



## Acero Engineering

Acero is a Calgary based, full-service engineering, procurement, and construction management (EPCM) company focused on upstream & midstream oil and gas pipeline and facility development. An adaptive approach to meeting our clients' needs and then exceeding expectations has garnered Acero a reputation of being 'Responsive, Flexible, and Efficient.' This motto is reflected in Acero's core values, and integral in executing our projects, expanding relationships, and adapting to the different cultures and business practices that are dealt with globally.

Our core purpose, values, and motto have developed a 'get it done' corporate culture that has been paramount to Acero's personnel exceeding our client's expectations on every project, no matter the size or complexity. Our clients and employees are attracted to quality and believe reputation earned through walking the talk, is the foundation to ongoing success.



## CORE VALUES



### WALK THE TALK

Do What You Say  
You Will Do  
(DWYSYWD)

### 100/0

100% Responsive  
to our clients  
with 0% excuses

### TEAM PLAYERS

Collaborative  
Transparent  
Honest

### 100% TECHNICAL COMPETENCE

◀ Providing full-service EPCM expertise to the Canadian and International energy industries since 2006 ▶

## Health, Safety, Environment, & Quality

Acero is committed to the safety of its employees, contractors, clients, visitors, property and the environment. Everyone employed by Acero is responsible for maintaining the health and safety program.



Managers, with input from all employees, set the example for the corporate Acero team by: identifying safety needs, communicating safety hazards, investigating hazardous conditions (and accidents), providing training, supplying appropriate safety and personal protective equipment, and ensuring that all equipment is properly maintained and meets legislated safety standards.

The goal of Acero's safety program is to have an accident free workplace. Employees are aware of their responsibility to work safely and maintain a safe work environment. All company employees and others on company work sites are responsible for obeying the safety rules, following recommended safe work procedures, wearing and using personal protective equipment when required, participating in safety training programs and informing supervisors of any unsafe work conditions. Acero's

commitment to health and safety has been recognized by the Alberta Government through the Certificate of Recognition (COR) program. COR is an occupational health and safety accreditation program that verifies a fully implemented health & safety program which meets national standards. Acero reviews and makes updates regularly, and performs annual audits to keep up-to-date with industry standards. Acero renewed its' COR certification in 2019 with a score of 98%. A great success while still leaving room for future improvements.

Acero is also an ISNetwork and ComplyWorks member which helps to demonstrate the excellent track record Acero has as a safe and reliable company. Additionally, Acero achieved ISO 9001:2015 certification in December 2018, ISO 14001:2015 certification in July 2019, and ISO 45001:2015 in February 2020.

## ◀ OUR CUSTOMERS ▶



From Possibility to Reality



## WESTERN CANADA

- ▶ Pipeline Projects
- ▶ Well Pad Equipment Projects
- ▶ Commissioning Support
- ▶ Field Development Projects
- ▶ 20 mmscfd Sour Gas plant & expansion
- ▶ Laprise Creek Parallel Pipeline
- ▶ Sour gas plant debottleneck and Expansion
- ▶ Power Generation
- ▶ Water Injection Facility & Pipeline

## AL-BASRAH, IRAQ

- ▶ 40,000 Bopd Operation & Maintenance Support Facility ◀

## KURDISTAN, IRAQ

- ▶ Summail Gas Train ◀
- ▶ Early Well Testing Facility ◀
- ▶ Standard Rental EPF ◀
- ▶ Kurdamir 3 - Modified Testing Facility ◀
- ▶ 5000 Bopd Production Facility ◀

## QATAR

- ▶ Ras Laffan Sea Water Pipeline

## BAHRAIN

- ▶ Power Generation Gas Turbine

## YAMAL, RUSSIA

- ▶ Well Optimization Skids

## ABU DHABI, UAE

- ▶ Mubarras Island Sour Gas Injection and Expansion
- ▶ ADNOC Fuel Oil Storage & Distribution Facilities
- ▶ Three Distillation Plants
- ▶ BAB Modification
- ▶ Flare Upgrade
- ▶ RUWAIS REFINERY Expansion
- ▶ LPG Dehydration Unit
- ▶ Gas Oil Dispatch Facility
- ▶ GASCO 48km of 20" Gas Pipeline

## ASSAM, INDIA

- ▶ Amguri Interim Condensate Recovery

## JORDAN

- ▶ 30 km of 24" Water Supply Pipeline ◀

## YEMEN

- ▶ CPF Produced Water Handling Facilities

## K.S.A

- ▶ Aramco Tabreed District Cooling Plant

## ADAR, SUDAN

- ▶ 20" 76km Crude Oil Pipeline

## QALAT AL FULA, SUDAN

- ▶ 80,000 bbl/d Production Facility Field Gathering Pipeline

## CHAD, AFRICA

- ▶ Badila & Mangara Well Pad Detailed Designs
- ▶ Gas Injection
- ▶ CPF Water Injection FEED
- ▶ Blending & Export Terminal Expansion
- ▶ Power Generation to Well Site FEED
- ▶ Crude Oil Topping Unit

## RED SEA, EGYPT

- ▶ Heavy Oil Truck, Tank Terminal and Pipeline

## NILE DELTA, EGYPT

- ▶ Gas Plant Optimization Inlet Modifications
- ▶ Gas Plant Optimization De-propanizer Addition
- ▶ Gas Plant Inlet Compression Gathering System Optimization Project

## LORETO, PERU

- ▶ 2,500 BPD EPF

## PUTUMAYO, COLOMBIA

- ▶ Mobile Testing Facility

## ACORDIONERO FIELD, SAN MARTIN, COLOMBIA

- ▶ CPF expansion phase 1 –from 3,500 Bopd to 7,500 Bopd (pre-FEED through detailed design including procurement support)
- ▶ CPF expansion phase 2 –15,000 Bopd (FEED, procurement & detailed design support)
- ▶ CPF expansion phase 3 –25,000 Bopd (debottlenecking study)
- ▶ Water injection for 30k Bwpd (pre-FEED)
- ▶ Power generation 15 MW (pre-FEED)
- ▶ Truck loading 15K Bopd (pre-FEED)
- ▶ Blending terminal 15K Bopd and export P/L (pre-FEED)

## SANTA MARTA, COLOMBIA

- ▶ Distillation Facility Upgrade

## Services

Acero has successfully executed projects both in western Canada, as well as in International regions such as Iraq, Chad, Russia, Peru, Colombia, India, and Egypt. Our services range from greenfield facility design to process optimization & debottlenecking and plant expansions. Acero's expertise includes process equipment design, water treatment, well site tie-ins and gathering lines, gas processing including condensate and water removal, amine treating, sulfur recovery, dehydration, flaring, NGL recovery, fractionation and off sites including pipelines and compressor and metering stations. Acero's robust team is experienced enough to handle the most complex assignments while maintaining the ability to tailor its execution style to fit the smallest of activities.

