

# CAREER ZONE: ENERGY SECTOR

Helping High School Students  
Prepare for a Career in the Energy Sector



Ministry of  
Education

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# THIS GUIDE

This guide provides general background on the Canadian information and communications (Energy) sector, followed by more specific information on a range of job possibilities within three Energy sub-sectors.

It also includes sample bundles of high school and post-secondary courses and training to illustrate how high schools, post-secondary institutions and industry partners/employers may work together to develop paths for individual students to follow to help them qualify for a career in Energy.

This guide is an *introduction* only to the job and career possibilities within this sector. More detailed information is available from a variety of general and sector-specific sources mentioned throughout this guide.

## WHAT IS A CAREER ZONE?

A Career Zone is a group of courses, certifications and work opportunities that BC high schools can develop to help students in Grades 11 and 12 get ready to pursue a career within a particular industry, while still meeting provincial requirements for graduation.

By working within a Career Zone in high school, students have the opportunity to:

- Select courses that match their specific skills, interests and career goals.
- Acquire work experience relevant to those career goals.
- Obtain industry-recognized certifications.
- Complete college or university courses for a career head start and valuable post-secondary experience.



## WHAT'S INCLUDED IN A CAREER ZONE?

Individual BC School Districts are encouraged to develop their own Career Zones, based on local labour market needs, student interests, industry and post-secondary partnerships, and local work experience opportunities.

Where available, Career Zones should include:

- Mathematics, Language Arts and Science courses at the Grade 11 to 12 level.
- An Applied Skills elective at the Grade 11 to 12 level, or a local or provincial trades exploratory course.
- A variety of transition opportunities, including:
  - college/university (dual credit) courses
  - Board/Authority Authorized (BAA) courses
  - Independent Directed Studies
  - Advanced Placement courses, and
  - Work Experience 12A and 12B, as well as other workplace training opportunities, including co-op placements and summer internships.
- Career preparation certifications, such as CPR, First Aid or Workplace Hazardous Materials Information System (WHMIS).

## IS THERE ONLY ONE ROUTE WITHIN A CAREER ZONE?

Each Career Zone has a variety of routes within it for students to reach their career destinations. Depending on each student's specific goals, a Career Zone route may lead from high school graduation to either:

- direct-to-work;
- apprenticeship program;
- college certificate or diploma program;
- college/university degree program.





## Direct-to-Work Route

The direct-to-work route helps prepare students to transition immediately from high school to work following graduation.

## Apprenticeship route

An apprenticeship is a combination of on-the-job training and classroom learning at a college, technical university or private trades training institution. All apprenticeship training is delivered by skilled, certified trades people with experience in the field.

In BC, successful apprenticeship training leads to a Certificate of Qualification (CoQ) awarded by the **INDUSTRY TRAINING AUTHORITY**, which is recognized across the province. About 50 trades also offer the Interprovincial (IP) Red Seal certificate, which is recognized across Canada.

## College route

Students on a college route have decided to pursue a career that requires a college certificate or diploma. Most certificates and diplomas require one to two years to complete, but some may take less time.

## College/university route

Following high school graduation, students on a college/university route will enrol in a university (or a degree-granting college) to take a program of study in their career-related area of interest, leading to a degree. This route can take four or more years to complete.

### INDUSTRY TRAINING AUTHORITY PROGRAMS

The **ACE-IT PROGRAM** allows high school students to take first level (classroom) technical training in a trade that gives them credit for both high school and apprenticeship or industry training programs. Technical training classes are most often taught at colleges, but can also be offered at school district facilities.

#### SECONDARY SCHOOL APPRENTICESHIP (SSA)

lets students begin the work-based training component of an apprenticeship program while still in high school. Students “earn while they learn,” getting credits toward both their high school diploma and apprenticeship on-the-job training. SSA students complete up to 480 hours of work experience that counts toward their apprenticeship and 16 graduation credits.

## IS IT POSSIBLE TO CHANGE A ROUTE?

While one student's route within a Career Zone may be direct – straight from high school to an apprenticeship, for example – another student may start on one route but later decide, as the student learns and experiences more, to switch to another. Some may also wish to change direction later, after they have perhaps started a diploma or degree program or even entered the workforce.

As a result, it's helpful for students interested in a particular industry sector to complete as broad a range of core high school courses, sector-specific electives and industry certifications when they are still in high school. Though students can of course pick up credits later, doing them early will ensure they are ready to follow any route at any time.



## NOT ALL INDUSTRY JOBS ARE IN THE FIELD

In addition to skilled and experienced people who work in the field, every industry needs people who work in the office, in such areas as IT, accounting, health and safety, human resources, investor or customer relations, communications, etc. While general certificates and degrees are available in these fields, it can help to have relevant courses, certifications and work experience within the industry sector.

