Subcommittee on Long-term Regional Planning Processes and Business Modeling

Climate Vulnerability and Risk Assessment

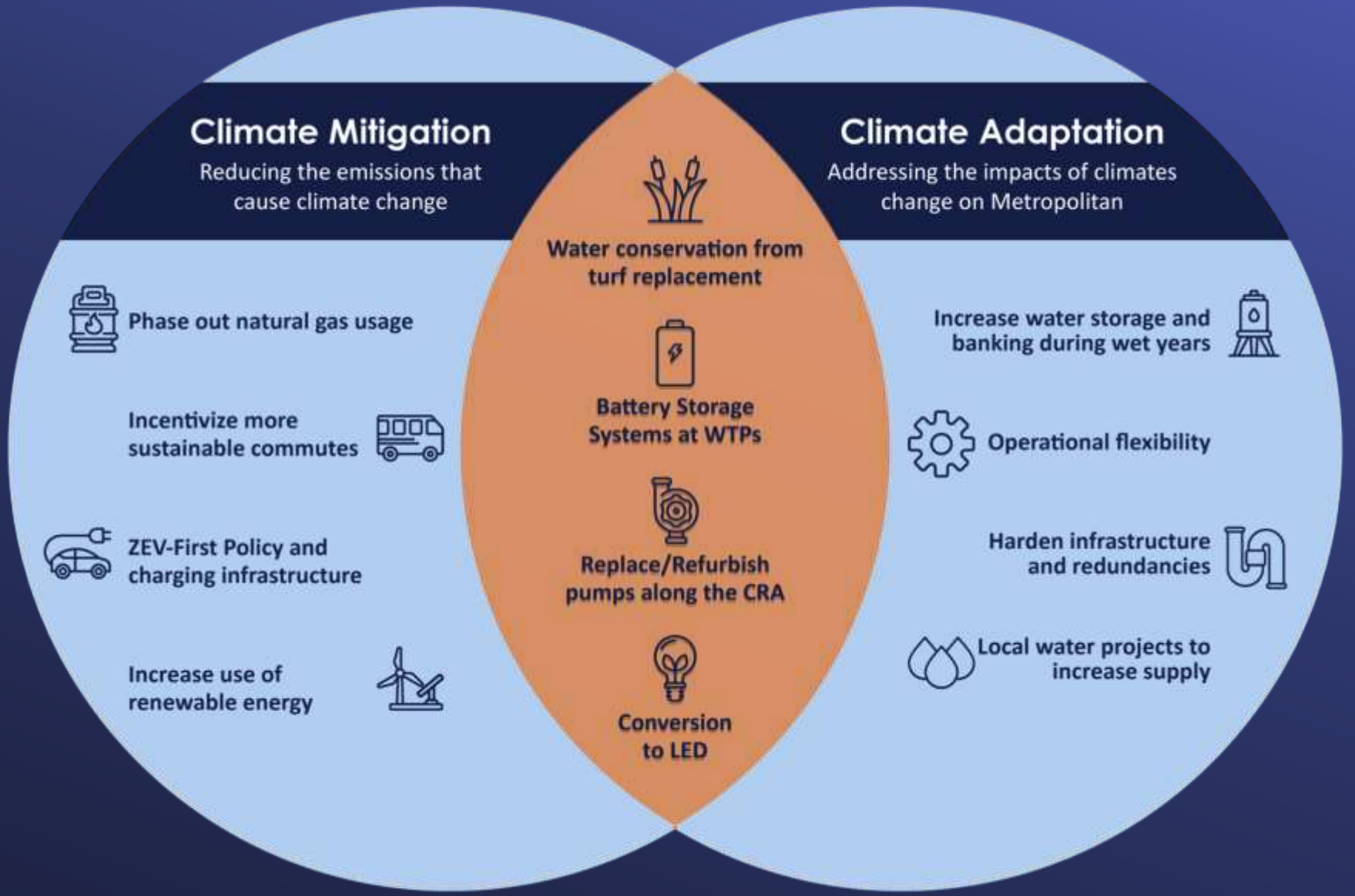
Ensuring climate change is addressed throughout Metropolitan's existing Systems Reliability Processes

Item 3c
June 26, 2024

Increasing Climate Resilience

Resilience

Metropolitan builds climate resilience by continuing to reduce its GHG emissions & by investing to manage more frequent & severe climate hazards



