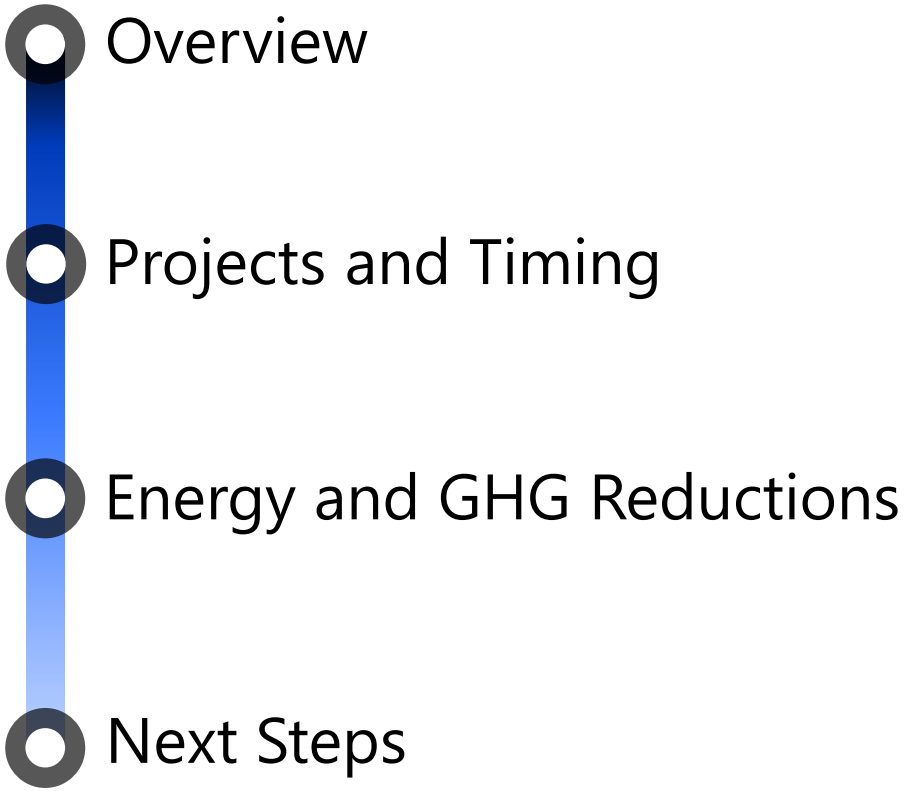
Energy Facilities Master Plan

January 16, 2024

Dublin San Ramon Services District
Water, wastewater, recycled water

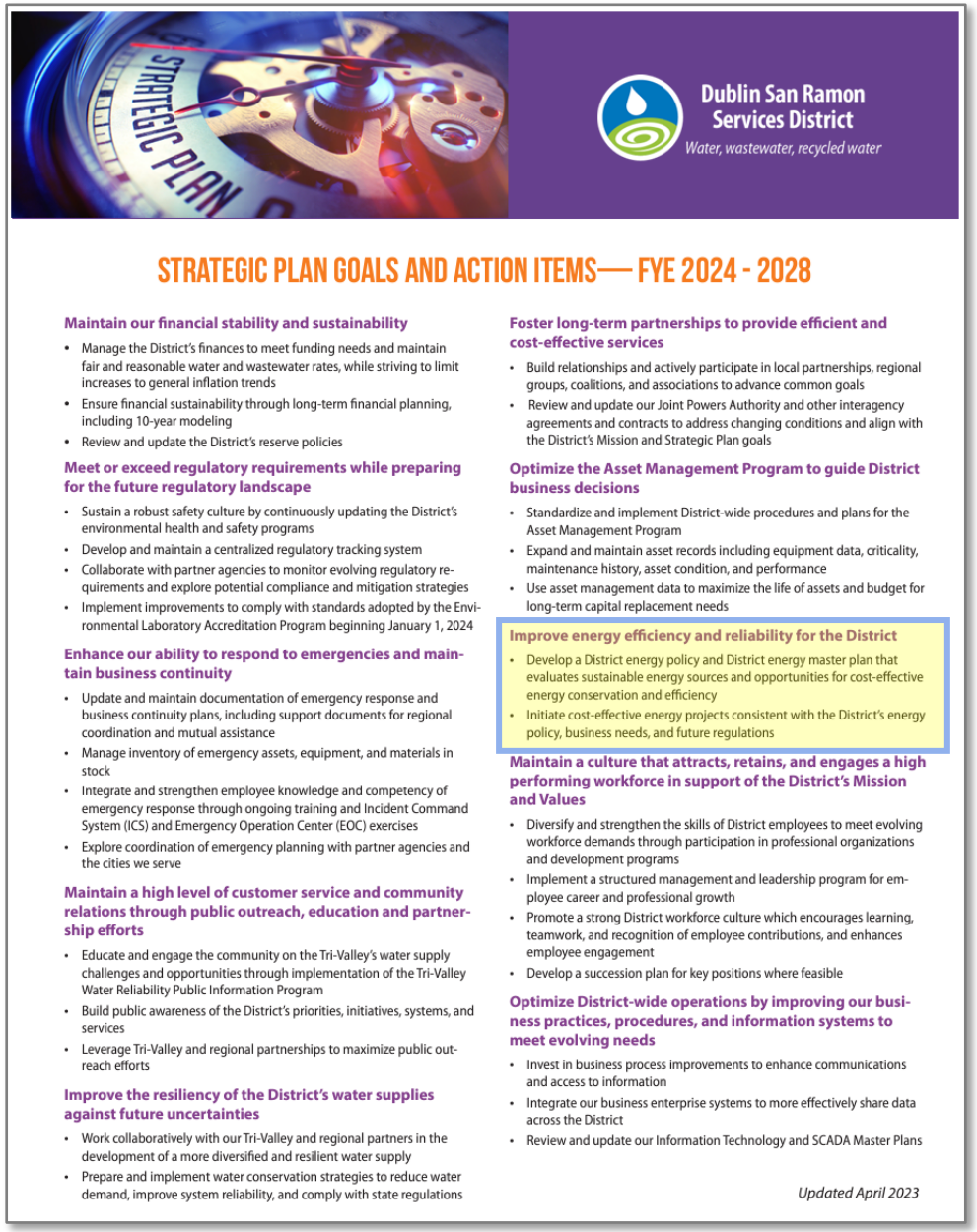
Agenda


Overview
Projects and Timing
Energy and GHG Reductions
Next Steps

Strategic Plan

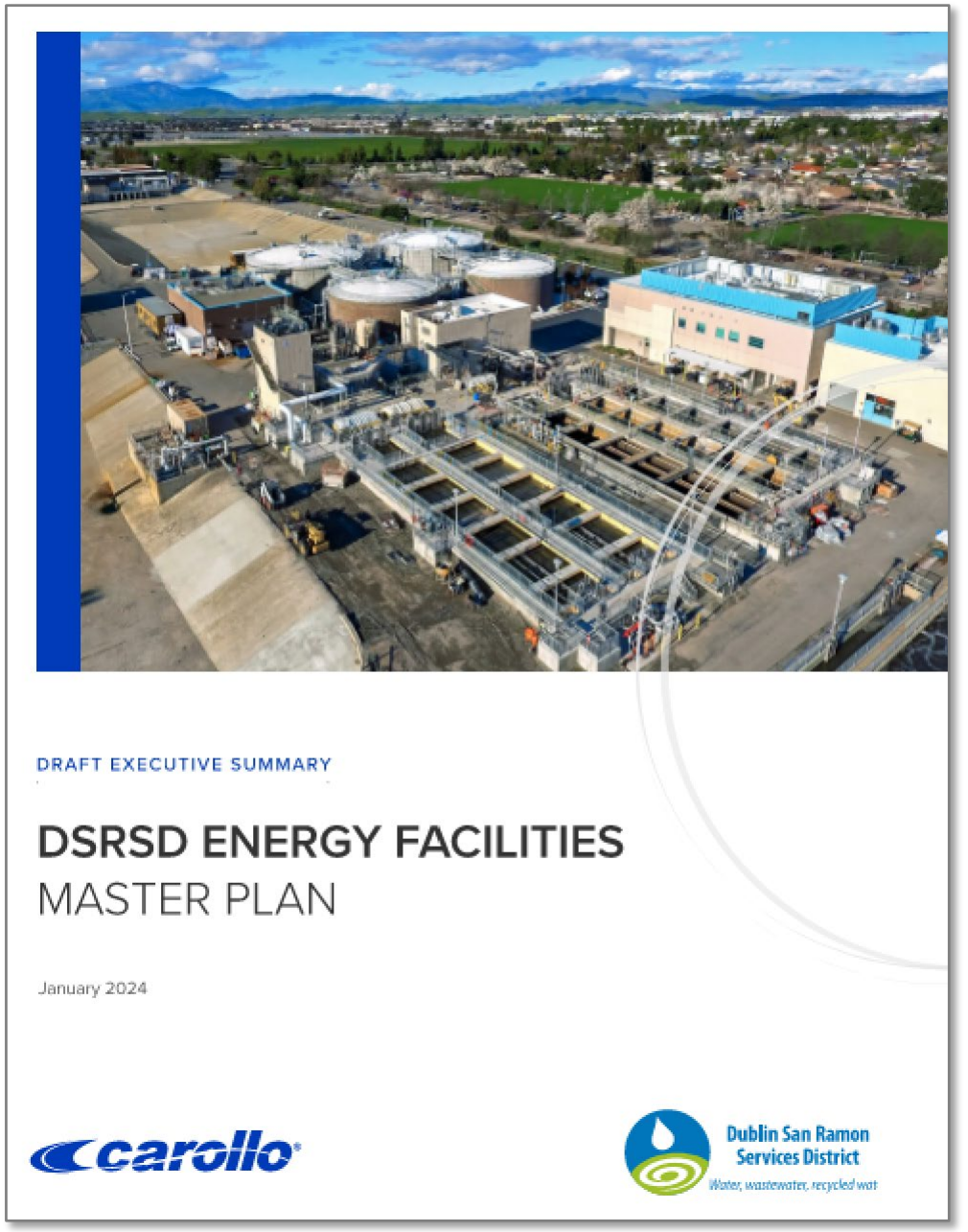
Improve energy efficiency and reliability for the District

