

OG&E Grid Modernization Overview

November 2019

Evolution of OG&E System Investments

Smart Grid 2009 - 2012	
Implementation	Impact
\$350M Investment Smart Meters Field Communications System Distribution Mgmt. System Integrated Volt/Var Control Automated Switches	95 FTEs Reduced > 233,000 Truck Rolls Avoided through Dec 2011 956 Theft/Tamper Incidents Detected 2% Demand Reduction from IVVC

System Hardening 2010 - 2013	
Deployment	Circuit Impact
\$45M Investment on 103 Circuits Grid Reinforcement Aggressive Vegetation Mgmt	55% Reliability Improvement 80% Reduction in Storm Outages 90% Reduction in Storm Damage

Technology Growth 2013 - Current	
Implementation	Impact
Verified Service Outage Customer Notifications One Network Model Fault Location Automated Restoration Smart Lateral Fuses Animal Protection	Increased Customer Satisfaction Reduction in Restoration Time Reduction in Customers Impacted by Momentaries

Grid Resiliency

- Distribution line reliability
- Underground cable
- Overhead conductor
- Transformer replacement
- Breaker replacement
- Animal protection
- Lightning arrestors

Distribution Automation

- Automated circuit tie lines
- Smart lateral fuses
- Communications to capacitors
- Communications to voltage regulators

Substation Automation

- Fault location SCADA inputs
- Substation relay replacement
- SCADA
- Substation meter replacement

Technology Platforms and Applications

- Digital field services management
- Digital workforce optimization
- Distribution planning tools
- Transmission emergency management system

- Improve grid reliability and resiliency
- Improved visibility and control
- Enhance grid flexibility
- Streamline operations
- Prepare for two-way flow
- Increase grid security
- Increase customer satisfaction

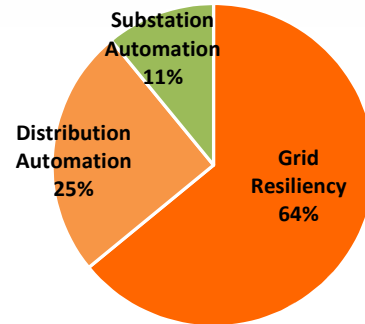
- **Reliability Improvement**
 - Reduction in Customer Minutes of Interruption (CMI) due to technology and automation
 - Improved storm resiliency (poles withstand higher wind speeds)
- **Cost savings**
 - Avoided customer lost revenue
 - Annual avoided O&M & Capital maintenance
 - Avoided storm costs
- **Streamlined Operations**
 - Integration with existing Smart Grid investment
 - Faster outage response time (Distribution Management System, fault location, etc.)
 - Decrease in annual truck rolls
- **Stronger Oklahoma Communities**
 - Lost customer revenue
 - Economic development