Climate Vulnerability & Risk Assessment

Characterize Climate Extremes

Threat

Where & When

Examples: wildfire, flood, storm

Climate Extremes

Assess Climate Vulnerabilities

Vulnerability

What, Why & How

Examples: power requirements, single points of failure

Connectivity & Dependencies

Develop Adaptations

Risk

Potential Impacts

Examples: facility damage, service disruptions, health risks

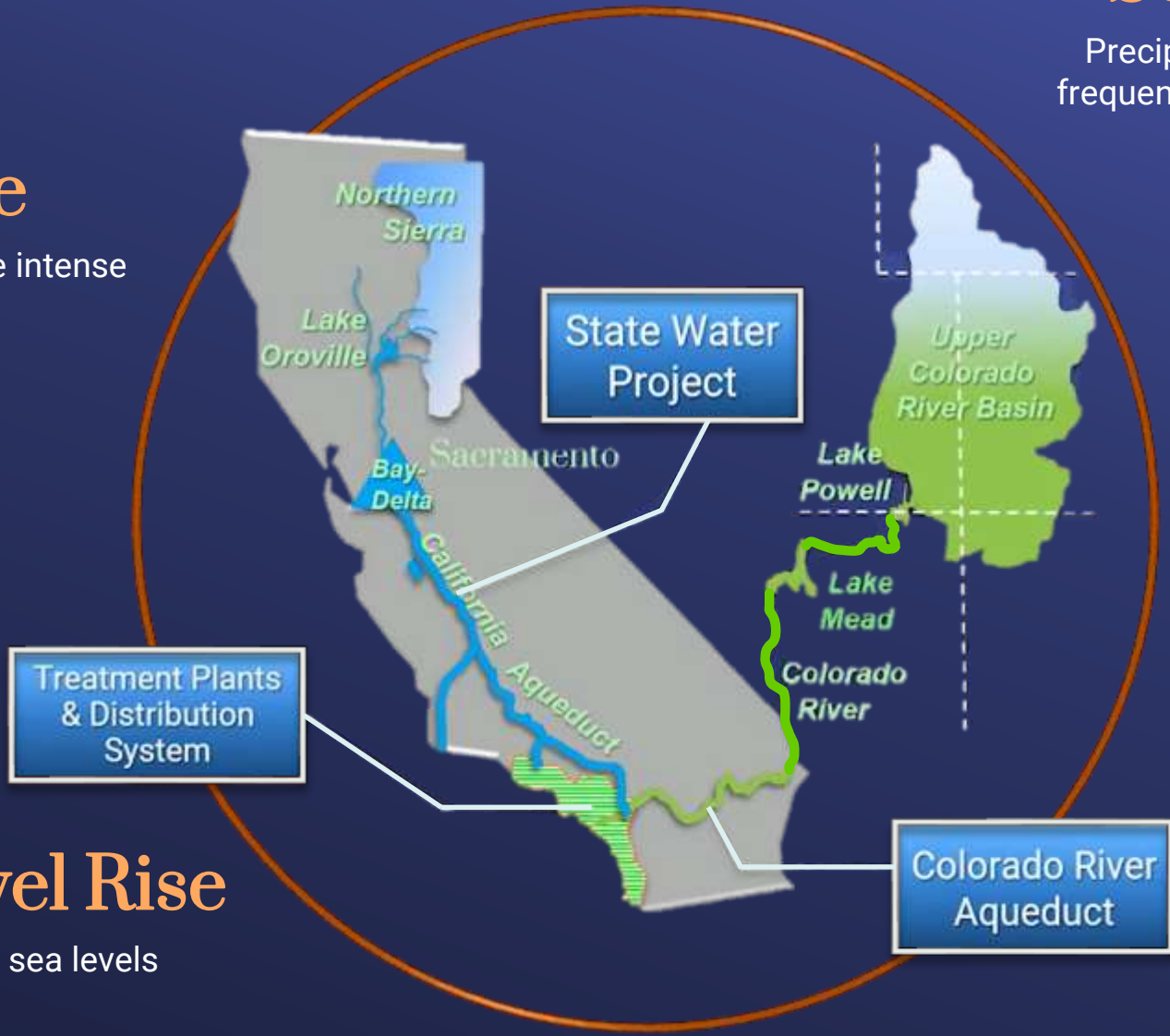
Direct & Cascading

Severe Storms

Precipitation from larger and less frequent events (Climate Whiplash)

Wildfire

Larger and more intense



Drought

More frequent and extended

Sea Level Rise

Increased global sea levels

Extreme Heat

High temperatures over extended periods

Delta Island Projects

Metropolitan is securing grant funds to support new adaptation investments

Characterize Climate Hazards

- Drought, severe storms, sea level rise and extreme heat all impact the delta and are expected to increase over time.

Assess Potential Impacts

- Land subsidence, flooding, increased salinity, levee failure, species decline, water supply issues.

Identify Adaptation Strategies

- Convert farms to wetlands and rice production
- Habitat Restoration activities

Castaic Lake Turbidity Event

Metropolitan is already managing climate extremes

Characterize Climate Hazards

- Heavy rain event in January caused debris and silt to flow into Castaic Lake

Assess Potential Impacts

- Stresses the ability of the plant to meet compliance requirements
- Increases operation & maintenance costs

Identify Adaptation Strategies

- Reduce flow
- Repurposed out of service basins
- Increase coagulant dose
- Combined chlorine and ozone

Energy-Water Nexus on the CRA

Metropolitan is exploring adaptation options along the CRA

Characterize Climate Hazards

- Drought, extreme heat, and extreme flooding are expected to become more frequent and extreme.

