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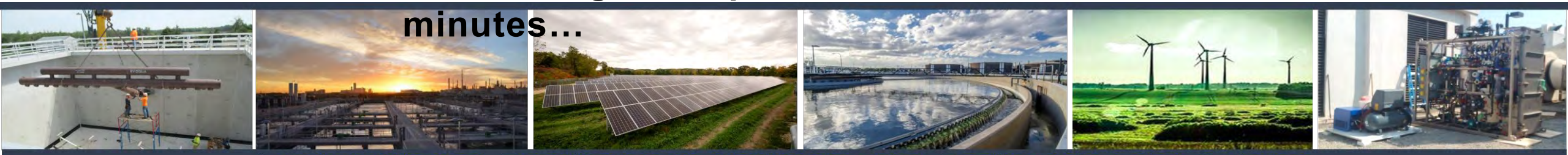
LA DWP Los Angeles Department of Water & Power

We will begin our presentation in a few minutes…



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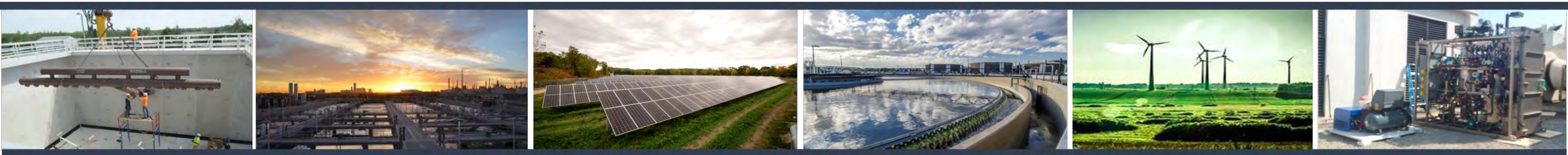

Stanley Consultants

Colorado Springs Utilities

Implementing an Energy Vision

Introduction by Phil Tunnah, Operations Director, Stanley Consultants

Speakers

David Longrie
Manager of Energy Resource Planning and Innovation
Colorado Springs Utilities

David Tennant, P.E.
Senior Engineer
Stanley Consultants

ABOUT US

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NATURAL GAS

WATER

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SINCE 1924,

WE'VE PROVIDED 4 SERVICES IN 1 UTILITY.

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- Planning and Consulting
- Program Management
- Project Management

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Agenda

- **PART 1** 2020 Energy Vision and Electric/Gas IRPs
- **PART 2** Delivery of the Drake Generation Portfolio
- **PART 3** 2023 Adaption of IRP to Regulatory Drivers

Agenda – Part 1

2020 Energy Vision and Electric/Gas IRPs

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Colorado Springs Utilities

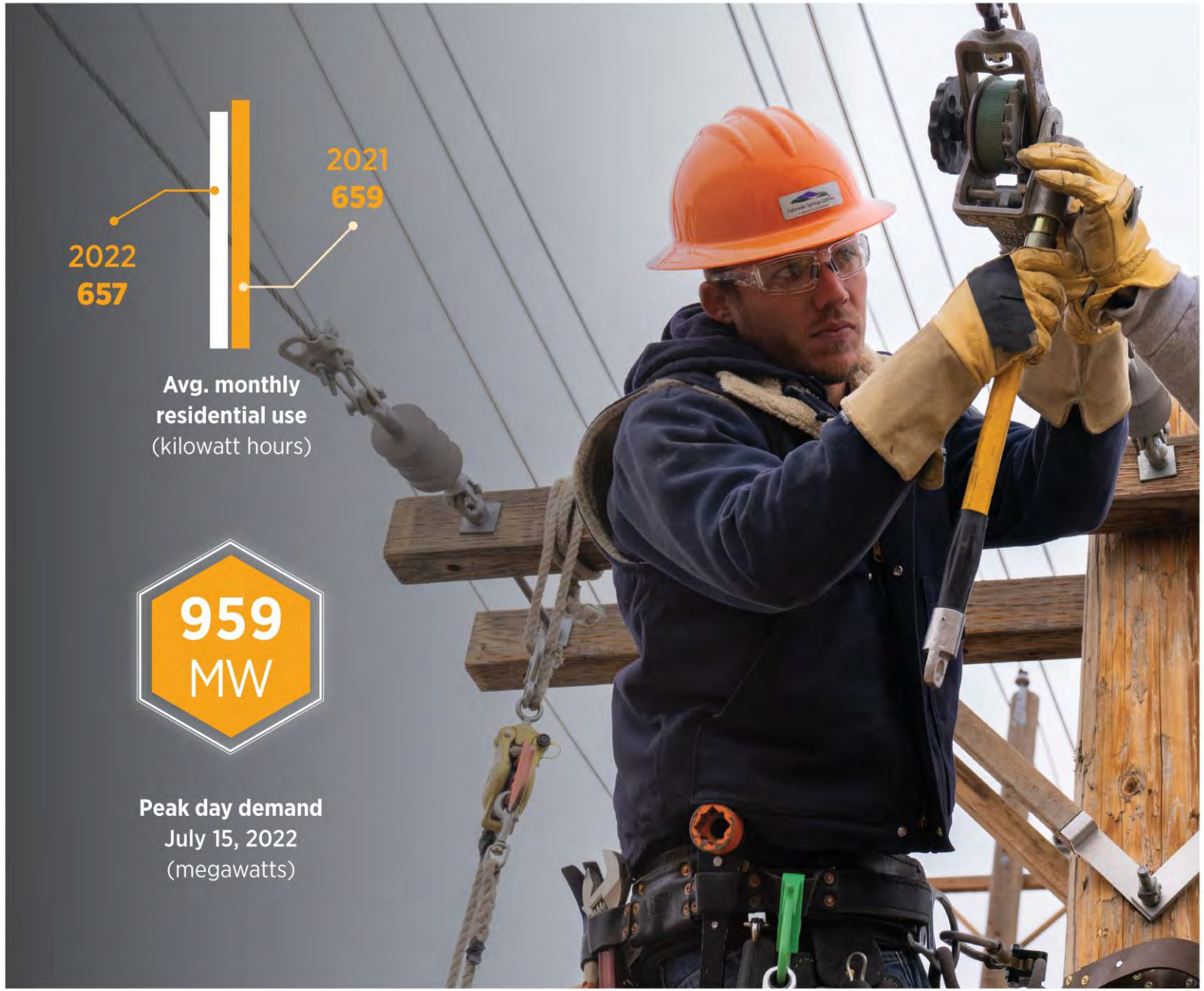
ELECTRIC

MILES OF POWER LINES*	3,968
SUBSTATIONS	54
GENERATION PLANTS	7
SERVICE POINTS	248,277

*overhead and underground power lines.

