Water Forward
Austin's Integrated Water Resources Plan
Task Force Meeting

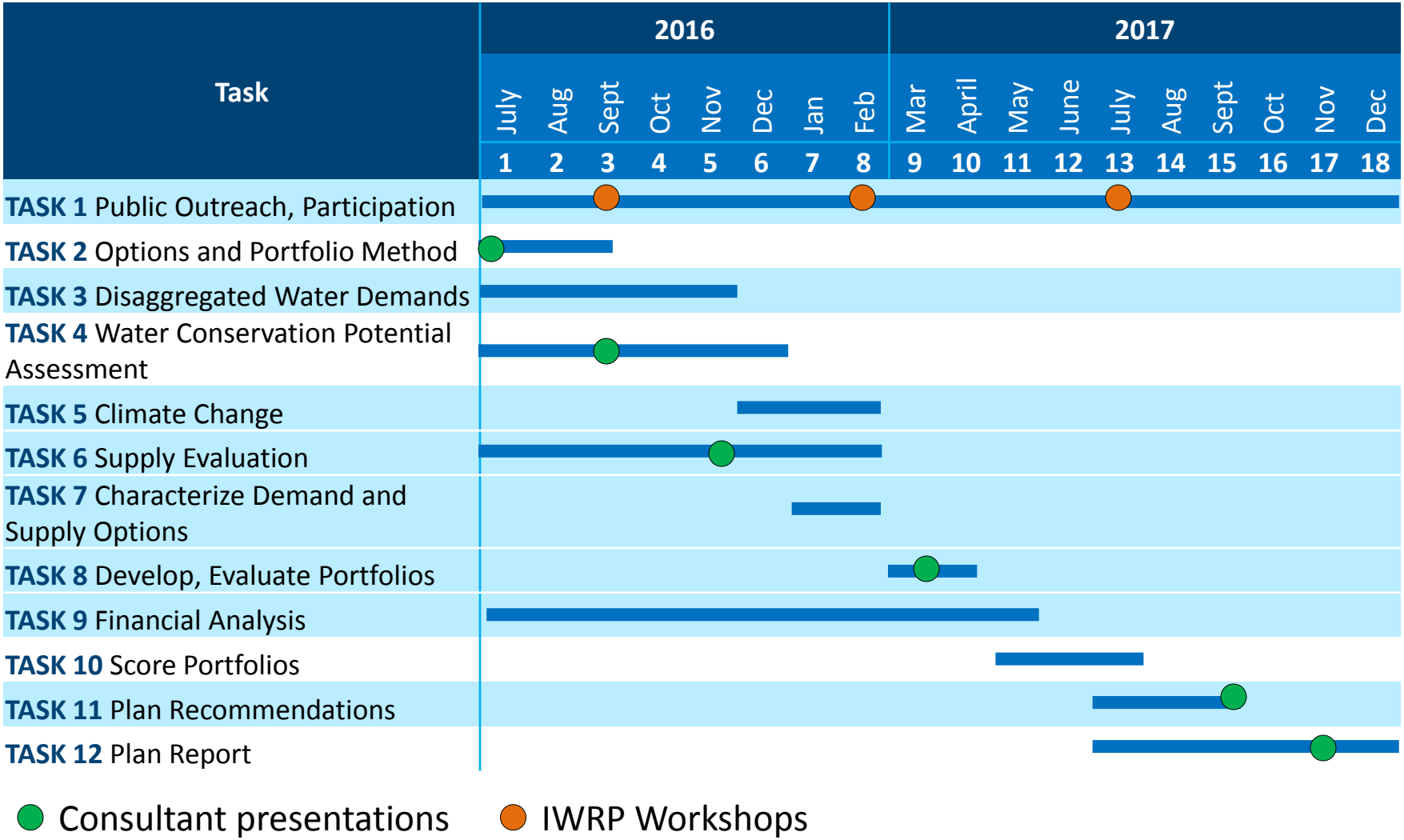
July 12, 2016

IWRP Draft Mission, Guiding Principles, and Objectives Presentation

IWRP Project Expectations

- Shift from knowledge building and scope development to project execution
  - Collaboration and input is key to desired outcome
  - Maintaining project schedule is key to keeping project on track and within budget

Project Schedule



Task Force and COA Expectations

- All input is important
- Anticipated Task Force review process
  - Technical memoranda (TMs) will be drafted to document interim technical work and will be the basis for sections in the IWRP report
  - Task Force comments on TMs will be documented and summarized by AW and presented back to Task Force
  - TMs will not be re-drafted but rather Task Force comments will be considered when preparing subsequent TMs and the draft IWRP report
  - This process will provide multiple avenues for input, while keeping on schedule and avoiding duplicative/conflicting comments

