

NATURAL GAS FROM COAL



What is Natural Gas from Coal? (NGC)

Natural gas from coal is natural gas created, produced and stored in a coal seam.

How is it formed?

Millions of years ago, dead plant remains collected in swampy areas in many parts of the world. The plant material gradually became buried underneath deposits of sand and clay and these layers began to harden as a result of naturally occurring pressures and heat (a process known as coalification). Over time, the coal seams formed during the coalification process matured so that natural gas is generated within the coal. While there are always exceptions to the rule, we can generally say that the more mature the coal, the higher the natural gas content.

Natural gas produced from coal seams is generally referred to as Natural Gas from Coal (NGC) or Coalbed Methane (CBM). The gas is usually **sweet**, meaning it has minimal to no additional gases or chemicals, thereby reducing potential health and safety issues associated. This is different from **sour gas**, which contains hydrogen sulfide (H_2S). Because of its purity, NGC requires little to no processing. In other words, from the moment NGC is first extracted from the coal seams, it is virtually ready to heat your home.

Where is Natural Gas from Coal Found?

Most of the Natural Gas from Coal (NGC) resources in Canada occur in Alberta and north eastern British Columbia. Other resource areas have been identified in other parts of British Columbia, Saskatchewan and Nova Scotia.

TERMINOLOGY

Sweet gas: Natural gas that does not contain hydrogen sulfide [H_2S] or significant quantities of carbon dioxide [CO_2].

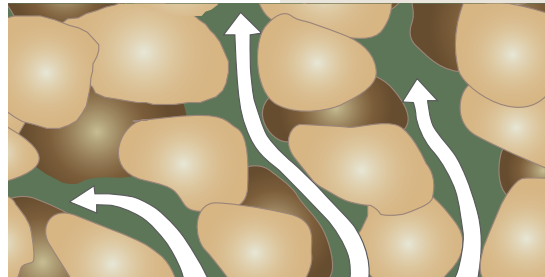
Sour gas: A general term for those gases that are acidic either alone or when associated with water. Two sour gases associated with drilling and production are hydrogen sulfide, H_2S , and carbon dioxide, CO_2 .

Adsorption: The property of some solids and liquids to attract a liquid or a gas to their surfaces.

Reservoir: Rock that contains potentially economic amounts of hydrocarbons.

Why is Natural Gas from Coal Referred to as an Unconventional Resource?

Industry refers to NGC as an unconventional resource because the method by which the gas is stored within the formation is different than that of conventional natural gas. In coal reservoirs natural gas is stored by adsorption of gas molecules to the solid hydrocarbons (coal). At higher pressure more gas is adsorbed. In conventional gas reservoirs, gas is trapped within the open pore spaces between the mineral grains by compression.



How Do You Release the Natural Gas from the Coal?

To produce gas from coal seams, the pressure in the **reservoir** must be lowered before the gas can flow through fractures within the coal seam (cleats), up the wellbore and into the pipeline.

Depending upon the gas content within the coal and/or the presence of water within the seams, NGC wells may be drilled and completed in different ways. If required, the coal seam must be dewatered. Dewatering removes the water that naturally exists within the cleats of the coal using a pump located at the wellhead. In some NGC reserves hydraulic fracturing is used to connect the natural fracture system to the wellbore. This in turn, reduces the pressure in the coal seam allowing the gas to then flow into the wellbore and up to the surface. The gas is then collected and compressed into a pipeline to be shipped.

What is the Footprint of Natural Gas from Coal Development?

Surface Lease

A standard single well lease site for conventional gas typically measures 100 metres by 100 metres. In Alberta Natural Gas from Coal (NGC) wells may be shallow in comparison to conventional gas wells and, as such, smaller rigs and smaller surface areas may be used.

Where coal seams are deep enough to permit directional drilling, drilling pads may be used to house multiple wells. Typically, a standard multi-well pad will measure 100 metres by 200 metres. While this type of surface lease has a larger surface impact, the cumulative effect on the environment is reduced as pad sites allow multiple wells to be drilled from one surface location.

Once drilling is complete and the well is connected to the pipeline, the lease area can be reclaimed to minimize surface disturbance.

Flaring

In general, flaring associated with NGC development is minimal. Most flaring occurs after drilling and prior to tying into a pipeline. Flaring is legally mandated for safety reasons and governed by regulation.