Avg. interruption duration

Electric reliability



Changing Planning Landscape

- Long-standing responsibilities of safety, reliability and affordability of service
- Major factors driving changes in the industry
  - Environmental and regulatory requirements
  - Need for increased resilience
  - Expanded customer choice
  - Innovation
- Changes have significant implications requiring a clear vision, integrated resource planning and ongoing customer engagement

Colorado Springs Utilities Strategic Plan 2019-2023

Identified Strategic Energy Initiatives, including:

- Energy Vision/Integrated Resource Plans
- Energy Markets
- Grid Modernization
- Rate Design
- New Electric Business Model
- Plant Decommissioning

Energy Vision

Provide resilient, reliable and cost-effective energy that is environmentally sustainable, reduces our carbon footprint and uses proven state-of-the-art technologies to enhance our quality of life for generations to come.

STRATEGIC PILLARS TO SUPPORT THE ENERGY VISION

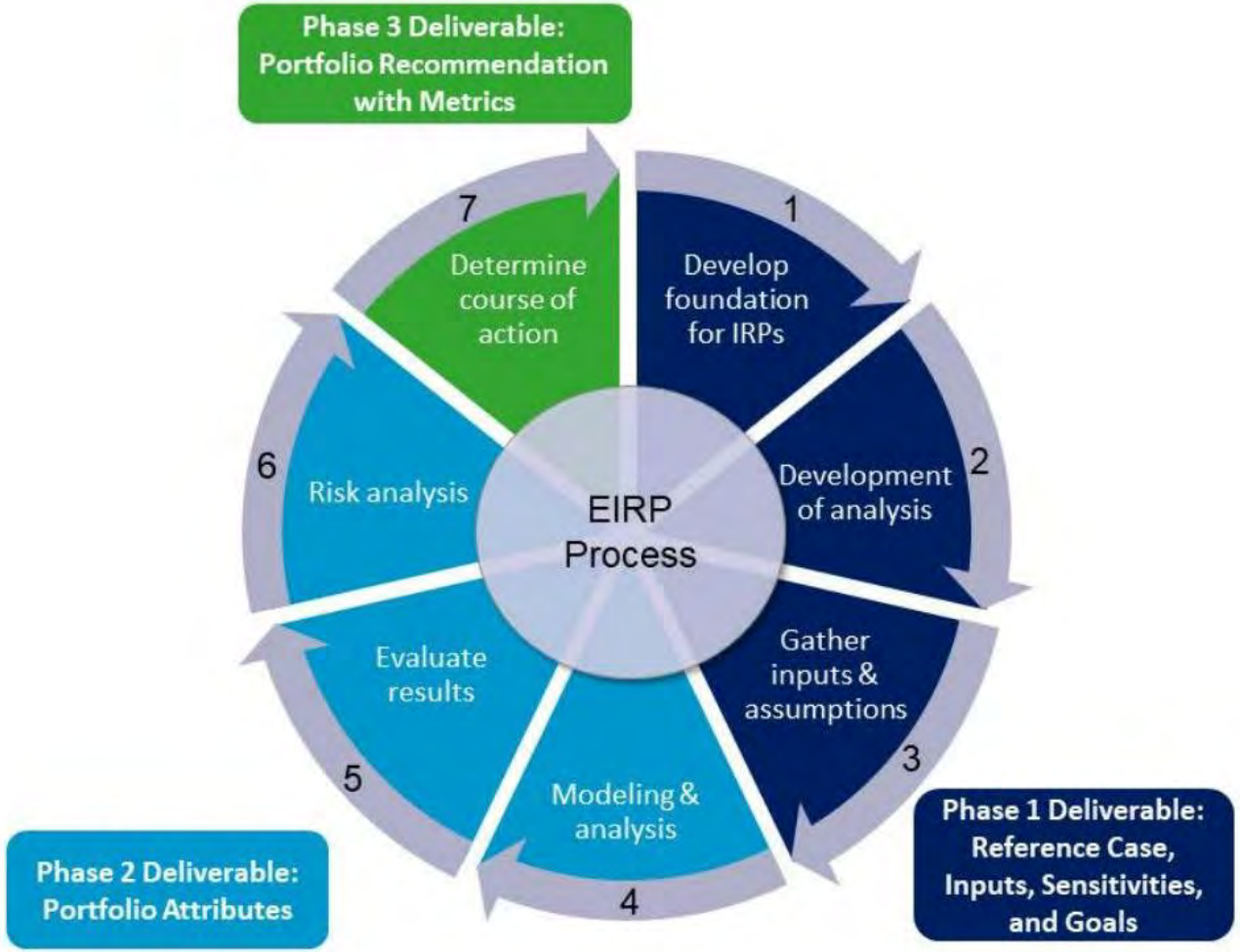
ECONOMIC

ENVIRONMENT

RESILIENCY

INNOVATION

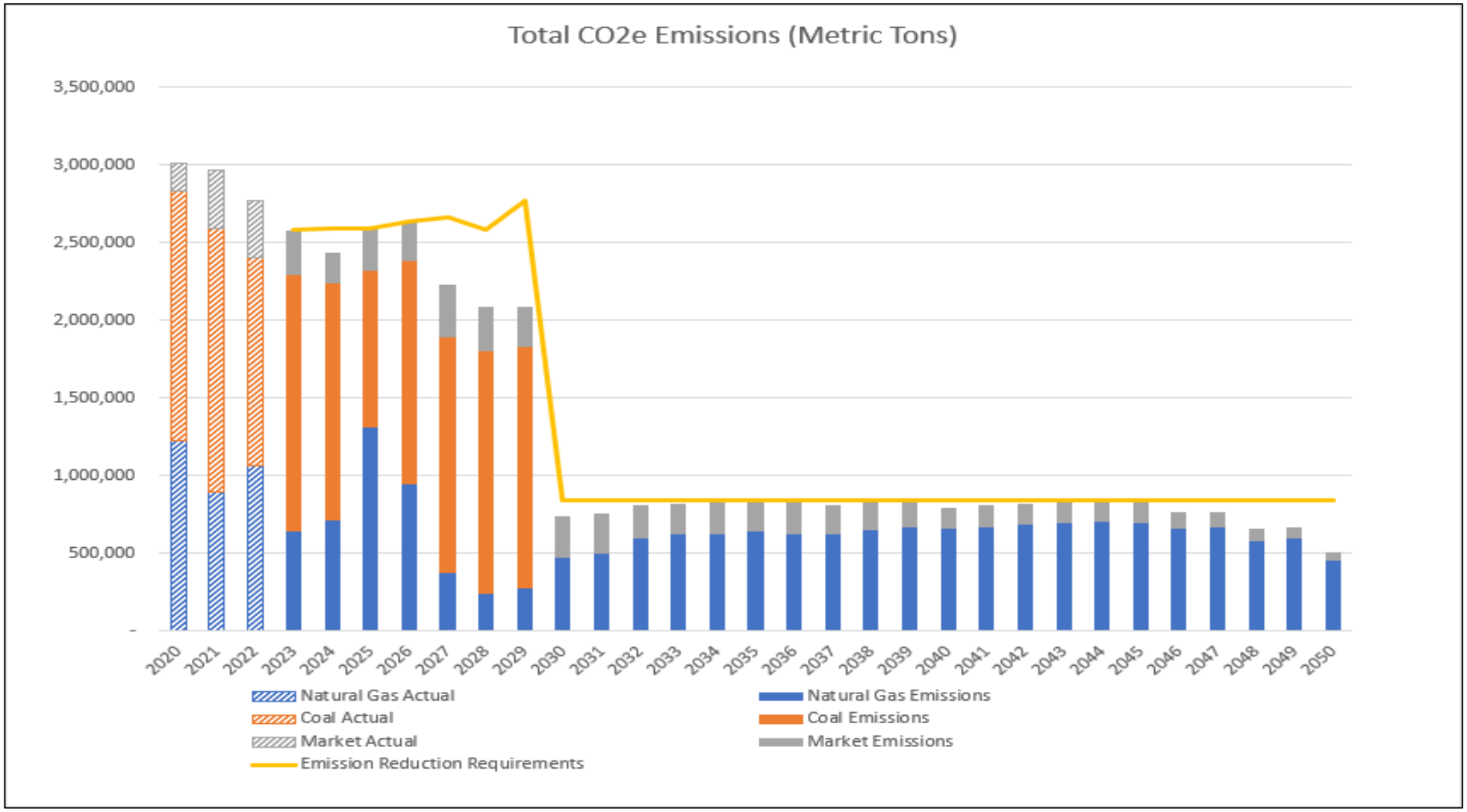
EIRP and GIRP Process



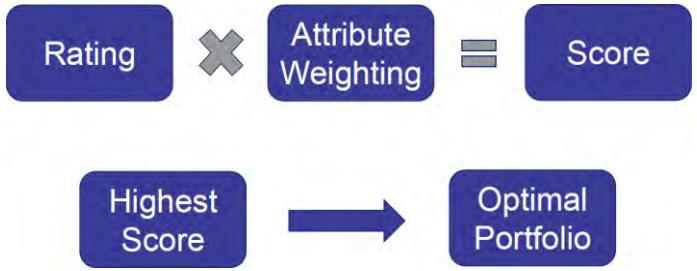
Phase 1 – Input and Assumptions

- Electric Load Forecasts
- Gas Load Forecasts
- Demand Side Management Potential
- Planning Reserve Margin
- Gas Price Forecast
- Potential Electric and Gas Resources
- Environmental Data
- Energy Markets
- Operational Characteristics

