



# Power Operations and Planning Update

Engineering and Operations Committee

Item 6a

July 12, 2021

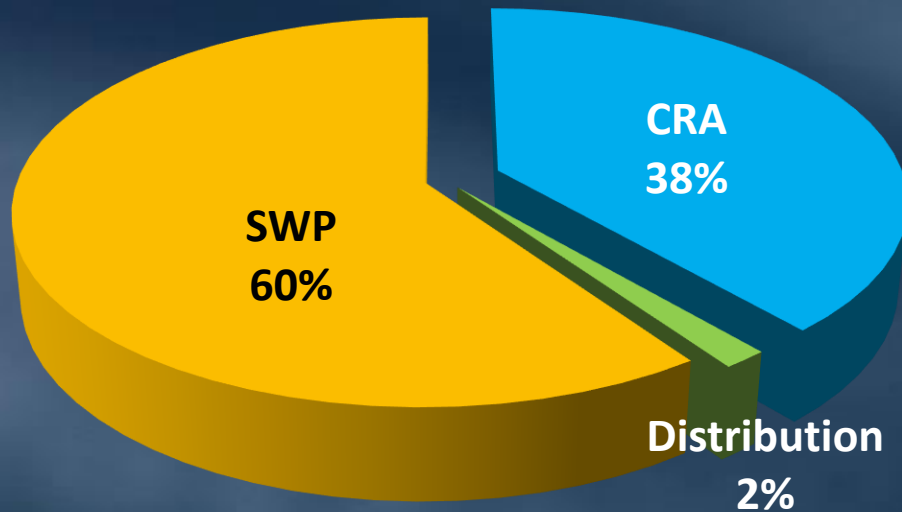
# Metropolitan's Energy Requirements



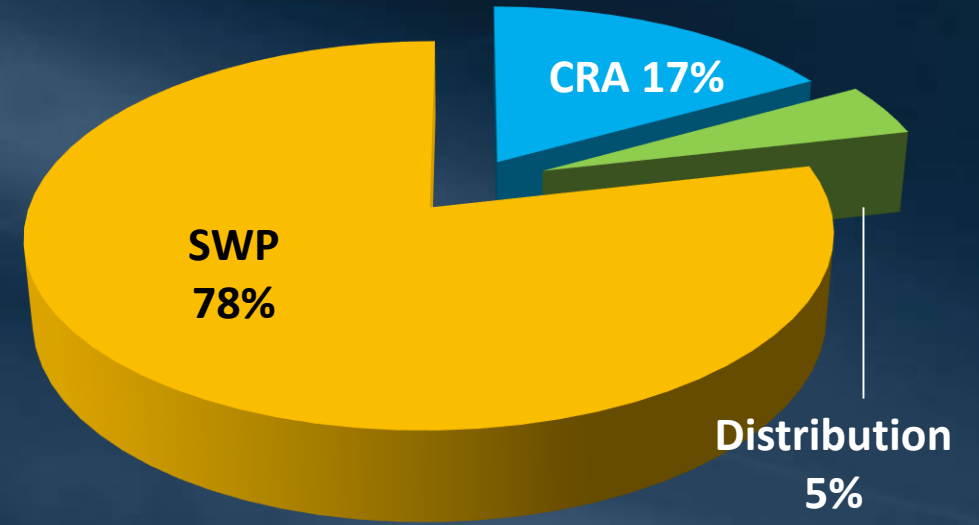
# CRA and SWP – Cost and Energy

Higher “Fixed” SWP Energy Costs

Energy (MWh)



Cost (\$M)



