

Natural Gas Supply Update

October 18, 2018

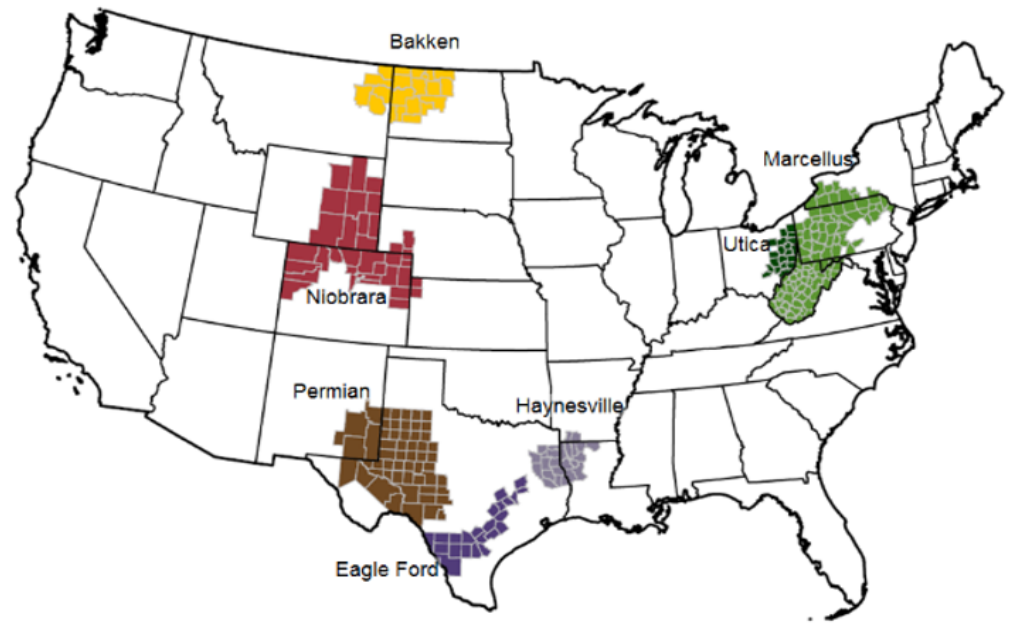


Today's Discussion

- Natural gas supply trends
- Local issues
- Winter bill projections
- Compliance update

Shale Gas Has Changed Everything

- Shale gas accounts for over 60% of domestic production
- Decreased cost of production
- Lower and more stable prices
- Increasing gas exports
- Pipeline capacity full

