GRIDMOD

The Great Energy Transition: ATCO's Journey in Implementing an ADMS system

CIGRE 2022

ATCO

Today's Outline

01. RFP - Start of the Journey

02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A

Today's Outline

01. RFP - Start of the Journey

02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A

RFP – Start of the Journey

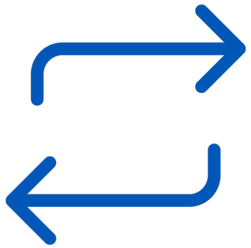
Tendering & RFP Aspects to Consider

T&D Operation alignment

Vendor project execution capacity & capability

Vendor Technology maturity & roadmap

Utility Ops Support bench strength



Change Impact

Today's Outline

01. RFP - Start of the Journey

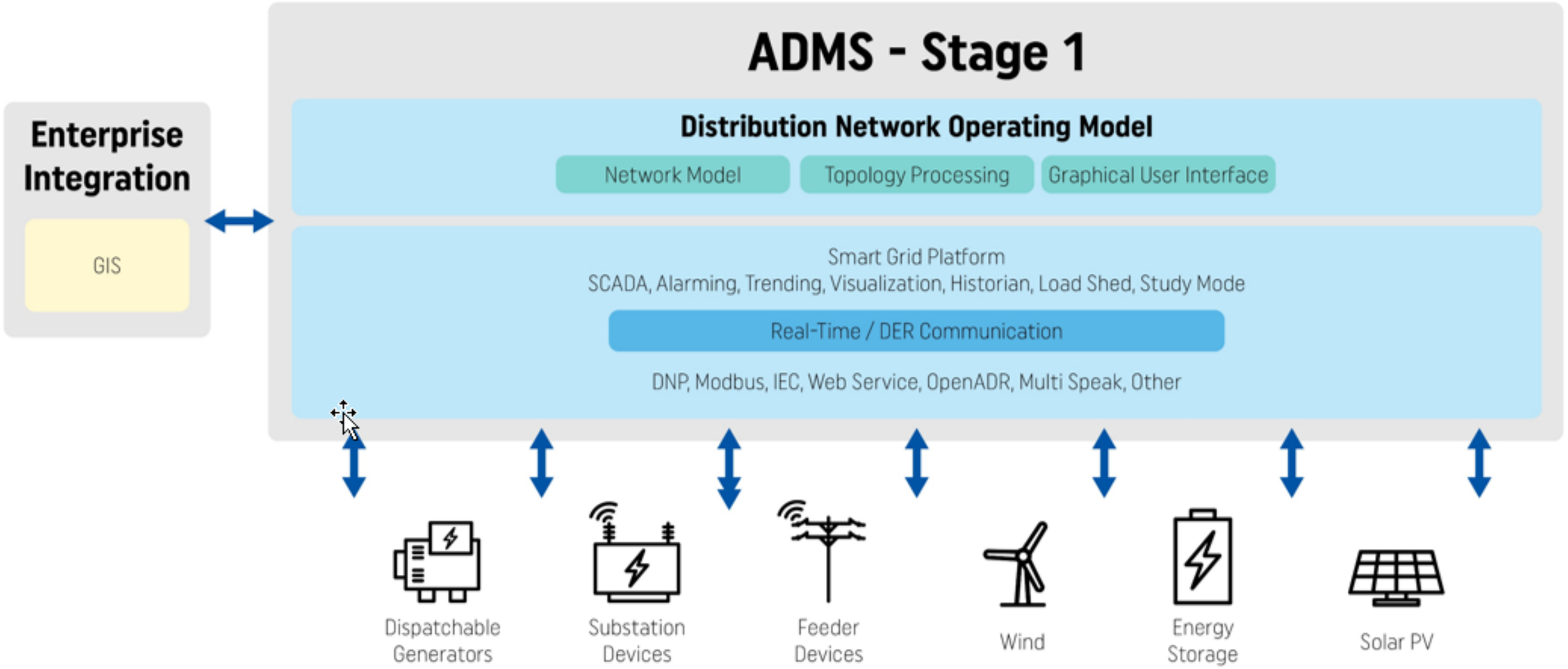
02. Execution Approach

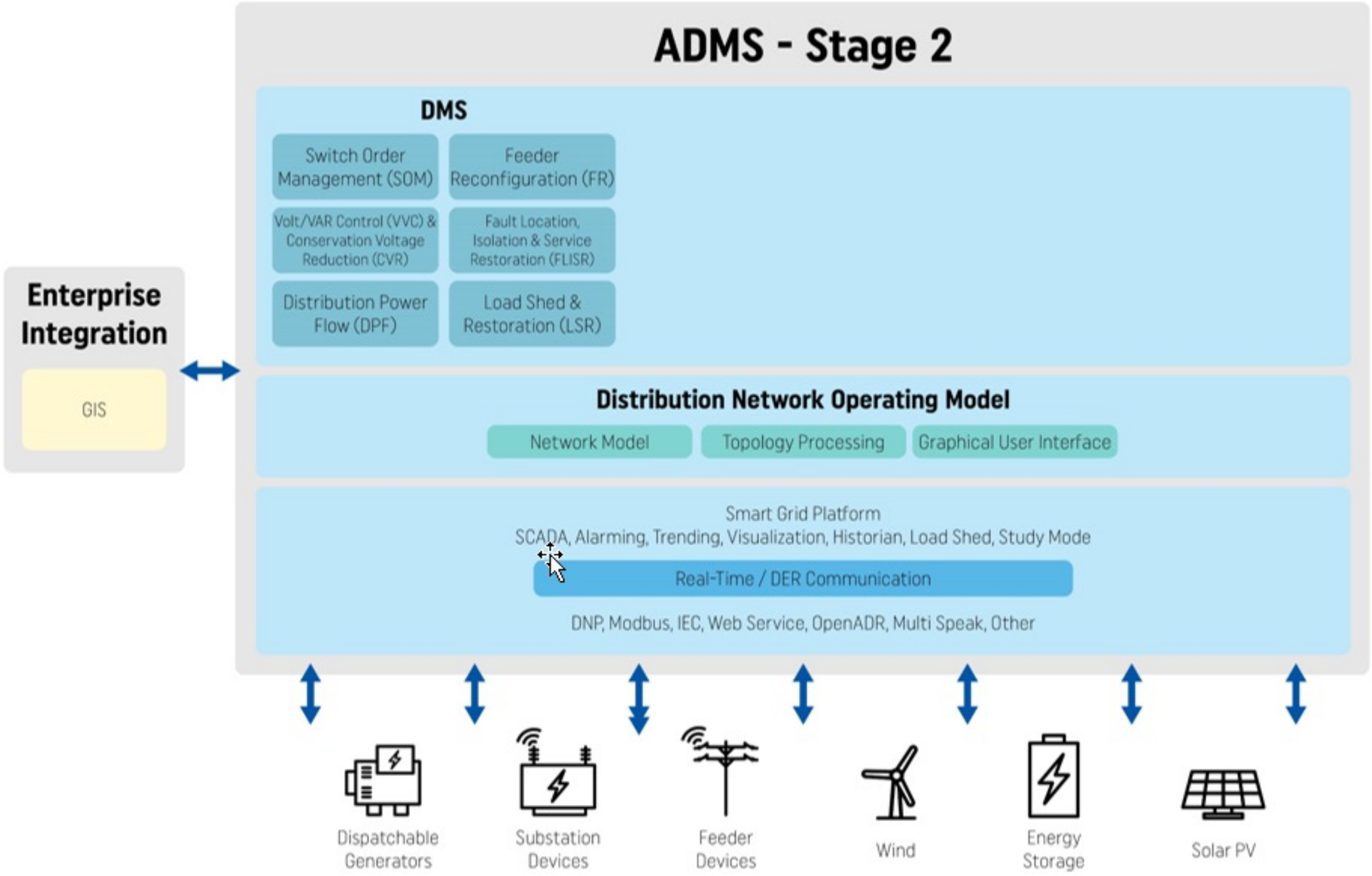
03. Data Sources

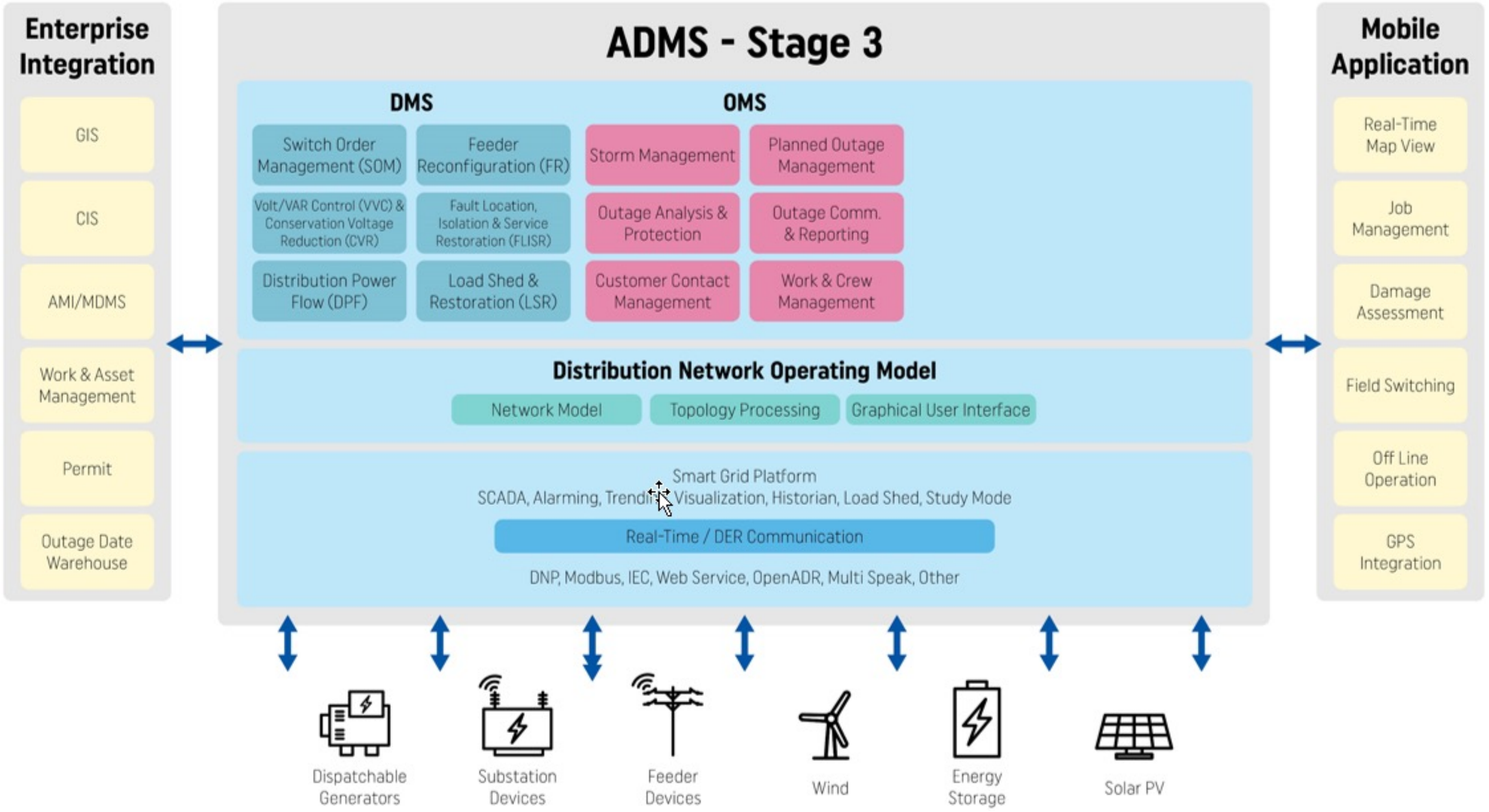
04. Challenges, Benefits & Lessons

05. Looking Ahead

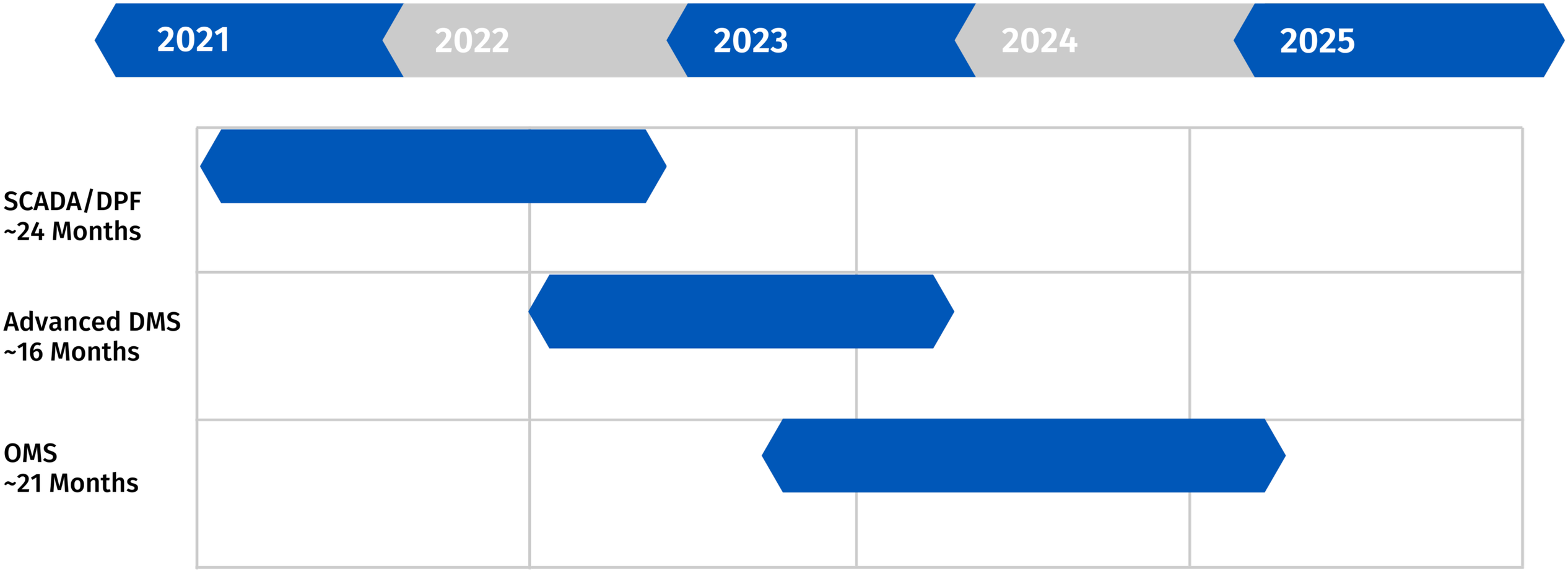
06. Q & A


ADMS - Stage 1
Enterprise Integration
GIS
Distribution Network Operating Model
Network Model
Topology Processing
Graphical User Interface
Smart Grid Platform
SCADA, Alarming, Trending, Visualization, Historian, Load Shed, Study Mode
Real-Time / DER Communication
DNP, Modbus, IEC, Web Service, OpenADR, Multi Speak, Other
Dispatchable Generators
Substation Devices
Feeder Devices
Wind
Energy Storage
Solar PV

