

Building a Roadmap for a Successful Grid Modernization Strategy

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Agenda

- What is Grid Modernization?
- Why is Grid Modernization Needed?
- Grid Modernization Roadmap Process
- Lessons Learned & Key Benefits
- Q&A

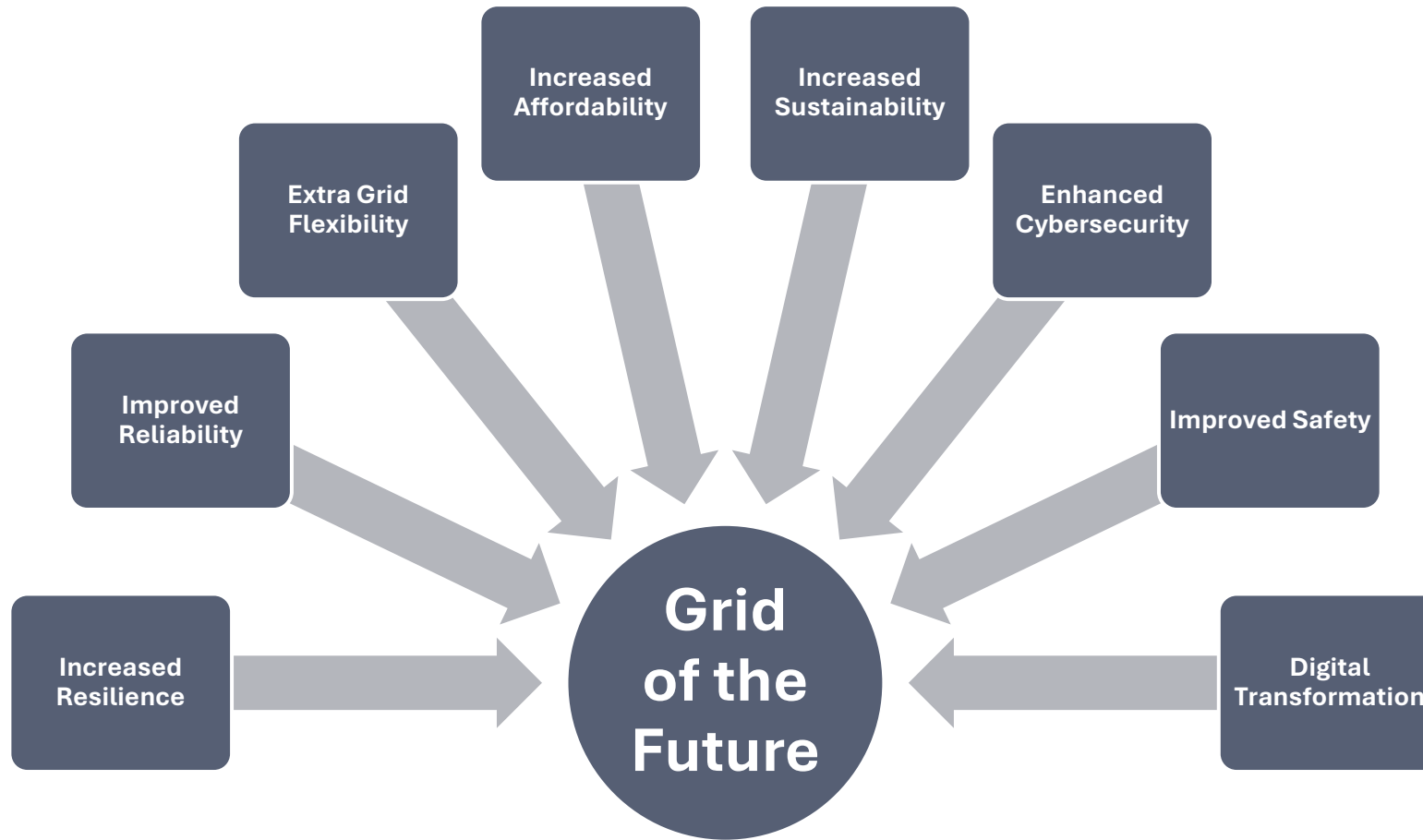


What is Grid Modernization?



What is Grid Modernization?

Improvement Needed for the Future



What is Grid Modernization?