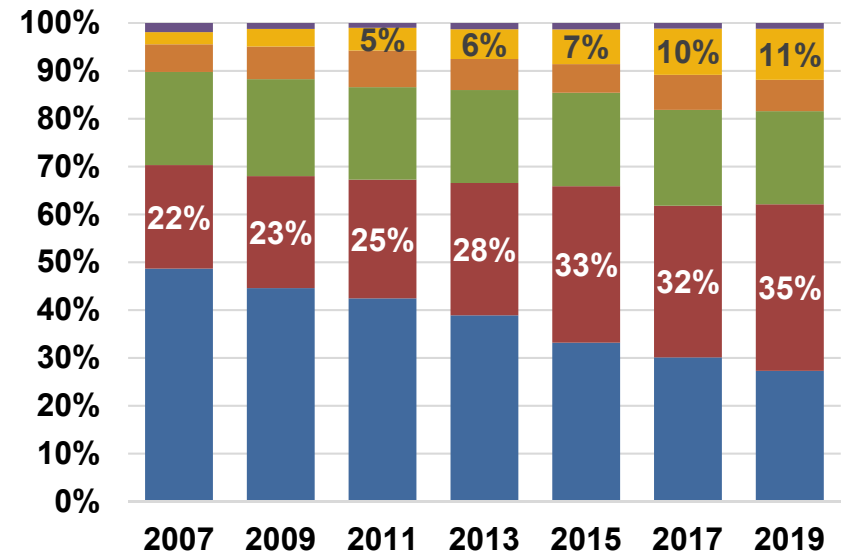
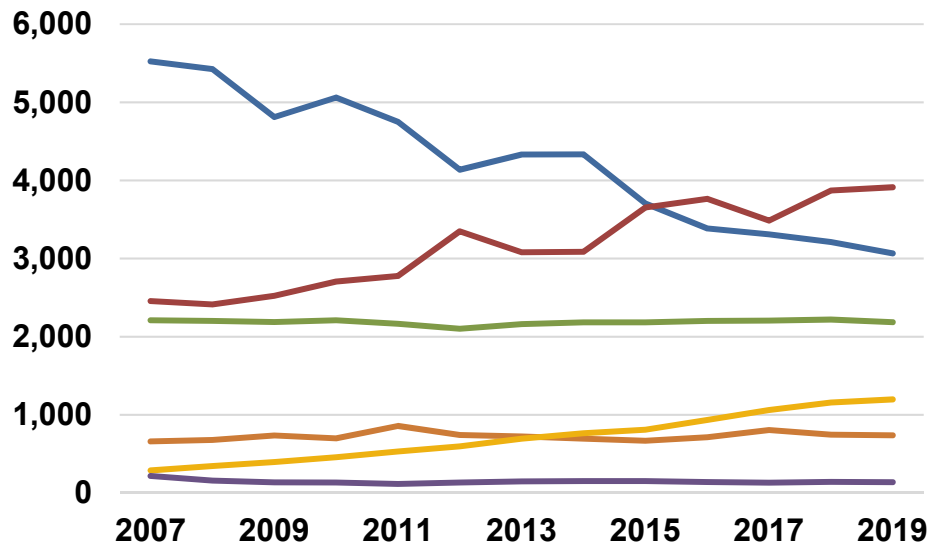


Natural Gas Prices Have Declined and Become More Stable



U.S. Electric Generation From Natural Gas and Renewables Continues to Grow

United States Electricity Generation By Fuel

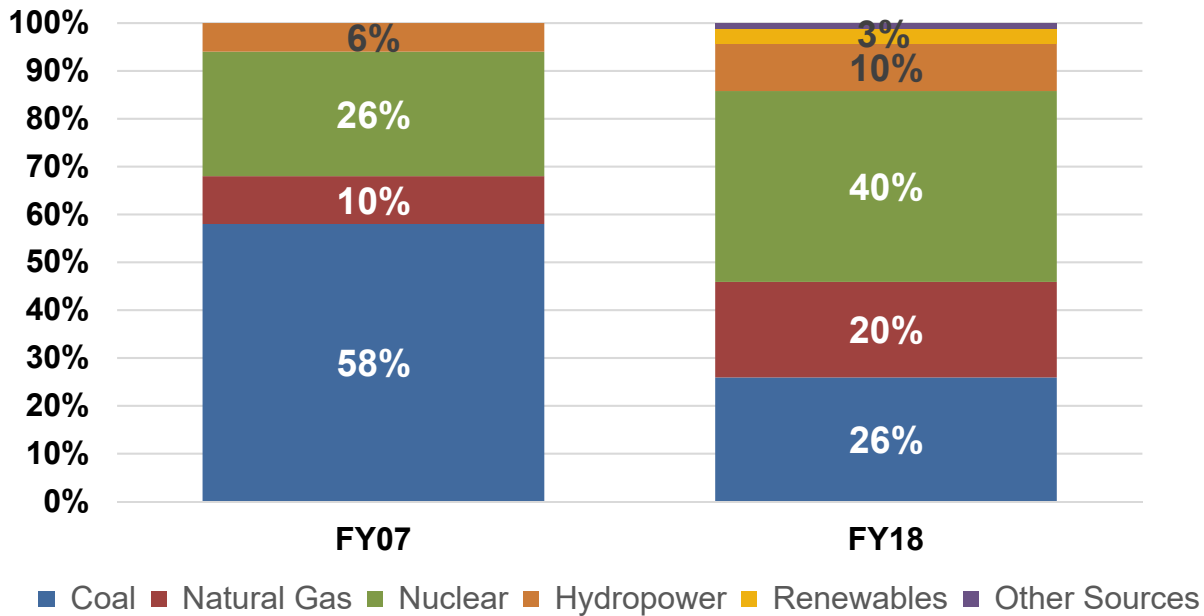


■ Coal ■ Natural Gas ■ Nuclear ■ Hydropower ■ Renewables ■ Other Sources

Source: EIA's Short-Term Energy Outlook. Data for 2018 and 2019 are forecasts.

