Case Study:
30 HP Pump Jack in Valley County, MT

The Solar Jack Energy Management System Reduces Pump Jack Operating Costs

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SOLARJACK

About Solar Jack

Solar Jack, LLC is a solar-centric, energy efficiency management company that specializes in providing state-of-the-art technologies to the artificial lift segment of the oil and gas industry.

The Solar Jack Energy Management System (EMS) captures and combines the otherwise wasted regen energy created by the pump jack combined with solar energy, lowering the energy cost for pump jack operators. The system also allows operators to easily optimize the strokes per minute of pump jacks; saving energy and lowering maintenance costs.

Solar Jack offers two models of our Energy Management System:

- Net-Meter model – combines solar, variable speed regen drive with soft-start technology, and regenerative power whereby an operator can qualify for Net-Metering (power purchase) with their electric utility (where applicable).
- On-Site Storage model – combines solar, variable speed drive with soft-start technology, and on-site power retention that lowers energy cost by capturing and temporarily storing the energy created by the solar array along with the regenerative energy from the down stroke of the pump jack.

Visit **www.solar-jack.com** or contact us at **888.562.1005** to learn more.

Overview

In August of 2014 Solar Jack installed an Energy Management System – Net Meter Model on a 30 HP Pump Jack in Valley County, MT and collected pre- and post- Energy Management System data. The well was equipped with an across-the-line starter and a Lufkin Well Manager pump off controller. Data was collected using an ANSI rated, utility grade, Accuenergy Acuvim II power meter.

Results

1) **ENERGY USE REDUCTION:** In addition to the baseline energy use reduction achieved with our system, using our system to reduce the pump jack speed results in increased energy savings, while maintaining production levels:
   a) 7 Strokes Per Minute, 100% runtime = 39% energy use reduction
   b) 6 Strokes Per Minute, 100% runtime = 47% energy use reduction

2) **POWER FACTOR:** The data collected in our sample shows this site to have a power factor of 0.4. After the Solar Jack Energy Management System was installed the data showed a power factor of 0.7. *Power Factor is a ratio of the capacity of a circuit to the required load. In the case of pump jacks, power factor is an efficiency index of the pump jack motor. Many utilities charge a penalty for low (inefficient) power factors.*

3) **STROKES PER MINUTE REDUCTION:** This pump jack was originally set at 7 strokes per minute (SPM), running 100% of the time. Significant maintenance savings will be realized from the reduction in strokes that can be easily achieved with Solar Jack Energy Management Systems (fewer strokes = less wear and tear on the pump jack). "Dialing in" on the optimal number of strokes per minute will result in a substantial reduction of overall strokes, with no loss in production. For example:
   a) Going from 7 SPM to 6 SPM = elimination of 1,440 strokes/day and 525,949 strokes/year
   b) Going from 7 SPM to 5 SPM = elimination of 2,880 strokes/day and 1,051,898 strokes/year
   c) Going from 7 SPM to 4 SPM = elimination of 4,320 strokes/day and 1,577,847 strokes/year

   The Solar Jack Energy Management System gives operators the ability to change pump jack speed with the turn of a dial vs. expensive sheave changes.

Conclusion

The harnessing of energy inefficiencies in the operation of pump jacks in the oil & gas industry will yield substantial cost savings to pump jack operators. With each stroke of a pump jack, operators are losing energy that could otherwise be used to offset energy costs. Solar Jack offers the industry a cost effective answer in the form of a solar enhanced, zero-waste energy solution that allows the regenerative energy and solar energy captured by the Solar Jack system to accrue to the benefit of the pump jack operator.

By combining the benefits of variable speed “soft start” technology, regenerative energy, solar power, and custom energy management the Solar Jack Energy Management System reduces the overall lifting cost for the pump jack operator. Solar Jack’s patent pending solar enhanced variable speed system allows pump jack operators to reduce power usage and maintenance costs using a clean, renewable solution.

Solar Jack is a solar enhanced, variable speed energy management system that gives oil producers the ability to capture the regenerated energy from their pump jacks, combined with solar energy, to offer a solution for reducing energy consumption and energy cost, as well as reducing maintenance downtime and cost. Solar Jack is a joint venture formed by North Creek Energy, LLC and P&J Energy Services, LLC.

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