

Intelligent Rod Lift System Reduces over 430,000lbs of CO₂ Emission Per Year, A Permian Basin Case Study

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As international and state regulators catapult the oil and gas sector towards more clearly defined Environmental, Social and Governance (ESG) targets, producers are faced with carving a dramatic critical path to lowering electricity inputs which in turn provide significant reductions in their overall carbon footprint.

Innovative and Intelligent Artificial lift solutions offer a clear advantage in balancing lower kilowatt hour per barrel, lowering operational costs, all while exceeding target production rates, will continue to upset traditional methods of lift and move towards the forefront of industry technology.

To meet their carbon neutral targets, industry leaders are taking an innovative approach to manufacturing valuable intelligent solutions, based upon an increasingly low tolerance of energy intensive production. The Case Study to be examined in this paper, is a Permian Basin application which demonstrates within one year, a sizeable reduction of 430,663 lbs. of estimated CO₂ emission without the loss of hydrocarbon production.

By utilizing a Long-Stroke, Intelligent Pumping Unit which offered a lower speed, energy conscious approach to high producing oil wells; the Well 1 saw a significant cost reduction in electricity usage as compared to the ESP on Well 3, but critically important, a clear advantage when comparing BFPD produced and KW*H usage per Barrel.

Well	Pumping Unit Model/Type	Average Production	PPRL (lbs)	Electricity Consumption (KW*H/day)	Electricity Consumption KW*H/bbl
Well 1	SSi 400LS	750 BFPD	30155	975	1.30
Well 2	C912	400 BFPD	21944	462	1.15
Well 3	ESP 1750	800 BFPD	N.A	2410	3.01

*The electrical consumption was measured by the Producer at each well location.

*Within the United States, making one Kilowatt hour (KW*h) of electricity by using natural gas is equivalent to 0.92 lbs. of CO₂ emission *International Energy Regulator.

Additional Benefits realized within this study included:

- Increased Production through Gravitational Gas Separation
- Reduced Costs for Installation
- Reduced Costs for Workovers
- Accelerate the move to Rod Lift significantly earlier
- Reduced Electrical Usage & Cost
- Corresponding reduction in estimated CO₂ emissions from electricity generation
- Auto-Optimization Function & Digital HMI – Reducing occurrences of manual well intervention

Now more than ever, designing a production cost model which delivers the maximum number of barrels at the lowest cost per barrel input, must be balanced with the necessary goal of substantial reductions in a company's carbon footprint. The advancements highlighted within this study, offer a revolutionary, multifaceted solution to balancing the production, environmental and return on investment equation.