

Puget Sound Energy Telecom Efficiency Program Introduction

CONTACT:

Geoff Overland, *Manager IT & Telecom Energy Services*

✉ goverland@willdan.com

☎ 608-513-1175



Agenda

01 Introduction to PSE's Telecom Program

02 Turnkey Project Approach

03 Mission-Critical Project Examples

04 Telecom Program Summary

05 Questions & Answers

Puget Sound Energy – Telecom Efficiency Program



Experienced Mission-Critical Specialists to Assist With:

- Identify **cost effective efficiency measures**
- **Liaison** to utility energy efficiency programs
- Demonstrate how measures can **improve facility reliability**
- Provide PSE with **energy analysis** for measures
- Identify, analyze, and establish **financial business cases** for projects



PSE Program Resources and Process:

- **Engage the Willdan team** to identify measures and submit project applications
- Willdan's program team can perform a **no-cost facility energy assessment**
- Qualify for **one-time cash incentives**
 - Over \$2.5M qualified incentives
- High-level **program process**:
 - Application, Grant Agreement, PO, Project Implementation, measurement and verification, and check payment

Build **energy efficiency project** business cases and **break down** internal team silos

Telecom Program – Turnkey Project Approach



Ongoing QA/QC and Program Management Tasks

Mission-Critical Energy Efficiency Projects

Our Telecom Program can take a **wholistic system approach** to maximize interactive savings on each project for the best payback

Traditional Measures

Prescriptive measures are common:

- One-for-one HVAC replacements
- VFDs on fans and pumps
- Lighting
- Single measure with limited impact



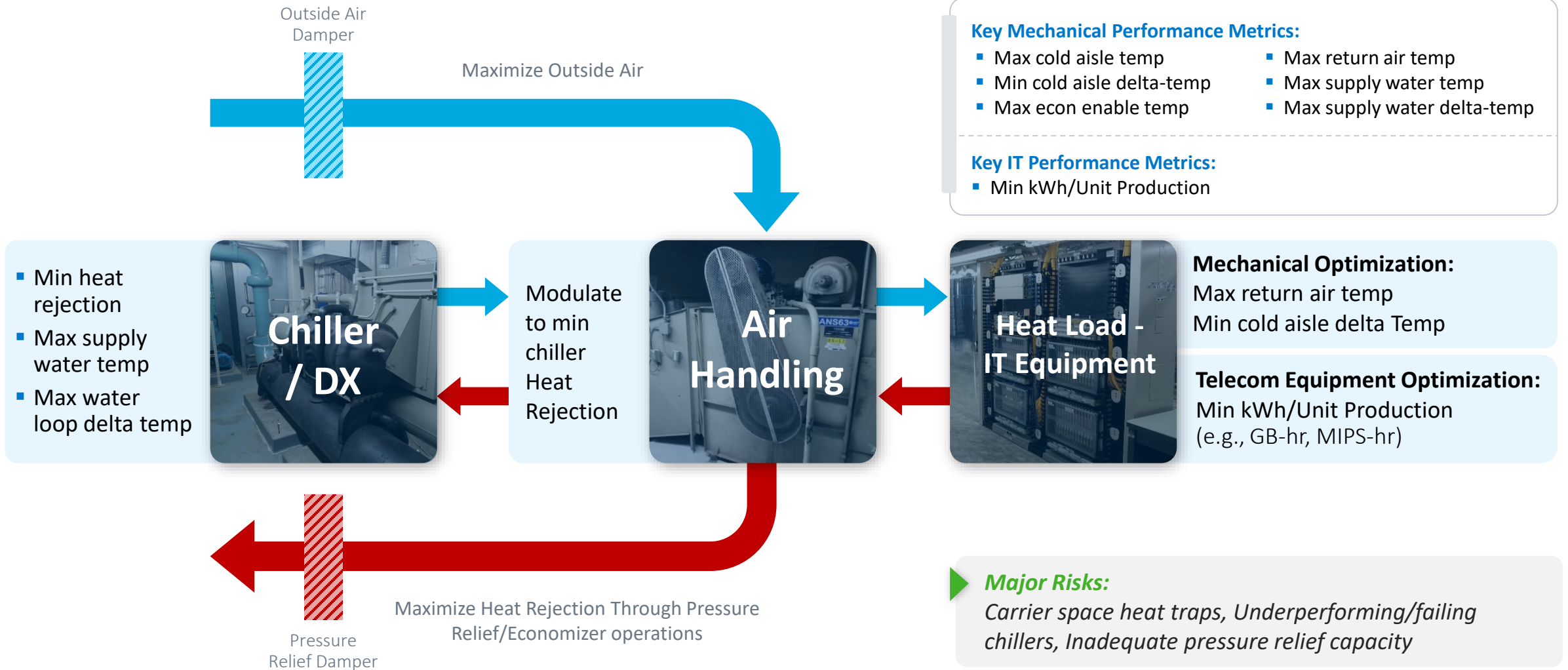
PSE Telecom Program Measures

Including proven and new technologies like:

- IT & Switch equipment optimization
- HVAC airside optimization
- Maximizing economization hours
- Controls optimization to maximize reliability and energy savings
- Central office, data center, and head-end optimization

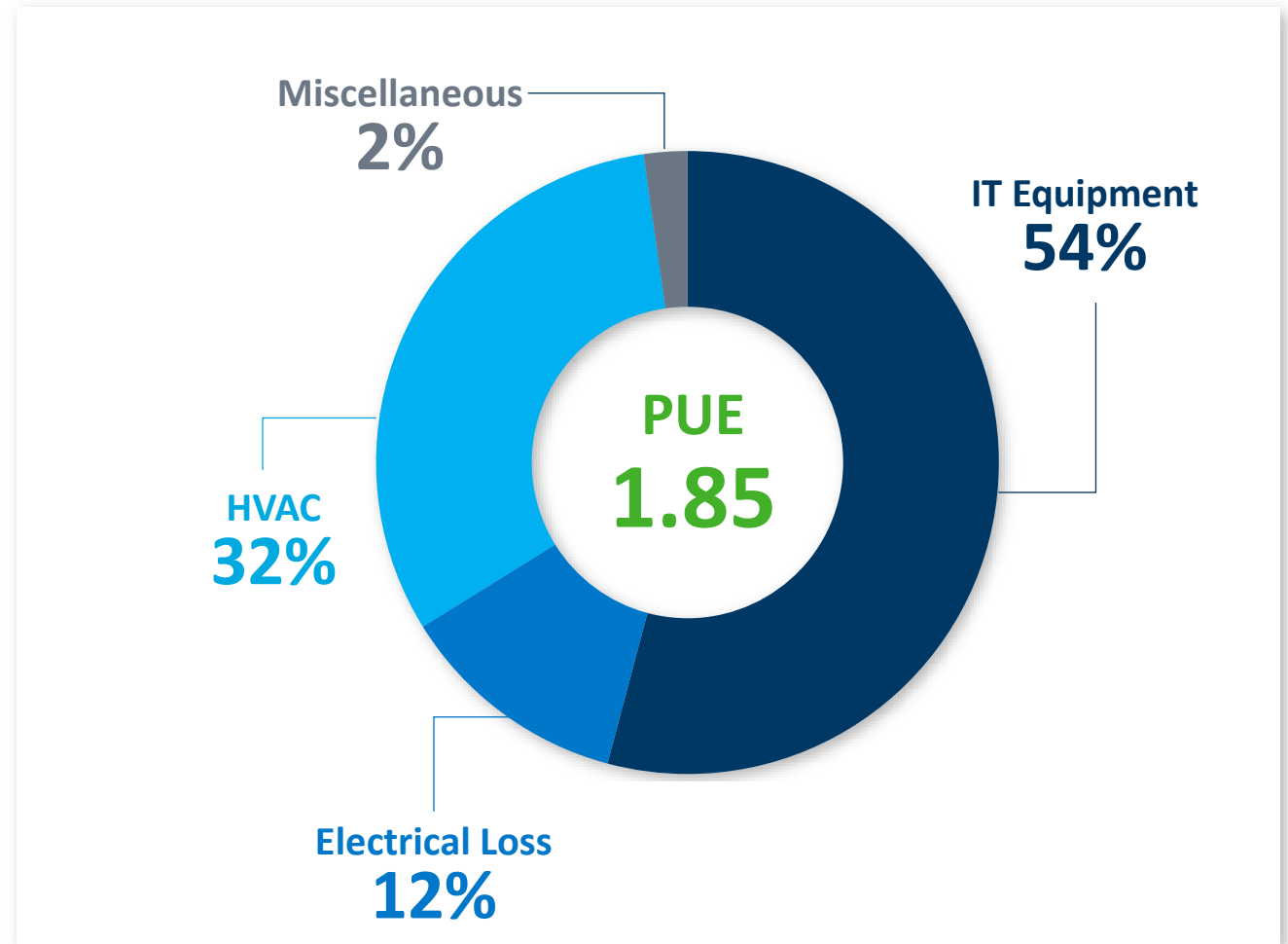
Program Optimization Strategy – Energy Efficiency Improves Reliability