Every industry also needs leaders: managers, supervisors, executives. Most people occupying leadership roles start by gaining relevant work experience then adding further on-the-job training, additional certifications or advanced degrees.





## USEFUL CAREER PLANNING RESOURCES

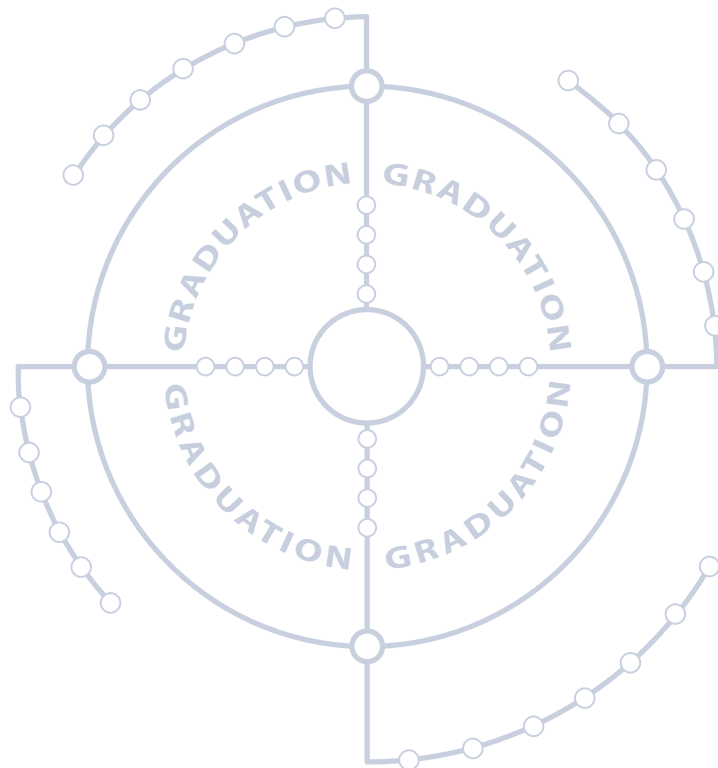
**WORKBC** provides profiles of more than 500 different occupations, with details on job duties, education and training required, employment outlook and average salaries or wages. The site also offers a comprehensive database of BC job postings, and a blog featuring trends, job-search tips and employment programs.

**EDUCATION PLANNER** allows users to compare BC post-secondary programs.

**TRADES TRAINING BC** helps students and employers find trades programs offered at 14 post-secondary institutions throughout BC.

## CAREER ZONE MAP

Like a transit map, the chart on the next page shows four possible routes from high school to a range of the most in-demand careers in the energy industry.

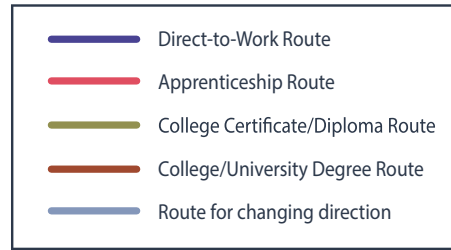


# Career Zone: Energy

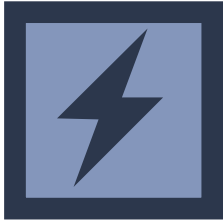
This map shows the various routes high school students can take to achieve high-demand jobs in the energy sector.

Routes start from the centre, with core high school courses, followed by options that help prepare students for the next steps along the route of their choice.

At any point, students may decide to switch their direction of travel and try a different route.







# ENERGY SECTOR CAREERS

The energy sector in Canada is made up of companies and agencies involved in a number of areas, including exploring new sources of energy; producing or generating energy; and refining, storing and distributing energy. Energy includes hydro-electricity, nuclear power and renewable energy and fuels (such as wind and solar energy or biofuels), as well as oil and gas.

Canada is one of the world's five largest energy producers and is the principal source of US energy imports.

## FOR MORE INFORMATION:

[ENERGY IQ \(CANADIAN GEOGRAPHIC EDUCATION\)](#)

[ENERGY BC](#)

## RECOMMENDED ELECTIVES FOR CAREERS IN THE ENERGY SECTOR

*Beyond the core courses required for high school graduation, the Energy sector recommends all students interested in an energy-related career take:*

- Physics 11
- Sustainable Resources 11
- Locally developed Board/Authority Authorized (BAA) courses, such as Patch 11 and Patch 12 offered by SD #71
- A range of Applied Skills 10 - 12 courses
- Work Experience 12A and 12B

## WORK EXPERIENCE 12A AND 2B

With Work Experience 12A and 12B – each 100 to 120 hours long – the community is the classroom. Work site placements help prepare students for the transition from high school to the world of work by providing opportunities to gain valuable workplace knowledge, determine (or change) career goals, and develop job skills.