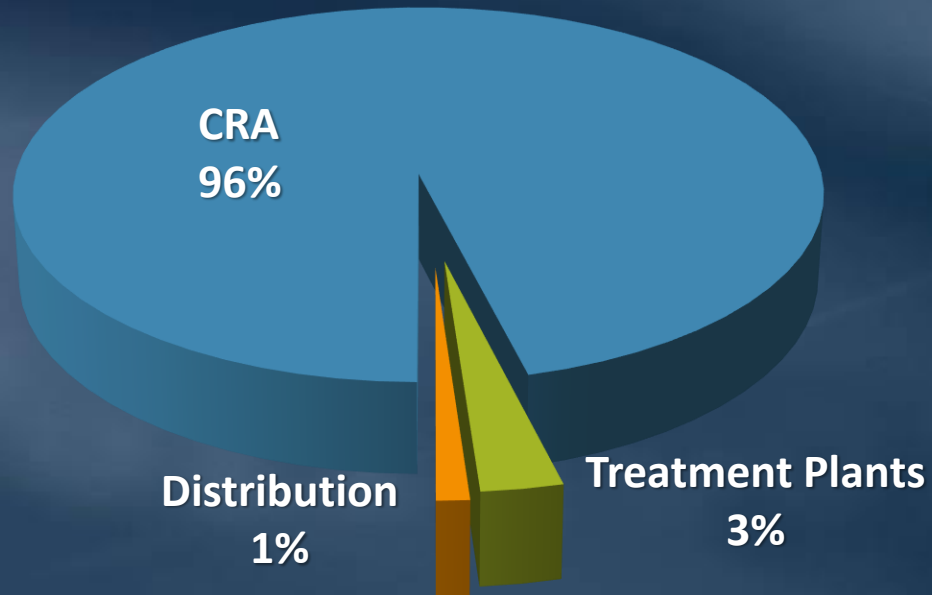
CY2010-2020 Average Annual Electricity Consumption = 4.52M MWh

CY2010-2020 Average Annual Electricity Cost = \$190M

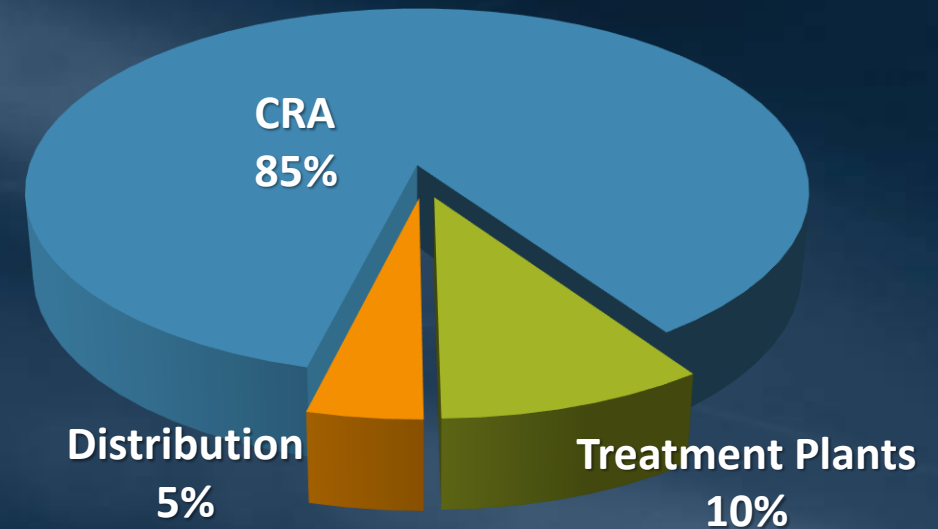
# CRA is the Largest Direct Energy Cost

Pumping accounts for over 90% of energy use

Energy (MWh)



Cost (\$M)