FOCUS ON 3 BIGGEST ENERGY LOADS



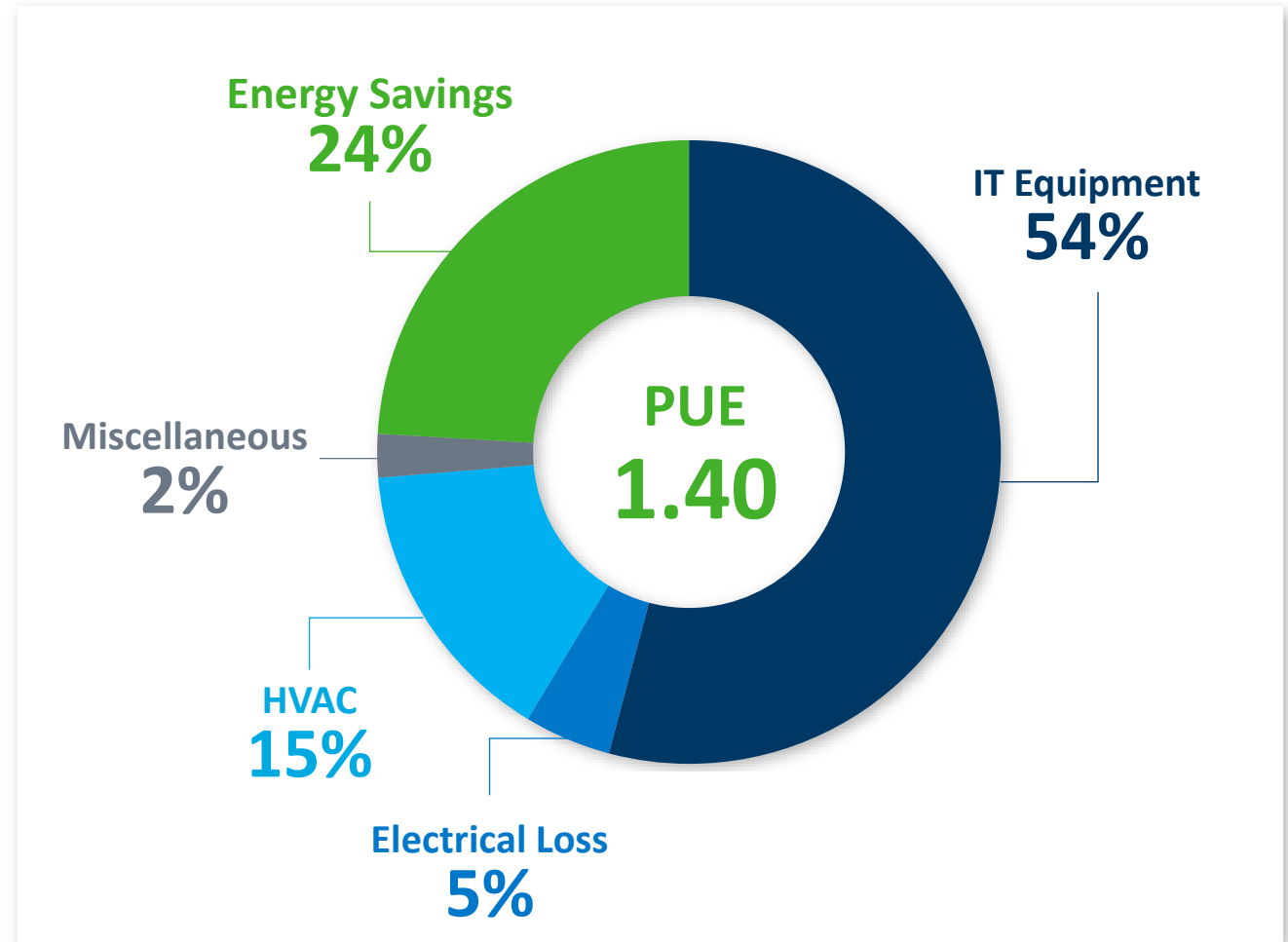
Telecom Central Office Optimization Project Overview

- Willdan has implemented central office optimization projects since 2015
- Projects are comprehensive and address the process cooling system in a holistic manner
 - Temperature consistency through out the space
 - Fan speed optimization
 - With a focus on HVAC efficiencies