### Projects Executed by Acero

### Projects Executed by Acero Principals



## Core Business & Engineering Discipline Overview

### FEASIBILITY AND ECONOMIC STUDIES

- ▶ Conceptual, Pre-FEED & FEED studies
- ▶ Facilities and system optimizations
- ▶ Capital cost estimating
- ▶ Process evaluations and selection

### ENGINEERING AND DESIGN

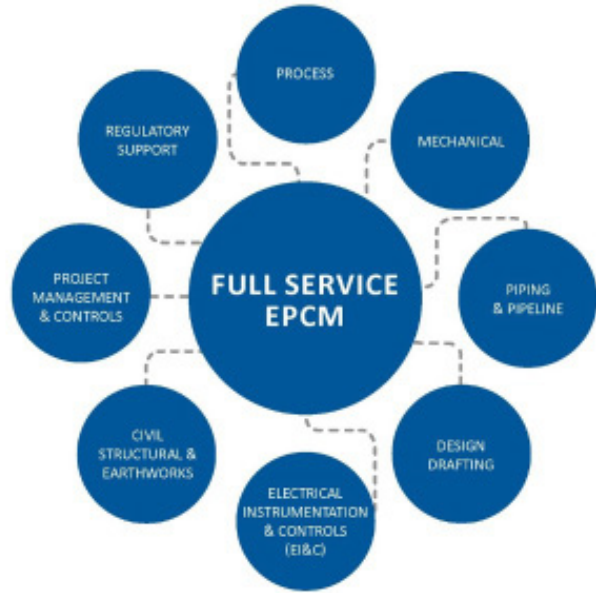
- ▶ Process, mechanical, EI&C and piping design
- ▶ Civil/structural design
- ▶ Stress analysis, metallurgy analysis
- ▶ Detailed engineering
- ▶ SCADA/PLC/DCS design
- ▶ HAZOP and HSE Studies
- ▶ Material and equipment specifications
- ▶ Engineering and design quality control
- ▶ In-house Project Controls specialists
- ▶ Pipelines & Piping Integrity

### PROJECT MANAGEMENT

- ▶ Budgeting development and cost control
- ▶ Project execution planning and procedures
- ▶ Project scheduling
- ▶ Progress measurement and tracking
- ▶ Contract administration
- ▶ Quality assurance
- ▶ Change management control

### PROCUREMENT

- ▶ Technical and commercial specifications
- ▶ Bid solicitation and evaluation (technical and commercial)
- ▶ Purchase order and contract development
- ▶ Transportation, logistics and expediting
- ▶ Vendor data control, inspection surveillance



### OPERATIONS SUPPORT

- ▶ Pre-commissioning and commissioning support
- ▶ Start-up assistance
- ▶ Operator training
- ▶ Operation and maintenance manuals
- ▶ Engineering support for operations
- ▶ Contract operations and maintenance

### CONSTRUCTION

- ▶ Construction planning, scheduling and constructability
- ▶ Contractor bid, award and management
- ▶ Field supervision, engineering and inspection
- ▶ Contract administration and change control
- ▶ Quality assurance and control

## Specification Development

### E&P FACILITIES & PIPELINES

Acero has developed & implemented in-house mechanical specifications for Domestic and International energy companies: Pembina Pipeline Corp., Baytex Energy Corp., Painted Pony Energy Ltd., Razor Energy, Accel Energy Ltd., Pengrowth, Glencore, Centurion, Gran Tierra Resources Ltd.

#### Equipment Specifications

- ▶ API 610 centrifugal pumps
- ▶ ASME B73.1 general sour horizontal centrifugal pumps
- ▶ Positive displacement/reciprocating pumps
- ▶ Direct and indirect fired heaters
- ▶ Heat medium packages
- ▶ Pressure vessels and heat exchangers
- ▶ Above ground knock out drums

#### Process & EI&C Related Specifications

- ▶ Emergency shutdown valves
- ▶ Instrumentation for skid packaged equipment
- ▶ Design specifications: process design of flare and blowdown systems, pressure control and OPP guidelines, isolation standard

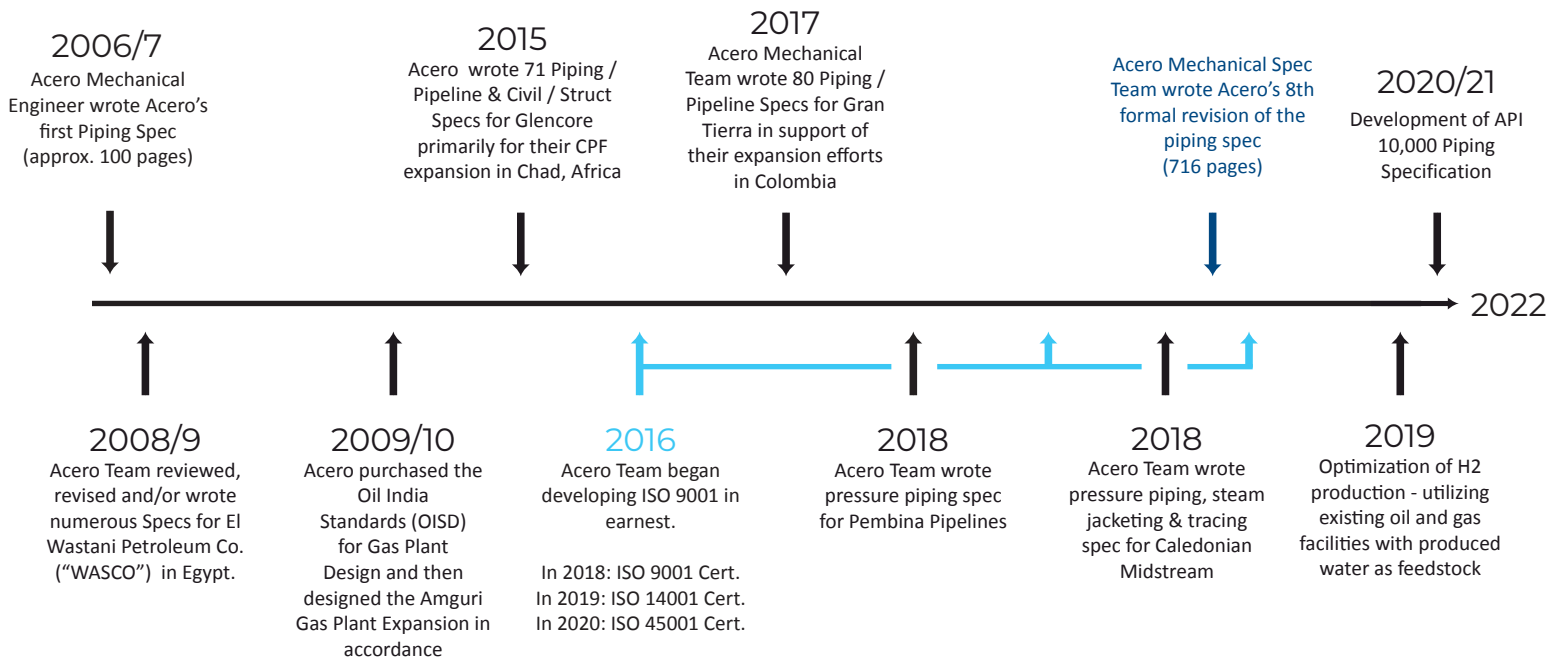
#### Facility Piping Specifications

- ▶ Piping tables for B31.3, B31.4, B31.8, B31.12, CSA B149.1, CSA Z662
- ▶ Services: sweet, sour, cryogenic, corrosive, fuel gas distribution system, liquid sulphur, utility, heating fluids, lubricants/hydraulic fluids
- ▶ Materials: carbon steel, stainless steel
- ▶ Manual valves
- ▶ Stainless steel tubing

#### Other Specifications & Standards

- ▶ Pig closure replacement procedure
- ▶ Bolting, gaskets and torqueing
- ▶ Induction bends from steel pipe
- ▶ Structural steel design & fabrication
- ▶ Structural steel erection
- ▶ Supply and Install of Reinforced Concrete

## ◀ OUR HISTORY ▶





## Pipeline PROJECT HIGHLIGHTS

Over the past decade, Acero has been responsible for numerous pipeline projects of varying sizes (3” to 22” nominal), complexities (1km – 30km), and design pressures (1,000 kPag - 15,200 kPag).