**CY2020 CRA and Treatment Plant/Distribution Electricity Consumption = 1.70M MWh**

**CY2020 CRA and Treatment Plant/Distribution Electricity Cost = \$48M**

# Metropolitan's CRA Transmission System





# What Makes MWD Unique?

Flexibility, Access, Independence

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**Imported  
Generation**

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**Cal ISO  
Energy Market**

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**Hoover &  
Parker**

**Supplemental Energy**

**Base Supply**

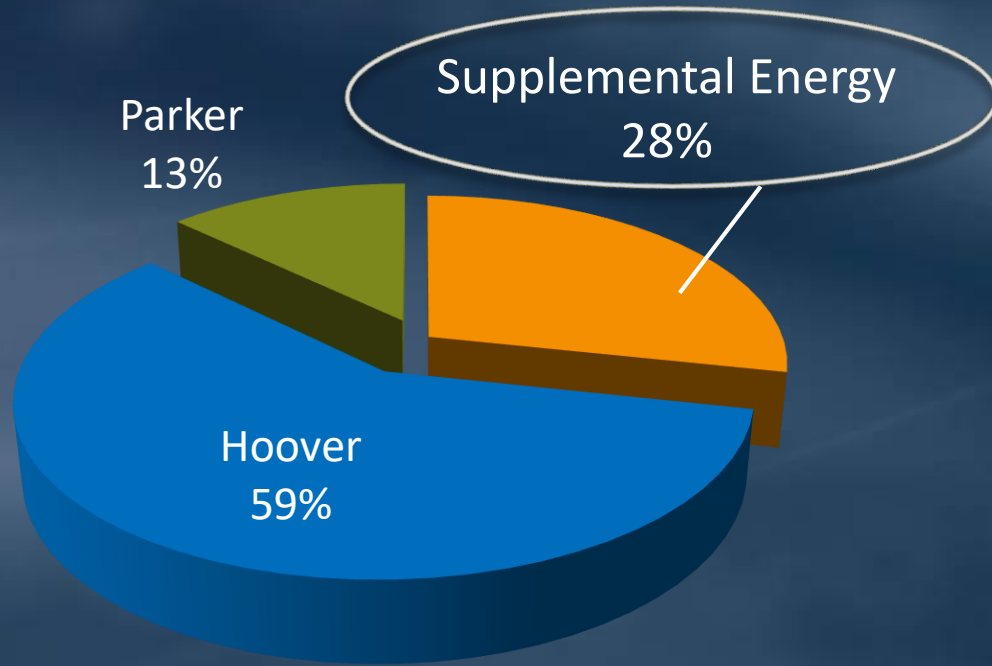