- Develop a District **energy policy** and District **energy master plan** that evaluates sustainable energy sources and opportunities for cost-effective energy consumption and efficiency
- Initiate cost-effective **energy projects** consistent with the District's energy policy, business needs and future regulations



Overview

- All-Encompassing Review of All District Facilities
- Energy Master Plan
- Energy Policy
- Capital Improvement Program



Scope of Phase 1 and 2 of this Planning Project

Phase 1

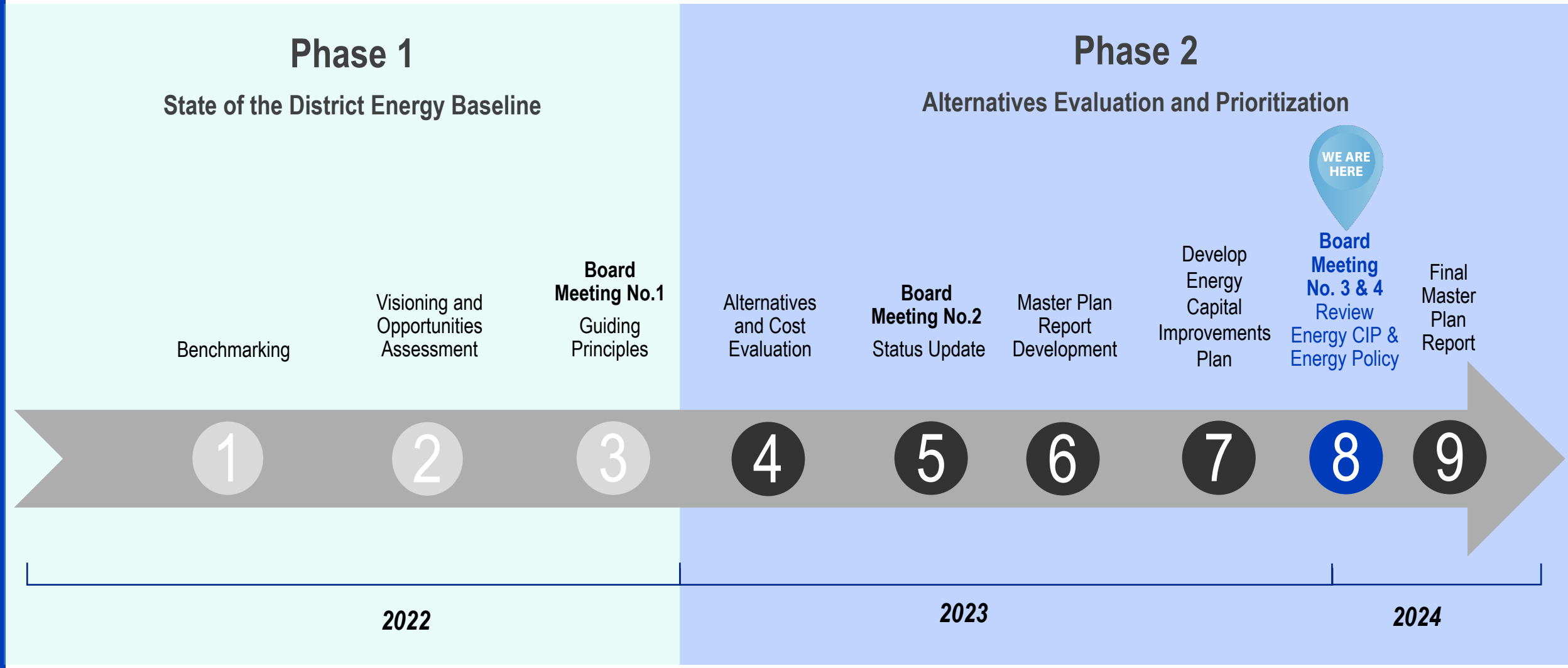
State of the District Energy Baseline

Phase 2

Alternatives Evaluation and Prioritization

2022 ***2023*** ***2024***

Scope of Phase 1 and 2 of this Planning Project



Phase 1 Summary

Summary of the Baseline Findings

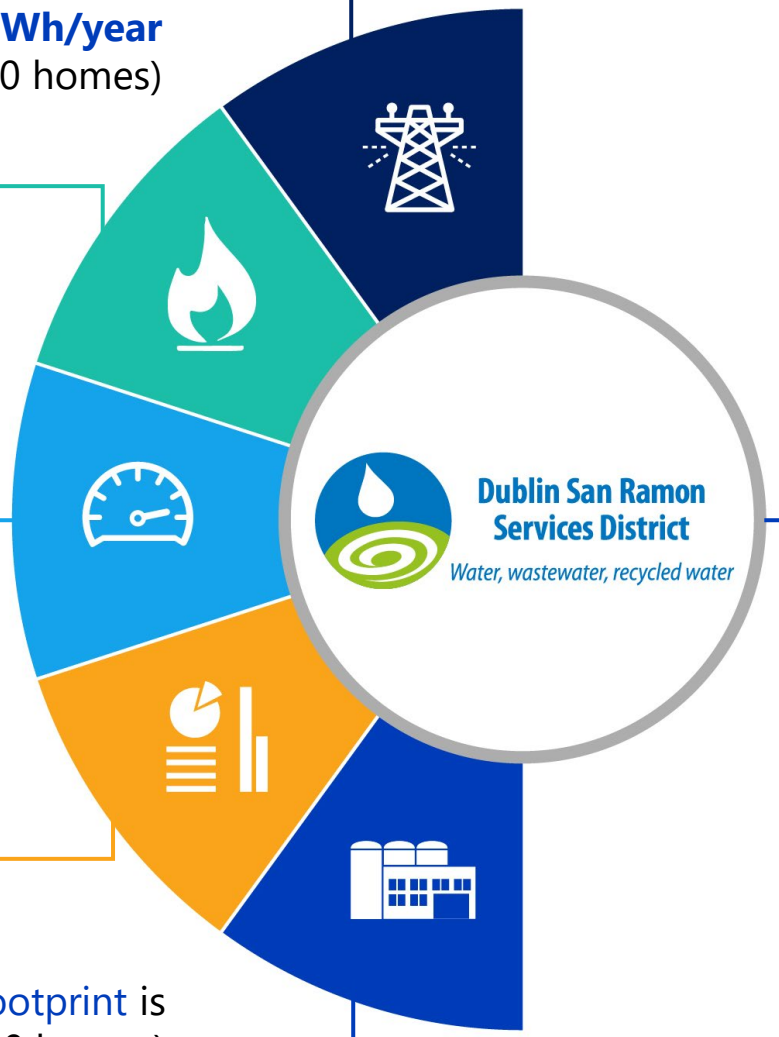
Electricity demand:
~15 GWh/year
(~2,500 homes)

Thermal energy demand:
~720,000 therms/year
(~2,100 homes)

Fuel consumption is comparable to **~60 vehicles** driven in the United States

~94% of the District's electrical energy demands are associated with the operation of its wastewater treatment and water distribution facilities