Assess Potential Impacts

- Increased energy costs, greater risk of grid instability, health & safety issues, equipment failure, water supply disruptions

Identify Adaptation Strategies

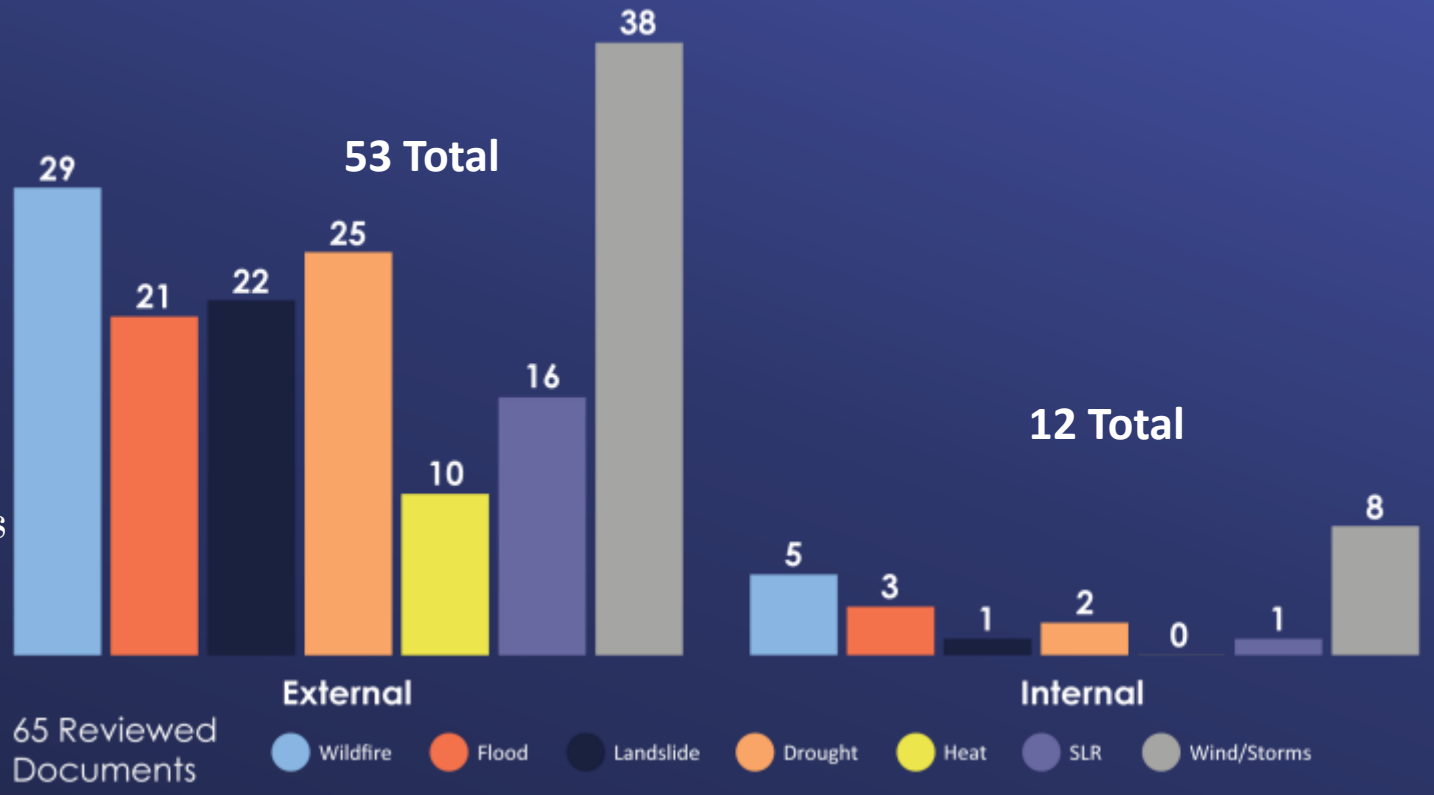
- Infrastructure upgrades, hardened facilities, power generation facilities, transmission investments

