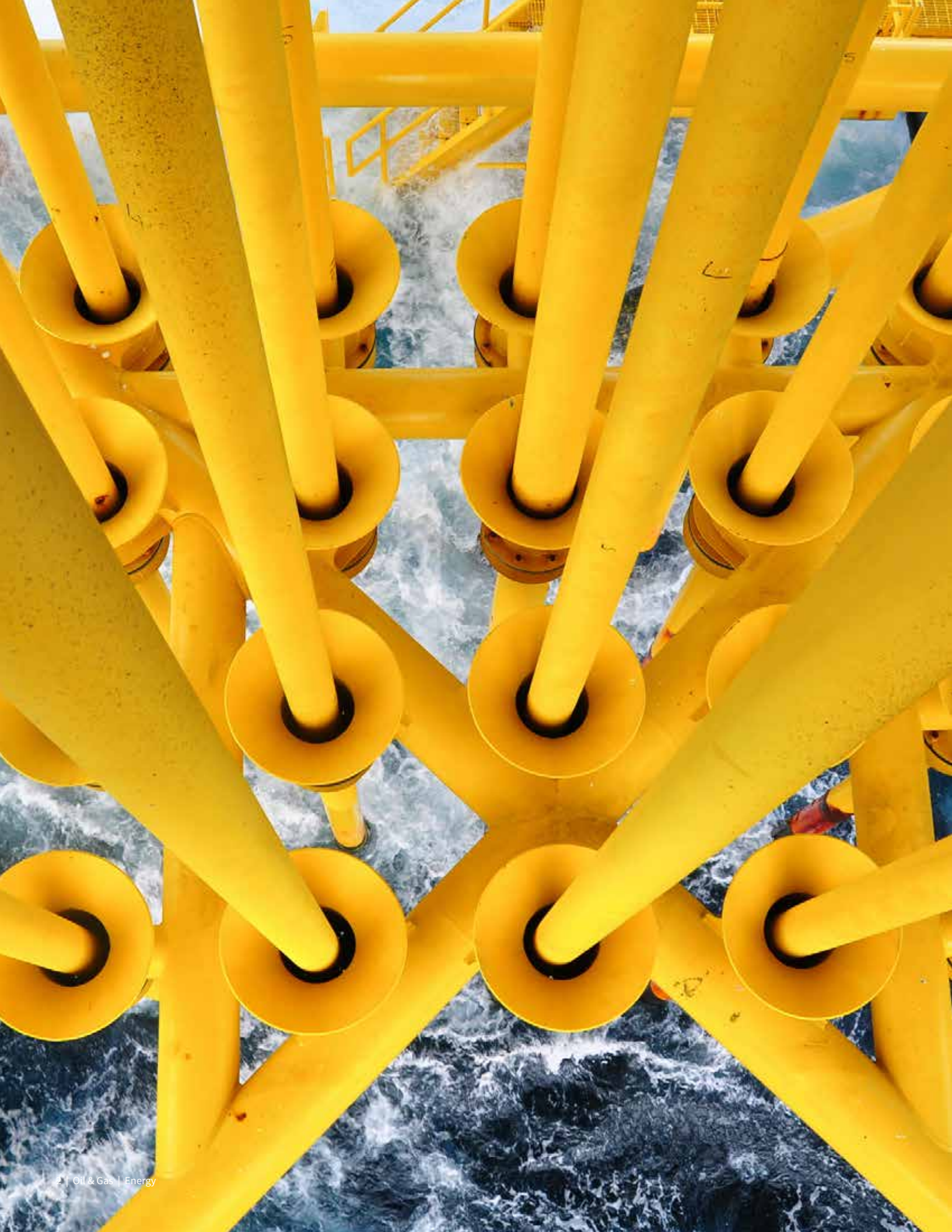




+ Oil & Gas





# A new era for oil & gas



Across the globe, demand for oil and gas continues to grow. At the same time, the industry is realizing it must come to terms with new pricing levels, ever-increasing environmental consciousness, and a shift to producing less carbon intensive forms of energy.

Today, companies like yours are focused on the bottom line. Conventional oil and gas developments are seeking to extract maximum value out of existing facilities and for new investments. They're looking to reduce capital expenditures by shaving down the size of their projects and rolling them out in phases.

Unconventional sources of supply are also evolving. Heavy oil, tight oil and gas, oil sands, oil shale, waste, and biomass are all being investigated, pursued, and perfected where the economic and strategic conditions are right.

Hydrocarbons, both oil and gas, are being found in new areas. More pipelines, rail, and marine infrastructure are needed to transport it.

New extraction and production technologies have increased natural gas's contribution to the global energy mix, helping the power

sector transition to more flexible, lower carbon generation. Interest in gas monetization opportunities, like gas-to-liquids (GTL) and liquefied natural gas (LNG) is strongly gaining interest as a transportation fuel.