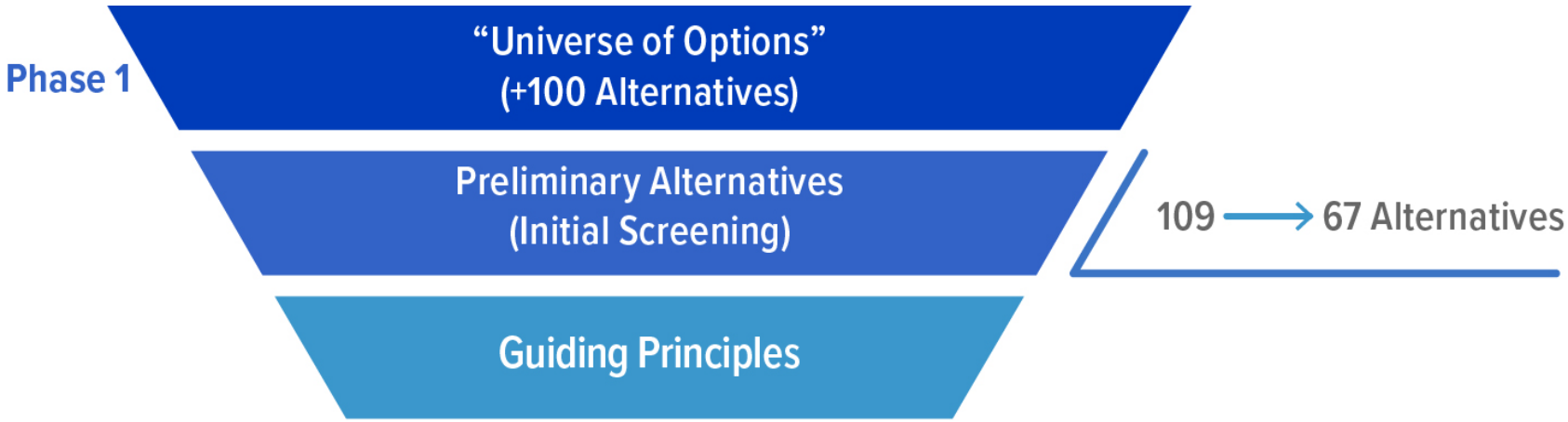
The District's GHG footprint is **~4,400 metric tons CO2e**(~140 homes)



~96% of the power required for the WWTP is generated on-premise via the cogeneration system

Nearly **100%** of the thermal energy demands for the WWTP are met through thermal energy recovered from the on-premise cogeneration system

Master Planning Process

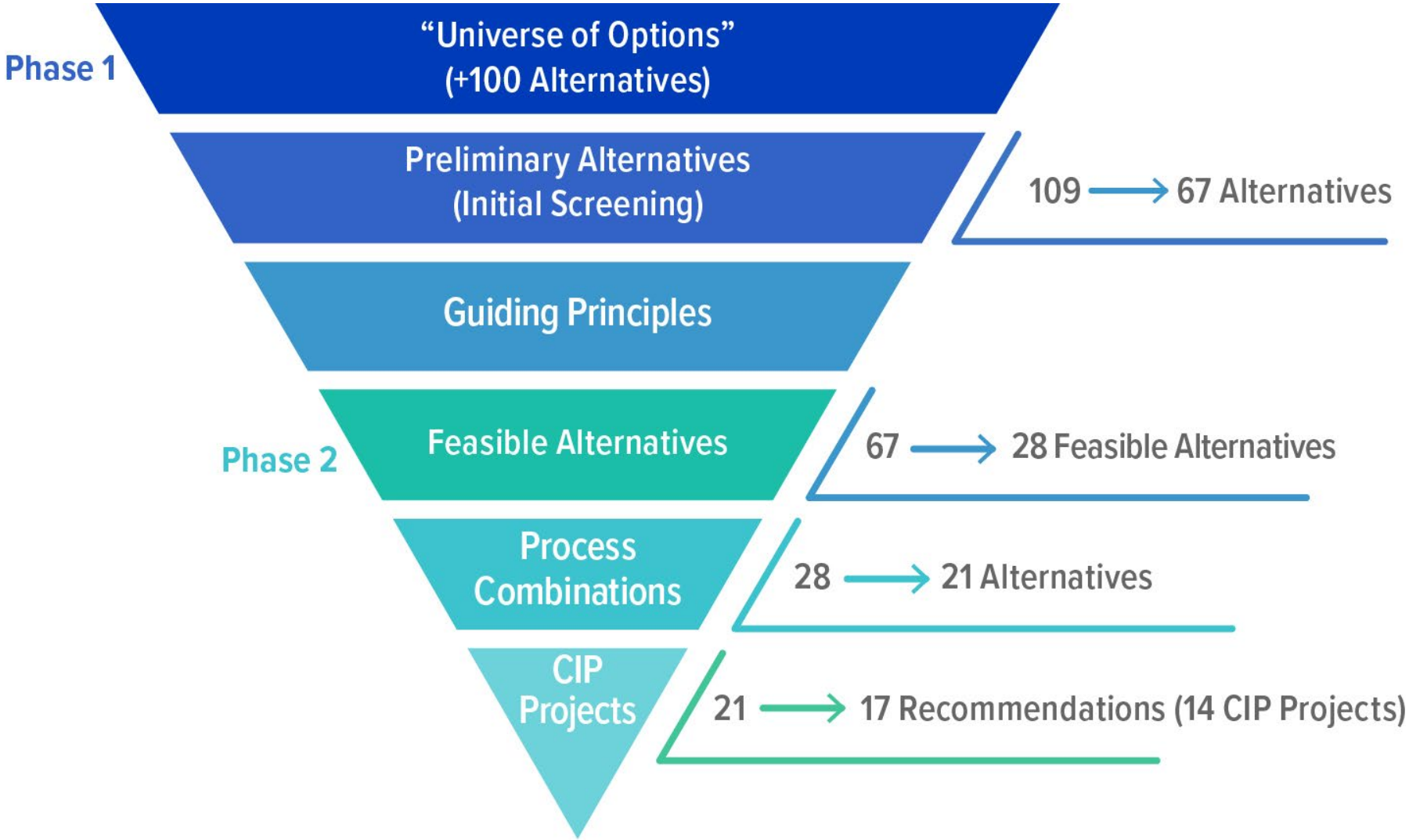


Energy Guiding Principles Review

1. Strive to establish a **diverse, reliable, and resilient energy** supply portfolio for operation of its facilities.
2. **Comply with all regulatory energy and GHG related mandates** and strive to exceed them when related investments are cost-effective with consideration to the anticipated payback period and life cycle cost.
3. **Capital improvements** shall consider the **impact on energy demand, energy efficiency, and GHG impacts** where relevant.
4. Seek opportunities to **offset any additional future energy demands** with **renewable energy** production.

Phase 2 Summary – Proposed CIP

Master Planning Process



Projects

CIP Project Summary

Regulatory Compliance

1. Fleet Assets Program

Renewable Energy Generation/Energy Diversification

6. Off-Site Solar Power
7. Battery Storage
8. On-Site Solar Power, Battery Storage and EV Charging Stations
9. Co-Digestion of Food Waste
10. Additional Cogeneration Engine

Asset Replacement (Efficiency)

2. Cogeneration Engine Replacement
3. Aeration System Upgrades
4. DAFT Replacement with Mechanical Thickening
5. WWTP HVAC Replacements

Electrical Resiliency/Reliability

11. Install Load Bank for DP-G
12. Reconfigure Switchgear for Power Outages
13. WWTP Electrical Improvements – Phase 1
14. WWTP Electrical Improvements – Phase 2

CIP Project Summary

Regulatory Compliance

1. **Fleet Assets Program**

Renewable Energy Generation/Energy Diversification

6. Off-Site Solar Power
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8. On-Site Solar Power, Battery Storage and EV Charging Stations
9. Co-Digestion of Food Waste
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Electrical Resiliency/Reliability

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12. Reconfigure Switchgear for Power Outages
13. **WWTP Electrical Improvements – Phase 1**
14. WWTP Electrical Improvements – Phase 2