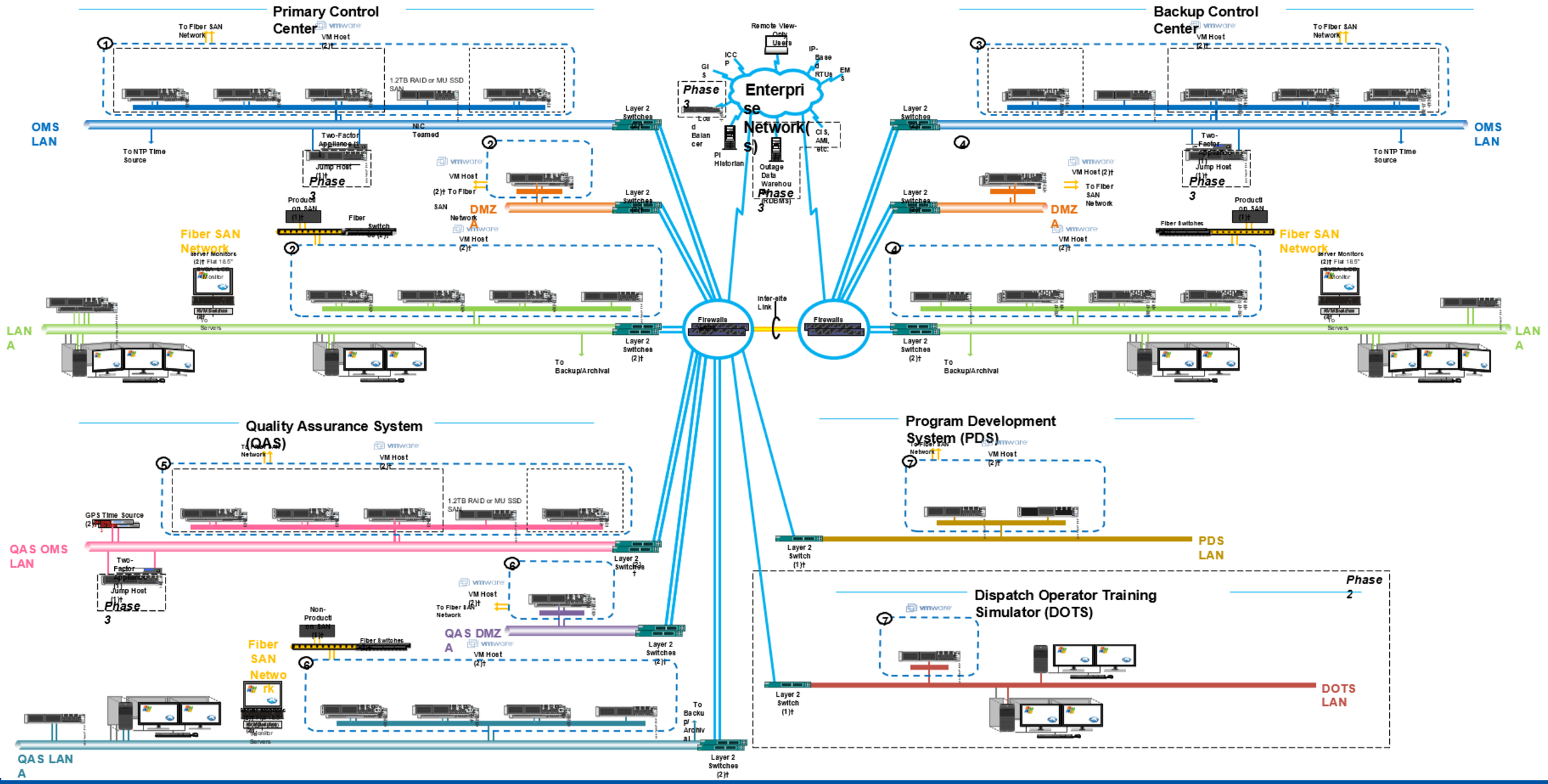

ADMS - Stage 2
DMS
Switch Order Management (SOM)
Feeder Reconfiguration (FR)
Volt/VAR Control (VVC) & Conservation Voltage Reduction (CVR)
Fault Location, Isolation & Service Restoration (FLISR)
Distribution Power Flow (DPF)
Load Shed & Restoration (LSR)
Enterprise Integration
GIS
Distribution Network Operating Model
Network Model
Topology Processing
Graphical User Interface
Smart Grid Platform
SCADA, Alarming, Trending, Visualization, Historian, Load Shed, Study Mode
Real-Time / DER Communication
DNP, Modbus, IEC, Web Service, OpenADR, Multi Speak, Other
Dispatchable Generators
Substation Devices
Feeder Devices
Wind
Energy Storage
Solar PV


Enterprise Integration
GIS
CIS
AMI/MDMS
Work & Asset Management
Permit
Outage Date Warehouse
ADMS - Stage 3
DMS
OMS
Switch Order Management (SOM)
Feeder Reconfiguration (FR)
Storm Management
Planned Outage Management
Volt/VAR Control (VVC) & Conservation Voltage Reduction (CVR)
Fault Location, Isolation & Service Restoration (FLISR)
Outage Analysis & Protection
Outage Comm. & Reporting
Distribution Power Flow (DPF)
Load Shed & Restoration (LSR)
Customer Contact Management
Work & Crew Management
Distribution Network Operating Model
Network Model
Topology Processing
Graphical User Interface
Smart Grid Platform
SCADA, Alarming, Trending, Visualization, Historian, Load Shed, Study Mode
Real-Time / DER Communication
DNP, Modbus, IEC, Web Service, OpenADR, Multi Speak, Other
Mobile Application
Real-Time Map View
Job Management
Damage Assessment
Field Switching
Off Line Operation
GPS Integration
Dispatchable Generators
Substation Devices
Feeder Devices
Wind
Energy Storage
Solar PV

