# FACT SHEET - Climate Change and Oil Shale

## WHAT IS THE OVER-ARCHING CLIMATE CHANGE ISSUE?

Observed changes in the environment suggest that the global climate is changing, and many experts believe some if not all of the change is resulting from human activity. In particular it is postulated that man-made emissions of greenhouse gases are at least partially responsible for the changes, and that the earth is warming at a higher than expected rate, based upon observations over the last few decades. In light of these observations and the potential impacts upon society, international conferences have been held and the Kyoto Accord adopted by many of the world's nations. This accord calls for the reduction in emissions of greenhouse gases over the next decades. The debate in the United States centers on the timing of reductions, enacting regulations, and how to assure our economy and standard of living can endure while the changes are being implemented. The debate also includes how this country will meet our growing energy needs and increasing dependence on imports of petroleum. Even with huge improvements in energy efficiency and substantial growth in renewables, fossil fuels will still be the major part of the energy mix by mid century. Oil shale can play a role in filling the domestic fuel supply gap.

## WHY IS CLIMATE CHANGE AN ISSUE FOR OIL SHALE?

The greenhouse gas of primary interest is carbon dioxide ($CO_2$). It is a produced any time something is burned, such as coal, petroleum products and natural gas. For instance, when these natural resources are burned in a power plant to produce the electricity we use in our homes, $CO_2$ is emitted. The same holds true for the production of shale oil from the vast deposits of oil shale in the world, because energy in the form of heat is needed to process the oil shale. Therefore, oil shale is not unique in its emission of greenhouse gases. All forms of fossil energy are dealing with this issue in one manner or another and to a lesser or greater extent depending upon the resource and the recovery technology.

## HOW CAN FUTURE IMPACTS BE MITIGATED?

There are a number of means of mitigating the impacts of greenhouse gas emissions from oil shale projects. They vary with the technology being employed but generally include reducing emissions from the source, capturing the greenhouse gases, disposing of them, or using the captured $CO_2$ for beneficial uses. Reducing $CO_2$ emissions at the source is accomplished by employing energy efficiency measures. Capturing $CO_2$ can be accomplished using known technologies. The isolation of carbon dioxide, know as sequestration, is practiced today where the $CO_2$ is injected into oil fields to enhance the recovery of petroleum. Alternatively, $CO_2$ may be disposed of in subsurface strata. Also, one of the current oil shale developers is proposing to use $CO_2$ in its insitu oil shale recovery technology.

## WHAT IS BEING DONE?

Oil shale developers are actively engaged in research, development and planning for the best methods to manage the carbon that will be produced during the production of shale oil. They will benefit from the work going on around the world in this area of science and engineering because the technical issues being faced are common to all industries that burn fossil fuels. Governments are beginning to propose regulatory standards and devising carbon trading scenarios.

## WHAT ARE THE CURRENT LEGAL/REGULATORY ISSUES?

There are no Federal regulations for the levels of and timing for reductions of greenhouse gases. Nor are regulations in place covering the injection of $CO_2$ into geologic strata. Therefore, industry cannot definitively plan for or estimate the cost of meeting future carbon reductions from either existing or future fossil energy projects, including oil shale plants.

## CAN CLIMATE CHANGE IMPACTS FROM OIL SHALE BE MITIGATED?

Yes, the technology to reduce greenhouse gas emissions exists and can be implemented. However, the means and cost of disposing of or sequestering vast amounts of $CO_2$ poses a significant challenge. Lastly, the cost of meeting uncertain future regulatory requirements adds significant investment risk.

## OIL SHALE – ENERGY TO FUEL OUR FUTURE

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