

# Greenhouse gas emissions set to rise as new sources for transport fuel are used

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The use of low-quality sources of petroleum, such as tar sands, will dramatically raise global greenhouse gas emissions according to a new study.

The work is reported in the paper *Risks of the oil transition*, published in the new Institute of Physics open-access electronic-only journal, *Environmental Research Letters* (ERL).

Lead author Professor Alex Farrell of the University of California, Berkeley said: “Liquid fuels for transportation are increasingly coming from a wide range of sources other than conventional petroleum. We call this the oil transition and we conclude that the environmental risks associated with this transition are much bigger than the risk to a country’s economy or the security of their fuel supply.”

Tar sands are currently one of the biggest unconventional sources for petroleum. Bitumen, a very thick mixture of organic liquids, is mined from the tar sands. Natural gas is then bubbled through the bitumen to separate the impurities, mostly sulphur. The use of natural gas for removing impurities and then in refining tar sands into oil is a highly energy intensive process itself, even before the resulting oil is refined into gasoline and then burned in vehicles.

The sulphur separated in the production combines with Hydrogen to form H<sub>2</sub>S, the characteristic 'rotten egg' compound. Solid sulphur is then separated out, yielding vast pyramids of yellow sulphur blocks which are

stacked and stored on the site.

“We have calculated that production of fuels from low-quality and synthetic petroleum, such as tar sands, could have greenhouse gas emissions 30%-70% greater than the emissions from conventional petrol. Tar sands are already being used as a source for petrol, with over one million barrels refined each day in Alberta, Canada. With oil selling for \$60/barrel on the international market, the \$30/barrel production cost for tar sands is no longer an obstacle to production as it used to be.”

Professor Farrell continued: “The enormous abundance of fossil fuel reserves means that the real challenge for the future is not dealing with scarcity of supply but managing the transition from traditional sources such as oil fields to new unconventional sources whilst protecting the environment and balancing the changes that the transition will bring to the global economy and the security of supply for individual countries.”

Source: Institute of Physics

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