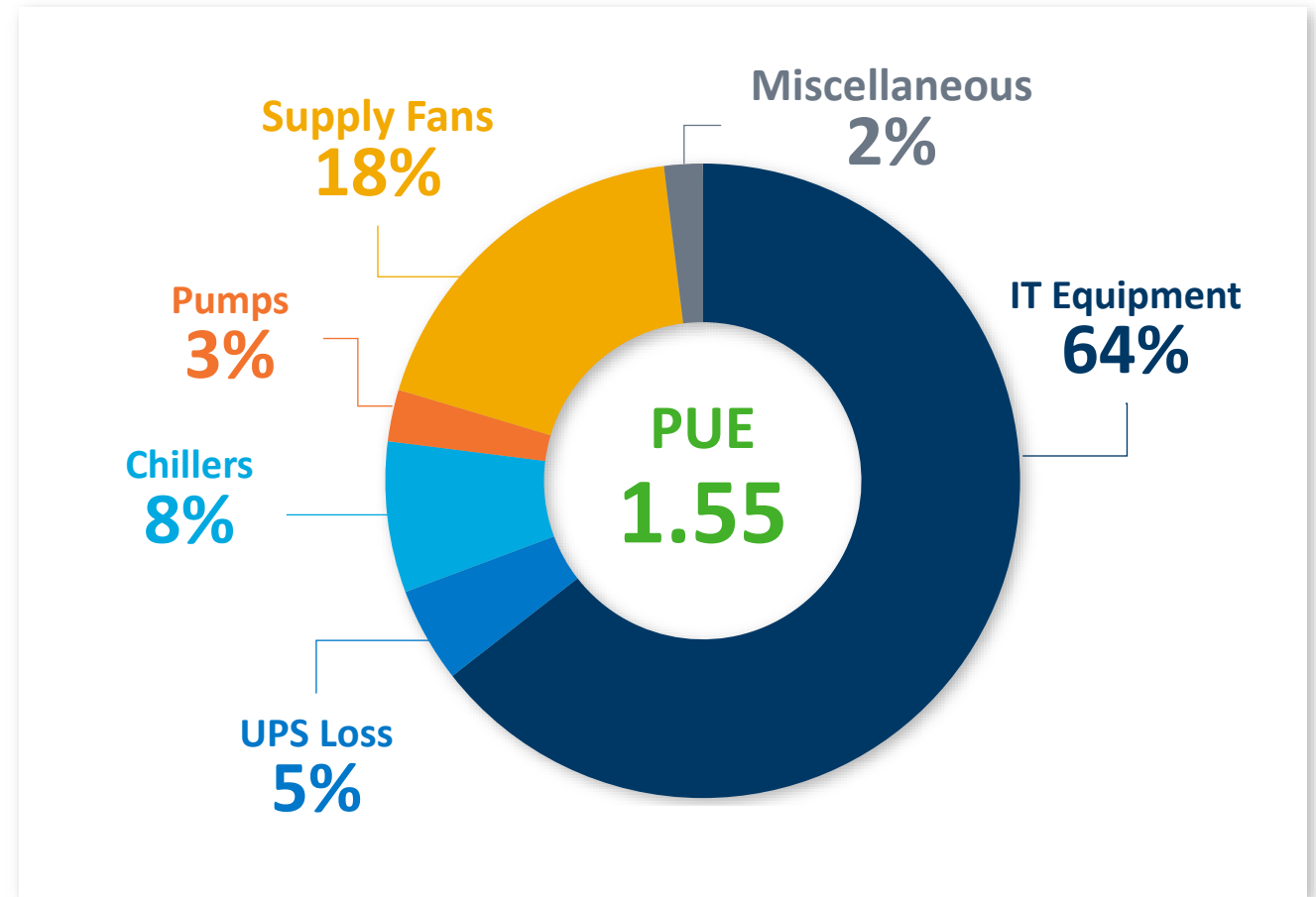
Telecom Central Office Optimization Project Results

- Achieve **15%-25%** overall facility energy reduction
- Achieve **25%-40%** reduction in energy used for cooling
- Many 1-year project paybacks after utility cash incentives
- Many energy efficiency projects improved the reliability of the facility



