

## ENVIRONMENTAL BENEFITS OF KERS SYSTEM WITH ELECTRICAL/DIESEL RIGS

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Rigs powered by electrical grid along with Kinetic Energy Reuse and Storage (KERS) system will be more energy efficient. This paper analyzes the effects of applying such a system to the rig in context of environment.

The design and implementation of KERS was given in SPE 12285. This paper assess the benefits after implementation of KERS in drilling rigs. These benefits are important and they affect not only the operator but also the surrounding ecosystem.

The drilling process contributes to 80-90% of total emissions from construction, transport and operations of drilling equipment. Emissions by the drilling rigs are associated with the operation of diesel engines. There is a direct correlation between emissions and operating time of the diesel engines. Longer is the time of operation of diesel engines higher is the fuel consumption and more are the emissions. Hence improving the efficiency of diesel engines can greatly help in reducing emissions. The KERS unit coupled with diesel engine will significantly reduce the amount of fuel consumed and hence lowering the emissions. Furthermore, it is possible to eliminate the emissions altogether if such a KERS unit is used with a power grid. A study of emissions is done to estimate the probable environmental benefits and cost reductions.

The LOC250 casing drilling uses three Volvo Penta TAD1642GE/VE engines. Their diesel consumption is around 3400 liters per day. Some of the commercially available flywheel systems have proven to save as much as 38% of the total fuel consumption if connected to these engines. Assuming 20 days/well, a diesel engine coupled with KERS can save as much as 25,840 liters of diesel. Not only is this big in terms of cost but also environmentally friendly. KERS system can offer a gamut of environmental benefits such as reduction in CO<sub>2</sub>, NO<sub>x</sub>, CO, SO<sub>2</sub> and PM (particulate matter) emission, noise reduction (making the aural workplace somewhere in the range of 90-100 dBA), lower footprint, lesser cost of operation (upto \$5000/well varying with diesel prices).

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