Regulatory Compliance

Project 1: Fleet Assets Program

Description

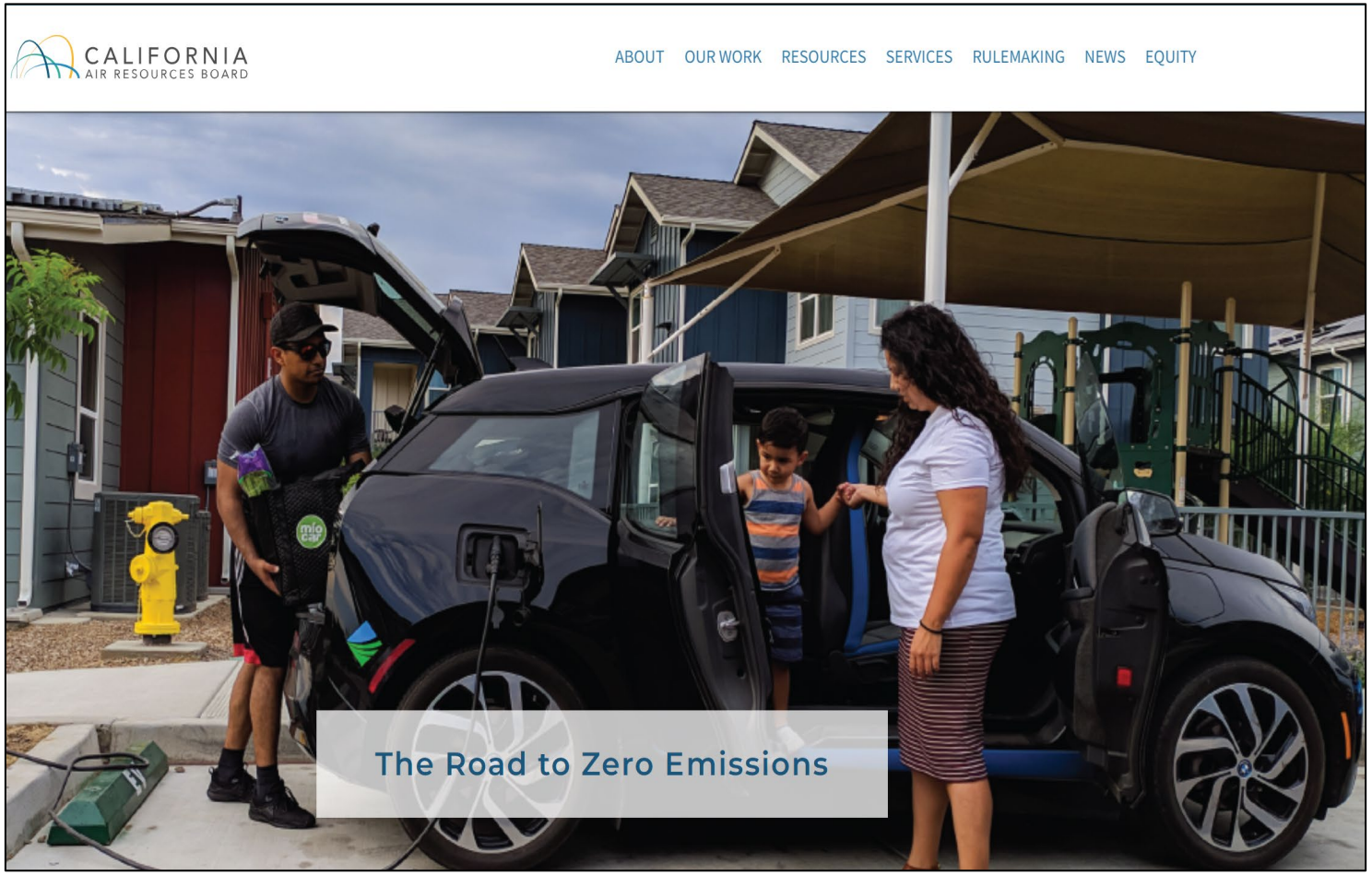
- Fleet vehicle replacements to comply with new regulations
- Starting in 2027, replacements must be Zero Emission Vehicles (ZEVs)

Justification

- Required to comply with regulations

Capital Cost: $13.0 M over 20 years

Project Implementation: Starting in 2025, and as fleet assets are replaced



Asset Replacement

Project 2: Cogeneration Replacement

Description:

- Two 700 kW engines in a new building

Justification:

- Cogeneration equipment nearing end of useful service life (30-40 years old)
- Newer engines will provide 20% more power to offset future demands

Capital Cost: $44.4 M

Project Commencement : FYE 2026 to maximize IRA funding incentives

Funding: Up to 30% available through IRA

Renewable Energy Generation & Energy Diversification

Project 6 & 8: On-Site/Off-Site Solar, Battery Storage and EV Charging Stations

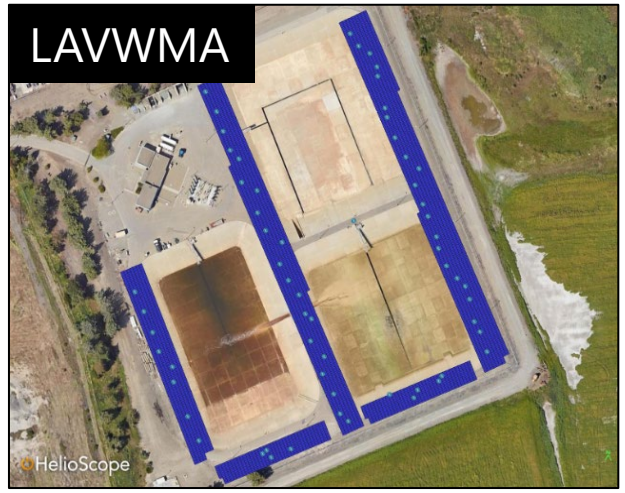
Description

- New solar facilities on DSRSD properties, including battery storage and EV charging

Justification

- Stabilization of energy costs
- Offsets future energy demands with renewable energy source
- Supports next generation of Zero Emission Vehicles (ZEVs)

Capital Cost: $18.4 M



Renewable Energy Generation & Energy Diversification

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Justification

» Stabilization of energy costs

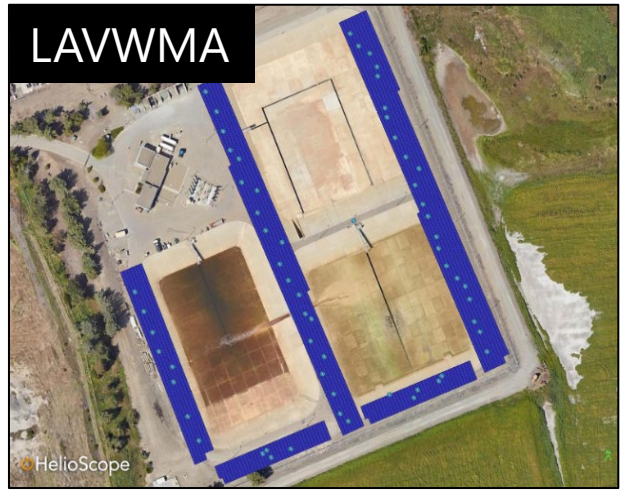
» Offsets future energy demands with renewable energy source

» Supports next generation of Zero Emission Vehicles (ZEVs)

Capital Cost: ~~$18.4 M,~~ Purchase Power Agreement

Project Commencement: FYE 2025

Funding: PPA



Renewable Energy Generation & Energy Diversification

Project 9: Co-Digestion of Food Waste & Other High-Strength Wastes

Description:

- Waste receiving facility for feeding digesters

Justification:

- Regional Partnerships to help jurisdictions meet requirements of SB 1383
- Offsets future energy demands

Capital Cost: $3.9 M

Project Commencement : FYE 2026 to maximize IRA funding incentives and customer base

Funding: Up to 30% available through IRA

Energy Resiliency & Reliability

Project 13 & 14: WWTP Electrical Improvements

Description

- Improvements to address issues with load and short circuit deficiencies
- Implemented in 2 phases