Definition of Planning Terms

IWRP Term	Meaning
Mission Statement	Defines the overall purpose of the IWRP and describes what we aspire to accomplish.
Guiding Principles	Provides a path forward on how the IWRP will be achieved, offering clear direction on desired actions. Guiding Principles are typically policy-oriented and used to guide the planning process.
Objectives	Defines the major goals of the IWRP in broad, understandable terms. Objectives should be distinctive, measurable, non-redundant, and concise to maintain focus.
Sub-Objectives	Adds further clarity to the objectives. Sub-objectives form the basis for the evaluation criteria used to compare/score portfolios.

IWRP Mission Statement (DRAFT)

The Integrated Water Resource Plan (IWRP) will provide a mid- and long-term evaluation of, and plan for, water supply and demand management options for the City of Austin in a regional water supply context.

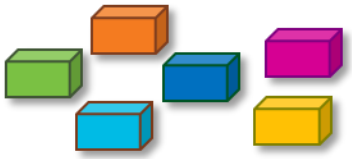
Through public outreach and coordination of efforts between City departments and the Austin Integrated Water Resource Planning Community Task Force, the IWRP offers a holistic and inclusive approach to water resource planning.

The plan embraces an innovative and integrated water management process with the goal of ensuring a diversified, sustainable, and resilient water future, with strong emphasis on water conservation.

IWRP Guiding Principles (DRAFT)

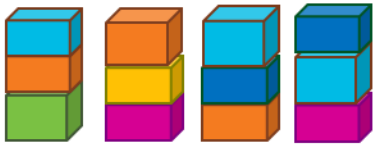
- Recognizing that Colorado River water is Austin's core supply, continue a strong partnership between the City and LCRA to assure its reliability
- Continue Austin's focus on water conservation and water use efficiency
- Strengthen long-term sustainability, reliability, and diversity of Austin's water supply through maximizing local water resources
- Avoid severe water shortages during times of drought
- Focus on projects that are technically, socially, and economically feasible
- Continue to protect Austin's natural environment, including source and receiving water quality
- Ensure Austin's water supply continues to meet/exceed all federal, state and local public health regulations
- Align with Imagine Austin's "Sustainably Manage Our Water Resources Priority Program"
- Maintain coordination and communication with regional partners
- Engage the public and stakeholders throughout the plan development process

IWRP Planning Process



Characterize Options/Strategies:

- use of Geospatial Analysis Tool for decentralized options
- yield estimation
- cost estimation
- energy usage
- environmental impacts



Assemble Portfolios Based on Themes:

- highly resilient
- lower cost
- more sustainable
- lower risk
- others

Water Availability Model

Hydrologic Evaluation of Portfolios

Along with Other Metrics

Decision Software

Rank Portfolios

Scenario Planning

Test Under Uncertainties

Preferred Strategy

Re-formulate Portfolios
(hybrids)

Define Planning Objectives & Metrics
(Criteria)

Attributes of "Good" Objectives

- Distinctive
- Measurable
- Non-Redundant
- Concise in Numbers
  - Best practice: 4-7 objectives
    2-4 sub-objectives per objective

Objectives, Sub-Objectives and Performance Measures (DRAFT)

Objective	Sub-Objective
Water Supply Benefit	Water Reliability – Baseline (period of record)
	Water Reliability – Worse than Critical Period
	Storage Reserve
	Local Control
	Supply Diversification
	Operational Impact

Objectives, Sub-Objectives and Performance Measures (DRAFT)

Objective	Sub-Objective
Economic Impacts	Capital Life-cycle Unit Cost
	Operation Life-cycle Unit Cost
	Energy Generation
	External Funding Potential

Objectives, Sub-Objectives and Performance Measures (DRAFT)

Objective	Sub-Objective
Environmental Impacts	Endangered/Threatened Species Impact
	Change in Return Flow
	Natural Environment Water Quality Impacts
	Energy Use
	Water Use Efficiency

Objectives, Sub-Objectives and Performance Measures (DRAFT)

Objective	Sub-Objective
Social Impacts	Multi-beneficial Infrastructure/Programs
	Impacts to Water-Based Recreation
	Impacts to Local Economy
	Impacts on Neighboring Water Supplies/Sources
	Public Health & Safety Impacts

Objectives, Sub-Objectives and Performance Measures (DRAFT)