TVA Electric Generation Follows Trend

TVA Electricity Generation By Fuel

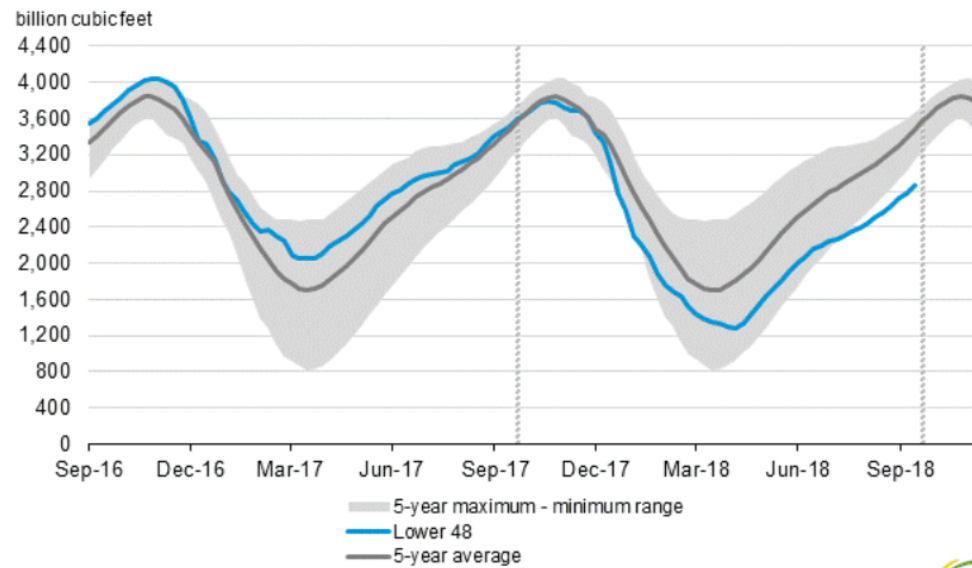


Source: TVA.GOV

Potential Upward Pressure on Natural Gas Prices

Warm Summer Reduces Natural Gas Storage Levels

Working gas in underground storage compared with the 5-year maximum and minimum



Source: U.S. Energy Information Administration

Note: The shaded area indicates the range between the historical minimum and maximum values for the weekly series from 2013 through 2017. The dashed vertical lines indicate current and year-ago weekly periods.

