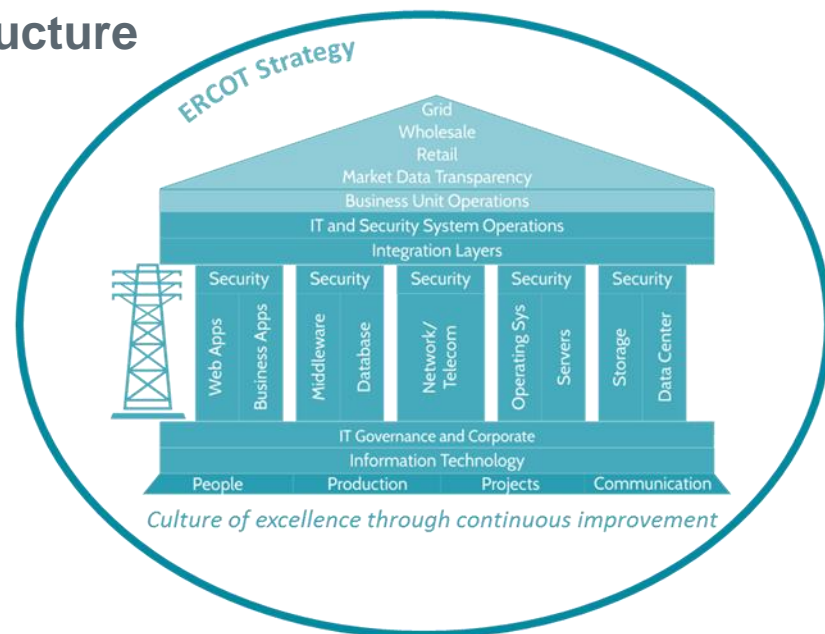**Item 10: Data Center Refresh Update**

Jerry Dreyer
Senior Vice President and Chief Information Officer

Board of Directors Meeting
February 14, 2017
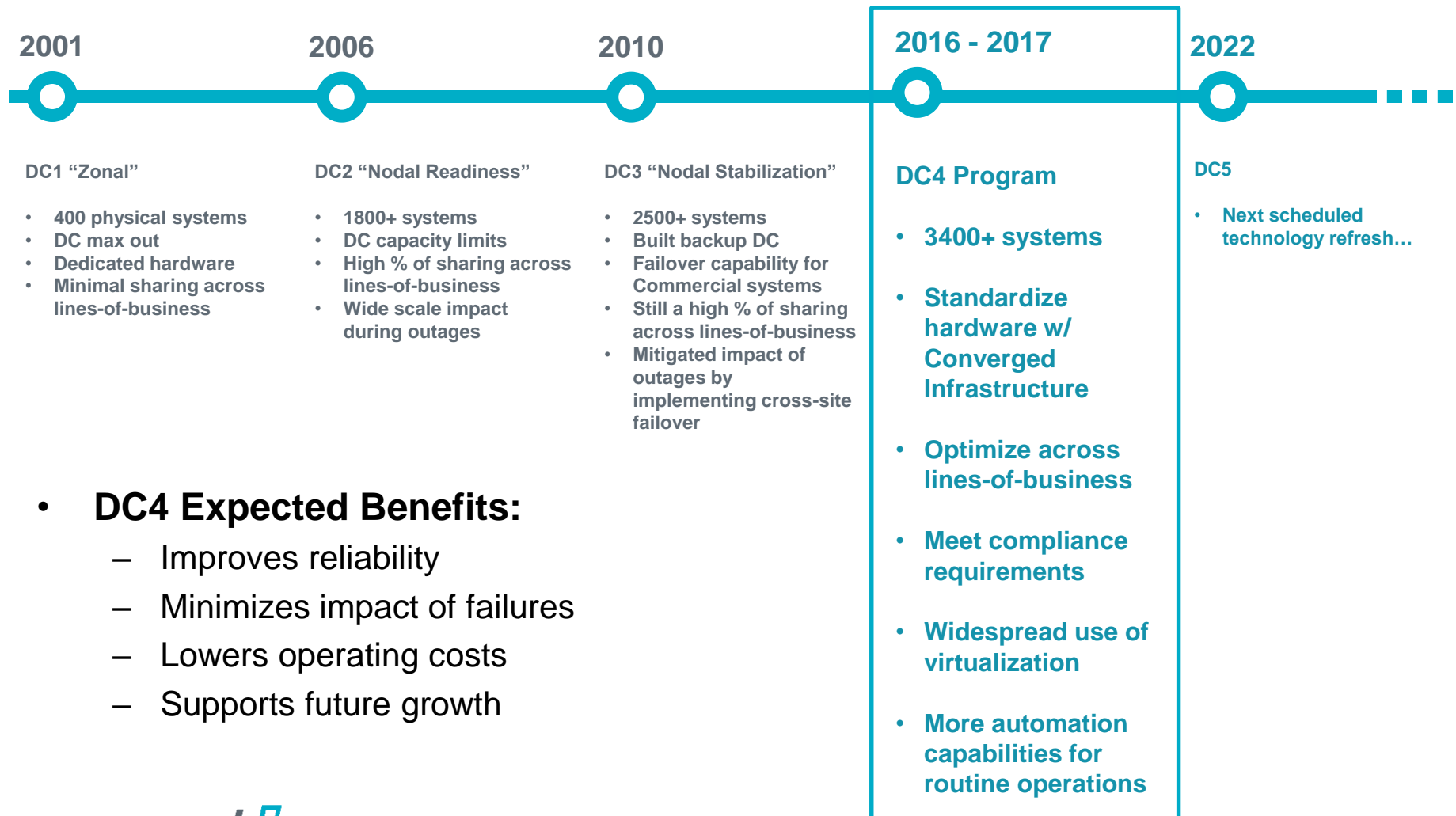
ERCOT Public

