



# Electric System Evaluation & Modernization

## Alignment and Vision Stage Gate Presentation

Presented by Aaron Smith, Director – Customer Experience

Presented on 8/19/2021

# Today's Update

## PURPOSE

Update the OPPD Board of Directors on progress made by the Electric System Evaluation & Modernization (ESE&M) Strategic Initiative during the initial phases

## GOALS

To share:

- Vision and approach
- What we learned
- Next steps

# ESE&M Objective and Vision

## OBJECTIVE

Develop a cross functional, integrated vision and roadmap for the modern OPPD electric system and supporting technologies that will deliver customer value, enable future products, services, and solutions, while increasing employee engagement and effectiveness by providing them the tools they will need.

## VISION

Resilient, Digital Grid & Integrated Service Platform



# Resilient, Digital Grid & Integrated Service Platform

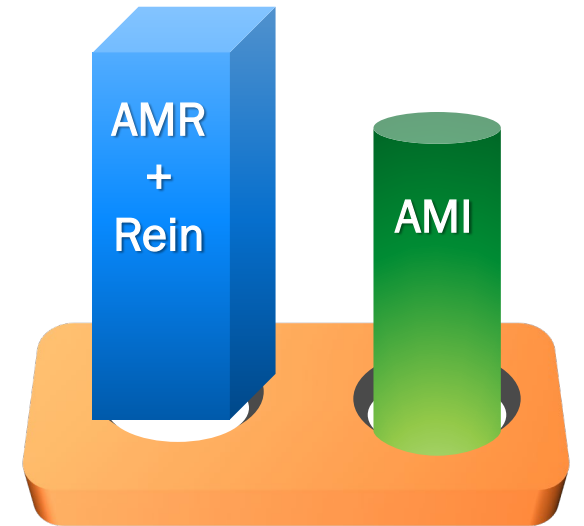


# AMR (Automated Meter Reading) + Rein Findings

**Pilot:** Network of Rein collectors to remotely read existing AMR meters.

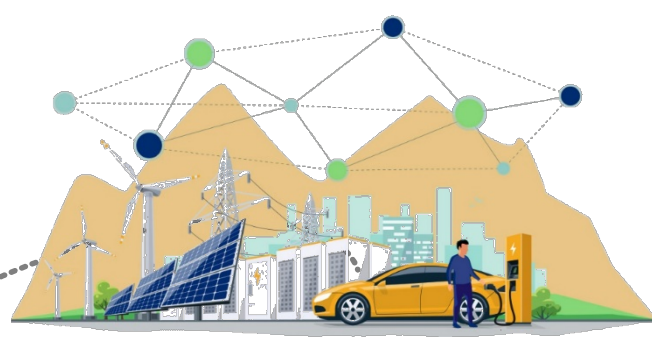
The following limitations were identified:

- Read frequency limits future rate options
- Meters are only capable of one-way communication
- Outage algorithm resulted in many false positives
- Existing meters are reaching projected end of life
- Manual integration limits scalability

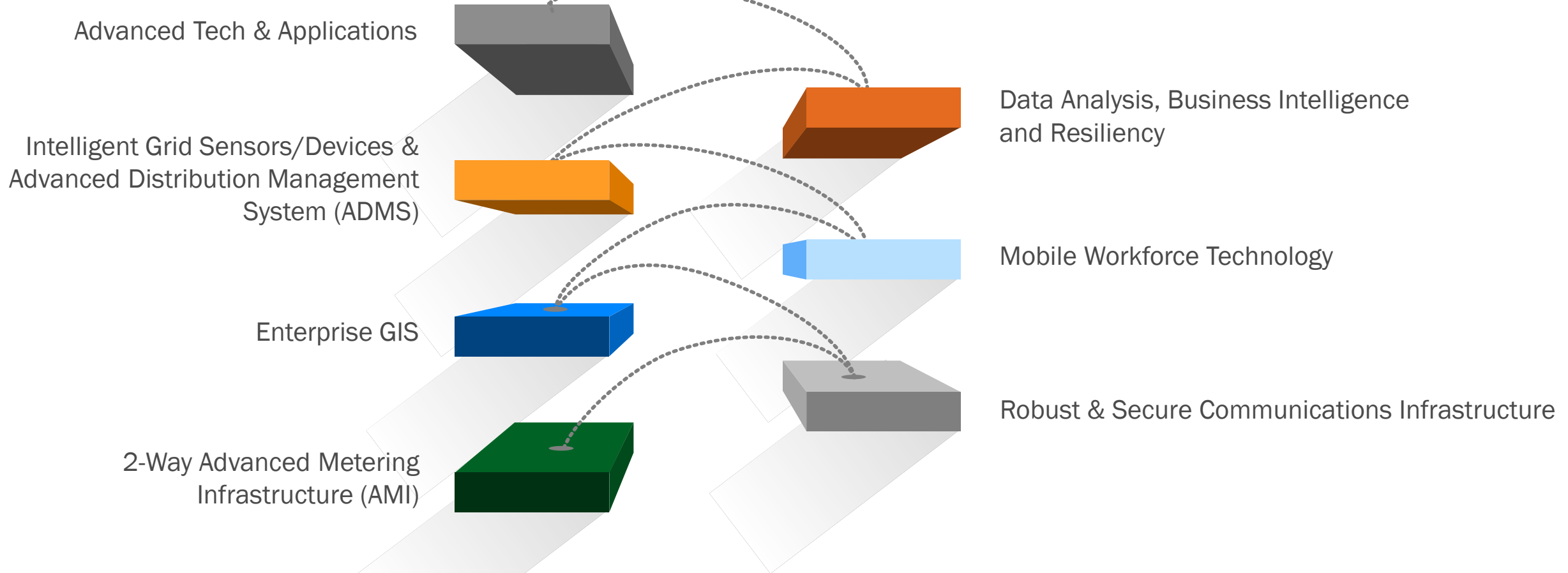


**Conclusion:** Rein + AMR doesn't fully align with the future vision for a modern grid with two-way communications.

# How We Get There



Resilient, Digital Grid & Integrated Service Platform enabling Enhanced Products & Services



# Advanced Metering Infrastructure (AMI)

## ENABLING DYNAMIC COMMUNICATION

AMI provides the two-way, dynamic communication that can travel in real time to/from customers, OPPD infrastructure and assets, and any integrated OPPD systems.