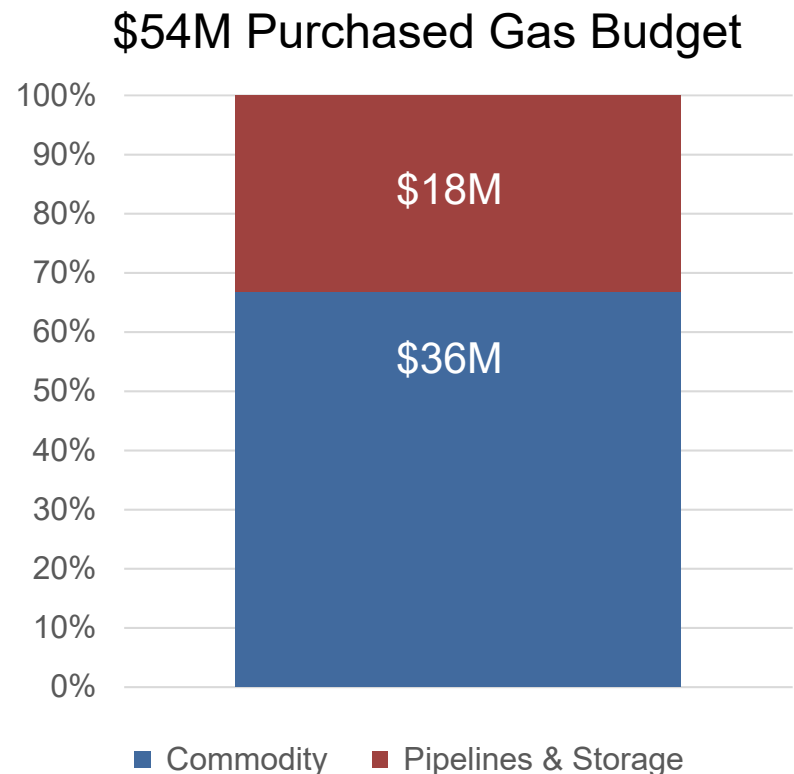


East Tennessee Pipeline Issues

- Limited supply directly on East Tennessee Natural Gas (ETNG) pipeline
- ETNG pipeline fully subscribed and highly utilized
- Pipeline expansions are expensive, have long lead times, and require long-term commitments
- ETNG rate case anticipated

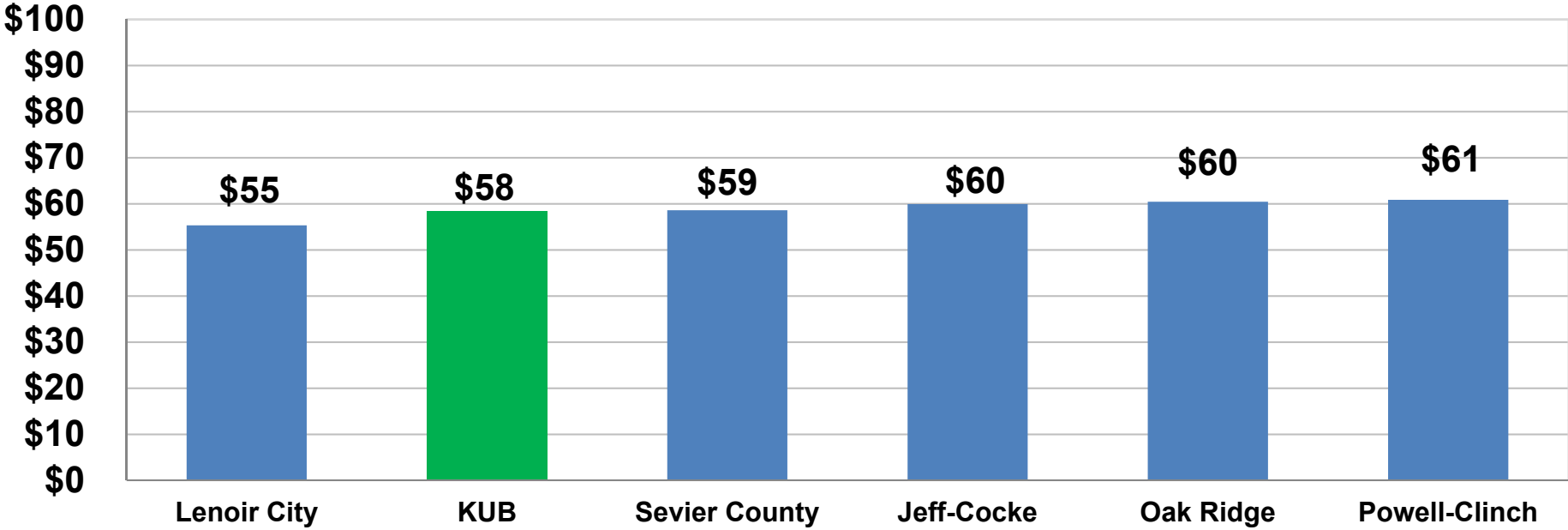
National and Local Issues May Impact Future KUB Gas Costs

- Pipelines and storage cost
 - Federal tax cuts
 - Rate cases
- Commodity cost
 - Liquefied Natural Gas (LNG) export prices
 - Electric generation
 - U.S. storage levels
 - Regional supply
 - **WEATHER** – national & local



