



The Oil Climate Index

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"The 1.5°C global temperature threshold is a tall order for oil," Deborah Gordon, Director of the Energy and Climate Program at the Carnegie Endowment for International Peace, said in an energy policy seminar at the Harvard Kennedy School. "Oil and gas supply most of the 'stuff' in our everyday lives through a 20th century, tightly woven value chain that has found a use for nearly every molecule." Oil products are in gasoline and heating oil, but also in an array of construction and consumer goods including asphalt, cosmetics, cleaning products, clothing, and even dentures.

In order to address oil and gas emissions, Gordon stressed the importance of two observations. First, she noted, "Oil and gas resources are not in short supply." "Massive stockpiles" of oil and gas resources exist, she said, such that "peak oil will never, ever happen." Second, she said, it is important to understand that oil resources are heterogeneous. "There is no one 'oil,'" she explained. In fact, crude oil comes in many different varieties (conventional oil, fracked light tight oil, condensates, oil sands, depleted oil, etc.), and it refines into as many as ten different products (including fuel oil, diesel, jet fuel, and gasoline).



These two facts, abundance and heterogeneity, have important policy implications, Gordon said. For one thing, there is no set amount of carbon emissions associated with a generic barrel of "oil." The lifecycle emissions of different oils (including production and also consumption of the resulting products) can differ by almost a factor of two, Gordon observed.

To clarify this point, Gordon gave the example of "petcoke," a solid that is produced when oil sands and depleted oils are refined. Highly polluting when burned, petcoke is not consumed in the United States, but was, until recently, exported to countries like India, where it was mixed with coal and burned for energy. The production of petcoke, and its use, is one of the factors that makes oil sands and depleted oils especially polluting, and it is something that could be targeted in a policy that was sensitive to the differences in oil types, Gordon explained.

Another important public policy implication of the heterogeneity of oil products is the complexity it implies for efforts to reduce oil consumption, Gordon noted. Many public policy discussions approach oil primarily in terms of gasoline for cars and/or heating oil for homes, with the idea that electrifying transportation and heating would go a long way towards eliminating emissions from the oil sector. However, Gordon explained, the problem is more complex. As long as oil is being refined for some use or other (jet fuel or petrochemicals, for example), the refining process will result in a full complement of petroleum products inherent in the given type of crude oil—gasoline, diesel, etc. For this reason, even in a world in which vehicles and heating are electrified, the displaced gasoline and fuel oil will find their way to other countries and other products. Therefore, an oil transition strategy will need to address not only oil consumption but the future of the oil refining process overall.

In order to better develop the ability to analyze and compare emissions of different kinds of oils, Gordon reported, while at the Carnegie Endowment she partnered with researchers from Stanford University and the University of Calgary to develop the first open-source model to analyze the variance in oils' lifecycle greenhouse gas emissions, which led to the creation of the [Oil Climate Index](#). Data in this index continues to be updated and is currently being expanded to include an analysis of natural gas with emphasis on methane emissions. The hope, Gordon reported, is to improve access to information, transparency and disclosure in the oil and gas sector. This will be crucial to meeting the 1.5°C climate targets set by the Intergovernmental Panel on Climate Change, Gordon said.

One potential use of this information, Gordon said, might be in constructing a "[smart tax](#)" for oil emissions that takes into account the actual lifecycle emissions associated with different types of oil and different methods of oil

production and refining. The information might also be used to guide institutional investors and to target policy efforts on the most polluting oil sources, Gordon said, noting that, for example, this kind of information is motivating Suncor, in Canada, to begin sequestering petcoke, rather than shipping it abroad, and has contributed to bans on the burning of high-sulfur petcoke for power generation in China and India.

Gordon spoke as part of the Kennedy School's Energy Policy Seminar Series, which is sponsored by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.