Identified Climate Hazards

Literature Review

65 Total Documents:
12 Internal and 53 External

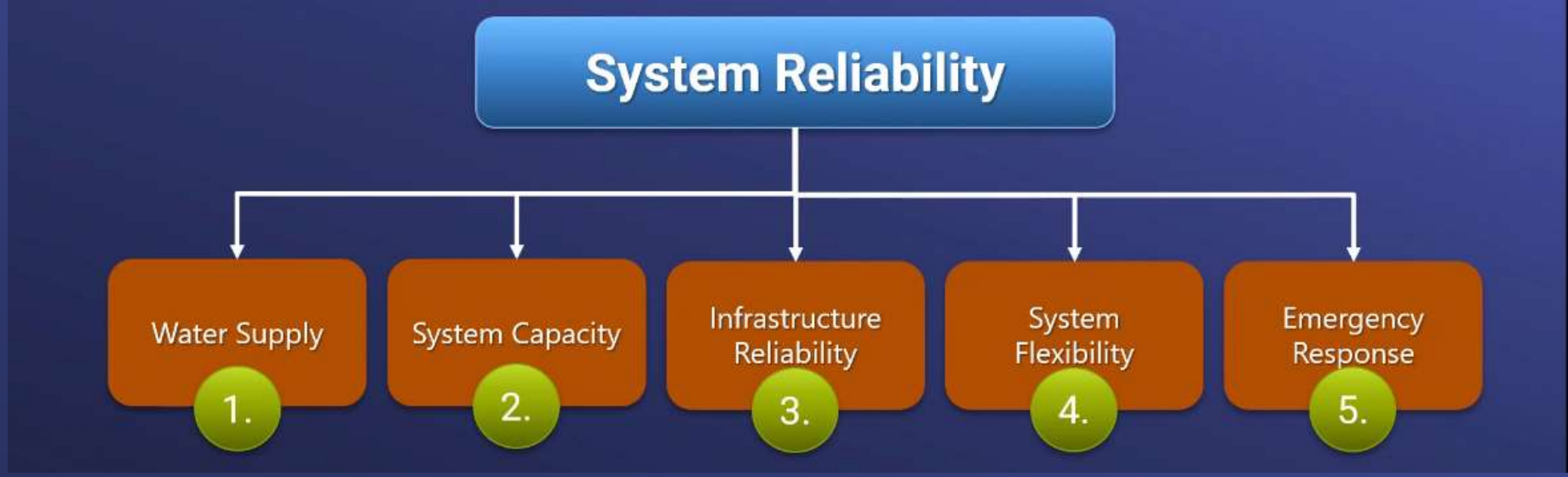
Cited:
- Municipal Water Agencies
- Ground Water Agencies
- Energy Utilities
- Counties
- CA State Agencies
- Federal Agencies
- Fire Departments
- Academic



- Drought and Wildfire were the most assessed climate hazards
- Energy-related documents thoroughly identified climate hazards