Justification

- Provides for resiliency of equipment by preventing failures due to overloads

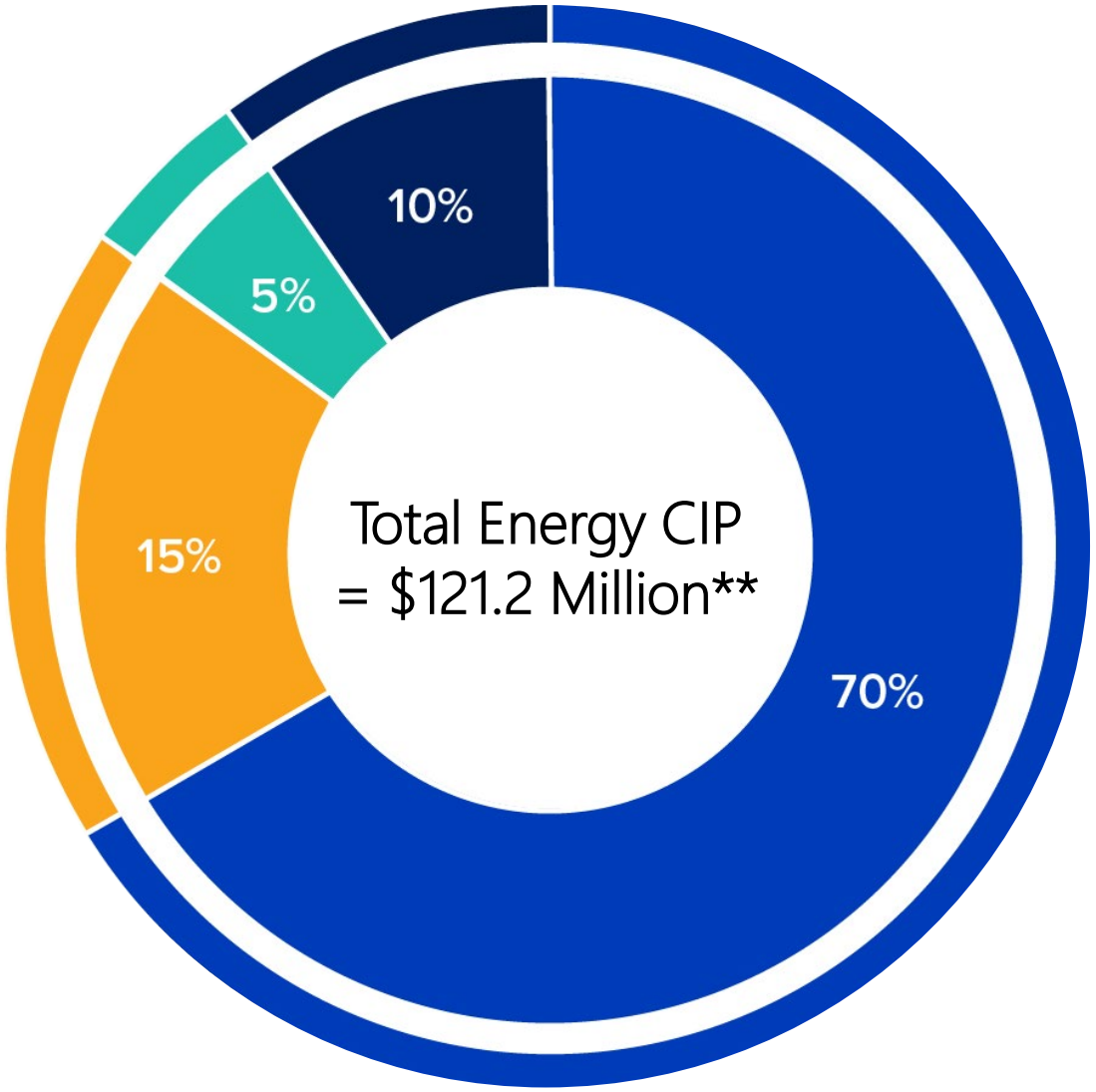
Capital Cost: $6.2 M

Project Commencement : FYE 2025 to address immediate needs and provide continued reliability of electrical distribution infrastructure

Non-CIP Project/Initiative Summary

Project	Opportunities Included	Justification
Project 15: Fats, Oils, and Grease (FOG) Facility Activation	Co-digest FOG	Reduction of 1,230 metric tons in carbon dioxide equivalents for a slight increase in operating costs ($300k).
Project 16: Potable Water Distribution System Improvements	Address pump performance issues identified.	Efficiency issues associated with poor pump performance not only impact energy use but reduce the life of equipment and impact system reliability.
Project 17: Energy Management Improvements	Renewable Energy Generation Partnerships Alternative Power Monitoring Energy Decision Management Tools Staff Focus on Energy Management	Allows for better energy management decisions by understanding where power is consumed.

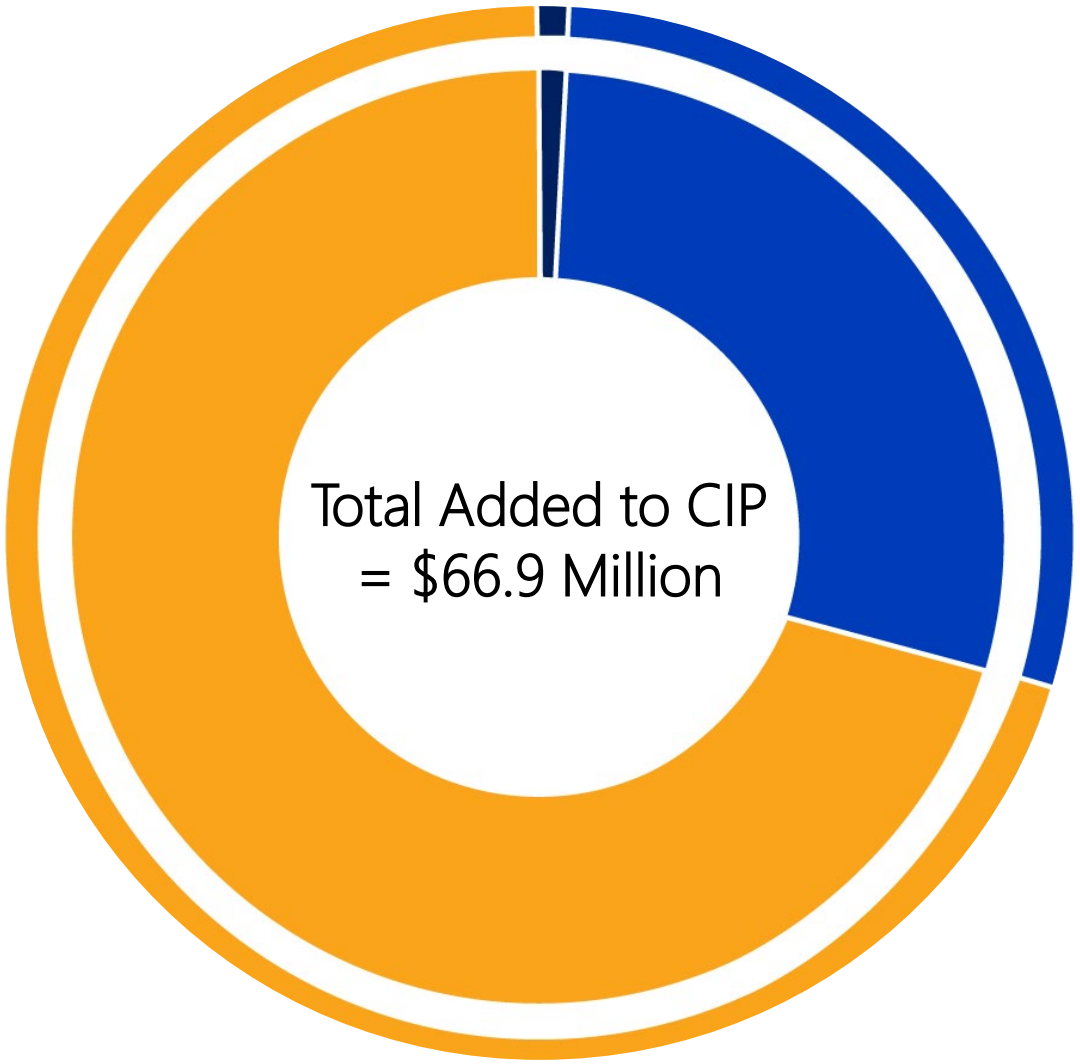
$121.2 Million Energy Capital Improvement Program



Project Type	Total
Asset Replacement	$84,500,000
Regulatory Compliance	$11,700,000
Energy Resiliency	$6,500,000
Renewable Energy Generation/Diversification	$18,500,000
Solar Projects funded through PPA	**$121,200,000****

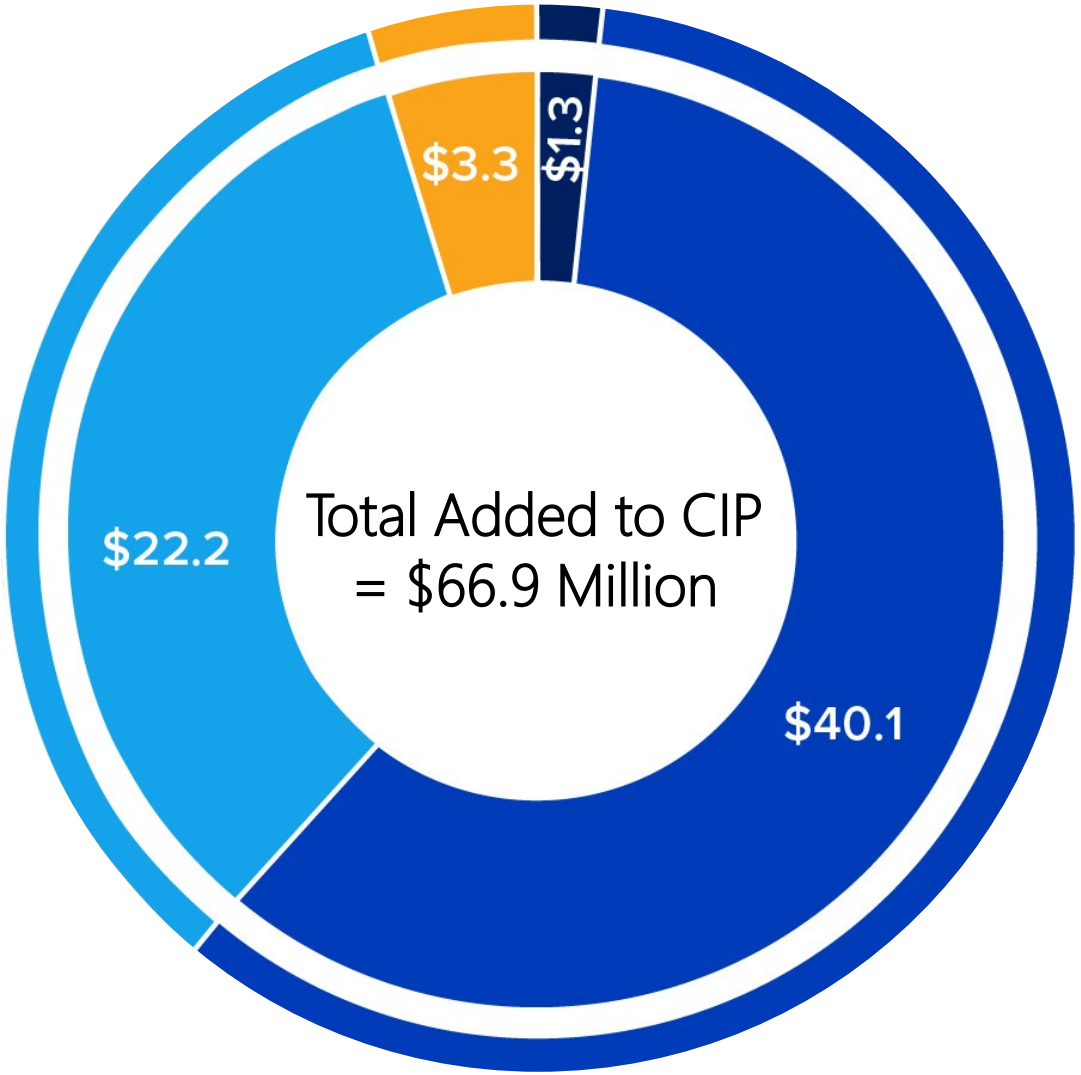
**Total Energy CIP without Solar Projects Funded through PPA is approximately $139.4 million

