

Planning,  
Working,  
Investing  
*for a better tomorrow.*



2017 Annual Report



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KUB Board of Commissioners:

- Celeste Herbert  
Chair
- John Worden  
Vice Chair
- Jerry W. Askew
- Kathy Hamilton
- Sara Hedstrom Pinnell
- Tyvi Small
- Nikitia Thompson

Management

- Mintha Roach  
President and  
Chief Executive Officer
- Mark Walker  
Senior Vice President and  
Chief Financial Officer
- Susan Edwards  
Senior Vice President and  
Chief Administrative Officer
- Gabriel Bolas  
Senior Vice President and Chief Engineer
- Eddie Black  
Senior Vice President
- Derwin Hagood  
Senior Vice President

Vice Presidents

- Mike Bolin
- Julie Childers
- John Gresham
- Dawn Mosteit
- Paul Randolph
- Dennis Upton





Mintha Roach  
KUB President and CEO

There are a lot of “moving parts” that must work together for KUB to deliver utility services to our more than 453,000 customers. We keep the parts in sync through our proactive Century II infrastructure management plan.

Century II helps us meet customers’ needs for safe, reliable utility service today and plan for future needs. To do that, we must balance our systems’ needs with our customers’ ability to pay.

Our strategy includes ongoing cost management and steady investments in system replacement plans. Thanks to KUB’s Board of Commissioners, which again endorsed a 10-year funding plan for Century II and a three-year rate increase schedule for all systems, we are making meaningful progress replacing aging infrastructure.

Many utilities nationwide, however, are still struggling, as reported in The American Society of Civil Engineers 2017 Report Card, which gave U.S. infrastructure a D+. We are pleased to note that the Report Card’s key solutions for

- improvements mirror our ongoing Century II program philosophy:
- Increased investment.
  - Leadership and long-term planning.
  - New approaches and technologies.

KUB is taking a step forward with new technology through the Century II Grid Modernization Program. The four-year program started in summer 2016, and it will replace more than 400,000 aging electric, water, and natural gas meters systemwide. The new technology will benefit customers by providing quicker service restoration through automatic outage notification and KUB’s improved ability to perform more functions remotely. Customers will also have better access to utility usage information to help them find ways to conserve energy and water to reduce bills. Replacements are ahead of schedule, and customer feedback is positive.

You’ll see more inside about our infrastructure replacement efforts and technologies that help KUB and our customers. You’ll also see employees’ efforts to support education, our environment, and other initiatives that will benefit our community today and into the future.

*Mintha Roach*



Sound, Balanced Financial Philosophy

KUB’s 10-year plan continues our proactive financial strategy to manage costs, support customer growth, use debt responsibly, and adopt modest rate increases. Our systems have sound financial plans and strong, high-quality credit ratings on outstanding bonds, which helps keep our borrowing costs lower. Following a Water Division upgrade from Moody’s in fiscal year 2017 (FY17), our ratings are the highest ever in KUB history. Moody’s reported that it based the upgrade on “the well-managed operations of the water system.” In its most recent rating report, Standard & Poor’s noted, “based on our financial management assessment, we view KUB to be a ‘1’ on a scale of 1–6, with ‘1’ being the strongest.”



KUB’s Financial Strategy

- Manage costs
- Support customer growth
- Use debt responsibly
- Adopt modest rate increases

Bond Ratings Highest in KUB History		
	Standard & Poor’s	Moody’s
Electric	AA+	Aa2
Natural Gas	AA	Aa2
Water	AAA	Aa1
Wastewater	AA+	Aa2



FY17 was a great year for KUB, with an excellent performance record in all four systems. The most recent customer survey yielded KUB’s highest-ever customer satisfaction rating. And our employees’ workplace satisfaction is reflected in KUB’s recognition as one of Knoxville’s Top Workplaces by the Knoxville News Sentinel in 2017.

Century II is paying off in terms of stronger systems—we had historically high electric reliability in 2016, for example, with a 32 percent improvement since 2006. To maintain a strong electric system and achieve high reliability, we have plans in place under Century II that focus on everything from ongoing maintenance, to vegetation management, to rehabilitation and replacement of electric assets.