Emissions

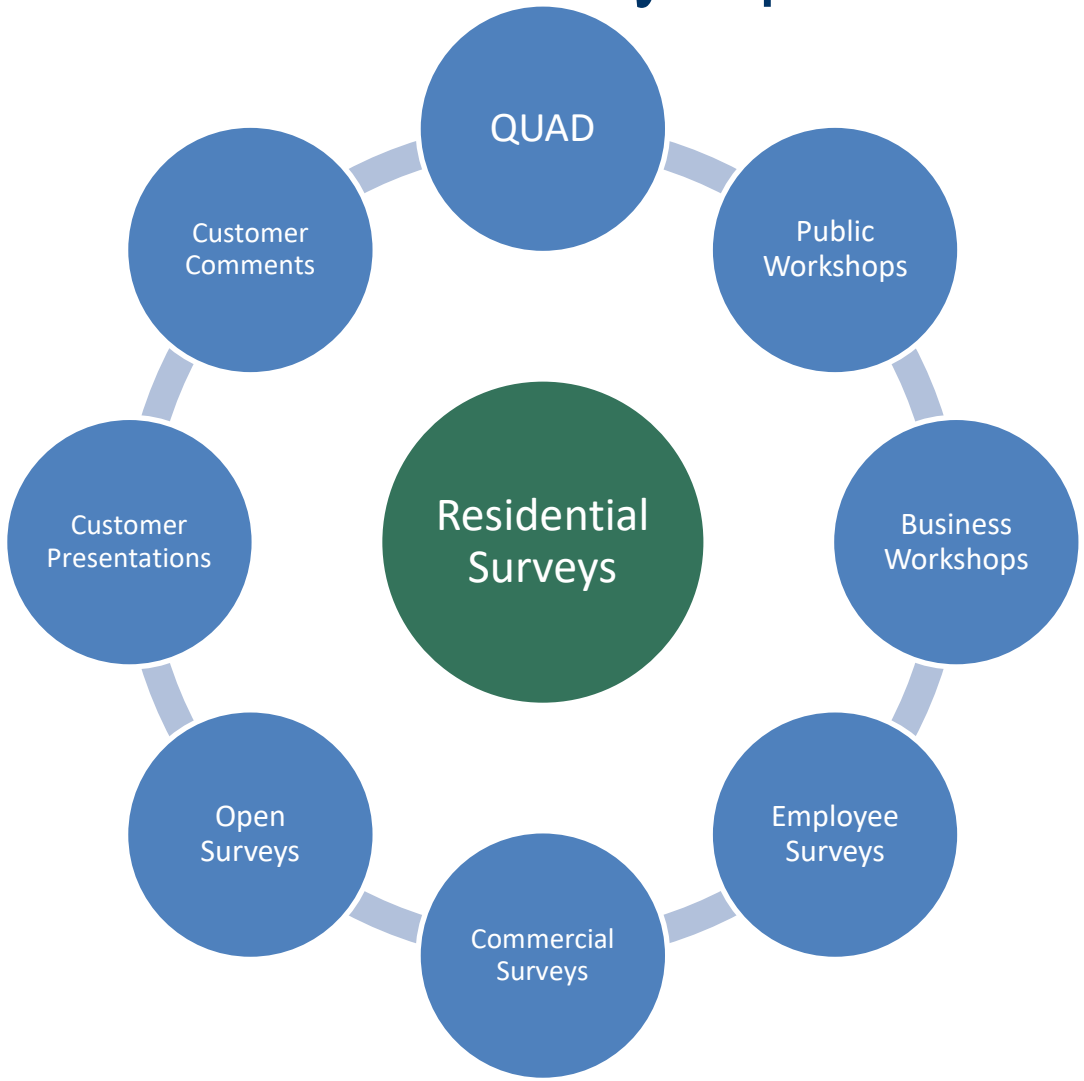


Phase 2

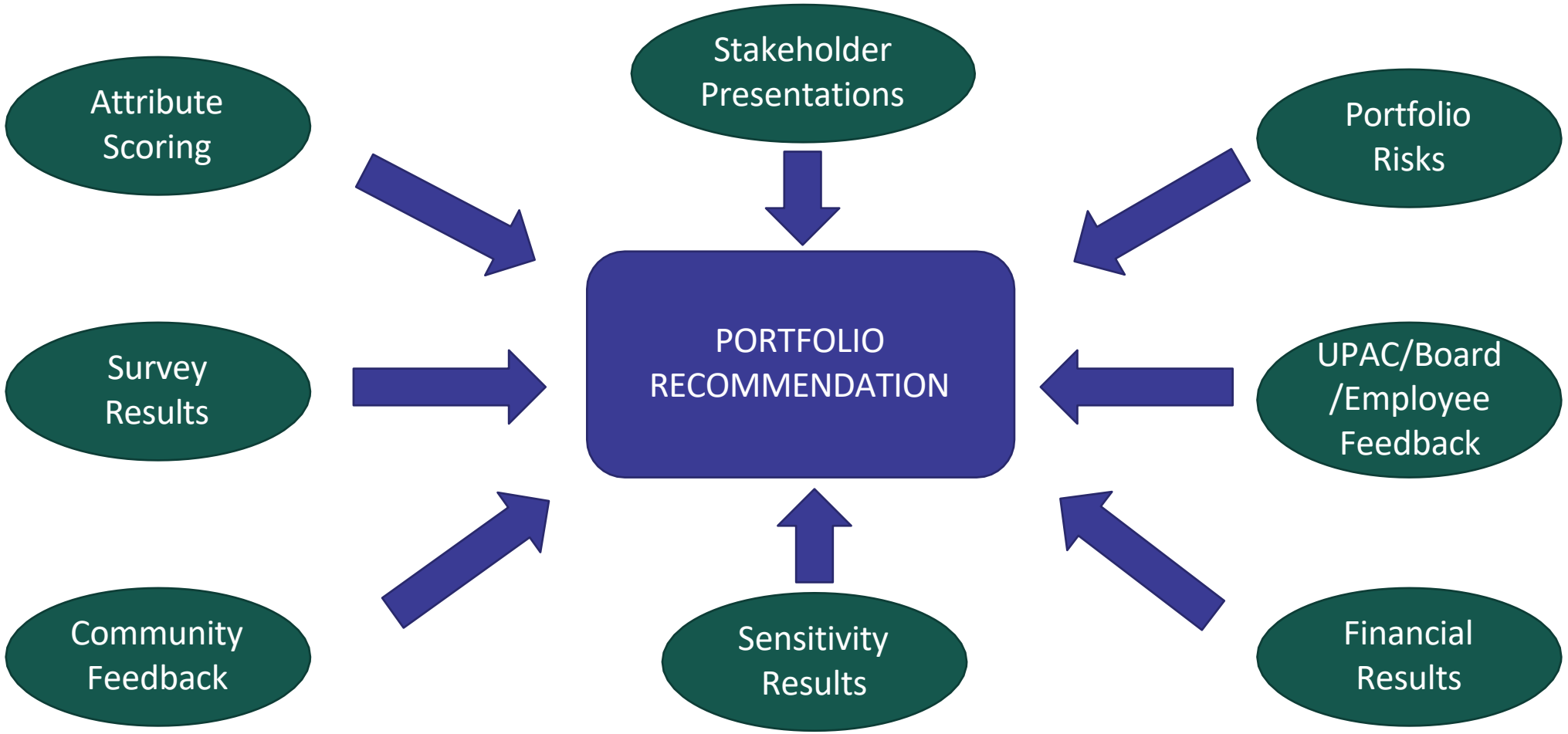


Attribute	Weight	
Reliability	32%	Ability to react to variable or extreme daily operating conditions (i.e., the lights stay on).
Cost/Implementation	22%	Cost-effectively maintain competitive, affordable rates and the financial health of the utility to drive a strong economy with ability to execute portfolio in desired timeframe.
Environment/Stewardship	22%	Sustainably grow renewable portfolio, reduce carbon footprint and meet all environmental regulations while responsibly protecting and supporting quality of life now and for the future.
Flexibility/Diversity	14%	Ability to adapt to regulatory and market disruptions by balancing multiple types of generators and fuel sources, including distributed generation, and reduce reliance on fossil fuels.
Innovation	10%	Proactively and responsibly integrate technologies and programs.