Once fully operational, AMI will enable:

- Electric model verification
- Personalized products & services-based energy profile
- Data trending
- Rate options
- Net metering for two-way power flow
- Grid situational awareness for enhanced reliability
- Remote turn on/off for move in/out
- Outage notification
- Demand response & aggregation
- Power quality monitoring
- Two-way communication network
- Storage/DER management & enablement

# Grid Communications

## THE ENABLING INFRASTRUCTURE OF THE DIGITAL GRID

- Provide the infrastructure for the secure transmission of data:
  - Mobile device connectivity
  - Grid monitoring & control
  - Distributed Energy Resource (DER) monitoring & control
  - AMI network integration
  - Sensors & Internet of Things (IoT) devices for asset monitoring
- Strategy & roadmap will be developed in conjunction with the Technology Platform Strategic Initiative





# GIS (Geographic Information System) Integration

## THE DATA WE NEED, WHEN AND WHERE WE NEED IT

**GIS** provides a virtual representation of the electric grid and physical surroundings. This helps enhance asset management to boost reliability and increase workforce productivity to improve the customer experience across several fronts.

GIS can provide:

- Data analysis
- Visualization (example: external outage map)
- Integration of asset data
- Enterprise capabilities
- Digitization of historic data
- System design tool integration



# Advanced Mobile Workforce

## THE DATA WE NEED, WHEN AND WHERE WE NEED IT

**Mobility** provides a platform for real-time information flow for both utility operations and customer updates - enabling faster restoration times, more accurate estimated restoration times, reduced truck rolls, and paperless workflow.



- Secure, web-based platforms
- GPS (Global Positioning System) Integration
- Enhanced Outage Information Collection
- Design Tool Integration & Digital Work Orders
- Future inventory / supply chain integration
- Crew management & scheduling optimization
- Enhanced Asset Information & Visualization

# Intelligent Devices

## VISIBILITY INTO THE MODERN DIGITAL GRID

**Intelligent Devices** provide system visibility and control in real-time to enhance operations and reliability to the benefit of our customers.

### Intelligent Grid Sensors & Device Components:

- System self healing with Smart Reclosers
- Proactive maintenance with asset health monitoring
- Reduces truck rolls and time spent patrolling circuits
- Forecasting & optimization of Electric Vehicle (EV) charging
- DER monitoring, forecasting and control

“I love that sensors can help pinpoint outage or fault locations before ever rolling a truck”



# ADMS including Outage Management

## THE BRAINS OF THE MODERN DIGITAL GRID

**Advanced Distribution Management System (ADMS)** provides Intelligent Device integration allowing for reduced outage times and enhanced customer reliability and resiliency.

**ADMS** delivers:

- Distributed Energy Resource (DER) integration including customer and utility owned generation
- Real-time monitoring & control of the distribution system with grid device/sensor integration
- Integrated outage management capabilities (OMS)
- Advanced Metering Infrastructure (AMI) integration for precise outage identification
- Centralized hub for self healing applications that automatically reroute power, reducing the number of impacted customers
- Reduced system losses through optimization
- Weather forecast integration and predictive modeling for resource allocation in advance of storms

“I like that OPPD provides outage updates and estimated restoration times.”

# Business Intelligence (BI)

DATA + BI = USABLE INFORMATION

**Business Intelligence (BI)** provides the front end consumption of data for decision making, enabling enhanced customer communications, products and services and reliability programs

**BI** delivers:

- Customer insights
- Geospatial intelligence
- Asset performance & grid hardening
- Maintenance program effectiveness
- Enhanced data driven decision making
- Developed in conjunction with the Technology Platform SI and others across the enterprise



# Advanced Technology

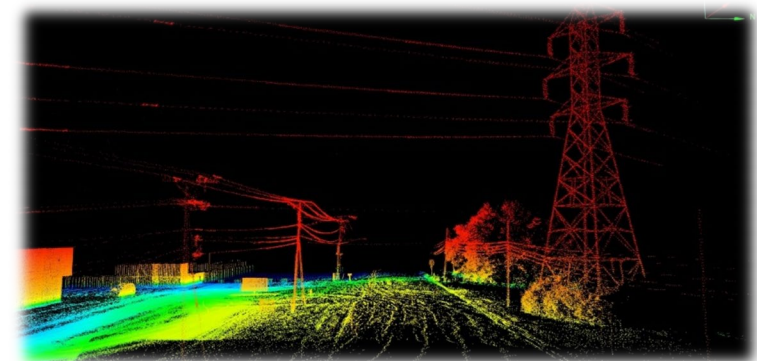


## FUTURE READY

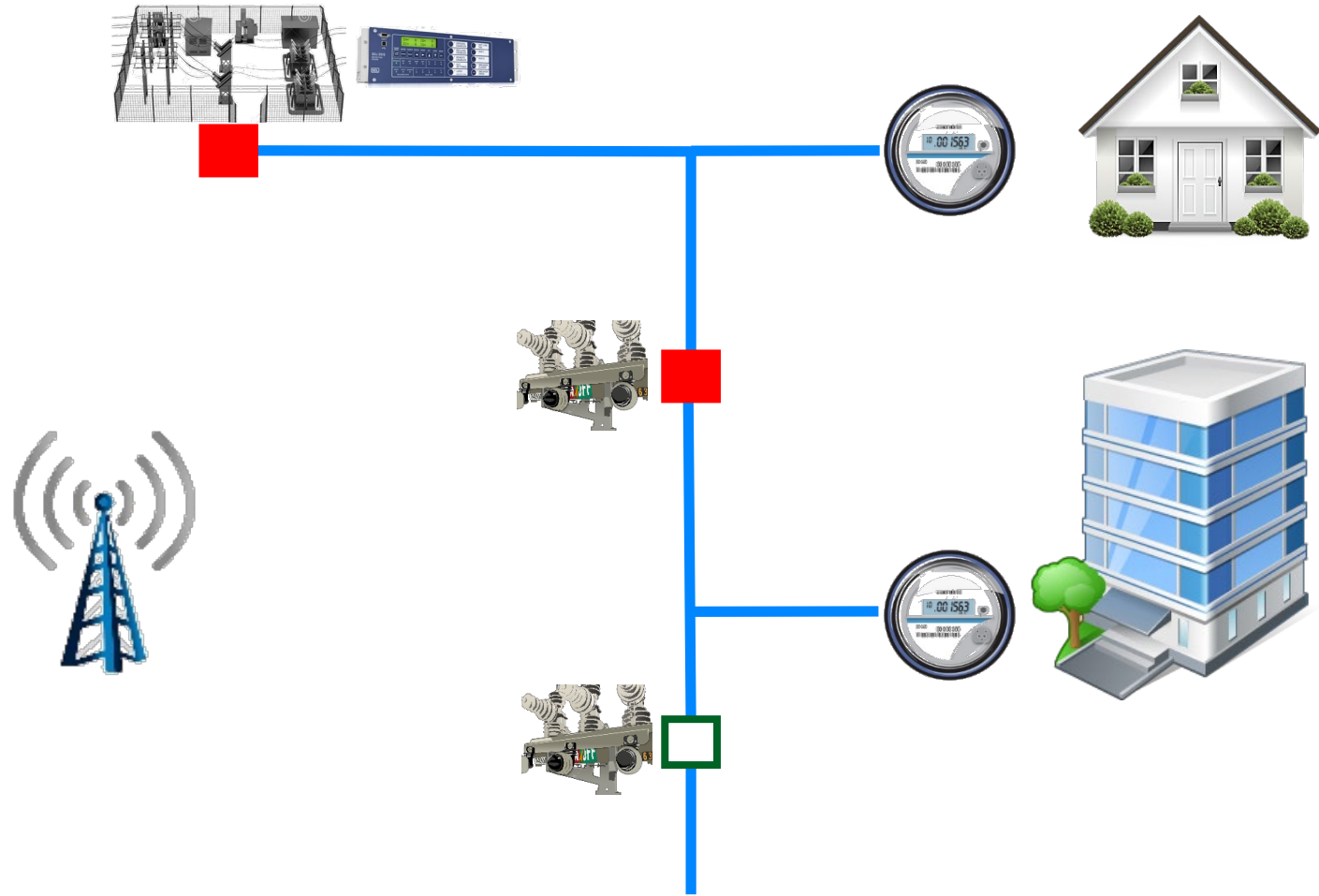
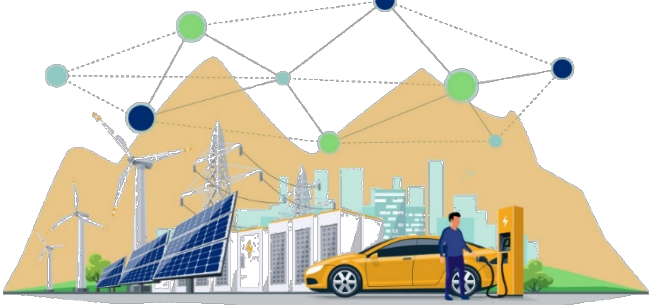
The Resilient, Digital Grid will better position OPPD to leverage **future advanced technologies** and innovation.

