PATHWAYS TO INTEGRATING CUSTOMER CLEAN ENERGY DEMAND IN UTILITY PLANNING

HEIDI BISHOP RATZ AND LORI BIRD
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EXECUTIVE SUMMARY

State, utility, and customer decarbonization goals are driving transformative changes across the United States electricity industry and will require greater collaboration between these parties, particularly to improve how utility planning incorporates customer demand for clean energy. As large corporate customers, and now increasingly cities, work toward achieving their own ambitious clean energy goals, some have begun to more closely track, and potentially become involved in, utility resource planning processes such as those for integrated resource plans (IRPs). Where IRPs are used, they serve as public plans that set the long-term vision for resource development in a utility’s territory. By collaborating to share information and align their goals and actions, utilities and customers can work together to deliver more transformation across the electricity system at a lower cost. Collaboration may better identify the highest-impact investments, set utilities up to better anticipate and plan for additional renewable energy, and reduce independent actions that customers must make to meet their goals.

This paper explores the potential for creating greater alignment between utilities and their customers. It responds to growing interest in the benefits of stakeholder input (Volk et al. 2018; Carvallo et al. 2016) and the need to drive innovation in resource planning practices. To collaborate effectively, utilities and their customers should learn about each other’s needs, limits, and planning processes as well as follow basic best practices around engagement. Utilities reading this paper can benefit by learning how customers approach their clean energy goals, carbon goals, and concerns for the future. As utilities improve their collaboration with customers, they will gain a greater understanding of customer demand for clean energy and how to incorporate it into their planning. Customers reading this paper can learn more about utility planning processes, mainly those for developing IRPs, but also how IRPs fit into wider planning activities and how they may evolve in the future. Future utility-customer collaboration may be broad and address a wider suite of actions to reduce carbon emissions, such as through energy storage or electric vehicle solutions, and their related planning activities.

A portion of this paper illustrates how IRP requirements and practices vary across states and utilities, including how they incorporate stakeholder input. It also breaks down the major steps and elements of IRPs as a starting point for customers considering becoming engaged. From here, customers can address the paths to engagement. One-on-one collaboration early on in utility resource planning and/or robust stakeholder processes within the IRP process may provide better outcomes than limited engagement after IRPs have been filed. Customers may also consider partnering with others who interact with their utility on an ongoing basis within engagement forums to overcome some of the barriers to engagement. We provide insights from utilities, customers, and parties working with these groups as well as some key examples that illustrate current forms of collaboration.

Finally, we conclude with some reflections on what is needed in the near term to improve collaboration and then how this collaboration may evolve in the future. Direct engagement between utilities and customers on an ongoing basis helps provide the relationships and opportunities to better understand each other’s needs and the opportunities to find solutions to issues. Developing more robust stakeholder outreach within the IRP process itself can be a concrete way to better incorporate stakeholder feedback. To reach higher penetrations of renewables on the system, utilities and customers may expand collaboration to include activities that focus on reducing carbon intensity on the grid or help with renewables integration. IRP processes themselves may evolve in ways that more clearly address customer demand for a cleaner energy supply. Overall, this paper provides perspectives on how planning processes can evolve to increase engagement and collaboration opportunities to help customers and utilities achieve clean energy goals and more effectively plan for the future.
INTRODUCTION

As utilities and their customers both work toward reaching increasingly ambitious decarbonization goals, engagement between these parties will need to evolve so that customer demand for clean energy is better incorporated into utility planning processes and investment decisions in future energy resources to maximize carbon impact. As large corporate customers work toward achieving their own ambitious clean energy goals, some have begun to more closely track and potentially become involved in utility resource planning processes, such as those for integrated resource plans (IRPs). IRPs are public plans that set the long-term vision for resource development in a utility’s territory. IRPs indicate not only projected levels of clean energy resources but also how the utility approaches planning and its goals. In recent years there has also been interest in resource planning across all utility types and a wider range of customers, including municipal governments, as well as a growing consensus that the development of resource plans can benefit from stakeholder knowledge (Volk et al. 2018; Carvallo et al. 2016) and improved resource planning practices.

This paper explores the potential benefits of creating greater alignment between these activities, provides basic education needed by utilities and customers to engage, gives an overview of what current engagement looks like, and points to ways collaboration can improve in the near and long terms.

This paper was developed as a thought leadership piece on behalf of the Special Clean Power Council (CPC), a two-year effort between select U.S. electric utilities and their large-scale corporate customers to drive innovation in the utility sector by working collaboratively on mutually beneficial solutions that can be embraced by state regulators and policymakers. From these efforts, the CPC has focused on identifying regional best practices for simplifying access to low-cost, clean energy options while conveying overall benefits to the grid. Recognizing the connection between utility resource planning and decarbonization goals among large customers, this paper explores the potential benefits of creating greater alignment between these activities.

ALIGNING CUSTOMER GOALS AND UTILITY RESOURCE PLANNING

Customer Clean Energy and Carbon Goals

Corporate utility customers, and now cities as well, are increasingly setting more ambitious clean energy goals. There has been a strong movement to pursue 100 percent renewable or clean energy with targets as near as 2020. More than 190 companies have joined the RE100 pledge (RE100 2019), a global corporate leadership initiative for 100 percent renewable electricity commitments, and more than 220 U.S. cities have adopted 100 percent targets (EIA 2012). While they pursue these goals, customers must balance the cost and effort to achieve them against their other business needs.

To achieve clean energy goals, customers have a range of options for purchasing renewables depending on the regulatory structure of their state. Some of these include procuring off-site renewables within their local markets or other markets in amounts that offset their usage, procuring on-site renewables that more directly offset their energy usage, or working with their utility to develop programs for renewable energy purchasing. See Box 1, which expands upon

BOX 1 | GREEN TARIFFS: ACHIEVING CLEAN ENERGY GOALS THROUGH CUSTOMER-UTILITY COLLABORATION

As customers have become active participants in the energy market over the last decade, they have collaborated closely with utilities to develop solutions and utility products that drive customer investment in large-scale renewable energy. Most notably, this has involved the development of green tariffs, or renewable energy tariffs. Green tariffs allow a class of customers to source up to 100 percent of their electricity from renewable resources. Green tariff customers purchase renewable energy from their utility and have the associated renewable energy certificates (RECs) retired on their behalf through either an additional line item on their existing electric bill (also known as a rider) or participation in a new electric rate (tariff).

Since 2002, approximately 31 green tariffs have been approved or are pending approval by 19 electric utilities in 18 states. From these green tariff solutions, approximately 3,210 megawatts (MW) of new renewable energy have been used by large-scale customers. Through these efforts, utilities have not only created solutions for their customers but established themselves as leaders in clean energy investment.

Although green tariffs have been a great solution to date, often they meet only a portion of customers’ total consumption due to program size and customer participation limitations, or they are otherwise limited in use due to pricing. Given this, customers with ambitious decarbonization goals are increasingly looking to utilities for the next frontier of utility solutions, including more aligned resource planning, for new renewable energy procurement options.
one type of utility program: green tariffs. Through these actions, large corporate customers have brought online more than 15.6 gigawatts of new renewable energy capacity through off-site deals and even more including their on-site projects (BRC 2018). Cities are increasingly seeking to use similar solutions (Shaver and Ratz 2019).

Customers not only set ambitious clean energy goals but also often have goals that specifically target carbon emissions reductions. While reporting is currently voluntary, corporations use greenhouse gas (GHG) reporting, including carbon accounting, to demonstrate the impact of their efforts publicly and drive internal decisions. Corporate carbon accounting is split into three categories: Scope 1 accounting covers emissions from direct uses, Scope 2 addresses emissions from the electricity the customer uses to power its activities, and Scope 3 quantifies indirect emissions, such as those related to purchased materials or from products sold (WRI and WBCSD 2004). Customers often work with their utility to collect the information needed to calculate Scope 2 emissions, which includes the carbon intensity of the grid mix serving them and the emissions from renewable energy products they have purchased.

