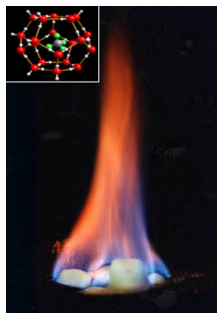


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By: Tudor Vieru, Science Editor



Methane ice could offer some much needed relief for all countries, while they switch their energy production from fossil fuels to alternative sources
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[Methane Ice Could Be the Next 'Big' Renewable Fuel](#)

Gas molecules are trapped in regular ice

Over the past couple of years, the necessity of finding sustainable alternative fuels to replace coal, oil, and natural gas for the next decades has become abundantly clear to everyone with a bit of common sense. Researchers from various universities and institutes have taken it upon themselves to come up with solutions, and efficient wind turbines, solar panels, fuel cells, and electric motors have been shortly after created. However, a small part of this initiative has focused its efforts on the most unlikely place to find something that burns - ice sheets.

Their research on the vast stretches of ice did not come from their desire to uselessly spend the money they got as funding, but because these regions contained potentially the vastest unexploited energy resource in the world, namely methane ice. More formally known as methane clathrate, the solid clathrate compound features large amounts of methane, trapped within the crystal structure of water ice. The stuff was originally thought to only belong to the outer regions of the solar system, where temperatures were very low, and large amounts of water ice already existed.

However, careful investigations of the planet's oceans have revealed vast deposits of methane ice immediately beneath a superficial layer of sediments on the ocean floors. According to the most recent and scientifically founded estimates of the amounts of methane clathrate in the Earth's oceans, we could benefit from one quadrillion to five quadrillion cubic meters of the stuff.

This is equivalent to 500 to 2,500 gigatonnes carbon (Gt C) of energy, as opposed to the some 230 Gt C natural gas reserves estimated to have remained around the globe. As for other fossil fuels, an estimated 5,000 Gt C are left, including yet undiscovered deposits, those under miles of ice or in rough seas, as well as those locked in tar sands at high latitudes.

Some countries, including the US, China, Japan, South Korea and Canada, have already begun to take steps towards exploiting their methane ice reserves. According to the South Koreans, their deposits could meet all the energy demands of the country for the next 30 years. Plans are to bring the first operational plant online by 2015. The great difficulty that lies ahead now is to figure out the best way to extract them, without polluting the environment in the process, such as while extracting oil from tar sands.