**Advanced Technologies** including:

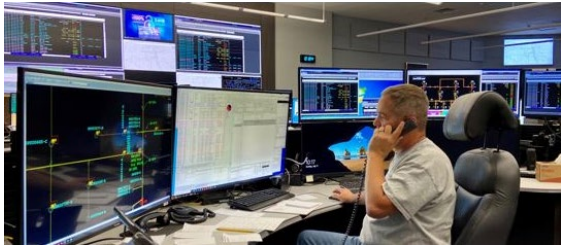
- Drones
- Specialized cameras & scanning technology for asset health
- Failure “Anticipation”



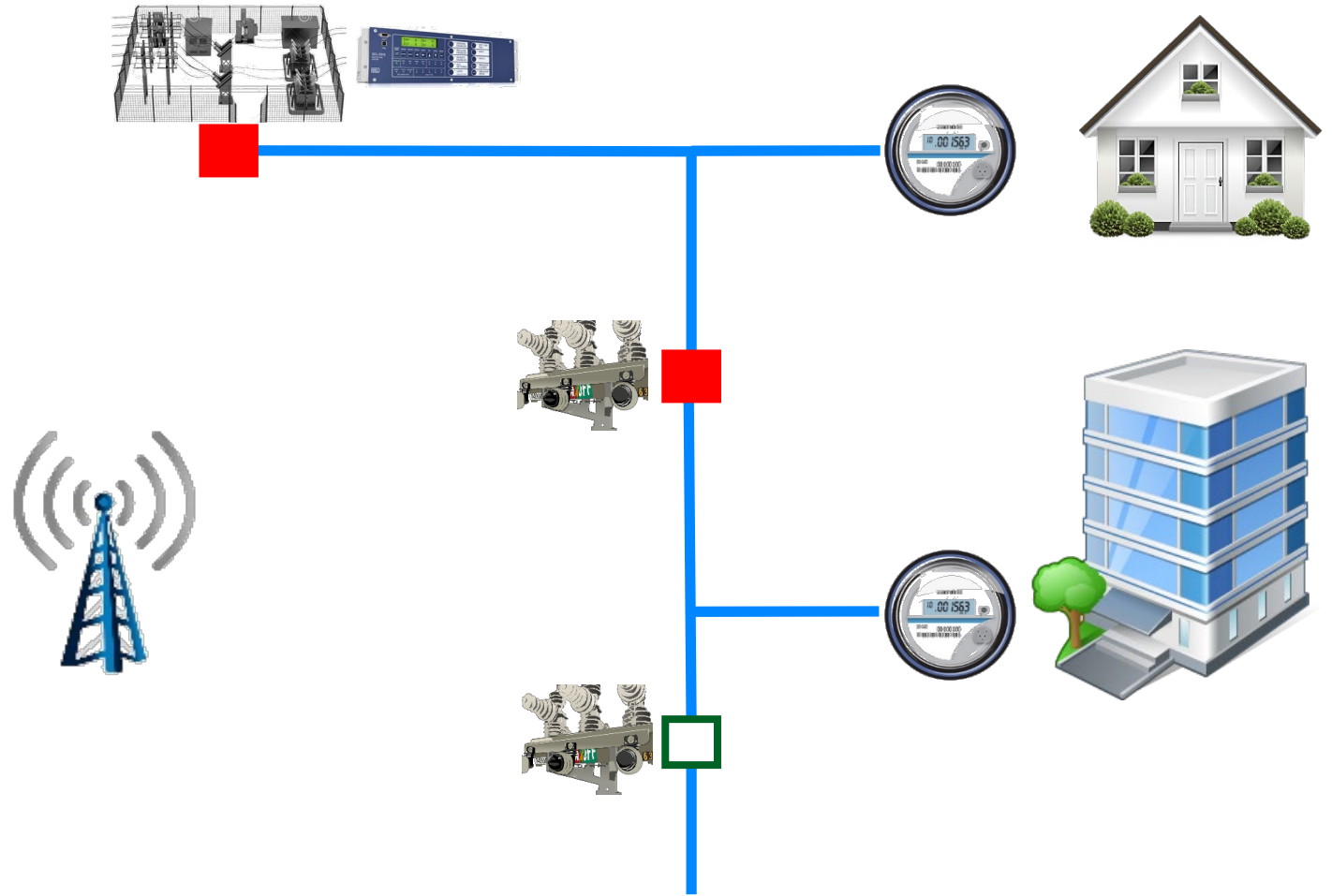
# A Future Customer Outage Journey



# A Future Customer Outage Journey

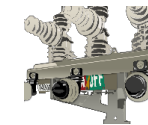
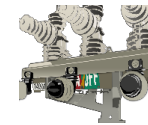
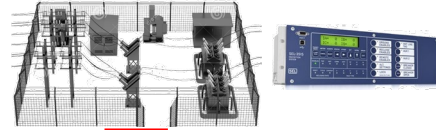
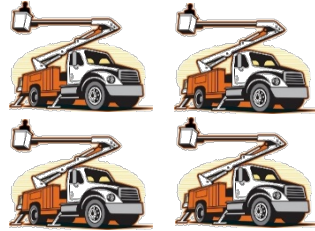