**Additional Considerations for Customer Goals**

For customers working toward both renewable energy and carbon reduction goals, there are several questions to consider regarding how to align the two in addition to how to align customer goals with the efforts of utilities overall (explored below). Accounting mechanisms for renewable energy, the carbon impact of renewable energy purchases, and the future role of the utility in driving decarbonization in resource planning all further impact how customers approach their goals.

One of these considerations is the lack of standardization in how to treat renewable energy provided to customers by the utility through the standard grid mix. Generally, customers currently count only the renewable energy certificates (RECs) they retire themselves and are unable to use the percentage of renewable energy on the grid as the starting point as they plan toward a 100 percent renewable goal. For those interested in counting the grid mix, there are varying approaches to doing so: Should customers apply the grid mix percentage to their entire usage or just the usage left over after they have removed their own purchases? Is there a credible way to count the grid mix? Figuring out a standardized approach could create parity across customer accounting, align customer-utility efforts, and optimize investments that move the entire system to a state with higher renewables and lower carbon emissions. See Box 2 for an example of such efforts. There could be a role for utilities in supporting goal alignment through innovative programs.

**BOX 2  |  CERTIFIED RENEWABLE PERCENTAGE PROGRAMS**

In spring 2019, Xcel Energy launched the Certified Renewable Percentage (CRP) program to help its commercial and industrial customers achieve individual renewable energy goals through the retirement of renewable energy certificates. The CRP program allows its customers—including IBM, Best Buy, 3M, and Target—to set their planning baselines at the level of renewables in the CRP of that year and then invest in additional renewables, through Xcel Energy’s Renewable*Connect program or other purchasing strategies, to achieve up to 100 percent renewable energy.

Novel in its approach, the program enables customers to meet their goals by taking credit for renewable energy procured by the utility including and beyond what is needed to meet its renewable portfolio standard (RPS) requirements. After retiring the RECs needed to meet required RPS mandates for a given year, Xcel Energy also retires its remaining RECs on behalf of its customers rather than saving them for future use. Xcel Energy has launched the CRP program in Wisconsin and Minnesota, has proposed developing similar programs for other states, and is currently working to gain approval from the Public Utilities Commission in Colorado.

Xcel Energy’s CRP program builds on MidAmerican Energy’s GreenAdvantage program, approved in November 2017, which also retires RECs on behalf of its customers. The most notable difference between this program and the CRP is Xcel’s decision to exclude RECs tied to excess energy that is sold into the spot market due to variations in generation, for example, when wind generation is higher than predicted. Instead, the CRP counts only RECs driven by owned resources and long-term power purchase agreements that serve retail customers.

MidAmerican’s GreenAdvantage program has been supported by a variety of prominent stakeholders including Microsoft, Google, the Iowa Business Energy Coalition, and the Environmental Law & Policy Center.

Other customers are interested in options that address carbon emissions in the wider energy system. Large buyers are looking to collaborate on new approaches that can guarantee GHG emission reductions, and some understand that the most economical solution with the lowest carbon impact may not always be a new wind or solar plant for an individual company, but rather a system-wide approach to providing clean energy for multiple customers. Electric vehicles,
large batteries, hydroelectric systems, nuclear energy, and demand response strategies, among other innovations, all have the potential to provide a high-value contribution to achieving ambitious goals for carbon emission reductions. Integrated resource planning (IRPs), as we will see later on, is one entry point for understanding how utilities plan to meet demand considering the impact and characteristics of all of these resources. In addition, broader customer engagement around these other low-carbon solutions such as demand response, storage, and electric vehicles can also help customers and cities target specific solutions. As renewable penetration grows, customers may also become interested in supporting renewables integration through demand shifting, enabling technologies, or transmission development. It’s worth noting that smaller customers that may not have the resources that large corporate customers do to engage with utilities will still benefit as collaboration leads to solutions that maximize carbon reductions at the lowest cost.

Finally, there are sophisticated customers that are concerned about the carbon reductions tied to their renewable energy investments and are focusing on more closely aligning their purchases with their hourly usage (Bird and Ratz 2019). They recognize that other customers claiming 100 percent renewable energy commitments continue to depend on existing fossil fuel capacity and integrated grid services if they account for renewable usage on an annual basis instead of hourly. Google, for example, is pursuing a new strategy called “24 x 7 Carbon Free.” This strategy involves putting enough renewables on the grid in each region where it operates to match consumption more closely. Google will use a range of clean energy plants producing at different times as well as source energy and invest in storage closer to its facilities. Other customers may become interested in similar strategies to more fully reduce their use of fossil fuels (Google 2016).

### Aligning Customer and Utility Goals

Electric utilities are also announcing their own ambitious renewable and clean energy goals. For example, MidAmerican is targeting 100 percent renewable energy for retail customers in Iowa on an annual basis and Tennessee Valley Authority (TVA) is targeting a 60 percent reduction in carbon emissions by 2020 and a 70 percent reduction by 2030 from a 2005 baseline (TVA 2019). TVA is also evaluating end-of-life dates for aging fossil units to inform long-term planning, which has the potential to drive further declines. Several utilities have established both a renewable energy and carbon target. Southern Company has established a 100 percent low-to-no-carbon energy goal by 2050 as well as a 50 percent carbon emissions reduction from 2007 levels by 2030 (Southern Company 2018). Xcel Energy has announced a target of 100 percent carbon-free generation by 2050 and an 80 percent reduction in carbon emissions from 2005 levels by 2030 (Xcel Energy 2019). Consumers Energy is targeting 40 percent renewable generation and a 90 percent reduction in carbon emissions by 2040 (Consumers Energy 2019).

Ambitious goals are also being established at the state level, impacting the utilities operating there (Cleveland 2019). With the growing number of state and utility renewable energy goals layered on top of corporate and city goals, customers are questioning how these efforts may interact and become more efficient. Achieving alignment on these goals and resource planning will require education for both utilities and customers.

For utilities, understanding both customers’ demand for renewable energy as well as their concerns can help position them to provide innovative solutions for procuring and accounting for clean energy in addition to taking a leadership role in supporting broad decarbonization across the grid. Customers are increasingly interested in long-term planning activities, such as IRPs, to provide important insight into not only how the utility plans to achieve its goals but also how the utility is planning to help them meet theirs. By setting and achieving their own clean energy goals, utilities are assisting customers by decarbonizing across the electric system. For some customers, this grid mix can be the starting point from which they plan their renewable energy purchasing goals while others will still strive to purchase renewables equivalent to 100 percent of their energy usage and therefore push for even greater amounts of renewable energy. In a future where both utilities and customers are setting and achieving ambitious goals, aligning their planning efforts would likely achieve both goals more efficiently.

Customers interested in engaging with their utility around resource planning will need to understand the role of and process for resource planning requirements, their utility’s specific approach to these processes, and how these efforts connect to their goals. As there is increasing interest in integrated resource planning (IRPs) efforts specifically, it’s important for customers to understand how the process interacts with other utility planning activities and specific resource decisions, including the limits of the process. Finally, customers choosing to engage will need to think through their options for engaging and how to maximize the value of those interactions.

Many utility resource planning activities require a certain level of formal stakeholder engagement organized by the utility, which can be a useful starting point for this collaboration. Later on we discuss how engagement forums such as coalitions or associations can help facilitate the creation of working relationships. Large customers can also reach out to the utility’s key accounts manager and establish a dialogue to share their needs and learn more about how their utility can assist.
As utilities consider how to work with customers on these topics, one of the most important things utilities can learn about customers is that they value customized approaches and communication. No customer is the same just as no utility is the same. In addition, the regulatory landscape affecting the decisions of both varies greatly across the country, making it hard to find one-size-fits-all solutions. While customized solutions need to be balanced against the desire for greater standardization, innovative ideas and stronger relationships can help customers and utilities become partners on that path forward. For both customers and utilities, engagement around resource planning is similar to utility engagement in general and many of the best practices established to date apply to these activities as well.