KUB Residential Natural Gas Rates Among Lowest in Region

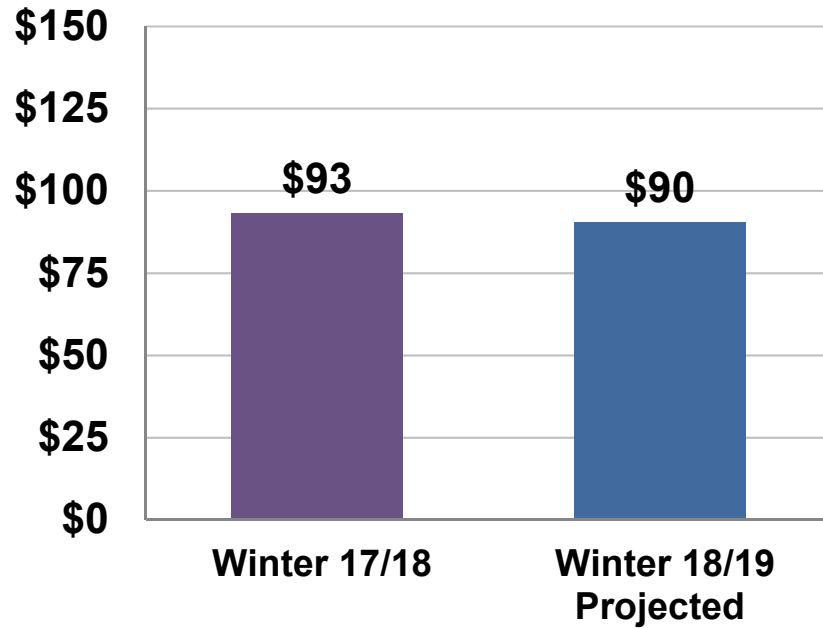
Monthly Bill (\$)



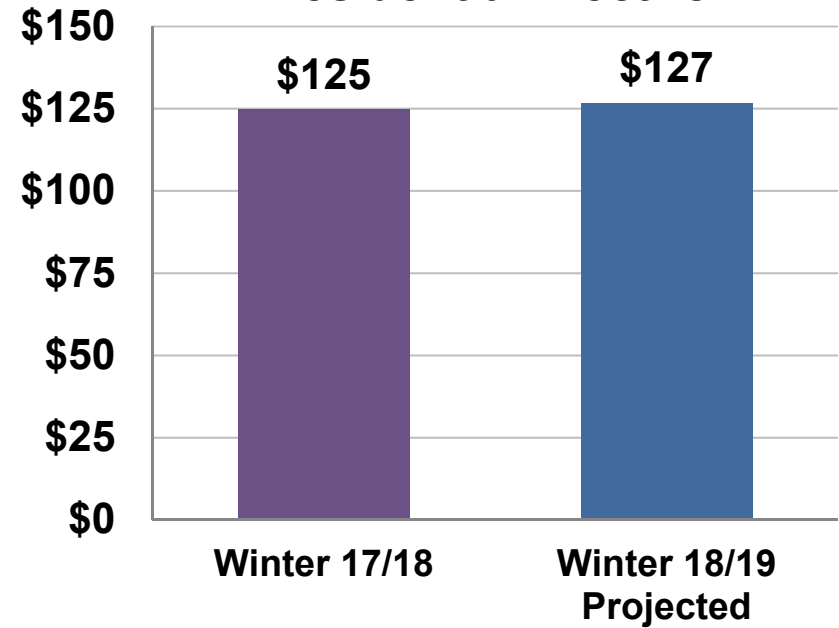
Average monthly bill for 605 normalized annual therms, twelve months ended June 30, 2018.