Common Activities

**Grid Scale
Energy Storage**

**Managing Aging
Infrastructure**

**Modern Power
Electronics**

Adaptive Networks

**Implementing
Advanced
Technologies**

**Intelligent
Communications
& Control Systems**

**Robust Data
Analytics**

**High Voltage
Direct Current
(HVDC)**

**Flexible Alternating
Current
Transmission
Systems (FACTS)**

**Advanced
Protection,
Control, & Grid
Management**

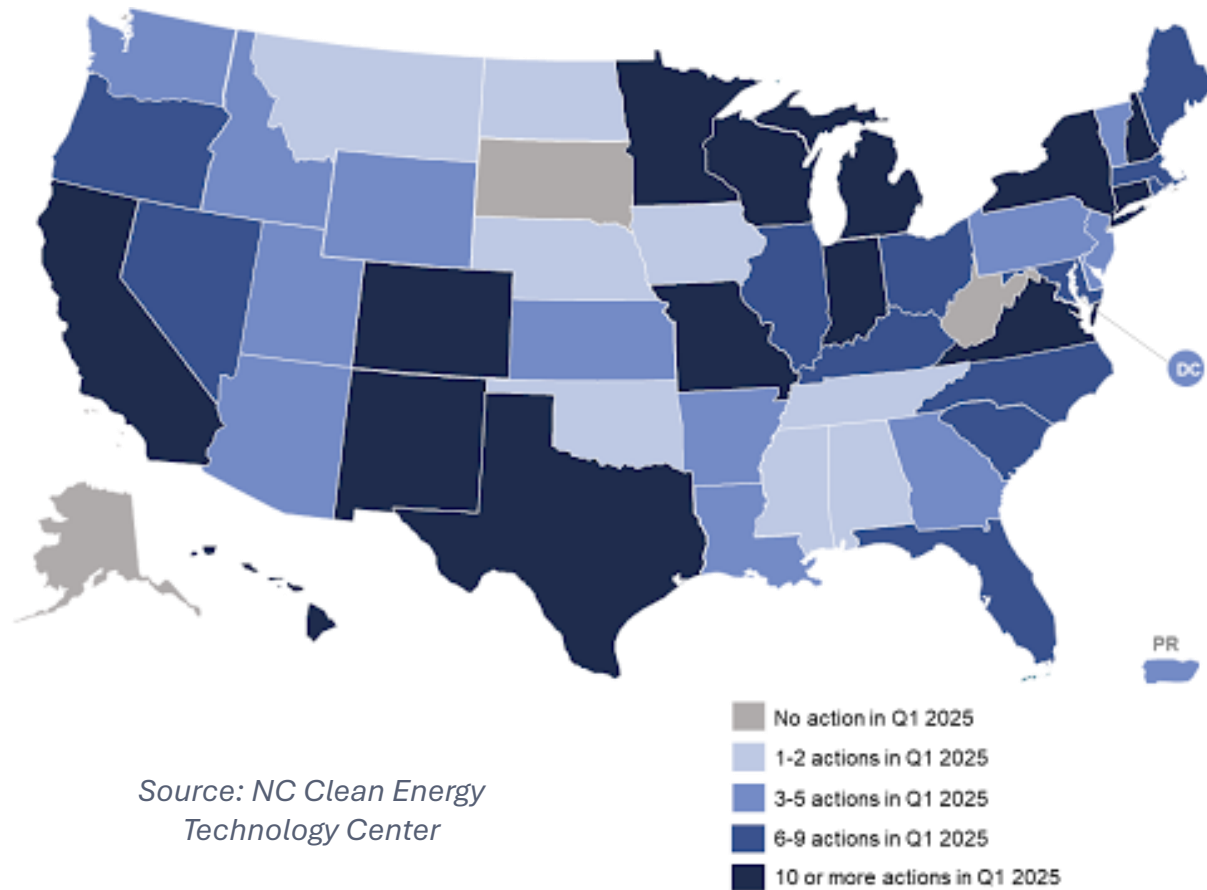
**Energy-Efficient
Load Management**

**Grid Enhancing
Technologies
(GETs)**



What is Grid Modernization?

