STRATEGIC ENVIRONMENT

Electric Industry and Regional Power Markets

**Utility 2.0:** Unprecedented change is underway in the electric utility industry. In an August 2017 report issued by the Department of Energy, Secretary Perry described this industry change as “massive”. This change is driven primarily by two factors: advancements in technology and regulatory policy. Major advancements in technology have led to tremendous advancements in shale hydraulic fracturing which has tapped huge natural gas reserves and a corresponding decrease in wholesale energy prices. Regulatory policies have also significant impacts on utilities at both the state and federal levels. Nationwide, both solar and wind energy are provided significant tax credits. At the state level, the Energy Independence Act currently requires qualifying utilities purchase 9% of their customer load from wind or solar projects or equivalent amount of renewable energy credits.

In summarizing the impacts of changes to the industry, Secretary Perry noted “While these changes are providing more choices for consumers, they are also challenging the regulatory paradigm that has guided the industry’s growth for decades. It is apparent that in today’s competitive markets, certain regulations and subsidies are having a large impact on the functioning of markets, and thereby challenging our power generation mix. It is important for policy makers to consider their intended and unintended effects.”

**Renewable Energy Integration:** Thousands of megawatts of installed wind generation capacity is now operating in the BPA Balancing Area with continued requests for additional transmission interconnections of wind and solar projects. The increasing concentration of intermittent generation associated with wind and solar projects can produce large swings in generation, which in turn requires significant balancing reserves to preserve system stability and reliability. The intermittency of wind and solar generation creates operational complexities and cost risks for power balancing area authorities like BPA.

The installed utility-scale and customer solar generation capacity within the California Independent System Operator (CAISO) balancing area is large enough to create periods of significant surplus energy in California. The effect of this non-dispatchable energy is to create what is referred to as a “duck curve” when considering a daily electrical load profile that is net of solar generation (“net load”). Relatively rapid drops in “net load” in the mornings and increases in the evenings corresponding to the rising and setting of the sun requires conventional rotating generators to ramp down and back up each day. This creates operational complexities and reduces the opportunity for certain generation projects to recover costs due to reduced volumetric sales. In addition, opportunities to sale surplus BPA hydro energy into California have been diminished by the massive solar buildout thereby reducing BPA’s secondary sales revenues and increasing the pressure to raise their rates to preference customers.

Overall, the continued build out of renewable energy projects to meet state mandated renewable portfolio standards is depressing wholesale power market prices to unprecedented levels throughout the west and northwest. This has a negative impact on many utilities’ net power costs and is resulting in the need to consider ways to increase customer energy and power product sales rather than sell into a depressed secondary market. BPA is beginning to explore how the flexibility and fast-ramping capabilities of their fleet of hydro generation projects may have value in meeting the challenges of the California “duck curve” thereby potentially offsetting the large reduction in secondary energy sales that is expected to continue.
**Energy Storage:** Energy storage in a variety of forms is being promoted as a way to firm intermittent renewable generation sources such as wind and solar and is also being considered as a means for relieving congestion on transmission and distribution systems which may allow utilities to defer costly upgrades. Energy storage systems are also being considered for ancillary services related to stable power grid operations. Battery based energy storage is emerging as the preferred technology for a wide variety of purposes. Battery storage is seen as a complement to the growth of distributed solar generation and has begun to enter the mainstream. Volume production of established battery technologies are helping to drop prices, while new, potentially less-expensive technologies are moving toward commercial deployment. Commercialization of energy storage technologies is also being spurred by federal and state legislatures, including in California where a bill was passed requiring 1,325 megawatts of energy storage by the year 2020. In addition, Tesla Motors is producing lithium-ion batteries at their “Gigafactory” in Nevada for use in their electric vehicles and Powerwall home energy storage units. Powerwall is advertised as ready to integrate with solar, enabling customers to self-power their homes and even go off-grid if desired.

**Electric Vehicles:** While a mass market for electric vehicles has been very slow in coming, there were about 30 different offerings available at the end of 2016. Following a 5% decline in sales from 2014 to 2015; US EV sales jumped by 37% in 2016. Electric vehicles are also a key component to the carbon reduction objectives being pushed by federal and state legislators. In an era where electric utilities are seeing small or declining load-growth rates due to conservation and customer self-generation, electric vehicles may represent an opportunity for utilities to preserve or even grow revenues.

Interest has grown in the Tri-Cities and a sub-committee of TRIDEC’s MCEI group has been formed – Electric Vehicle Infrastructure Transportation Alliance (EVITA) – to advocate for sustainable electric transportation and to promote public/private partnerships for the development of electric vehicle charging stations across the Tri-Cities region.

**Shale Gas:** Changing technology in the area of natural gas exploration and recovery has significantly increased the supply of domestic natural gas and as a result the market prices have remained relatively low. Low gas prices tend to depress northwest wholesale electricity market prices thereby reducing the revenue opportunities for the District and our "long" energy position. Most predict only modest price increases for natural gas in the foreseeable future. However, with Liquefied Natural Gas, a world market in natural gas may begin to impact the supply and demand equation. Natural gas price forecasts have been incorporated into the District's long range financial forecasts and plans.

