Origins of Coal

COAL BEGINS FORMING 360 MILLION TO 290 MILLION YEARS AGO

Tectonic movements buried plant material from swamps and peat bogs, which were covered under silt and sediments, often to great depths. With burial, the plant material was subject to high temperatures and pressures. This cause physical and chemical changes in the vegetation, transforming into peat and then into coal.

Initially, the peat was converted into lignite or 'brown coal' and over many more millions of years, the continuing effects if temperature and pressure produces further changes in the lignite, transforming it into the range known as 'sub-bituminous' coals. Further chemical and physical changes occur until these coals become harder and blacker, forming the 'bituminous' or 'hard' coals. Under the right conditions, the progress can continue until anthracite is formed.

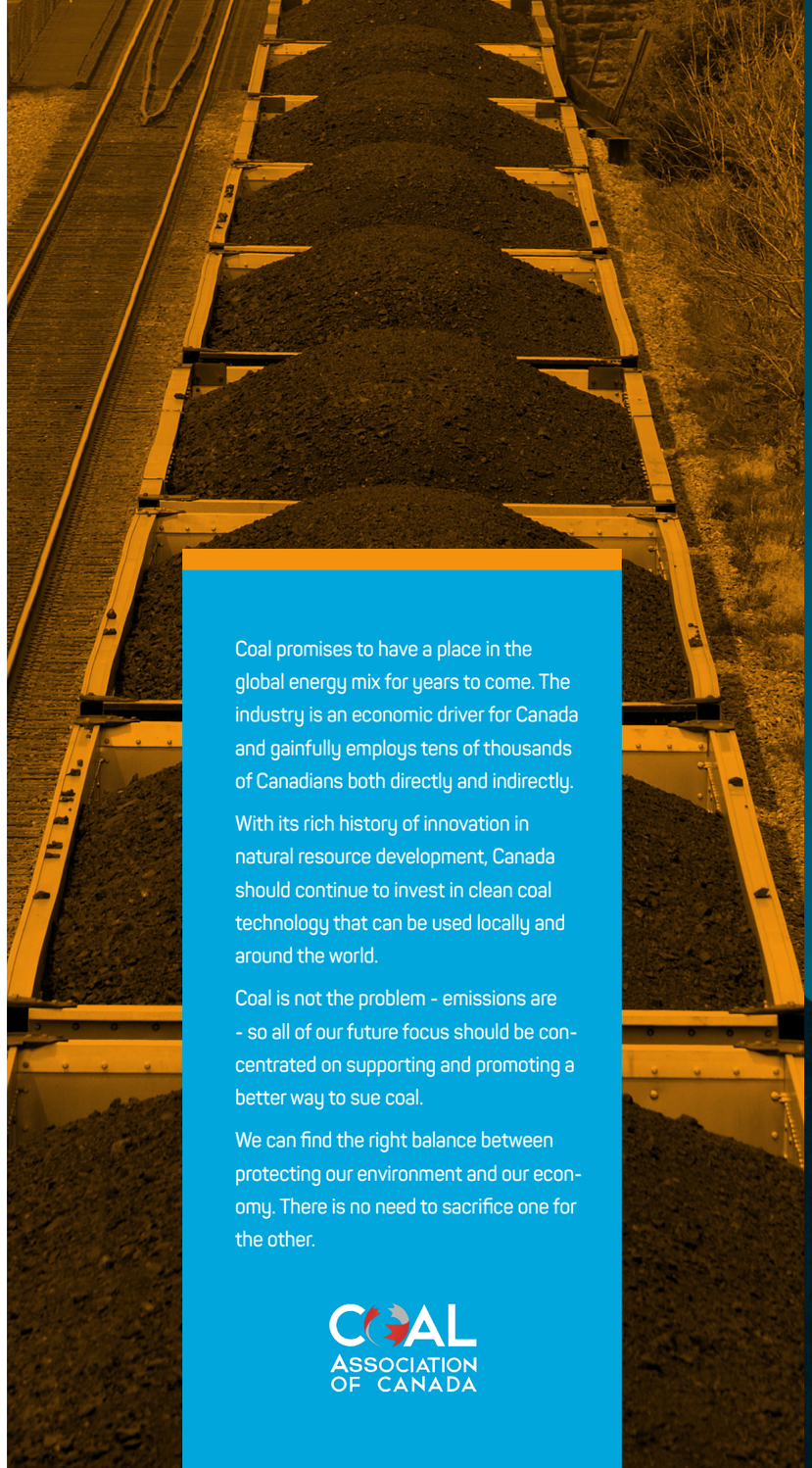
Types of Coal

METALLURGICAL COAL

Metallurgical coal is the oldest, hardest and cleanest burning type of coal and is essential to steel production. 1 billion tonnes are produced world-wide each year with Canada contributing 30 million tonnes to that total. Western Canada is home to some of the largest and highest-quality steel-making coal deposits in the world. Close proximity to the west coast allows for convenient transport to seaborne markets around the world.