Increased Activity Across the US

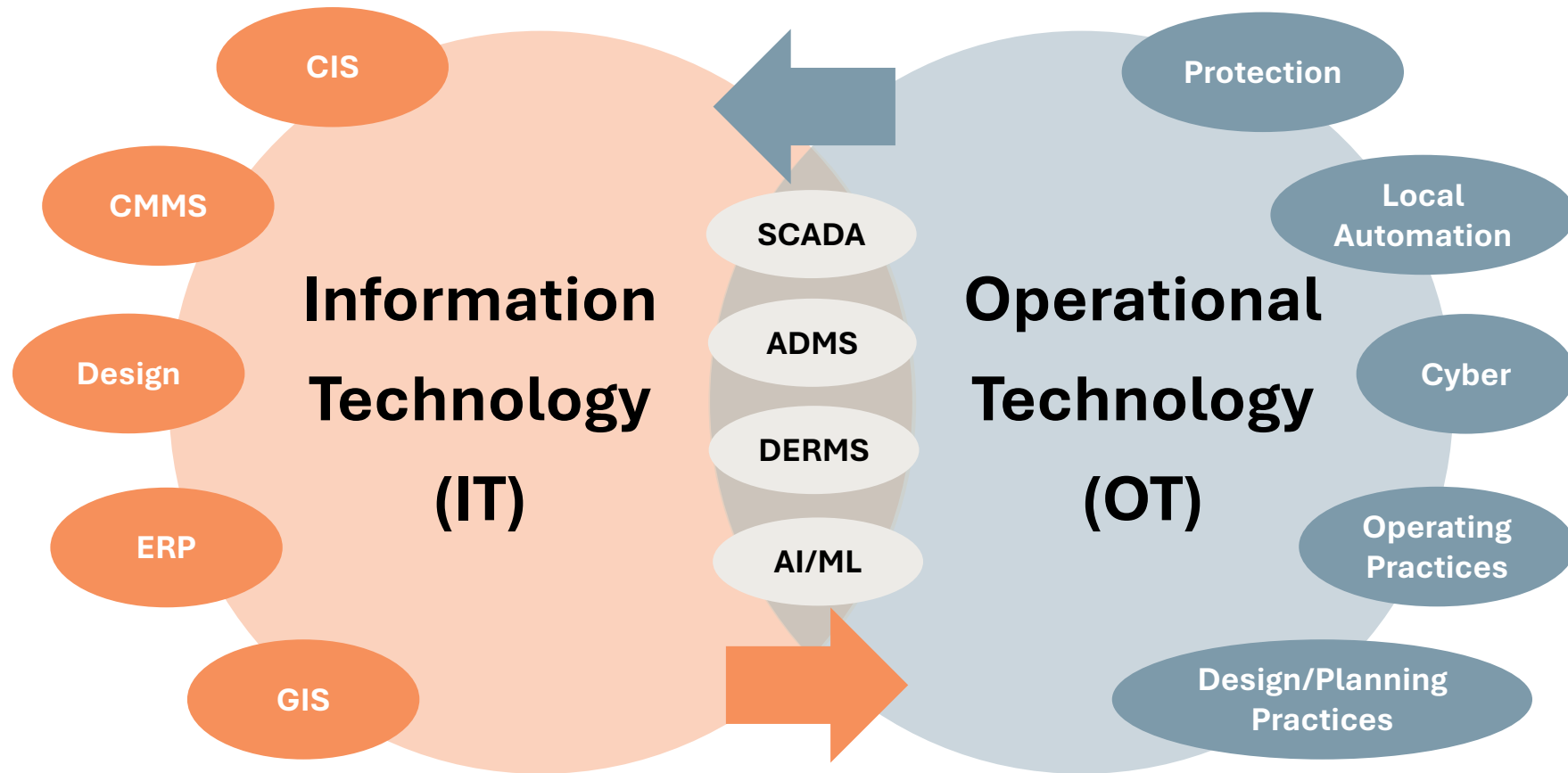


Popular choices included energy storage deployment, interconnection rules, smart grid deployment, and miscellaneous utility business model reforms.



What is Grid Modernization?

Key Challenge



Why is Grid Modernization Needed?



Why is Grid Modernization Needed?