### Pipeline Project

*Polar Star Oil and Gas Inc* ♦ *Laprise Creek, BC*

Acero’s scope of work included the engineering and design, procurement, and regulatory support for a 10”, 12 km main trunk line with 4” parallel common ditch fuel gas pipeline, as part of a new gathering system. Crossing considerations included 7 open-cut road allowances, 18 stream crossings (3 of which were bored), and 4 archaeological no-work zones, which were bored.

### Gas Pipeline Replacements

*Pengrowth Energy Corp.* ♦ *Swan Hills, AB*

Acero’s scope of work included the detailed design and procurement of multiple 4” to 12” LP & HP gas pipeline replacements (externally coated steel as well as free standing liner composite pipelines). Projects featured a new pipeline separator (96” OD x 20’ S/S), surface piping, instrumentation and controls, pig launching and receiving facilities, major road and water crossings.

### Garrington Pipeline Installation

*Pengrowth Energy Corp.* ♦ *Southern AB*

Acero was responsible for the engineering, design, procurement, and construction support of a new 6”, 8 km pipeline to an existing facility in order to re-route field production to a third party. Scope of work also included analysis of stress caused by elevated operating temperatures and flow reversal of an existing pipeline; required to accommodate the re-routing of production.

### Pipeline Projects

*CNRL* ♦ *Dawson Creek, BC*

Scope of work consisted of the evaluation and technical recommendations for various pieces of process equipment, single and multi- well tie-ins for sweet and sour oil emulsion wells, installing free standing composite liners through existing pipelines to restore production, as well as a 4 km acid gas pipeline and tie-in.

### Doseo Pipeline Project

*Glencore* ♦ *Chad, Africa*

Scope of work consisted of hydraulic simulations to analyze options for pumping and heating stations, variations in MAOP, throughput capacities, pipeline sizes; based on crude oil assay and temperature as well as cost estimating to support alternative configurations and options of a 520 km 16” pipeline, development of temperature gradient monitoring and feasibility assessment of using on-shore pipe laying barge equipment.

### FRP & Carbon Steel Pipelines

*Accel Energy Canada Ltd./ Pengrowth Energy Corp.* ♦ *Judy Creek, AB*

Acero was responsible for the engineering, procurement and construction support for multiple 4” to 12”, high pressure pipeline projects which featured underground anchor blocks & supports, required to counter the stress imposed on the FRP pipeline due to poor soil conditions and elevated operating temperature. In addition to the civil / structural work associated with the riser supports, Acero designed stainless steel risers, multiple road crossings and water crossings.

### Dual 12” Pipelines

*Painted Pony Petroleum Inc.* ♦ *Montney Field, BC*

Responsible for the engineering, procurement, construction management, regulatory, and project management for dual NPS 12” pipelines. Project featured 13 crossing considerations including the HDD of 1 major river.

### 3” & 4” FRP HP Produced Water Injection Pipeline

*Accel Energy Canada Ltd./ Pengrowth Energy Corp.* ♦ *Judy Creek, AB*

Acero was responsible for the engineering, procurement and construction support for multiple 3” & 4” FRP high pressure (14,900 kPag) pipelines, and multiple 6” to 12”, high pressure (15,200 kPag) water injection steel, thermoplastic-lined pipelines. Projects featured new underground anchors, new stainless steel risers, as well as design considerations for road, water and underground service crossings.

### Pipeline Network Modeling

*Pengrowth Energy Corp.* ♦ *Irricana, AB*

Project featured a Pipe-Flo model for the existing wells and pipelines in the Irricana area to evaluate the existing network, simulate options for the re-routing of production, and to bring low producing shut-in wells back online. Network contained 20 wells, 42 pipeline segments, and 1 booster compressor.

## Piping & Pipeline Integrity

### REPAIRS, SECTIONAL REPLACEMENTS, AND REROUTING

- Scope of work included the engineering and assessment of several temporary & permanent B-sleeve repairs between 6” – 22” designed to fit directly on pipe or with an elevated collar (dependent on severity of wrinkle). Typical deliverables have included, repair drawings, Finite Element Analysis, fatigue analysis, and final report.
- Acero provided several design packages for partial pipeline replacements including rail, road and water body crossings. Typical scope has included stress analysis, pipeline & riser details, bend specification & schedule and alignment sheets.
- Scope of work included the engineering and assessment of several FRP pipeline failures, temporary & permanent repairs. Typical deliverables have included, repair drawings, stress analysis, fatigue analysis, and final report.

*(CUI) is one of the (petro) chemical processing industries worst problems; the cost associated to mitigating it is astronomical.*