To thrive in this complex, shifting environment, you need your projects to become leaner, smarter, and simpler. They need to be better executed—more quickly and efficiently. That means utilizing strategies and innovations that cut capital outlays and operating costs without compromising the integrity of your operation.

You need innovative solutions, in-depth industry knowledge, and new technologies that can reduce capital intensity and your environmental footprint. In short, you need to maximize value.

We can help.

# Upstream

Hydrocarbon markets are complex. The long-term health of the oil and gas industry will be determined by how well we adapt and transition into a new era of challenging markets.

This means re-evaluating how we explore, extract, and produce resources sustainably and safely to satisfy ever-increasing consumption habits, new technology, and evolving regulations.

As economies grapple with resource constraints, it is imperative that we unlock stranded resources by leveraging technology and digitalization. Doing so will be key to reducing costs, improving safety, and limiting the effect of emissions on the environment.

The market has its challenges, but these challenges present massive opportunities and are in fact catalysts for making real change. Let us help you extract more value from your assets.

## Field development planning

Whether it's unlocking the most remote reserves, overcoming the harshest environments, or commercializing the most marginal of fields, we've got the expertise and innovation to maximize the value from your development opportunity. From reservoir to market, we bring a fully integrated and customized approach tailored to align with your business drivers and project delivery processes. A 'one-size-fits-all' approach is no longer good enough and there is no substitute for in-depth subject matter expertise. We deliver the ability to undertake reservoir uncertainty and lifetime variation analysis, while providing you with process facility design, rotating equipment expertise, screening tools, and cost and bench-marking data, all of which is provided with a clear audit trail for decision-making.

## Onshore, offshore, and subsea engineering

Offshore real estate is limited and expensive. We have to 'fit' facilities into a confined space while ensuring the facilities keep the people on board safe and equipment maintainable. Transporting the fluids from the seabed requires a deep understanding of fluid flow and operating philosophy to avoid blocking flowlines through hydrates. Onshore, our challenges are often to do with logistics and remote locations. Equipment must travel by road and fit within very defined transport envelopes. Multi-train solutions are most prevalent. Our knowledge lets us design the most economic and environmentally friendly facilities.

## Production facilities design

When it comes to production facilities design, we seek to maximize your operation's output from the offset—from well tie-ins, gathering systems, field compressor stations, phase separation, gas dehydration and sweetening, to produced water handling and disposal. This also means assisting with difficult issues around emulsion breaking and multi-phase flow measurements, as well as installing communication systems that will allow you to monitor and control facilities remotely. We can help you optimize existing installations and expansions, while analyzing the most cost-effective arrangements of modifications.

## Enhanced oil recovery (EOR)

The right techniques for enhanced oil recovery can maximize the amount of oil and gas that can be recovered from your assets—and do it more quickly. We have the know-how to deploy technologies for CO<sub>2</sub> miscible floods, thermal





recovery, water floods, and polymer floods while also helping you to maintain and enhance reservoir pressure and design artificial lift systems to optimize oil and gas production to the surface, unlocking value and maximizing revenue.

### Carbon capture, utilization, and storage (CCUS)

As we continue on our journey through the global energy transition, CCUS will play a prominent role in helping oil and gas producers to lower their carbon footprint and allow strides to be made towards a goal of net-zero emissions. We combine a long history in the design and execution of surface facilities to capture CO<sub>2</sub> and couple that with established EOR experience to utilize and sequester CO<sub>2</sub> in both depleted oil fields and other geological formations, such as deep saline aquifers.

### Oil sands, oil shale, and mineable oil recovery

From mining through to ore preparation, hydrotransporting, extraction, tailings, and upgrading—responsible development is key to the industry’s sustainable development. Efficient bitumen recovery, minimization of environmental impacts, and effective project management and execution strategies are the drivers for growth. Developers involved in extracting and producing unconventional oil products need cutting-edge technology to maximize returns and minimize impacts on the ecosystem. Tools such as computational fluid dynamics and finite element analysis help prove the viability and efficiency of our clients’ projects.

Our services range from design to operations, covering everything in between. From conceptual design and mine planning, to mine development, bitumen processing and utilities, as well as offsites—we can deliver the full suite of upstream oil recovery services.

### Subsurface engineering and geoscience

Our specialists in petroleum geology and subsurface engineering partner with you to enhance the profitability of your oil and gas properties, as well as provide strategic evaluations regarding long-term asset management. We can assist you with your field development planning, and work with you from initial exploration programs and characterization of your resource through recovery scheme selection and implementation.

### In-situ solvent extraction

Hatch is the owner Nsolv<sup>®</sup>, an in-situ solvent extraction technology for the production of bitumen. Nsolv<sup>®</sup> uses less energy and produces 80 percent less greenhouse gas emissions than traditional methods. It uses no water and very little natural gas in the extraction process and produces a better-quality oil and a higher return on investment.