ERCOT: Critical Role

- **Grid, Wholesale, Retail and Market Data Transparency functions**
    - Manage 90% of Texas electric load
    - Perform financial settlement for the wholesale bulk-power market
    - Administer retail switching for 7+ million premises
    - Up to 1 million reports and extracts delivered daily

- **Requires reliable and secure IT Infrastructure**
    - 400+ business applications
    - 3400+ compute servers
    - 4+ petabytes of storage
    - Redundant high speed fiber networks
    - Wide Area Network (WAN) for MPs
    - 3 active data centers (2 production, 1 test)

ERCOT: Reliable, Cost Effective

- **IT Infrastructure approaching end-of-life and support**
    - Increased risk of failure
    - Vendor support limited
    - Greater risk for compliance and security gaps
    - Higher operating costs

- **Technology refresh is needed to support reliability**

- **Funding was approved in 2015 with ERCOT's fee request**

- **Scope defined to replace the technology at end-of-life and support**
    - Includes Network, Telecommunications, Servers and Storage
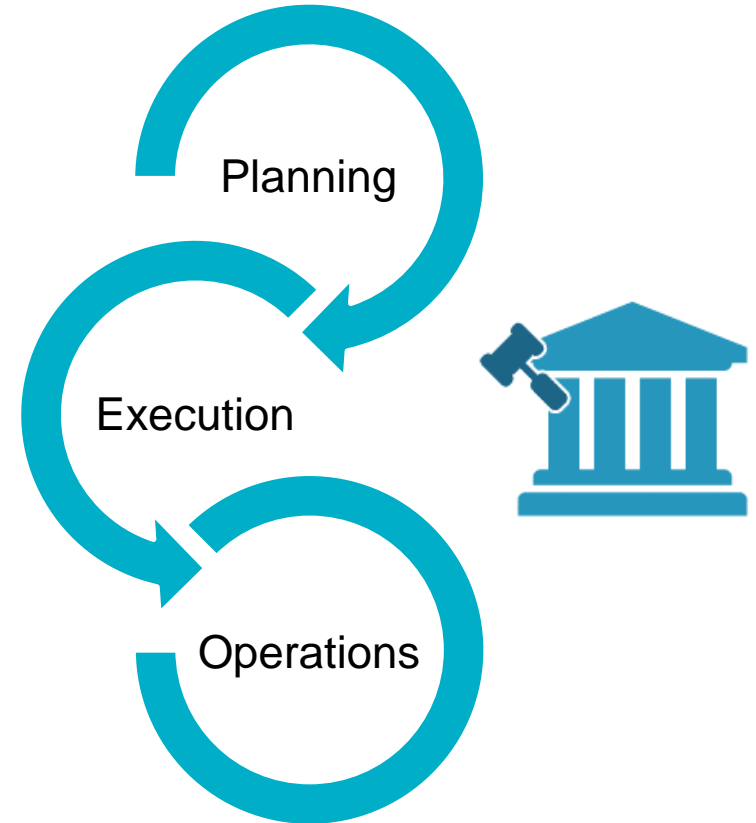
Technology Refresh Initiated: DC4 Program