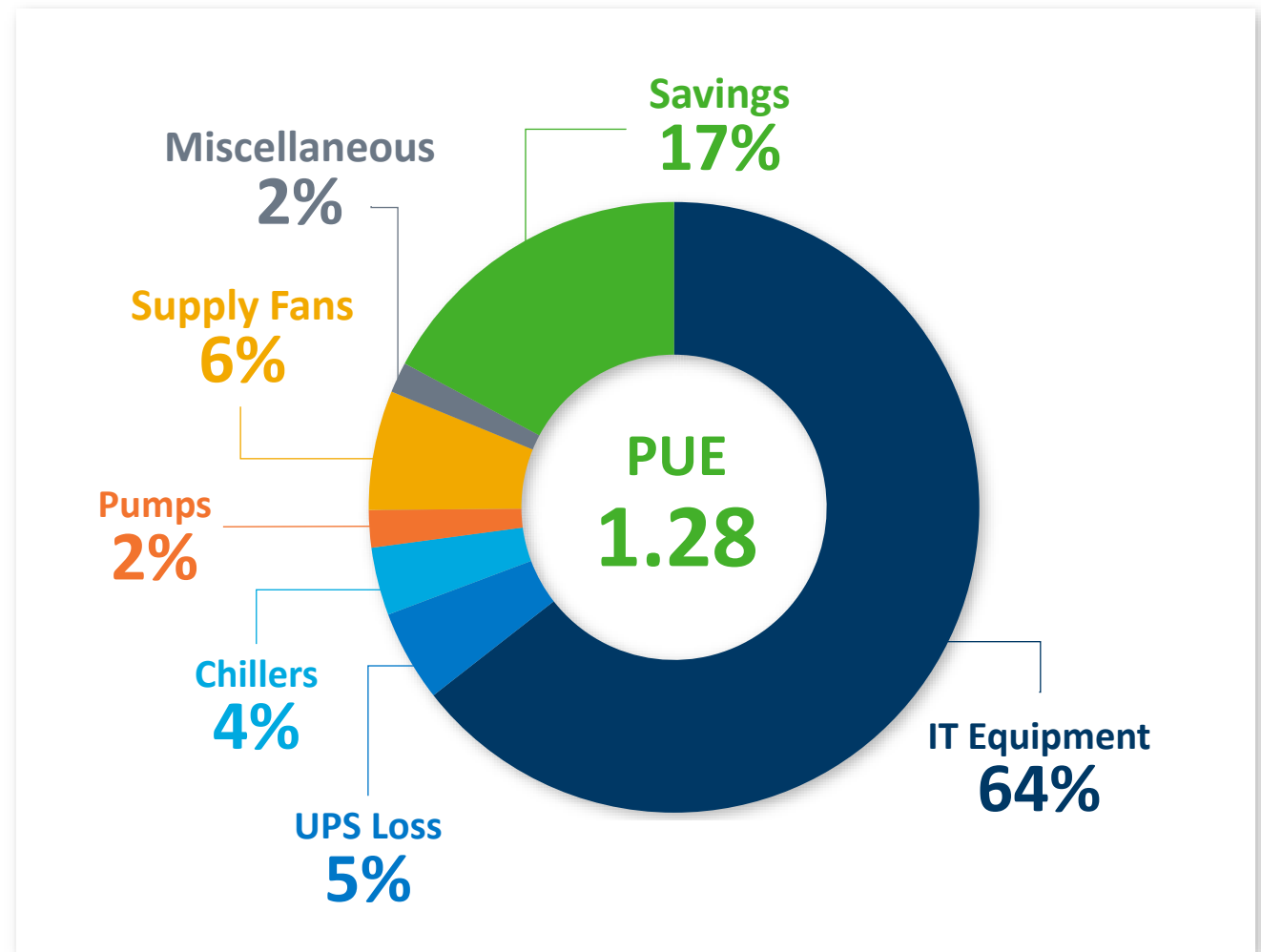
Data Center Energy Optimization Opportunities

- Target interactive effect between key environmental areas:
 - Minimize hot/cold air mixing
 - Supply air temperatures
 - Supply fan speeds
 - Humidification controls
 - Chilled water reset
 - Delta T across CRAC/H units
 - Maximize free cooling hours
- The order of implementing projects is critical to maximize energy savings



Data Center Energy Optimization Results

- Identified energy savings ranges from **15%-25%**
- Some of our operation and maintenance recommendations have less than a **1-year payback**
- Utilize energy efficiency projects to improve data center reliability by:
 - Freeing up trapped HVAC and power capacity
 - Extend the life of data center equipment
 - Increase data center redundancy
- To maintain energy savings over time, it is recommended to commission the system on an annual basis



Telecom Program Summary

- Industry experts to assist customers with the following areas
 - Facility energy assessments
 - Identification of low-and no-cost energy-saving measures
 - Recommendations for capital energy efficiency projects
 - Program applications and processes
 - Stay involved through the full project lifecycle
- Available incentive rates to improve project paybacks:
 - Custom incentives at \$0.45 per verified kWh saved on capital projects
 - Custom incentives at \$0.05 per verified kWh saved on low/no-cost projects
 - Prescriptive offerings also available at incentive rates that vary by equipment type

Q&A

CONTACT:

Geoff Overland, *Manager IT & Telecom Energy Services*

goverland@willdan.com

608-513-1175

CONTACT:

Bill Stairs, *Manager Audits & Optimization*

bstairs@willdan.com

760-681-7214