# **The Kinetic Energy Potential of Pressurized Natural Gas Wells**

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#### Kinetic Energy Potential of High-Pressure High Flow-Rate Gas Wells for Producing MW's of Electricity

Computation of the ideal power produced by pressurized gas Methane (M=16 kg/kmol)

High Pressure Gas Wells			
Enter Flowrate in Mcfd	10,000	6,000	2,000
Volumetric flow rate in cfs:	115.7	69.4	23.1
Enter Pressure in psig:	7000	5000	3000
Pressure ratio for expansion to 15 psig	0.0021	0.0030	0.0050
Enter Temperature in degrees Fahrenheit:	150	150	0
Temperature in degrees Kelvin		338.6	255.2
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Equals Power Produced in Megawatts (MW)	359	150	33
Equals MW Hours Per Year			272,496
Equals Annual Profits @ 2.5-cents/kWh	\$149,419,771	\$62,381,026	\$13,624,814
Expected Temperature w/ isentropic expansion turbine	82.32	88.94	75.41
Expected Temperature in degrees Fahrenheit			-323.65
Ideal work (kJ/kg)		562.62	405.29
volumetric rate in m^3/s		1.97	0.66
mass flow rate in kg/s		380.66	100.99
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mass flow rate in lb/s	1954.06	837.45	222

Three high-pressure, high flow rate natural gas wells of the magnitude of the well presented in Column One has the kinetic energy potential to generate as much power as a nuclear power plant that would cost billions of dollars to build!

# Problems Associated with the use of Rotating Equipment in regard to Harnessing the Potential Energy of Natural Gas Wells are:

# Centrifugal Forces try to Rip the Equipment Apart

### End Thrust

# Inability to Process Dual-Phase Working Fluids

Three components comprise the linear power equipment used to harness the kinetic energy of natural gas wells: (1) a linear alternator that is driven back-and-forth by a pneumatic ram in order to generate 60 Hz AC electrical power; and, (2) a pneumatic ram prime mover, being a movable piston and rod within a cylinder that is actuated by a (3) driver that controls the flow of high-pressure natural gas into the cylinder of the ram and directs the exhaust flow from the cylinder.

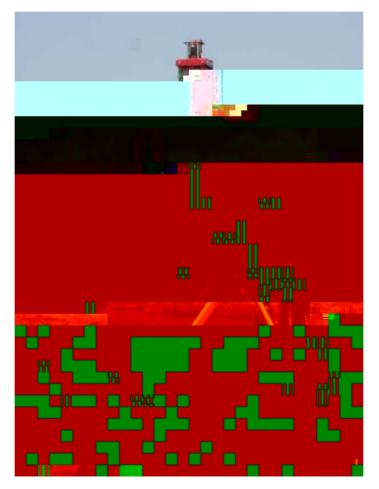
### Ram

### Driver

#### Linear Alternator

### Movable Coil of Alternator

# Unit Under Construction by Linear Power, Ltd.



### Propane Gas-lift Kinetic Energy



#### Bench Test of Unit



Linear Power is Developing a wide range of Linear Power Equipment Capable of Harnessing Kinetic Energy Resources