To find out more, see the [PROGRAM GUIDE FOR MINISTRY AUTHORIZED WORK EXPERIENCE COURSES](#).

*Those interested in a college or university route should also consider taking:*

- Geology 12 (particularly if interested in a career in energy exploration)
- Math, Physics and Chemistry 11 and 12

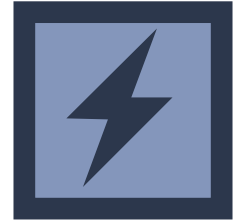
## RECOMMENDED CAREER PREPARATION CERTIFICATES FOR CAREERS IN THE ENERGY SECTOR

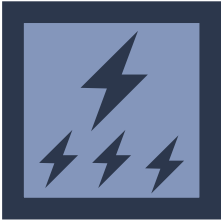
Most energy-related companies require applicants to have at least a high school diploma and a driver's licence. Acquiring relevant career-specific certificates can also ensure students have a better chance of employment – or perhaps a higher level of employment – directly out of high school, college or university. Certificates recommended by the energy sector include:

- First Aid Level 1
- CPR
- Workplace Hazardous Materials Information System (WHMIS).

*For those who are considering a career in the oil and gas industry, the energy sector also recommends:*

- Occupational Health and Safety
- H2S Alive
- Fall Protection
- Confined Space Awareness
- Transportation of Dangerous Goods
- Petroleum Safety Training





# ENERGY SUB-SECTORS

For purposes of this guide, we have divided the energy sector into three sub-sectors:

- The **oil and gas industry**, including oil companies and petroleum refiners, distribution (fuel transporters) and end-user sales at gas stations, as well as liquid natural gas (LNG) extraction, distribution and sales.
- The **electrical power industry**, including hydroelectric generation, distribution and sales.
- The **sustainable energy industry**, including renewable energy generation (solar, wind, biomass), distribution and sales, as well as energy efficiency and energy conservation.

Depending on local circumstances, an energy sector Career Zone may be designed to have a particular focus within a sub-sector – for example, on LNG production within the oil and gas industry, or solar generation within the renewable energy industry.

## FOR MORE INFORMATION:

[ENERGY IQ \(CANADIAN GEOGRAPHIC EDUCATION\)](#)

[ENERGY BC](#)



# ENERGY SUB-SECTOR PROFILE #1: OIL AND GAS INDUSTRY

Canada's oil and gas industry includes:

- Oil sands development in Alberta.
- Light and heavy oil production in Saskatchewan and Manitoba.
- The Hebron offshore oil project in Newfoundland and Labrador.
- The Deep Panuke offshore gas project in Nova Scotia.
- Potential liquefied natural gas (LNG) exports in British Columbia.
- Storage, transportation, delivery and sales of oil and gas products across the country.

## MORE FACTS

In 2006, 1416 natural gas wells were drilled in British Columbia. Total Crown revenue collected from oil and gas royalties, sales of gas rights, fees and rentals was \$2.14 billion. The sales value of oil and gas production was \$7 billion. Industry investment was \$6.1 billion. (Source: [BC Ministry of Natural Gas Development](#))

In 2012, the Canadian oil and gas industry directly employed a total of 195,200 people, with about 12,000 workers in British Columbia. The majority of BC's industry currently operates in the northeastern part of the province and is focused on natural gas exploration, production, processing and transportation. However, the development of the oil and gas export sector will expand BC's industry beyond this region. Oil pipelines and rail deliveries to BC ports and LNG export facilities are planned for the northwestern coast, including Kitimat and Prince Rupert. (Source: [Careers in Oil and Gas](#))

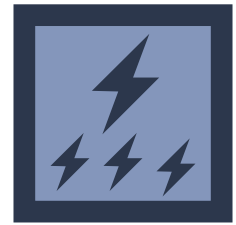
## FOR MORE INFORMATION:

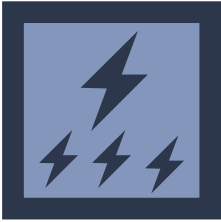
[PETROLEUM HUMAN RESOURCES COUNCIL OF CANADA](#)

[FUTURE PATHS: OIL & GAS LABOUR MARKET](#)

[CAREERS IN OIL AND GAS](#)

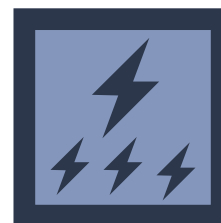
According to a recent labour market study released by the Petroleum Human Resources Council of Canada, the industry will need to hire over 100,000 workers to support new oil and gas activity as well as replace retiring workers by the year 2020. Of those hires, approximately 65,000 will be needed in core occupations, such as engineering, trades, operator and field worker roles.