$66.9 Million Added to Capital Improvement Program



- **$500,000** increase to **2-Year CIP Budget** (<1% increase)
- **$19.7 Million** increase to **10-Year CIP Plan** (6% increase)
- **$47.2 Million** increase to **11-25 Year CIP**

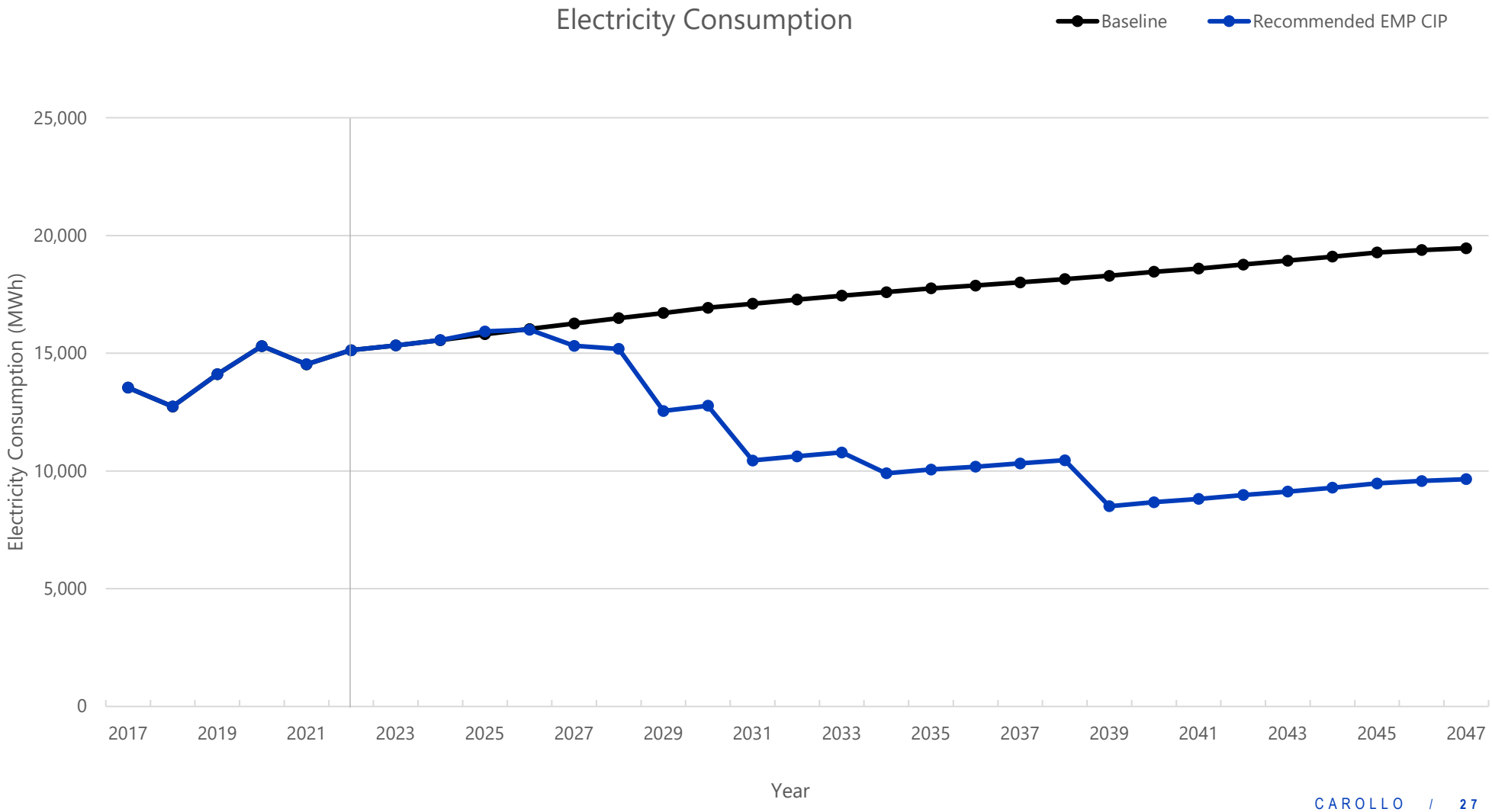
$66.9 Million Added to Capital Improvement Program



- Fund 210: **+$1.3 Million**
  Local Wastewater Replacement Fund
- Fund 310: **+$40.1 Million**
  Regional Wastewater Treatment Replacement Fund
- Fund 320: **+$22.2 Million**
  Regional Wastewater Expansion Fund
- Fund 610: **+$3.3 Million**
  Water Replacement Fund