The Electric System’s strong performance shows that the whole system can be strong only if all the parts are strong and working smoothly together. The same is true for our other systems, too, which also performed well in FY17:

- The Tennessee Department of Environment and Conservation awarded us a perfect score on a water system survey.
- KUB had zero violations at each of our four wastewater treatment plants.
- KUB had zero violations in a Tennessee Public Utility Commission natural gas system inspection.

We are receiving positive feedback from regulators, utility organizations, and—most important—our customers.

KUB employees remain committed to good stewardship of our community’s utility assets. They focus on day-to-day management and on planning and investing for the long term. That will help us continue to meet the needs of our current and future customers.



Top Public Power Provider



Zero violations in natural gas system inspection



Zero violations at all four wastewater plants



Perfect score on TDEC’s water system sanitary survey



Highest-ever customer satisfaction rating



Recognized as one of Knoxville’s Top Workplaces



# Electric Reliability Remains Strong



Customers today enjoy the highest electric service reliability in KUB history. KUB has significantly improved reliability in the past 10 years through a combination of ongoing maintenance programs, including regular tree pruning, and increased investment in our Century II long-term infrastructure management program.

For example, KUB replaced 2 percent of electric poles in FY17 to stay on track with renewing this important asset. We completed a 10-year cycle to inspect distribution and transmission poles and immediately started another cycle to ensure poles inspected 10 years ago are still sound.

KUB also continued Century II efforts to modernize substations in FY17. At the Lonsdale Substation, we began work to replace the oldest transformers on our system, which dated from 1942. We also upgraded

existing infrastructure and added capacity at our Arlington Substation, which is one of our oldest substations and a major switching point with ties to three infeed stations.

In the next 10 years, KUB will invest \$741 million to continue replacing aging electric infrastructure and add facilities to improve reliability. KUB will build five new substations and complete modernization of all existing substations. We will also rebuild our transmission lines and add new technology, including automated meters.

Reliability is important to most customers, but it is essential for some. Plastics manufacturer Lifetime Products, for example, cited “cost-effective utilities and dependable service” as the deciding factor to locate in Knoxville. It will bring 500 jobs to our area when it is fully operational in three years.



## Electric System Stats

688 square mile service area



**205,088**  
customers



**5,472,817**  
megawatts total  
purchased power



**\$422 million**  
purchased power cost  
**79%** of sales



**5,343**  
miles of service lines  
**63** substations



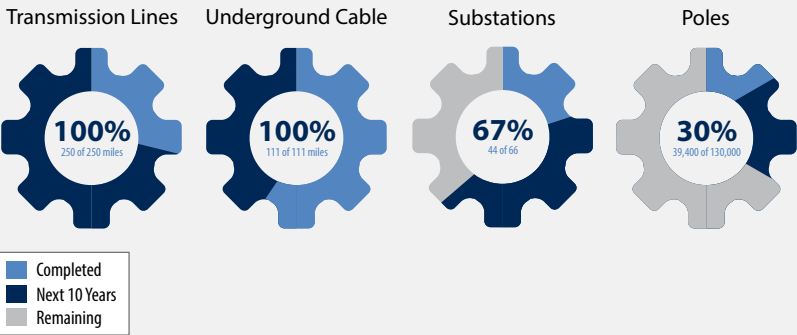
**1,328,313**  
kilowatts (kWh)\*  
Peak Day (2-20-15)  
**3,009,600** kVA  
Peak Capacity



**12,000 kWh**  
annual use by typical  
residential customer  
**\$106.90/month**  
**\$3.51\*\*/day**

\*A kilowatt-hour (kWh) is the amount of electricity required to burn a 100-watt light bulb for 10 hours.  
\*\*Based on monthly rates 7-1-16 to 6-30-17.