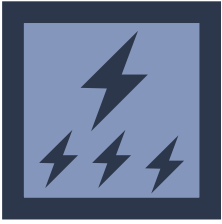


## OIL AND GAS INDUSTRY POSSIBILITIES

Route:	Job Possibilities:	Possible Training/ Credentials:
Direct-to-Work	<ul style="list-style-type: none"> <li>• Construction labourer</li> <li>• Heavy equipment operator (except crane)</li> <li>• Oil and gas field operator – <i>see Sample Bundle 1 for a suggested route to this career</i></li> <li>• Oil and gas field worker:               <ul style="list-style-type: none"> <li>• drilling</li> <li>• pipeline transportation</li> <li>• well services</li> <li>• seismic</li> </ul> </li> <li>• Production logistics coordinator</li> <li>• Truck driver</li> </ul>	<ul style="list-style-type: none"> <li>• Dual credit training for an Oil and Gas Field Operations Certificate – <i>see Sample Bundle 1</i></li> <li>• Short (one day to five week) programs at select BC colleges in such subjects as:               <ul style="list-style-type: none"> <li>• Introduction to Oil and Gas</li> <li>• Hoisting and Rigging</li> <li>• Industrial Rigging Basic</li> <li>• Class 1 Truck Driver Training</li> </ul> </li> </ul>
Apprenticeship	<ul style="list-style-type: none"> <li>• Carpenter</li> <li>• Concrete finisher</li> <li>• Crane operator</li> <li>• Industrial electrician</li> <li>• Industrial mechanic (millwright)</li> <li>• Industrial instrumentation and control technician</li> <li>• Insulator</li> <li>• Heavy duty equipment mechanic – <i>see Sample Bundle 2 for a suggested route to this career</i></li> <li>• Heavy equipment operator</li> <li>• Machinist</li> <li>• Oil and gas well driller, servicer or tester, through a rig technician apprenticeship</li> <li>• Oil and gas well drilling and services operator, through a rig technician apprenticeship</li> <li>• Petroleum equipment installer or service technician</li> <li>• Power line technician</li> <li>• Steamfitter, pipefitter, gas fitter</li> <li>• Welder</li> </ul>	<ul style="list-style-type: none"> <li>• ITA Certificate</li> <li>• Interprovincial Red Seal Certificate</li> </ul>



Route:	Job Possibilities:	Possible Training/ Credentials:
<b>College Certificate or Diploma</b>	<ul style="list-style-type: none"> <li>• Engineering technologist or technician               <ul style="list-style-type: none"> <li>• Chemical</li> <li>• Drafting</li> <li>• Geological and mineral</li> <li>• Mechanical – <i>see Sample Bundle 3 for a suggested route to this career</i></li> </ul> </li> <li>• Industrial</li> <li>• Natural and applied science policy researcher, consultant or program officer</li> <li>• Non-destructive tester or inspection technician</li> <li>• Contractor or supervisor, oil and gas drilling and services</li> <li>• Purchasing (supply chain) manager</li> </ul>	<ul style="list-style-type: none"> <li>• Civil Engineering Technology Diploma</li> <li>• Mechanical Engineering Technology Diploma</li> <li>• Electrical Engineering Technology Diploma</li> <li>• Electrical and Computer Engineering Diploma</li> <li>• Industrial Engineering Certificate</li> <li>• Global Supply Chain Diploma</li> </ul>
<b>College or University Degree</b>	<ul style="list-style-type: none"> <li>• Engineer               <ul style="list-style-type: none"> <li>• Chemical</li> <li>• Civil</li> <li>• Electrical and electronics – <i>see Sample Bundle 4 for a suggested route to this career</i></li> <li>• Industrial and manufacturing</li> <li>• Mechanical</li> <li>• Petroleum</li> </ul> </li> <li>• Geoscientist</li> <li>• Oceanographer</li> <li>• Natural resources production or fishing manager</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelor of Science in Engineering</li> <li>• Bachelor of Technology</li> <li>• Bachelor of Engineering – Mechanical</li> <li>• Bachelor of Engineering – Civil</li> <li>• Bachelor of Engineering – Electrical</li> <li>• Bachelor of Electrical Engineering</li> </ul>



## ENERGY SUB-SECTOR PROFILE #2: ELECTRICAL POWER INDUSTRY

In 2010, BC exported 5,670,655 MWH of electricity to the US, the bulk of which was generated through hydro-power.

