

A Roadmap for Developing the Public Utility of the Future

Introduction

Electric utilities throughout North America are in the midst of a period of rapid evolution as they cope with changing market dynamics. Operating and business models that have delivered stakeholder value in the past are becoming increasingly obsolete while new approaches promise potential benefits. Technology is one driver of the change. Renewables continue to penetrate the generation market, the economic and operational benefits of Distributed Energy Resources (“DERs”) and other grid-edge technologies are becoming increasingly compelling as capabilities increase and costs fall, and the emerging importance of battery storage has the potential to disrupt the industry. On the business side, capital investment planning has become much more complicated, pressures to control costs are intense, and load growth is stagnant in many areas. Customer behavior is also changing. Utilities have become accustomed to dealing with largely passive, captive customers. Now those same ratepayers have more options, and the increasingly important “voice of the customer” demands new and tailored services that support decarbonization preferences.

The industry has responded with changes to business and operational models that have collectively come to be known

as the Utility of the Future (“UoF”), a generally broad term that has come to identify those utilities who harness new technologies and develop practices that reorient their business models to include objectives of efficiency and sustainability in addition to traditional utility goals. Implementation varies widely from case to case and business to business. Even at the current early stage, it is clear that UoF adopters are accruing first-mover benefits while those utilities that are clinging to increasingly outdated models may be disadvantaged in the new paradigm.

Herein, we provide a general road map for public utilities that are seeking to evolve their businesses to keep up with changes in the environments in which they operate. These guidelines could apply both to the implementation of organizational strategy or for program- or asset-specific initiatives. Our focus is on managerial decision-making and the creation of logical frameworks to develop effective strategies. Importantly, we view the process by which UoF capabilities are incorporated into the utility not as a linear process but as an ongoing, iterative cycle. The embrace of change may be a requisite for success, and as discussed, the transfer of knowledge from one iteration to the next will be

critical to sustaining that success. We view each of these cycles as being comprised of six distinct stages, each of which is described below.

Figure 1. UoF Evolutionary Cycle



1. Creating the Policy Objectives

A statement of policy objectives is a necessary precondition to embracing new technologies and operating models. Organizational objectives are set by upper management, with input from stakeholders, while segment or department managers should be tasked with creating supporting goals within their areas of responsibility. In our view, policy objectives should be aspirational, yet also reasonably achievable.

For Investor Owned Utilities (“IOUs”), the evolution of business models is often driven by financial motivations and regulatory mandates. For example, in many states, regulators may require implementation of UoF measures, provide financial incentives for achievement of specific targets through Performance-Based Ratemaking (“PBR”), create regulatory frameworks to insulate companies from adverse financial impacts, or some combination of all three. Public power is different. Goals are internally defined (within the locality, if not necessarily within the utility itself), and benefits are inevitably customer-centric. For community-owned utilities, policy goals are developed by those who will bear the cost of achieving them. As such, collaboration between the utility and customer to create policy objectives is critical.

Objectives may be oriented towards achievement of a specific objective (e.g. 100% renewable energy by some date), be end-state oriented (e.g. development of an organization more capable of providing economic, reliable power to ratepayers), or may be a combination of both. Regardless of the specifics, both organizational and sub-organizational (department, segment, etc.) goals should be sharply defined in written

mission statements, which are made internally and externally available. These statements then serve to support strategic and tactical decision-making across the utility.

As discussed below, regular re-visitation and re-assessment of objectives is an ongoing part of the UoF evolution.

2. Understanding the Organization

In order to change an organization, one must first understand it. There is no single model for organizational transformation in the electric industry, or in any other industry. Instead, an effective strategy to evolve business models will build off organizational strengths and either remedy or work around weaknesses. While ideal approaches for understanding organizational dynamics may vary from utility to utility, we propose that the evaluation of the company’s culture, resources, expertise, and stakeholder relationships, undertaken through the filter of a SWOT analysis, which reviews strengths, weaknesses, opportunities, and threats as they relate to each of those areas, may be beneficial in many cases.

Figure 2. Internal SWOT Schematic



Here, culture refers to the shared goals and views of the organization. This may include acceptance to new ways of doing business, openness to new technologies, or willingness to move away from traditional roles. Expertise is the level of education, training, and experience the workforce brings to the organization. Importantly, expertise refers not only to team members’ ability to perform their current roles, but also an understanding of other aspects of the utility as well as of the energy industry as a whole. Resources include all non-human capital, including operating assets and financial resources, as well as the characteristics of the operating system. Finally, stakeholder relationships are those relationships with customers or members, other interested parties (advocacy groups, etc.), and the authorities that oversee the utility.

With regard to an overall UoF strategy or any particular program, each of these aspects of the utility will have strengths and weaknesses which will, in turn, give rise to specific opportunities and threats. As an illustrative example, we outline below a SWOT analysis along these criteria for a relatively small municipal electric utility seeking to implement Automated Metering Infrastructure (“AMI”) for all of its customers. We assume that this hypothetical utility serves 20,000 electric-only customers, has 50 employees, does not own generation, and is overseen by an elected utility board. The utility aggregates administration of its Energy Efficiency (“EE”) program with other municipal utilities in the region. It has a long track-record of effective, efficient management of its system; however, innovation has been limited and is currently motivated in large part by a recent rate hike to cover distribution cost increases. AMI is one measure that appears promising based on a preliminary analysis.

