

## **The Environmental Impacts of Biofuels**

*Dr. Xiaomin Yang - BP America*

This presentation covers the potential soil and groundwater impacts associated with the production, storage, distribution and use of biofuels. A preliminary environmental quality assessment shows that the new generation biobutanol may be more environmental friendly than the ethanol fuel.

Since ethanol's environmental behavior is quite different from gasoline hydrocarbons, biofuel handling facilities are facing new environmental protection challenges imposed by various ethanol fuels. Those issues range from the design of ethanol storage tanks, to surface water collection and treatment, to emergency response procedure. In addition, ethanol could change the fate and transport of hydrocarbons in soil and water. For example, ethanol biodegradation consumed the subsurface electron acceptors which otherwise will be used for the biodegradation of petroleum biodegradations. So ethanol may elongate dissolved benzene plume, potentially doubling groundwater remediation cost and time. In addition, ethanol release can mobilize existing, stable petroleum hydrocarbon sources in the subsurface.

A life cycle fuel use process is used to assess the environmental quality of biofuels. The quality matrix includes the environmental fate and transport of biofuel molecule, its impacts on petroleum hydrocarbons, and release scenarios. The preliminary evaluation indicated that new generation biobutanol may not inherit the negative environment impacts that ethanol fuel has.

## **Biography**

Dr. Xiaomin YANG

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Dr. Xiaomin Yang is the regional technology coordinator for US North Region, including 19 states, of BP Remediation Management Function. He is leading BP's technology development on fuel oxygenates and biofuel remediation program, and has evaluated the potential environmental impacts of biofuel for various BP business units. Dr. Yang is also a member of the API Soil & Groundwater Task Force. He has a Ph.D. in Chemical Engineering from Purdue University, IL. He's investigated bioprocesses for ethanol production from cellulosic materials and developed a solid-state bioreactor for cellulase production. In addition, Dr. Yang is an expert on pulsed air sparging for fuel oxygenates and petroleum hydrocarbon remediation.