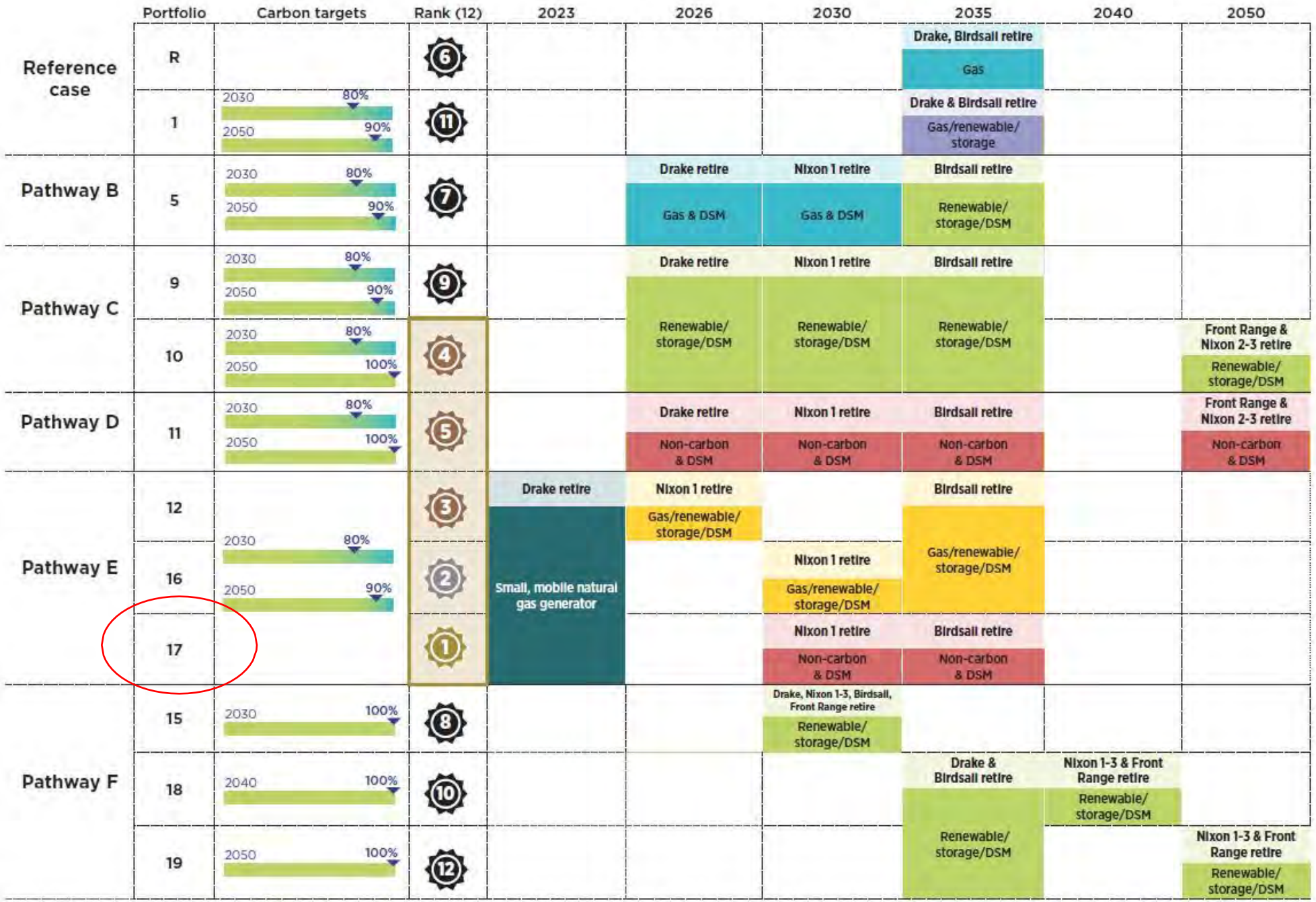
Voice of the Customer – Community Input



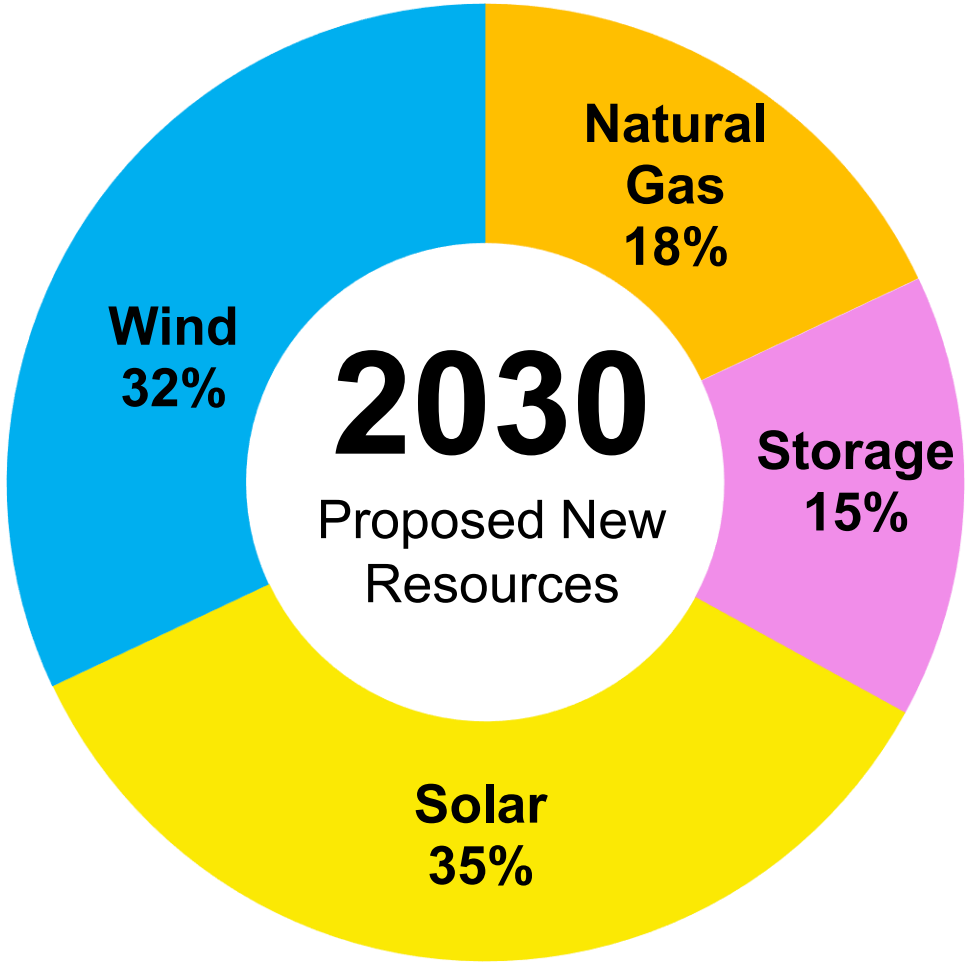
Inputs to Portfolio Recommendation



Electric Integrated Resource Plan | pathways and portfolios selected by UPAC for further evaluation



Proposed Additional Resources Available by 2030



a greener FUTURE

- 175 MW Solar Underway
- 200 MW Battery Storage Underway
- 525 MW Solar
- 100 MW Storage
- 625 MW Wind
- 350 MW Gas Generation

Agenda – Part 2

Delivery of the Drake Generation Portfolio

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TNGG Project Highlight Outline

Project Overview
- Before and After
- Technology Selection

Project Stakeholders
- Owner
- Engineering
- Procurement
- Construction

Project Constraints
- Site Constraints
  - Existing high-voltage yard
  - Existing coal pile and undergrounds
  - Liquid fuel deliveries
- Equipment Scope and Procurement
  - Equipment reuse
- Future Relocation Considerations
  - Redundancy requirements
- Environmental Considerations
  - Gas turbine stack emissions
  - SCR ready exhaust and CO catalyst
  - Fuel oil containment
  - Drains storage and containment

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Project Overview: Before and After

Project Site – Before Project

- Existing high-voltage yard
- Existing operational coal plant
- Existing coal pile and conveyance systems

Project Site – After Project

- New 162 MW total, 27 MW each gas turbines
- Reused transformers from coal facility at new plant and tied into existing switchyard

Natural Gas vs. Coal Generation:

- 90 times less sulfur dioxide
- 5 times less nitrogen oxide
- 50% less carbon dioxide
- Natural gas is the least carbon-intensive fossil fuel