Projected Average Winter Bills Consistent With Previous Year

Residential Natural Gas



Residential Electric



Assistance Available for Customers in Managing and Paying Bills

- Energy savings information
- Levelized Billing Plan
- Customer counselors
- Project Help
- KUB gift card
- Home weatherization
 - Round It Up
 - Home Uplift



KUB In Compliance with Resolution 970

- Board authority required for
 - Contracts in excess of 6 years
 - Contracts in excess of volume limits
 - Purchase and transportation: 160,000 dth/d
 - Storage: 5 million dth maximum on inventory
- Purchasing authority delegated to CEO/CFO for contracts
 - 2 years or less
 - 2 to 6 years for purchase and transport of up to 15,000 dth/d
 - 6 years [max] storage for firm withdrawal rights up to 10,000 dth/d
- Authorizes sale of excess capacity

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Investing In Growth

October 18, 2018



Natural Gas Marketing Pilots

- Water Heater Program
 - Incentive for customers with inactive gas service
 - Addresses need to use or remove these services
- Natural Gas Appliance Rebate Program
 - Incentive for existing gas customers to convert electric/propane appliances to natural gas
- Implemented in December 2017

Water Heater Program Update

- Free turnkey gas water heater installation
- Contacted ~1000 (or 35%) of the customers with an inactive gas service
- Offer extended to customers in major project areas
- 71 water heaters installed to date
- Inactive services will be disconnected beginning this fall

Appliance Rebate Program Update

Marketing Efforts

- Postcards mailed to current residential customers
- Creating program awareness with local contractors and retailers
- Billboards along I-40, I-75, and Chapman Highway
- Social media (KUB website, Facebook, NextDoor, etc.)



Appliance Rebate Program Update

- Current rebate offers
 - \$600 Furnace
 - \$300 Water heater
 - \$100
Range/Dryer/Log/Grill/Fire
Pit
- 107 rebates provided
totaling \$25,000



Key Takeaways From Marketing Pilots

- Water heater installations cost more than expected
- Rebates provide incentive to switch
- Rebate program requires education and consistent messaging

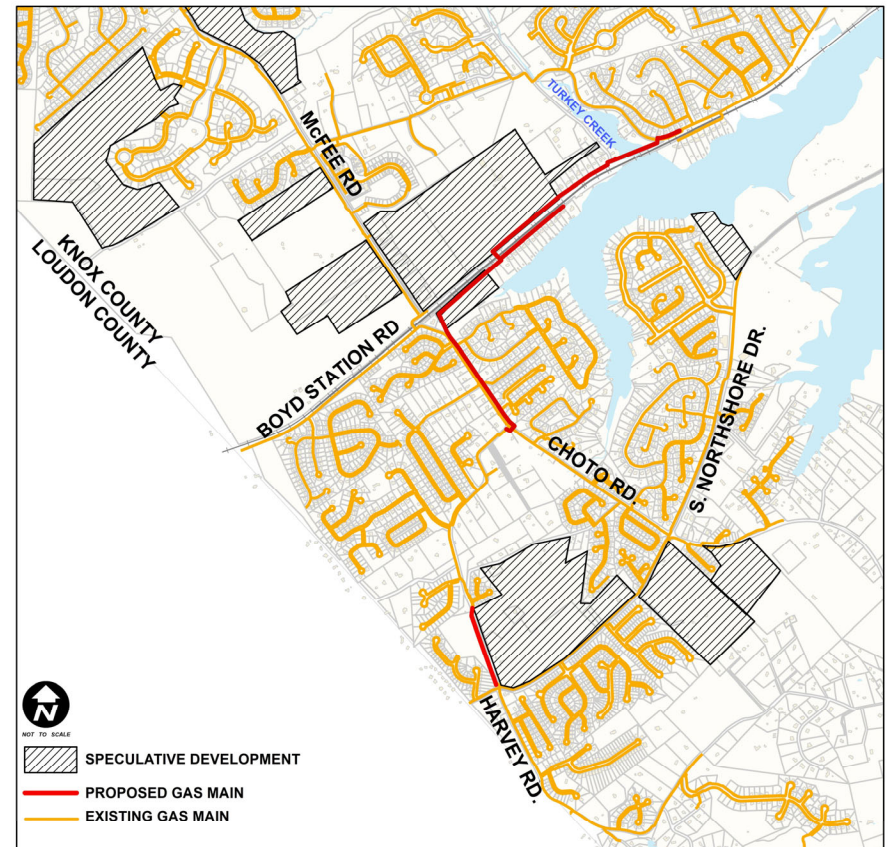
Strategic Natural Gas Extensions

- \$3.5M budgeted in FY 19
- Improve system reliability and support future development
 - Capital engineering projects
 - New Service projects
- Several projects underway
 - Choto Road
 - Hardin Valley
 - Maryville Pike
 - Ball Camp Pike