### Smart asset support

Combining our digital practice specialists with our oil and gas expertise gives powerful insight to support your asset. We don’t just monitor your asset, we understand it and have the knowledge and experience to improve it. This deep understanding allows you to truly unlock the value of digitization.

# Midstream

Stringent regulations. Increased public scrutiny. Remote production locations. Extreme weather events. The midstream oil and gas business is becoming increasingly complex.

Navigating inherent complexities requires big picture thinking and a willingness to critically assess all parts of the process in an integrated fashion—processing, transportation, and storage. To be successful, the whole industry needs to work together to drive profitability and minimize environmental and social impacts, while always maintaining the highest levels of safety.

As your partner, we work with you to minimize risks and increase stakeholder value through efficient project planning, analysis, and execution. Leveraging our core expertise, we provide a well-thought-out plan that incorporates all aspects of your project—from concept through to completion.

## Hydrocarbon pipelines

Pipeline networks are quintessential for the safe transmission and distribution of hydrocarbons. The pipeline transportation channel calls for sophisticated designs that enable an uninterrupted supply of gases and fluids to transport safely and in a way that's environmentally sensitive. Our expertise is comprehensive in all aspects of pipeline systems and the associated infrastructure—compressor and pump stations, field devices, tie-ins, valve stations, LACT units, trenching, and trenchless technologies. Let us help you minimize the risk of working in extreme environments and remote locations, increase stakeholder value, obtain necessary regulatory approvals, and maintain pipeline integrity.

## Storage and distribution

From above ground storage tanks to salt caverns, we have a proven track-record of assessing, planning, designing, and constructing reliable hydrocarbon storage solutions. We specialize in large oil storage terminals with tank sizes ranging up to 500,000 bbl. Our in-house talent executes all ancillary facilities including the incoming and outgoing interconnections, meter manifolds, containment areas, and hydraulic and pumping designs. With health, safety, and the environmental performance always top of mind, we can help you update existing site infrastructure in a safe and robust manner, while our optimization solutions seek to increase peak fuel demand storage capacity.

## Gas and oil processing

From dehydration, to acid gas removal, to fractionation, we have the gas-processing knowledge to optimize your operation. Our expertise includes designing systems for water removal from gas and NGL liquid streams, and implementing amine and scavenger systems, and physical solvents to remove CO<sub>2</sub>, H<sub>2</sub>S, and mercaptans from natural gas. We can also recover NGLs from dehydrated gas streams through propane refrigeration, turbo expander plants, and lean oil absorption. Our oil processing expertise also includes battery design and expansion, LACT units, and blending facilities.

## Rail transport and dispatch

A lack of pipeline-takeaway capacity along with high-diluent demand and increasing costs have been pushing many producers to ship their crude oil and products by rail. Rail terminals play an important role in the oil and gas transportation network. Efficient loading and offloading facilities support the seamless transfer of liquids between rail and other forms of transportation. Our team of in-house multidisciplinary engineers and architectural experts can help you design and construct a new terminal or transload facility from the ground up, or successfully execute work in an operating environment. Let us help you improve your terminal's overall operability and efficiency, so your entire supply chain runs more smoothly.

## Marine terminals

The world's ports are the heart of a dynamic, interdependent oil and gas logistics network. They are the backbone of global trade. But aging infrastructure, lack of investment, and more stringent regulations are challenging this critical supply chain. To manage these challenges effectively, you need a thorough understanding of the business drivers; effective integration of the planning, design, construction, and operation phases; and a comprehensive, innovative, and cost-effective approach to problem-solving. From new facility constructions to upgrades and expansions, we have the background and know-how to make your port and marine terminal project a success.





# Downstream

Aging facilities. Emerging environmental policies. Evolving fuel standards. An ever-changing communications and digital landscape.

As the processing and distribution of hydrocarbon products and byproducts becomes increasingly challenging, it's time for downstream oil and gas producers to rethink their processes to be safer and more sustainable.

Globally, energy consumption continues to increase, month-over-month, year-over-year. You need value-added products that will maximize yields, grow profit margins, reduce costs, and tighten environmental and product quality standards. As the last and final link in the value-chain, it's an opportune time to incorporate digital technology and operational excellence to improve your productivity and profitability.

## Refining

Whether you're considering a new build or retrofitting and upgrading an existing refinery, we can help you to move your project forward. From front-end conceptual studies through to execution, we have the skills and experience to deliver your project. Our due diligence reviews, market analysis, and full-range of business consulting services can help

add certainty to project outcomes. Highly skilled in conceptualization, we can develop configurations for refineries of all sizes and complexity, including performing CAPEX and OPEX estimating and financial modeling.