**The Benefits of Greater Alignment**

Utilities and customers should pursue collaboration around clean energy goals and resource planning to achieve the following: more effective clean energy procurement and integration, more rapid decarbonization as parties achieve their goals faster, a more efficient review of utility resource plans, and a stronger relationship between utilities and their customers that can lead to future innovation.

Collaboration through resource planning, specifically including customer demand in integrated resource planning processes, allows utilities to better anticipate the associated additional renewable energy capacity within their generation portfolios. It gives the utility the opportunity to site these resources where they are most efficient and to work to reduce grid issues that arise from variable renewable sources. This advanced planning also provides utilities with time to assess and respond to the impact of this new capacity on the retirement timelines of existing resources and transmission planning to bring new resources online.

Aligned planning also supports faster decarbonization for the utility territory. Whether the utility plans to include more customer purchasing options within its resource planning or increase renewable resources to reduce the carbon intensity across the grid, in both cases...
Utility resource planning takes different forms across the United States depending on the regulatory structure of the market and type of utility. Vertically integrated utilities, which own generation, transmission, and distribution assets and are generally found in areas where retail access does not exist, rely more heavily on integrated resource planning. IRP processes help vertically integrated utilities meet their responsibilities for generation, transmission, and resource adequacy. IRPs also articulate how these utilities will address public policy needs, such as renewable energy development and state greenhouse gas reduction goals.

In restructured markets where retail choice markets do exist (mainly in the Northeast, MidAtlantic, parts of the Midwest, and California), competitive generation suppliers are not required to develop IRPs; however, the local distribution utilities often develop plans because they are obligated to serve customers that do not choose a competitive generation supplier, though those plans may be less comprehensive than those of vertically integrated utilities. Figure B1 illustrates where retail choice markets have developed.

In areas where organized wholesale markets have developed, regional transmission organizations (RTOs) and/or independent system operators (ISOs) now have a role in transmission planning and resource adequacy. If retail access does not exist, however, utilities still have a role in coordinating resource adequacy with their RTO/ISO, planning for generation, and planning for public policy needs. For example, vertically integrated utilities such as Southern California Edison and Xcel Energy participate in planning processes that intersect with planning performed by their RTO and state agencies. Figure B2 illustrates areas where wholesale markets have developed.

Finally, public power utilities in all regions of the United States are generally not required to submit plans; however, though their role varies by state, many still prepare long-term resource plans.

**Figure B-1** States with Retail Choice Electricity Markets

**Figure B-2** Areas with Organized Wholesale Energy Markets and Their ISOs/RTOs

*Note: In some states retail choice has been enacted but is not easily available (often called “partial retail choice”) due to caps on participation, restrictions on which customers can participate, high exit fees, or other barriers to participation.
Source: National Renewable Energy Laboratory 2017.*

*Note: ISO stands for independent system operator and RTO for regional transmission organization.
it can reduce the independent actions customers must take and allow them to leverage the expertise of the utility. Joint efforts to reduce the carbon intensity of the local grid mix can also drive economic development or improve local air quality. It can also reduce less impactful customer investment in markets that are already saturated with renewable energy. Partnering with customers through resource planning also increases utilities’ incentive to seek higher amounts of renewable energy than required by state mandates as a way to meet customer demand. This shift away from simply meeting mandates and offering green tariffs also represents a shift from focusing on additionality to focusing on impact.

Collaborating early on within an IRP process enables the utility to integrate customer input before the modeling has been completed and the plan has been filed with the commission. Collaborating often also gives both parties the chance to better understand each other’s needs and areas of goal convergence. Through this type of engagement, utilities and their customers can become partners that work together to craft a story of impact for regulators and other stakeholders. Through this type of engagement, utilities and their customers can become partners that work together to craft a story of impact for regulators and other stakeholders. As partners, the two may be able to reduce disagreements between parties prior to or within the formal process and find solutions that benefit all of the utility’s customers (Kahrl et al. 2016, 8). Finally, this partnership builds a relationship between the parties that can lead to better collaboration around other issues such as energy efficiency, demand response, and electric vehicles, or other opportunities to efficiently reduce carbon emissions.

Overview of IRPs

Integrated resource planning is a formal process for utilities to develop IRPs—long-term plans to deliver reliable supply at the lowest reasonable system-wide cost. While resource planning processes have existed for some time, states became interested in requiring formal IRPs during the 1980s in response to several trends that presented planning challenges, such as declining demand growth, cost overruns at generating facilities, excess capacity, rising fuel costs, and new environmental regulations (Kahrl et al. 2016). Within traditional resource planning processes, utilities mainly met new demand by building new infrastructure. The IRP planning process, on the other hand, examines a combination of both supply-side resources (e.g., generating assets) and demand-side resources (e.g., energy efficiency, demand response) to meet forecasted demand plus a reserve margin. By creating requirements for planning to integrate supply- and demand-side solutions, regulators hoped to drive consideration of a wider range of low-cost solutions (Girouard 2015).

By comparing these options side by side, IRP processes allow utilities to evaluate portfolios of different resource solutions to provide the best value to their customers. IRP planning, for example, can address decisions such as the relative value of meeting new demand through investments in new generation assets versus purchasing electricity from other generators or investing more heavily in programs that could reduce the projected increase in demand. Similarly, if new generation investment is needed, the utility uses the planning process to compare the costs of investing in different generation resources. In addition to selecting an optimal portfolio of resources that provides the lowest cost for customers, IRPs also examine other factors that address the long-term value of the portfolio, such as environmental impact, risk mitigation, or economic development.

IRP processes are often structured as proceedings, organized through dockets, required by state legislation, conducted at the state level (even for multistate utilities), and evaluated and in some cases approved by the state regulatory body, such as a Public Utility Commission (PUC) or Public Service Commission (PSC), referred to broadly as “commissions” throughout this paper. As public processes, they provide a forum for utilities, their customers, and other related stakeholders to engage in discussions about the development of IRPs.

Table 1  Demand-Side versus Supply-Side Resources

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<td>Demand response, energy efficiency, energy conservation, distributed generation and storage</td>
<td>Owned utility-scale generation plants, purchased power from utility-scale resources, utility-scale solar</td>
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The content within an IRP, which is explored below, typically affects additional utility planning processes and regulatory planning requirements. IRPs require utilities to take a broad perspective on the portfolio of resources the utility needs to meet demand over a long-term horizon, which can connect IRPs to other planning activities, such as those addressing demand-side resources. Many IRPs require an evaluation of the costs and benefits of energy efficiency and demand response, which can be done within the IRP modeling process or come from a separate demand-side management plan. IRPs can also propose a portfolio of new customer programs and projects or these can be proposed through separate dockets.

The recurring cycle for IRPs in many states—e.g., a new IRP every two to five years, each covering a much longer planning period—is a built-in mechanism allowing the utility to adjust to changes in technology, costs, policy, and customer preferences. Several IRPs include a short-term action plan to cover the next few years. But, after that horizon, the utility is likely to revisit the changing conditions before taking action on new resources. Once completed, IRPs may also impact parallel or subsequent proceedings that plan for supply-side resources, either building new generation, purchasing generation from others, or decommissioning existing plants. For example, to construct new plants utilities often request what is called a certificate of need (CON), which may require that the utility provide demand and cost data that have been updated since its last IRP to the commission when requesting approval. Some CONs may also require a second approval from the commission to authorize construction. Similarly, if the utility plans to meet demand through power plants it does not own it may need to secure direct commission approval of its power purchase agreement (PPA) or file a “Notice of Significant Energy Purchase” (Utah State Legislature 2008).