Market Drivers: Changes at All Levels

Production

A few large power plants



Many small producers & BESS

Market

Centralized and mostly national



Decentralized, no boundaries

Transmission

Large AC power lines



Includes small scale & HVDC

Distribution

One direction flow



Bi-directional flow

Consumers

Passive, only paying

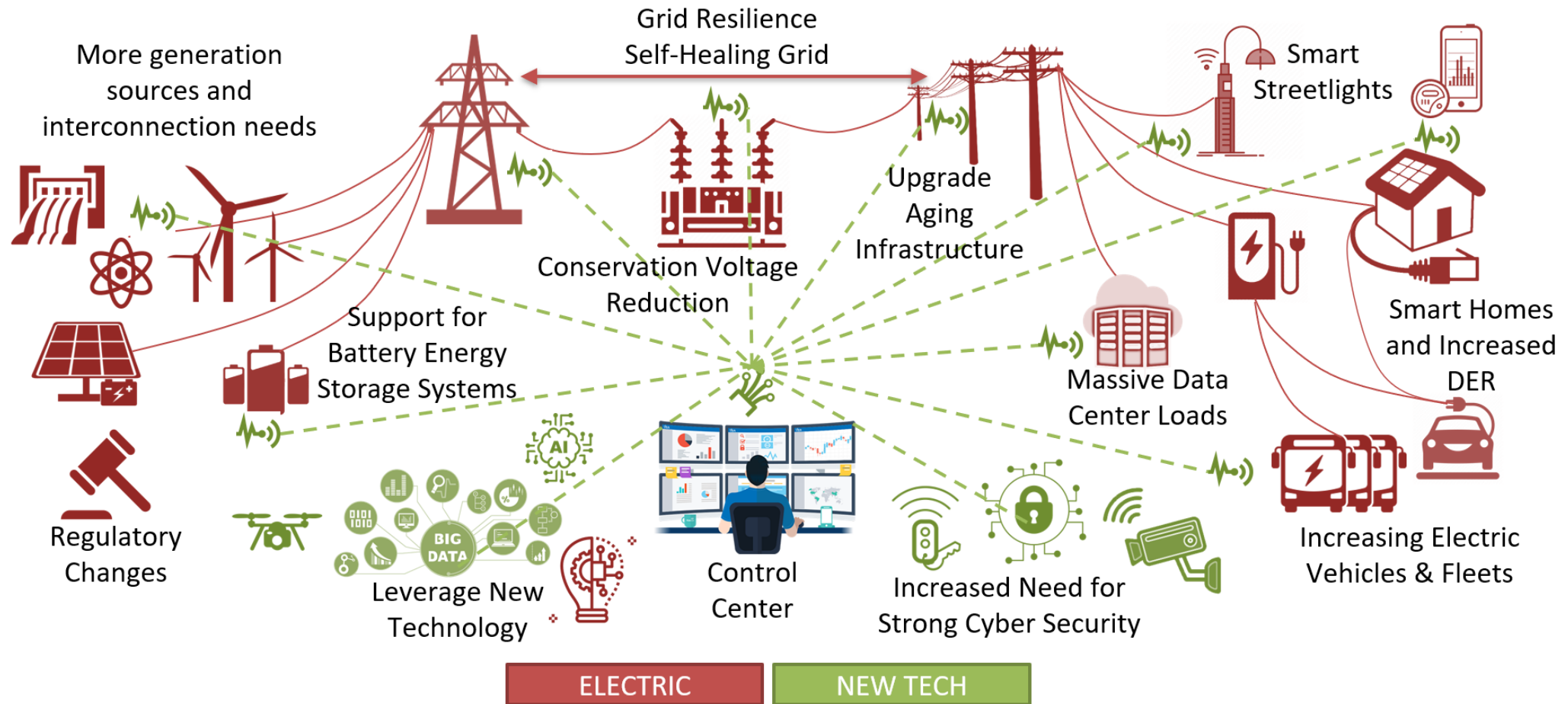


Active, participating in the system



Why is Grid Modernization Needed?