Using integrated, advanced weather forecast models and historical outage trends, OPPD readies resources for potential severe weather



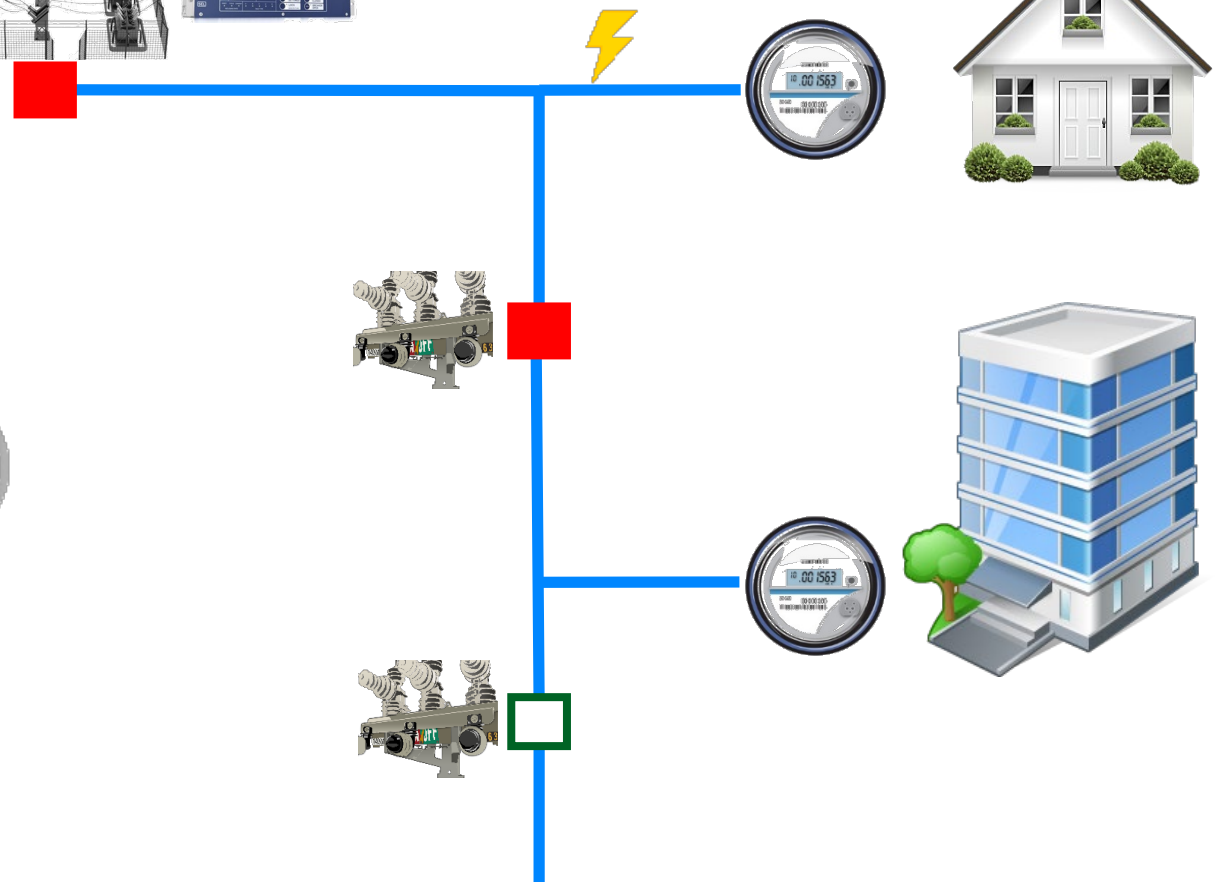
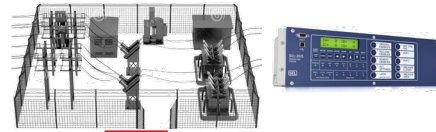
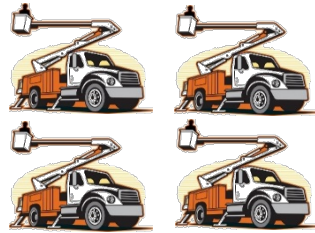


# A Future Customer Outage Journey



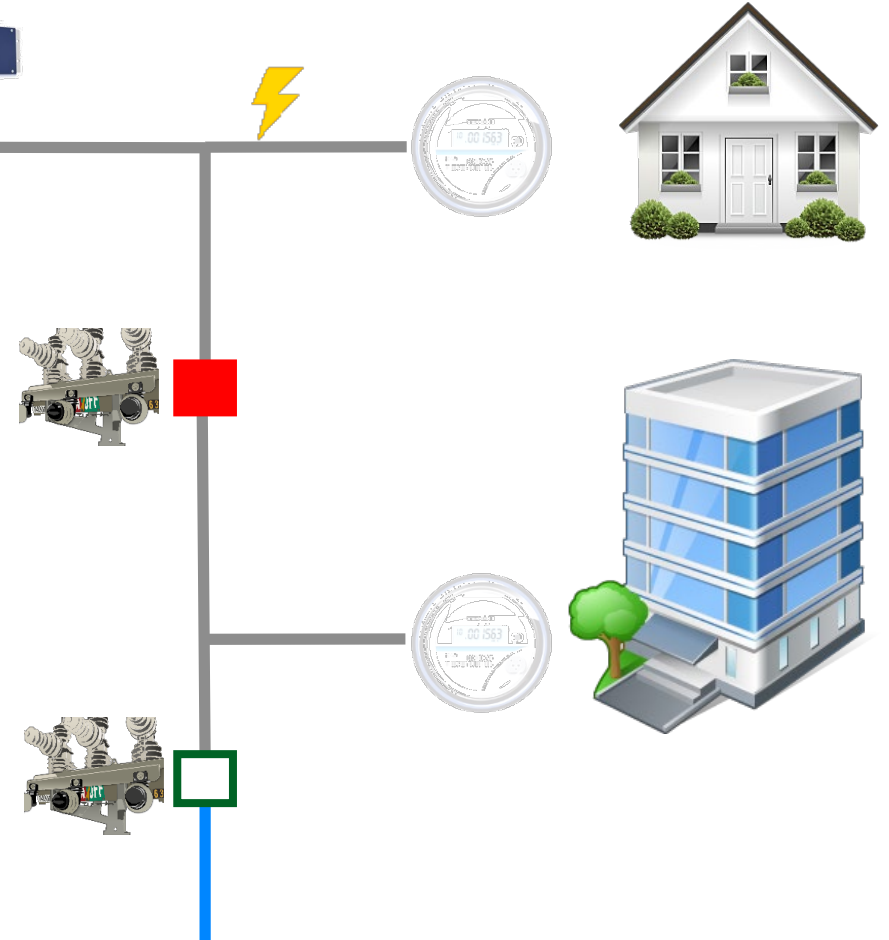
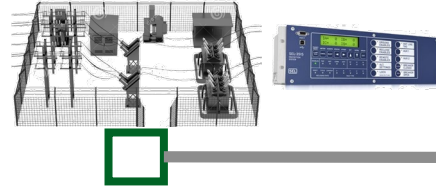
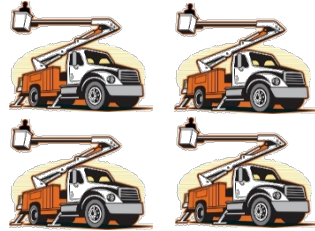
Using integrated, advanced weather forecast models and historical outage trends, OPPD readies resources for potential severe weather