Choto Road Loop

- Creates backfeed for the area
- Improves system resiliency
- Supports rapidly growing community

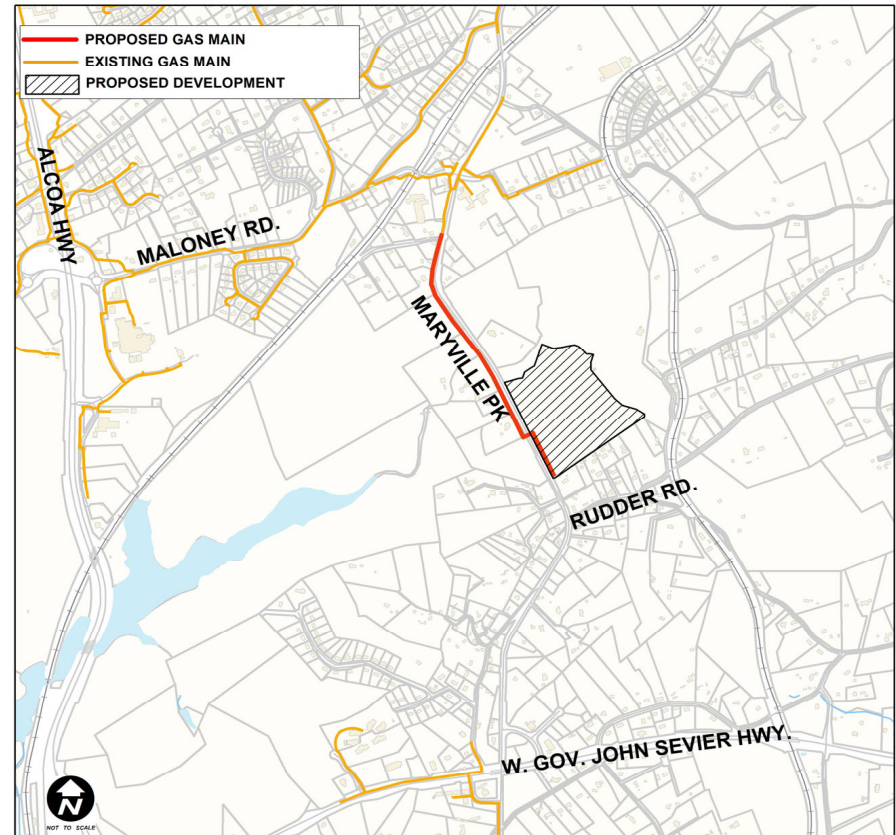
Choto Loop (\$1.5M)
10,000 feet of 8-inch pipe



Maryville Pike

- Developer driven
- Supports future customer growth
- Part of effort to improve system flexibility