Objective	Sub-Objective
Implementation	Regulatory Approval
	Public Acceptance
	Legal/Contractual Uncertainties
	Scalability
	Technical Feasibility

Summary of Objectives/Sub-Objectives

- 5 objectives (this is good)
- 25 sub-objectives (this is too many)
- Project team is reviewing the sub-objectives to look for opportunities for combining/reducing these
- We invite your input to help us narrow the sub-objectives down to 12-15 in total
  - Please identify the top three sub-objectives for each objective that you feel are most important
  - We plan to send the definitions of the sub-objectives to you on July 18th
  - We will take this into consideration as we finalize the sub-objectives

Next Steps

- Obtain comments on mission statement, guiding principles and objectives (by July 26th to AW)
- Draft TM on IWRP evaluation method (for discussion at September Task Force meeting)
  - Objectives, sub-objectives and performance measures
  - Method for evaluating options and portfolios
- Finalize objectives and performance metrics and present the method for weighting objectives (September Task Force meeting)

City of San Diego
PUBLIC UTILITIES
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City of San Diego Long-Range Water Resources Plan

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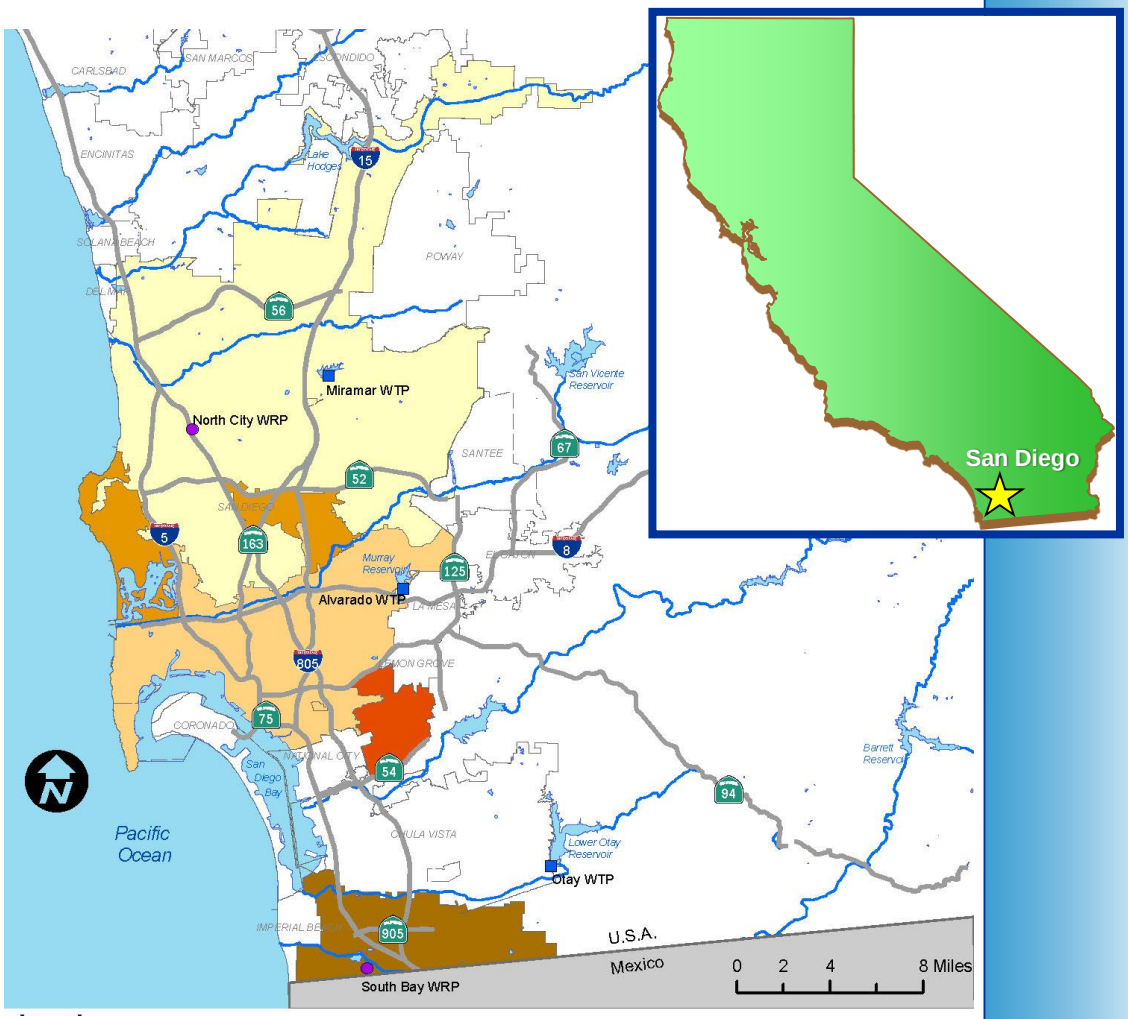
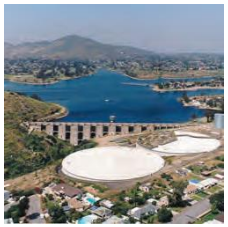
City of San Diego Background