# A Future Customer Outage Journey



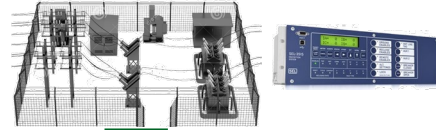
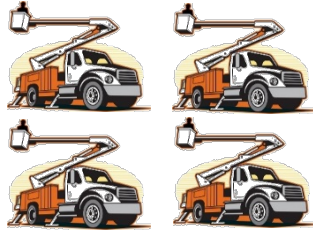
When an event occurs, meters validate and notify the technology systems of the outage, with no customer action required

# A Future Customer Outage Journey

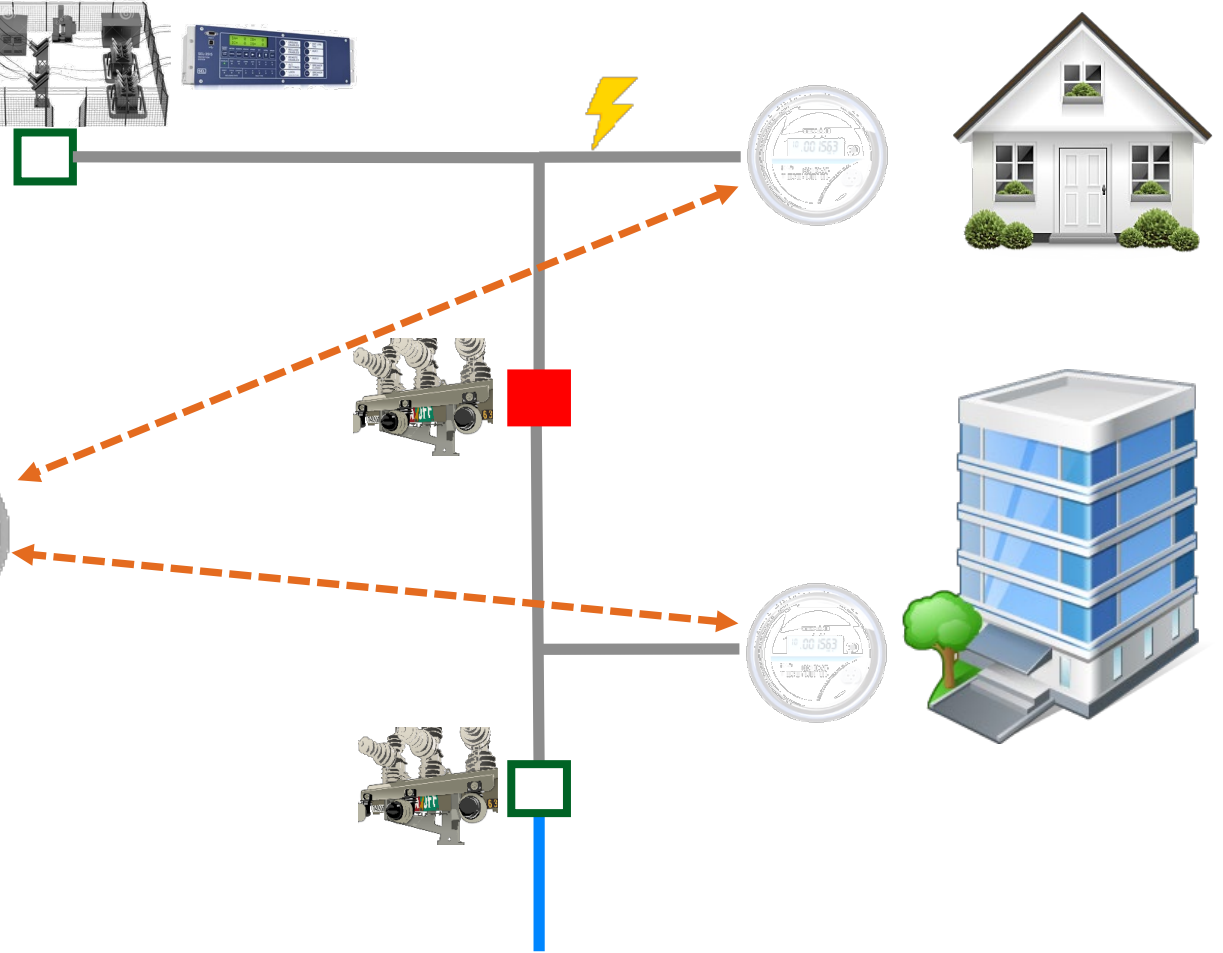


When an event occurs, meters validate and notify the technology systems of the outage, with no customer action required