IT & OT Convergence

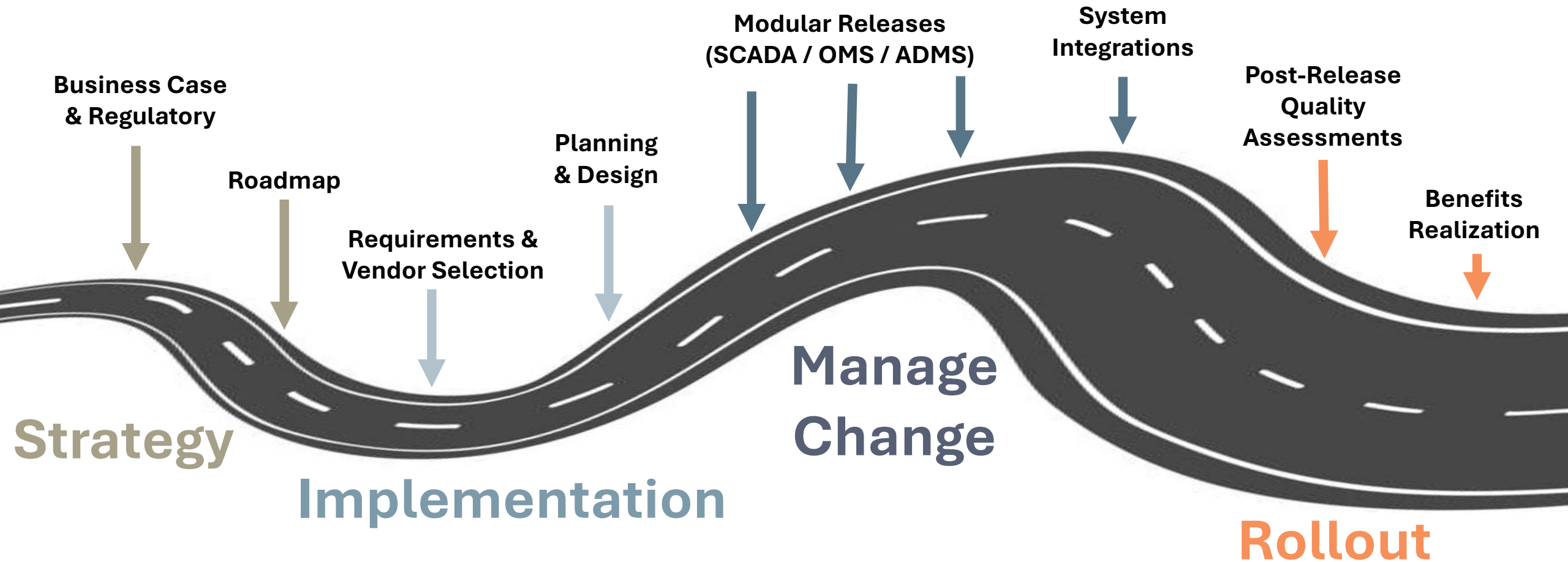


Grid Modernization Roadmap Process



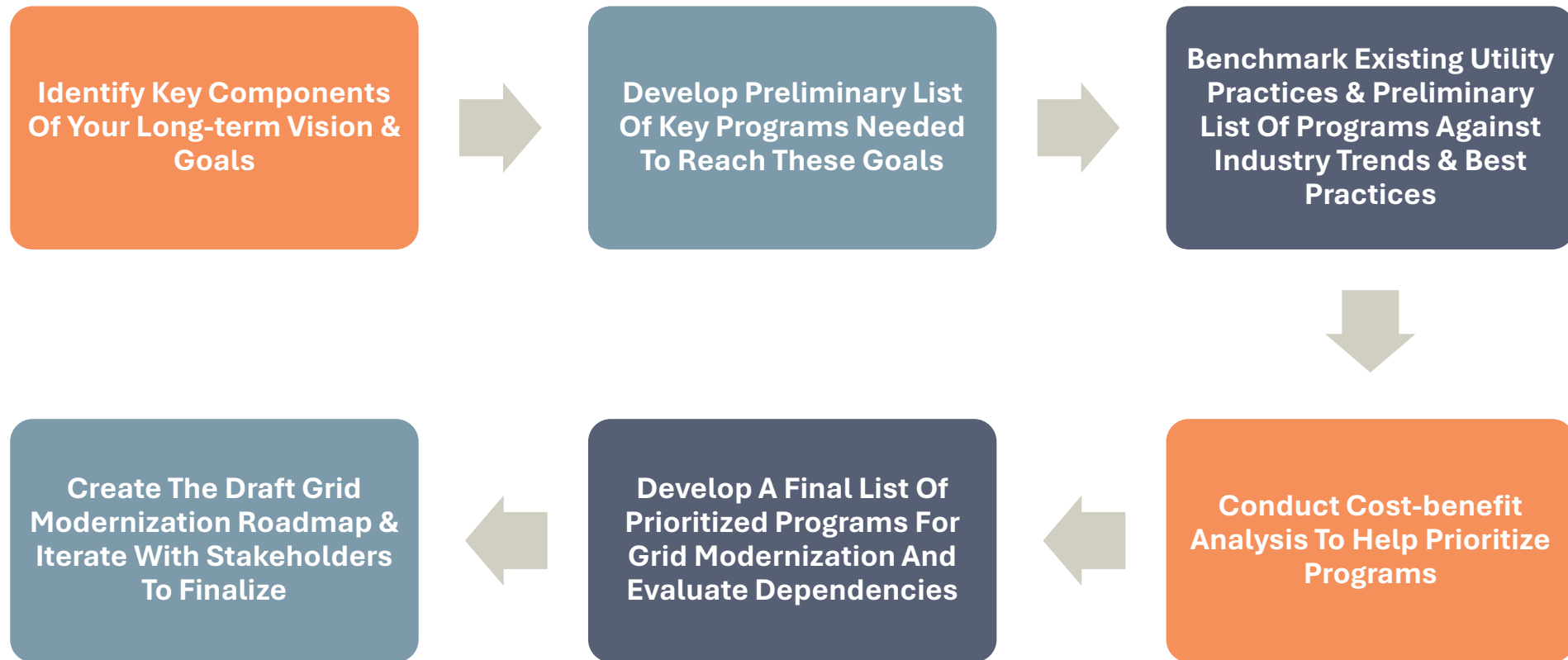