## Bitumen upgrading

Maximizing the value obtained for bitumen and heavy oil is critical to project economics. We're experienced in the full upgrading of heavy feedstocks to create high quality, light, low-sulfur crude, or partial upgrading to a lighter crude to help free up pipeline capacity, provide higher netbacks, and produce your most valuable and marketable sales oil.

## Liquefied natural gas processing

The potential for liquefied natural gas (LNG) is tremendous. But LNG projects are not always easy. Remote locations provide tough challenges, and often have extreme environmental standards. We work to minimize these risks and increase stakeholder value through efficient project planning and execution, while using strategies such as modularization and digital project





delivery. Our core expertise in transportation, handling, conversion, and storage of LNG helps provide a well-thought-out plan that incorporates all aspects of your project site.

### Unconventional syngas production

With growing global environmental consciousness and the emergence of the circular economy, the ambition to create fuel and chemical products from biomass and/or waste is becoming an imperative. By applying our gasification and syngas treatment expertise, we can devise viable options to monetize just about any feedstock you may have. The syngas produced through gasification can be used in a multitude of applications, including power generation, steelmaking, and the production of liquid fuels and chemicals.

### Gas-to-liquids

Natural gas is becoming increasingly abundant. No longer limited to power generation and space heating, it's being converted to high-value products such as liquid transportation fuels and chemicals. There has been tremendous technological development in gas-to-liquids (GTL) conversion technology in recent years. We have been working alongside technology developers, assisting Fischer-Tropsch (FT) and syngas generation licensors with proprietary technology development, as well as crafting various non-FT-based syngas conversion solutions, including methanol-to-gasoline and similar flow schemes. This bespoke capability has been honed over more than a decade of dedication and focus.

### Anything-to-liquids

Biomass- (BTL) and waste- (WTL) to-liquids are pathways to the production of transportation fuels and chemicals from abundant, renewable resources such as biomass, municipal solid waste, and other refuse-derived feedstocks. Recent advances in these technologies offer large fuel consumers such as rail and aviation companies and chemical producers, for whom electrification through renewable sources is not an option, lower carbon intensity options. Our deep expertise can fully exploit the potential synergies offered by hybrid gas-to-liquid and waste or biomass-to-liquid concepts to exploit the synergy of high-carbon and lower-carbon options.

### Hydrogen and industrial gas capabilities

With growing interest in the potential of hydrogen as a primary energy carrier, we have the expertise to both help you generate hydrogen, as well as implementing its use. By leveraging our gasification and syngas experience, we can develop cost effective, integrated flow sheet solutions to produce hydrogen from coal, biomass, waste, and natural gas. Similarly, our in-house renewable power capabilities provide clients with the expertise required to develop several low carbon routes to hydrogen via electrolysis technologies. It is in the convergence of conventional hydrogen production with alternative feedstocks and technologies that we see the potential for hydrogen to become a real alternative fuel for industrial and commuter transportation applications, as well as feedstock for industrial use.

# Selected project experience

## Chevron-operated Gorgon project

Chevron, Western Australia

The largest single-resource development in Australia's history, this project is located in the Gorgon and Jansz-lo gas fields, between 130 and 200 kilometres off the northwest coast of Western Australia. Working in joint venture, we contributed to the project's greenfield development that consisted of three, 5.2 million tonnes per annum LNG trains, a domestic gas plant, and product storage and offloading facilities. From the FEED phase in 2004 to the EPCM phase beginning in 2009, we participated in the project's planning and execution, balance-of-plant infrastructure engineering, procurement, quarantine management, quality management, logistics, and supporting services.

## North Montney mainline project

TransCanada Corporation, Canada

A 300-kilometre-long, natural-gas line was constructed in the Peace River Regional District of British Columbia, Canada. We provided FEED through to execution services for the project, including routing and workspace reviews, stress analysis, geohazard engineering, five major HDD/trenchless crossings, regulatory and engineering support during construction, and post-construction services. Our experts achieved significant project execution and cost benefits for TransCanada.

## Habshan sulfur granulation project

GASCO, United Arab Emirates

This new facility was to receive liquid sulfur to be granulated, stockpiled, and ultimately transported via rail to a new sulfur handling terminal at Ruwais. We developed the right, unique measures for handling the friable sulfur granules and mitigating concerns about fire hazards. Ultimately, we built the largest integrated facility in the world, with 12 granulators and an extensive network of sulfur pipelines. A custom stockpile-management strategy eliminated shelf-life issues for sulfur kept in storage.

## North Sea offshore field developments

Various clients, North Sea

Our experts helped pioneer some of the original platform designs in the 1980s, establishing enduring relationships with operating companies that have kept us at the forefront of North Sea field developments and offshore technologies, right through to today.