**CRA Pump  
Energy Use**



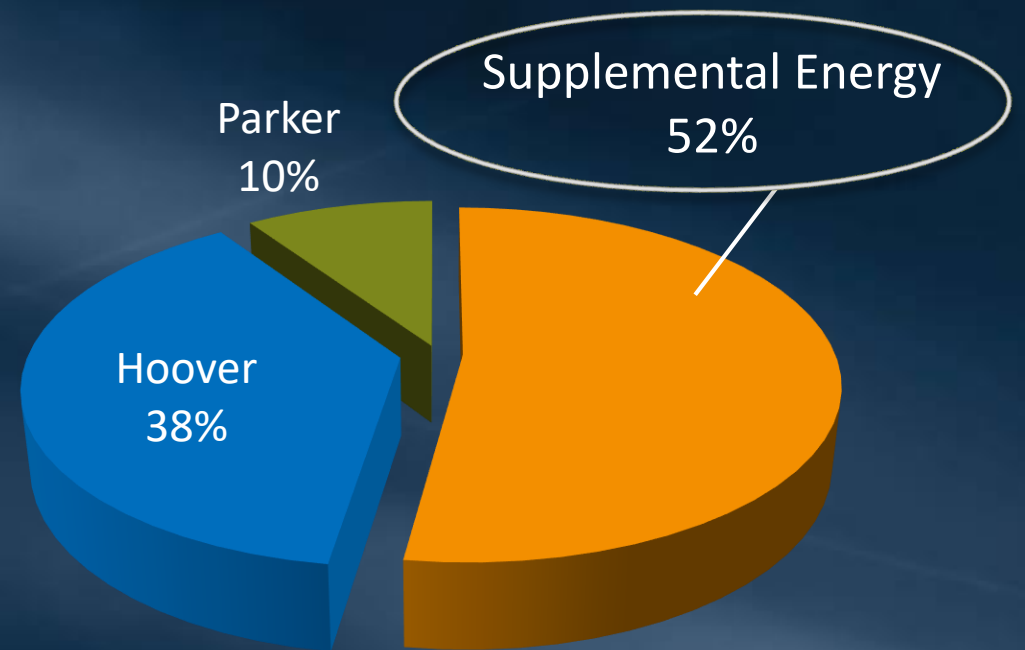
# Managing Supplemental Energy Costs

## Hoover and Parker Independence

2020 CRA Energy (MWhr)



2020 CRA Energy Cost (\$M)

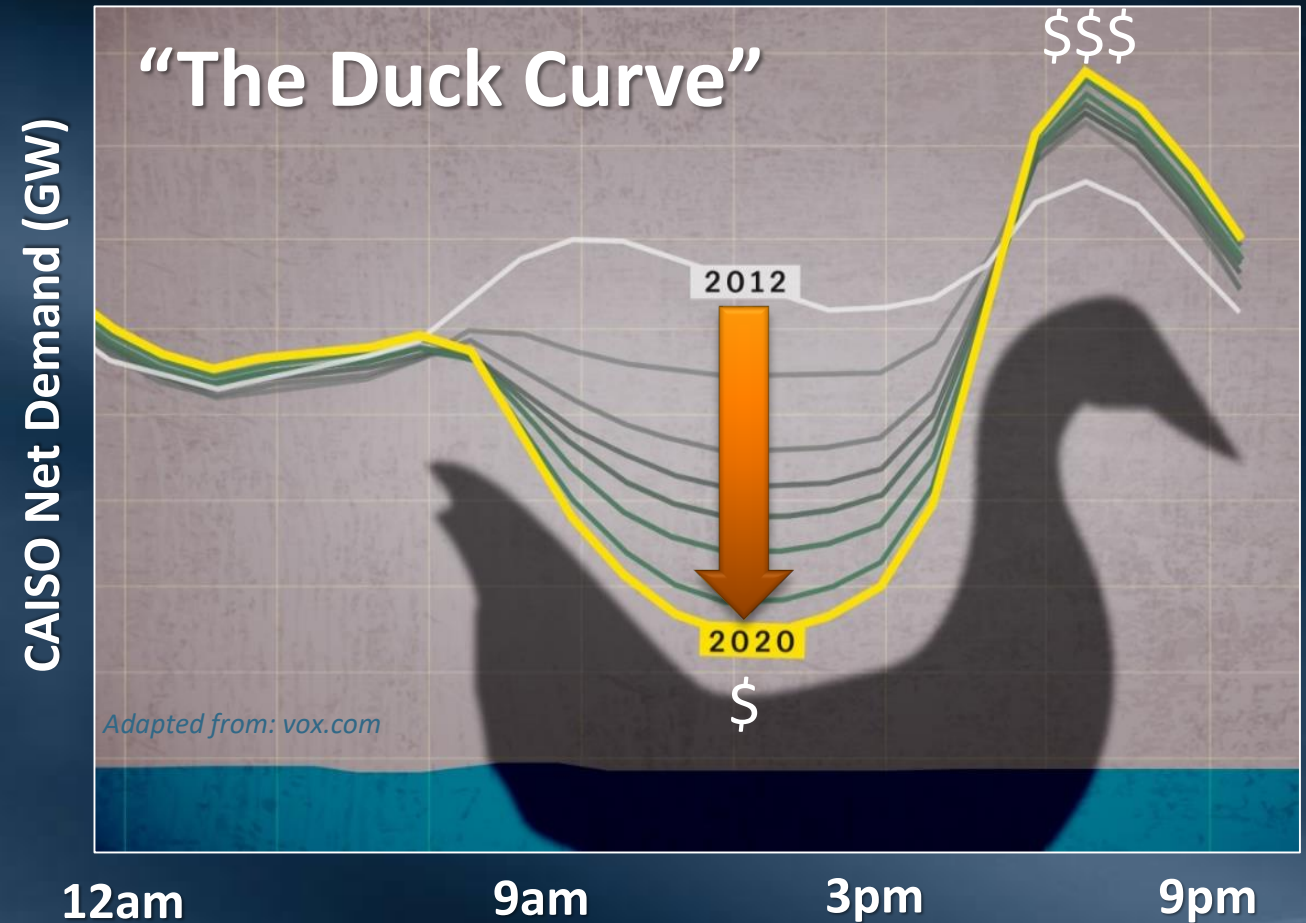


**CY2020 CRA Electricity Consumption = 1.63M MWh**

**CY2020 CRA Electricity Cost = \$40M**

# Optimizing Power Management Strategies to Minimize Costs

- Metropolitan works with Arizona Electric Power Cooperative (AEPCO) and ACES Energy Management
- Overall Strategy:
  - Minimize CRA pumping costs
  - Optimize Hoover and Parker generation schedules





# Preparing for Summer 2021

## Lessons Learned From 2020

- Climate change-induced extreme heat wave
- Renewable generation didn't meet demand
- Day-ahead energy market exacerbated supply challenges under highly stressed conditions

<http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>



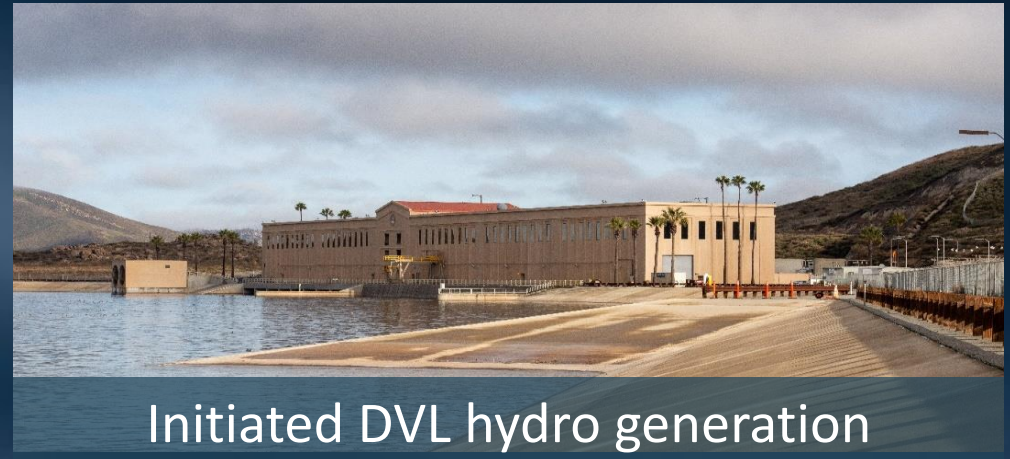


# Metropolitan Actions in 2020

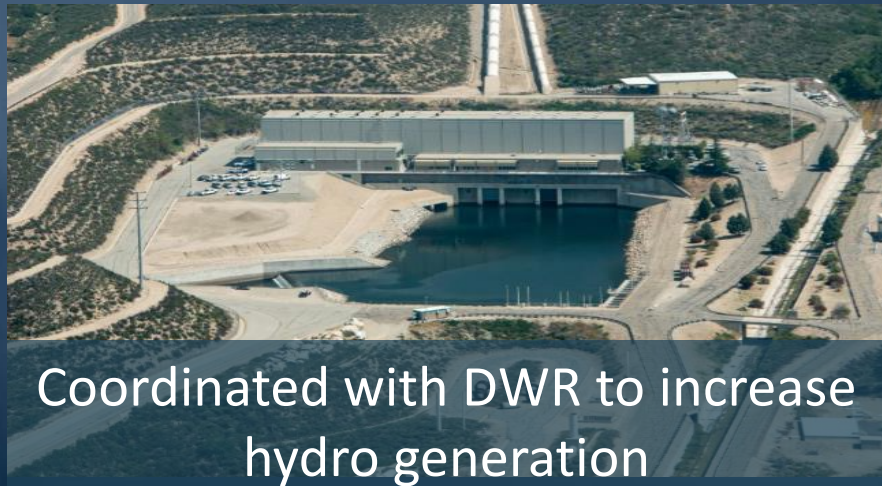
## 300 MW of Grid Relief During Statewide Energy Crisis



