

Canadian Energy Export Guide:

Oil & Gas and related Clean Technologies



Canada is renowned **worldwide** for its **excellence** and **innovation** in the oil

and gas industry, including as a world industry leader in heavy oil production and shale gas/tight oil plays. Many countries have recognized Canada's **leading** positions in oil and gas technology, such as enhanced oil recovery, processes and oilfield legislation, and are modeling their own regulations on what they see from Canada's various **energy regulators**.

Canadian firms, including **pipeline** operators and **upstream** exploration and production companies, are active in dozens of oil and gas producing countries **worldwide**. Canada can offer a wide range of **services** and **products** in **oil & gas and related Clean Technologies** from grass roots exploration, pipeline construction and operation, to end of production abandonment, reclamation and remediation as reflected in this guide and



canadianenergyexportguide.com





Search the database of hundreds of Canadian Exporters in Oil & Gas and Cleantech

Register your Canadian company

Geology and Play Development Capabilities

- Geological consulting
- Coring of wells and reservoir delineation
- Core analysis
- Geological software development
- Geologic model development



Exploration Geophysics

- Geophysical technologies including prospecting and surveying (such as 4-D seismic techniques)
- Geophones and electronic detonators
- Geomatics and remote sensing
- Software data management systems
- Exploratory test wells (tested with current geophysical techniques)
- Geophysical downhole and seismic data interpretation and feedback into the geological model

Drilling, Well Completion & Stimulation, Pumping services

- Drilling and completion engineering and design including:
 - Well planning (directional placement & spacing requirements)
 - Casing design and frac string design
 - Fracture technique selection (open hole or cemented completions)
 - Frac design, proppant and fluid selection
 - Tubing string design and selection
 - Well test design and evaluation engineering
 - Artificial lift design, selection & optimization
 - Injection well thermo dynamic analysis
 - Well life-cycle & risk mitigation engineering
- Drilling and coring of wells
- Drilling technologies and services (including engineering consulting & design, rathole drilling, multidirectional drilling)
- Drilling equipment and machinery (construction of equipment and components)
- Well Completion and Stimulation technologies and services (including consulting and design) e.g. hydraulic fracturing
- Well Completion and Stimulation equipment and machinery (e.g. packers and isolation tools)
- Well Completion and Stimulation wireline/stickline and perforating services
- Niche Technologies & Services (i.e. Methane emission - fugitive gas capture, recovery and reuse), surface casing/vent flow services
- Pumping services
- Drilling fluids & chemical suppliers
- Production testing
- Well intervention and workover services
- High temperature wellhead equipment
- High temperature and pressure downhole instrumentation
- Connections/fitting for stream lines
- Wireline logging & monitoring
- Fluids analysis (frac fluids, drilling mud, produced water)
- Sand control
- Inflow control devices
- Supply and rental stores
- Well cementing
- Coiled tubing services
- Rig and Access Mats



Canada is the world's 4th largest oil producer with 4.2 MMb/d*
Canada is the 4th largest natural gas producer 183 bcm*

* source IEA



Reservoir Engineering

- Reservoir analysis, advanced software and project management services
- Studies including oil and gas reserves estimates, production and economic modelling



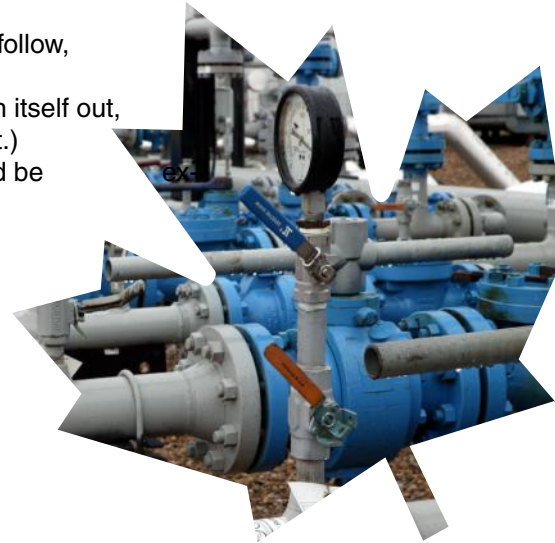
Field Development and Infrastructure

- Field development based upon reservoir engineering production and economic modeling
- Surface facilities and gathering systems including pipeline & oilfield construction
- Processing facilities
- Snubbing, workovers & servicing
- Production optimization