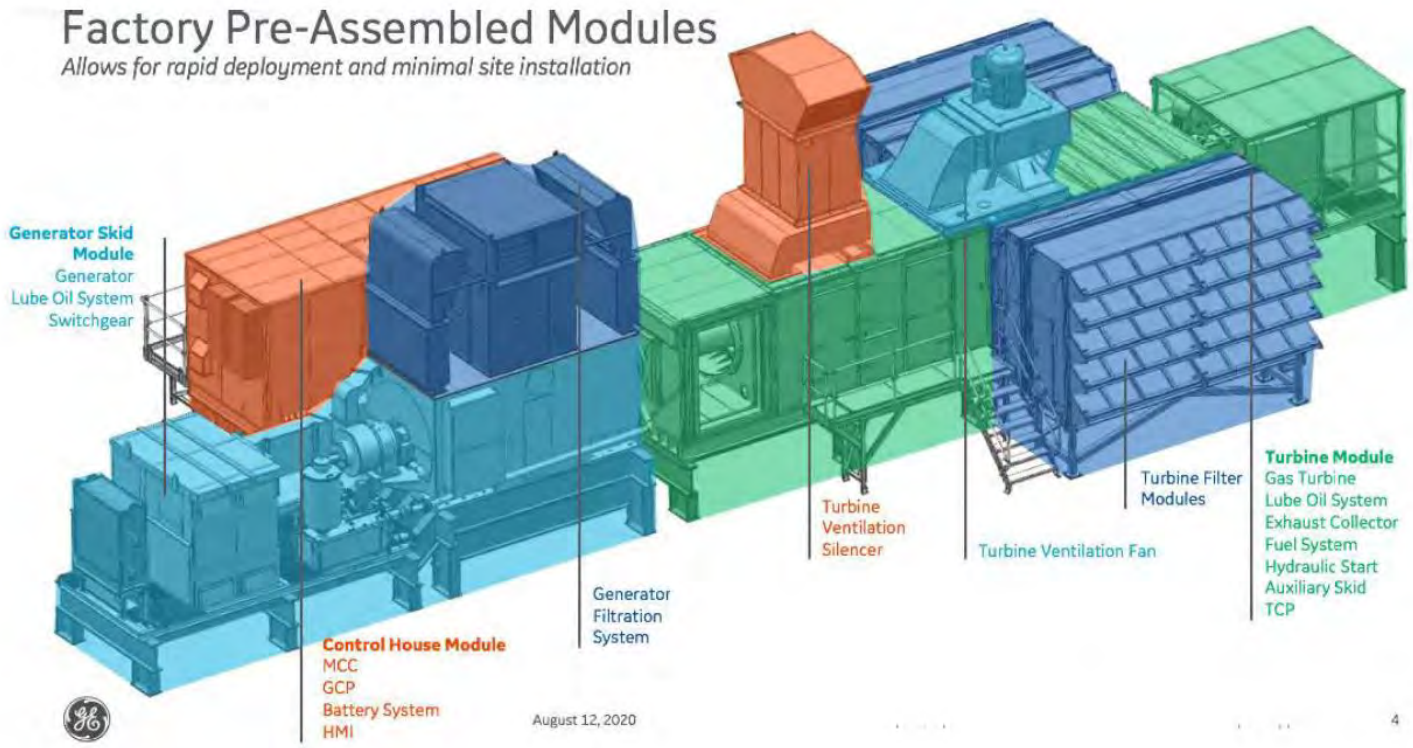
Project Overview: Technology Selection

Gas Turbines

General Electric (GE) model LM2500+G4 Xpress

Aeroderivative package, dual fuel (fuel gas & fuel oil), dry low emissions (DLE) combustor (no water injection required to meet emissions)

Quick Start – 8 mins
Efficiency – 39.2%
Reliability – 99.7%
Availability – 98.2%



Project Overview: Technology Selection

Reliability

Inlet Cooling System
Evaporative Cooling
Available > 60°F

Protection to ensures power output on hot ambient days

Water Spray Module w/ Drift Eliminator

Gas Turbine Air Inlet

Water Supply

Project Overview: Technology Selection

Reliability

Inlet Heating System
Designed to -20°F

Equipment
Exhaust Heat Exchanger
Electric Heaters

Protections
Turbine Blade Anti-Icing
Emissions Compliance

Exhaust Air Heat Exchanger

Injection Air Fan

Electric Heaters and Air Injection

Project Stakeholders

Owner
Colorado Spring Utilities

Engineering
Stanley Consultants
Civil, Structural, Electrical, Mechanical, Instrumentation and Controls

Procurement
Colorado Springs Utilities Procurement Department

Construction
TIC – The Industrial Company
MMR

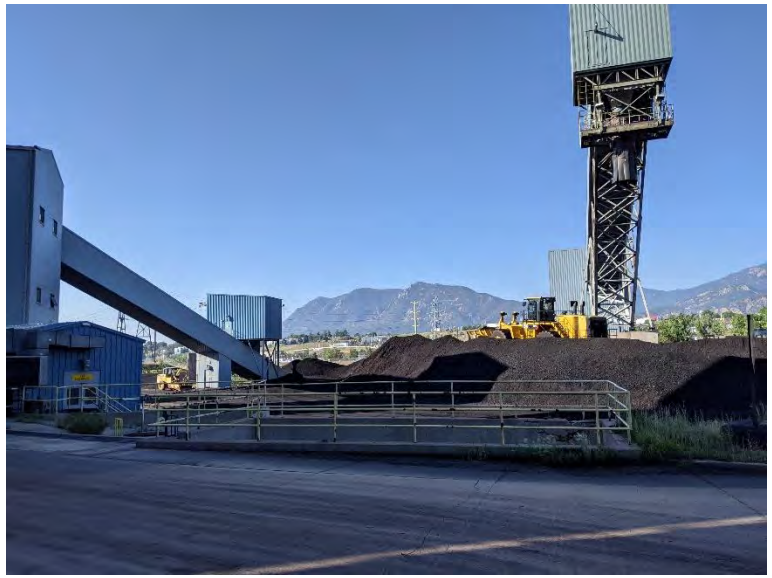
Major Equipment
General Electric – Gas Turbines

Project Constraints - Site Constraints

Existing substation and high-voltage yard

South Plant Substation

Project Constraints - Site Constraints



Existing Coal Pile and Conveyance Equipment

Geotechnical Evaluation and Soil Borings

- South end of site
- Middle of site as coal supply used
- North end of site once conveyance equipment removed