ADMS Program Schedule Highlights



ATCO ADMS System Configuration Diagram



Today's Outline

01. RFP - Start of the Journey

02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A

Key Data Sources for ADMS

Source & Data Considerations

01

GIS

- Feeder Topology
- Device Data

02

Substation One Lines

- Migrate from EMS
- Embedded in GIS
- Manually drawn

03

Customer Information System

- Customer meter to transformer relationship
- Customer report outages

04

CYME

- Electrical engineer data

Key Data Sources for ADMS

Source & Data Considerations

01

SCADA

- Distribution Automation SCADA data from field
- Transmission SCADA data from EMS

02

AMI/MDM

- Outage related data
- Interval load/generation data
- Voltage data

03

Maximo

- Work order management
- Workforce dispatch

Today's Outline

01. RFP - Start of the Journey

02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A

Anticipated Technical Challenges

01

Radial Distribution Power Flow (DPF)

Foundational application required for other applications

- Stitching substation models to feeder models
- Reconciliation of mismatches in GIS data accuracy and completeness
- Multiple data sources (GIS, CYME, etc.)
- Load profile sources and details
- Convergence criteria

Anticipated Technical Challenges

01

Switch Order Management

- Substantial configuration of forms, workflows and processes
- DPF dependence

02

Fault Location Isolation & Service Restoration (FLISR)

- Application validation & testing
- DPF dependence
- Field device data visibility