Coordinated Across The District

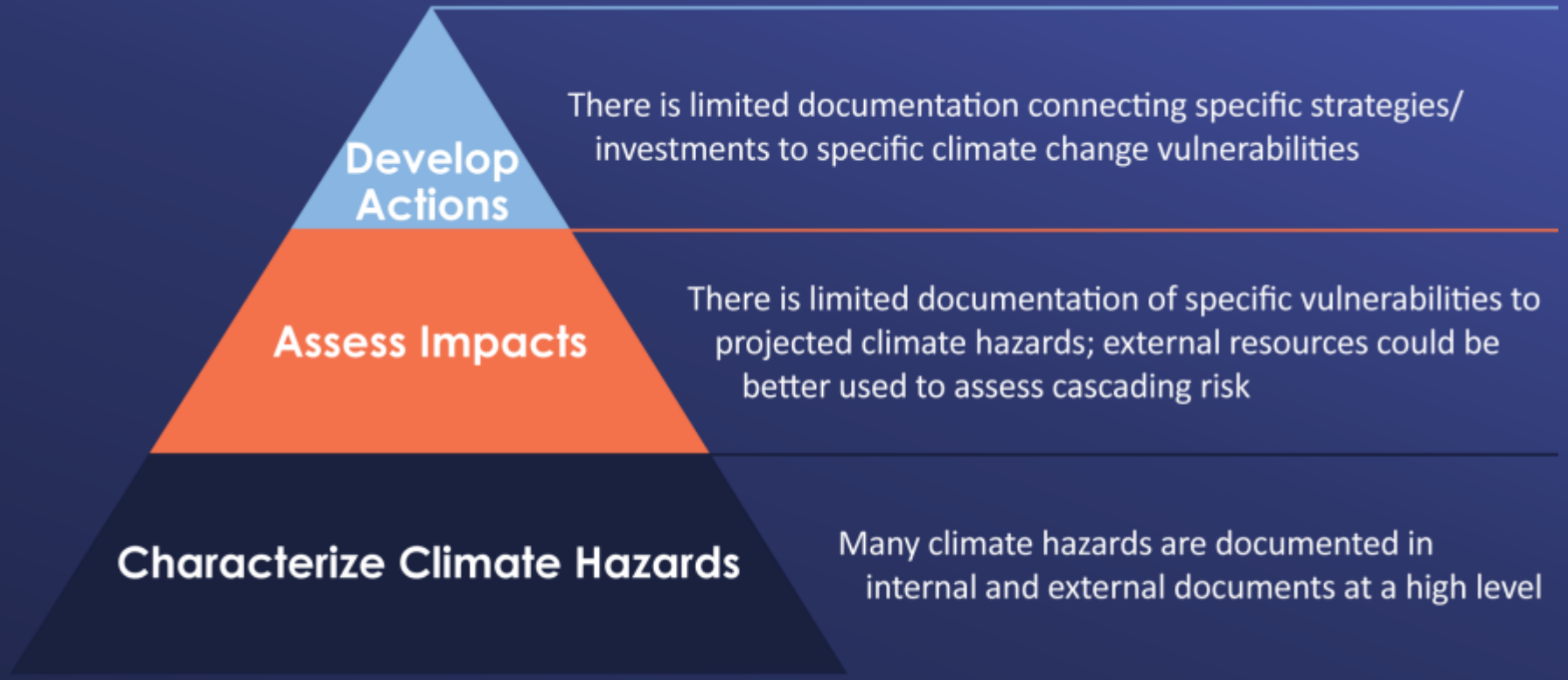
>70 Internal Contributors



- **Goal:** Ensure climate change is sufficiently addressed throughout Metropolitan's existing Systems Reliability Processes
- Design Charettes
  - Energy and Desert Operations
  - Asset Management
  - Water Quality
  - Emergency Management & Security
  - Engineering

Initial Findings

Documentation **decreases** across the spectrum of characterizing hazards, assessing impacts, & developing adaptation actions



Recommended Strategies

Integrate work into the Climate Adaptation Master Planning Process

Select CVRA Recommendations

	Characterizing Climate Hazards	Assessing Vulnerability	Developing Actions
Funding	Secure grant funds to conduct and/or support studies that provide advanced characterization of key climate threats like flooding and extreme weather events	Secure annual funding for specific climate vulnerability assessments	Build on Metropolitan's exploratory work in the Feather River Watershed by evaluating potential roles and benefits of a resilience bond
Partner-ships	Develop regional partnerships to develop more advanced characterization of key climate threats like flooding and extreme weather events	Coordinate and/or partner to support Member Agency vulnerability assessments to understand how Metropolitan can best address local vulnerabilities	Develop partnerships for addressing water supply and power cascading risks. Co-develop funding strategies for projects that reduce cascading risks.
Decision Support	Develop "stress test" scenarios designed to replicate projected future climate threats for system modeling	Partner with external stakeholders to assess cascading risks that impact Metropolitan	Incorporate adaptation into an internal funding opportunity pipeline to support existing projects with state, federal, and private funding opportunities
Data	Establish and maintain a catalog (using spatial attributes, as feasible) of direct and cascading climate threat exposure of Metropolitan's facilities and operations	Catalog and track specific vulnerability assessments across different Metropolitan systems (i.e., water quality, energy, conveyance, headwaters)	Catalog Metropolitan investments in terms of adaptation criteria developed through Recommendation 3-1
Policy	Establish and maintain a set of climate hazard characterizations updated based on CA Climate Assessment Cycle	Establish a climate vulnerability assessment methodology and structure	Incorporate adaptation criteria into the investment development/ prioritization process based on climate hazards