**Energy Imbalance Market:** Due to the increasing need to more efficiently and cost effectively balance generation and loads in the western interconnection, many balancing area authorities are participating or planning to participate in the Western Energy Imbalance Market (EIM) hosted by the California Independent System Operator (CAISO). BPA has enabled northwest utility participation in the EIM through the use of their transmission system and has begun the process of evaluating the costs and benefits of joining themselves. While BPA’s preference customers continue to express concerns that expansion of the EIM might lead to a loss of preference rights, increased costs to BPA, or to cost shifts, these same customers are encouraging BPA to explore ways to increase the market value of their hydro generation assets as a means for increasing secondary revenues and mitigating future BPA rate increases. Some utilities also expressed concerns that an EIM could lead to a Regional Transmission Organization (RTO) and FERC regulation of the Northwest power grid. The Public Power Council has remained actively involved in the EIM issue and is pursuing outcomes relative to the CAISO EIM and RTO expansions that mitigate BPA costs and enhance its secondary revenues to the largest extent feasible.
and achieve fair and comparable treatment of BPA and other Northwest public utilities when they trade in those markets.

**Distributed Generation (DG):** Customer interest in DG has grown significantly in California and other states. This growth has been fueled by two major factors: 1) economic benefits that arise from the avoidance of high electric rates charged by utilities, coupled with significant federal and state incentives that help offset purchase and installation costs, and 2) environmental benefits that arise from the substitution of “green” solar energy for carbon-emitting energy sources. Recently, a number of factors have come together to incentivize customer demand for solar panel installations in Washington state. A continued reduction in the cost of solar panels and new technology advances, along with federal tax credits, accelerated depreciation, state incentives and changes to net metering policies have generated interest in roof-top and other solar installations. Governor Jay Inslee and the state legislature continue to look for ways to expand the use of solar energy in Washington State.

Community solar projects continue to be a popular option for utilities to partner with their customers to increase sustainability branding and to allow them to exercise personal environmental beliefs without the hassle of building roof-top or other on premise solar arrays.

In other states, solar leasing companies have lowered the price of entry thereby broadening the availability of rooftop solar to middle income households. Here in Washington, third-party ownership has been slowed by two factors: 1) third-parties are not currently eligible for state incentives, and 2) in July 2014, the Washington Utilities and Transportation Commission signaled that it will regulate third-party owned systems for purposes of safety and consumer protection. Nonetheless, solar leasing in Washington State may become more prevalent in the future. The advance of DG as a complement to traditional electric service has potential benefits as well as operational challenges for electric utilities. Potential benefits include lower line losses and avoidance of new generating facilities in the long term. Operational challenges include grid reliability, potential hazards for line workers, and cross-subsidization of net-metered DG customers by other customers.

**Third Party Entrants to the Utility Industry:** Recently, non-utility businesses have communicated business plans to offer services normally provided by utilities. Tesla has announced a home storage solution. Solar leasing companies have had a significant impact on utility loads in California. Industry experts have indicated that solar may cause the next 10 years to change the electricity industry more than the past 100. Looking into the future, public power may find advantages in strategic partnering opportunities with third party service providers with expertise in specific business processes, such as energy efficiency, solar, demand response, and energy storage.

**Public Power Business Model:** The value offered by the public power business model continues to be relevant although some threats to the model have emerged, particularly related to third party entrants into the utility industry. Public ownership, local control, and cost-based rates, continue to be strengths of the public power model. According to the APPA, the public power business model must remain flexible to respond to customer needs. Flexibility is key due to the uncertainty surrounding the massive changes underway in the utility industry.

**Northwest Power and Conservation Council Seventh Power Plan:** The 7th Power Plan was approved in February 2016 and has an effective life of 6 years to coincide with BPA rate periods. The Power Plan is most impactful to BPA customers through the relationship it has to BPA’s energy efficiency program. The Power Plan includes a regional conservation target of 1,400 aMW over six years which is in line with the 6th Power Plan targets. BPA’s commitment to “backstop” the target tends to drive up their wholesale
rates. The 7th Power Plan also discusses the future of demand response (DR) measures and encourages the region to ramp up its efforts and achieve 600 MW of DR over the effective life of the Plan. The Plan’s resource portfolio in the coming years largely consists of energy efficiency and natural gas fired generation to meet any increases in load with renewable generation development at a level equal to that representing achievement of state mandated renewable portfolio standards. The Plan encourages research in advanced technologies to improve the efficiency and reliability of the power system through emerging smart technologies such as integrating electric vehicles, geothermal, ocean waves, advanced small modular nuclear reactors and emerging energy efficiency technologies.

**Power Supply**

**Power Supply Contracts:** The District has assured itself of an allocation of low-cost Tier-1 power from BPA through 2028 up to a “critical water” contract high-water mark (CHWM). While the original CHWM was set at 204,642 average megawatts (aMW), the District’s current allocation has been adjusted down to approximately 198 aMW (rate-period high-water mark) due to BPA’s assessment of the current energy production capability of the Federal Columbia River Power System (FCRPS). The District’s annual wholesale power purchases currently can exceed our BPA contract amount in a critical water year by as much as 10 aMW depending on weather. However, the District’s Frederickson contract for 50 megawatts together with 6.3 average megawatts of other hydro and wind generation along with water years that typically outperform the critical water baseline has created a “long” energy position for the District. While the District is “long” on energy, we are regularly short on capacity during summer months and can be short capacity in the winter during extreme cold weather events. The District continues to rely on market purchases to cover capacity deficits but is beginning to be concerned about the emerging regional capacity deficits caused by coal-fired power plant retirements and the reluctance to build new natural-gas plants caused by looming carbon legislation and the promotion of renewable generation. In spite of the District’s "long" position, the Energy Independence Act requires the District to procure additional energy or renewable energy credits to meet the 15% renewable energy mandate for 2020.