We provided concept, feasibility, and FEED studies to lay the foundations for numerous offshore projects. We have produced innovative, cost-effective designs to extend the life of aging assets as well as for new offshore field developments. Our designs, whether greenfield or brownfield, use the full range of new technologies to find the optimum value adding solution.



## Fort Hills ore preparation plant

Suncor, Canada

The ore preparation plant (OPP) is one of nine silos which form the bitumen production plant that produces 165,000 bpd of bitumen to the upgrader. We provided the review and validation of the DBM and front-end engineering design (FEED) for phase 1—a class III cost estimate and stage gate review.

## Four additional gasifiers project

Sasol, South Africa

In 2010, Hatch was appointed as Licensor's Engineers to oversee the upstream and downstream components of the Sasol® FBDBTM Gasification Technology. Our scope of work includes technology development, new gasification projects, as well as operational support. In 2014, Hatch was responsible for the detailed design of the proprietary components for the four new, additional Mk IV™ Sasol® FBDB™ gasifiers installed at the Sasol Synfuels Operations site in Secunda south Africa. The Hatch team was awarded with the Project of the Year award by Sasol Group Technology for its efforts.

## Pipeline facilities

Confidential client, Canada

This greenfield facility accepts 100,000 bpd of hot blended crude, and includes 300,000 bbl of tank storage, blending crude cooling, pumps and interconnecting piping to ship blended crude to various tie-in locations within existing sites. We completed FEED, detailed engineering and construction support to develop this new plot area.



