careers in energy | career pathways

Technologists

Technologists have a critical role in helping make energy production viable. Their work directly helps companies steward responsible energy development. There are many, varied opportunities for Technologists across Canada's energy industry. Often, they use specialized equipment and apply science, engineering, and mechanical skills to conduct experiments, tests, and analyses. There are various disciplines that Technologists can pursue. They may research new products, conduct studies in the field, prepare technical plans/specifications, design operational processes, coordinate field operations, manage projects, evaluate performance, analyze data, troubleshoot issues, or lead in management roles. There is an ongoing need for Technologists in the energy industry where operational efficiency and sustainability are so important.

As their experience grows, Technologists take on increasingly complex technical responsibilities. They may work independently, under general direction, or in leadership positions. Leadership can include directly overseeing field operations at a facility or leading a team of technical/operational professionals. They possess theoretical and practical knowledge of many different types of technology. For certain types of technical work and decisions, the support of a professional engineer or architect may be required.

This career might be a fit for you if you enjoy creating, conceptualizing, or building things like equipment, models, and electronic devices. You probably also have an interest in math, science, and applied engineering. Working in teams with others is also important. Types of Technologists that are needed in the energy industry include: chemical, electrical, mechanical, petroleum, geological, and civil. Once Technologists have experience in a specialized area, they can work in a variety of sectors.

Established Energy Sectors:

- Oil and Gas
- Offshore Oil and Gas
- Oil Sands
- Energy Services
- Pipelines
- Refining

Emerging Energy Sectors:

- Biofuels
- Hydrogen
- Liquefied Natural Gas (LNG)
- Carbon Capture and Storage (CCS)

For energy sector definitions, go to **CareersinEnergy.ca**

What Technologists Do

Design and Build Equipment, Systems, or Studies

Technologists apply their science and engineering knowledge to varied tasks. These include designing, developing, and building equipment, systems, and processes. Some Technologists also interpret specifications and prepare or modify technical drawings or specifications. Other roles may be more research-oriented and involve the design and implementation of testing programs in the lab or field. Collecting samples, conducting experiments, and analyzing results are parts of the research. All this work can be used in energy exploration, development, and production.

Direct operations

Technologists monitor and direct one or more daily operations as per prepared plans/specifications. They provide real-time problem-solving and solutions. They monitor and track key performance indicators (KPIs) and optimize operations where applicable to drive efficiencies.

Operate and Maintain Equipment

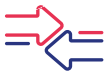
Technologists take charge of or help with the installation, operations, and maintenance of processing plants, equipment, and systems. They operate equipment for studies and tests. They can perform inspections and maintenance of parts, technical equipment, or entire machines. This work helps identify safety risks and more efficient ways of operating equipment.

Recommend Improvements and Install Upgrades

Technologists develop procedures and technologies that make performance the best it can be. They also analyze, evaluate, and troubleshoot problems. They may recommend technology upgrades, using different approaches with equipment, or changing the way work is performed.

Compile and Interpret Data and Prepare Reports

Technologists compile data, conduct analyses, and create reports. The reports record results and support decisions about resource development. Some Technologists support the management of cost controls for facilities and projects. They prepare estimates of time, quantities, material, and labour requirements for activities such as testing, installation, and maintenance. Other Technologists will be more involved in field or laboratory work. They will prepare and analyze studies and field survey data.



Stay Up to Date in Their Field of Technology

Technologists know that technology advances quickly and they need to be constantly educating themselves. They stay current by reading technology publications, attending conferences, and participating in training.

Key Skills and Abilities Technologists Need

This chart shows the skills, abilities, certifications, and personal attributes needed as Technologists enter and advance their careers in the energy industry. Each occupation, job level, and responsibility will require a different mix of these skills and abilities.

Core Knowledge

Develop discipline-specific knowledge such as geology, geoscience, chemistry, mechanics, petroleum technology, instrumentation, electrical technology, and electronics

Specialized digital tools for business and data analysis, computer-aided design, process engineering, industrial controls, and mapping

How to design, operate, and maintain instruments, equipment, and facilities

How to conduct and design geological/geophysical studies and field survey programs