Recommended Strategies

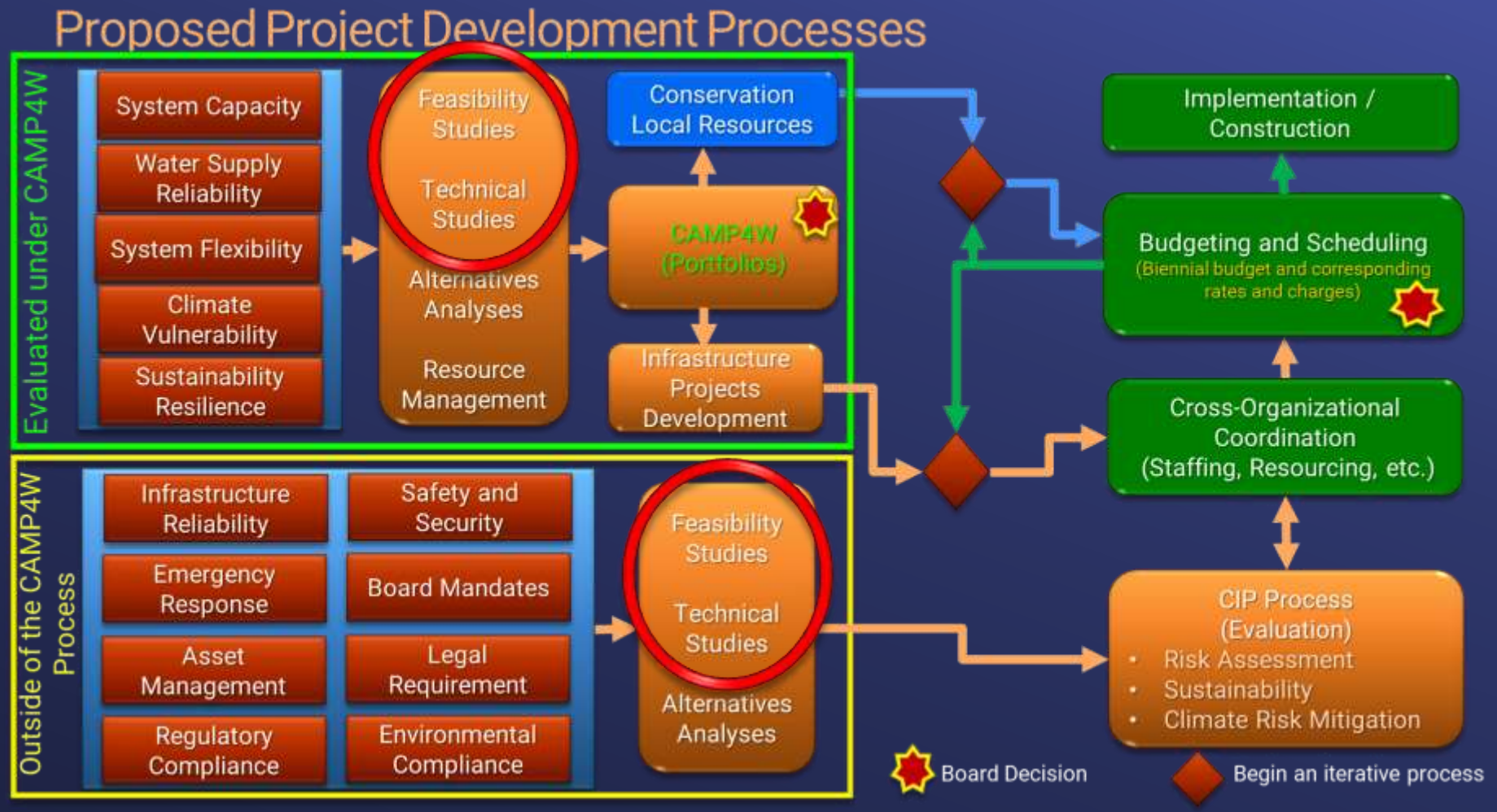
Characterize Climate Hazards - Near-Term Recommendations

- Establish & maintain a database of Metropolitan's climate hazard characterizations that align with RCP 8.5
- Regularly collect the latest climate science and employ a digital platform to catalog and monitor climate hazard exposures and the occurrence of extreme events
- Secure O&M funding to conduct studies and support research that better characterizes climate hazards

Recommended Strategies

Characterize Climate Hazards - Near-Term Recommendations

- Secure **O&M funding** to conduct **studies** and support research that better characterizes climate hazards



Recommended Strategies

Assess Vulnerabilities - Near-Term Recommendations

- Fund, catalog, and track specific vulnerability assessments across different asset and climate hazard typologies
- Revise design standards to mitigate projected asset vulnerabilities
- **Energy** – Pursue diversification of Metropolitan's energy sources, **address power assets along the CRA** that have exceeded their end of life and are becoming capacity constrained, assess the benefits of new Power Purchase Agreements.