Grid Modernization Roadmap Process

Real World Use Cases



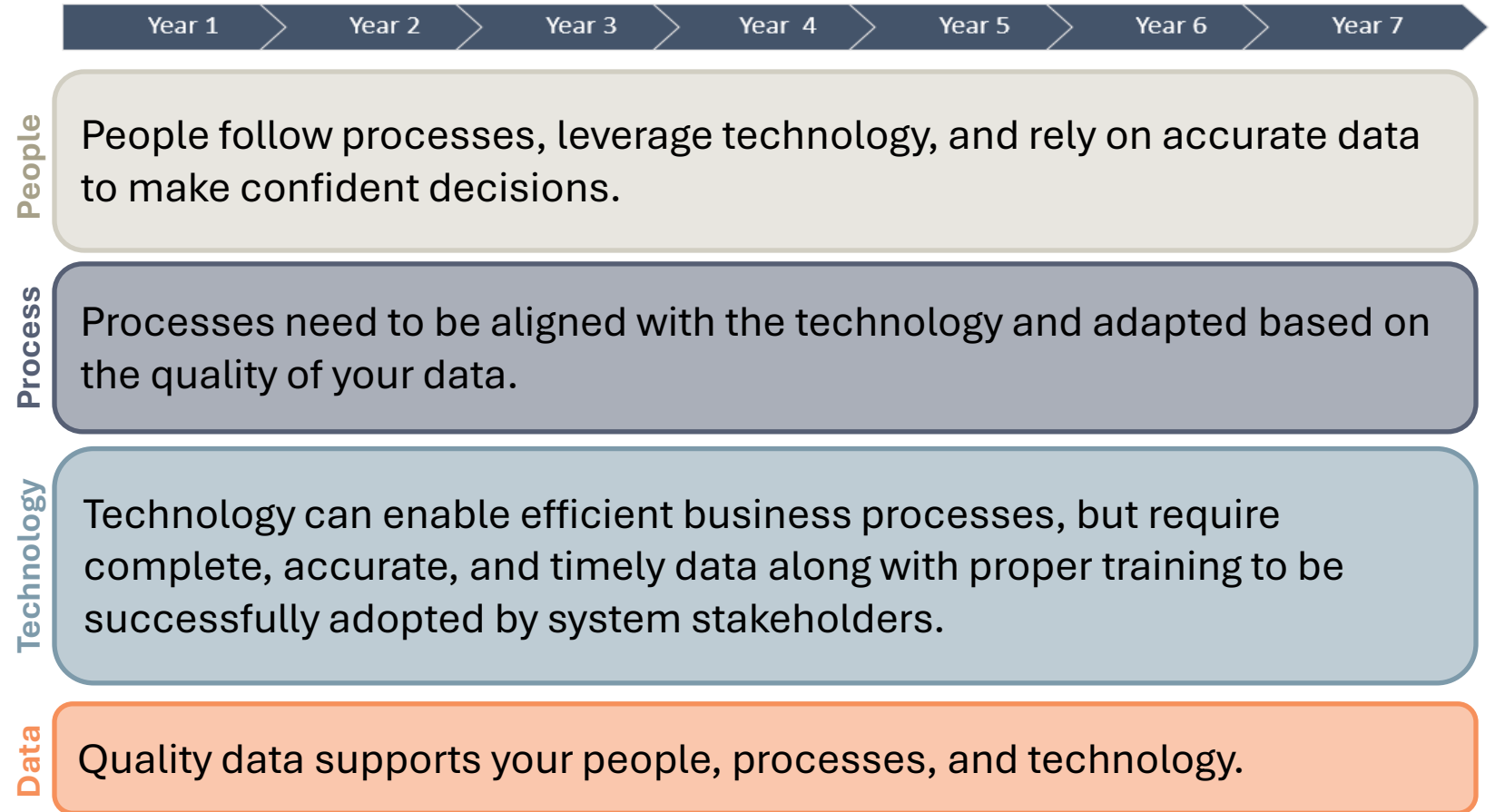
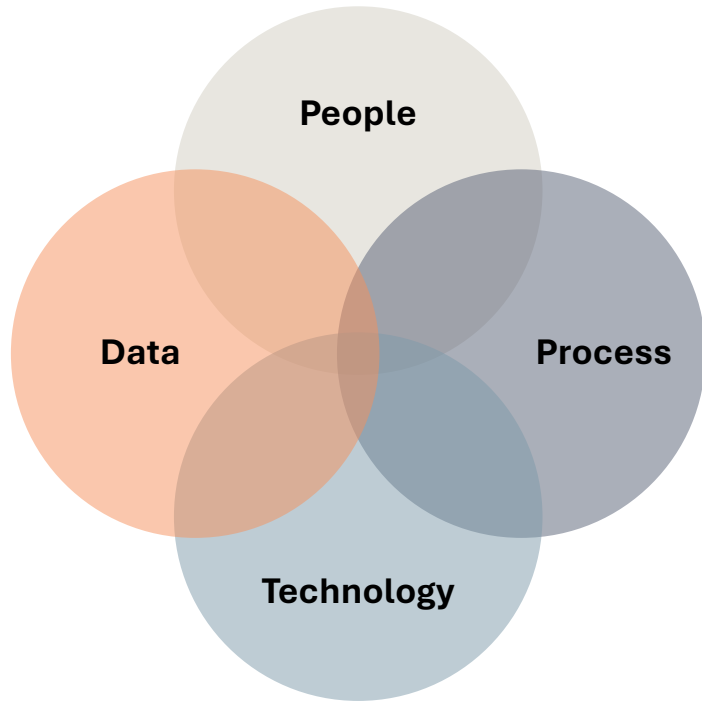
Grid Modernization Roadmap Process