While IRPs often set the basis for future planning, commissions generally don’t review progress or how well the utility has adhered to the plan but will instead refer to the plan as a guide when, for example, related issues come up in a CON or a review of PPAs (Wilson and Peterson 2011). The IRP can also guide the commission when it reviews the utility's rate case. A utility rate case is the commission's formal process for reviewing a utility’s proposed rates and may include a review to determine if the investments the utility has made were prudent. How an IRP may connect with other utility and/or regulatory processes is complicated and differs by utility and state. However, Figure 3 begins to explore these connections.

If the importance and capacity available from demand-side resources grow and integration of distributed resources becomes more complex, distribution-level planning may begin to intersect more with integrated resource planning. Consumers Energy, for example, is taking a major
step in comprehensive electric system planning by working to integrate its IRP with distribution system planning—two processes that are traditionally managed separately by utilities. This decision stems from increasing awareness that the rapidly transforming energy system presents opportunities for utilities to plan for the electric system in new ways that provide more value to the customer while also optimizing utility cost, efficiency, and system performance. Figure 4 outlines some elements of how Consumers Energy is approaching this shift.

Similarly, planning for more large-scale renewable projects will also impact transmission planning to ensure that developing this infrastructure does not become a barrier to bringing new renewable resources online (Walton 2017; Wind Solar Alliance 2018).

The potential benefits of electric vehicles (EVs) to create new load for utilities and significantly contribute to decarbonization may also elevate the importance of planning for EVs within IRP planning. Utility planning processes are also expanding to include technology-neutral solicitations that define a need and solicit bids from resources that can meet those needs. Colorado’s Public Service Company, for example, used an all-source solicitation in 2018 that led to an additional scenario in its resource plan that considered accelerating the retirement of a coal unit and replacing it with a combination of low-carbon resources (Public Service Company of Colorado 2018). Overall, the impacts of IRPs and connections to other planning processes are broad and will likely evolve along with the utility industry.
Viewing the system more holistically, across generation, supply, transmission and distribution, leading to integrated decision-making and rightsizing to the needs of customers

Leveraging technology and digital capabilities to integrate planning tools and analytics (more granular and robust modeling)

Considering technologies such as non-wires alternatives as both supply and grid solutions (lowering costs and offsetting capacity needs)

Evaluating investment impact and customer benefit across the entire value chain


IRP Requirements and Processes

Status of IRPs

Thirty states currently require utilities to file IRPs while nine more have long-term filing requirements that do not constitute full IRP processes. These long-term filing requirements are not thought of as fully developed IRPs if they do not require the utility to examine both supply- and demand-side resources (Wilson and Biewald 2013). Still, utilities such as TVA and Alabama Power are not required to perform an IRP process but do anyway. Figure 5 provides an overview of these requirements and highlights the popularity of IRP requirements in states where utilities are vertically integrated. Across this landscape of IRP requirements, there are several state-specific guidelines or uses for plans. Kansas, for example, has not developed ongoing IRP requirements but obligates merging utilities to perform an IRP to ensure their merged operations maximize the efficiency of their resources (Kansas City Power & Light Company et al. 2019). For some multistate utilities, their IRP processes may require creating a plan that addresses their entire territory, which is then filed separately for each state.

IRP processes and elements

Despite these variations by state, there is a broad process that IRPs follow, outlined in Figure 2. At a high level, the starting place for every IRP is establishing the scope of the process as well as the development of the load forecast, which involves collecting data and modeling the future demand the utility must meet over the planning horizon. The load forecast is considered in combination with the utility's goals, regulatory requirements, and existing resources when assessing what new resources will be needed. To do this, utility staff collect information on potential supply and demand options, such as cost and performance data, and use this information to create candidate resource portfolios to meet future need (Greacen et al. 2013, 13). These candidate portfolios are developed with the help of investment planning models such as capacity expansion modeling and financial models (Kahrl et al. 2016, 28). From here, the candidate portfolios that could meet demand are compared using production cost models that evaluate how the resource portfolios perform under a variety of scenarios (Greening the Grid 2019). Sensitivities are often run on key variables—e.g., energy and demand forecasts, coal and gas...
costs, renewable energy technology costs, electrification projections, carbon costs—that have the greatest impact on planning. In addition to quantitative analysis, there are opportunities for qualitative and strategic analysis. The utility selects its preferred plan, and sometimes additional contingency plans, and develops a near-term action plan.

How is demand forecasted?
Demand forecasting is often based on energy end-use data, electricity sales records, and economic and demographic data and projections. These data are used in one or more forecasting models to generate several potential forecasts for future demand (Greacen et al. 2013, 8). One forecast, the “base case,” represents what the utility believes is the most likely scenario for the future. Other scenarios are developed exploring how various changes could impact future demand and are one element of risk analysis for the planners (Carvallo et al. 2016, 8). The assumptions driving these scenarios may be based on demographic and economic forecasts and capture changes in load patterns, capacity needs, or other considerations. Utility staff generally develop separate forecasts for each customer class and may incorporate feedback from large customers into their forecasts (Carvallo et al. 2016, 9). Increasingly, projections for electrification (e.g., of transportation, building energy demand) must be part of the energy and demand forecast.

How are portfolios developed?
To develop candidate resource portfolios, utilities collect information on the attributes of various supply- and demand-side solutions. Attributes considered may include the following: plant capacity (measured in MW), maximum and optimal capacity factors (fraction of a year the plant is likely to generate electricity), fuel type, efficiency (amount of electricity generated per unit of fuel), fuel costs, reliability, capital and operating costs, plant lifetime, decommissioning costs, and environmental impact (Greacen et al. 2013, 11). Utilities use these data to run capacity expansion models that combine the load forecast and supply/demand resources to simulate investment in generation and transmission and identify possible resource portfolios that could meet potential demand (Boyd 2016). These models also incorporate assumptions on potential environmental regulations, assumed adoption of distributed energy resources, changes in load growth, capital costs, and potential policy changes.
How these models incorporate supply-side resources can impact whether these resources are used to their fullest extent. For example, some IRP processes may treat energy efficiency or renewable energy as set amounts based on what their state policy requires so that they are predetermined as opposed to allowing the model to actively select demand-side resources when they are more cost effective than other resources (Greacen et al. 2013, 13). Other IRP processes model demand-side resources more robustly using resource potential studies that estimate the size, type, timing, location, and cost of the demand-side resources in the utility’s supply area. PacifiCorp, for example, develops cost curves for demand-side resources based on studies that estimate potential energy efficiency, load control, and price response as well as hourly load profiles of distributed generation (Kahrl 2016, 37, 39). Some states, such as California and Connecticut, have policies called “Loading Order Requirements,” which dictate preference over low-cost energy efficiency or renewable resources and require that the utility make use of these resources first (State of Connecticut 2017, 15; CEC 2019).

How are portfolios compared?

Once a utility creates candidate portfolios, it compares them to identify the portfolio it believes will best meet demand and balance its several goals. Production simulation (cost) models are most often used to model the costs and operations of plants more granularly, on an hourly or sub-hourly basis. Ultimately, these models take the output of a capacity expansion model and solve for the least cost dispatch of generation across the utility’s system to reliably meet load in every hour of the day at every location (Boyd 2016).

Production cost models also provide scenario analysis that allows the planners to see how the candidate portfolios would perform under a range of potential future scenarios. To do this, planners identify a set of assumptions, or sensitivities, about the future that they want to test. These often include future fuel prices, load growth, environmental regulations, and other factors. The models test the portfolios by changing one sensitivity (such as lower-than-expected natural gas prices) to see the impact on outcomes. In addition to measuring the impacts of these incremental changes, some utilities also integrate stochastic modeling—a more complicated analysis that incorporate randomness into a greater number of scenarios to identify the bounds of risk associated with the portfolios (Wilson and Biewald 2013). There is significant variation in the modeling approaches used to compare scenarios; however, the key goal is for the IRP to provide insight into how the portfolios may play out in the future and identify plans that are robust to changes in key variables.

How are clean energy development and environmental externalities accounted for?