**Rising BPA Wholesale Power Costs:** BPA rates for their next rate period (FY 2020–2021) are projected to increase by an average of 5.4% for wholesale power and 10% for transmission. Among other things, rate increases are being driven by hydroelectric system capital as well as operations and maintenance expenses which are expected to continue into the future. While costs vary from year to year, fish and wildlife program expenses are also putting pressure on rates. In recent years, fish and wildlife costs have ranged from twenty-five to thirty percent of total cost for BPA power. BPA is also experiencing significant reductions in secondary sales revenue due to the continued decline of wholesale electricity prices precipitated by historically low natural gas prices and the continued build out of wind and solar generation projects.

**Energy Efficiency Requirements:** The Energy Independence Act (EIA) requires utilities with greater than 25,000 customers to implement all cost-effective conservation. Energy efficiency has many long-term benefits for the District in that it helps avoid the purchase of higher-cost resources. It also helps lower monthly bills for those customers who invest in conservation. In the short term, the District's investments in conservation have led to increased revenue requirements and higher retail rates. In the longer term, the District's customers should benefit from investments in conservation due to the avoidance of future power purchases. Distribution system efficiency improvement projects have now emerged as approved conservation measures that can be claimed toward EIA targets. Conservation voltage reduction (CVR) whereby distribution system voltages are optimized using automated control and monitoring equipment to reduce energy consumption is a measure that is emerging as a candidate for implementation by many utilities. CVR represents a continuing trend toward the use of technology...
based solutions as the means for meeting continually increasing efficiency goals.

**Renewable Energy Requirements:** The EIA requires utilities with customers greater than 25,000 to comply with renewable energy requirements. Achieving compliance with the 2016 target of 9% through purchases of renewable energy credits has resulted in a projected incremental net cost of just over $3 million annually with additional expenses in 2020 when the 15% renewable energy requirement begins. This increase in spending levels would not be required except for the EIA. Since the initiative was passed in 2006, many of the assumptions pertaining to the calculation of the targets have changed. For example, the EIA assumed a 1.4% average annual growth rate in utility loads. Due to investments in energy efficiency and other factors, load growth estimates have been revised downward to fractional percentages.

**Political & Regulatory**

**Hydroelectric Power:** Some environmental interests continue to promote the removal of the lower Snake River dams. Hydropower comprises nearly 77% of the District's power supply. Electricity provided by the dams is low-cost, carbon-free energy that fuels the economy of the Northwest. In addition to providing energy, these dams are critical to irrigation, navigation, transportation, and are essential in providing balancing reserves for variable renewable energy. According to PNUCC, in 2007, the Northwest Power and Conservation Council estimated that the removal of the lower Snake River dams would increase CO2 emissions by around four million metric tons power year. The Lower Snake River dams generate around 1,000 megawatts of average energy per year. This roughly translates to 4,000 metric tons of CO2 per 1 MWa lost.

In May 2016, Judge Simon ruled the Biological Opinion (BiOp) was not adequate and called for the agencies to give serious consideration to breaching, bypassing or removing one or more of the dams on the Lower Snake River. His ruling failed to acknowledge that the BiOp is the most science-based, comprehensive and expensive effort to restore endangered species and ignored the tremendous salmon returns. This has generated much debate in the news on the pros and cons of dam removal and fish mitigation adequacy which our customers pay for through rates. It has also heightened congressional concern. The Northwest House congressional delegation sent a letter to the federal action agencies asking a series of questions related to Judge Simon’s recent decision. In addition, Representatives McMorris-Rodgers, Newhouse, and three others introduced H.R. 3144 that requires federal agencies to follow the current Columbia Snake River management plan through 2022 or until the court-ordered comprehensive NEPA process concludes, a new BiOp is in place, and judicial review is complete. H.R. 3144 passed through the House.

**Investment in Fish & Wildlife:** Since 1978, BPA customers have invested nearly $16.0 billion in Endangered Species Act and other statutory fish and wildlife obligations. The Public Power Council (PPC) estimates 25 - 30% of the power cost charged by BPA is attributable to fish and wildlife measures. According to PPC and BPA, fish populations are trending upward. There are more salmon and steelhead returning to the Columbia River Basin now than at any time since the first federal dams were constructed in 1938. In 2014, over 2.5 million salmon and steelhead passed Bonneville Dam, setting a new record. Snake River fall Chinook have made a tremendous recovery. In 1990, only 78 adult fish returned to the Snake River; almost 76,000 returned in 2013. Dams are not the single detriment to the salmon runs. Poor ocean conditions have adversely affected the return of many salmon and steelhead stocks and hatchery practices, habitat and harvest have to be considered. Snake River dams are getting blamed for the decline of Orcas in the Puget Sound area which has become a hot topic in the news. Countering the misinformation about the Snake River dams and the overall hydrosystem is an ongoing challenge.
**Columbia River Treaty:** 2014 was a milestone year in the treaty between the United States and Canada. Beginning in 2014, with notice of 10 years, the United States or Canada may terminate the Columbia River Treaty. BPA and the U.S. Army Corps of Engineers, who together form the U.S. Entity, have submitted a recommendation to the Department of State that calls for a modernization of the Treaty and rebalancing of the Canadian Entitlement. An Interagency Policy Committee has been formed by the White House to determine the next course of action. A successful renegotiation of the Canadian Entitlement could result in lower District retail rates between 1.7% and 2.4% beginning in 2026; however, significant uncertainty remains as to how this will be resolved. Led by the U.S. Department of State, the United States and Canada began negotiation to modernize the Treaty regime in May 2018.

**Carbon Initiatives:** On April 29, 2014, Governor Inslee signed Executive Order 14-04 that calls for carbon pollution reduction within the state. The Governor’s carbon reduction bill did not pass through Legislation, but carbon reduction remained a key topic and a variety of bills are introduced each legislative session. The bills generate a lot of discussion and what has become clear to most legislators is there is no simple answer.