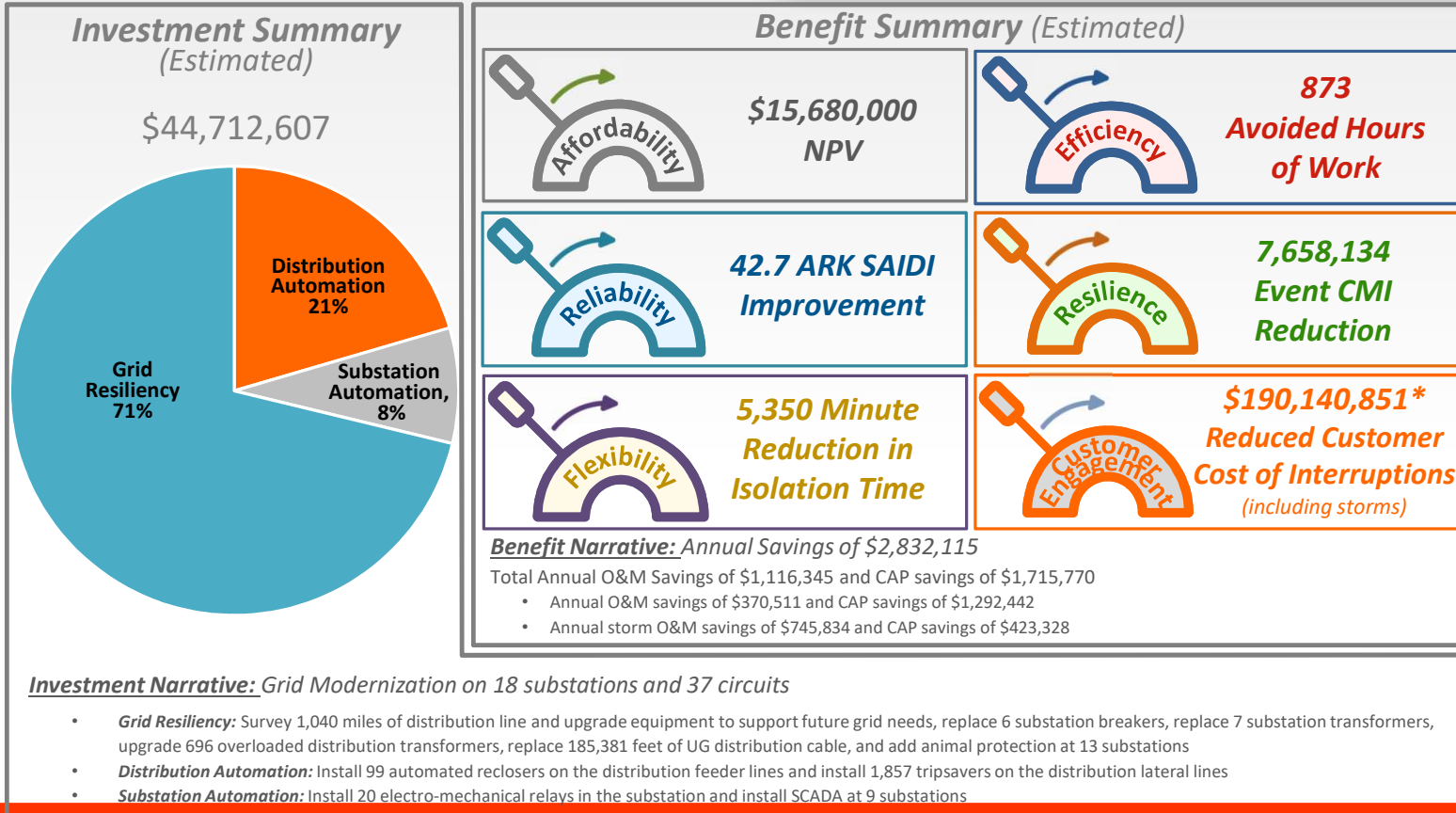
- Arkansas Series I completed Q1 2019
- Modernization of 14 circuits and 6 substations
- Preliminary results exceeding expectations
- Deployment of Series II currently underway

Results from Ft. Smith Weather Event – May 18, 2019:

- Intense lightning and winds in excess of 70 MPH
- Modernized circuits had 89% less CMI than other circuits
- Modernized circuits had 28 minutes of SAIDI compared to 234 on other circuits
- 4% of customers on modernized circuits experienced a sustained outage compared to 50% on other circuits
- Minimal structural damage on modernized circuits when compared to other circuits

Category	Investments	2018
Grid Resiliency	#1 Animal Protection	\$ 20,421,622
	#2 Conductor Upgrades	
	#3 Equipment Upgrades	
	#4 Storm Reinforcement	
Distribution Automation	#5 Automated Circuit Tie Lines	\$ 6,280,354
	#6 Automated Lateral Lines	
Substation Automation	#7 Modern Protection Relays	\$ 396,733
	#8 Substation Automation	
Total		\$ 27,098,709







55
Distribution
Circuits



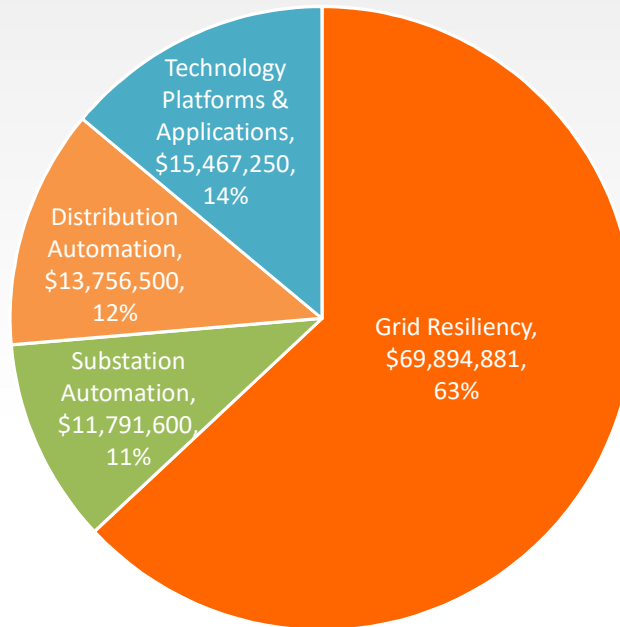
33 Transmission
Substations



40 Distribution
Substations



5
Transmission
Lines



Forecasted Investment of \$90M - \$110M