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WHITE PAPER

Selecting the Right Contracting Model for Distribution Investments

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Over the next decade, U.S. utilities will continue to invest billions of dollars in modernizing the electrical distribution grid. Given decreasing internal staff sizes due to a wave of retirements, many will face new risks and challenges in executing and managing these large-scale investments. The contracting model each chooses will be key to optimizing expenditures, mitigating cost overruns and building the experience of its contracting partners.

Global electricity demand is expected to grow by more than 25% by 2040, according to the International Energy Agency. On top of this, President Biden set a goal to achieve 100% clean electricity by 2035.

This build-out poses major challenges and considerable risks to the power distribution grid, which has received less attention than the transmission grid in recent decades. Given the growth in demand and the need for increased flexibility because of renewables, utilities are identifying needs for more distribution lines, as well as greater reinforcement and protection of existing lines.

Construction is already underway on dozens of large-scale power distribution projects nationwide, some with decadelong schedules and values exceeding $1 billion. With a limited number of qualified design and construction contractors to execute these programs, utilities will benefit from selecting contracting models that optimize their investments and make efficient use of available resources.

Mitigating Program Risks

To be successful, large-scale distribution modernization programs will need to avoid the traps that have ensnared some early movers, such as:

Overly ambitious goals: Eager to demonstrate results, a utility may overcommit to the number of projects it expects to complete yearly in its program. There are inherent risks to this approach, especially when the program itself is still evolving. Permitting or easement bottlenecks as well as design development and completion delays can quickly derail dozens of projects in an overly aggressive schedule. Barring contractual restraints on spending, costs can also escalate.

Beware also of lofty modernization goals that are unrealistic. For example, a utility might be tempted to set a goal of undergrounding the majority of its distribution system. A few projects into such an effort, however, it may discover that undergrounding costs are significantly higher than

anticipated. It may then be necessary to shift gears quickly and think strategically about which lines to relocate underground and how to protect the remaining overhead lines from failure. Budgets may need to be reallocated to solutions that minimize the work performed and investment applied to a circuit while still meeting reliability targets set forth at the project's onset.

A less ambitious start may have greater chances of building a foundation for long-term success. By aiming to complete construction on a smaller set of projects in the first year, a utility and its project team can identify and address potential risks upfront. With early focus on the design, permitting and easement processes, utilities can be prepared to hit the ground running in year two with more realistic goals and shovel-ready projects.

Insufficient due diligence during contractor selection: While experience in previous transmission and distribution projects is valuable, it does not always produce the knowledge base and skill sets that large-scale distribution modernization programs require. A great number of distribution projects take place in downtown or metropolitan areas. The noise and other disruption they can create along streets and sidewalks can be significant for people living and working nearby. Community outreach plays a larger role when decisions are made regarding which distribution lines to locate underground.

Similarly, contractors with deep experience in transmission projects may be attuned to the rate at which construction materials are consumed and the productivity rates that can be anticipated on construction. Distribution projects can be more unpredictable. For example, when undergrounding a line, a construction crew might hit rock, forcing it to mobilize in a location that requires different easements or more conduit than anticipated. Contractors must be aware of the potential for variables like these when bidding on projects.

Extra scrutiny, therefore, is needed when evaluating contractor portfolios during the request for qualification and proposal processes. Utilities are wise to request greater-than-typical details on prior applicable experience, along with insights on the project risks contractors anticipate and how those risks have been factored into their pricing, schedule and project delivery plans.

Imprecise contract language: On investments of this magnitude, some of which may total in excess of $1 billion, project success can hinge on the fine print in construction contracts. Clear role definitions, change management strategies, performance incentives and missed-milestone penalties should all be clearly articulated. Each is critical to mitigating risk and meeting schedule and budget targets.

Supplier contracts should be equally precise. When projects are small, utilities often have a good sense of the materials and equipment they have on hand. On large programs, material and equipment management becomes far more complex. These contracts should be written with the consequences of delivery delays and other risks in mind.

Choosing a Contracting Model

Utilities sometimes presume that large-scale distribution modernization programs can be contracted using the same models they use for smaller initiatives, and sometimes they can. But these programs can also present contracting challenges that may require different methods. For example, a utility with a large scope of work and a small pool of experienced contractors may have fewer contracting options. Underground distribution projects may warrant a different approach than overhead projects. In some cases, multiple contracting models may be employed on a single program, with the model changing as the scope of the project becomes more clearly defined.