The geography and climate of British Columbia make hydro-electric power, using dams and high capacity distribution systems, a reliable source of electricity.

BC Hydro, a provincially owned Crown corporation, was established in the 1960s to develop large-scale hydro-electric facilities and to distribute electricity province-wide. BC Hydro operates 30 power plants, and produces more than 43,000 gigawatt hours of electricity annually, providing energy for over 1.7 million residential, commercial and industrial customers.

But BC Hydro, while a major employer in the production and distribution of electrical energy in BC, is not the only producer of hydro-electricity in this province. Small hydro, also called “run of river,” refers to the production of hydroelectric power without the use of dams and is an emerging supplement to large hydro. Currently, there are 32 small hydro projects in BC. In addition, some aspects of maintenance of the electrical system are contracted out to third-party service providers who employ people in a variety of jobs.

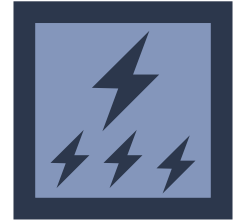


### FOR MORE INFORMATION:

[BC HYDRO](#)

[BRIGHT FUTURES BC](#)

## ELECTRICAL POWER INDUSTRY POSSIBILITIES



Route:	Job Possibilities:	Possible Training/ Credentials:
<b>Direct-to-Work</b>		
<b>Apprenticeship</b>	<ul style="list-style-type: none"> <li>• Cable splicer*</li> <li>• Electrician*</li> <li>• Industrial electrician</li> <li>• Industrial mechanic (millwright)</li> <li>• Interchange plant operator*</li> <li>• Heavy duty equipment mechanic – <i>see Sample Bundle 2 for a suggested route to this career</i></li> <li>• Mechanic*</li> <li>• Power line technician*</li> <li>• Vehicle tradesperson*</li> <li>• Winder*</li> </ul> <p><i>*Offered through BC Hydro's Apprenticeship Program. In this program, participants earn 75 percent of the full trade rate, with further increases during the apprenticeship. Graduates receive certificates from the Apprentice and Trades Training Committee and IBEW Local Union 258, as well as a Certificate of Qualification with a Red Seal Endorsement from the Industry Training Authority.</i></p>	<ul style="list-style-type: none"> <li>• ITA Certificate</li> <li>• Interprovincial Red Seal Certificate</li> </ul>
<b>College Certificate or Diploma</b>	<ul style="list-style-type: none"> <li>• Environmental manager</li> <li>• Land surveyor</li> <li>• Power engineer</li> <li>• Project manager</li> <li>• Technologist or technician                             <ul style="list-style-type: none"> <li>• Electrical and electronics engineering</li> <li>• Communications, protection and control</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Mechanical Engineering Technology Diploma</li> <li>• Civil Engineering Technology Diploma</li> <li>• Electrical Engineering Technology Diploma</li> <li>• Electrical and Computer Engineering Diploma</li> </ul>
<b>College or University Degree</b>	<ul style="list-style-type: none"> <li>• Engineer                             <ul style="list-style-type: none"> <li>• Civil</li> <li>• Electrical and electronics – <i>see Sample Bundle 4 for a suggested route to this career</i></li> <li>• Geological</li> <li>• Mechanical</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Bachelor of Electrical Engineering</li> <li>• Bachelor of Engineering – Electrical</li> <li>• Bachelor of Engineering – Civil</li> <li>• Bachelor of Technology</li> <li>• Bachelor of Applied Science</li> </ul>



## ENERGY SUB-SECTOR PROFILE #3: SUSTAINABLE ENERGY INDUSTRY

The sustainable energy industry generates power from renewable sources, such as sun, wind, waves and tides. It also includes geothermal and bioenergy technologies, which help to heat and cool buildings, to generate electricity, and to travel without producing unwanted greenhouse gases and other forms of pollution. Renewable energy services include professional, technical, and scientific services.