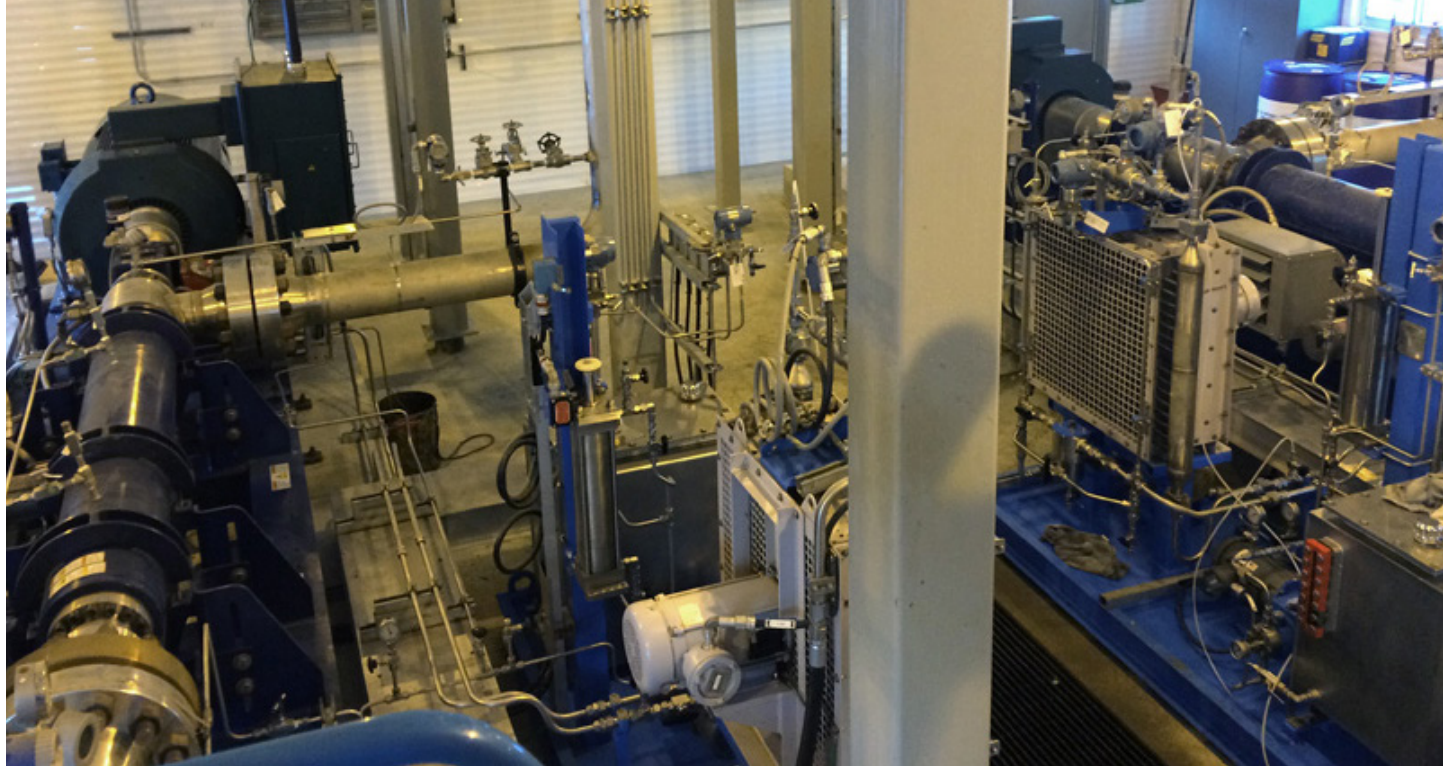
## ASSET CIRCUITIZATION

### Asset Circuitization Support

*Confidential Client* ♦ *Various*

Acero’s scope of work was to prepare the circuitization package for 70 sites (including several pump stations LACTs, and Gas processing facilities) and identify the circuitization loops and asset verification to assure integrity and safety. Each site examined required tailoring of the inspection scrutiny, based on operating conditions.





## LACT Units & Pumping Station

### PROJECT HIGHLIGHTS

#### Booster Pump Installation

Pengrowth Energy Corp. ♦♦ Judy Creek, AB

Acero was responsible for the detailed engineering and design, procurement of main equipment and construction support of a pump station in central Alberta. The project featured two 750 HP pumps and housings to provide water injection capacity of 16,000 m<sup>3</sup>/d at 14,900 kPag.



#### NEBC Midpoint Pump Station FEED

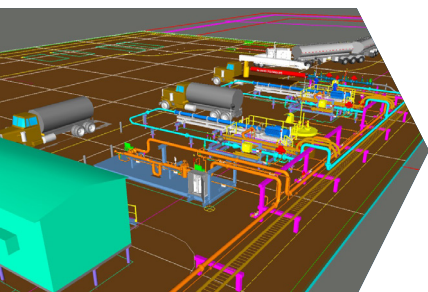
Confidential Client ♦♦ NE BC

Acero was responsible for FEED study to construct a mid-point pump station to support increased volumes (C3+ & C5+) on the line using a 5,000 HP pump. Scope of work included the necessary drawings, philosophy, TIC cost estimate, and associated deliverables to complete the FEED.

#### Kaybob Site Upgrades

Pembina Pipeline Corp. ♦♦ Kaybob

Acero was responsible for the FEED, detailed engineering and procurement for the upgrades to the 03-29 Kaybob site which consists of a tank farm with a booster pump and a shipping pump station. The scope of work included the replacement of the BS&W analyzer, sump tank, Electrical building, controls, and upgrading the OPP on shipping pumps.



#### North Inga Crude LACT FEED

Confidential Client ♦♦ NE BC

Acero was responsible for the engineering and procurement to connect ConocoPhillips' North Inga Gas Plant to the to start of Pembina's Blueberry mainline; using two multistage horizontal centrifugal pumps of 500 HP each. The LACT is designed to handle 11,000 bpd at a discharge pressure of 6900 kPag.

#### Nig Creek C5+ LACT FEED

Confidential Client ♦♦ NE BC

Acero was responsible for the engineering and procurement to connect Black Swan Energy Aitken Gas Plant to Pembina Town Terminal. The product will be shipped using multistage horizontal centrifugal pump of 300 HP. The LACT is designed to handle 50 m<sup>3</sup>/h at a discharge pressure of 6900 kPag.

#### Saturn LACT Modifications

Confidential Client ♦♦ Saturn LACT Facility

The Saturn LACT facility is comprised of two LACT skids. Acero's scope of work included the FEED and detailed engineering, procurement, and construction management of the below modifications:

- ▶ Installation of a pump sleeve casing drain and vent piping to allow for water removal and antifreeze injection
- ▶ Piping modifications and installation of DIB-2 valves associated with Saturn 1 & 2 LACT meters and prover
- ▶ Re-build and installation of discharge piping
- ▶ Repair of damaged structural steel on pump skid, and the rotation of the pump motors to improve maintenance access



## MOC Work

### PROJECT HIGHLIGHTS

Acero has developed and grown from wellsite tie-in and MOC (Management of Change) project roots. These types of tight-budget quick turnaround projects have been the life blood of the company for the past fifteen (15) years. To this day, MOC work makes up anywhere from 25% to 50% of the corporate workload at any given time.



#### Typical MOC-related work that Acero is currently involved with includes:

- ▶ Pump or compressor replacements
- ▶ Piping modifications
- ▶ Tank investigation and/or repair
- ▶ Pipeline replacements or repairs
- ▶ Process simulations and reports
- ▶ Regulatory submissions and/or investigation
- ▶ Low load power generation (eg. TEG, Solar, Holly gen, etc.)
- ▶ Plot plan, P&ID or similar edits
- ▶ Hot taps or stopples
- ▶ Facility revamps
- ▶ Flare systems
- ▶ Gas blanketing
- ▶ Vessel optimizations
- ▶ Debottleneck studies
- ▶ ESD and PSV compliance checks / reports
- ▶ Facilities "Asbuilts"
- ▶ Specification checks (eg. Acceptable material or test substitutions, etc.)

#### Commissioning Support

Enbridge Inc. ♦♦ Fort St. John, BC

Acero has been providing commissioning support for the shut-downs and scheduled turnarounds at the McMahon and Pine River gas plants since 2017. Acero's scope included defining roles and implementation plans to project groups, preparing and supporting commissioning activities, executing commissioning check lists, and coordinating the handover of all systems to operations.

# Oil & Produced Water Storage

## PROJECT HIGHLIGHTS

### Tank Replacements

Pengrowth Energy Corp. ♦ Judy Creek, AB

Project featured the replacement of an existing 10,000 bbl crude oil shipping tank, replacement of 3,000 bbl water tank, on-site jack-n-roll relocation and refurbishment of 10,000 bbl produced water storage tank (including foundation design and roof replacement), and construction planning and schedule control.

### Carson Creek Tank Installations

Pengrowth Energy Corp. ♦ Carson Creek, AB

Acero was responsible for the detailed tank and foundation design of a 15,000 bbl produced water storage tank c/w skim system. Work included process review (CFD simulation), internals design, cathodic protection, mechanical, civil, site grading, new 10” LP flare system and VRU. Acero also assisted Pengrowth’s integrity team with the pipeline integrity management, which included inline logging inspection.