Gorgon LNG project, Barrow Island in Western Australia



Offshore field developments, Europe's North Sea



Fort Hills OPP project, Canada



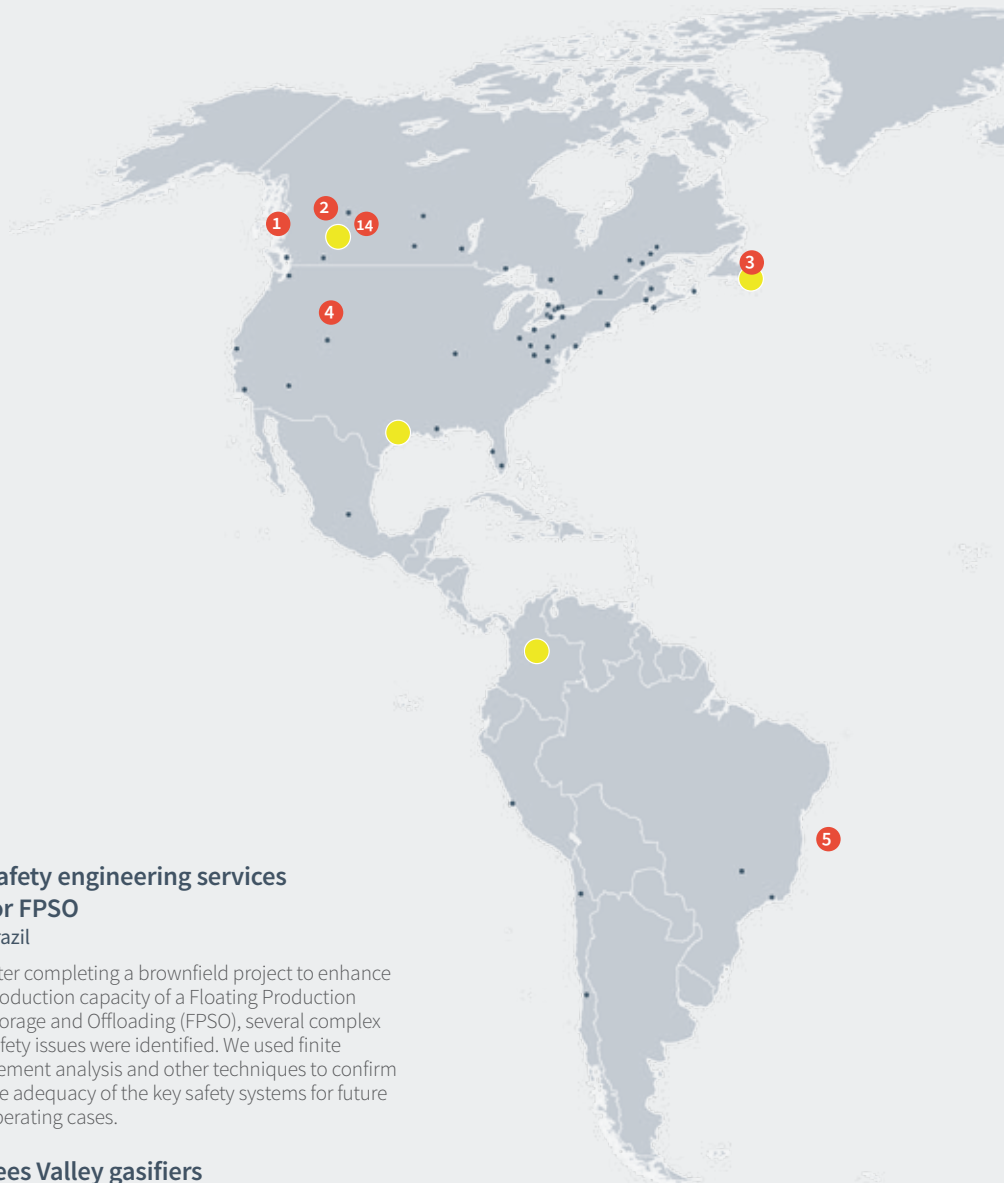
# Global presence, local focus

● Hatch offices

● Oil & gas centres of excellence

● Selected oil & gas projects\*

\* More oil & gas project experience is detailed on page 10



## 1 Kitimat clean fuel refinery project Canada

With in-depth expertise in refining and using GTL technologies, we designed the refinery with zero coke and fuel-oil production, minimal water intake, and zero water disposal. Novel technologies minimized emissions of nitrogen oxides, sulfur oxides, and carbon dioxide so that the latter are among the lowest in the world for any refinery processing heavy crude.

## 2 Canexus North American terminal operations Canada

Strict quality and safety guidelines—and a very aggressive schedule—were met as we provided full-range EPCM services and commissioning support for Canexus's dilbit storage and railcar-loading facilities.

## 3 Upgrades of the Newfoundland Transshipment Terminal Canada

NTL's major marine transshipping terminal, with 3-million-barrel storage capacity, is undergoing another expansion—this time to handle the high viscosity crude oil expected to be produced by Hebron. Having been involved with the facility since startups in the late 90s, we led the design and construction support of the terminal expansion and since then have provided engineering services such as multidisciplinary design, feasibility studies, and operational support to the facility.

## 4 Red Leaf Resources Inc United States of America

Basic and detailed engineering was only the beginning or our contribution to Red Leaf's Ecoshale technology. As part of the scale-up to commercialization, we worked to mitigate risk with finite element analysis, computational fluid dynamics, and heat transfer modeling.

## 5 Safety engineering services for FPSO Brazil

After completing a brownfield project to enhance production capacity of a Floating Production Storage and Offloading (FPSO), several complex safety issues were identified. We used finite element analysis and other techniques to confirm the adequacy of the key safety systems for future operating cases.

## 6 Tees Valley gasifiers United Kingdom

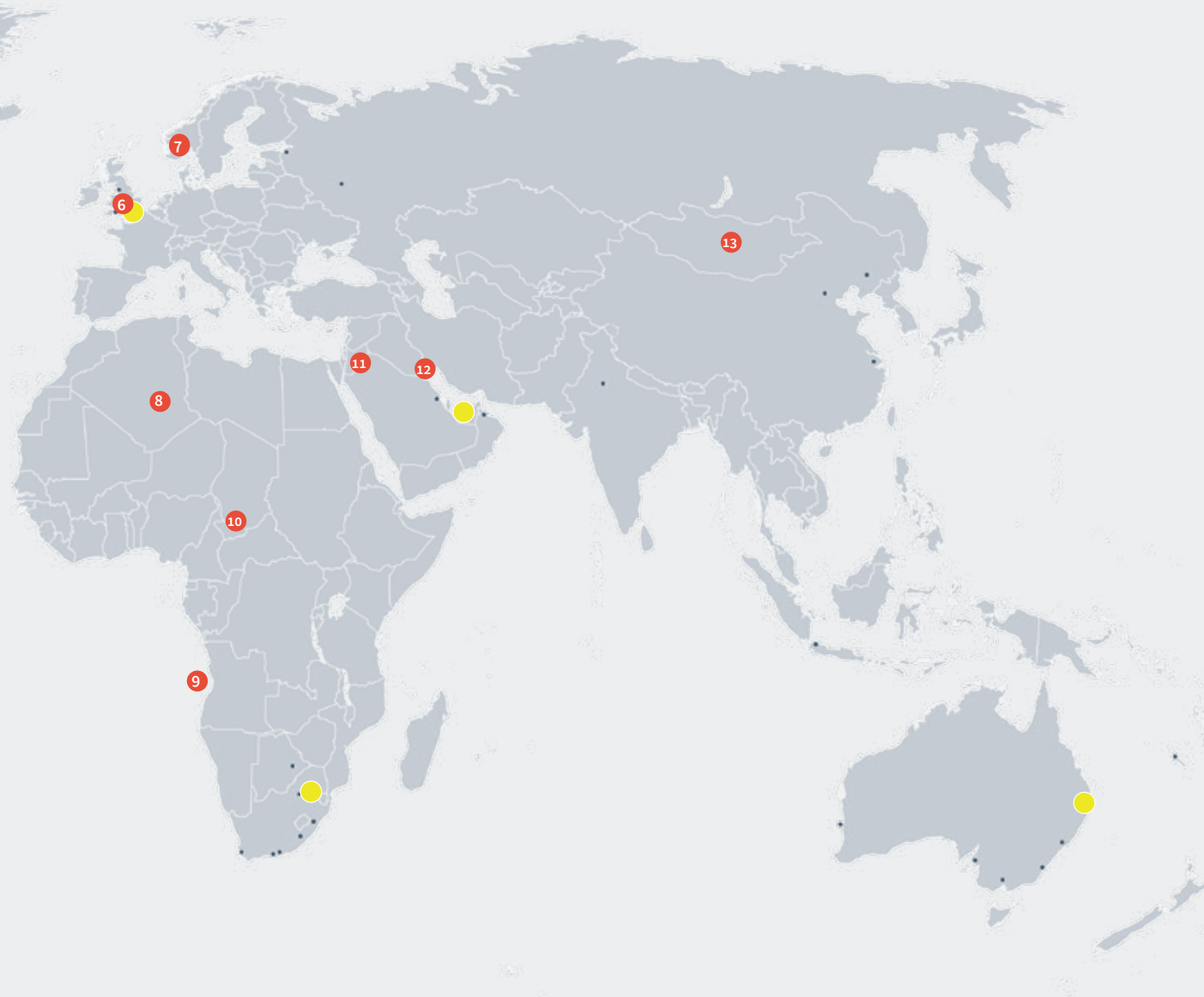
Two Alter NRG plasma gasifiers were installed to convert 950 tonnes per day of municipal solid waste into syngas to produce 49 MW of power to help the UK meet EU landfill diversion targets and reduce the use of fossil fuels for base load power generation. We helped the initial design and optimization of its gasifier technology, provided detailed engineering services and supported the fabrication and commissioning.