Reduced pumping on CRA



Initiated DVL hydro generation



Coordinated with DWR to increase hydro generation



Switched from ozone to chlorine disinfection

# Summer 2021 Operating Conditions

## Electric Grid is Still At Risk and Prices are High

- Cal ISO has implemented operational and market changes
- Grid still vulnerable to widespread heat events
- Energy markets reacted to the energy crisis with much higher prices for energy





# Summer 2021 Operating Conditions

## Managing Power Operations During a Record Drought

- Record low SWP allocation makes deferral of CRA pumping difficult
  - 8-pump flow planned through August and may continue through end of 2021
- Hoover generation declining due to Lake Mead levels
- Low hydro conditions and record heat across the West reduces generation imports available to Cal ISO
- Cycling pumps avoided due to aging CRA infrastructure
- Energy price forecasts significantly higher after 2020 energy crisis

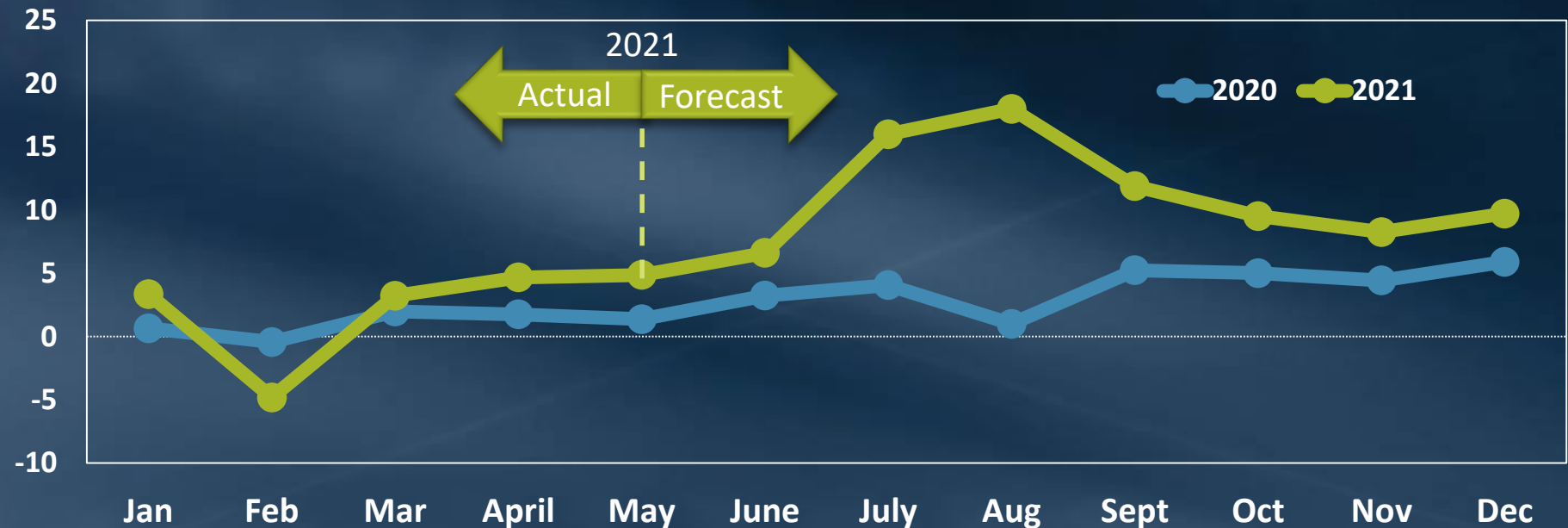




# Summer 2021 Energy Costs

Need to Pump + High Prices = Potential High Costs

CRA Energy  
Costs By  
Month (\$M)

