EPIC-3, Project 3 Application of Advanced Metering Infrastructure (AMI) Data to Advanced Utility System Operations

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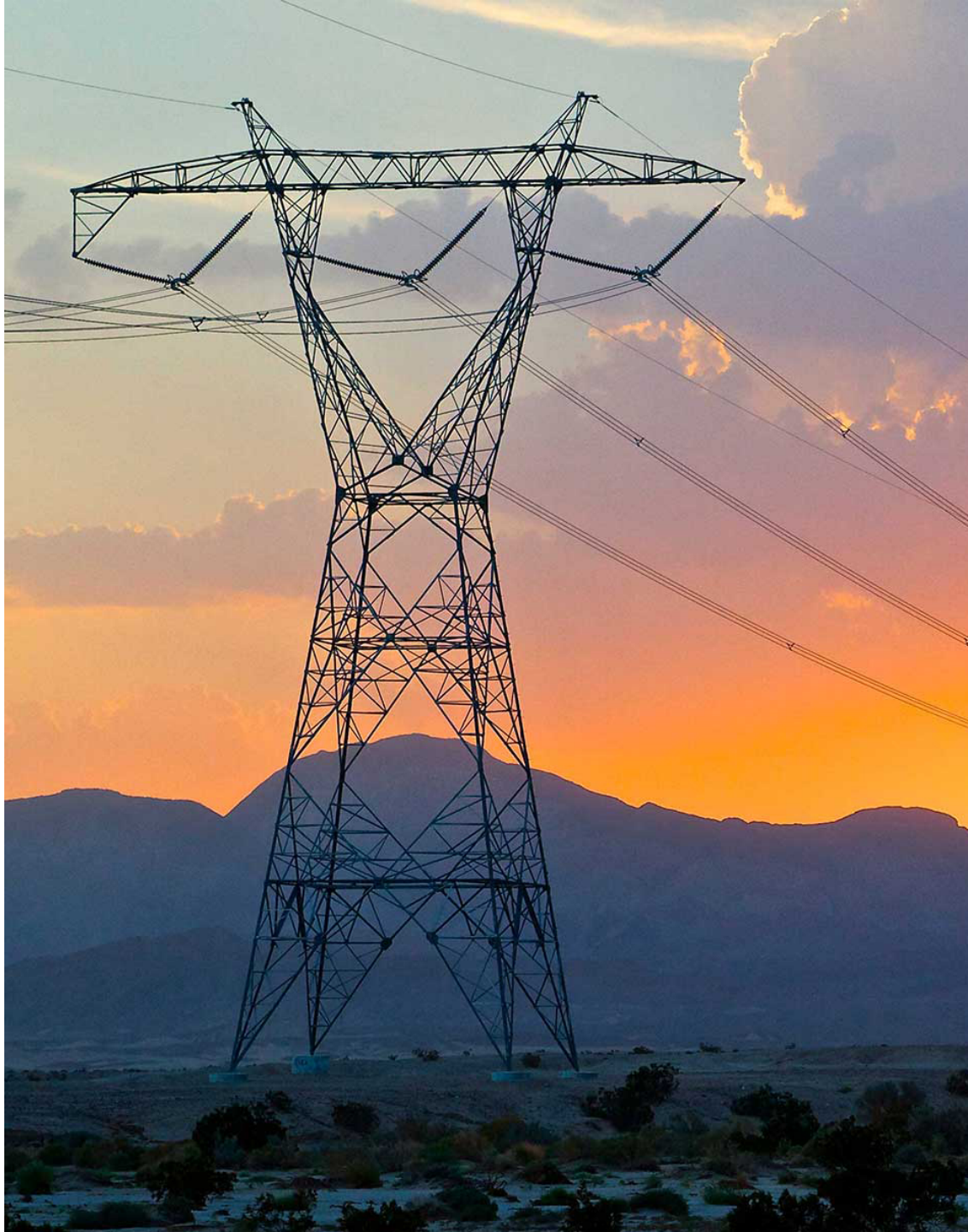

EPIC-3, Project 3 Objective

The Project Demonstrated and Evaluated Critical Capabilities:

1) The AMI system as a voltage sensor network
2) The AMI system as a phase identification and meter to transformer mapping tool for leveraging SDG&E's AMI system with its 1.4 million endpoints to provide actionable secondary voltage data and analysis to SDG&E and other prospective users

Principal Project Focus Areas:

1) Use the AMI system as a voltage sensor network, to translate secondary voltages that can then be used in operation or planning tools
2) Evaluate alternative methods based on available AMI data to identify phasing information of each distribution segment, load and customer

Benefit Areas:

1) Safer and more efficient operation practices resulting in better power quality for every customer

2) Improved reliability and resiliency

3) Reduced operating cost

Module 1

Voltage Sensor Network (with related phasing ID effort)

Module 2

Phase Identification/Meter to Transformer Mapping

Module 1 – Voltage Sensor Network

Demonstrate algorithms for leveraging existing AMI infrastructure to provide a foundational and reliable secondary voltage monitoring network solution

- Utility PV Inverter Study
- Planning Model Anomaly Detection Tool
- Meter-to-Transformer Mapping
- Phase Identification
- SDG&E feeders on Advanced Distribution Management System (ADMS) test bed to evaluate AMI-based algorithms
- Co-funded through CRADA with NREL and SDG&E EPIC funds

Module 2 – Phase Identification and M2T

- Using an analytical, data-based approach, identify end point phasing and meter to transformer (M2T) mapping using interval data from two meters per transformer
- Clustering algorithms iteratively applied to time series data
- Algorithm tuning
- Verified results with known source (field verification)

Use Case	Accuracy Range
Phase Identification	83% - 98%
Meter-to-Transformer	*65% - 89%*