## 7 Gas plant reliability and availability improvements Norway

The goal was to improve the reliability and availability of a large gas processing plant, helping to maintain the capability of two major gas plants providing 30 percent of Northern Europe's natural gas requirements. Our work included process and mechanical designs, safety and operating reviews, MTOs, cost estimates, project schedules and project management deliverables.

## 8 Unlocking new production Algeria

As part of project stage-gate preparations, conceptual and feasibility studies were conducted for an onshore, greenfield development of a tight gas reservoir and condensate. Our integrated production modeling and dynamic flow assurance analysis optimized the design for the gathering network and promoted an optimized gas processing plant to maximize NGL recovery and production revenue. Optimization enabled the project to successfully pass through the gate.



**9 Deepwater solutions for offshore production**  
Angola

Transient simulation studies included analysis of field data to identify flow instability mechanisms and determine the impact of changes to the gas-oil ratios of the well fluids on the riser systems in order to provide production assurance.

**10 Developing Glencore’s assets in Chad**  
Southern Chad

Having acquired a working interest in the Mangara and Badila oil fields located in southern Chad, Glencore required expertise to address the risks of operation. Our insight in process design and technical safety was used to complete various process safeguarding reviews to ensure the risks of operation are as low as reasonably practicable.

**11 Jordan Energy and Mining Limited (JEML) Al Lajjun oil shale**  
Central Jordan

In order to produce an average 15,000 bpd of refinery-grade oil over the mine life, we conducted a feasibility studies of the mining, processing facilities and supporting infrastructures designed to process oil shale and using the Alberta Taciuk Process (ATP) technology.

**12 Renovating a super-giant field**  
Iraq

Years of conflict and sanctions have taken their toll, with underinvestment compounding a range of engineering challenges. We have optimized existing facilities; replaced missing documentation, revalidated process safety cases, and performed debottlenecking studies to help increase production from the field by nearly 50 percent in the period since 2009.

**13 Feasibility Study for POSCO and Energy Resources LLC Mongolia CTL**  
Mongolia

Hatch’s ability to quickly model and compare the process performance for several configurations helped POSCO and MCS choose the most appropriate technology configuration to achieve optimal results.

**14 Expanding a crude oil hub**  
Alberta, Canada

For many years we have worked with the majority of the midstream companies operating in the Hardisty area of Alberta. We have optimized existing infrastructure and increased storage capacity through design of new terminal expansions. The Hardisty Terminal area has a combined storage capacity of over 30,000,000 barrels of storage, with plans for future expansion which we intend to play a significant part in.

# Key practice areas

## Front-end engineering and design

We recognize the importance of executing front-end loading (FEL) and engineering and design work flawlessly. Unlike general contractor companies, we have the know-how to build concise, auditable design packages based on robust technical solutions. We insert just the right balance of techno-economic detail to inform a sensible business decision at any point during the project life cycle. Your final investment decision will be built on a solid foundation, ready for project execution to begin.