### PCT Blending & Export Terminal Expansion

PCM, a Glencore Company ♦ Chad, Africa

Acero was responsible for increasing capacity of the PetroChad Transportation Company (PCT) blending and export terminal from a rate of 35,000 bpd to 75,000 bpd in Chad, Africa. Facility required installation of three 17,500 bbl storage tanks c/w heating capabilities and transfer/recycle pumps, electrical building, and chemical injection packages.



### Power Generation

Accel Energy Ltd. ♦ Central, AB

Acero provided full engineering services for the scoping, design, procurement and installation of 16 MW of power (at five locations) so as to significantly reduce reliance on utility power costs while at the same time, taking advantage of available (less costly) fuel gas.

### Mangara Power Generation & Distribution

Glencore ♦ Chad, Africa

Acero was responsible for completing a FEED study for the power generation (5 MW), sub-station and transmission line requirements to supply power to a minimum of 20 well sites with provision to expand to 50 well sites.

### Badila Power Generation & Distribution

Glencore ♦ Chad, Africa

Acero was responsible for completing a FEED study for the power generation (9 MW), sub-station and transmission line requirements to supply power to a CPF, blending and export facility, water injection facility, camp area, and a minimum of 12 well sites with provision to expand to 19 well sites.



# Power Generation

## PROJECT HIGHLIGHTS

### Acordionero Power Generation and Distribution Pre-FEED

Gran Tierra Energy Inc ♦ Middle Magdalena Basin, Colombia

Acero was responsible for a pre-FEED study to build a 15 MW central power generating facility located at the Acordionero CPF. The intent of the generation facility was to supply power to the CPF, water injection facility, truck loading and six (6) well pads via a transmission network.

# Water Handling

## PROJECT HIGHLIGHTS

### Water Injection Facility & Pipeline

Pengrowth Energy Corp. ♦ Judy Creek, AB

Acero was responsible for the detailed engineering, design, procurement, regulatory support and construction management of a water injection facility and pipeline in Judy Creek, Alberta. The project featured the installation of two salt water injection pipelines, facility piping, including pipeline tie-ins (as well as design considerations for future tie-ins), horizontal filter selection, pump design, line pipe design and selection.

### Water Disposal Facility

Baytex Energy Corp. ♦ Peace River, AB

Acero was responsible for the detailed engineering, design, procurement and construction management of the expansion of an existing oil battery to incorporate water handling and disposal capability at the site. The project featured new (fiberspar) pipelines to gather water from other batteries, and to deliver produced water to nearby disposal wells. Facility work included the design and installation of three 2000 bbl water tanks, and various water transfer/skim oil/disposal pumps.

### Gas Plant Water Offload Truck-In

Confidential Client ♦ Edson, AB

Acero was responsible for the engineering, procurement, and construction of a new water offloading facility capable of accepting 100 m³/d of produced water at the Edson Gas Plant. Project featured the installation of access roads, two (2) 4000 bbl storage tanks, containment, water transfer and condensate transfer pumps, filters, meters and piping.

### Acordionero Water Injection Facility

Gran Tierra Energy Inc. ♦ San Martin, Colombia

Acero was responsible for providing a conceptual design for the expansion of the Acordionero central processing facility (CPF) to include produced water treatment and injection equipment. The new water handling facility was designed for a throughput capacity of 39,000 bwpd complete with necessary high pressure pipeline to inject into six (6) nearby injection wells, each with two zones.

### Badila CPF Water Injection Project

Glencore ♦ Chad, Africa

Acero was responsible for Pre-FEED and FEED for a water treatment and injection facility over two phases (35,000 bwpd & 65,000 bwpd) by installing CPI, skimming tanks, booster pumps, filters and high pressure injection facility complete with a high pressure water injection network. Scope of work also included an 8 MW gas to power generation facility, required to service the facility’s increased power demand.

### Parkland Water Injection

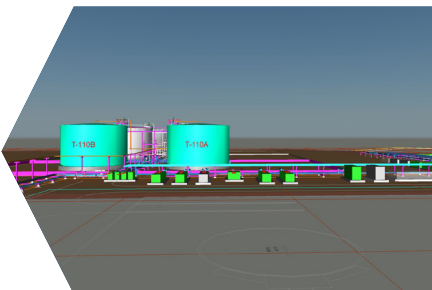
Canlin Energy Corp. ♦ Fort St. John, BC

Acero was responsible for the detailed design and procurement for a water disposal facility at the Parkland Gas Plant, capable of handling 300 m³/d, with the ability to expand to 600 m³/d in the future. A new injection pump skid, condensate tank and pipeline will be installed as part of the project.

### Jenner SKUD

Pengrowth Energy Corp. ♦ Southern AB

Acero was responsible for the engineering review, design and procurement to increase the water handling capacity of an existing battery by adding an additional inclined free water knockout unit (“SKUD”), two 75 HP booster pumps with VFDs, and one 1,250 HP HPS horizontal centrifugal water injection pump (3,500 m³/d) with VFD.



## Compressor Station

### PROJECT HIGHLIGHTS.



#### Wilrich 16-27 Compressor Station Expansion (FEED and Detailed Engineering)

Confidential Client ♦ Central, AB

Acero was responsible for expanding the Wilrich compressor station from a historic throughput of 22 MMSCFD of raw gas and condensate to 60 MMSCFD, by adding a 42 MMSCFD train parallel to the existing 22 MMSCFD facility. In addition to the compression upgrade, 3-phase inlet separators, a dehydrator, a new MCC building, an upgrade to the existing incinerator burner, one new high pressure flare stack, and one new flare knockout drum were also incorporated.

#### Compressor Station Debottleneck and Expansion

Painted Pony Petroleum ♦ NE BC

Acero was responsible for the FEED, detailed engineering and regulatory support of a compression expansion from 28 MMSCFD to 40 MMSCFD. Other facility upgrades included flare system upgrade, power generation including generator installation, and fuel gas measurement.

#### Pine Creek Compressor Station FEED

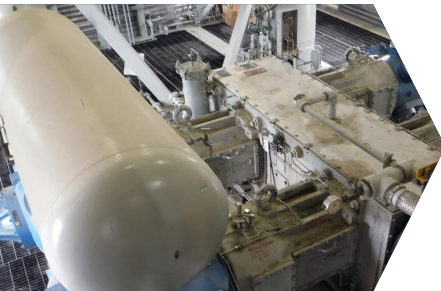
Confidential Client ♦ Edson, AB

Acero was responsible for the engineering, design and procurement of a compressor station in order to process the production of new sour wells. Plant capacity designed to handle 20-25 MMSCFD of gas with a maximum liquid yield of 100 bbl/MMSCFD.

#### Daiber Compressor Station

Painted Pony Petroleum ♦ NE BC

Acero's scope of work included the engineering, design and regulatory support of a new compressor/dehydration facility designed for 50 MMSCFD of high press production and 25 MMSCFD of lower pressure compression. Water storage, power generation and sales gas metering was also required



## Battery & Oil Processing

### PROJECT HIGHLIGHTS

#### Carson Creek Oil Handling Facility Modifications

Pengrowth Energy Corp. ♦ Carson Creek, AB

Acero was responsible for the design and regulatory support, procurement and construction of Carson Creek oil battery expansion by 2,000 m<sup>3</sup>/day. Modification of the inlet separators, reconfiguration of the separator piping and controls, addition of a new process treater, new booster compressor, new oil pumps, new flow meter skid, new electrical building, and multiple upgrades of the existing facility

#### Garrington Glycol Dehy Installation

Pengrowth Energy Corp. ♦ Southern AB

Acero was responsible for the process sizing, selection, and integration of a Glycol Dehy into an existing facility to allow for increased production through the battery, and onward, to a new third party producer. El&C design was also required to upgrade the existing MCC, as well as a technical review of vendor design and documentation.