The SWOT analysis reveals several actionable insights, which are denoted in bold in Table 1. First, from a cultural perspective, utility employees can be reasonably characterized as diligent and analytical, but also risk averse. While this constitutes a potential threat to program buy-in, it also indicates an opportunity insofar as staff in place can clearly support a thorough evaluation of investment options. Second, the company’s relationship with other utilities through joint administration of its EE programs is a valuable resource. The utility’s relatively small size and

limited experience with implementing new technologies point towards a third-party solution for program implementation as a potentially viable solution. Seeking partnerships with other utilities to procure a vendor solution may create sufficient buying power to achieve the economies of scale required to mobilize a turnkey solution vendor. Third, company staff has no experience with AMI programs. While a third-party solution may be acceptable for implementation, management of an ongoing AMI program will likely require in-house expertise. The cost of adding staff to manage the program should be considered as part of the business case. Finally, solid reliability performance has engendered high levels of satisfaction from customers; however, the relationship with the utility board has been strained by the recent rate hike. Here, the company should make efforts to communicate the benefits of AMI to the board and explain how the implementation of this new technology can reduce operational costs and may help to displace the need for additional, expensive distribution infrastructure.

In many cases, utilities feel as though they undertake this type of analysis on an ongoing basis as part of the normal course of business. It has been our experience that a formal analysis of strengths and weaknesses using SWOT or some other framework, conducted either by an independent team or an external advisor, often promotes new awareness regarding opportunities that can be capitalized upon or areas of need.

Table 1. Illustrative SWOT Example

	Strength	Weakness	Opportunity	Threat
Culture	Commitment to due diligence and risk management	Risk-averse thinking pivots to traditional models	Apply rigorous analytical approaches to evaluation of AMI options	Challenges to internal buy-in
Resources	Existing relationships with other utilities	Limited revenue base	Aggregate outsourcing of implementation programs	Small size challenges significant investment
Expertise	Strong data management capabilities	No in-house AMI experience	Seek turnkey solutions from third-party suppliers	Bandwidth constraints to maintain the operating system
Stakeholder relationships	Highly reliable system has promoted satisfaction among customers	Rate hike has strained relationships with utility board	Outreach to customers and regulations positions program as a means of displacing expensive distribution investments	Regulatory push-back

3. Defining the Business Case

Before deploying capital for any project or strategy, a sharp understanding of the relative merits of available options, and of the *status quo*, is required. Whereas the SWOT analysis previously described is largely an internally-focused exercise, developing a business case for investments in new initiatives is primarily externally-focused. Managers will need to evaluate how financial and operational performance could be affected by any proposal, quantify impacts, and make informed decisions that maximize returns for the organization and for customers. At its heart, the business case for investing in change is a cost-benefit analysis that incorporates, at a minimum, the following variables:

System Dynamics

How does your grid work and what do your customers need? Strategies for modernizing a system that is primarily residential, has a low capacity factor, and is supported by utility-owned generation may be very different than strategies to modernize a system that provides service to more industrial customers, has a flatter load shape, and buys power from the wholesale grid.

Technology Choices

What technologies are available, how much do they cost and how do they align with policy objectives? Both direct and indirect costs and benefits must be considered. For example, ownership costs of new technologies will include not only operations and maintenance (“O&M”) but also staffing and training costs.

Systems Integration

How do new technologies integrate into the system? Realization of UoF measures’ full potential often requires investment in new infrastructure, particularly in IT, and system processes in order to better collect and utilize system data.

Financial Impacts

How do new investments affect the company’s financial health? Measuring project-level costs and savings is reasonably straightforward, but indirect impacts like changes to company risk profiles, alignment of fixed and variable costs and revenues, and other impacts may require a bigger picture view.

Business Impacts

How do new initiatives align with the utility’s business model? Of particular concern with some UoF measures is the fact that efficiency improvements tend to reduce sales, which, in turn, will reduce company revenues if rates are not increased.

Changes to rate structures, exploration of a revenue decoupling mechanism, benefits sharing with customers, and other approaches may alleviate negative impacts; mitigation strategies, if necessary, should be part of any business case.

Real Options

How does an investment now facilitate future investments? Some UoF investments are foundational. Others are accretive. For example, investments in IT infrastructure now to support one measure may support subsequent investments which can be made in the future at a lower cost. Managers should be mindful of these “real option” benefits while also recognizing the need to “future proof” current investments to avoid expenditures on assets that will be obsolete before their value can be fully realized.

Customer Impacts

How will new initiatives impact the customers’ bills? How will rate structures need to change? While these are issues for any utility, decision-making in public power may be especially centered on customer impacts. Investments in new infrastructure must provide some return for customers – in the form of bill reductions, achievement of policy objectives, or both – in order to be viable.