## EPCM and PMC

You need projects delivered reliably and efficiently. Our international knowledge, experience, and technical expertise give you that assurance. We manage capital programs and construction projects for major industrial facilities all over the world. The highest standards of safety, performance, quality, cost, and schedule are always top-of-mind.

## Operational support

In the oil and gas sector, the focus is continually on maximizing value from the asset portfolio. With a unique blend of process expertise, operational understanding, and project delivery excellence, we tackle your most difficult problems. We provide full operational support services to sustain capital projects and engineering, including operational readiness, asset management, and performance enhancement. We share your values and objectives and align our operations to your business.

## Technology consulting and development

From concept to commercialization, we're on the leading edge with our partners and clients. Together, we research and develop innovative

approaches to processing oil and gas, oil sands, oil shale, and syngas generation. We plan detailed components, systems, and apparatuses for Fischer-Tropsch reactors, gasifiers, product upgrading, and refining processes. Your vision becomes our obsession.

## Advisory

In the midst of rapid market changes and technological development, you expect quality, comprehensive and practical insights, and solutions to address the technical, social, environmental, and financial challenges that you and your stakeholders are facing. We work closely with you from the initial idea to the full implementation of solutions to help you bring your vision to life and deliver sustainable results.

## Sustaining capital

From ongoing maintenance to small capital projects with tight engineering timelines, you are focused on improving the performance of your assets while protecting your investment. Our experts provide an optimal execution strategy that suits your project's size, scope, and complexity by utilizing our sustaining capital benchmarks and criteria. This method allows for a more flexible approach to procedures by determining where your needs fit in based on a set of criteria.

## Flow assurance

Flow assurance is more than the study of fluid flow, it plays a significant role in ensuring continuous and manageable oil and gas production. Because of this understanding, we value the importance of full life-cycle analysis, the different types of artificial lift, and the boundaries of flow modeling—and how far to push those boundaries. We provide an overarching capability to link and optimize gathering systems and host/facility interfaces both onshore and subsea.



## Process system modeling

Coupling flow assurance capabilities with process dynamics ensures that your operation will achieve remarkable results. By assembling and linking models, we are adept at forecasting how your processing system will react when faced with serious instability. This allows us to action small changes to your operation and ensure the gas is properly utilized, the compressors continue to run, and flaring is avoided. Other process system modeling capabilities include linear modeling for refinery configurations, particulate modeling (discrete element modeling), as well dynamic simulation (RAM modeling).

## Water and effluent treatment

You need state-of-the-art solutions for chemical/biological treatment, oil-water separation, and slurry handling. We're experienced in allied processes, membrane separation technologies, fouling and scaling membrane dynamics, and fluid chemistry. We will help you minimize cost and water usage, increase your economic advantage, and comply with regulations.

## Environmental services

Across the oil and gas sectors, stakeholders are becoming more ecologically aware. Communities and governments are demanding higher environmental standards. Global expansion of the extractive and energy sectors, coupled with the consolidation of ownership and assets, has made development projects more visible. We can help you manage the growing interest, demands, and assertiveness by host governments, communities, investors, and civil society organizations, especially when the environment is at risk.

## Digital transformation

Technologically agnostic and with deep sector expertise, we bring the best consulting, engineered solutions, systems integration, off-the-shelf and bespoke applications, and services and support for your digital transformation. We can help to transform your projects, operations, and value chain to make your business more efficient, optimized, and sustainable. By embracing digital technologies and platforms, we can transform and optimize your business across the entire value chain. From project delivery to operations, whether greenfield or brownfield.



Nsolv®—an in-situ solvent extraction technology—reduces the environmental impact of bitumen extraction, eliminates water consumption, and reduces energy intensity and greenhouse gas emissions

## Remote asset de-carbonization

Remote assets are seeking to reduce their carbon footprint while maintaining uptime. Hybrid power systems can handle on-and-off contingencies, manage the integration of large amounts of renewable power, and ensure that power is reliably maintained. Improved methodologies, such as Hatch's proprietary microgrid controller technology, help integrate renewables into the supply mix in isolated settings. Our smart installation design includes energy storage such as hydrogen, fuel cells, compressed gas, and lithium-ion batteries.

## Specialized engineering analysis & design (SEAD)

With a broadly experienced, integrated and committed team, no problem is too complex. Our in-house capabilities span a variety of advanced analysis techniques, including computational fluid dynamics and heat transfer, structural mechanics (finite element analysis), non-destructive testing, and more. Simulations have been used to solve problems and add value in all project phases, from design to operational support. We can carry out all three levels of fitness for service assessment for equipment to extend the life of even damaged equipment. We analyze compromised structures to calculate available load bearing capacity, which in turn can prolong the life of your assets.



# About Hatch

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

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

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