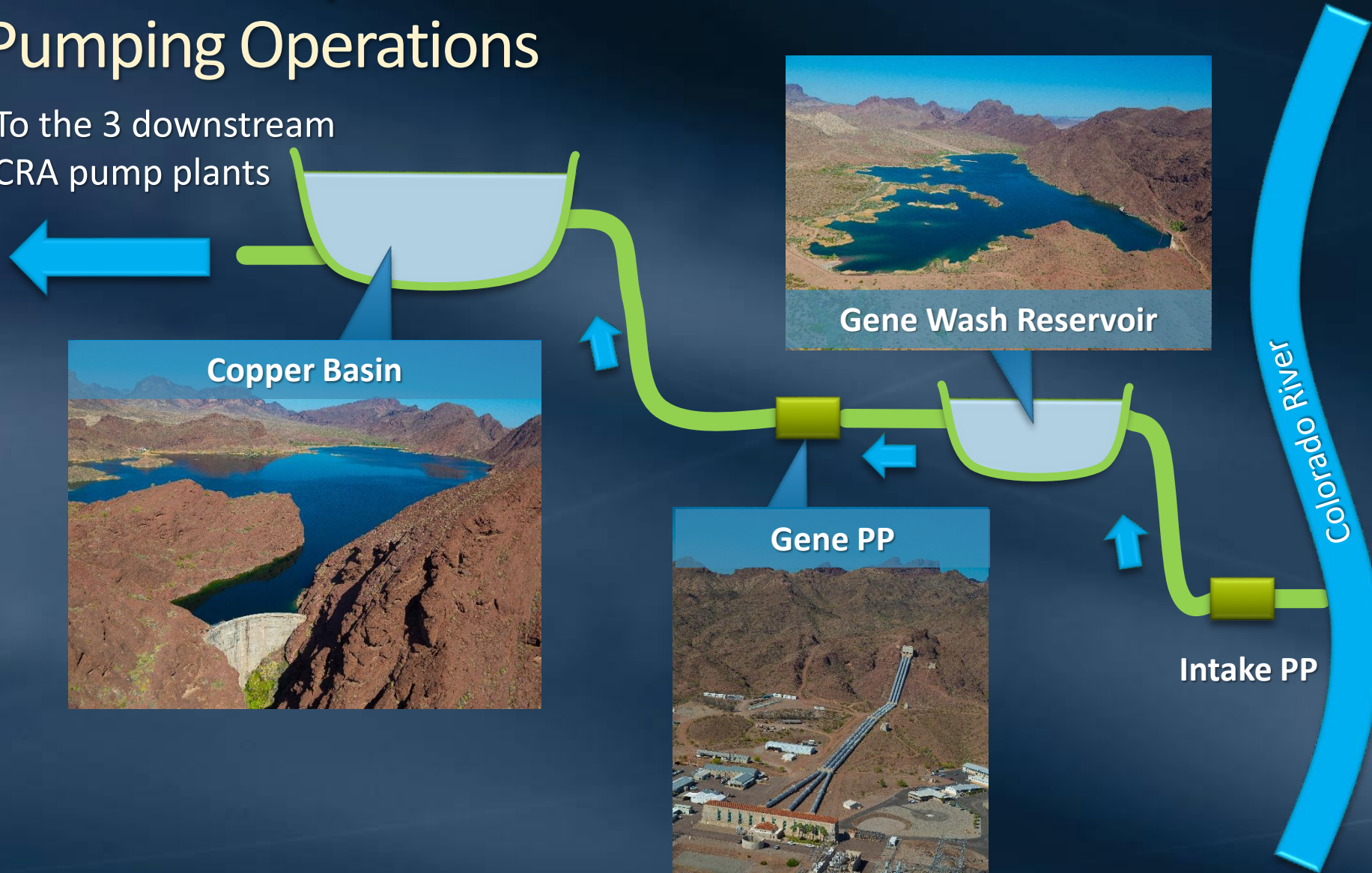


- 2020 CRA Energy Costs (Actual) - \$40 million
- 2021 CRA Energy Costs (Forecast) - **\$80-100 million**

# How CRA Pump Reductions Work

## Typical Pumping Operations

To the 3 downstream  
CRA pump plants





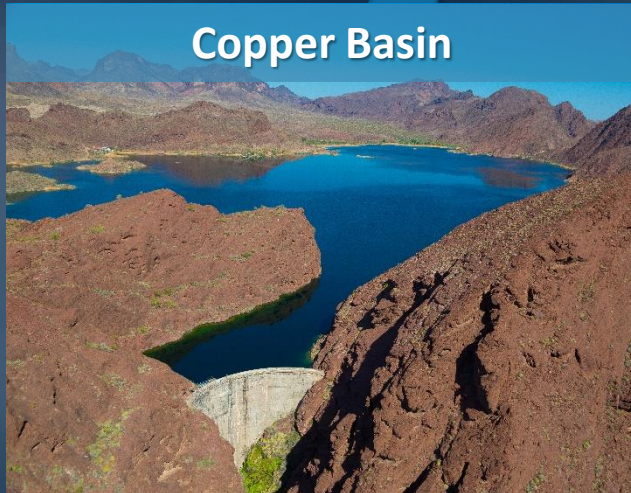
# How CRA Pump Reductions Work

## Dropping Pump Load

To the 3 downstream  
CRA pump plants



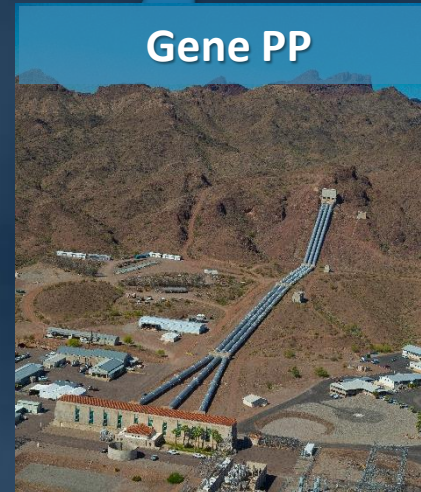
Copper Basin



Gene Wash Reservoir



Gene PP



Intake PP



= Load dropped at 2 pump plants  
up to 110 MW total

# Planning For The Future

## Future Cal ISO Actions May Impact Metropolitan

- Cal ISO continues to study market for 2022 and beyond operational changes
- These may significantly impact Metropolitan
  - Require purchasing more than planned power to ensure a reserve margin
  - Change interruptible load rules which could affect CRA pump operations





# Success Through Partnerships

- Working diligently with all of our partners, including:
  - AEPCO & ACES – Forecasting & market surveillance
  - CAISO – Visibility and operations
  - USBR – Managing hydro resources
- Leveraging our unique system attributes – Access, Independence, and Flexibility
- Focused on maintaining reliable and economic water deliveries for our member agencies during this time of unprecedented drought



# Summary

## Success Through Careful Planning

- The severe drought is impacting CRA operations
- Tight grid system conditions may lead to system emergencies and higher than normal energy prices
- CRA energy costs for 2021 will be higher than normal
- With careful planning, Metropolitan will meet water delivery goals and manage financial impact