How to use quality management systems

Technical Skills

Install equipment

Troubleshoot and identify needed repairs for machines and systems

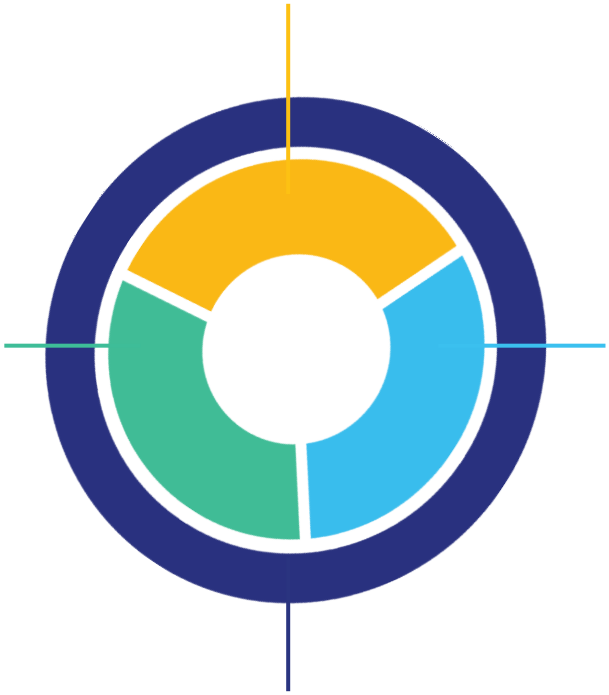
Use statistics and analytical software

Evaluate equipment failures and equipment changes

Read geological maps

Evaluate samples, geological data, and maps

Gather information and write reports



Personal Attributes

Adaptability

Active learning

Attention to detail

Analytical thinking

Collaboration

Stress tolerance

Beneficial Certifications

Driver's Licence plus a clean abstract

First Aid

H2S Alive

Fall Protection

Confined Space Entry

Aerial Lift

Equipment Isolation

Workplace Hazardous Materials Information System (WHMIS)

Technologist Careers in the Energy Industry

There are different education and work experience requirements for the Technologist career. These may differ from province to province. Entry to a Technologist career in energy can start with relevant education, or education combined with related job experience. The chart shows how roles and educational requirements change for each career level. As you advance your career, your education and experience can help you to move across the various sectors in the energy industry.

Career Level	Entry	Mid	Senior
Types of Jobs After Completion of a 2–3-year College Program in a science/ engineering Technology discipline Visit Technologies Professionals Canada for more information. Licensing and certification are required in most provinces/ territories and may vary by jurisdiction	**Entry-level Technologist** **Technologist in Training (T.T.)** **Technologist (certified)** 2 years of relevant experience to qualify in one of the following equivalent licences: • Applied Science Technologist (AScT), or • Certified Engineering Technologist (C.E.T.)	**Intermediate Technologist (certified)** Work experience to develop the technical and personal skills needed to adapt to a variety of situations and work settings **Applied Science Technologist (AScT)** **Or** **Certified Engineering Technologist (C.E.T.)**	**Senior Technologist (certified)** Specialization based on interests and technical and personal skills developed through experience **Technology Supervisor /Manager** Professional Engineering Technologist (P.Tech) [ASET] Professional Licensee (P.L. Eng) • Available in Alberta, BC, Saskatchewan; called Limited License in other jurisdictions ; 6 years of relevant work experience required

Transferring Technologist Skills from One Energy Sector to Another

There are core skills and knowledge that all Technologists need for their careers. These building blocks apply across all energy sectors and for all specializations.

The following flow chart presents the core skills and knowledge Technologists need as building blocks. It also identifies evolving skills required to address the needs of each energy sector. Each energy sector uses the building blocks in different ways.

New entrants to a Technologist career can use the diagram to understand the building block skills needed to work in sectors across the energy industry. Experienced Technologists can use the diagram to explore how each building block is applied across the energy sectors.

Skill: Design, construction, and optimization of facilities and operational processes

Skill: Knowledge of science, technologies, and operational processes

Skill attributes	Sector
Production optimization	All sectors except Energy Services
Physics, geology, engineering, chemistry, statistics, and thermodynamics	All sectors except Energy Services
Emissions detection, reduction, and monitoring	All sectors except Energy Services
Exploration and production	Oil and Gas
Field and processing facility operations	Oil and Gas
Production facilities, vessels, and offshore exploration and operations	Offshore Oil and Gas
Geophysical mapping	Oil and Gas
Reservoir modelling and engineering	Offshore Oil and Gas
Well design, planning, and completion	Oil Sands
Bitumen mining and in-situ extraction	Oil Sands
Upgrading processes and facilities	Oil Sands
Remediation and reclamation	Oil Sands
Seismic data collection and interpretation	Energy Services
Drilling, testing, completing, maintaining, and reclaiming services	Energy Services
Executing well decommissioning, remediation, and repurposing	Energy Services
Geophysical mapping	Energy Services
Safe disposal of waste fluids into underground formations	Energy Services
Applying expertise and skills to emerging technologies and energy sources	Energy Services
Exploration and production	Pipelines
Field and processing facility operations	Pipelines
Production processes using electrolysis technologies, electrochemical, and thermochemical reactions, and carbon capture and storage (CCS)	Hydrogen
Underground storage	Hydrogen
Compressing, liquifying, and blending of hydrogen for truck and pipeline transportation	Hydrogen
Working with fuel cells	Hydrogen
Properties, behaviour, and handling of hydrogen	Hydrogen

Skill: Knowledge of science, technologies, and operational processes (continued)

Skill attributes	Sector
Drilling and completion of CO2 injection wells Capture, separation, purification, liquefication, steam generation, and transmission of carbon Storage of CO2, including evaluation and monitoring of CO2 storage sites Properties, behaviour, and handling of carbon/CO2	Carbon Capture and Storage (CCS)
Natural gas liquefication and LNG storage, transportation, and re-gasification processes	Liquefied Natural Gas
Oil refining processes and creating end uses and products	Refineries
Refining, petrochemical processing, and carbon capture technologies Feedstock production, handling, and processing Storage and transportation of feedstock to refinery (by pipeline, tanker, rail, etc.)	Biofuels