In addition, Initiative 732, proposing a carbon reduction related tax, was on the November 2016 ballot and did not pass. Initiative 1631, proposing a “pollution fee”, was on the November 2018 ballot. Both Initiatives raised awareness and interest. It is expected there will be future initiatives and bills related to carbon reduction.

As the EIA approaches the 15% renewable resource requirement in 2020, there is a growing push in the legislature to update the EIA post 2020 or sooner. While some minor changes in the EIA could help utilities, an increase in the RPS would be costly for the utilities, threaten electric system reliability and may not reduce carbon to desired levels. As Oregon and California move forward to meet higher RPS standards, there are repercussions to Washington utilities. The proposed increases in renewable resource requirements coupled with the various carbon reduction proposals would have a compounding impact.

**Reliability Regulations:** Increased regulatory standards have been placed on utilities to ensure the integrity of the bulk power system. Compliance requirements are increasing the complexity and frequency of interactions between BPA and District operations and engineering personnel.

**Customer & Community**

**Reliability:** The single most important factor in customer service remains system reliability. As more sophisticated electronics are used in customer processes, power quality and reliability continue to rise in importance. Systematic and timely replacement of aging infrastructure is key to maintaining the District’s standard of reliability. Online outage management enhancements for customers are becoming increasingly expected in the modern utility grid.

**Customer Engagement:** Emphasis continues to be placed on the need for utilities to understand evolving customer expectations, and to act on those changes. In May of 2017, the APPA launched their initiative “The Future by Design” which identifies a ten-step plan of action for utilities to prepare for the changing power industry. Among the ten steps are three related to customer engagement – identify customer and community preferences, educate and engage with customers, and develop new customer services. Opportunities exist for the district in each of these areas. New service offerings will be available with the implementation of kiosks and prepay services. Data analytics will be used to improve customer interactions or offer new services. With the implementation of SmartHub, customer
education on the use of its services will continue, along with identifying other opportunities that may be available as a result of the District’s partnership with NISC. The District will also pursue community involvement opportunities to raise awareness of the goal to be the trusted energy partner to our customers.

Customer Demographics: The Smart Grid Consumer Collaborative has urged member utilities to recognize the expanding diversity of their customer base in order to best serve the interests of each customer segment. The District’s Customer Engagement Strategy recognizes the need to segment customers to encourage program participation through targeted messaging and marketing. It is also important to understand the environment created by the local employment market and how it has influenced the diversity of the regional work force and ultimately, the District’s customer base. The region enjoys a broad spectrum of employers, including research and development, health services, governmental entities and agricultural producers. In turn, the District’s customer base consists of a 1) broad spectrum of workers including both relatively high wage, highly technical and stationary workers and 2) mobile, cash paying agricultural workers. This diverse customer base presents both opportunities and challenges in terms of successfully meeting expectations and creating value for all customer segments. Customer surveys and focus groups can help define Benton PUD customers and help the District target communications.

Citizen Engagement: In addition to trends in the utility industry relative to customer engagement, there is an emerging practice within local governments to proactively reach out to their citizens. This trend helps emphasize one of the key aspects of the Public Power Business Model: local control. Benton PUD has placed a priority on transparency and information sharing; however engagement involves more: ".... convening groups of people, giving them the facts, talking over issues respectfully, and implementing the decisions you make together." This next step in customer engagement is a significant opportunity to strengthen the public power model, but also involves more staff time in planning, organizing and participating in constituent sessions.

Local Economy: In an article in the Tri-City Herald (7/25/17), Ajsa Suljic, regional labor economist for Benton and Franklin counties noted the Tri-Cities is now more than four years into a continuous growth streak. Newcomers drive jobs in retail and hospitality, health and education, and construction. Unemployment fell to 4.8% compared to 6.2% the previous year. Suljic noted in a 4/1/18 Tri-City Herald article that the average annual rate of nonfarm job growth for the Tri-Cities region has been 2.1% over the last decade. Tri-City regional growth is almost double that of Washington State’s growth of 1.2% and three times faster than the nation’s growth of 0.6%. The Tri-Cities reached 112,500 nonfarm jobs, even more than the previous high reached when stimulus dollars catapulted Hanford jobs. Job gains are expected to continue in manufacturing, health care, education, transportation and warehousing and professional and business services which include Hanford jobs.

TRIDEC notes the Tri-Cities economy continues to out-perform its neighbors and is the brighter spot in Washington State and across the nation. Since 2000, no other community in Washington has grown faster than the Tri-Cities. Current population estimates are now 283,800, an increase of 11% since 2010.

While there are positive economic trends in the community, our customers are diverse. The US Census shows 14.2% of Benton County’s population is below poverty level. There is a population of low income families who experience difficulty paying their electric bills. While many are eligible for discount programs and energy assistance funds, these customers still struggle. Many have had limited access to energy efficiency programs that might reduce their heating and cooling costs. The District recognizes
the challenges facing these customers and will consider programs and services that will make electric service more affordable.

**External Factors Affecting Rates:** While the District has completed a comprehensive retail rate design; efforts to develop rate structures that address the dynamic environment facing today’s utilities will continue. The District will continue to evaluate the rate impact of rising BPA costs, low wholesale market prices, conservation initiatives, technologies, changing customer perceptions, distributed generation and demand response.

**Fixed Cost Recovery:** Distributed generation continues to highlight challenges with fair and equitable recovery of fixed and variable costs for all customers and will potentially require additional retail rate design changes. Across the industry, it is common that half or more of the utilities costs are fixed, while retail rate design continues to overwhelmingly recover the majority of revenues through variable charges. Utilities across the country are continuing to increase base charges to address this issue. In the Northwest, the median base charge amongst comparable utilities has risen nearly $4 in the past three years to almost $20. Utilities are also beginning study and understand demand charges for residential customers as another way to align revenue collection with costs.