Whether executing projects using engineer-procure-construct (EPC), design-build or design-bid-build, most utilities bid projects competitively using variations of two basic contracting models. There is a time and a place for each — often on the same project. They are:

Lump Sum (Fixed Price)

A majority of utilities rely on some form of lump sum contract. With these contracts, bidders quote a single, fixed price for an entire project, which they base on their review of provided information. This approach places the risk on the contractor. But it also offers potential financial rewards, incentivizing contractors to seek ways to expedite project completion and reduce costs.

A lump sum approach can be most effective on projects where the contracting parties have a high comfort level with permitting requirements, stakeholder engagement, design parameters and other issues. It poses greater risks when used on projects that are new, novel, large or otherwise outside of a contractor's or utility's typical area of specialization. That could include projects to install distribution lines underground, which typically present above-average permitting and stakeholder engagement risks

to contractors. Additions or changes to the design that are outside the bounds of a fixed-price contract can result in change orders and cost overruns.

Time and Equipment

When the project scope is not clearly defined, a time and equipment contract — with payment based on the hours and resources required to complete a project — is often the contracting method of choice. Consider, for example, a project to relocate a 5-mile distribution line whose underground route has not yet been selected. Without information on any structures in its path or other details, it is difficult for any contractor to estimate the cost of construction. A time and equipment contract can be valuable on such a project, at least until work has proceeded to the point at which the project's scope is clear.

Time and equipment budgets place cost risks squarely on the shoulders of the utility, which agrees to pay the contractor for its actual expenses. Without controls in place to manage spending, contractors may have little incentive to identify efficiencies that minimize project costs. Change orders can be common. To help limit risks, extensive oversight of field personnel is typically needed. Still, the potential for cost and schedule overruns on time and equipment contracts can be substantial, which can erode the confidence of the public service commissions that many utilities report to and whose approval they rely on in rate cases.

Mitigating Contract Risks

Many risks can be mitigated by using variations on these models or by combining methods within a single project.

Undergrounding projects with high permitting and stakeholder risks, for example, are often candidates for a contracting approach that changes over the course of the project. A progressive EPC model often works well until the project scope is defined, risks are identified, and the utility and bidders have greater certainty about the project. At 30% design, these projects can often switch to a fixed-price contracting model, providing contractors with the plans and specifications needed to prepare lump sum bids for final construction.

In some cases, a utility and contractor might enter a time and equipment contract with a guaranteed maximum price (GMP). These contracts can be written to incentivize contractors to identify time- and money-saving opportunities, with any savings shared between the parties. Similarly, contracts can specify liquidated damages if construction completion milestones go unmet.

In cases in which the final scope of work is unclear and the project can be split into bundles, a lump sum or fixed-price contract with unit pricing may be appropriate. For these contracts, the utility prices discrete parts of a project as individual units. Should a project grow in scope, a contractor can bill for additional units. This approach can also be used to determine costs for the portions of a project that can be easily quantified, offering utilities a modicum of cost certainty on projects that might otherwise be difficult to estimate.

In addition to helping control costs, unit pricing approaches also facilitate estimating and the tracking and monitoring of work as it is completed. By breaking down a project into specific, comparable components, unit pricing provides contractors with a template they can follow, which can reduce review time and simplify invoicing while also making field validation easier. In addition, this approach makes it possible for contractors to receive compensation for precisely the amount of work they complete.

Whether it is combined with a time and equipment model or a fixed-price approach, unit pricing can call for greater levels of owner oversight. The utility depends on the contractor to estimate a unit price that accurately reflects the cost of performing the work. In some cases, it can be difficult to verify that the utility is receiving top value for its investment.

Starting on the Right Foot

Over the life of a distribution modernization program, a utility can expect to execute hundreds of contracts using multiple variations of the basic contracting models. As knowledge and experience increase, these programs are likely to evolve in ways that maximize technical objectives while optimizing the use of funding.

Given their scale and complexity, distribution modernization programs benefit from having a dedicated, high-level program manager to oversee their many moving parts, manage project interdependencies and address issues that are outside the scope of individual projects. A program manager's ability to coordinate smaller initiatives while also keeping an eye on long-term program objectives is key to success.

The challenge many utilities face is finding program managers who understand the full scope of the distribution modernization challenge. Utilities need firms that can leverage their distribution experience to perform the necessary due diligence to get these projects off on the right foot. That includes managing the processes for goal-setting, contractor evaluation and contracting method selection.

The number of firms capable of assuming these roles today is limited. But project by project, we can build the contractor experience needed to construct a distribution grid that is resilient and has the capacity to meet modern clean energy needs. These program manager–utility partnerships are a win-win for utilities, which can use them to bring their distribution modernization programs to successful completion, as well as for the power industry, which can learn what distribution modernization programs can and should be.

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