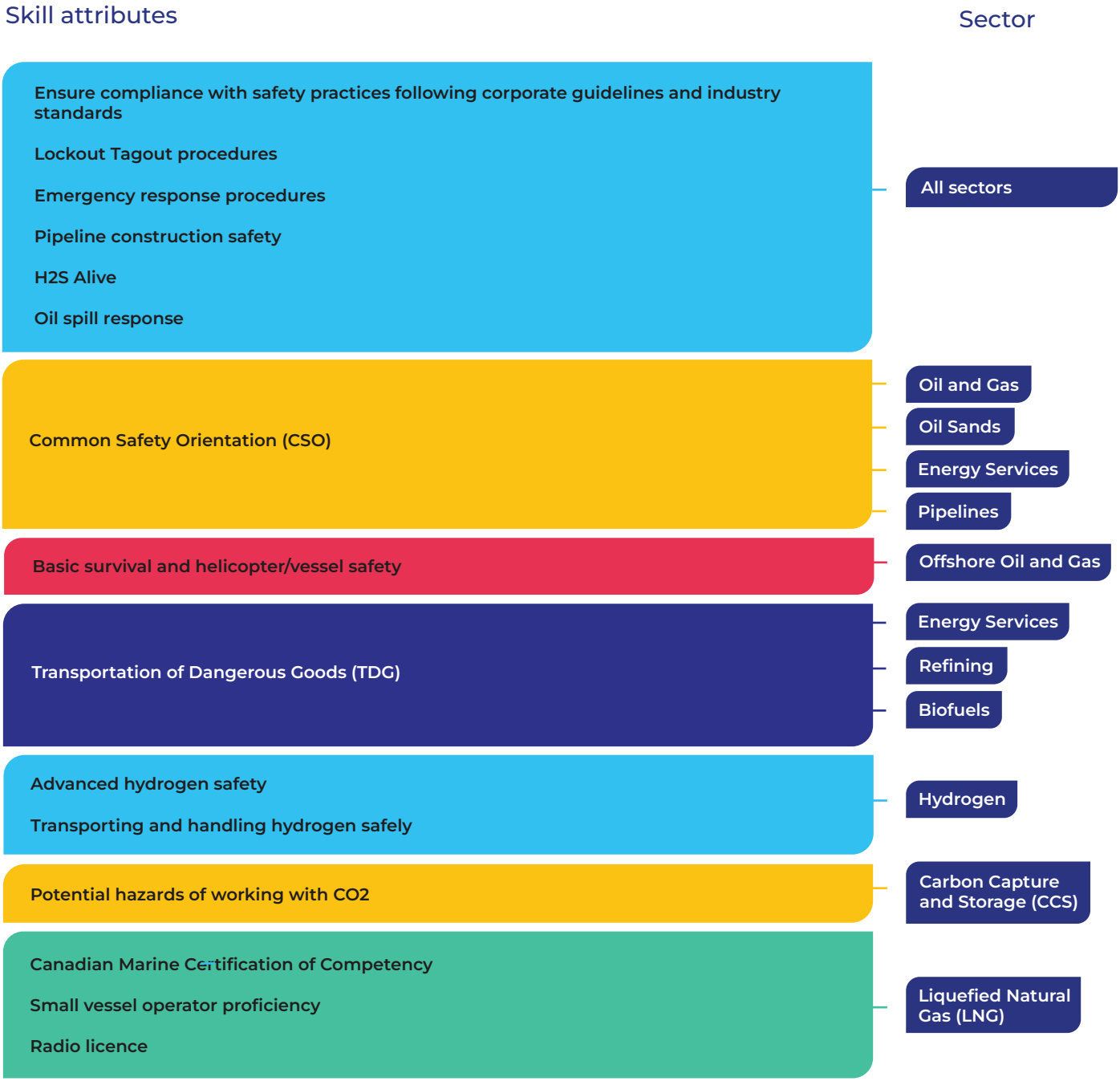
Skill: Use tests, tools, and techniques to study and monitor equipment and processes in facility, field, and laboratory settings

Skill attributes	Sector
Selection and use of the appropriate testing method, tools, and techniques to: • Create drawings and models • Conduct experiments, tests, and studies • Evaluate the safety and quality of equipment, materials, and products • Research new and improved products, processes, and technologies Use statistics and analytical software for interpretation and decision-making	All sectors

Skill: Install and maintain tools, equipment, and systems and perform troubleshooting

Skill attributes	Sector
Perform equipment upgrades and maintenance Address mechanical equipment problems and issues Complete predictive maintenance and troubleshooting Inspect installations of equipment and facilities	All sectors except Energy Services

Skill: Safety programs and certifications for industrial operations



Career Outlook for Technologists

Projected labour shortages

The demand for workers is projected to be greater than the supply of available workers.

Source: Careers in Energy, National Labour Market Outlook to 2035

careers in energy™

CareersinEnergy.ca

@energycareersca

@energycareersca

/energycareers

/careersinenergy

Canada

Funded in part by the Government of Canada's Sectoral Workforce Solutions Program.