### FOR MORE INFORMATION:

[CANADIAN SOLAR ENERGY ASSOCIATION](#)

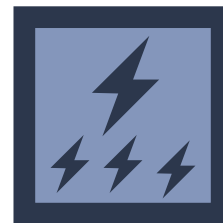
[BC SUSTAINABLE ENERGY ASSOCIATION](#)

[ECO CANADA](#)

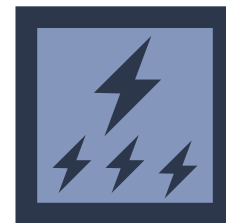
[EMERGING GREEN JOBS IN CANADA](#)

The sustainable energy industry also includes:

- energy efficiency and energy conservation, which refers to designing and building new structures – and retrofitting older ones– to be more energy efficient, as well as encouraging individuals, business and industry to reduce the amount of energy used
- building inspection and audit services for resource and energy efficiency
- deconstruction of inefficient systems or structures
- resource-efficient landscaping
- the development, use and installation of energy-saving building materials, lighting, HVAC and building control systems
- design and development of energy storage and smart grid technologies to make transmission and distribution infrastructure more efficient
- energy-saving consumer products and appliances
- energy consulting, software and services, and
- fuel cell technologies



Clean Energy Canada reports that investment in the sustainable renewable energy industry is growing rapidly, and estimates cumulative investments at \$25 billion over the past five years. It also reports that job openings at all skill levels are occurring in both new and traditional occupations, and that demand continues to grow: in 2013, 37 percent more Canadians worked in the sustainable energy industry than in 2009.



## SUSTAINABLE ENERGY INDUSTRY POSSIBILITIES

Route:	Job Possibilities:	Possible Training/ Credentials:
<b>Direct-to-Work</b>	<ul style="list-style-type: none"> <li>• Energy specialist</li> <li>• Geothermal installer</li> <li>• Solar installer</li> </ul>	
<b>Apprenticeship</b>	<ul style="list-style-type: none"> <li>• Insulator (heat and frost)</li> <li>• Geothermal technician</li> </ul>	<ul style="list-style-type: none"> <li>• ITA Certificate</li> <li>• Interprovincial Red Seal Certificate</li> </ul>
<b>College Certificate or Diploma</b>	<ul style="list-style-type: none"> <li>• Environmental engineering technologist</li> <li>• Solar photovoltaic systems technician</li> <li>• Wind turbine installer</li> <li>• Wind turbine maintenance technician</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Engineering Technology Diploma</li> <li>• Wind Turbine Maintenance Technician Diploma</li> </ul>
<b>College or University Degree</b>	<ul style="list-style-type: none"> <li>• Environmental engineer</li> <li>• Environmental planner</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelor of Applied Science in Environmental Engineering</li> <li>• Bachelor of Planning</li> </ul>





## ENERGY SECTOR CAREER ROUTES – SAMPLE BUNDLES

The four sample bundles of high school and post-secondary courses and training that follow illustrate how high schools, post-secondary institutions and industry partners/employers may work together to develop a particular route for students to follow.

### **SAMPLE BUNDLE 1: DIRECT-TO-WORK – OIL AND GAS FIELD OPERATOR**

This bundle shows a path already developed to meet a specific local need. It models how other high schools could work with a post-secondary and an industry partner to develop similar paths to meet recognized needs.

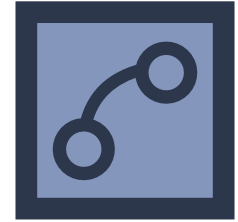
Northern Lights College developed the 71 program at the request of local industry to address current and projected shortages of skilled workers in this field. Students are trained to become professional and technically knowledgeable individuals specifically for the oil and gas industry. Oil and gas production operators are in high demand in the oil and gas industry, and are considered essential personnel to keep the industry running.

A sample bundle of courses for a student in School District No. 59, 60 or 81 – where Northern Lights has an Agreement to offer dual credit courses – who wants to become an Oil and Gas Field Operator right (or very soon) after graduation might look like this:



## DIRECT-TO-WORK – OIL AND GAS FIELD OPERATOR

Core High School Courses, plus Electives such as:	Career Preparation Certificates at Northern Lights College	Dual Credits at College/ University	Credential
Physics 11 Sustainable Resources 11 Locally developed Board/Authority Authorized (BAA) courses, such as Patch 11 and Patch 12 offered by SD #71 Apprenticeship and Workplace Mathematics 11 English 11 Work Experience 12A and 12B	POPR304 Basic Fire Fighting WFTR101 Occupational First Aid (OFA) Level 1 WFTR102 Occupational First Aid Transportation Endorsement WFTR108 H2S Alive WFTR114 Transportation of Dangerous Goods WFTR164 Confined Space and Entry - Level II WFTR169 Industrial Worker Fall Protection WFTR302 Petroleum Safety Training	OGOP102 Work Practicum (80 Hours) OGOP106 Oil and Gas Field Operations One OGOP107 Oil and Gas Field Operations - Two OGOP108 Oil and Gas Field Operations - Three OGOP109 Oil and Gas Field Operations - Four	Certificate in Oil and Gas Field Operations





## SAMPLE BUNDLE 2: APPRENTICESHIP – HEAVY DUTY EQUIPMENT MECHANIC

Through a Heavy Duty Equipment Mechanic Apprenticeship, students learn how to maintain, manufacture, overhaul, recondition and repair equipment powered by internal combustion engines or electricity. This equipment might include graders, loaders, shovels, tractors, trucks, forklifts, wheeled and tracked vehicles of all types used in the energy sector, as well as the mining, construction, logging, sawmill and manufacturing industries.