Enhanced Oil Recovery (EOR)

- EOR and economic value analysis (once a reservoir has been tested and produced, an analysis will be made to determine the type of EOR that could be used and the economic value of implementation/development)
- EOR pilot design and construction (once analysis shows that it is economically viable to test EOR, then design and construction will follow, on pilot basis.)
- Limited commercial production test (once the pilot stage has proven itself out, then it would be expanded into a limited commercial production test.)
- Field wide commercial production (once this is proven, then it would be panded into field wide commercial production.)
- Solvent injection
- Electric and/or Radio frequency heating
- Water/polymer injection
- Chemicals
- Partial upgrading technologies



Oil and Gas Pipeline and Processing Facilities

- Pipeline and oil & gas facilities engineering and design
- Construction-related services (surveying and staking the line, clearing and grading overburden, trenching, pipe stringing/joining, welding, inspection, placement of pipes, backfilling, hydrostatic testing, commissioning, cleanup of affected environment)
- Production, installation and maintenance of the pipeline infrastructure (piping, tankage, compressor and pump stations, metering stations, gate stations, valving, pig launching facilities, and monitoring facilities)
- Advanced leak detection technologies, corrosion, spill response
- Integrity management (corrosion), surveillance (including remote and automated), inspection (hydrostatic testing services)
- Emergency response, safety and security technologies, environmental protection, training for first responders and workforce
- Building and operating natural gas plants and processing plants, LNG facilities



Clean Technologies and Environmental Management

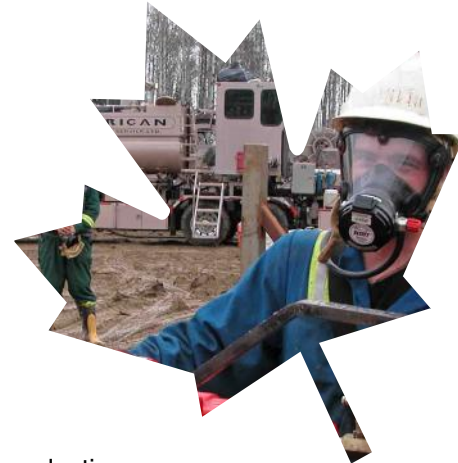
- Oilfield recycling, drilling waste management, water treatment, site remediation and reclamation, monitoring equipment, environmental protection services, containment, equipment and training
- Well integrity, decommissioning and reclamation
- Methane emissions reduction
- Carbon capture and storage (CCS)
- Offshore

Health and Safety

- Controls
- Computer applications
- Protection services
- Equipment and training
- Fluids analysis

Training

- Oil and gas industry training and education (Canada's educational institutes and partners are world leaders in training and education and offer services abroad.)



Offshore Development

- Transportation, storage, refining and marketing
 - Supply/distribution of petroleum products
 - Ship management and crewing services
- Environmental Management
 - Oil spill equipment, services and training
 - Spill protection equipment and services
 - Marine biology/fisheries science, policy
- Health, Safety and Training specific to offshore
 - Biomonitoring
 - Competency assessment programs
- Exploration and production
 - Geological/Geophysical/Geotechnical Services
 - Research and development
 - Project management, engineering and construction - offshore structures/services
 - On-shore infrastructure considerations (Considerations of the on-shore infrastructure to receive and support offshore production)
 - Commissioning and start-up
 - Subsea equipment, services and systems design
 - Offshore field services, equipment and supplies
 - Offshore project logistics
 - Engineering, testing and installation
 - Facility operations support
 - Facility Inspections

Explorers & Producers

For additional information and other related resources, please visit these websites:

Petroleum Services Association of Canada: psac.ca

Canadian Global Exploration Forum: cgef.org

Newfoundland and Labrador Environmental Industry Association: neia.org

The Maritimes Energy Association: maritimesenergy.com

Petroleum Technology Alliance of Canada: ptac.org

Environmental Services Association of Alberta: esaa.org

CanadaCleantech: www.canadacleantechalliance.ca

Global Petroleum Show: globalpetroleumshow.com

Government of Alberta: albertacanada.com

Canadian Trade Commissioner Service: tradecommissioner.gc.ca

Saskatchewan Research Council: src.sk.ca

Export Development Canada: edc.ca