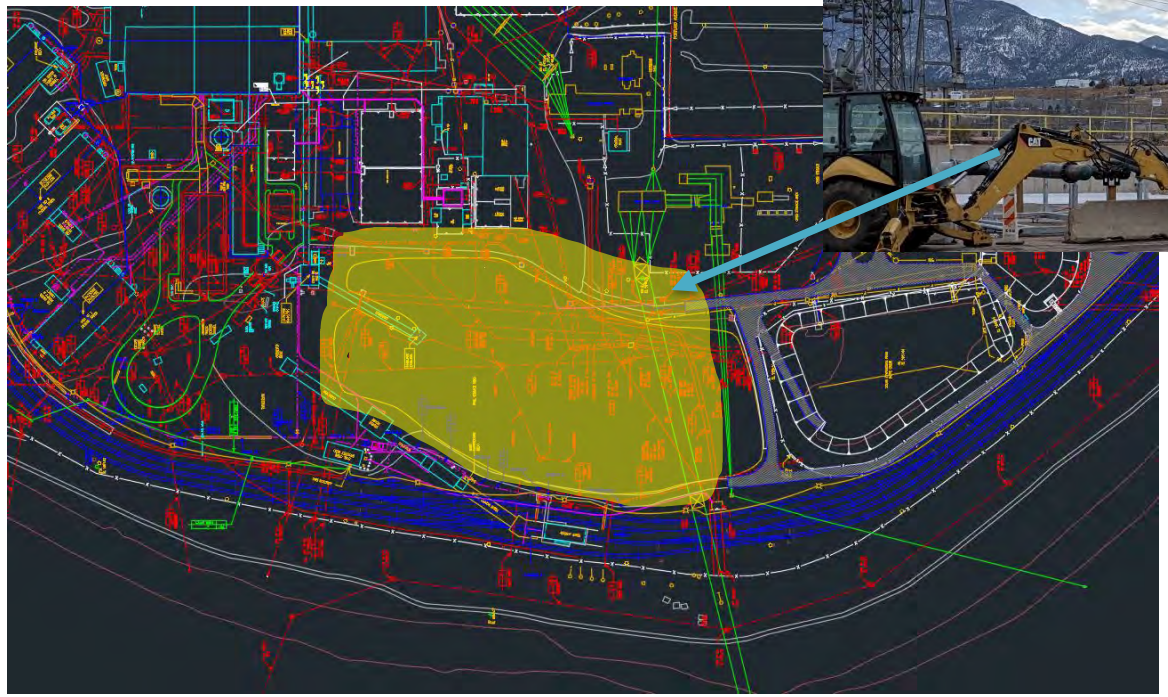
Project Constraints - Site Constraints

Existing Underground Utilities

Maintained Existing Site Drainage

Overhead Power Lines

Design And Construction to Avoid Interference with Existing Transmission Lines



Project Constraints - Equipment Scope and Procurement

Reuse of equipment:

(2) Generator Step-Up (GSU) Transformers

(2) Unit Aux Transformers

(2) Switchgear Lineups

From decommissioned Drake coal units 6 and unit 7

Original Drake Location Unit 6

Original Drake Location Unit 7

New Plant Location

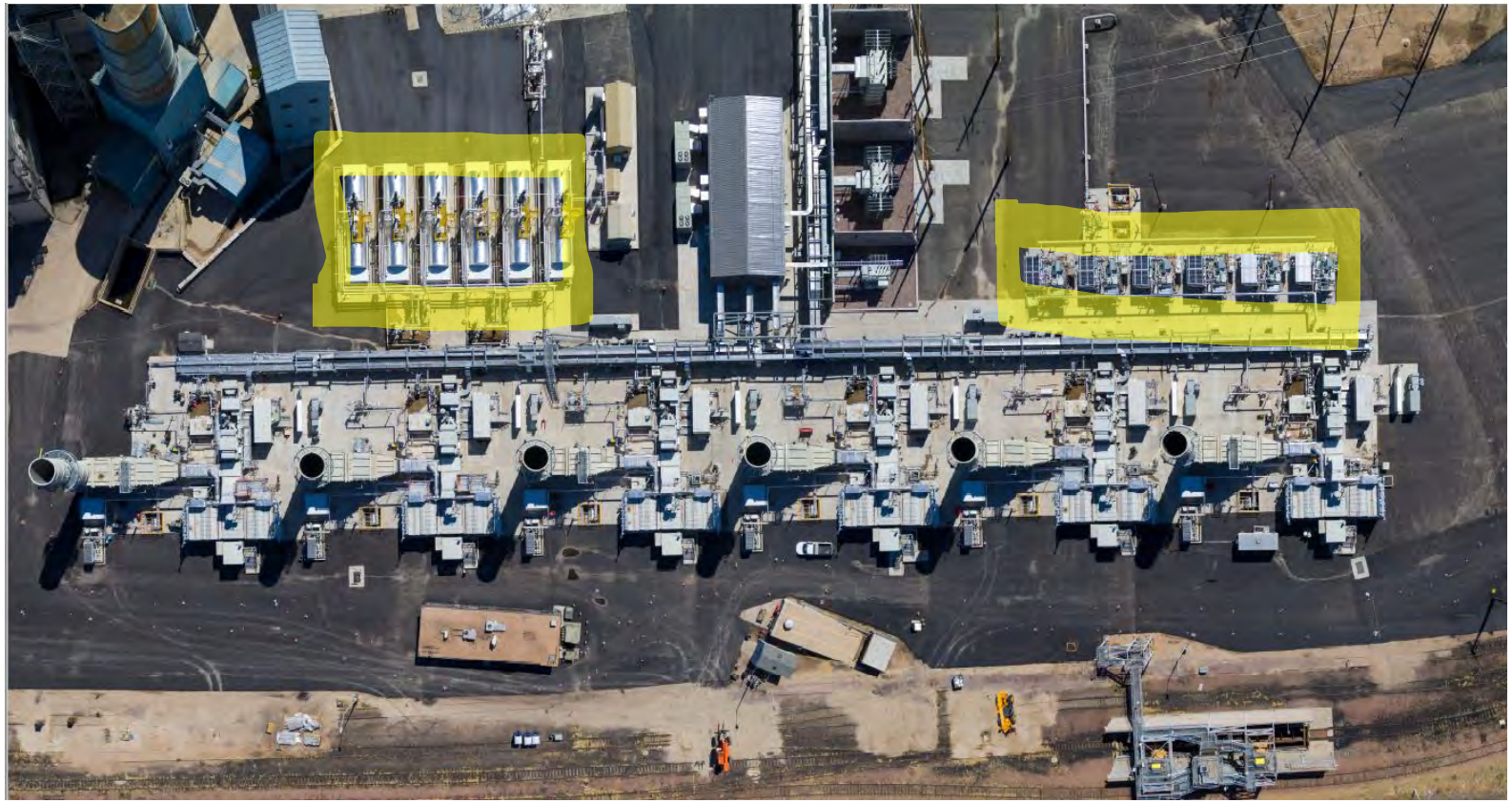
Project Constraints - Future Relocation Considerations