The Heavy Duty Equipment Mechanic Apprenticeship Program takes four years and includes 6,000 workplace hours and 720 in-school hours of training.

Students interested in becoming a Heavy Duty Equipment Mechanic may either:

- take a Foundation (pre-apprenticeship) program at a college or university while in high school (dual credit), then go into a Heavy Duty Equipment Mechanic Apprenticeship Program, starting at Level 2, or
- go directly after graduation into a Heavy Duty Equipment Mechanic Apprenticeship Program, starting at Level 1.

### MORE INFORMATION ON A CAREER AS A HEAVY DUTY EQUIPMENT MECHANIC:

Career profile: [WORKBC](#)

Training providers: [EDUCATION PLANNER OR TRADES TRAINING BC](#)

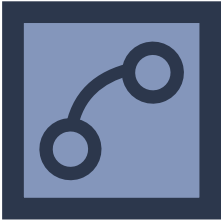
Apprenticeships: [INDUSTRY TRAINING AUTHORITY](#)

## APPRENTICESHIP – HEAVY DUTY EQUIPMENT MECHANIC



Core High School Courses, plus Electives such as:	Career Preparation Certificates	Dual Credits at College/University	Heavy Duty Equipment Mechanic Apprentice Program	Credential
<p>Earth Science 11</p> <p>Sustainable Resources 11</p> <p>Locally developed Board/Authority Authorized (BAA) courses, such as Patch 11 and Patch 12 offered by SD #71</p> <p>Apprenticeship and Workplace Mathematics 11</p> <p>Work Experience 12A and 12B</p> <p>Note: Some employers may require English 12, Math 12 and Physics 11</p>	<p>CPR</p> <p>First Aid</p> <p>WHMIS</p> <p>Fall Protection</p> <p>Confined Space Entry</p>	<p>Heavy Duty Mechanic Foundation:</p> <ul style="list-style-type: none"> <li>• Available at colleges/universities across BC: see <a href="#">Trades Training BC</a></li> <li>• Employer not required</li> <li>• Goal is to gain experience and familiarity with the trade and make it easier to find an employer to sponsor the apprenticeship</li> </ul>	<p>Levels 1 – 4:</p> <ul style="list-style-type: none"> <li>• Must have an employer and be registered with the Industry Training Authority</li> <li>• Available at colleges/universities across BC: see <a href="#">Trades Training BC</a></li> </ul>	<p>Certificate of Qualification (Red Seal) and Certificate of Apprenticeship</p>





## SAMPLE BUNDLE 3: COLLEGE DIPLOMA – MECHANICAL ENGINEERING TECHNOLOGIST

Mechanical engineering technologists and technicians support a wide variety of processes in machinery and power transfer systems. People in this occupation help design, develop, test and maintain power generation and power conversion plants, machines, components, tools, industrial robotics, heating and ventilating systems, mining and manufacturing operations and equipment.

A job as a technologist/technician generally requires a two-year college diploma of technology or a technician certificate, followed by certification from the Applied Science Technologists and Technicians of British Columbia (ASTTBC).

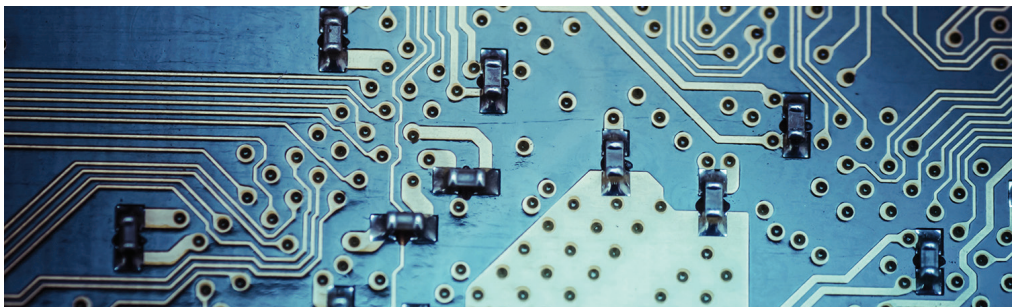
Okanagan College is one of several post-secondary institutions to offer a Diploma in Mechanical Engineering Technology. Students in School Districts 19, 22, 23, 53, 58, 67 and 83 (where Okanagan College has an agreement to offer dual credit courses) may apply to take courses in Industrial Trades and Services, including mechanical engineering technology. The program includes on-the-job work experience, where students alternate periods of paid employment with academic study.