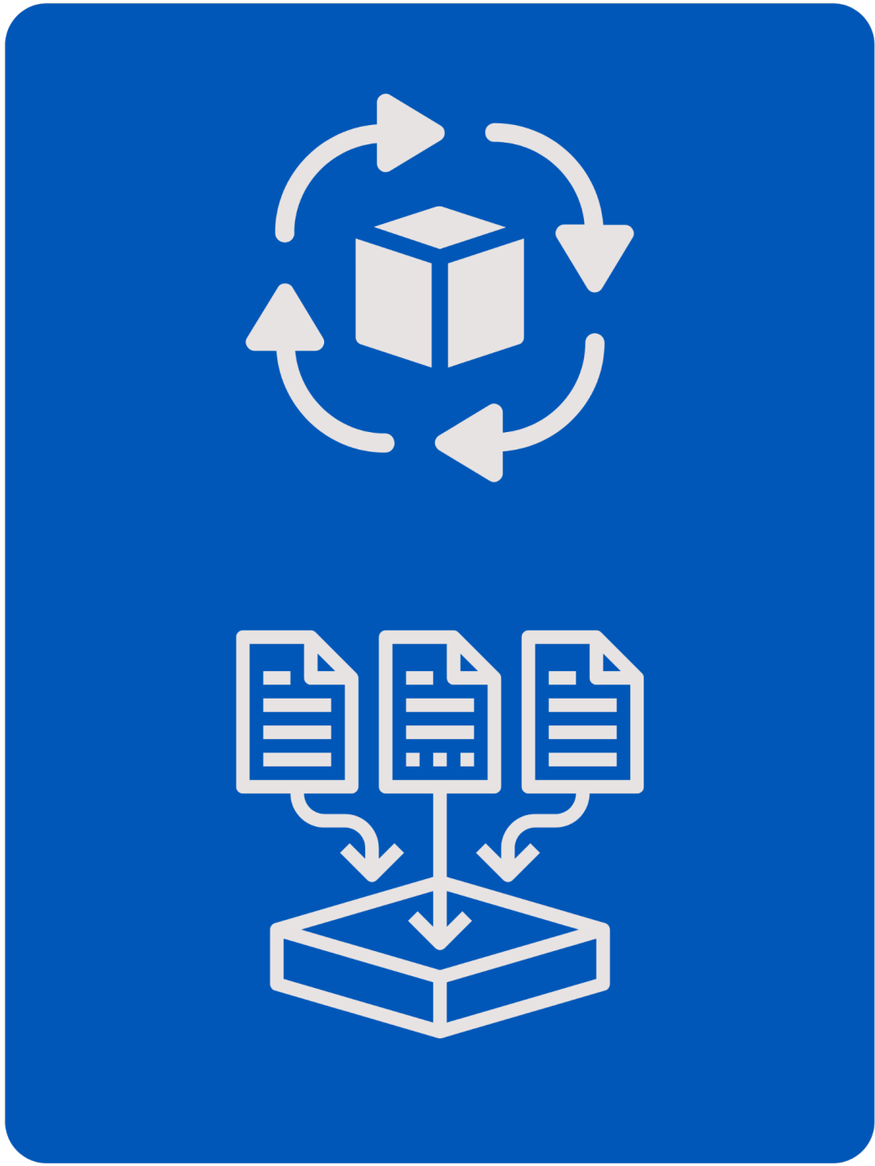
03

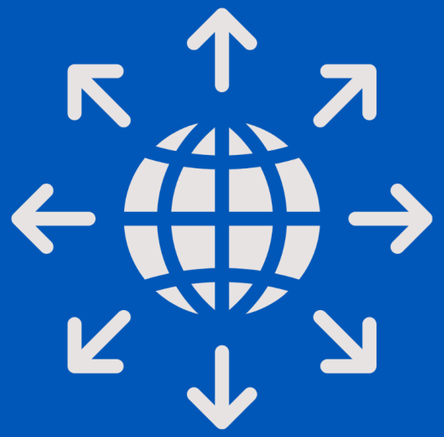
OMS Replacement

- Existing OMS system
- Existing OMS-IT integration
- New IT/OT integration

Other General Challenges

- New business processes
- Vendor accountabilities
- Product technology maturity & standardization
- Supply chain
- Competing for resources with other programs





Benefits

- Improved headend system reliability
- Improved visibility and control
- Rules based to model driven solution
- Forward looking operation
- CIP compliance readiness