Public power’s approach to business cases will differ from IOUs’. Because community-owned utilities are self-regulating, they must simultaneously weigh costs and benefits for the companies and for their customers; for IOUs, customer costs and benefits are generally the purview of the state regulator.

Additionally, public utilities need to define those business cases themselves; doing so may be as much opportunity as challenge. In many states, IOUs are provided a framework for evaluating new investments. Some cost-benefit analysis using an established framework and hurdles is typical. Because public power is largely self-regulating, no such framework is imposed. On the one hand, this means that companies can borrow from frameworks in use elsewhere, which may be beneficial; on the other, the complexity of some methods used for this purpose, coupled with the lack of an institutional track record of embedding these criteria in investment decision-making, can challenge straightforward implementation.

4. Securing Buy-in

Any large change program like UoF evolution will require both internal and external buy-in. Team members will need to internalize organizational policy objectives, create organizational and departmental goals, and most importantly,

incorporate each into daily decision-making. Externally, buy-in from oversight organizations is obviously critical; for a public power utility, buy-in from customers is also key.

In our experience, each relies heavily on communications. For both internal and external stakeholders, efforts should be made to explain the rationale and benefits of UoF implementation and to seek feedback. While organizational goals should be set by upper management, lower-level objectives that support those organizational goals and the approaches that will be taken to achieve them should be created collaboratively with team members and subject matter experts.

Wherever possible, results of the internal analysis should be used to identify and address potential areas of resistance to program buy-in.

5. Implementing Change

Successful implementation of strategic change requires that new approaches be fully incorporated in core business models. While standalone programs can be financially accretive, evolution towards a UoF necessarily involves changes to large segments of the organizational structure including diverse functions such as resource planning, IT, human resources, system operations, and others.

At a highly reductive level, we envision a three-step procedure for implementing process and strategic changes:

Step 1

In Step 1, the “current state” of business operations are

defined. Here, the utility focuses on how processes are currently organized, what roles team members play, and how performance is measured and analyzed. In the context of UoF evolution, the focus is on current system assets, and data are deployed and managed.

Step 2

In Step 2, the foundation for managing change is created. New processes to support UoF are defined, and ownership for each is determined. Personnel are given sufficient training to take on new roles and responsibilities; where necessary, new staff is added and brought up to speed. Key Performance Indicators (“KPIs”) are created to measure results.

Step 3

Finally, in Step 3, new processes, metrics, and human capital are implemented, which would be taken simultaneously with the commercialization of new assets or business practices that support the UoF evolution. Ongoing monitoring of KPIs is critical at this phase to identify where implementation is less than complete and where refinement in business processes or deployment of human capital is required. The objective is to achieve an “ideal state”, whereby new functions are fully integrated into the business model in a way that maximizes efficiency.

The schematic below is, by design, generic and reflects a company-wide implementation of a long-run evolutionary change. A similar approach suits implementation of subprograms. Strategies, procedures, and KPIs for moving from current state to ideal state will vary from department to department and from investment to investment.



6. Applying Lessons Learned

In a practical sense, the process of evolving operating and business models to adopt UoF paradigms is open-ended. Markets will continue to change, new technologies that create both opportunities and challenges will continue to be commercialized, and achievement of policy objectives will motivate new and more aspirational goals. The evolutionary cycle will be iterative, and each iteration builds on lessons learned from the previous.

As a result, a new organizational capability arises: the ability to rapidly adapt to a business environment characterized by an accelerating pace of change. In the end, this may be one of the most significant benefits of a UoF evolution (and may itself be among the policy objectives announced as part of the process). If this capability can be successfully cultivated, an increasingly flexible and dynamic organization emerges.

Transference of knowledge from one evolutionary iteration to the next is predicated on close analysis of outcomes on an ongoing basis. Stakeholders must track and understand performance using KPIs and qualitative measures, make adjustments as needed, and embed the knowledge in the organization in the form of training, procedures, and human capital.

Conclusion

Evolving a utility's business to embrace UoF principles has the potential to benefit public electric utilities and their customers in a number of ways. At the same time, the challenges are significant. FTI Consulting's view is that these challenges are ultimately manageable, and that the evolutionary cycle we describe above provides a useful framework to guide strategic and tactical decision-making. In the final analysis, those companies that manage to successfully navigate the complexities in developing the UoF will be in the best possible position to serve their customers in the new industry paradigms that will arise in the next decade and beyond.

Endnote

i. Most public power utilities are self-regulating, in which case the overseeing authority could be an independent board of directors, a body of municipal government, or some similar structure. Some public utilities are regulated by the state like IOUs in whole or in part, particularly in regard to rates, in which case authority would be placed in the public service commission.

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- Expert witnesses recognized in their respective fields
- Regulatory expertise that includes cost of service, cost of capital, rate design, and M&A for regulated companies and assets
- Understanding of financing models for public power
- Systems and process integration for the Utility of the Future

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