## Electric System Renewal





# Proactive Maintenance Helps Ensure Natural Gas Safety and Reliability



KUB's natural gas system is safe and reliable, and we work every day to keep it that way. In FY17, for example, KUB hired a specialized contractor to complete a leak survey of our high pressure pipelines from a helicopter. In addition to using helicopters—and drones—we inspect for leaks by walking and by driving trucks, Segways, and all-terrain vehicles. Those measures help us exceed regulatory standards for the frequency of leak detection.

Natural gas is highly regulated for safety, and Century II supports all regulatory requirements through programs that cover corrosion control, damage prevention, valve maintenance, and more.

In FY17, KUB continued work on a 35-year program to replace cast iron mains with long-lasting, low-

maintenance polyethylene pipe. We also started the next phase of infrastructure replacement: a 20-year program to replace steel distribution pressure mains with polyethylene pipe. At the conclusion of this program in 2035, KUB's natural gas distribution system mains and services will be made up of high performing, polyethylene pipe.

To improve system reliability and support growth, KUB is investing \$7.7 million for a new gate station and main in South Knoxville. The new station will have modern, automated controls that will help improve operational flexibility and reduce costs.

Under our Century II infrastructure management program, KUB will invest \$243 million over the next 10 years to ensure the system continues to meet customers' needs and help our community grow.



## FAST FACTS:

Rates remain comparable with our peer utilities

Residential natural gas customer charge 40% below national average

1 among 30 utilities in EPA Methane Challenge Program

American Gas Association Safety Award Industry Leader in Accident Prevention

\$0.75 monthly increase for residential customers FY 18–20

## Natural Gas System Stats

284 square mile service area



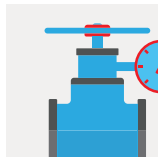
**101,023**  
customers



**10,852,041**  
dekatherms total  
purchased gas



**\$44 million**  
purchased gas cost  
**49%** of sales

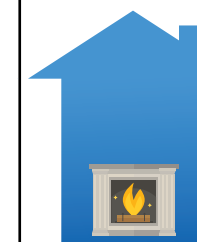


**2,336**  
miles of service mains



**136,356**  
dekatherms (dth)\*  
Peak Day (2-19-15)

**157,381** dth  
Peak Capacity



**603 therms**  
annual use by typical  
residential customer  
**\$56.70\*\*/month**  
**\$1.86/day**

\*A therm will dry six loads of clothes in a gas dryer.

\*\*Based on monthly rates 7-1-16 to 6-30-17.



# Straight From the Tap: Safe, High-Quality Water



Water is a fundamental necessity, and KUB's water plant, which was built in 1926, has a perfect record of supplying safe, reliable water to our customers. To continue that record, KUB continually upgrades the plant with new technology.

In FY17, KUB substantially completed work to transition the plant's treatment process from gaseous chlorine to sodium hypochlorite. The new sodium hypochlorite disinfectant requires much less maintenance and eliminates gaseous chlorine hazards.

In addition to focusing on the water plant, we continued to upgrade our water distribution system in FY17. We replaced 1 percent of our mains, for example. That keeps our system on a sustainable replacement cycle. It also puts us in the American Water Works Association's top quartile for infrastructure investment.

KUB also continues to replace galvanized pipe at a rate of 8 miles per year, and we are on track to replace it completely by 2023. We are replacing cast iron and cement pipe at the rate of 6 miles per year.

KUB will invest \$330 million in the water treatment plant and distribution system over the next 10 years. [See next page for a partial list of major projects.] That includes \$104 million to add a second treatment train at the water plant, to provide redundancy and offer more flexibility for daily operations and maintenance. We will invest \$113 million to replace aging mains and improve water tanks and booster pump stations.

By 2055, we will have replaced 100 percent of the older pipe types in our system. As pipe replaced early in the plan ages to the end of its useful life, we will start another proactive replacement cycle to continue to ensure we meet the needs of our customers and our community.



Four hypochlorite tanks and multiple feed pumps help ensure continuous water treatment even if there is an equipment failure.



## Major Water System Investments in KUB 10-Year Plan

These investments will help KUB continue to provide safe, high-quality drinking water to our customers. The KUB Board's commitment to funding sustainable replacement helped put us in the American Water Works Association's top quartile for infrastructure investment.