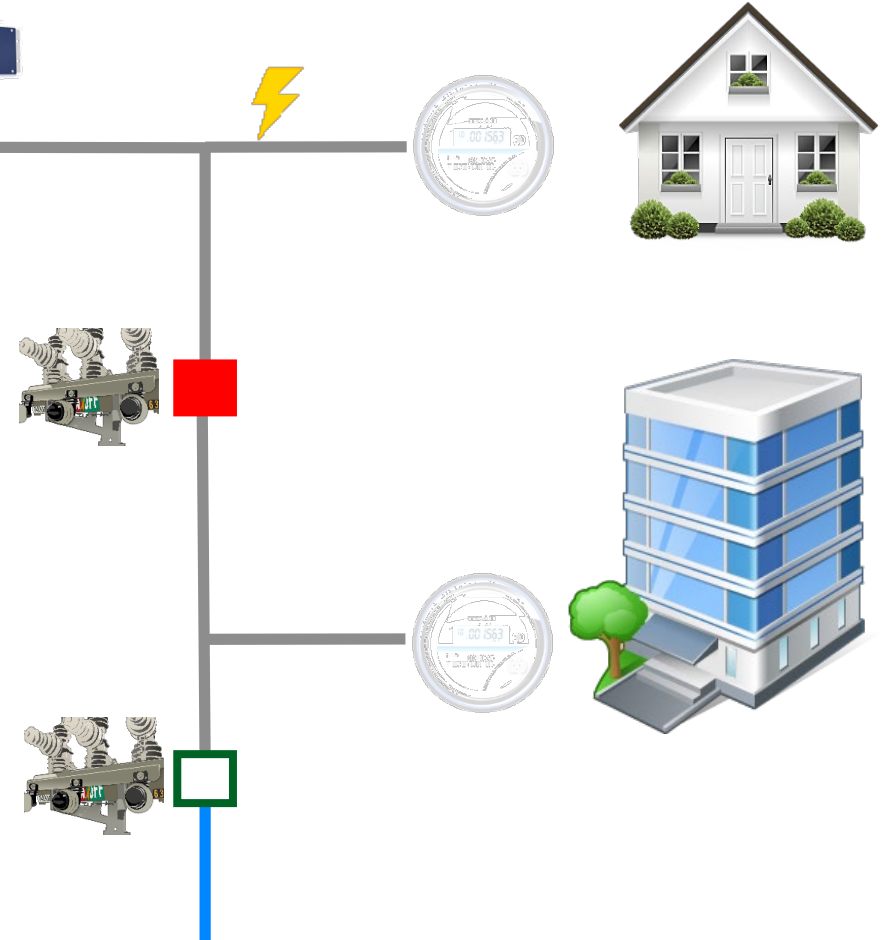
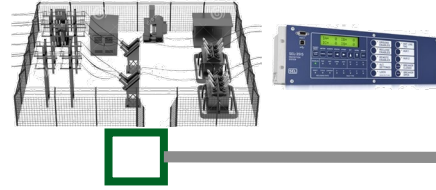
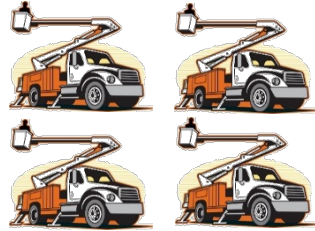
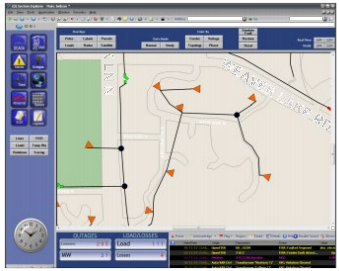
# A Future Customer Outage Journey



When an event occurs, meters validate and notify the technology systems of the outage, with no customer action required

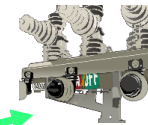
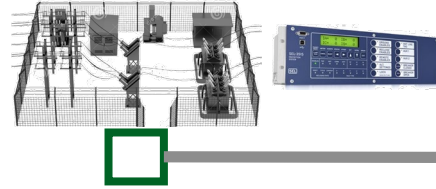
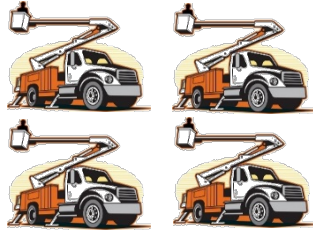


# A Future Customer Outage Journey



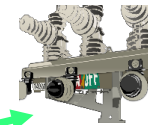
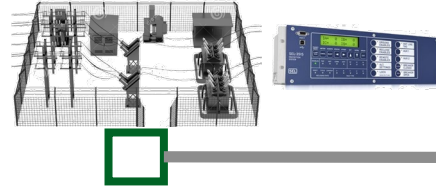
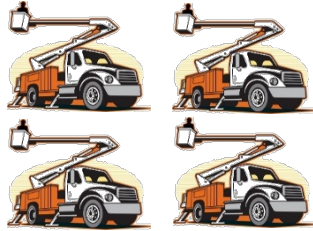
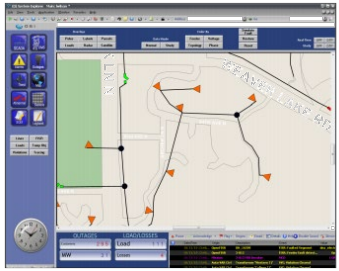
OPPD System Operators use intelligent field devices to restore customers remotely to intact parts of the distribution grid

# A Future Customer Outage Journey



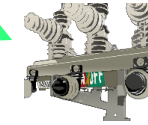
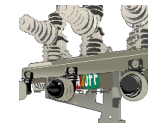
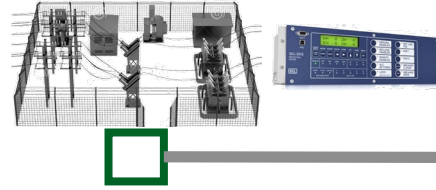
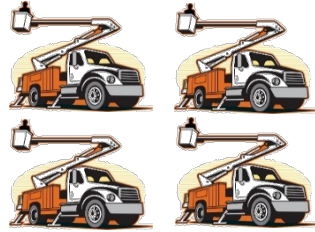
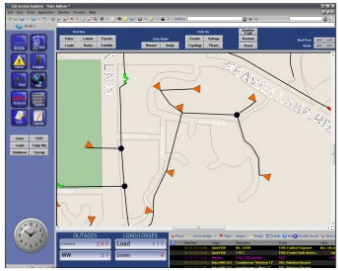
OPPD System Operators use intelligent field devices to restore customers remotely to intact parts of the distribution grid

# A Future Customer Outage Journey



OPPD System Operators use intelligent field devices to restore customers remotely to intact parts of the distribution grid

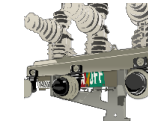
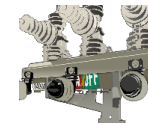
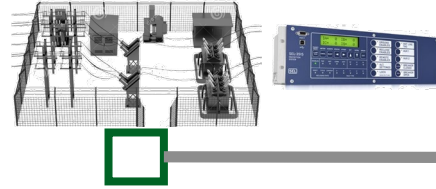
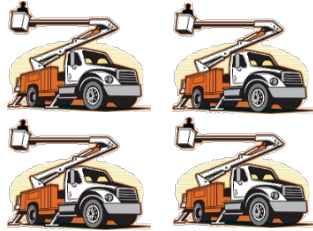
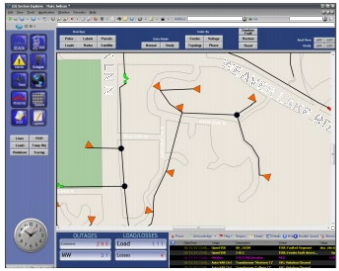
# A Future Customer Outage Journey



OPPD System Operators use intelligent field devices to restore customers remotely to intact parts of the distribution grid

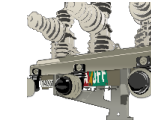
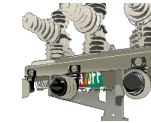
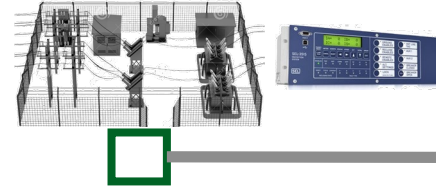
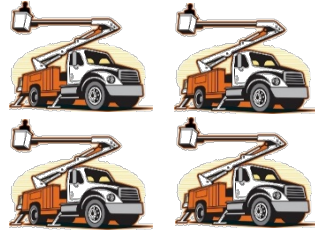
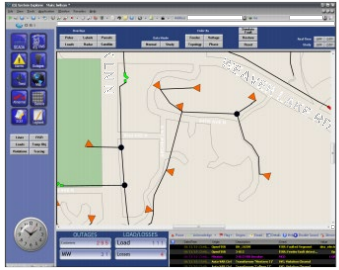