2001

2006

2010

2016 - 2017

2022

DC1 "Zonal"

- 400 physical systems
- DC max out
- Dedicated hardware
- Minimal sharing across lines-of-business

DC2 "Nodal Readiness"

- 1800+ systems
- DC capacity limits
- High % of sharing across lines-of-business
- Wide scale impact during outages

DC3 "Nodal Stabilization"

- 2500+ systems
- Built backup DC
- Failover capability for Commercial systems
- Still a high % of sharing across lines-of-business
- Mitigated impact of outages by implementing cross-site failover

DC4 Program

- **3400+ systems**

- **Standardize hardware w/ Converged Infrastructure**

- **Optimize across lines-of-business**

- **Meet compliance requirements**

- **Widespread use of virtualization**

- **More automation capabilities for routine operations**

DC5

- **Next scheduled technology refresh…**

- **DC4 Expected Benefits:**
  – Improves reliability
  – Minimizes impact of failures
  – Lowers operating costs
  – Supports future growth

DC4 Program Approach

- **Governance Established**
  - Executive Steering Committee established
  - CIO, COO, CFO and CCO

- **Plan Vetted**
  - Charter, scope and program developed
  - Architected to improve resiliency
  - Communication plan developed
  - Third-party independent review performed

- **Procurement Best Practices Followed**
  - Vendor symposium
  - RFPs from competing vendors
  - Knowledge-based negotiation

- **Migration Process Validated**
  - Tested migration patterns and repeatable workflows

Planning

Execution

Operations

DC4 Program Timeline

2015	2016	2017	2018 / 2019

Program Governance

Database Servers (POWER8)

Core Network

Telecom Control Room / Grid Ops

Network Command & Control

x86 Server

x86 App Migrations

Database Storage

Remote Access

Telecom VoIP

Telecom DC Connectivity

- **DC4 made up of 11 projects**
  - Many coordinated efforts
  - Well managed…dedicated team
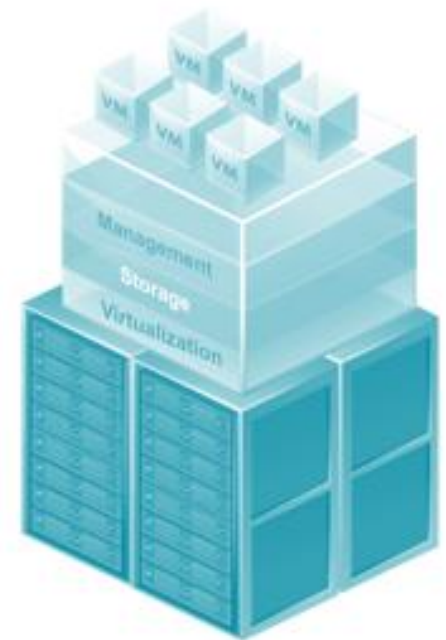
  ▬ = 8 projects in-flight

  ▬ = 3 projects upcoming

DC4 Program Update

Scope	Schedule	Budget
Green	**Green**	**Green**

- **Program is tracking to plan**
  - No major risks or issues to report
  - Team delivering on scope and schedule
  - 38% of new technology deployed and migrations have started

- **Approved Budget is trending favorable**
  - 70% of new technology investments under contract
  - 40% of the $48 million budget spent thru 2016
  - Forecast to be on budget or slightly below budget

- **New technology is performing as expected**

Summary

- **ERCOT plays a critical role and requires reliable technology**
  - ERCOT remains committed to its mission and operational excellence

- **DC4 replaces ERCOT's aging IT Infrastructure at end-of-life or support**
  - Ensures continued reliability and support
  - Minimizes impact of failures
  - Lowers operating and maintenance costs
  - Supports future growth and enables new capabilities

- **DC4 Program is tracking on scope, schedule and budget**
  - Majority of the projects are in-flight
  - Most procurements are complete
  - Team continues to successfully deliver on projected results
  - More work is still ahead, but our team is dedicated to success