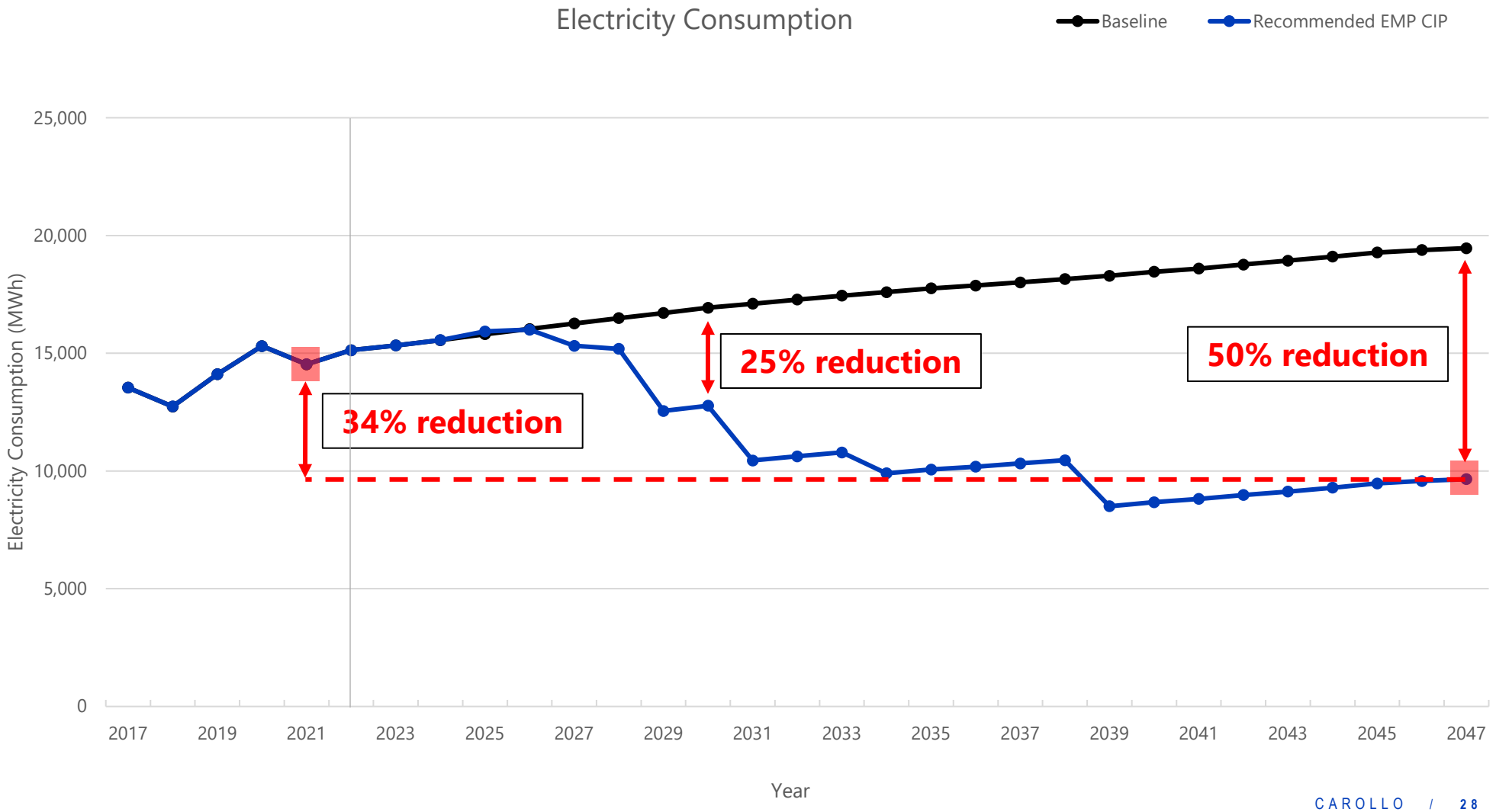
Energy and GHG Reductions

Energy Impacts

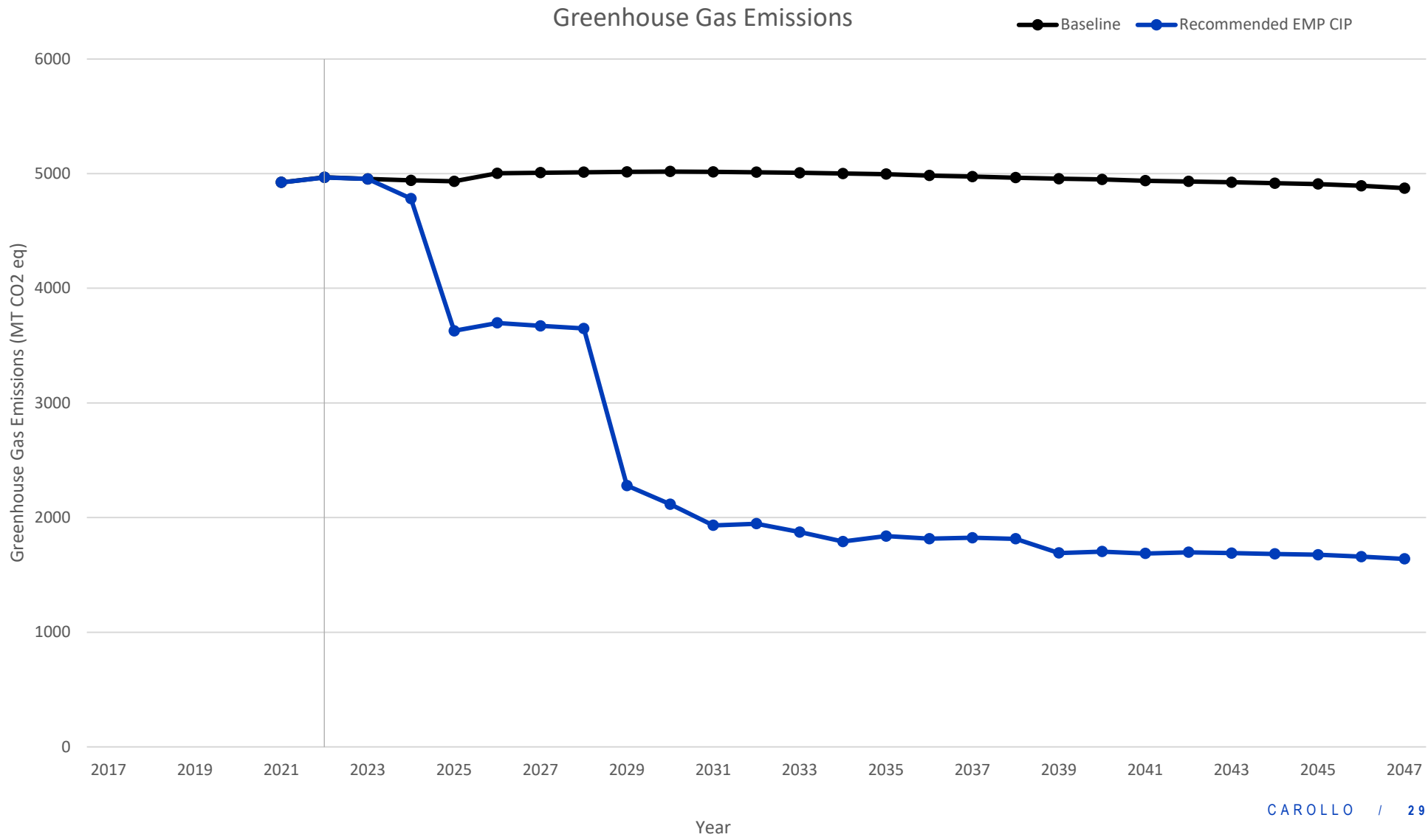


Energy Impacts

- 34% reduction from 2021 baseline
- 25% reduction in electricity consumption by 2030
- 50% reduction by 2047
- $21 million total savings

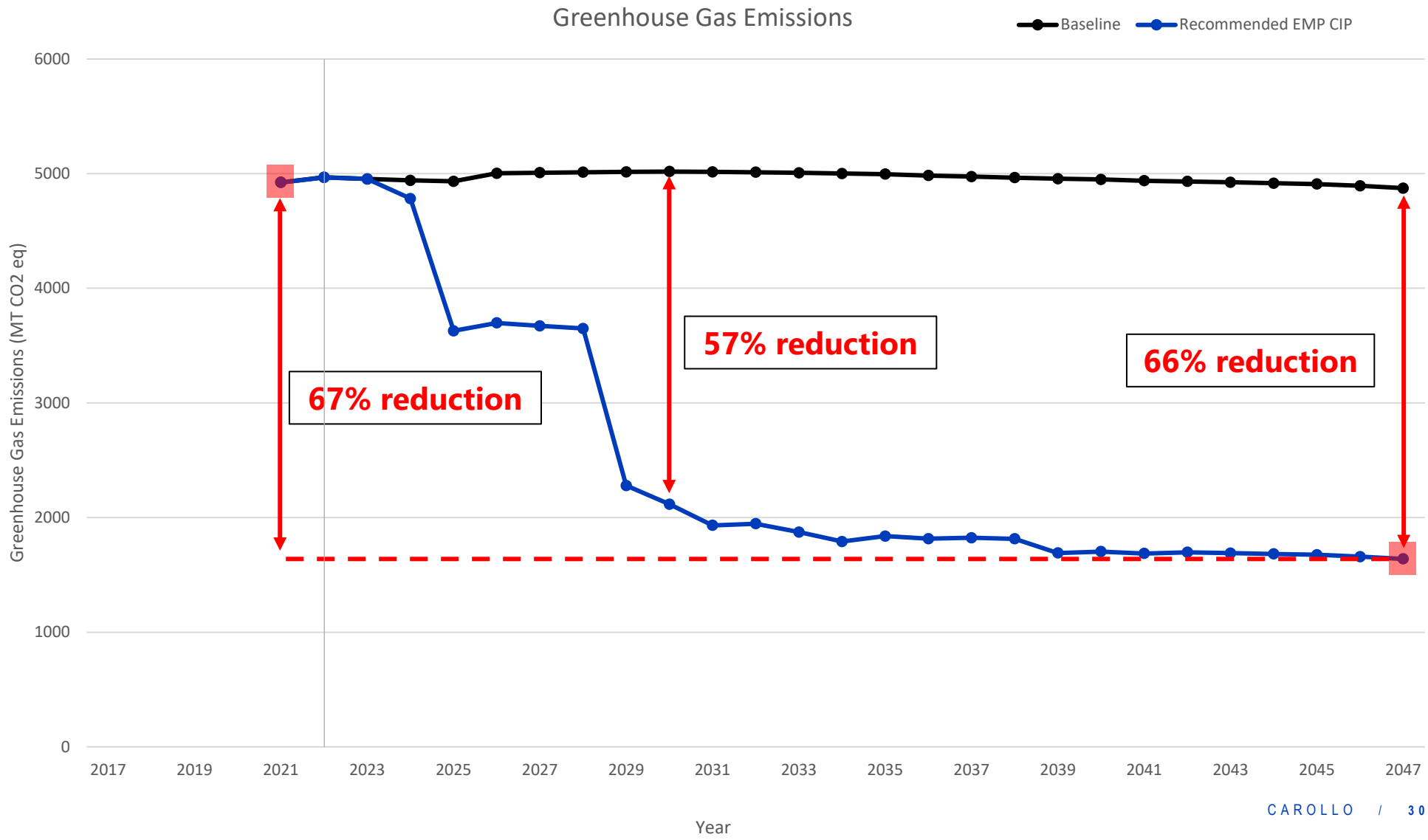


GHG Emissions Impacts



GHG Emissions Impacts

- 67% reduction from 2021 baseline
- 57% reduction by 2030
- 66% reduction by 2047



