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**EXPERIENCE
FOSSIL FUELS**



**ENERGY
EDUCATION**

TOOL KIT

BY INSIDE EDUCATION



EXPERIENCE FOSSIL FUELS

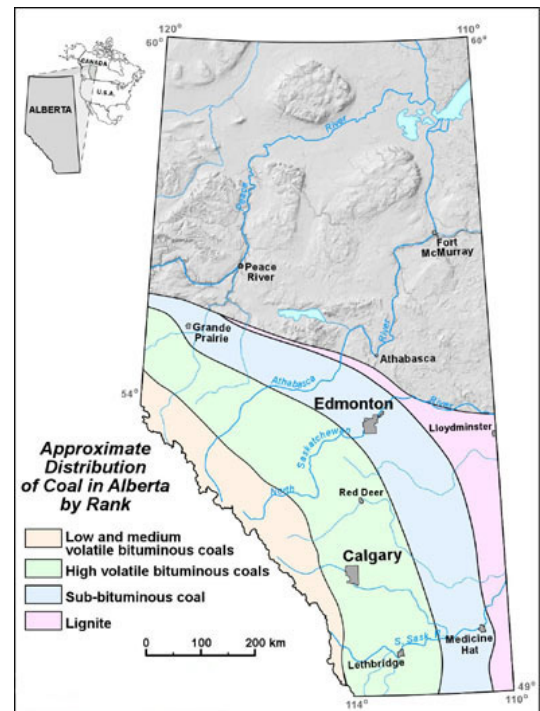
GUIDING QUESTIONS

- What are fossil fuels?
- Where are fossil fuels found in Alberta?
- How do we extract energy from fossil fuels?
- What is being done to lessen the impact of the fossil fuel industries on water, wildlife and air?

Fossil fuels are formed from the buried, fossilized remains of plants and animals that lived millions of years ago. The fossil fuels found in Alberta are **coal**, **oil** and **natural gas** and we have relied on these resources for many decades. Fossil fuels are found nearly everywhere in Alberta and we have industries to find, extract and process these resources; fossils fuels are a big part of the Alberta economy. The production and use of fossil fuels contributes to increased greenhouse gas emissions, and has impacts on water, air and wildlife.

COAL

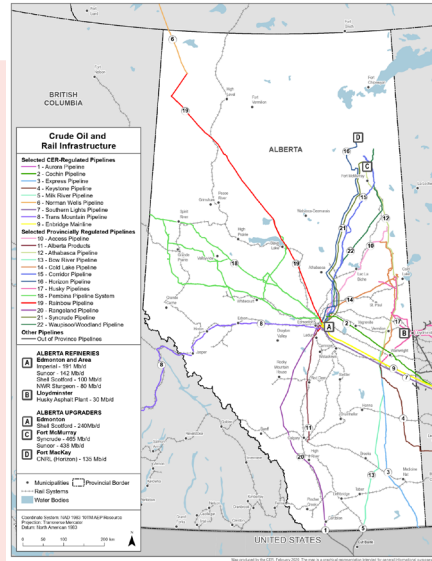
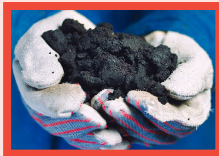
Coal-bearing formations underlie nearly half of Alberta, and Alberta has 9 coal mines. 78% of Alberta's mined coal is **thermal coal**, which is used for electricity generation. The remaining 22% is **metallurgical coal**, which is used to produce materials such as steel. Most coal is extracted using surface mining, which includes strip mining (*reclamation can be carried out throughout the mining process*) and open pit mining (*once the pit has been mined, it is backfilled and resurfaced*). In 2018, the government of Canada announced it would phase out coal-fired electricity by 2030 because the burning of coal releases greenhouse gases that contribute to climate change.



Alberta coal distributions (Credit: Alberta Energy Regulator/Alberta Geological Survey)

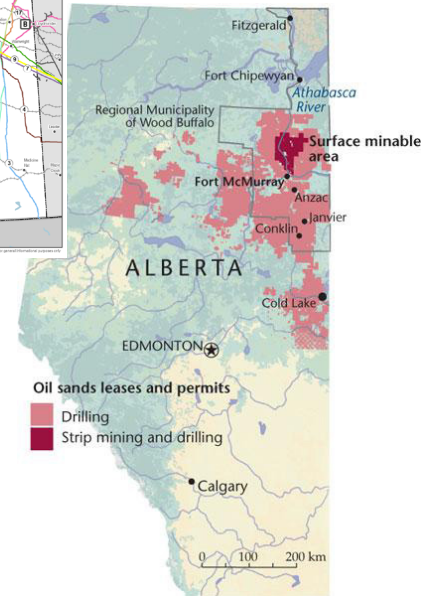
OIL

Canada is the 4th largest oil producer in the world and is home to some of the largest oil reserves. Western Canada accounts for 95% of the country's total crude oil production, most of which is exported to other countries. Crude oil can be made into petroleum products such as gasoline, diesel, jet fuel and plastics. Crude oil is transported through Canada using pipelines and rail, and to overseas markets using tankers.