- Future ready

ATCO Lessons Learned

- Dedicated continuity vendor resources
- Solid understanding of client responsibilities
- Significant internal SME involvements
- Rapid issue escalation
- Task level cutover plan & execution

- GIS derived model is critical
- Phase approach minimize risks
- Be aware of scope crepe
- Strategic deferrals may be considered
- Don't underestimate business change management

Today's Outline

01. RFP - Start of the Journey

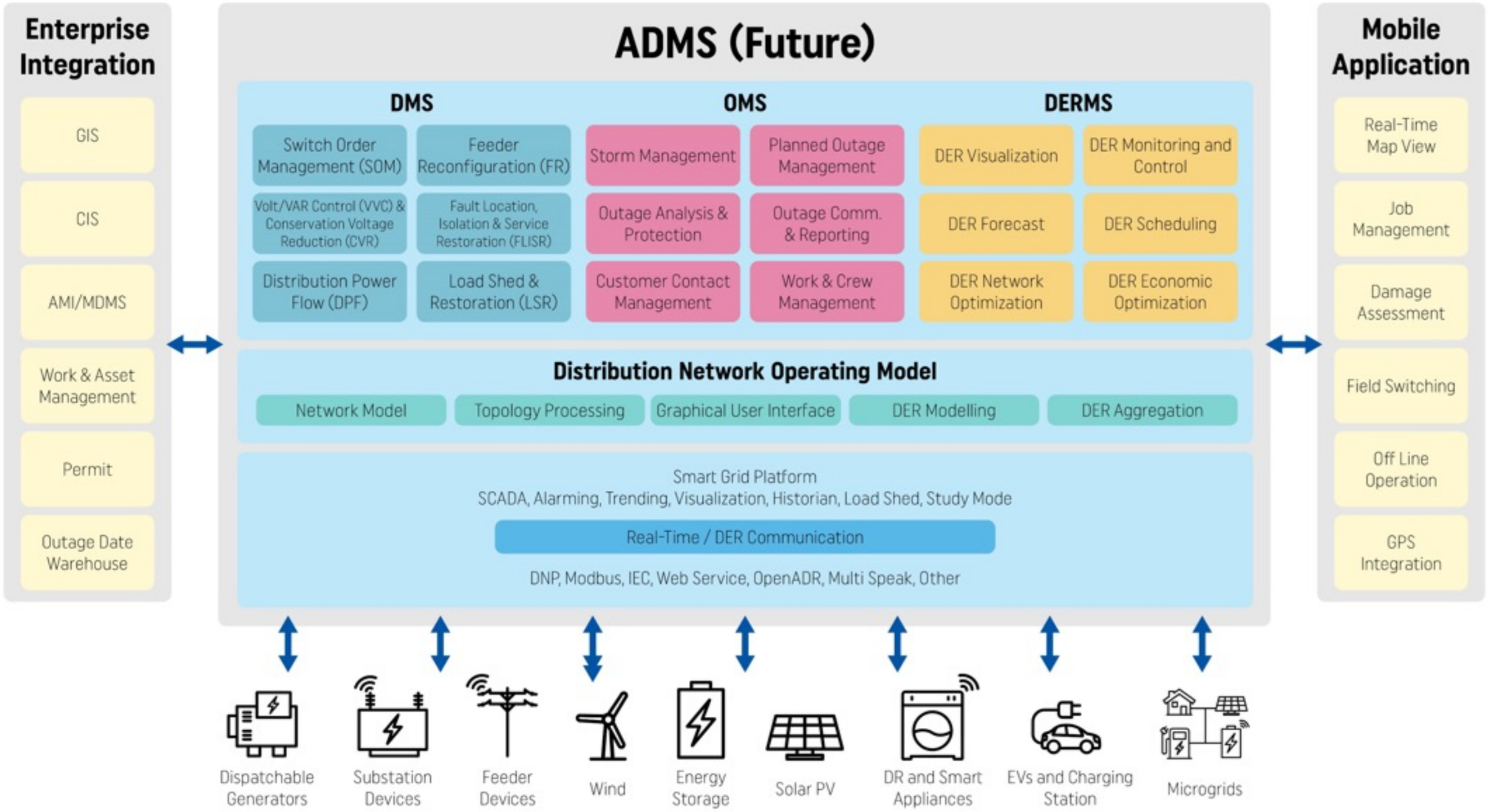
02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A