One of the most impactful ways to account for state, local, or customer sustainability goals is to fully incorporate analyses of renewable energy, energy efficiency, distributed generation, demand response, storage, and other clean resources into the IRP process. In recent years, best practices for properly integrating an analysis of new, clean resources have emerged and we summarize a few in Box 4.6. At a minimum, these resources should be actively considered as resources to meet demand rather than ignored or introduced as a fixed requirement to meet a policy, such as a RPS, in candidate portfolios (ScottMadden 2015).

Regulators and policymakers are increasingly requiring utilities to account for environmental externalities, particularly in relation to carbon dioxide (CO2) emissions. This is the case with the commissions of Colorado, Minnesota, Nevada, and Washington State, which all have requirements for utilities to disclose information about their emissions. Under Minnesota statutes, utilities must account for both potential future CO2 regulatory costs (via a regulatory cost range that is updated every few years) and CO2 externality costs (via a CO2 environmental cost range derived from the federal social cost of carbon). These cost ranges, applied in resource plan modeling, result in a “present value of societal cost” ranking of scenarios that favors non-emitting over emitting resources, all else equal. In Colorado, a recently passed bill requires utilities to include the cost of CO2 emissions related to the evaluation of electric generation resources in filings such as IRPs (State of Colorado 2019). Another example is Washington State where regulations direct utilities to include “the cost of risks associated with environmental effects including emissions of carbon dioxide” in their lowest-cost analysis (Grab et al. 2019, 22–23).

How is the selected portfolio approved and implemented?

A utility’s internal processes for developing an IRP, including conducting stakeholder outreach, can take over a year. The IRP process is cyclical, with planning kicking off and completing within a set timeframe to meet filing deadlines.

In many states, commissioners have the ability to approve, request modifications to, or reject the plan based on its review. Accordingly, when the IRP is complete, the utility files it with its regulatory commission. At the regulatory level, a formal proceeding is often required to allow for review and provide stakeholders an opportunity to provide written or oral comments. The commission may also make use of hearings with stakeholders to discuss the plan, its potential impacts, how it was selected, the utility’s inputs, and other elements.
As discussed earlier, an approved IRP represents the planning vision for the utility that may be implemented over the coming years through a variety of related proceedings. For example, a needed new generation resource identified in the IRP will require an additional regulatory approval proceeding. More direct approval comes when the utility files a certificate of need to demonstrate that the resource is necessary to meet public interest (Lazar 2016). As another example, Utah must file for “Approval of a Significant Energy Resource Decision,” which gives the commission another opportunity to review the cost, need, and impact of a project and also requires a public hearing to do so (Utah State Legislature 2008).

Variations in IRP requirements

While IRP planning follows a general format (noted above), it is important to note that there are variations between the requirements adopted by each state that impact the process each utility undertakes. Differences include the planning horizon, frequency of updates, resources evaluated, level of stakeholder involvement, requirements for asset retirement and resource procurement, levels of independent evaluation, and other aspects.

For the most part, planning generally covers a 10–20 year horizon, though some states, such as Michigan, require additional five year intervals.

Table 2  Selected Utilities and Their IRP Planning Cycle Requirements

<table>
<thead>
<tr>
<th>PARENT COMPANY</th>
<th>SUBSIDIARY</th>
<th>STATE</th>
<th>FREQUENCY (YEARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Electric Power (AEP)</td>
<td>American Electric Power Ohio*</td>
<td>Ohio</td>
<td>When requested*</td>
</tr>
<tr>
<td></td>
<td>Indiana Michigan Power</td>
<td>Indiana</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Michigan</td>
<td>5</td>
</tr>
<tr>
<td>Appalachian Power Company</td>
<td>Virginia</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West Virginia</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Public Service Company of Oklahoma</td>
<td>Oklahoma</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Southwestern Electric Power</td>
<td>Arkansas</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Louisiana</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Kentucky Power Company</td>
<td>Kentucky</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Berkshire Hathaway Energy</td>
<td>Pacifi Corp-Pacific Power</td>
<td>California</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oregon</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Washington</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>PacifiCorp - Rocky Mountain Power</td>
<td>Wyoming</td>
<td>Not specifiedb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utah</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Idaho</td>
<td>2</td>
</tr>
<tr>
<td>CMS Energy</td>
<td>N/A</td>
<td>Michigan</td>
<td>5</td>
</tr>
<tr>
<td>Southern Company</td>
<td>Georgia Power</td>
<td>Georgia</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Alabama Power**</td>
<td>Alabama</td>
<td>3</td>
</tr>
<tr>
<td>TVA</td>
<td>N/A**</td>
<td>Tennessee</td>
<td>3</td>
</tr>
<tr>
<td>Xcel Energy</td>
<td>Xcel Energy Colorado</td>
<td>Colorado</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Xcel Energy Minnesota</td>
<td>Minnesota</td>
<td>2 or 3</td>
</tr>
<tr>
<td></td>
<td>Xcel Energy New Mexico</td>
<td>New Mexico</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes: * Information was received from AEP. ** AEP Ohio provides a long-term plan instead of an IRP. *** Completes IRP voluntarily. ** Completes IRP voluntarily.

scenarios (Gonzalez 2019). In Colorado, for example, the utility itself determines what the planning horizon will be and there is no requirement for length (State of Colorado 2007, 89). The frequency of updates also varies across states with some filing annually and others every five years. For some states, such as Missouri, the utility is required to file annual updates to highlight significant changes and actions taken since the last plan was filed (Ameren Missouri 2019).

Table 2 outlines a few planning cycle requirements.

While integrated resource planning by nature requires the utility to examine both supply- and demand-side resources,8 there are variations in how specific the requirements are to do so. In some cases, the IRP requirements point to specific resources that must be considered such as energy efficiency, distributed energy resources, or transmission. Delaware’s requirements are detailed enough to specifically call out “short and long-term procurement from DSM [demand-side management], DR and customer sited generation; resources that utilize new or innovative baseload technologies; resources that provide short or long-term environmental benefits.” and other resources for consideration.9

Furthermore, the level of stakeholder involvement can vary greatly. For many utilities with multistate territories, the process and requirements they follow likely differ in each state. The requirements for stakeholder engagement across the territories of AEP illustrate these differences. A formalized stakeholder process is required in Indiana, Arkansas, and Louisiana and includes engagement with customer groups, industry groups, and environmental groups. For example, utilities submitting IRPs in Indiana are required to have a public advisory process under 170 IAC 4-7-2.6 Public Advisory Process. This process must consist of at least three meetings, which are generally held in the service territory of that utility (Borum 2018). In AEP’s Oklahoma, Kentucky, Virginia, and West Virginia territories, however, the IRP process does not require stakeholder input (AEP 2019).

West Virginia, for example, is a state without strong stakeholder involvement and views the IRP as an informational filing. In a 2015 IRP planning cycle, seven IRPs were filed with the commission, one of which faced major pushback from stakeholders who requested a hearing to examine the plan (State of West Virginia 2015, 1). Ultimately, the commission declined to hold a public hearing on FirstEnergy’s plan (Brown 2016) but did encourage the utility to consider the comments filed. Ultimately, the PSC stated it was required only to accept the plan as informational—not to approve or deny it based on the state’s IRP requirements (West Virginia Legislature 2015). It noted that accepting the filed plan did not guarantee approval of specific proposals tied to the plan (Energy Central 2016).

In Minnesota, while there is not a formal requirement for stakeholder consultation, the commission has signaled its desire to see utilities engage stakeholders in the IRP development process, in response to which Xcel Energy held 13 stakeholder workshops prior to filing its most recent IRP (see Box 6). Other states take a much more comprehensive approach, such as Hawaii, which requires utilities to organize advisory groups including county agencies and environmental and community interest groups (Wilson and Biewald 2013, 27). Some stakeholders have even noted that the role of the commission has shifted from an approver of the plan to that of a convener that moderates the forum to examine the plan and ensure it is well formed (Volk et al. 2018, 18).