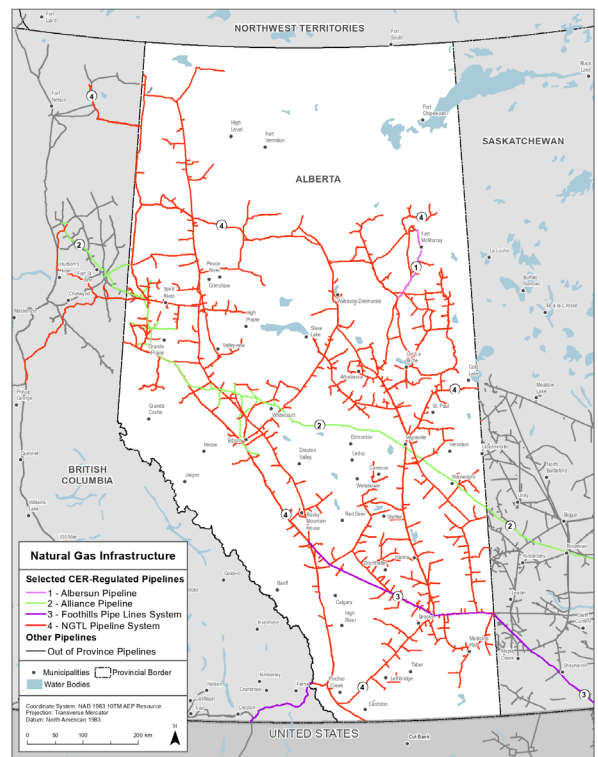
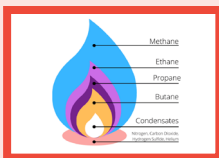
Alberta's Crude Oil and Rail Infrastructure (credit: Canada Energy Regulator)

Alberta's Oil Sands (credit: Steven Fick/Canadian Geographic)



NATURAL GAS

Alberta and B.C. produced 97% of Canada's natural gas in 2018. Once the natural gas is extracted and processed in western Canada, pipelines carry it to markets in central/eastern Canada and the United States. Natural gas can be used for heating and transportation, and made into products such as propane (for cooking), electricity, fertilizers, and more.



Alberta's natural gas pipelines. The NGTL Pipeline System in Alberta gathers and carries natural gas from the Western Canadian Sedimentary Basin to domestic and export markets. It is 24,568km in length. (credit: Canada Energy Regulator)

MATERIALS FROM KIT

- Issues & Innovations Matching Cards

TRY THESE ACTIVITIES

- **Answer the following questions using the oil, natural gas and coal descriptions found on the previous page :**
 1. Canada is the _____ largest oil producer in the world.
 2. What are 4 products that crude oil can be turned into?
 3. What are the 2 main ways oil is extracted from Alberta's oilsands?
(*hint: look at the legend on the Alberta Oilsands Map*)
 4. How is natural gas typically transported?
 5. What are 3 uses of natural gas?
 6. What is the most extensive network of natural gas pipelines in Alberta called?
(*hint: look at the red lines on the Natural Gas Infrastructure Map*)
 7. What type of coal is used for steel making?
 8. Why is Canada phasing out coal for electricity generation?
 9. Is most of Alberta's coal located in the Northern or Southern half of the province?
- **Complete the Issues & Innovations matching cards - match the issue to the innovation and learn more about what's being done to lessen the impact of the fossil fuels industries on water, wildlife and air.**



CONSIDER ...

In general, the world is transitioning away from fossil fuels and toward more renewable and alternative energy sources. What are some of the benefits and challenges of using fossil fuels?

CONNECT ...

Fossil fuels generate most of our electricity, fuel most of our cars, and produce many of the items we use on a daily basis. Think of 5 ways you've used fossil fuels in the last 24 hours.

LEARN MORE ...

Check out Inside Education's Oil Sands & Petroleum Field Trip Videos to learn more about how we produce fossil fuels in Alberta.

> <https://www.insideeducation.ca/oil-sands-field-trips>

> <https://www.insideeducation.ca/petroleum-field-trips>