

**INDUCED ALTERATIONS TO THE ENERGY STATE WITHIN OIL & GAS FIELDS:
A NEW TECHNOLOGY FOR ENHANCED HYDROCARBON PRODUCTION**

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ABSTRACT

Oil and gas fields are contained within viscoelastic media that have its own distinguishing energy state. Such media are not only inhomogeneous in terms of composition (material and fluids distribution), but also inhomogeneous with respect to their ‘energy state’. We have developed a technology whereby the energy state of the media can be measured, monitored and altered so that net hydrocarbon production can be increased. The technology has been registered by European (2005) and Eurasian (2000) Patents bodies.

In brief the technology uses an approach where the stress distribution within the medium that contains the hydrocarbon field is initially characterized and monitored over time using geophysical, topographical, and subsurface pressure measurements. This yields an energy model for the medium, and a predictive model for vibration influences. Vibrations are then induced at the earth’s surface over an area typically 1.5 to 2.0 times larger than the underlying hydrocarbon field to raise subsurface energy states. This in turn alters the stress state within the field, and the pressure distribution, resulting in enhanced fluid flow. No damage is caused to the field during the operation. In order to optimize an enhanced level of hydrocarbon output, induced vibrations are repeated every 1.5-2 months before the medium returns to its original state after a certain period of time following cessation of induced vibration.

Since 1994 this technology has been applied to many hydrocarbon fields, achieving significant increase in production and decrease of water cut. We have proved in practice, that the Technology can be applied to a wide range of geological structures and reservoir characteristics. In addition, the induced vibrations tend to correct non-optimal disturbances in the medium caused by previous uncontrolled exploitation.