# A Future Customer Outage Journey



When the remote restoration is complete, the meter verifies the power is restored and customers are automatically notified

# A Future Customer Outage Journey



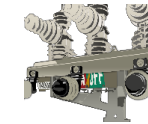
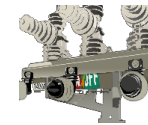
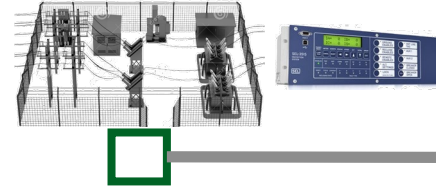
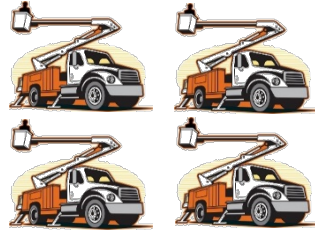
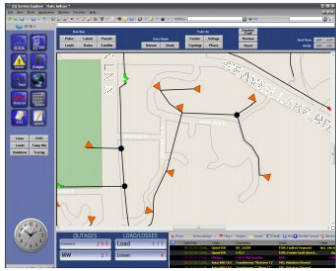
*"Your power has been restored"*



When the remote restoration is complete, the meter verifies the power is restored and customers are automatically notified

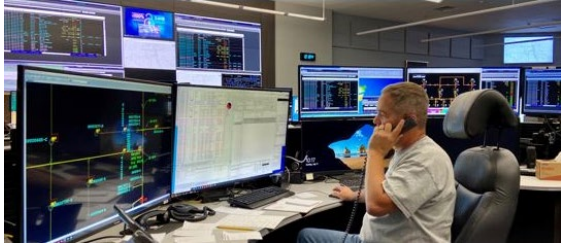
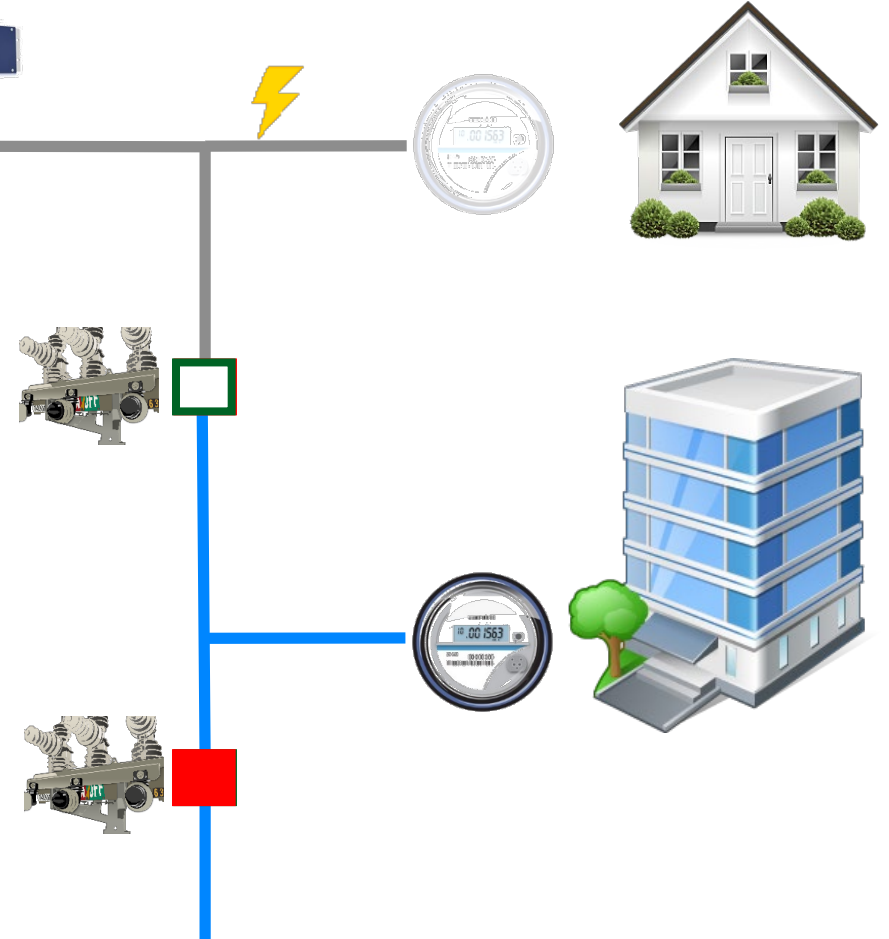
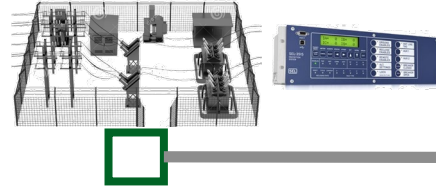
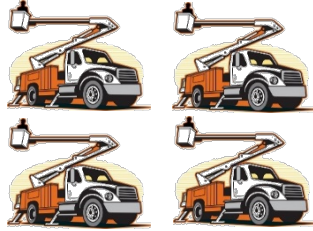
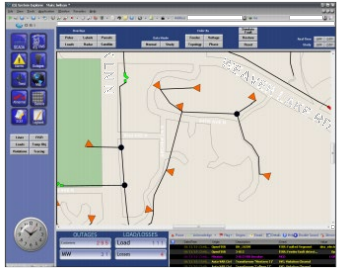
# A Future Customer Outage Journey

*"Your estimated restoration time is 2 PM"*



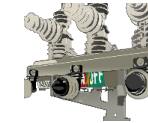
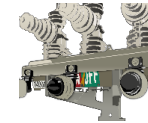
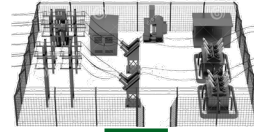
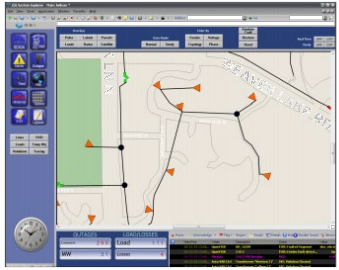
Customers who remain out are sent a personalized estimated time of restoration

# A Future Customer Outage Journey



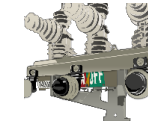
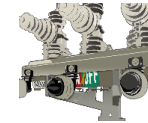
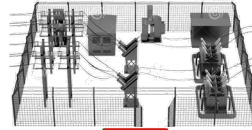
Using the GPS-enabled maps, the closest crews are routed to make repairs to remaining outages

