OSLI | OIL SANDS LEADERSHIP INITIATIVE

iGEM

The Oil Sands Leadership Initiative (OSLI), along with the Institute for Sustainable Energy, Environment and Economy and the School of Energy & the Environment, are collaborating on an iGEM initiative to offer sponsorship in the *Energy* and *Environment Tracks*. Teams are invited to submit iGEM project proposals in the area of biologically based solutions to advance the environmental sustainability of the oil sands, as well as supporting new energy ideas for the future.

We invite you to take a look...

OSLI is about collaborating, innovating and improving environmental, social and economic performance. It's about recognizing that new solutions and new ideas don't always come from within our own industry – so to create true and important breakthroughs in energy and the environment, OSLI is reaching outside the sector in hopes of turning some of our challenges into opportunities.

Last year OSLI sponsored five great iGEM teams from four different countries; and this year we're looking to sponsor more teams who want to either further these projects or create their own in relation to our challenges.

Craig Venter during a tour of the oil sands

Tell us your ideas!

- ❑ Bioremediation
- ❑ Microbes and algae that feed on carbon dioxide (CO_2) and turn it into a valuable product such as food or fuel
- ❑ Microorganisms that generate hydrogen
- ❑ Microorganisms that detect and destroy waste
- ❑ Novel biosensors
- ❑ Bacteria that could upgrade the bitumen *in situ* producing lighter hydrocarbons
- ❑ Microbes that process biomass into biofuels or electricity

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About the oil sands

The Canadian oil sands, located in northern Alberta, are the second largest energy resource in the world (after Saudi Arabia). The oil sands are an important, secure and reliable energy source for North America and abroad, but sustainable development presents a challenge.

Bitumen is a heavy and viscous form of crude oil, with a consistency similar to peanut butter at room temperature. About 18 percent of the oil sands lie within 75 metres from the surface and the bitumen is extracted through mining using hot water and chemicals. Ninety percent of the water from mining operations is reused and the remaining 10 percent (mixed with fine clays, small amounts of hydrocarbon and other compounds) goes into tailings ponds.

The vast majority of the oil sands deposits are too deep to surface mine so the bitumen is recovered *in situ* by injecting steam and solvents to reduce its viscosity so it flows into producing wells.

Traditionally, the energy to produce the steam and hot water used in these processes has come from natural gas. The use of increasingly large amounts of natural gas for oil sands recovery presents a number of economic and environmental challenges; steam generation and upgrading processes contribute large amounts of greenhouse gas (GHG) emissions.

Challenge = Opportunity

One of the key pressure points in oil sands development is GHG emissions. There are two main methods of reducing emissions per barrel of oil produced – one is to increase energy efficiency of oil sands production; the other is removal of CO_2 from combustion streams.

The main challenge oil sands producers face is to reduce the environmental intensity while maintaining or improving oil sands production.

Breakthrough energy-saving and alternative processes are sought to reduce the environmental impact of the oil sands. Biological processes are particularly attractive, since bitumen itself is the result of past biological activity.

Why get involved?

- ❑ Sponsorship for your team
- ❑ Generate exciting iGEM project ideas
- ❑ Create the energy of the future
- ❑ Gain knowledge and experience that could lead to an exciting career!

For more information and how to apply, please visit www.osli.ca/newideas

Applications must be submitted by May 15, 2011

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