**Renewable Rate Schedules:** There is an increasing trend across the nation for individuals and organizations to express social responsibility by choosing green electric rate options. Facebook, Microsoft, Walmart and Google, just to name a few, have publicly expressed desire to use green power options to power their operations. There is an increasing trend for utilities to offer green rate options to meet the needs of their customers.

**New Large Load Rate Schedules:** Companies looking to expand or build new large facilities seek utilities that not only offer competitive rates, but that are also able to provide up-front how rates would be structured. These companies also may seek to attain environmental sustainability goals by seeking green power options. As an example, a large Mid-West publicly owned utility has published a rate schedule for large loads that allows the customer to buy enough green energy (wind) to offset the total power consumed, but since wind is intermittent, the utility sells power to the customer around the clock at wholesale market prices along with a demand charge to firm the green energy.

**Electricity Intensive Load (EIL) – Safety and Reliability:** The emergence of cryptocurrency mining and block chain operations has created new challenges for utilities. These technologies are still maturing and therefore are somewhat speculative, raising questions about business viability in the long term. Even so, cryptocurrency miners and block chain operators are locating throughout Washington state, attracted by low electric rates. They are bringing unique business operations that lack the load diversity of more typical residential and commercial customers. Utilities are being very cautious when serving these types of customers for several reasons: 1) Wanting to ensure distribution systems are sized properly to handle the load and not overheat, causing a safety issue; 2). Ensuring the added load does not cause reliability issues for customers served from common facilities; 3). Avoiding stranded investments in distribution system improvements to serve the additional load required by the customers; 4). Mitigating risk of financial loss if there are unpaid power bills. Several utilities in Washington have imposed moratoriums on crypto currency and block chain applications to allow staff time to monitor distribution system impacts, power supply impacts, and rate implications.

The District recognizes these concerns and also recognizes the benefits of the additional retail load these customers bring. The District has developed an Electricity Intensive Load (EIL) policy to establish requirements for EIL customers. This policy mitigates the risks associated with EIL customers while
allowing for a greater customer base to cover the District’s fixed costs and providing reliable service to all. The policy requires the customer provide advance notification to staff before starting service so that a distribution system analysis can be performed. Customers who fail to provide this notification and cause equipment damage are liable for costs associated with the repair. Customers are also given two billing options with deposit requirements that protect the District financially. While a policy has been implemented, ongoing monitoring by staff will be required as the industry matures, as block chain technology becomes more mainstream, and as the number of EIL customers submitting service requests - and being served by the District - increases.

Technology

Advanced Meters – Perceptions and Expectations: Nationally, advanced meters have raised some public concerns over privacy issues, possible health effects and electrical safety. The District believes our Sensus AMI system is safe and secure. According to the Federal Communications Commission (FCC) standards and guidelines for exposure to radio frequency electromagnetic fields, advanced meters do not pose a health risk. Other local utilities have indicated an interest in possible AMI implementations which may increase the awareness of advanced meters in our service territory. The District's "meter-to-cash functionality" of our AMI system is stable and providing the basic value used to justify our initial investment.

Smart Grid and Customer Data Privacy: With the implementation of advanced metering infrastructures (AMI), utilities now capture customer usage data at a granular level. Rightly or wrongly, some customers may be uncomfortable with utilities or any other third parties possessing such granular usage information, out of concern that it could be used inappropriately. This discomfort could lead to customer resistance of AMI systems and could potentially erode the trust customers have in their utilities. Further, customer awareness of the privacy of their data is growing, especially in light of the number of data security breaches that often occur in other industries. The District will continue to monitor data security best practices and will implement policy and technical changes as needed to strengthen data security and to proactively address potential customer concerns.

Smart Grid: The drive toward a smarter grid has become a goal for many utilities across the nation. Advanced Metering Infrastructure (AMI), Geographical Information System (GIS) and Outage Management System (OMS) deployments at Benton PUD represent a significant initial step toward a smarter grid. The District invested in a Supervisory Control and Data Acquisition (SCADA) system many years ago to provide substation automation functionality and grid level metering in near real time. Advancing the smart grid requires SCADA penetration on distribution system lines and equipment as well as the convergence and integration of SCADA with AMI, GIS, OMS and other systems. Customers expect high levels of power quality and that power be available continuously. If there is an outage, customers expect to be communicated with in a way that works for them and that the power is restored quickly. Further deployment of smart grid technology on our distribution system is expected to deliver benefits in the areas of customer service, asset optimization, load/resource management, and loss minimization.

Broadband Services: High-speed broadband is no longer a luxury. It's a necessity – for businesses looking to expand and create jobs and communities looking for access to better health care and education. The interconnection of the District’s broadband network with NoaNet’s regional network provides our community with access to the fastest and arguably one of the most reliable fiber-optic networks in the state. Commoditization of services continues along with increased competition resulting from mergers/acquisitions and strategic partnerships.
Cyber Security: Cyber security is a fundamental reliability factor for utilities of all sizes. Recent cyber incidents show a trend toward more advanced, more pervasive, and more damaging cyber-attacks on critical infrastructure and are often being conducted by well-organized and even state-sponsored groups. This threat can be expected to grow, thereby creating a greater challenge for utilities in the future.

Business Continuity - Disaster Recovery: Day-to-day reliance on technology requires sophisticated planning to ensure a prompt recovery from business interruption events. The District is pursuing robust capabilities to recover critical information systems in the event of a disaster or significant incident that affects business operations. There is an ongoing effort to create an Information Technology Disaster Recovery Plan that will meet the objectives specified in the Business Continuity Plan. Many of these factors are tracked and prioritized with the District’s Enterprise Risk Management program.