Redundancy Requirements:

(6) Gas Turbines

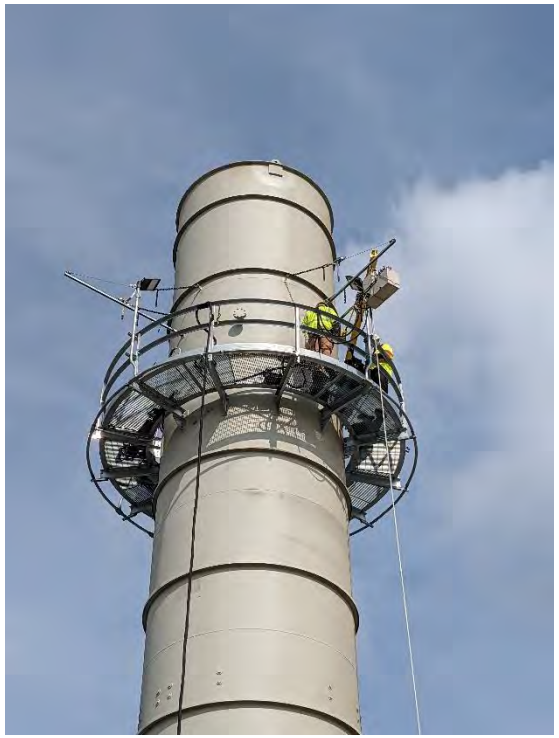
(6) Fuel Gas Compressors

(6) Fuel Oil Storage Tanks



Project Constraints - Environmental Considerations

Gas turbine stack emissions
Third-party emissions testing



GE emissions guarantees

Fuel Gas:

EMISSIONS ARE VALID FOR T2 WITHIN 10°F-100°F AND A GTG LOAD DOWN TO 50% AS DEFINED IN STEADY STATE CONDITIONS FOR EMISSIONS GUARANTEE

NOX:	25 PPMVD AT 15% O2
CO:	1.25 PPMVD AT 15% O2, after catalyst
VOC:	2.8 PPMVD AT 15% O2, after catalyst
FORMALDEHYDE:	91 PPBVD AT15% O2, after catalyst
PM10:	4 lb/h (total with evap on)

Fuel Oil:

EMISSIONS ARE VALID FOR T2 WITHIN 10°F-100°F AND A GTG LOAD DOWN TO 75% AS DEFINED IN STEADY STATE CONDITIONS FOR EMISSIONS GUARANTEE

NOX:	74 PPMVD AT 15% O2
CO:	2.8 PPMVD AT 15% O2, after catalyst
VOC:	12.1 PPMVD AT 15% O2, after catalyst
FORMALDEHYDE:	91 PPBVD AT15% O2, after catalyst
PM10:	10.7 lb/h (total with evap on)

EPA Test Methods

ENGINE CONDITION:	NEW AND CLEAN ≤ 200 SITE FIRED HOURS
FIELD TEST METHODS	
PERFORMANCE:	GE POWER & WATER SGTGPTM
NOX:	EPA METHOD 20
CO:	EPA METHOD 10
PM10:	EPA METHOD 5 / 202
FORMALDEHYDE:	EPA METHOD 320
VOC:	EPA METHOD 25A/18

Project Constraints - Environmental Considerations

SCR ready exhaust (pre-installed ammonia nozzles)

CO catalyst in exhaust

Project Constraints - Environmental Considerations

Fuel oil containment strategy

Fuel truck unloading
Self rising containment berm
Storage tanks
Secondary containment by metal dike
Spills
Concrete raised curbs

Project Constraints - Environmental Considerations

Drains, Storage and Containment

Above ground tanks drain into pre-fabricated concrete pits

Agenda – Part 3

2023 Adaption of Integrated Resource Plan to Regulatory Drivers

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Regulatory Changes

Clean Energy Plan

- Retail Sales
- Market Emissions

Clean Heat Plan

- Building Energy Performance Standard
- New Source Performance Standards for Greenhouse Gas Emissions

Clean Heat Plan

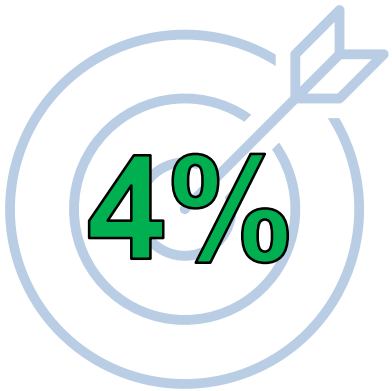
Colorado State Law as of 2021

2024-2025

Spend

2%

of total gas revenue working towards achieving



Target: reduction in greenhouse gas below 2015 levels

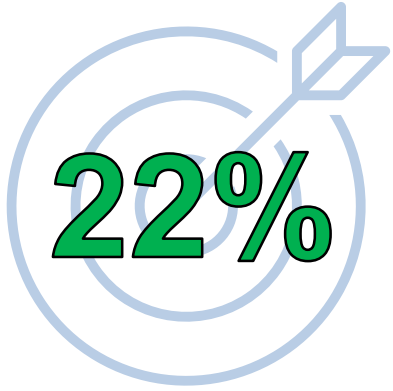
Colorado Springs Utilities submitted plan on July 28, 2023

2026-2030

Spend

2.5%

of total gas revenue working towards achieving



Target: reduction in greenhouse gas below 2015 levels

Meeting our Energy Vision Pillars

ECONOMIC

ENVIRONMENT

RESILIENCY

INNOVATION

Thank You

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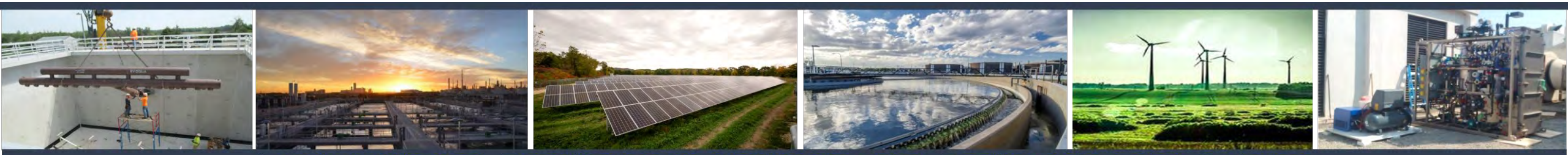

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