Enterprise Integration
GIS
CIS
AMI/MDMS
Work & Asset Management
Permit
Outage Date Warehouse
ADMS (Future)
DMS
Switch Order Management (SOM)
Feeder Reconfiguration (FR)
Volt/VAR Control (VVC) & Conservation Voltage Reduction (CVR)
Fault Location, Isolation & Service Restoration (FLISR)
Distribution Power Flow (DPF)
Load Shed & Restoration (LSR)
OMS
Storm Management
Planned Outage Management
Outage Analysis & Protection
Outage Comm. & Reporting
Customer Contact Management
Work & Crew Management
DERMS
DER Visualization
DER Monitoring and Control
DER Forecast
DER Scheduling
DER Network Optimization
DER Economic Optimization
Distribution Network Operating Model
Network Model
Topology Processing
Graphical User Interface
DER Modelling
DER Aggregation
Smart Grid Platform
SCADA, Alarming, Trending, Visualization, Historian, Load Shed, Study Mode
Real-Time / DER Communication
DNP, Modbus, IEC, Web Service, OpenADR, Multi Speak, Other
Mobile Application
Real-Time Map View
Job Management
Damage Assessment
Field Switching
Off Line Operation
GPS Integration
Dispatchable Generators
Substation Devices
Feeder Devices
Wind
Energy Storage
Solar PV
DR and Smart Appliances
EVs and Charging Station
Microgrids

Today's Outline

01. RFP - Start of the Journey

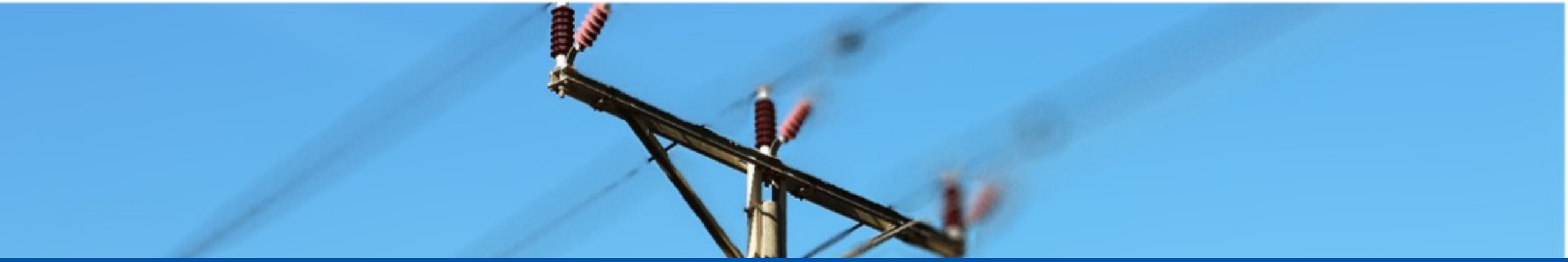
02. Execution Approach

03. Data Sources

04. Challenges, Benefits & Lessons

05. Looking Ahead

06. Q & A



Thank you