Maryville Pike (\$250K)
3,400 feet of 8-inch pipe



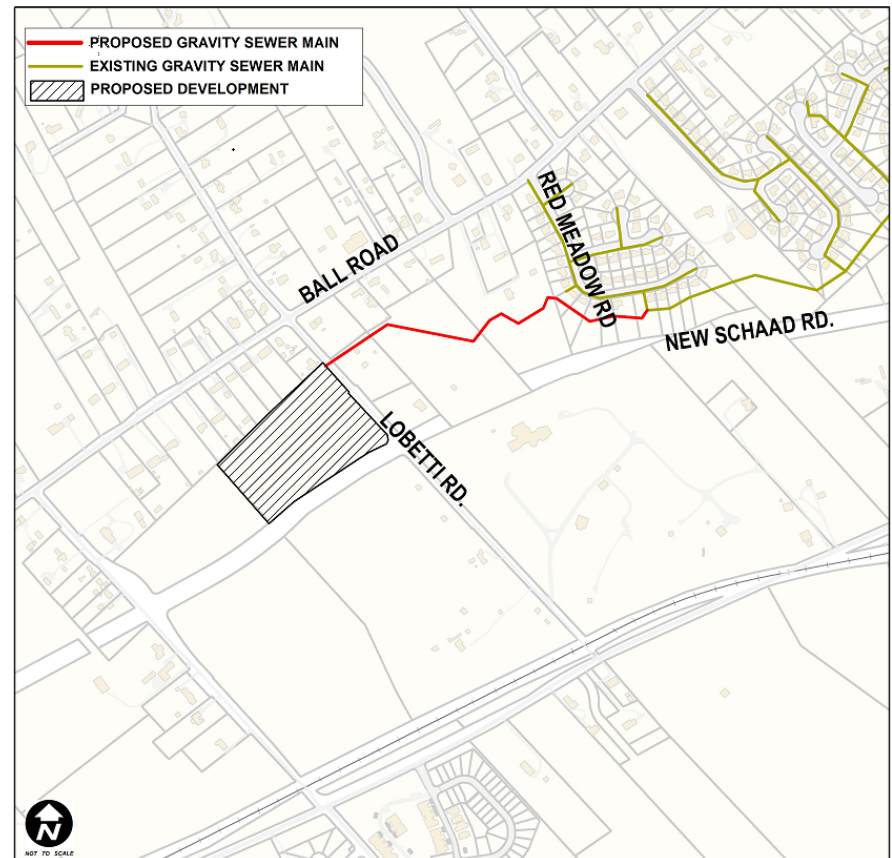
Utility Extension Policies Support Growth

- Refund credits available to builders of residential and commercial developments
- Residential refund credits:
 - \$800 per residential gas customer
 - \$800 per residential electric customer
 - **\$2,000 per residential wastewater customer**
 - **\$500 per residential water customer**
- Commercial credits vary based on economic analysis

Lobetti Road Wastewater Extension

- First executed wastewater contingent refund contract
- 280 new customers in phase 1, all four utilities
- Supports future growth

Lobetti Road (\$315K)
2,300 feet of 8" pipe



Recent Growth-Related Accomplishments

- Fort Hill Data Center under construction
 - In service spring 2019
 - 10 MW load when fully operational
 - Top 10 electric customer
- Executed contract with blockchain data center
 - In service January 2019
 - 53 MW load
 - Second largest electric customer

Upcoming Growth Initiatives

- “Home on the Main”
 - Incent residential homeowners located near natural gas main to connect to the gas system
 - Approximately 30,000 potential customers identified
- Develop a CNG station strategic growth plan
- Develop quantifiable growth metrics



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Plant Operations Demand Response Program

October 18, 2018



What is Demand Response?

- Demand is a customer's power used at specific time
- Demand response is a customer's response to a TVA request to lower power usage
- TVA supported sustainability program
 - Reduce energy usage on the TVA grid
 - Maintenance and peak system flexibility
- Reflects KUB's commitment to environmental stewardship

Demand Response Participation

- Incentivizes larger electric customers (>100 kW) to reduce power usage at certain times
- 48 KUB customers participate (7 MW of 186 MW)
 - Knox County Schools
 - Walmart
 - Knoxville Convention Center
- No cost to participate, no penalty for non-participation
- Includes metering tools and software for real-time monitoring

Demand Response Program

- TVA provides weekly forecast of potential events and 30 minute notice for reduction
- Program limits
 - Reductions last no more than 4 hours
 - Limited to no more than 40 hours per year
 - April-October: 12 p.m. - 8 p.m.
 - November-March: 5 a.m. -1 p.m.
- Participants receive quarterly payments
 - Contracted reduction amount
 - Payments based on amount of energy reduced

KUB Participation and Results

- Kuwahee and MBW (largest facilities)
- Manage 1MW of internal use
 - Modify pump operation
 - Reduce use of non-critical equipment
- Participation began in 2018
- Participated in 3 of 4 reductions in 2018
- Received \$12,200 total with first two payments

Benefits

- TVA online portal provides real-time monitoring and data
- Online monitoring allows for power management and increases payment opportunities
- Financial incentives for demand reduction
- TVA defers new generation facilities saving KUB and customers dollars
- Continued commitment to sustainability

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