#### Gilby Oil Battery Debottlenecking Pre-FEED

Confidential Client ♦ Central AB

Acero was responsible for determining the feasibility of developing a central multi-well processing oil battery for 2 production capacity options (25,000 bbl/d & 4,000 bbl/d) at a new Gilby pilot production facility versus debottleneck of an existing facility.

#### Gilby Central Oil Battery (FEED & Detailed Engineering)

Confidential Client ♦ Central AB

Project featured the detailed engineering and design of a new central oil battery to handle 4,000 bbl/d of light oil, and 5 MMSCFD of gas.

## Gas Processing Facilities

### PROJECT HIGHLIGHTS

#### Flare System Revamp

Enbridge Inc. ♦ Fort Nelson, BC

Acero was responsible for the engineering and design of a new above ground flare system at the Fort Nelson gas plant. Acero's scope included the evaluation of hydraulics and liquid loading to determine the sizing for the new flare lines, stress analysis for the new above ground flare header, and electrical and instrumentation drawings for heat tracing requirements. Scope also included the evaluation of the existing below ground flare network (ie. its fitness for continued use).

#### Septimus Sour Gas Plant Phase 1 – 20 MMSCFD, & Expansion to 40 MMSCFD

Crew Energy Inc. ♦ Fort St. John, BC

Acero was responsible for the engineering, procurement and construction management of a 20 MMSCFD sour gas inlet refrigeration and LPG extraction plant, and expansion to handle 40 MMSCFD. Scope of work included up front scoping support, including assessment of best location for plant placement, FEED and detailed design. Detailed deliverables included (but were not limited to) Process simulation and major equipment sizing, 3D model and associated outputs, E&I drawings (including I&C control schematics), costing and controls, planning (scheduling), logistics.

#### Gas Plant Debottleneck and Expansion FEED and Detailed Engineering

Painted Pony Petroleum Inc. ♦ Fort St. John, BC

Acero's scope of work included compressor installation to expand compression from 28 MMSCFD to 40 MMSCFD, flare system upgrade without taking the existing system offline, power generation expansion, coalescing filter installation, fuel gas measurement system, and regulatory support.

#### McMahon Gas Plant Amine Still Replacement

Enbridge Inc. ♦ NE BC

Acero's scope of work included the FEED, detailed engineering, and procurement for the replacement of an Amine Still (column #3) with an in-kind replacement, but constructed of 316L stainless steel materials, at the McMahon Gas Plant.



## Acid Gas Injection

### PROJECT HIGHLIGHTS

#### Acid Gas Pipeline & Tie-In

CNRL ♦ NE BC

Acero was responsible for the engineering and design for an acid gas pipeline from the Stoddart gas plant into a new injection well via acid gas compressors and pipeline. Provided process simulations for the acid gas pipeline hydraulics and technical recommendations including: Acid gas pipeline corrosion assessment, loss containment isolation requirements and confirmation of process condition ("dense phase") to avoid two phase flow for acid gas – (critical assessment to allow carbon steel usage for the situation. Developed the process design parameters for the acid gas pipeline and recommended the pipe material, wall thickness, welding and coating requirements.

#### JC GP Acid Gas Pipeline Analysis

Accel Energy Canada ♦ Judy Creek, AB

Acero provided process engineering support to resolve an acid gas hydrate formation within the pipeline and the acid gas injection well at the Judy Creek Gas Plant; along with determining the contributing factors.

#### B-24-H Sour Gas Plant Debottleneck and Expansion FEED and Detailed Engineering

Saguaro Resources Ltd. ♦ Fort St. John, BC

Acero's scope of work was to add an additional 40 MMSCFD train in parallel with an existing 20 MMSCFD raw gas facility. Facility improvements included slug catcher, relocation and use of an available separator as FKOD for acid gas going to incinerator, evaluation and upgrade of gas power/ generator units to accommodate winter consumption (mainly heat tracing); associated instrumentation and control upgrades and accommodations. Engineering review and design was required of the acid gas compressor to eliminate the continuous incineration of acid gas by re-injecting the acid gas into the sour gas stream.



## International PROJECT HIGHLIGHTS

Acero has successfully completed over 100 conceptual, Pre-FEED, FEED, Detailed Engineering and Construction Support Projects in Iraq, Egypt, Chad, Sudan, India, Russia, Colombia and Peru. Our extensive experience with full scopes of project work,

from concept through detailed engineering and construction management, allows Acero to examine the feasibility of various options and work with our clients to select a ‘best path forward’ for development.

### Mangara & Badila Field Development

Glencore ♦ Chad, Africa

Since 2015, Acero has provided FEED, detailed design, and procurement support for facility expansions and well pad development and tie-ins to accommodate 39 API crude oil produced in Chad Africa’s Mangara and Badila fields.

- ▶ Badila well pad designs and pipelines (Detailed engineering, design - including drawing package, procurement support)
- ▶ Badila 75,000 bopd PCT Blending and Export Terminal Debottlenecking and Expansion (FEED, detailed design & technical support for procurement)
- ▶ Mangara well pad designs (Detailed design & construction support)
- ▶ Badila Crude Oil Topping Unit (Conceptual study)
- ▶ Mangara 65,000 bopd CPF Water Injection (FEED)
- ▶ Mangara Power Distribution to Well Sites (FEED)
- ▶ Badila Gas Injection Facility (FEED & detailed engineering)



### Early Well Testing Facility

Confidential Client ♦ Kurdistan, Iraq

Responsible for the engineering, procurement and construction management of an early well testing facility (EWTF) located in Kurdistan, northern Iraq. To fast track the project, and allow operations to commence with as little downtime as possible, an Antonov AN-124 cargo plane was chartered to bring an in-stock oil cooler and refurbished electrostatic heater treater from Calgary, Alberta.

### Amguri Interim Condensate Recovery

Canoro Resources Ltd. ♦ Assam, India

Responsible for the engineering, procurement and logistics from North America to India, and construction management of a brownfield, 20 MMSCFD gas inlet/1500 bpd condensate recovery project in remote, northeast India. The project was fast-tracked due to an immediate need to install an interim condensate removal as the reservoir was approaching retrograde condensation.

### Kurdamir Field Development

Confidential Client ♦ Kurdistan, Iraq

Responsible for several projects from conceptual design to detailed engineering in Kurdistan, Iraq.

- ▶ Conceptual Study for 50,000 bopd CPF and gas plant 300 MMSCFD c/w sulphur recovery
- ▶ Conceptual study through to detailed engineering of 5,000 bopd (42 API & 75% WC) EPF
- ▶ Expedited detailed engineering & design of modified testing facility

### Crude Oil Topping Unit

Glencore ♦ Chad, Africa

Acero was responsible for the conceptual study to evaluate the feasibility of installing crude oil topping at the initial pumping station of a 520 km 16” pipeline. Pipeline hydraulic simulations were also provided to analyze options for pumping and heating stations along the pipeline route.