WHAT IS THE PATHWAY TO INTEGRATING CUSTOMER AND UTILITY PLANNING?

Considerations for Customers Interested in Engaging in Planning Processes

As previously noted, to identify and begin to achieve this collaborative resource planning, customers must first understand the purpose of the IRP processes, how IRP planning fits into the broader suite of utility planning activities, generally how IRP processes are structured, and specific IRP requirements their utility faces.

From there, customers can assess how they fit into the resource planning process and what potential benefits could be achieved through engagement. To make this assessment, customers require a deeper understanding of what the process looks like for their utility and the stakeholder outreach offered, including relevant timelines. Much of this information can be found through the commission website, the utility website, or directly from the utility. Knowing the history of the IRP and how other stakeholders have engaged in the past can also be helpful—this information can be found looking at past IRPs and stakeholder comments. While customers learn more about the IRP context for their area, they should also consider their own goals and whether they or the utility could benefit from engagement around resource planning. Finally, some advanced customers may choose to analyze the IRP process more deeply to see if the design presents barriers to renewable resource development. See Box 4 for an introduction to IRP best practices for driving clean energy development.
Opportunities for Customer Involvement

Customers interested in engaging with their utility around resource planning can do so by interacting one-on-one with their utility, participating in their utility’s stakeholder engagement process, and/or participating in the regulatory proceedings. These opportunities are not mutually exclusive and depend on the existing relationship a customer has with its utility, the planning process in place, and the customer’s goals. Customers thinking through the pros and cons of each option need to consider how each would work in their context, including their current relationship with their utility.

Generally, direct utility engagement provides the ability to raise and discuss issues quicker, often with less effort than within a formal, public comment period. At the same time, however, direct engagement through non-public communications does not offer transparency for others in documenting this work, nor necessarily have the level of influence that coordinated action by multiple customers can have on the utility and its regulatory commission. Participation in the stakeholder process provides targeted information on the IRP and can direct feedback through channels the utility has planned for; however, this process alone might not provide a direct response to a customer’s more individual concerns. Finally, commenting within the regulatory process after the plan has been filed provides a public and formal avenue to express reactions to the selected plan but can require the most expertise and resources.

Direct engagement

Customers may see value in collaborating with their utility in a one-on-one setting where they can communicate informally and directly on a broader set of issues and about their particular needs. During this engagement, customers and utilities can establish a relationship that can identify solutions within the IRP process or other planning processes. This type of communication can supplement participation in the stakeholder process or even help bridge information gaps where a meaningful stakeholder process does not exist, as well as support the regulatory approval process. This type of engagement could be set up by establishing new contacts or connecting with existing contacts and suggesting check-ins on key issues as often as possible.

While general, ongoing engagement can help both utilities and customers better understand each other’s needs and help identify opportunities for collaboration on a broader set of issues, customers can also pursue direct engagement to address a specific program or utility action. For example, customers could provide input on a recent resource decision or IRP filing by writing a letter to the utility that expresses their needs but is neither public nor filed with the commission

Robust Stakeholder Processes and Reviews of Filed Plans: IRPs with robust stakeholder processes that allow customer input early on and at several points in the process allow stakeholders to express their needs. Similarly, making proposed plans public and allowing for public comment after they have been submitted to the commission signals that stakeholder input is important.

Accurate Assumptions: In many parts of the United States, demand for electricity is now declining. If load forecasts for IRPs do not reflect this, the IRP could drive unneeded resources, including fossil-fueled plants, to stay operational longer than needed. Assumptions for the cost and generation profiles for renewable resources should also be up-to-date to capture recent price declines and accurately reflect their capacity contributions.

Give Clean Resources Equal Footing in Investment Models: Models that develop potential resource portfolios should treat resources such as wind and solar, energy efficiency, demand response, and storage as options for meeting demand. Models can incorporate them as “selectable resources” as opposed to assuming enough of these resources are developed to just meet requirements.

Include Environmental Costs and Constraints: IRPs should include potential future environmental compliance costs and analyze different compliance strategies.

Sensitivities that Support Clean Energy: When analyzing proposed portfolios to see how they perform under various future scenarios, IRPs should include sensitivities that address environmental regulatory regimes, costs, availability of demand-side management measures, high demand for clean energy, and other factors. This analysis highlights how clean energy resources can perform in future scenarios.

Transparent Plan Selection on Several Metrics: The preferred resource plan can be selected based on the present value of revenue requirements, but selection can also consider how the portfolios meet the utility’s other goals, such as environmental impact or risk. In addition, IRPs where the basis for portfolio selection is not transparent limit public comment on these decisions.

This list is not exhaustive and there are several resources that provide deeper analysis into best practices and clean energy integration, such as from Lawrence Berkeley National Laboratory,2 the Regulatory Assistance Project,3 the National Renewable Energy Laboratory:4


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In January 2018, the City of Milwaukee, Milwaukee County, Milwaukee Area Technical College, and Milwaukee Metropolitan Sewerage District Facilities, a regional government agency that provides water reclamation and flood management services, collectively sent their electric utility, We Energies, a letter expressing interest in collaborating with the company to create a utility-scale renewable energy solution and requesting additional engagement with large customers to plan and install new renewable energy projects.

This initial letter reinforced customer interest in renewable energy solutions and spurred the utility to hold one-on-one conversations with its customers to better understand their goals and desired outcomes.

Given this insight, when We Energies was later faced with forthcoming coal plant retirements, the utility was able to proactively replace the retired assets with renewable energy resources and design a utility program that would provide interested customers access to those resources.

Once approved at the regulatory level, the customers that drafted the original letter were able to file public comments indicating general support for the program, as it aligned with their stated renewable energy solutions, with some minor adjustments to the program design (City of Milwaukee 2018).

In June 2018, a year ahead of its initial filing of its 2020-2034 Upper Midwest Integrated Resource Plan to the Minnesota Public Utilities Commission, Xcel Energy kicked off an extensive stakeholder engagement process. Over the course of a year, Xcel held 13 stakeholder workshops on a broad range of topics including the basics of the IRP process and how to engage in the process, rapid technological change in the electric system, economic and technical considerations, modeling, demand-side management, power plant host community considerations, and stakeholder feedback on the preliminary “preferred plan.” In addition to its own experts and modeling, Xcel Energy engaged independent facilitators from the Analysis Group and modeling experts from Energy & Environmental Economics (E3) to conduct an independent validation of the company’s modeling. E3 conducted its own modeling of the Xcel Energy system as well as a statewide, multisector decarbonization analysis using the PATHWAYS model, a tool that evaluates long-term decarbonization scenarios, to understand the potential to decarbonize other sectors through electrification (Xcel Energy 2019, 4).

In addition to the overall stakeholder process, Xcel Energy engaged with several environmental organizations and labor groups—the Sierra Club, Clean Grid Alliance (Google included in membership), Fresh Energy, Minnesota Center for Environmental Advocacy, Union of Concerned Scientists, Center for Energy and Environment, and the Laborers District Council of Minnesota and North Dakota—to reach a consensus on topics ranging from renewable energy capacity to coal-powered-plant shutdowns. Xcel Energy and these groups ultimately entered into a settlement agreement committing to, among other things, retiring all of Xcel Energy’s remaining upper Midwest coal units by 2030, procuring at least 3,000 MW of additional solar, significantly increasing levels of energy efficiency and demand response, and creating local jobs. While the settlement agreement did not address all issues related to the IRP, it helped reduce the number of contested issues going into the formal filing and regulatory approval process.

Finally, Xcel Energy did dedicated outreach to its large, sustainability-oriented customers via the Minnesota Sustainable Growth Coalition. See Box 9 for more.

As of August 2019, the commission had not yet officially approved Xcel Energy’s newest IRP. Nonetheless, Xcel Energy’s process shows us that conducting robust stakeholder processes early on during planning and using innovative agreements can lead to a draft IRP that has stakeholder support on key issues ahead of the initial filing. The IRP, as well as materials from all 13 stakeholder workshops, are posted on a public website. 