District Internal Environment

Financial Condition: The District’s financial condition has been and continues to be solid. The District had gone over 3½ years without a rate action prior to 2015, absorbing an effective 5.2% increase in BPA power and transmission rates for the FY 2014-2015 rate period. BPA implemented a 6.7% increase in power and 5.2% increase in transmission effective for the FY 2016-2017 rate period, followed by a 5.4% increase in power and a slight reduction in transmission effective for the FY 2018-2019 rate period. As a result of continued increases in power costs, the District adopted an overall average 3.9% rate increase effective September 1, 2015 followed by an overall average 4.9% rate increase effective September 1, 2016, and an overall average 1.9% rate increase effective October 1, 2017. There will be no rate increase in 2018 with the next projected rate increase to be May 2019. Even with these increases, retail rates continue to be highly competitive, with the District in the bottom third of average monthly bills when compared to benchmark utilities. Liquidity, coverage, and debt ratios exceed targeted performance providing stability for the near future, however current projections are showing the need for possible rate action in 2019. Prior to any recommendation for a rate action, 2018 actual results and updated 2019 net power cost projections will be evaluated. The District continues to review policies to determine appropriate targeted performance. To meet current and future capital needs and achieve fair apportionment of costs over time, the District issued $15M in new bonds in 2016. As a result of continued strong performance and conservative planning, the District had its Aa3 rating affirmed by Moody’s and its A+ rating affirmed by S&P and Fitch during the bond issue. Fitch affirmed the District’s A+ rating in the summer of 2018 as part of their regular review cycle.

Public Records & Document Management: Open Government and transparency of District’s records, including electronic, is raising expectations of customers and third parties for access to public information and records as well as the expectation of customer privacy due to heightened awareness of identity theft. A number of issues have been identified relating to records transparency, particularly due to the rapid growth of electronic records:

a) Organizing records that are essential to the day-to-day business and what records are essential in the face of a disaster and recovery processes.

b) The need for efficient and accurate responses to public records requests.

c) Providing quick and easy access to a customer’s own information.

d) Maintaining and protecting customer privacy.

The impacts of changes and requirements of public records and electronic records in particular require policy and practice changes by public agencies throughout the state. New legislation effective in July 2017 amended the Public Records Act in the areas of agency response requirements, electronic records production, training requirements and fee allowances. The District continues to be involved in
organizations that train and collaborate on best practices and requirements of the Public Records Act, and policies are being modified and new ones written as they are identified.

**Enterprise System Optimization:** The District conducts technology planning in order to evaluate applications and technologies that support strategic operating objectives. This process has led to making significant investments in integrated enterprise systems that enhance service delivery in the areas of: customer engagement, workforce mobility, engineering workflows, distribution system automation, data analytics, and advanced metering. With the identified core systems implemented and integrated, the District must focus on optimizing these investments. This will be achieved by implementing additional services and features over time as they become available. Further optimization will occur by creating value through employee, business process, and customer service efficiencies. To ensure future challenges and opportunities are met; the District proactively leverages relationships with its strategic partners - NISC, Sensus, and Survalent.

**Culture:** Societal, technological, environmental, political, and economic changes are rapidly transforming the workplace. As a result, leadership must continue to find new ways to promote the District’s culture and values for long-term sustainability. The key to long-term success is a culture which is aligned with the District’s strategic plan and fosters adaptability to the changes facing the utility industry while maintaining exceptional customer service. In the face of the utility industry’s transformation, the District must create a workplace culture that demonstrates trust and collaboration and supports employee engagement, recognition, social responsibility, well-being, and transparency of information.

**Workforce Demographics, Development and Planning:** With new generations entering the workforce and increased competition for talent, the District must continue to implement new strategies to attract, engage, and retain the best talent. With the changing utility model, the District is in a favorable strategic position to be able to provide increased opportunities for meaningful and challenging work. In order to continue to be a leader in the utility industry, we need to leverage workforce data analytics to help insure we have the right roles, skills, and number of employees to carry out our new strategic initiatives. District leadership must continue to be open to new ideas and creative thinking allowing for work to be done in new ways or using new technology. As employees move toward retirement, the District will need to prepare the next generation of leaders who will succeed them. It is essential for the District to preserve the critical knowledge of more experienced or skilled employees and continue to increase the skill level of less experienced employees. The District must also look for ways to incentivize potential leaders into taking leadership roles. Thirty-five percent (35%) of our workforce will be eligible to retire within the next ten (10) years. As a result of these retirements and pending retirements, the District must continue to identify options for organizational restructuring, and develop change management strategies, and ensure leadership is developed to meet existing and future challenges.

**Healthcare Costs/Emerging Healthcare Strategies:** Under the Affordable Care Act (ACA) employers will be subject to a 40% excise tax on the value of health insurance benefits above a certain threshold beginning in 2022. However under a new presidential administration, the fate of the ACA remains unclear. Regardless, the District must continue to develop benefit strategies which contain rising healthcare costs such as plan design changes, promoting employee wellness, health coaching, work-life programs, educating employee on high deductible plans and healthcare consumerism. In addition, the District must explore emerging healthcare strategies as a way to lower costs for the employee and employer while improving healthcare benefits for our employees and their families.
SAFETY