Summary and Next Steps

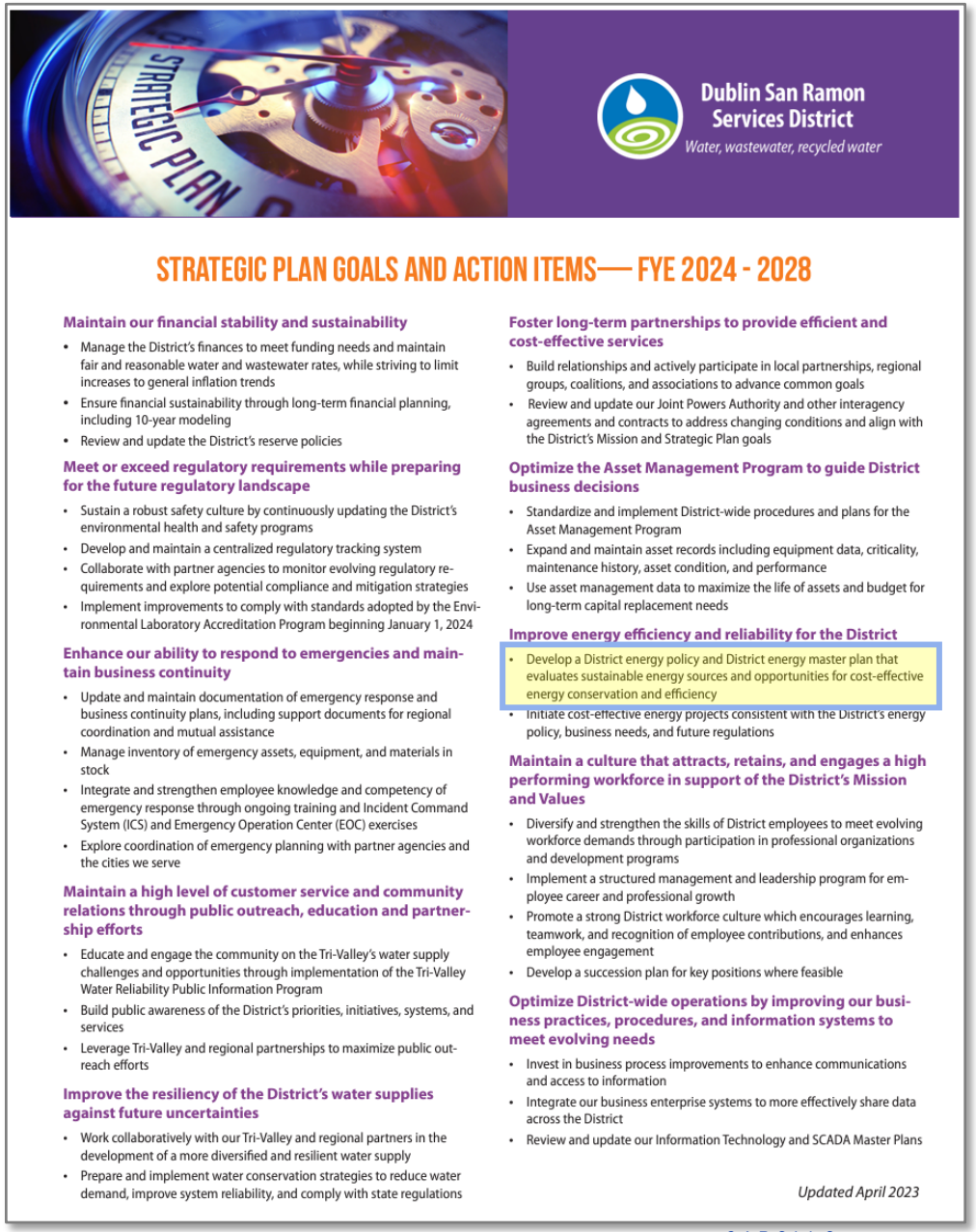
Energy CIP Key Points

- **17 Projects – 14 CIP and 3 Non-CIP**
- **$121.2 Million (Total Energy Master Plan CIP)**
  - Additional **$66.9 million** to overall **CIP**
  - Increase of **$500,000** (<1% increase) to **2-year CIP** budget
  - Increase of **$19.7 million** (6% increase) to **10-year CIP** plan
- **Energy and GHG Impacts**
  - Reduce **energy** consumption by **50%**
  - Reduce **GHG** Emissions by **66%**
- **Other Major Benefits**
  - Stabilizes and reduces energy costs
  - Diversifies energy supplies with renewable energy
  - Ensures regulatory compliance for the District's fleet
  - Improves energy reliability

Energy Policy

Improve energy efficiency and reliability for the District

- Develop a District **energy policy** and District **energy master plan** that evaluates sustainable energy sources and opportunities for cost-effective energy consumption and efficiency
- Initiate cost-effective **energy projects** consistent with the District's energy policy, business needs and future regulations



Energy Policy

- Energy Diversification, Reliability and Resiliency
- Regulatory Compliance
- Reduce Energy Consumption, Enhance Energy Efficiency, and Reduce Greenhouse Gas Emissions
- Offset Future Energy Demands and GHG Emissions through Renewable Energy
- Fleet Management
- Funding Opportunities

Next Steps

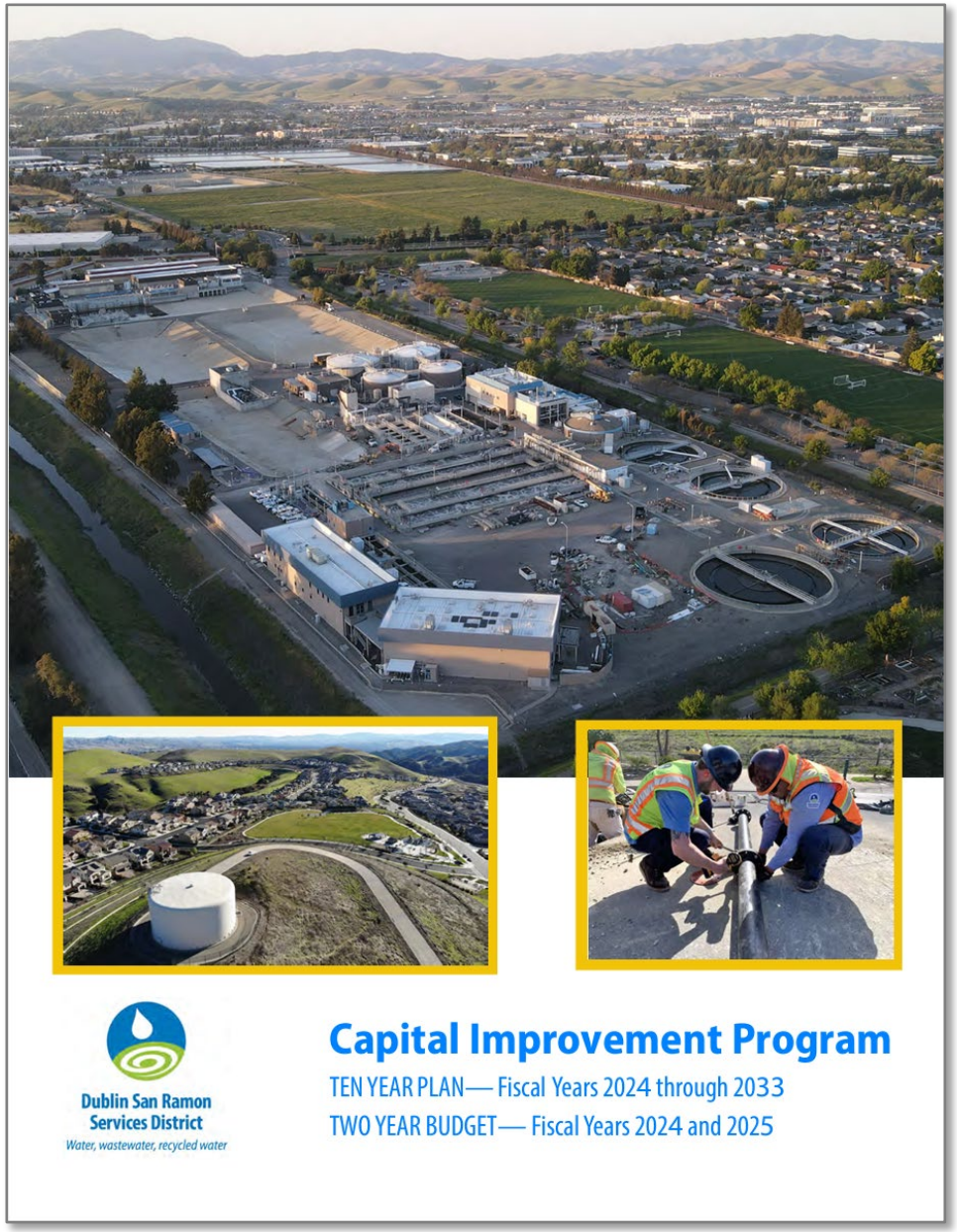
Finalize the **Energy Facilities Master Plan**

Adopt the **Energy Policy**

Amend the current CIP to add two new projects, and advance one existing project

- Onsite Solar, Battery Storage, EV Charging
  PPA/$100,000 in FYE 25
- Offsite Solar Power
  PPA/$100,000 in FYE 25
- WWTP Electrical Improvements
  $300,000 in FYE 25

Staff to assess strategies to incorporate **other projects** into CIP; recommendations will be made as part of the development of the **next CIP**



Questions