Typical Process is 3-6 Months



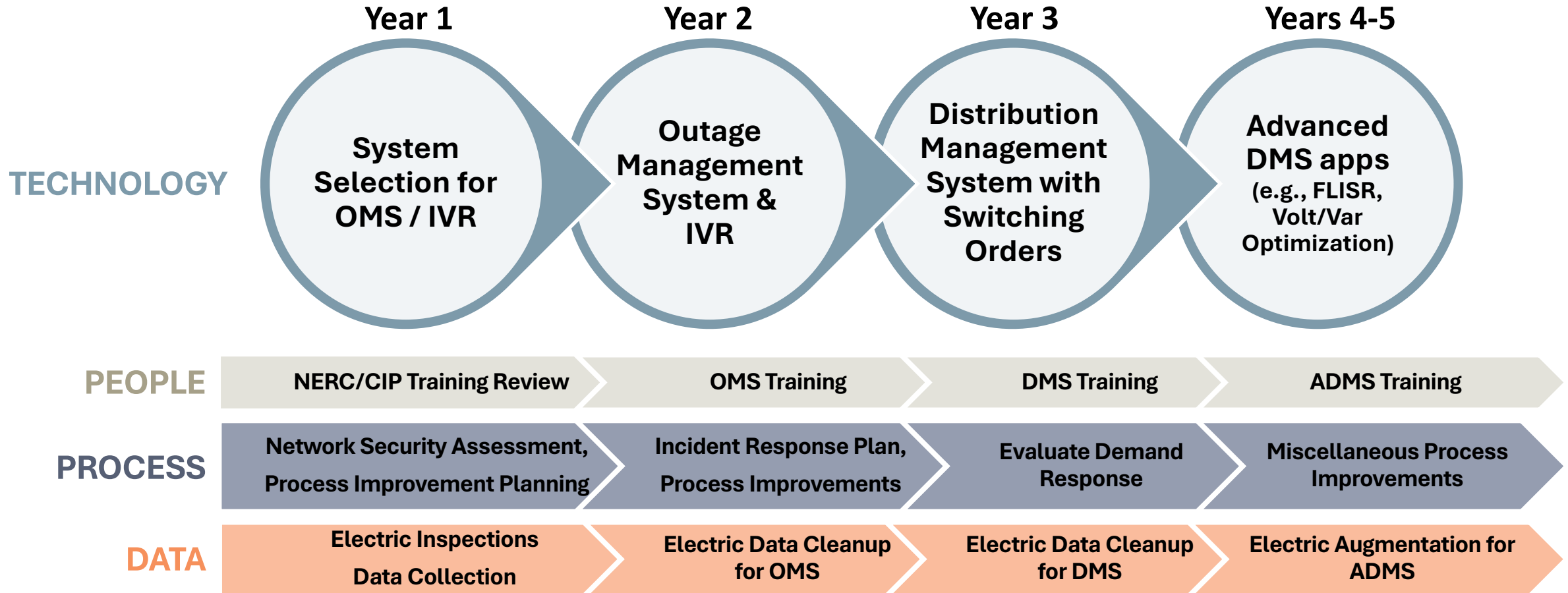
Grid Modernization Roadmap Process

Tailor Your Framework & Duration



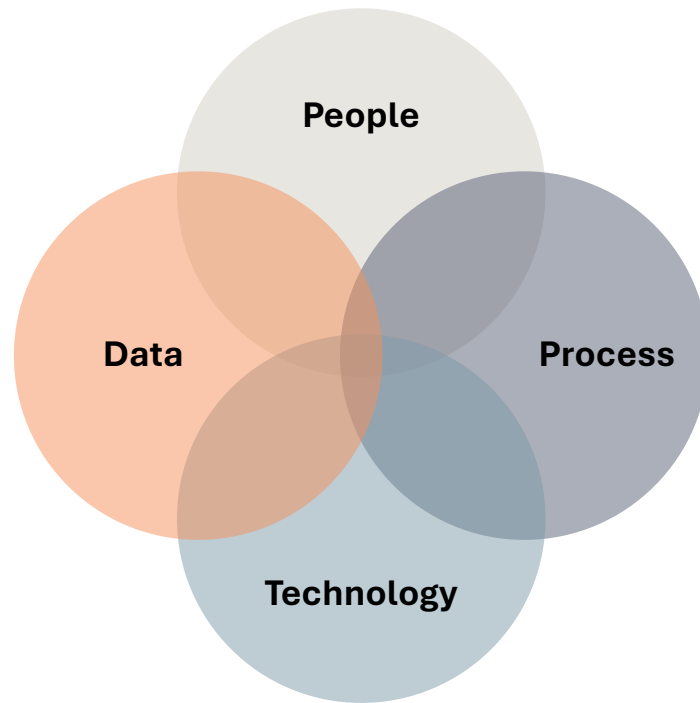
Grid Modernization Roadmap Process

Start with Related IT/OT Components



Grid Modernization Roadmap Process

Iterate with Stakeholders until Complete



Lessons Learned & Key Benefits



Lessons Learned & Key Benefits

Key Lessons Learned

**Change Is Hard, But
Organizational Change
Management (OCM)
Helps**

**Don't Get Stuck Waiting
For The Next New Thing
Since The Pace Of
Innovation Is Incredibly
Fast**

**Get The Right
Resources Involved
Early, And Mandate
Strong Communication
At All Levels**

**Data, Data, Data...
There Are Lots Of
Challenges And
Opportunities!**

**Focus On
Dependencies Between