Public and Employee Safety: Providing electrical power to consumers is by its nature hazardous work to the public and our employees if not done correctly. Given this fact, safety is a top priority for the District. The District’s culture promotes an uncompromising commitment to safety for the public and our employees, and it is considered a shared responsibility that each of us must take personal responsibility for and live it every day. Some of the tools we use to reduce work hazards are timely and appropriate training, a management and employee safety committee, an active on-site inspection program, proper mechanical guards, and personal protective equipment. The electric utility industry is facing increased regulations for electric power transmission and distribution work. Regulations for lockout/tagout, electrical safety work practices, and personal protective equipment have been in place for many years. A new ruling includes provisions for training, job briefings, fall protection, insulation and working position of employees working on or near energized parts, minimum approach distances, protection from electric arcs, de-energizing transmission and distribution lines and equipment, protective grounding, operating mechanical equipment near overhead power lines, working in vaults, and electrical protective equipment. These factors are all considered in an environment where electricity is viewed by many as a guaranteed product and this view continues to grow.
CUSTOMER VALUE – ACTIONS

**Trusted Energy Partner**
1. Enable additional customer payment options including kiosks and prepay services.
2. Promote SmartHub capabilities to increase customer utilization of key features including payment options, usage information, email and text alerts, and outage notifications.
3. Leverage the District’s investment in the Outage Management System, along with mobile workforce solutions to proactively connect with customers through the channel of their choice, i.e. phone calls, text messages, about outage events, power restoral, and updates.
4. Utilize data analytics to provide enhanced usage information to key account customers.
5. Develop informational programs to educate and support our customers on rooftop solar and electric vehicle charging stations investments, installations and incentives
6. Evaluate possible expansion of the District’s community solar program to include:
   a. Opportunities for businesses to meet corporate sustainability goals
   b. Businesses and individual participation in low income assistance programs
7. Participate in the Electric Vehicle Infrastructure Transportation Alliance to install electric vehicle DC fast charging stations included in the WSDOT grant program. Consider other grant programs.
8. Consistent with recommendations from the American Public Power Association, establish real connections with our communities by finding ways to engage in community-support activities.

**Maintain Competitive and Affordable Rates**
9. Promote load preservation and growth opportunities to mitigate the impacts of low secondary market prices including, but not limited to:
   a. New large load substation readiness
   b. New large load marketing efforts through TRIDEC
   c. Programs that support the development of electric vehicle loads

**Preserve Federal Power System Benefits**
10. Maintain the District’s leadership profile in public power organizations to monitor and influence issues that have a significant impact on District customers including, but not limited to:
    a. BPA budgets and rates
    b. Energy imbalance markets and CAISO expansion
    c. Value of hydropower
    d. Renewable portfolio standards & carbon emissions
    e. Columbia River Treaty

**Advocate for Low Income Customers**
11. Develop a dashboard that monitors the effectiveness and benefits of low income programs.
12. Develop new ways to share information about the District’s low income programs and create outreach opportunities for eligible customers:
    a. Host a low income program workshop for community and social services partners
    b. Coordinate with local entities to provide on-site application processing at social service agencies in the community, such as VFW, Kennewick Senior Center, etc.
13. Collaborate with affordable housing organizations to interact, educate and learn. Develop an understanding of how utility bills are viewed in the affordable housing process and evaluate potential new low income programs or changes to existing programs to better serve this group of low income customers. Share information about the District’s existing low income programs to promote enrollment. NEW for 2019

**World-class Broadband System**
14. In partnership with NoaNet, develop a proactive plan and strategy to respond to requests by telecommunication companies relative to the deployment of advanced wireless technology.
15. Develop cooperative agreements with the City of Kennewick for the deployment of advanced wireless infrastructure for facilities located in City Right-of-Way.

**RELIABILITY & RESILIENCY – ACTIONS**

**Advanced Metering Infrastructure**
1. Maximize the value of the District’s advanced metering infrastructure (AMI) system to include:
   a. Meter alerts and customer facing outage notifications and mapping
   b. Firmware updates to allow functional enhancements and encryption
   c. Evaluating the use of Sensus’ hosted AMI platform

**Substations**
2. Identify systematic upgrades and replacements for aging substation apparatus and equipment.
3. Review and update the Reata Substation winter contingency plan. Completed in 2018
4. Continue to partner with the City of Richland to complete design, procurement and construction activities necessary to energize the Leslie Road substation by the end of 2018. Completed in 2018
5. Complete design, procurement and construction activities necessary to upgrade the Benton City substation in 2019.
6. Continue to work with BPA to complete studies and agreements necessary to facilitate construction of the Southridge substation in 2020.
7. Complete analysis and substation equipment installations necessary to mitigate low voltage conditions associated with a BPA Horse Heaven 115-kV point-of-delivery outage during peak summer loading. NEW for 2019

**Transmission**
8. Preliminary planning and design for Edison Street substation transmission line.
10. Begin permitting and design of the Spaw to Phillips transmission line in 2019. (Deferred to 2020)
11. Work with BPA to complete studies and agreements necessary to facilitate future construction of a new 115 kV point-of-delivery at McNary substation.

**Distribution System**
12. Implement remote communications options and control upgrades to integrate feeder line devices into the District’s Supervisory Control and Data Acquisition (SCADA) system.
13. Promote the District’s involvement in the American Public Power Association’s Reliable Public Power Provider (RP3) program. Completed in 2018
14. Evaluate Distribution System operational impacts in areas where high penetration levels of customer solar generation has occurred. Develop monitoring tools and reports to provide day-to-day operational visibility of customer generation.
15. Continue technology surveillance related to the costs and benefits of energy storage.
16. Perform research and analysis necessary to determine the demand response potential within large customer rate classes as a contributor to maintaining load and resource balance. NEW for 2019

**Power Supply Markets**
17. Actively participate with other members of the Public Generating Pool to communicate the results of the Pacific Northwest resource adequacy study to key constituencies.