EPA CREAT Process

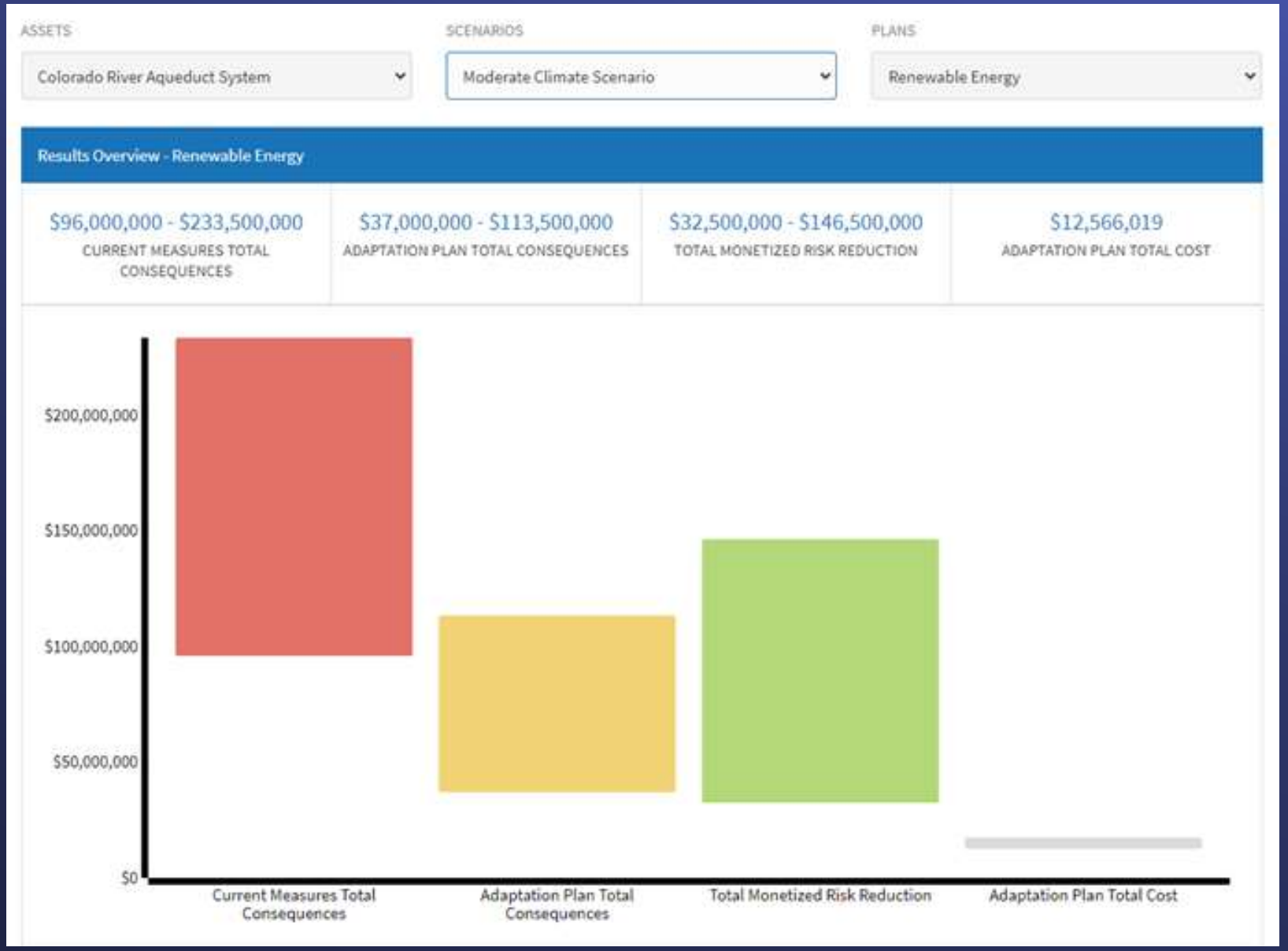
EPA Climate Resilience Evaluation & Awareness Tool (CREAT)

Results from CREAT help utilities compare risk reduction and implementation costs

Monetized Risk Reduction

Colorado River Aqueduct System
Renewable Energy
Plan Climate Scenario

Moderate Climate Scenario



Recommended Strategies

Develop Actions - Near-Term Recommendations

- Convene an annual Metropolitan climate risk summit to identify vulnerabilities, opportunities for further assessment, and share best adaptation practices
- **Infrastructure** – Develop and communicate a coordinated Asset Management Data Policy to the entire organization, that expands on the proposed Strategic Asset Management Plan

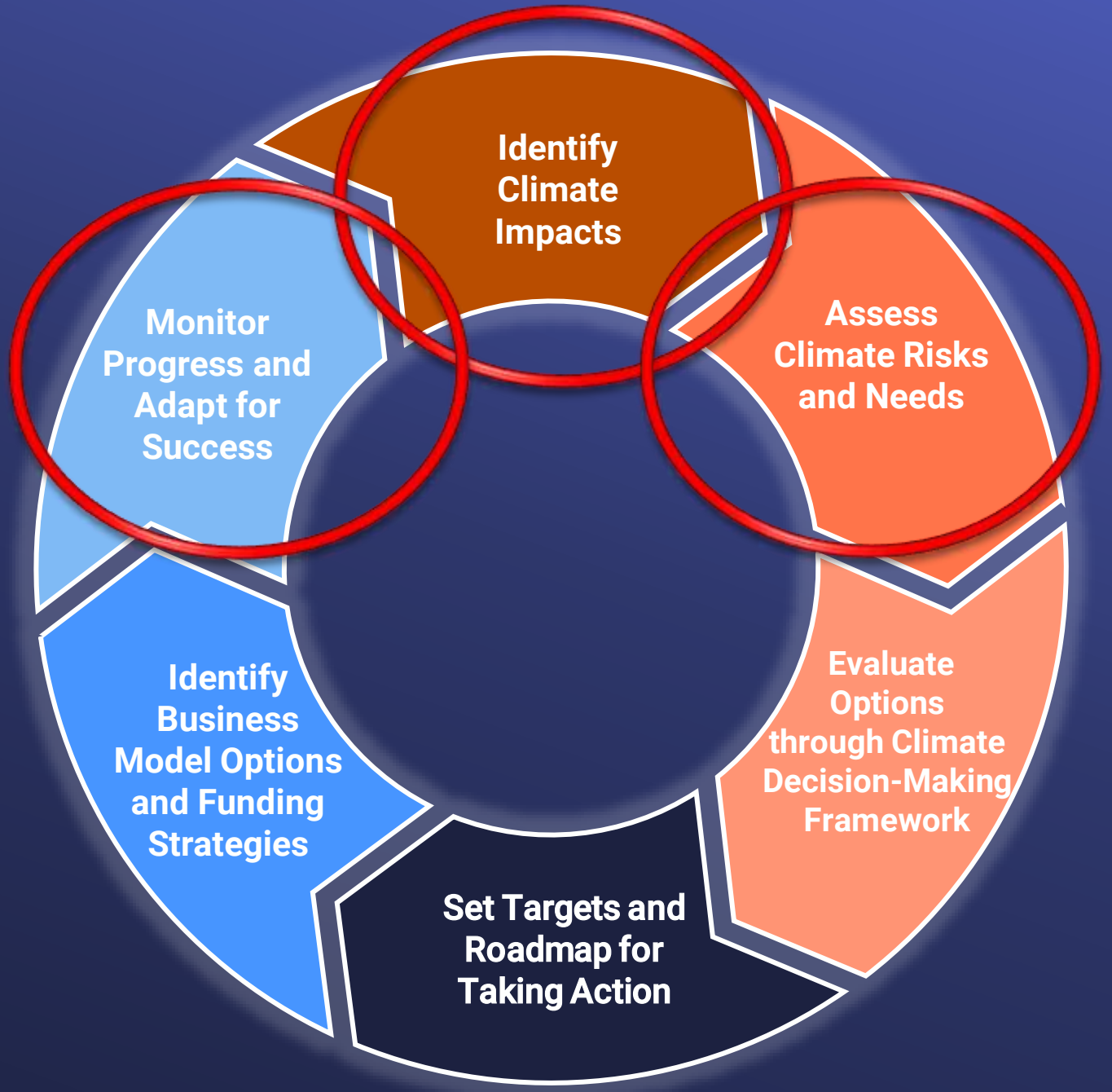
Climate Adaptation Master For Water (CAMP4W)