- \$102M replaces 129 miles of main
- \$15M replaces main for highway projects
- \$29M improves water treatment plant
- \$104M provides water treatment redundancy
- \$18M upgrades 59,500 water meters
- \$9M supports adding 2,400 water customers
- \$11M improves tanks and booster stations

## Water System Stats

186 square mile service area



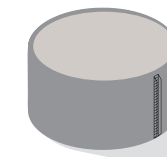
**79,442**  
customers



**12.6 billion**  
gallons total  
treated water



**1,407**  
miles of service mains

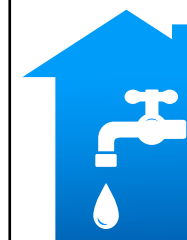


**1** treatment plant  
**24** booster pump stations  
**28** storage facilities

**38.1 million**  
gallons reservoir capacity



**32 million**  
gallons/day average flow



**44,880 gallons\***  
annual use by typical  
residential customer  
**\$23.45\*\*/month**  
**\$0.77/day**

\*KUB bills in Ccf. One Ccf (748 gallons) of water will flush a toilet about 374 times.

\*\*Based on monthly rates 7-1-16 to 6-30-17.





# Wastewater System Operating At Historically Strong Level



In 2016, all our treatment plants had perfect records with zero violations from more than 18,000 total compliance checks. The collection system also continued to see a decline in sewer overflows, which are down 83 percent from 2003. Those accomplishments are proof positive of the substantial progress we have made under Century II to improve our systems and processes.

To keep the system performing well, KUB will invest \$467 million over the next 10 years. That includes \$265 million to continue to maintain a sustainable lifecycle for the collection system. By replacing 2 percent per year, as we did again in 2016, we renew our system every 50 years.

KUB also budgeted \$120 million for treatment plant upgrades, including \$55 million by 2021 at our Kuwahee treatment plant for a project that completes KUB's federal

Consent Decree requirements. It will also ensure Kuwahee can provide full treatment during heavy rain events.

By 2021, we will spend \$13 million on alternative disinfection to convert our plants from gaseous chlorine disinfection to safer, more environmentally friendly methods, such as ultraviolet light or sodium hypochlorite. KUB is also partnering with TVA on a \$5.9 million project at Kuwahee to convert biogas from the treatment process to heat and electricity; that will be completed in late 2019. [See page 12 for more.]

KUB also continues its environmentally friendly Biosolids program. KUB's biosolids, nutrient-rich organic matter from wastewater treatment, are registered as a fertilizer with the Tennessee Department of Agriculture. In 2016, 22 area farms received over 29,000 tons biosolids, which helps improve soils and keeps the biosolids out of landfills.



## Zero Violations Earn Plants National Recognition From Clean Water Agencies

With zero violations in 2016, all four KUB wastewater plants won recognition from the Kentucky-Tennessee Water Environment Association (WEA) and the National Association of Clean Water Agencies (NACWA). KUB's Eastbridge plant also maintained the NACWA Platinum status, awarded for no violations in five years, that it first earned in 2010. With no violations since 2005, Eastbridge received a Platinum 11 award for 2016.



## Wastewater System Stats

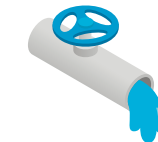
243 square mile service area



**70,751**  
customers



**12.6 billion**  
gallons total  
treated water



**1,306**  
miles of service mains



**4 treatment plants**  
**75 lift stations**  
**6 storage facilities**



**66.4 million**  
gallons Rated Capacity



**44,880 gallons**  
annual use by typical  
residential customer  
**\$56.50\*/month**  
**\$1.86/day**

\* Wastewater is billed in Ccf and based on your water usage.





KUB is committed to being a good steward of the environment. In January 2017, KUB opened its new compressed natural gas (CNG) fueling station to the public. The station is the first in Knoxville to provide this cleaner burning and more affordable fuel to current and future CNG public fleets. The station, which replaced KUB’s aging facility used only by our fleet, supports the goal to increase our CNG fleet to about 100 vehicles by 2020. Helping that goal is a \$67,500 grant from Tennessee Department of Environment & Conservation (TDEC) that will assist in funding the conversion of three new KUB dump trucks for dedicated CNG use. The public station promotes broader adoption of alternative fuel vehicles and provides a new source of revenue, which makes good business sense.