**Resiliency**
18. Prepare training materials and conduct an emergency response drill as outlined in the District’s Emergency Restoration Plan.
19. Participate in disaster response planning with Benton County Emergency Services relative to a
Cascadia earthquake in order to evaluate the direct and indirect impacts on the District’s electric system operations.


21. Evaluate critical construction components and supplies relative to the District’s historical inventory levels.

22. Evaluate drone technology and FCC licensing requirements.

23. Electricity Intensive Load (EIL)  NEW for 2019
   a. Monitor industry activities related to crypto currency mining and block chain operations, developing recommendations as needed to modify policies.
   b. Proactively evaluate impacts of EIL customers on power supply portfolio.
   c. Proactively evaluate impacts of EIL customers on the District’s transmission and distribution system, updating the line extension policy as needed.
   d. Evaluate distribution system impacts related to new EIL customers, ensure upgrades are made as needed, and monitor existing EIL loads to ensure ongoing system safety and reliability.
   e. Work with new EIL customers on selecting billing options; monitor existing customers on a monthly basis to ensure payments are being made, and ensure security deposits are adequate based on loads.
   f. Utilize technology to perform proactive distribution system monitoring to identify locations of potential EIL customers who have not declared their operations.
STEWARDSHIP – ACTIONS

Ensure long-term financial stability
1. Explore emerging healthcare strategies to help contain costs for the District and its employees while preserving the integrity of our benefit plans.
2. Participate in the Joint Utility Procurement Team facilitated by Energy Northwest to identify opportunities for cost savings.

Sustainable low-carbon power supply
3. Implement an initial voltage optimization project as a qualifying conservation measure at Kennewick Substation.

Manage Enterprise-Wide Risks
4. Conduct third-party cyber security assessment and evaluate the District’s security posture against the Department of Energy’s Cybersecurity Capability Maturity Model. Completed in 2018
5. Evaluate and implement the security assessment recommendations as part of the overall cybersecurity strategy. NEW for 2019
6. Update the Strategic Technology Plan:
   a) Define the strategic vision of business-driven opportunities for customer engagement and operational technology improvements over the next five years.
   b) Develop a Master Data Management Plan to define the processes, governance, policies, standards and tools that will manage critical data as part of a data analytics strategy.

Rate Design
7. Develop and implement plans to establish cost of service tolerance bands within which customer class rates should be adjusted to over time. Completed in 2018
8. Ensure adequate fixed-cost recovery through appropriate increases to the customer daily system charge; increases should benchmark to the median base charge of comparable northwest utilities.
9. Monitor industry developments related to the use of residential demand charges.
10. Implement commercial green retail rates for customers to achieve corporate sustainability goals.
11. Evaluate options for a new large load policy providing flexibility to the District to maximize retail revenues that would benefit all customers.

Advocate for Our Customers on Legislative & Regulatory Issues
12. Pursue legislation that would explicitly enable public utility districts to provide incentive programs for customers’ electric vehicle charging infrastructure.
13. Educate, inform and influence the state and federal representatives on issues that impact Benton PUD’s customers including:
   a. Modifications to the Energy Independence Act
   b. Carbon initiatives
   c. Distributed generation
   d. Telecommunications
   e. Electric vehicle charging infrastructure
   f. Value of hydroelectric power/salmon recovery efforts
   g. Low income assistance programs

Citizen Engagement
14. Increase citizen engagement in Kennewick and Prosser through a multi-channel approach that include school education programs, “Plug into Your Future” strategic education meetings, website videos, social media, speaker’s bureau, customer focus groups, community engagement, and “special topic” stakeholder panels.
SAFETY – ACTIONS

**Employee Safety**
1. Evaluate the results of the safety culture survey and develop actions to address recommended improvements. **Completed in 2018**
2. Restructure the employee safety incentive program to include leading indicators of safe behaviors. **Completed in 2018**
3. Engage the safety committee members in the review of accident/incident trends to identify areas of risk and deliver targeted training programs to address those risks. **Completed in 2018**
4. Leverage data analytics to assist safety committees in developing performance evaluation and metric analysis. **Completed in 2018**
5. Expand the new hire safety orientation program and include Central Safety Committee members in this process. **Completed in 2018**

**Public Safety**
6. Leverage technology and root-cause analysis processes to improve the District’s capabilities of identifying electrical system failure modes for which corrective actions can be implemented.
7. Correct safety code compliance and construction standard deficiencies related to the joint-use of District poles.
8. Develop recommendations and implement improvements to the District’s standards, practices and procedures relating to management of right-of-way encroachments.
9. Partner with other utilities on customer outreach and communications related to public safety.
SKILLED WORKFORCE – ACTIONS

**Leadership & Development**
1. Identify practical core leadership skills and create a training and development program.
2. Enhance e-learning opportunities for employees to continuously learn on their own time, at their own pace.
3. Develop programs that promote an “informed workforce” that will provide short, periodic updates to managers and supervisors via video related to strategic and other emerging issues.

**Recruitment & Retention**
4. Develop new approaches to recruitment by using branding and social media in order to attract and retain diverse and talented employees.
5. Explore new benefit offerings for employees to improve employee retention.

**Employee Engagement**
6. Continue communication and collaboration with IBEW in order to maintain positive employee/employer relationships.
7. Execute employee and manager human resources self-service which enhances employee engagement and provides access to information.
8. Leverage workforce data analytics to help make workforce decisions (trends, benchmarking, staffing needs, talent acquisition and development, retention, wellness initiatives, compensation and benefits).
9. Develop videos made by each department that inform employees on important aspects of the departments’ role in the District as well as other key issues.