### Putumayo Mobile Testing Facility

Gran Tierra Energy Inc ♦ Putumayo Basin, Colombia

Acero was responsible for the conceptual through to detailed engineering, procurement, and construction management of a long term fully mobile testing facility, to be fully transportable from site to site, capable of long term use on each well pad - from six months to one year. Equipment was designed to handle the production of two wellheads with each wellhead producing up to 1,500 bpd of crude oil.



Tank Farm



Truck Loading

### Acordionero CPF Expansion

Gran Tierra Energy Inc ♦ Middle Magdalena Basin, Colombia

Since 2017, Acero has been responsible for several projects; Pre-FEED through detailed design, related to the expansion of an existing early production facility (EPF) into a central processing facility (CPF) in the Acordionero field in Colombia. The facility was expanded to handle larger volumes of produced liquids; from 3500 bopd to 7500 bopd.

- ▶ CPF expansion phase 1 – from 3,500 bopd to 7,500 bopd (Pre-FEED through detailed design including procurement support)
- ▶ CPF expansion phase 2 – 15,000 bopd (FEED, procurement & detailed design support)
- ▶ CPF expansion phase 3 – 25,000 bopd (Debottlenecking study)
- ▶ Water injection for 30k bwpd (Pre-FEED)
- ▶ Power generation 15 MW (Pre-FEED)
- ▶ Truck loading 15K bopd (Pre-FEED)
- ▶ Blending terminal 15K bopd and export P/L (FEED)
- ▶ Field Gas injection Scheme 10 MMSCFD (FEED through detailed design)

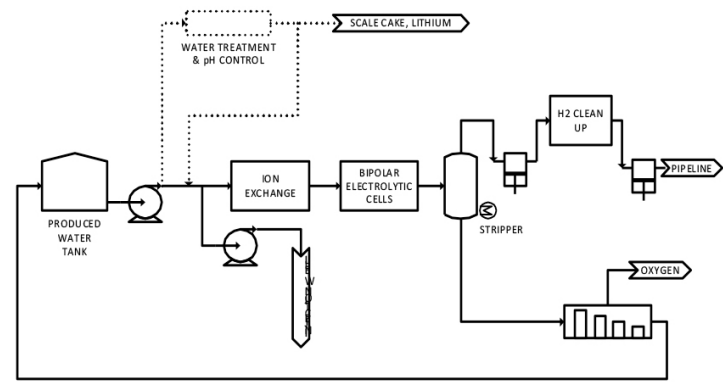
# ALTERNATIVE ENERGY

For the past several years, along with the standard slate of Oil and Gas Projects, new opportunities have emerged. Over its 15-year history Acero Engineering has developed expertise that is focussed on a lean engineering approach and applied this to the following technologies, all falling outside typical oil and gas engineering:

## I. HYDROGEN Generation & Optimization

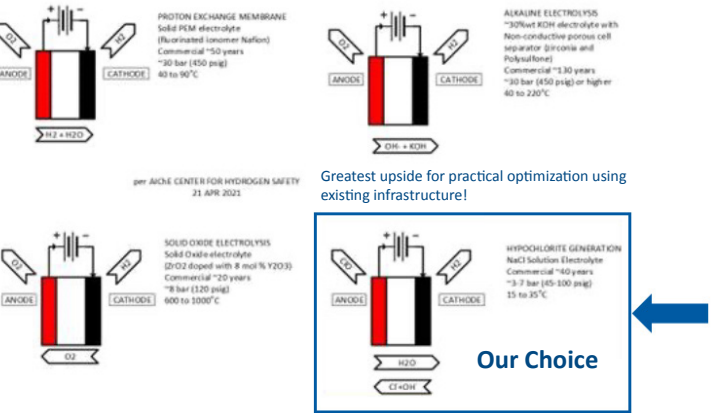
Acero has partnered with Alberta H2 (Acero-AH2) to provide engineering discipline installation. Acero-AH2 believe that the most practical way to succeed with hydrogen endeavors in the long term is to take advantage of the considerable capital already invested in Oil & Gas facilities development; this already-established infrastructure provides a significant economic advantage to any practical hydrogen or similar alternative energy development.

### Alberta H2’s Conceptual Optimized Hydrogen



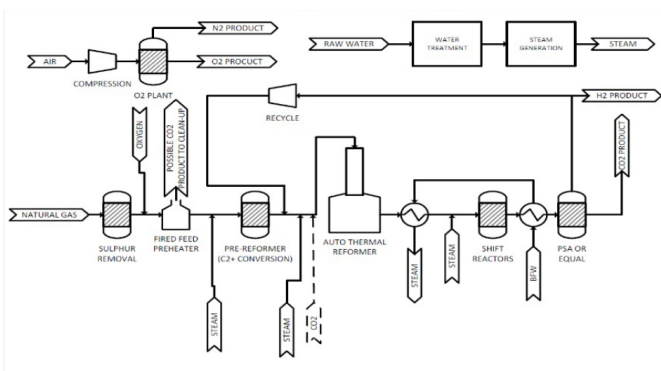
### Various Exchange Mechanisms & the ALBERTA H2 – Selected Front-Runner

#### Conventional Available Ion Exchange Technologies

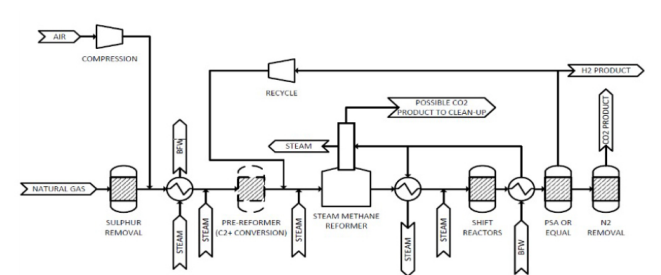


We recognize that clients may have unique criteria for selecting a given H2 production technology; available feedstock, GHG emissions, available market, etc. Acero-AH2 is certainly available to assist in evaluating all aspects of each to assist with those decisions.

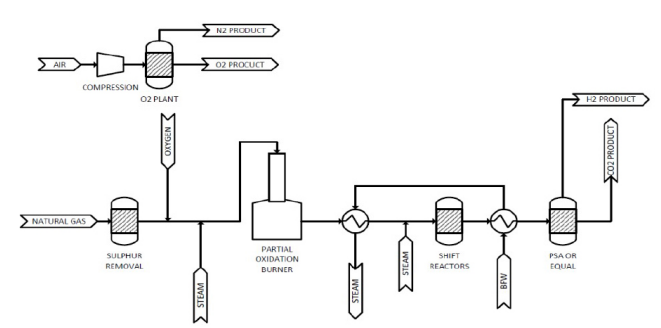
### Autothermal Reforming Process



### Steam Methane Reforming Process



### Partial Oxidation Process



## II. Carbon Capture & Geothermal

Acero has combined resources with Canadian Petroleum Engineering (CPE) for over a decade now, collaborating on a variety of projects that fully utilize both companies areas of expertise: Acero’s full-service engineering and design of facilities and pipelines; CPE’s geology, production and completions expertise.

Acero and CPE combine and their expertise and skills on:

- carbon capture
- sequestration
- geothermal projects

Recently this team has included Alberta H2 in order to optimize green hydrogen development by utilizing existing facilities and geological infrastructure along with storage and transportation.