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**BOX 5 | USING DIRECT ENGAGEMENT TO MEET CLEAN ENERGY TARGETS AND IMPACT THE GRID MIX**

**BOX 6 | XCEL ENERGY’S UPPER MIDWEST IRP STAKEHOLDER PROCESS AND SETTLEMENT AGREEMENT**
commission. See Box 5 for an example of direct engagement. As mentioned earlier, these kinds of communications can be limited in impact. For regulators reviewing an IRP, comments must be made "on the record" to be considered.

Where customers and utilities decide to directly engage around resource planning, there are some best practices that can maximize the benefits of this collaboration. As noted earlier, education is a key element. Customers that understand the resource planning process they are hoping to influence are better able to assess the impact of the plan on their goals and make more concrete requests to the utility. Utilities that understand the goals and concerns of their customers are more able to articulate their efforts to address concerns and provide important customer information. Box 6 provides an example of direct engagement where a utility used a consensus agreement, among other activities, to directly address some key customer concerns ahead of filing.

For both parties, addressing the regulatory barriers and constraints to incorporating customer demand is equally important. Parties may begin with a focus on the current IRP but find a broader set of issues or a different avenue for collaboration. Often, identifying areas that are nonstarters and those where compromise might be achieved is a good practice early on in collaboration to streamline conversations. Finally, customers may find it beneficial to connect with utility staff across teams. For example, a customer can work through the utility’s key account manager, who prioritizes understanding customer needs. The key account manager can also act as the liaison with the more technical team responsible for IRP analysis and planning. Creating the right set of relationships can impact how customer needs are communicated across the utility.

Participation in stakeholder processes

Stakeholder processes typically consist of a series of public forums, with stakeholder presentations, opportunities for questions and answers, and conversations to best understand or provide feedback on the plan. In areas where utilities have robust stakeholder processes in place, participation can provide customers the details on both the IRP process used by the utility and the preferred resource plan as it is selected as well as enhance the utility-customer relationship. These public forums also provide an opportunity for stakeholders to converse with and learn from each other, for example, about what other customers have requested or how they have engaged to date.

Many utilities have expanded their IRP stakeholder processes in recent years to begin earlier in the planning process and to collect initial feedback from stakeholders at several stages. TVA’s stakeholder process, for example, incorporates input from two comment periods. Early on, TVA engaged external stakeholders to understand diverse opinions and to challenge assumptions. The final comment period allowed for stakeholder input into what factors to consider in the final sensitivity analysis of potential resource plans, and allowed stakeholders to suggest additional scenarios to test (Kahrl et al. 2016, 80; DTE Energy 2018, 43). Customer input in the final comparison of the resource plans is important so that customer concerns can influence the plan selection. Figure 6 illustrates the points for public input in TVA’s stakeholder process.

Another example of a stakeholder process working to incorporate customer demand is shown in Box 7, which highlights the efforts of Consumers Energy to incorporate input early. While other examples exist, stakeholders see an opportunity for even greater transparency and new opportunities for information sharing and collaboration across a wider set of utilities in the future (Carvallo et al. 2016).

![Figure 6](image)

Example of TVA Stakeholder Process

Scoping/ Framework
Analysis and Evaluation
Presentation of Initial Results
Public Comment Period
Additional Analysis
Recommendation

Note: TVA’s IRP processes include three steps that are impacted by customer input. There are two public input periods: one occurs during scoping and another after the draft IRP was released. In addition, public comments and stakeholder input influence what additional analysis is conducted after the draft IRP is public.

Source: Figure created by TVA for this paper.
As part of its stakeholder process, Consumers Energy implemented a comprehensive, yearlong stakeholder engagement plan that included a series of widely promoted public forums and events during which community members had the opportunity to provide feedback on the IRP ahead of its official filing. Key stakeholders involved included government leaders, customer groups, environmental groups, and non-utility energy providers. In 2018, after these workshops, an initial version of the IRP was submitted for filing; the collaboration with stakeholders continued until May 2019 when a modified settlement was agreed upon by most stakeholders.

Key aspects of the approved agreement include the retirement of several coal units, significant new investments in energy efficiency and demand response programs, and ambitious plans to reduce carbon emissions more than 90 percent by 2040 and provide 90 percent clean energy to customers by the same year.


In June 2019, Consumers Energy’s final IRP proposal was approved by the Michigan Public Service Commission—the first long-term utility IRP approved under Michigan’s 2016 state law requiring utilities to submit IRPs to help meet the state’s goal of 35 percent renewable energy by 2025 (State of Michigan 2016). Consumers Energy’s process shows us that early involvement with a broad set of groups helps attain stakeholder support and approval during the filing.
Regulatory proceedings

To understand how a customer can engage at the regulatory level, it is important to first note that there are different types of regulatory proceedings. Adjudicated (or litigated) proceedings resemble court cases, often requiring written testimony, technical conferences to question expert witnesses, hearings before the commission, and written briefs by parties. Often, an adjudicated proceeding is used when a utility applies for cost recovery of an IRP-proposed resource, a rate increase, or program approval. In contrast, some planning processes are conducted less formally to gather information or explore a topic. The opportunity to engage in each of these types of proceedings varies, though adjudicated proceedings typically have more opportunities to engage.

During regulatory proceedings, individuals can participate as an official party to the proceedings, and are then referred to as formal intervenors, or simply in a public capacity. To formally participate, an individual may be required to meet specific legal requirements (e.g., standing), which vary by state. Participating as an official party allows an individual customer the opportunity to more actively engage if desired. Engagement opportunities for formal intervenors can range from submitting comments to providing expert testimony. In contrast, engaging in a public capacity has fewer requirements, if any, and engagement opportunities often include submitting written comments, a letter, or a memo, or making oral comments during open hearings. However, for both levels of participation—formal intervenor or public capacity—the stakeholder views become part of the record the commission can consider in its decision-making process. Customers may choose to participate in the regulatory process to either support utility efforts or critique the plan to drive further action. Box 8 illustrates an example where corporate customers and other parties participated in an IRP proceeding by filing formal comments.

BARRIERS TO ENGAGEMENT

Although engaging in some or all of these pathways can be valuable, there are several barriers that prevent or limit customer involvement and collaboration. One of the most common is that many customers have limited time, capacity, and resources to engage. Even within large corporations, which tend to have larger budgets, the sustainability and energy teams can be small and tasked with a wide range of activities beyond regulatory and policy engagement, including energy purchasing, emissions reporting, and overall strategy. This constraint is felt even more acutely among smaller companies and other customers, such as cities and local governments (NCEP 2019).

These limitations may impact engagement in the IRP process overall and can be specifically limiting for customer participation in regulatory proceedings. Participation at this level typically requires an understanding of the relevant processes, issues at hand, terms and methodologies, and potential opportunities. Although education can help overcome these barriers, the value in participation must be weighed against the opportunity cost of staff time needed to find and review educational resources, attend hearings, review filings, and, if appropriate, communicate with the utility or file formal comments within the proceeding.

As previously noted, IRPs are often, though not always, structured as an adjudicatory proceeding (Lazar 2016). While this type of process increases transparency and allows for public participation, depending on the level of participation, it can be time consuming to designate resources to stay aware of relevant proceedings and engage in proceedings. The regulatory proceeding may also be lengthy and take months to years. Ultimately, the lack of time, capacity, and resources may dictate and potentially limit customer engagement. For example, customers may choose to prioritize participating in engagement opportunities with substantial or direct impact, e.g., rate cases where the potential rate increase would directly impact their expenses. As the economics of clean energy continue to improve, the role customers can play in supporting their utility’s investment in low-cost renewable energy to reduce future energy costs is likely to become more important.