### MORE INFORMATION ON A CAREER AS A HEAVY DUTY EQUIPMENT MECHANIC:

Career profile: [WORKBC](#)

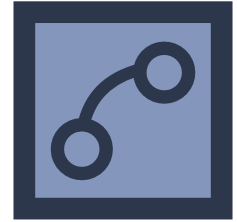
Training providers: [EDUCATION PLANNER OR TRADES TRAINING BC](#)

Professional organization: [ASTTBC](#)

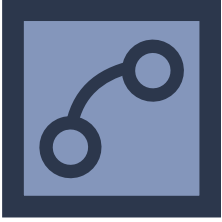


## COLLEGE DIPLOMA – MECHANICAL ENGINEERING TECHNOLOGIST

Core High School Courses, plus Electives such as:	Career Preparation Certificates	First-Year Dual Credits at Okanagan College	Okanagan College Diploma Program	Credential
Earth Science 11 Sustainable Resources 11 Locally developed Board/Authority Authorized (BAA) courses, such as Patch 11 and Patch 12 offered by SD #71 Physics 11 or 12 Math and English 12 Chemistry 11 or (strongly recommended) 12 Computer Science 11 or (strongly recommended) 12 Work Experience 12A and 12B	CPR First Aid WHMIS Fall Protection Confined Space Entry	MECH 131 MECH 133 MECH 134 MECH 136 MECH 139 MATH 135  For course details, see <a href="#">Okanagan College</a>	First year includes a four-month Co-op Work term	Diploma in Mechanical Engineering Technology







## SAMPLE BUNDLE 4: UNIVERSITY DEGREE – ELECTRICAL ENGINEER

Electrical and electronics engineers plan, engineer, design, research, evaluate, test, operate and maintain power systems and complex electronic circuits. People in this occupation work with:

- large-scale electrical systems such as generation, power transmission distribution and control of main and auxiliary systems, and/or
- smaller-scale electronic systems, including computers and integrated circuits as part of monitoring and control systems, and communication networks and systems.

Electrical and electronics engineers must complete a bachelor's degree in electrical or electronics engineering or in an appropriate related engineering discipline. They must also be registered with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC). Participation in an undergraduate co-op/internship program or applicable summer employment is highly recommended.

Employers include electrical utilities, large mining companies, communications companies, manufacturers of electrical and electronic equipment, consulting firms, government, and a wide range of manufacturing, processing and transportation industries.

UBC is one of several post-secondary institutions to offer a degree in electrical engineering.

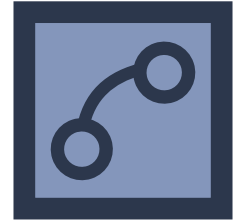
### MORE INFORMATION ON A CAREER AS A HEAVY DUTY EQUIPMENT MECHANIC:

[CAREER PROFILE: WORKBC](#)

[TRAINING PROVIDERS: EDUCATION PLANNER OR  
TRADES TRAINING BC](#)

[APEGBC](#)

## UNIVERSITY DEGREE – ELECTRICAL ENGINEER



Core High School Courses, plus Electives such as:	Career Preparation Certificates	Dual Credits	UBC Degree Program	Credential
<p>Sustainable Resources 11</p> <p>Locally developed Board/Authority Authorized (BAA) courses, such as Patch 11 and Patch 12 offered by SD #71</p> <p>Geology 12 (particularly if interested in a career in energy exploration)</p> <p>Math, Physics and Chemistry 11 and 12</p> <p>English 11 and 12, plus a language</p> <p>Approved social studies course</p> <p>Work Experience 12A and 12B</p>	<p>CPR</p> <p>First Aid</p> <p>WHMIS</p> <p>Fall Protection</p> <p>Confined Space Entry</p>	<p>APSC 122</p> <p>APSC 150</p> <p>CHEM 154</p> <p>ENGL 112</p> <p>MATH 100</p> <p>MATH 101</p> <p>MATH 152</p> <p>PHYS 157</p> <p>PHYS 158</p> <p>PHYS 159</p> <p>PHYS 170</p> <p>For course details, see the <a href="#">UBC calendar</a></p>	<p>The Electrical Engineering Program begins in second year of undergraduate studies after completing the required First Year Engineering courses.</p> <p>Students may apply for the Engineering Co-op Program at the beginning of their second year.</p> <p>For program details, see <a href="#">UBC</a></p>	<p>Bachelor of Applied Science (Engineering)</p>