Projects And Don't
Rush The Schedule**

**Current Practices May
Be Too Costly To Align
With Software Without
Extensive
Customizations**

**Solution Providers Have
Not Yet Fully Solved The
IT/OT Convergence
Challenges**

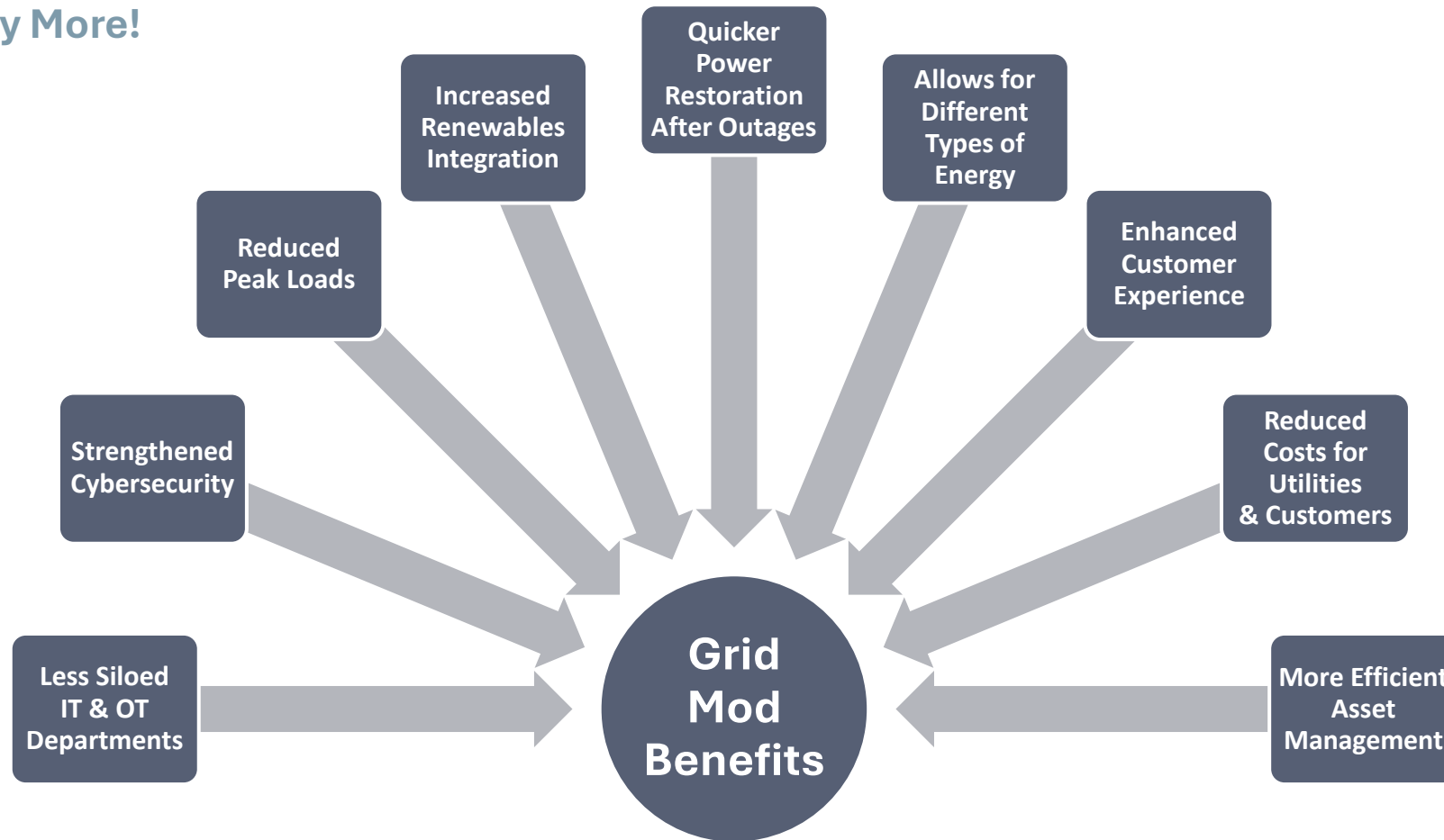
**Grid Modernization Is A
Catch-all Phrase And Is
Not Standardized
Across The Industry**



Lessons Learned & Key Benefits

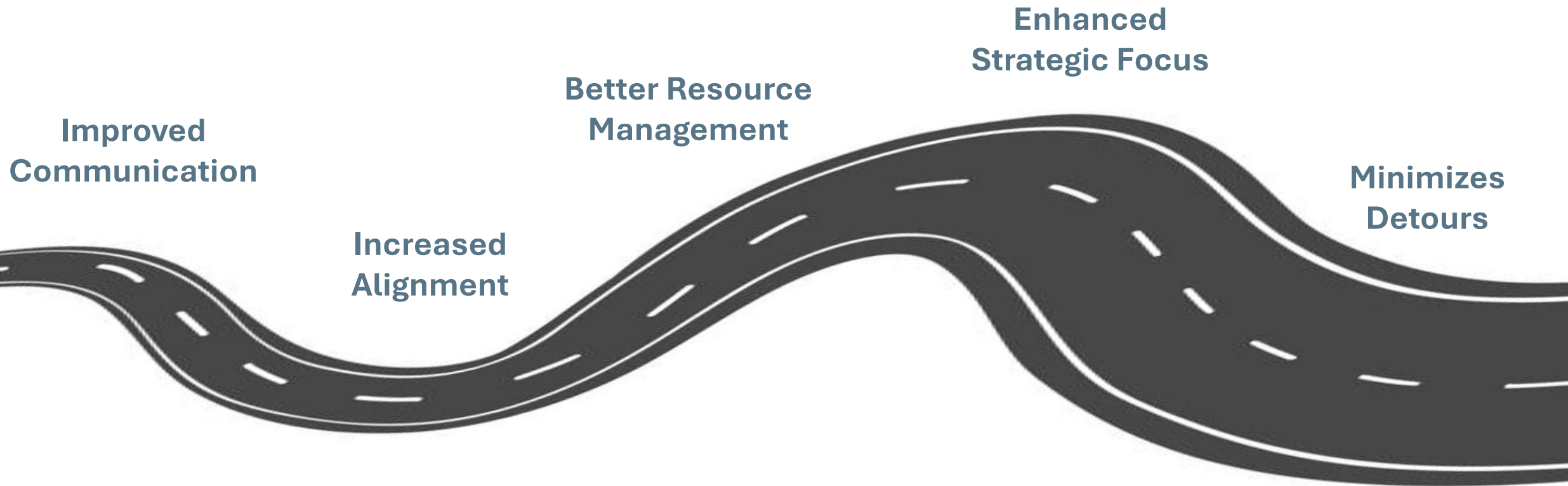
Grid Modernization Benefits

There are Many More!



Lessons Learned & Key Benefits

Roadmap Benefits



Roadmaps provide a clear, visual representation of goals, timelines, and dependencies, fostering collaboration and transparency across teams.



Thank you for your time!

Questions?

Keep in Touch



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