Some customers may have the education and resources to engage but may still find there are barriers to engagement inherent to the resource planning process itself. As explored earlier, the process and requirements for IRPs vary greatly by state and utility. Not all IRPs are handled as an adjudicatory proceeding or even docketed. For example, the state of Indiana does not format IRPs as a docketed proceeding but does provide stakeholders the ability to view past plans and comments, and submit their own comments on a page on the Indiana Utility Regulatory Commission website. It has recently developed requirements for the utility stakeholder process around the IRP process.

Lack of transparency within the IRP process can limit the ability of stakeholders to review important content, e.g., assumptions made by the utility or details on resource portfolio selection (CAC et al. 2017). In some IRP filings, utilities may choose to redact certain data considered trade secret, confidential, or proprietary in the public version of their IRP materials. This information may include load forecasts, customer projections, hourly generation data, fuel costs,
or plant data (CEC 2017). Many utilities, however, release this information only to stakeholders who sign a nondisclosure agreement. In addition, with IRPs where the utility does not automatically provide data to support its plan selection, customers may need to engage with the utility directly or ask their commission to require that more information be released so they can understand the benefits of the proposed plan.

**ENGAGEMENT FORUMS**

Engagement forums are an alternative or supplemental route to engagement, and likely a pathway that helps overcome some customer challenges. These forums are often facilitated by research organizations, nonprofit organizations, trade groups, associations, or coalitions and aim to help customers overcome educational barriers and reduce the time investment needed to participate in regulatory proceedings. Forums such as the Renewable Energy Buyers Alliance and Urban Sustainability Directors Network, which help bring together customers with similar needs, have also been instrumental in providing education and directing customers to useful resources. Research organizations and associations can also provide useful tools that aid analysis. For example, Lawrence Berkeley National Laboratory hosts a public portal to compare various resource plans and, similarly, the American Wind Energy Association provides its members with an IRP database that summarizes renewable energy additions, coal retirements, capital cost assumptions, capacity factors, and more for recent public IRPs.12

Other times, a smaller coalition of similar stakeholders in a specific region can organize efforts to express customer demand. The Arizona Advanced Energy Customer Collaborative, for example, was convened in 2017 to combine the efforts of the Advanced Energy Buyers Group13 with those of other companies, municipalities, and universities with similar demand for advanced energy in Arizona. Seeking market solutions for renewable energy, demand-side, and on-site generation needs, they began a collaborative effort directly with Arizona Public Service and communicated this effort to their state regulator, the Arizona Corporation Commission, early on in the IRP process. They similarly provided input during the Arizona Energy Modernization Plan docket (AAECC 2018).
CONCLUSIONS AND TAKEAWAYS

Utilities and customers can both benefit from collaborative planning to meet clean energy goals. As renewable and carbon goals proliferate at the state, utility, and customer levels, parties are increasingly interested in aligning efforts to ensure clean energy development is efficient and impactful. The potential benefits of greater alignment include more efficient clean energy procurement and integration, a more efficient review of utility resource plans, more rapid decarbonization as parties achieve their goals, and an overall stronger relationship between utilities and their customers. Alignment on clean energy goals requires education on both ends—for utilities to better understand customer needs and for customers to better understand how utilities approach resource planning. This paper provides an educational baseline for customers and utilities to consider how to engage around resource planning and presents some considerations and pathways as they structure this engagement. Some takeaways include the following:

Direct engagement between customers and utilities on resource planning benefits both parties. Customers and utilities have several options for engaging on resource planning, and increasing one-on-one, informal collaboration allows customers and utilities to learn more about each other’s needs, concerns, and processes. It also allows them to collaborate on a broader set of issues. This can result in customized solutions that help customers meet their goals and more meaningfully incorporate their demand for clean energy into the IRP. By finding solutions together, they can approach regulators as partners and gain approvals more easily.

Customers and utilities should engage early and often around resource planning. With IRPs, the earlier customer demand and input are expressed in the planning process, the more likely customer needs will be captured in the draft plan submitted to the regulator. Waiting until the plan has been submitted to comment on how well it aligns with customer goals does not incorporate this demand into the analysis used to craft the preferred plan and may be costly for customers if their participation requires formal intervention. If direct engagement with the utility is not an option, customers can overcome educational and resource barriers by finding forums or joining coalitions with stakeholders who have shared goals.

Robust stakeholder processes within IRP planning support engagement and should be pursued by states and utilities. IRP and stakeholder engagement processes vary by state and utility but in every case greatly impact how customers receive information on IRP plans. By developing methods to increase transparency around the planning process and seek stakeholder input early on, customers will better understand proposed plans and how their demand is being addressed.

Moving forward, customers and utilities can bring more value to their collaborations by working on a broader set of activities, addressing complex questions about the future of clean energy goals, and bringing innovation to the IRP process.

To reach higher penetrations of renewables, customers and utilities may innovate on a wider set of activities that impact carbon and can be mutually beneficial. Customers may expand collaboration to include activities that reduce carbon intensity on the grid and help with renewables integration, such as storage, demand aggregation, and managed charging of electric vehicles.

Innovation is needed on how to align layered goals. Customers are increasingly interested in aligning their renewable and carbon goals as well as understanding how their goals interact with those of utilities. New methods to account for utility grid mix or innovations to REC accounting could be helpful.

Aligning customer demand for clean energy into resource planning will require innovation around IRP processes. In a future of declining load growth and increasing focus on customer solutions, IRPs may need to shift to more clearly address customer demand for a cleaner energy supply. This may involve adding a review of customer demand early on during data collection, including modeling candidate portfolios that would meet customer demand for clean energy, or allowing customers to request sensitivities during scenario analysis.

Customers and utilities have had success finding solutions for clean energy purchasing and can become partners around resource planning through direct collaboration. Developing these relationships can allow them to align goals to reduce the costs of clean energy development and begin to drive innovation in this area.
ENDNOTES

1. For more information on how state regulation and policy impacts purchasing options, see the American Cities Climate Challenge Renewable Accelerator web tool: https://cityrenewables.org/renewable-options/.

2. A reserve margin is the amount of capacity above the forecasted demand needed to protect against grid interruptions if demand exceeds projections.

3. We sometimes say PUC for simplicity when broadly referring to the state regulatory commission.

4. Names vary across states; the certificate is sometimes referred to as the certificate of public convenience and necessity.

5. This varies by state, however. In Michigan, for example, when approving an IRP, the commission may also grant cost recovery for short-term actions in the first three years of the plan.


7. For some states, the IRP approves plants, for some a certificate of public convenience and necessity is needed, and for others both.

8. The federal Energy Policy Act of 1992 requires IRPs to “treat demand and supply resources on a consistent and integrated basis.” (42 USC § 111(d)(1)).


11. See “Chapter 6: Participation in the Regulatory Process” in Lazar 2016 for more details on what other types of proceedings are like and how stakeholders can participate in them.


13. The Advanced Energy Buyers Group is a coalition of leading advanced energy purchasers convened through Advanced Energy Economy to engage on policy.

14. Xcel’s broader range of IRP outreach also includes workshops, surveys, and community-level discussions.

REFERENCES


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Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth’s resources at rates that are not sustainable, endangering economies and people’s lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

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ABOUT THE AUTHORS

Lori Bird is the U.S. Energy Program director and the Polsky Chair for Renewable Energy within the global energy program at World Resources Institute. In this role, she focuses on decarbonization by the utility sector and large buyers, increasing grid flexibility through market design, and transportation electrification.

Contact: lori.bird@wri.org

Heidi Bishop Ratz is manager, U.S. electricity markets, working across the Energy and Climate programs at WRI. She provides project management, partner engagement, and research to drive the transition to a low-carbon economy in the United States. This involves research and analysis to support WRI’s existing and emerging U.S. energy initiatives related to deep decarbonization, electricity market design, innovative utility regulatory policy, and/or promotion of zero and low-carbon energy, demand response, energy storage, and energy efficiency.

Contact: Heidi.Ratz@wri.org