THERMAL COAL

Thermal coal burns less efficiently than its metallurgical counterparts, but will still remain the largest source of electricity generation world-wide through to 2040. 41% of the world's electricity comes from thermal coal and 6.7 billion tonnes are produced each year. Thermal coal is expected to increase its share in ASEAN nations power generation from 32% today to 40% in 2040 but will use high-efficiency supercritical or ultra-supercritical technology to reduce emissions.



Coal promises to have a place in the global energy mix for years to come. The industry is an economic driver for Canada and gainfully employs tens of thousands of Canadians both directly and indirectly.

With its rich history of innovation in natural resource development, Canada should continue to invest in clean coal technology that can be used locally and around the world.

Coal is not the problem - emissions are - so all of our future focus should be concentrated on supporting and promoting a better way to sue coal.

We can find the right balance between protecting our environment and our economy. There is no need to sacrifice one for the other.

COAL ASSOCIATION OF CANADA

COAL 101

More than you think.

COAL ASSOCIATION OF CANADA

Uses of Coal

Electricity Generation

Cement Production

Wind Turbines

Powering Electric Cars

Steel Infrastructure

Aluminum

Carbon Alloys

Water & Air Filtration

GLOBAL STEEL PRODUCTION IS DEPENDENT ON COAL

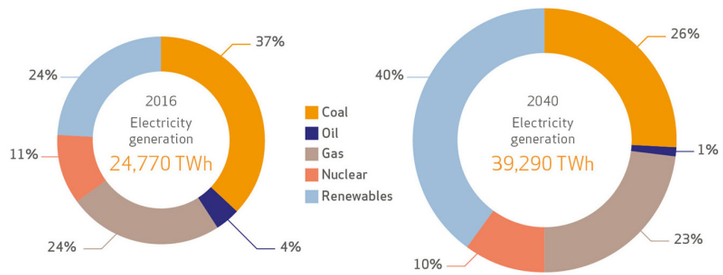
- 74% of steel produced today uses coal.
- Metallurgical coal - or coking coal - is a vital ingredient in the steel-making process.
- World crude steel production was 1.6 billion tonnes in 2017.
- Steel is an alloy based primarily on iron. As iron occurs only as iron oxides in the earth's crust, the ores must be converted reduced', using carbon. The primary source of this carbon is coking coal.
- Around 98% of iron ore is used in steel-making. During the iron-making process, a blast furnace id fed with iron ore, coke and small quantities of fluxes (minerals such as limestone which are used to collect impurities).

CANADA´S CLEANER THERMAL COAL

- Most thermal coal produced in Canada is used for domestic electricity generation.
- Canada's thermal coal is higher quality than much of the global supply. Combined with our efficient mining methods and reclamation, our product makes a positive impact on the industry
- Only current exporter of Canadian-produced thermal coal is the high grade deposit mined in Alberta's Coal Valley Mine, exported out of Prince Rupert, BC.
- Future mining plans are in place for this and other high-grade thermal coal deposits, such as Coalsur's Vista Mine in Alberta, for Canada to set the stage in the export of higher-grade coals. Canadian coal requires less volume and burns hotter than other global coals.

The Future of Coal

GLOBAL ELECTRICITY MIX UNDER IEA´S NEW POLICIES SCENARIO



Note: IEA's 2016 data is estimated
Source: International Energy Agency, World Energy Outlook 2017

The growth of global electricity from coal that is expected by 2040, according to the International Energy Agency.

Low Emissions Coal (HELE)

CLEANER COAL TECHNOLOGIES

During the burning of coal, emissions can occur that cause concerns about air quality, but technologies exist to address that challenge.

Cleaner coal technologies such as electrostatic precipitators, fabric filters, selective catalytic reduction systems, wet and dry scrubbers, sorbents and activated carbon injection can reduce the emissions of pollutants from coal combustion by between 90% and 99.9% by stripping out the pollutants before they are emitted through the smokestack.

Reduction of pollutants from coal combustion as a result of using cleaner coal technologies.

Carbon Capture

CARBON CAPTURE USE & STORAGE | CCUS

HELE technologies are important as a key first step towards the deployment of carbon capture,sue and storage technology (CCUS). HELE plants reduce the volume of CO_2 to be captured and hence the capacity of the capture plant required and the quantity of CO_2 to be transported and sorted.

- Identified as critical to meeting targets of Paris Agreement by IPCC and IEA.
- Applies to many industries - steel, chemicals, cement, fertilizers, pulp & paper, coal and gas-fired power generation.
- The Global CCS Institute says 2000 CCS facilities need by 2040 - currently about 20 in operation.
- Canada home to the world's first coal-fired generation CCS plant - Boundary Dam 3.