DIFFERENT OILS. DIFFERENT CLIMATE IMPACTS.

The climate impacts of different oils are defined by their composition of top-of-the-barrel and bottom-of-the-barrel products, that is, the more refined grades that correspond to gasoline, jet fuel, and diesel, respectively. Different oils have different compositions, different climate impacts. Measuring oils' greenhouse gas (GHG) emissions through their lifecycle helps scale climate impacts.

From upstream production to midstream refining to transportation to market, producing petroleum products has GHG emissions. Producing oil by extracting it from the ground with techniques like drilling, pumping, fracking, mining, or injecting substances into the reservoir increases. To produce oil from aging oil fields, different energy requirements (like water flooding, enhanced oil recovery) are needed for these processes, resulting in higher GHG emissions.

Separating oil from water, gas, and other impurities can require significant energy inputs. Upgrading heavier oils to remove excess carbon or diluting them for transport to reachable areas are becoming viable. These different oils have different natural gas contents. These resources may have to be burned at the resource, if infrastructure doesn't exist on-site.

Many of these inputs and outputs are reversible. The most GHGs when burned. Products that are not combusted or vented do not produce GHG emissions. Some very heavy oils actually release CO2 upon exposure to air. Three common GHG emissions sources are flare emissions, liquid storage tanks, and pipeline leaks. Many of these emissions are site-specific, and the emissions can span the entire lifecycle of the product from cradle to grave.

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Deborah Gordon and Eugene Tan

Petroleum products are used upstream, midstream, and downstream in the oil and gas industry to make energy, petrochemicals, and other products. The lifecycle of a petroleum product includes extraction, processing, transportation, and end use.

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The climate impacts of crude oil and refined products are not uniform. Oil composition can have an impact. Upgrading heavier oils to remove excess carbon or diluting them for transport to reachable areas are becoming viable.
Different types of oil require different refining techniques, including hydroskimming, gasification, and conversion methods such as steam cracking and catalytic cracking. Heavier oils generally require more energy to process due to their higher viscosity and complex composition. These processes can result in the emission of greenhouse gases (GHGs) into the atmosphere, or vented, if not burned. The emission of GHGs is a significant concern for climate change, as these gases contribute to the greenhouse effect and global warming.

Some processes, such as flaring—burning natural gas from oil wells—can lead to the release of large amounts of methane and other GHGs. Methane is a potent GHG that is released when natural gas is stored underground, flared, or vented. Methane is also emitted when oil and gas are produced, transported, and refined. The emission of methane is a concern because it is a powerful greenhouse gas with a global warming potential 28 times that of carbon dioxide over a 100-year period.

The extraction of oil from underground reservoirs can also emit GHGs. Oil can be extracted in various ways, including by drilling, fracking, or injecting substances into the reservoir to increase pressure and release oil. These processes can lead to the emission of nitrogen oxides (NOx), volatile organic compounds (VOCs), and other pollutants. The extraction of oil from unconventional sources, such as shale oil and tight oil, can also emit GHGs due to the use of water and chemicals in the fracking process.

The transportation of oil from the production site to the refinery can also emit GHGs. Oil is primarily transported by pipeline, tanker, or rail, with the choice of mode depending on the distance and other factors. The transportation of oil over long distances can lead to the emission of large amounts of GHGs, as well as other pollutants. The transportation of oil is a significant source of GHG emissions, and efforts are being made to reduce these emissions through the use of cleaner technologies and alternative modes of transportation.

The refining of oil to produce lighter products such as gasoline and diesel can also emit GHGs. The refining process involves separating oil into its various components, including a complex mixture of hydrocarbons. This process can require significant energy and can emit GHGs, such as nitrogen oxides and volatile organic compounds.

The combustion of petroleum products such as gasoline and diesel also emits GHGs. The combustion of these products is a major source of GHG emissions, as they release carbon dioxide when burned. The amount of GHGs emitted depends on the type of petroleum product and the efficiency of the combustion process. The refining and transportation of petroleum products can also lead to the emission of large amounts of GHGs, as well as other pollutants.

The downstream end use of petroleum products such as gasoline and diesel can also emit GHGs. The combustion of these products is a major source of GHG emissions, as they release carbon dioxide when burned. The amount of GHGs emitted depends on the type of petroleum product and the efficiency of the combustion process. The combustion of these products can also lead to the emission of other pollutants, such as nitrogen oxides and sulfur dioxide.

The production of oil by extracting it from the ground with techniques such as drilling, fracking, mining, or injecting substances is another significant source of GHG emissions. Producing oil from aging oil fields, such as those in California, produces especially large emissions due to the high energy requirements of the production process.

The clearing of land for seismic surveys, the operation of survey equipment, the injection of water and other substances into reservoirs through injection wells, and the use of steam or other methods to artificially lift oil, inject fluid and chemicals, and bitumen removal are used in different techniques with increasing oil field age. An oil field's conditions tend to change as the field ages and as the oil is consumed. Producing oil from aging oil fields, such as those in California, produces especially large emissions due to the high energy requirements of the production process.

Different processes are needed for these processes, resulting in significant GHG emissions. Steam, electricity, hydrogen, natural gas, and other intermediates are all needed for these processes, resulting in significant GHG emissions. The extraction of oil from underground reservoirs can also emit GHGs due to the use of water and chemicals in the fracking process.

The production of oil by extracting it from the ground with techniques such as drilling, fracking, mining, or injecting substances is another significant source of GHG emissions. Producing oil from aging oil fields, such as those in California, produces especially large emissions due to the high energy requirements of the production process. Producing oil by extracting it from the ground with techniques such as drilling, fracking, mining, or injecting substances is another significant source of GHG emissions. Producing oil from aging oil fields, such as those in California, produces especially large emissions due to the high energy requirements of the production process.
Different types of oil require different refining techniques, including hydroskimming, also emitting GHGs. Into the atmosphere, or vented, releasing GHGs. Associated gas content GHG emissions from leakage. Large amounts of energy and result in extracted. These processes require sands, kerogen oil shale, or condensed unconventional oil can be found. Conventional oil is a liquid, but highly gaseous form, such as oil gas. Unconventional oil can be found in unreachable areas are becoming viable. These different oils have different climate impacts. Measuring oils' greenhouse gas (GHG) emissions throughout, different energy requirements (like enhanced oil recovery). Associated with oil extraction, the more GHGs are produced. The ratio of water to oil in reservoirs increases as they age and become water flooding, enhanced oil recovery, different techniques with different energy requirements. An oil field's conditions tend to change as the field ages and as its time under active production increases. Oils extracted from reservoirs through injection to reservoirs through injection to increase recovery. Associated with oil extraction, each barrel of oil extracted is, the more GHGs are produced. Changes in land use that occur during the extraction process can disrupt landscapes that sequester carbon, like forests and permafrost. This releases carbon into the atmosphere and reduces the earth's natural sequestration capacity. GHG emissions from leakage. Large amounts of energy and result in extracted. These processes require sands, kerogen oil shale, or condensed unconventional oil can be found in unreachable areas are becoming viable. These different oils have different climate impacts. Measuring oils' greenhouse gas (GHG) emissions throughout.