

WHITE PAPER / WELLFIELD ELECTRIFICATION

# Oilfield electrification: Collaboration between producers and utilities can result in a win-win

BY Omar Urquidez, PE, Ph.D.

Getting electricity to oil and gas wellfields can be a complicated endeavor. Under normal circumstances, it may take years for a utility to build power infrastructure needed by oil and gas producers. However, a number of win-win strategies are available to help smooth the rough roads ahead.



Lengthy planning, permitting and regulatory approval cycles often are misaligned with the business realities faced by exploration and production companies (E&Ps). All E&Ps carefully follow the pricing signals from global oil markets and when it is time to begin pumping reserves out of the ground, the window can be as short as six to 12 months.

This often forces E&Ps to consider non-utility options, including inefficient on-site generators fueled by diesel or field gas for the power needed to operate pumps, motors and a wide variety of other processing equipment.

### Unpacking options

There is no real disagreement over the benefits of electrifying production operations. Electrification can greatly reduce lease operating expenses while reducing greenhouse gas (GHG) emissions — an increasingly important consideration.

The decision to electrify often boils down to density of production units in the wellfield and timing of power availability.

The amount of throughput from the well rigs to processing and pipeline facilities will determine the amount of voltage needed and at what distance. Mileage drives cost.

If wells are likely to be developed in closer proximity in the future, the reality of longer lead times may be easier to manage.

If there is a 10- to 20-year plan for basin development — with the likelihood of fairly dense production — it may be easy to cost-justify decisions to proceed with long upfront planning and permitting cycles needed to connect with the grid for utility power.

### Think win-win

A win-win strategy is the ideal way to cut through the inherent structural hurdles.

Utilities are well-equipped to accommodate new loads coming from large retail or commercial developments, but ramping up to provide power to an oilfield, where loads often reach 100 megawatts and higher, is not a scenario in which a fast response is feasible.

Producers looking to achieve the benefits of electrification must recognize that regulatory and environmental permitting

can become part of their critical path, but only with the understanding that it may take years of studies and approval hearings before construction can begin. Identifying the steps that can be taken early and at low cost and risk to the leaseholder should be considered, because these steps typically leave flexibility to adjust future courses of action as needs dictate.

### Environmental and social governance

A commitment to reduce GHG can be an important part of this early-game strategy. Most major E&Ps are well acquainted with institutional investor demands to demonstrate environmentally responsible policies on climate change as well as water management practices, global supply chain management, and worker health and safety. Electrification is a proven way to demonstrate a real commitment to address these issues, as it is easy to quantify the emissions that could be reduced by converting from inefficient diesel or field gas generators to systems driven by grid power.

Moving from Scope 1 direct emissions from an owned or controlled source to Scope 2 indirect emissions from purchased electricity should be a priority in electrification planning. These considerations can be included in a plan that allows producers to move quickly in response to oil and gas market pricing signals.

In fact, it may be possible for producers to go further than Scope 2. Under internationally recognized criteria defined by the Greenhouse Gas Protocol, other innovative options could be investigated, such as power purchase portfolios from renewable energy sources. This step could open the door to additional financial benefits accruing from renewable energy credits.

### Getting power to the wellfield

Master planning for electrification will assume very little variation in the physical power infrastructure that will be needed. The primary question is who owns it and at what metering point. That determination will dictate how the project gets executed and how fast it can proceed.

If utility-owned high-voltage transmission assets — preferably 138-kV or higher — are located within a few miles of the production basin, there are usually good options to build out to an agreed-upon interconnection point. Every basin is different, however, and there are many different approaches that can make sense.

## Do privately owned systems make sense?

Though utilities have experience in building transmission lines, they do not typically construct these assets without a prudency review with regulatory authorities, demonstrating why the system improvement should be eligible for rate recovery. This review is necessary to demonstrate benefit to all of the utility's customers, but understandably can take months or even years to complete.

If there is a reasonable option for an interconnection opportunity — high-voltage large transmission lines and substations located in and around the area — it often makes more sense to utilize those assets as the most secure source of power.

This pathway doesn't leave the E&P locked into the utility's rate structure. In fact, the interconnection may give it the opportunity for a market-based wholesale power purchase agreement from a third-party producer.

With private ownership and control of the feeder line project, the work can move faster. The prospect of having to acquire new rights-of-way is often avoided because the project can be built primarily on land that is already dedicated to production operations. Adding power assets to the portfolio of pipes, extraction facilities and other equipment often represents an incremental expense.

A utility may indeed prefer this scenario, especially if the project involves a commitment to transfer ownership of the power assets once they are up and running. A utility that is building a 30-mile transmission line, for example, could easily find itself confronted by intervenors demanding hearings over the cost of the project, as well as other factors. With the utility still having an agreement to control the assets at a later date, it can be another win-win scenario.

## Reducing the burden

Because E&Ps often are drilling in areas served by rural cooperatives or small investor-owned utilities, a partnership approach to electrification is often very welcome. For a co-op with a peak load of 100 MW, a request by an E&P to essentially double or triple that power demand for a short term as a transient peak demand may present difficulties. Though the prospect might be welcome, it is a simple fact that many co-ops would have difficulty meeting such a request from a staffing or operational standpoint.

Private electrification can provide a number of benefits to a co-op or other small utility in the form of more paying customers, greater economic activity in the region and reduced headaches of trying to meet excessive new demands. Electrifying oil and gas production basins can clearly create a number of win-win scenarios for multiple stakeholders. All should be weighed carefully when making long-term planning decisions.

## Biography

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