## III. Biofuel

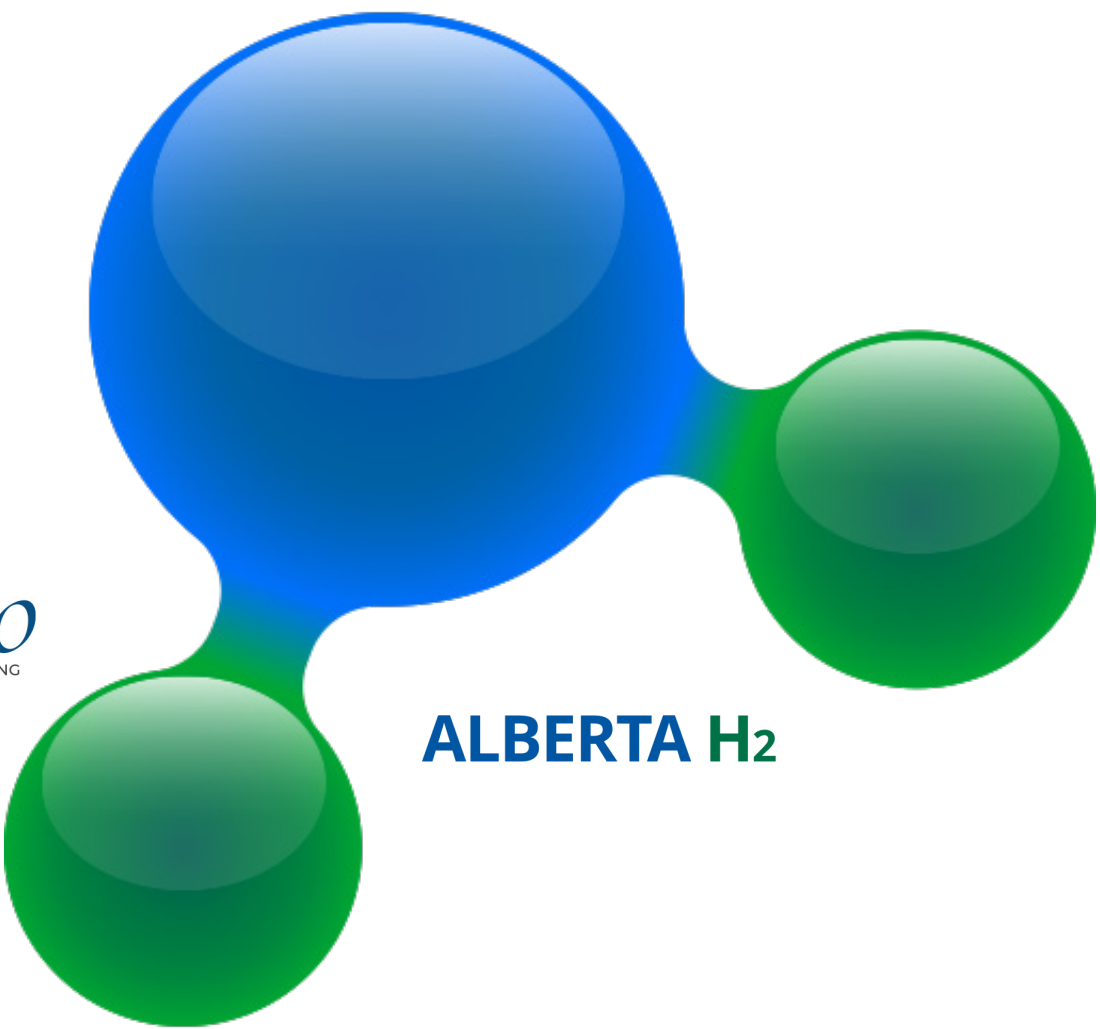
Acero personnel have extensive experience with biogas, biodiesel, ethanol, methanol, butanol and succinic acid facilities.

## IV. Incineration

In 2019 – 2020, Acero completed the execution of a confidential waste incineration project – this project has an estimated total installed cost of \$30 million (CDN). The details are confidential but this type of project – while not fitting the typical Oil and Gas facility “template” is ideally suited for Acero’s engineering approach.



ALBERTA H2





## ACERO’S ESG STRATEGY

Acero Engineering recognizes the rapidly increasing importance of ESG and is committed to supporting our clients’ ESG strategies.

### What is ESG?

ESG stands for Environmental, Social, and Governance and investors are increasingly applying these non-financial factors as part of their analytic process to identify material risks and growth opportunities and to determine those companies that they wish to align with, based on their ESG performance or score.

In compiling a list of ESG factors, it is evident that they can be linked and intertwined. The following are the relevant ESG endeavors being taken on and applied by Acero in its day-to-day service for its clients:

#### ENVIRONMENTAL

- ▶ Climate change and carbon emissions
- ▶ Air and water pollution
- ▶ Energy efficiency
- ▶ Waste management
- ▶ Water management/conservation
- ▶ Forest management
- ▶ Biodiversity

#### SOCIAL

- ▶ Gender, diversity and inclusion
- ▶ Data protection and privacy
- ▶ Community relations
- ▶ Human rights
- ▶ Labour standards
- ▶ Customer satisfaction
- ▶ Human Safety

#### GOVERNANCE

- ▶ Audit structure
- ▶ Executive compensation
- ▶ Political contributions
- ▶ Whistleblower schemes
- ▶ Lobby policies
- ▶ Board composition

#### Environmental (Conservation of the Natural World)

This includes the energy a company takes in, the waste it discharges, the resources it needs, and the consequences of the related activities. E encompasses carbon emissions and climate change. Every company uses energy and resources; every company affects, and is affected by, the environment.

#### Social (People and Relationships)

Addresses the relationships a company has and the reputation it fosters with people and institutions in the communities where business is conducted. This includes labor relations and diversity and inclusion. Every company operates within a broader, diverse society. Acero recognizes that this relationship is critical for its clients and further recognizes that, as a technical representative of its clients, we must be sure to emulate the same consideration and message as that of its clients.

#### Governance (Standards for running a company)

The internal system of practices, controls, and procedures a company adopts in order to govern itself, make effective decisions, comply with the law, and meet the needs of external stakeholders. Every company, which is itself a legal creation, requires governance.

We provide expertise in efficient project execution that is socially and environmentally responsible. We help our clients achieve their sustainability goals for their business and operations.

### Why ESG?

While an ESG proposition is compelling at an ethical and emotional level, it also provides value creation in a financial sense as well. How exactly does a strong ESG proposition make financial sense? ESG links to cash flow in five important ways:

- ▶ facilitating top-line growth,
- ▶ reducing costs,
- ▶ minimizing regulatory and legal interventions,
- ▶ increasing employee productivity, and
- ▶ optimizing investment and capital expenditures

Acero’s objective is to become an extension to each of its clients’ needs by incorporating the appropriate ESG plans and policies that complement and support. Essentially, our primary goal is for our clients to recognize Acero as a division of their organization, operating in a manner consistent with all of their corporate ESG strategies in executing engineering, procurement and construction activities. In Canada, a number of projects will thrive economically while considering social and environmental impacts (the triple bottom line) as a result of ESG compliance, and Acero will evaluate every potential for these opportunities in recommending options to meet its clients’ primary engineering, procurement and construction solutions.

Contact Acero today to [find out more about our ESG strategy](#) and how we will ensure a seamless execution of your engineering and ESG needs.