# A Future Customer Outage Journey



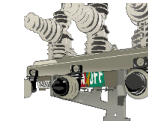
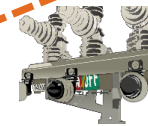
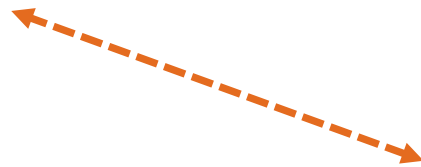
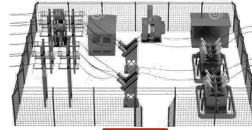
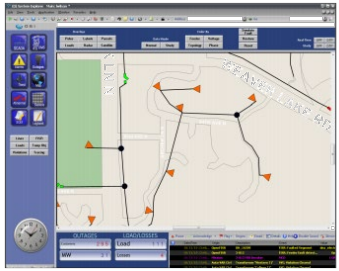
Using the GPS-enabled maps, the closest crews are routed to make repairs to remaining outages

# A Future Customer Outage Journey



Once repairs are made and the system can be safely energized, the meter verifies that power is restored and customers are automatically notified.

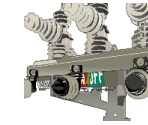
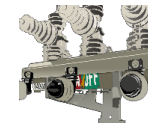
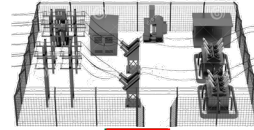
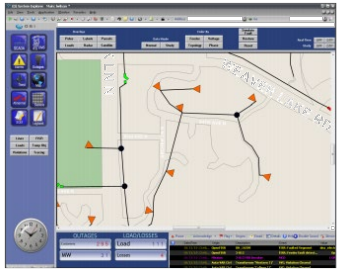
# A Future Customer Outage Journey



Once repairs are made and the system can be safely energized, the meter verifies that power is restored and customers are automatically notified.

# A Future Customer Outage Journey

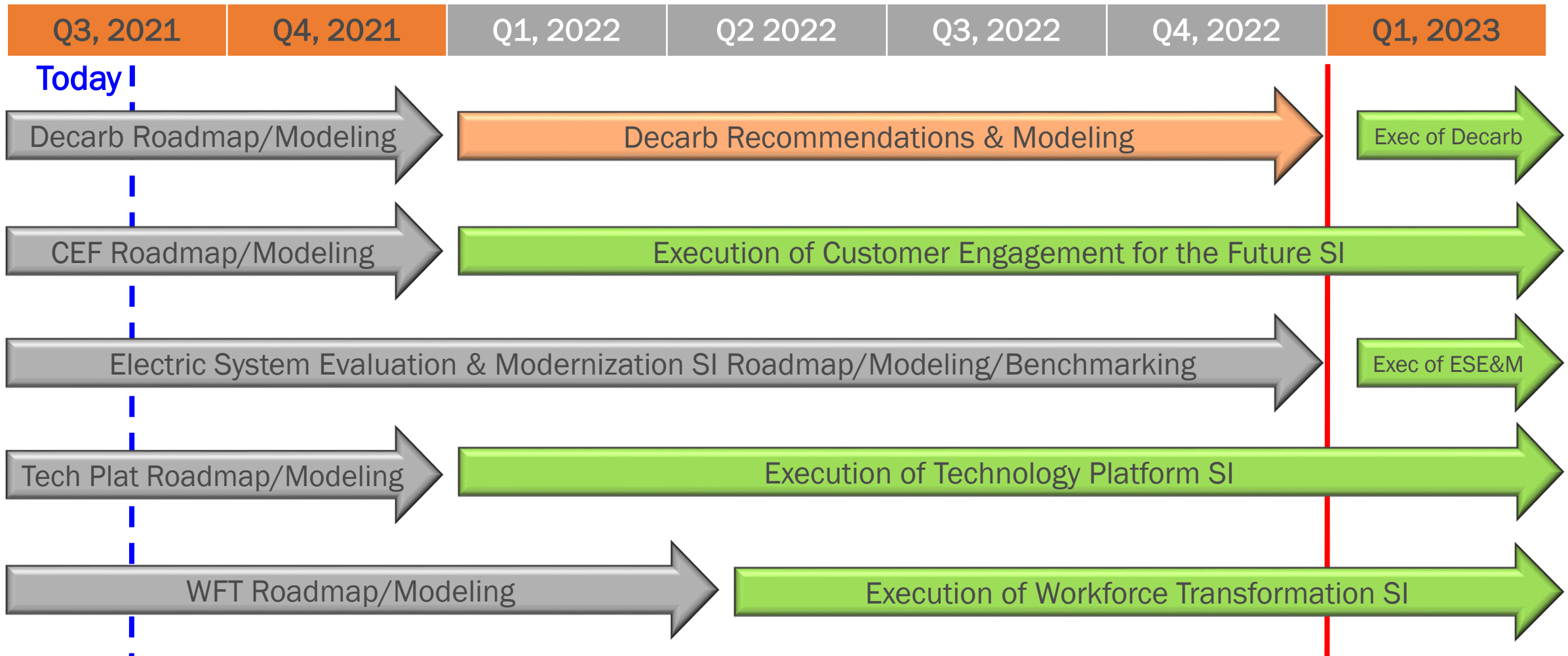
*"Your power has been restored"*



Once repairs are made and the system can be safely energized, the meter verifies that power is restored and customers are automatically notified.

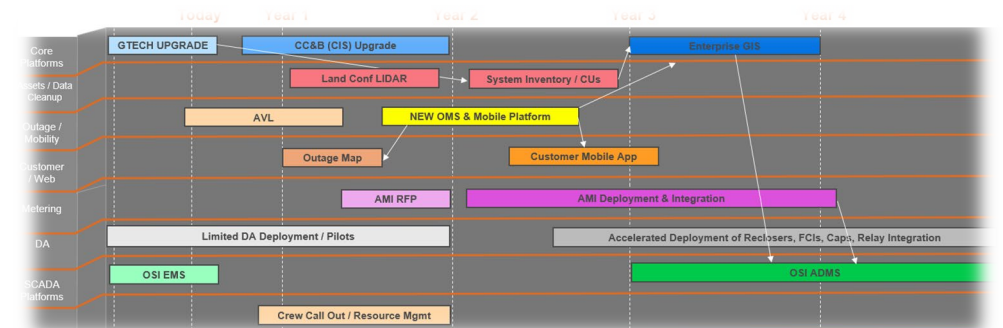


# Strategic Initiative Portfolio Overview



# Next Steps – Electric System Evaluation & Modernization SI

- Complete current state analysis across all capabilities
- Finalize the AMI business case numbers with our AMI consultant
- Continue cross SI and enterprise alignment
- Utility site visits (may be virtual)
- RFP & onboarding of consultant(s)
- Change management, education and outreach efforts
- Technology staging and implementation plans



# Questions