Addressing climate risks throughout planning processes

The CAMP4W integrates

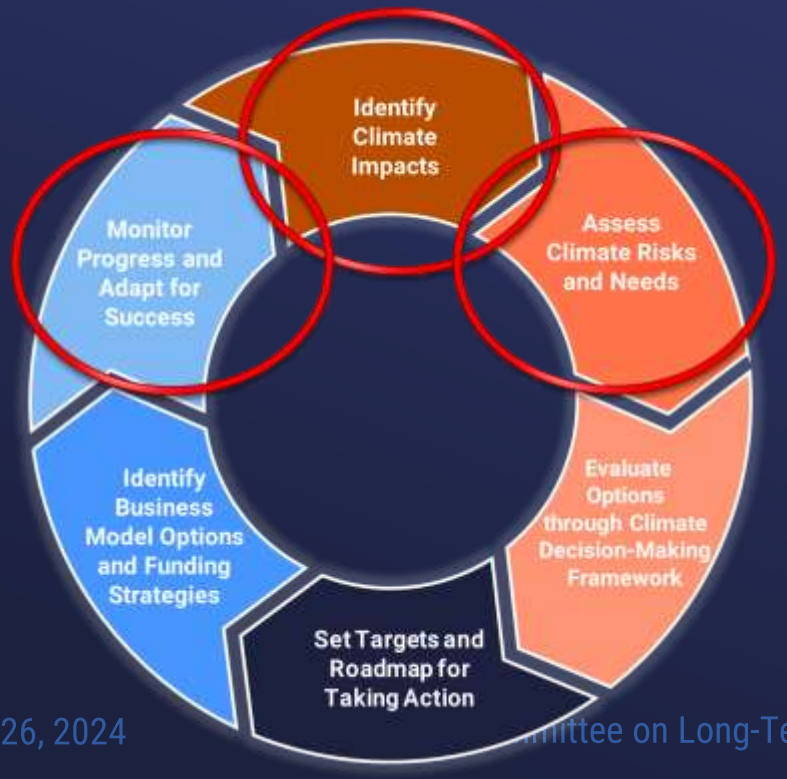
- water resources planning
- infrastructure development
- climate adaptation
- finance planning

into one interconnected process



Climate Vulnerability and Risk Assessment & CAMP4W

Determining CAMP4W Consideration



A “yes” to any of the following questions means a project or program will be considered through the CAMP4W process

- Providing or supporting new core or flex supply, or storage projects
- Addressing known vulnerabilities to an asset(s) or involve improvement beyond R&R
- Work towards a Time-Bound Target
- Project exceed a certain flow or cost threshold

Next Steps

Near-Term Recommendations

- **Initiate Near-Term Initial Recommendations**
  - Fund and conduct feasibility and technical studies
  - Taskforce on energy diversification and power infrastructure along the CRA
  - Asset Management Data Policy
- **Conduct further Deep Dives into Climate Vulnerabilities**
  - Identify climate risk signposts for CAMP4W Adaptive Management
- **Coordinate Climate Vulnerability Risk Assessments with Member Agencies**


THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA
1928