Construction was also completed in July 2017 on a 50-kilowatt rooftop solar array for KUB’s Corporate Services Building. The system will offset 15 percent of the building’s electric load and 45 metric tons of carbon dioxide equivalent annually, which is equal to

preventing emissions from over 100,000 miles driven or 5,000 gallons of fuel consumed. The project provides KUB an opportunity to better understand solar impacts on the electric system and support customers who are interested in installing their own systems.

The combined heat and power (CHP) system in design for Kuwahee Wastewater Treatment Plant is an environmental project that not only produces renewable energy, but also saves KUB money. The system will provide clean power by using biogas from the wastewater treatment process to fuel generators to supply approximately 85 percent of the plant’s electrical demand (up to 11,250 megawatt-hours annually). The project is estimated to reduce net carbon dioxide equivalent emissions by 20 million pounds each year, which is equal to removing 2,000 cars from the roads. KUB was selected by TVA to receive funds for a portion of the project as one of TVA’s Waste Heat Recovery EPA mitigation projects. In addition to the environmental benefits, the CHP system improves operational efficiency by lowering the plant’s energy costs.



KUB has a proud tradition of being involved in the communities we serve. The Vol Time program offers employees the opportunity to receive up to eight hours of paid time annually for approved volunteer efforts in KUB’s service territory. Employees set a record with their volunteer spirit in 2016 with 579 employees volunteering more than 4,000 hours.

In addition to the highest-ever Vol Time participation, KUB received the Helping Hands Award at the Salvation Army of Knoxville annual awards dinner in 2017. The award recognized KUB employees for their hard work on behalf of the Salvation Army over many years.

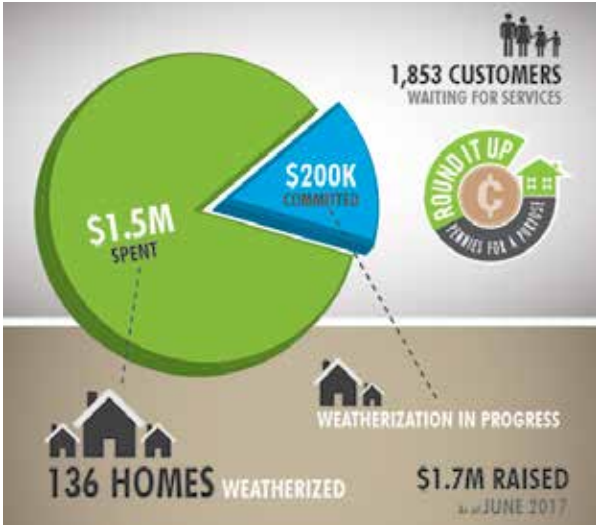
KUB employees also show their community spirit with the annual United Way fundraising campaign. Through various fundraising events and payroll contributions, employees once again exceeded the fundraising goal by raising more than \$226,000.

KUB’s community involvement also includes partnerships with TVA and other agencies on programs that help

create positive change in the community. KUB partnered with the Knoxville-Knox County Community Action Committee (CAC), the City of Knoxville, and The Alliance to Save Energy to apply for the \$15 million TVA grant that funded the Knoxville Extreme Energy Makeover (KEEM) program, which weatherized about 1,300 homes from August 2015 to September 2017.

Since May 2015, KUB customers have donated more than \$1.7 million to the Round It Up (RIU) weatherization program by rounding their bills up to the next dollar. Over 130 energy inefficient homes for low-income families have already been weatherized in our area, and many more homes are on the waiting list. KUB forwards 100 percent of RIU funds to the CAC weatherization program.

These weatherization programs provide a root-cause solution to an ongoing problem in our community—low income residents in energy-inefficient homes that are costly to heat and cool.







[www.kub.org](http://www.kub.org)