- San Diego Public Utilities Department provides water, wastewater and recycled water to City
- Population ~ 1.3 million
- Water demand ~ 180 mgd
- Average rainfall:
  - 15-30 inches in mountains
  - 10 inches in coastal plain



Current Sources of San Diego's Water Supply

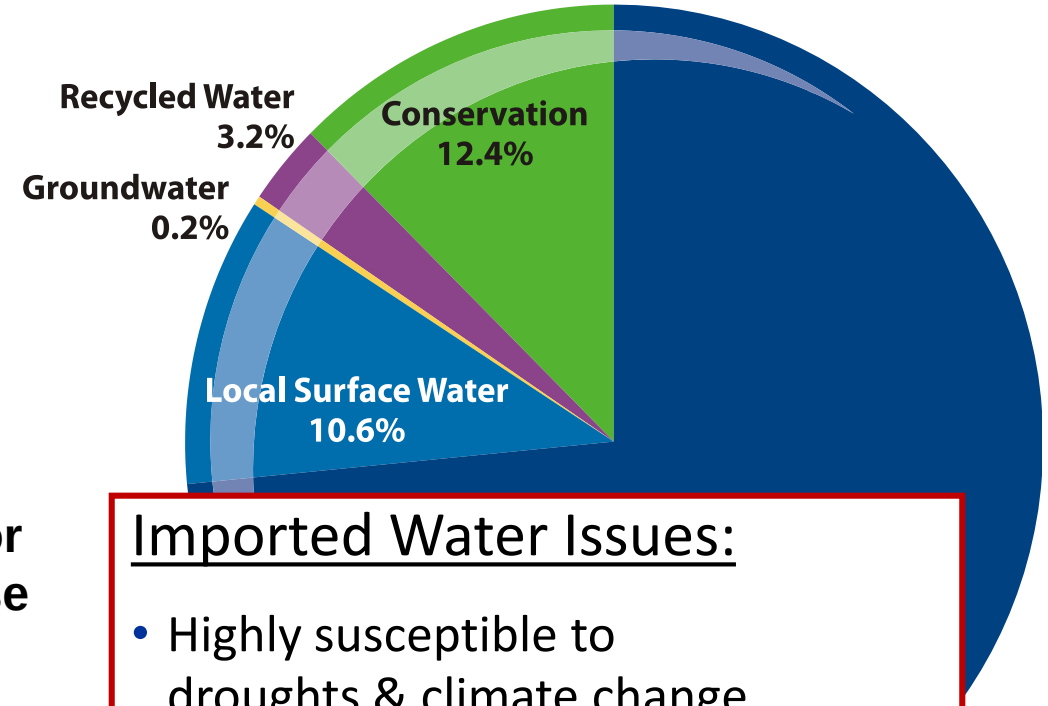
Imported Water
(Colorado River & N. California)



Local Reservoirs
(runoff capture)

Recycled Water for Non-Potable Reuse

Water Conservation



Imported Water Issues:

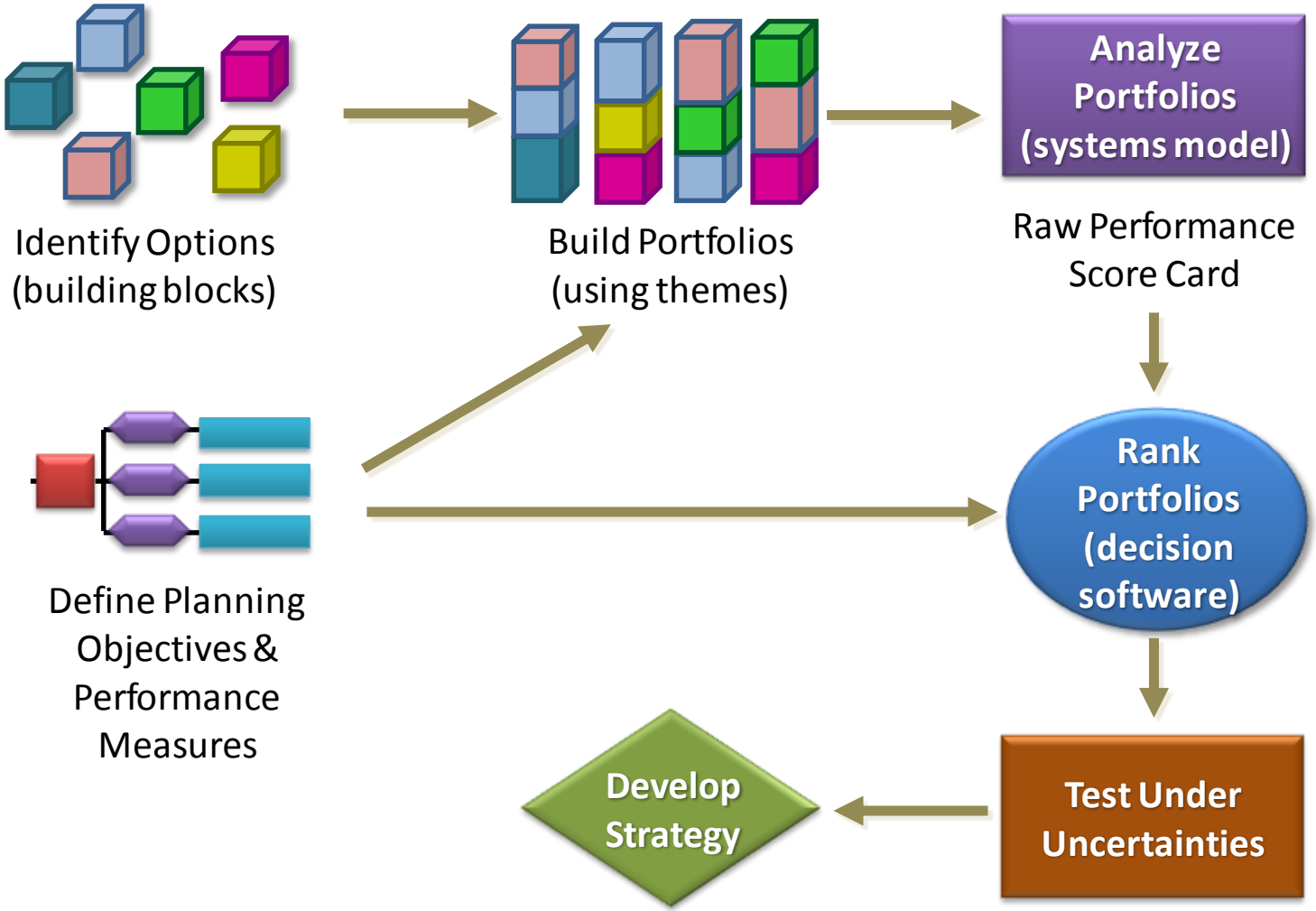
- Highly susceptible to droughts & climate change
- Sometimes restricted due to environmental regulations
- Energy intensive

Long Range Water Resources Plan (LRWRP)

LRWRP's mission was to:

- Characterize the issues and need for plan: *drought & climate resiliency, improved water quality, lesson impact on environment*
- Identify and analyze new water conservation and supply options, using a triple-bottom-line approach
- Develop a preferred long-term strategy using an adaptive management framework

LRWRP Planning and Evaluation Process



LRWRP Objectives

- Maximize supply reliability
- Maximize resiliency
- Develop cost-effective solutions
- Improve environment
- Improve water quality
- Maximize project implementation

These objectives translated into 11 specific metrics for evaluating the portfolios

The LRWRP was developed using a participatory stakeholder process. A dedicated advisory group was formed and met 8 times to help develop objectives, provide ideas and review recommendations

Range of Options Considered for LRWRP (AF = acre-feet)

Water Conservation
$300-$600 / AF

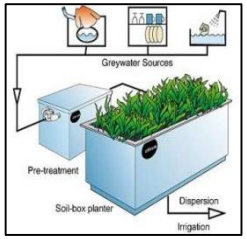
Groundwater
$1,000-$4,000 / AF

Imported Water
$1,800-$2,500 / AF

Recycled Water Indirect Potable Use
$2,100-$4,700 / AF

Recycled Water Non-Potable Reuse
$2,500-$9,000 / AF

Seawater Desalination
$3,000 / AF



Graywater Systems
$4,000-$10,000 / AF*

Rainwater Harvesting
$4,000-$15,000 / AF*

* Per device, these options are low cost

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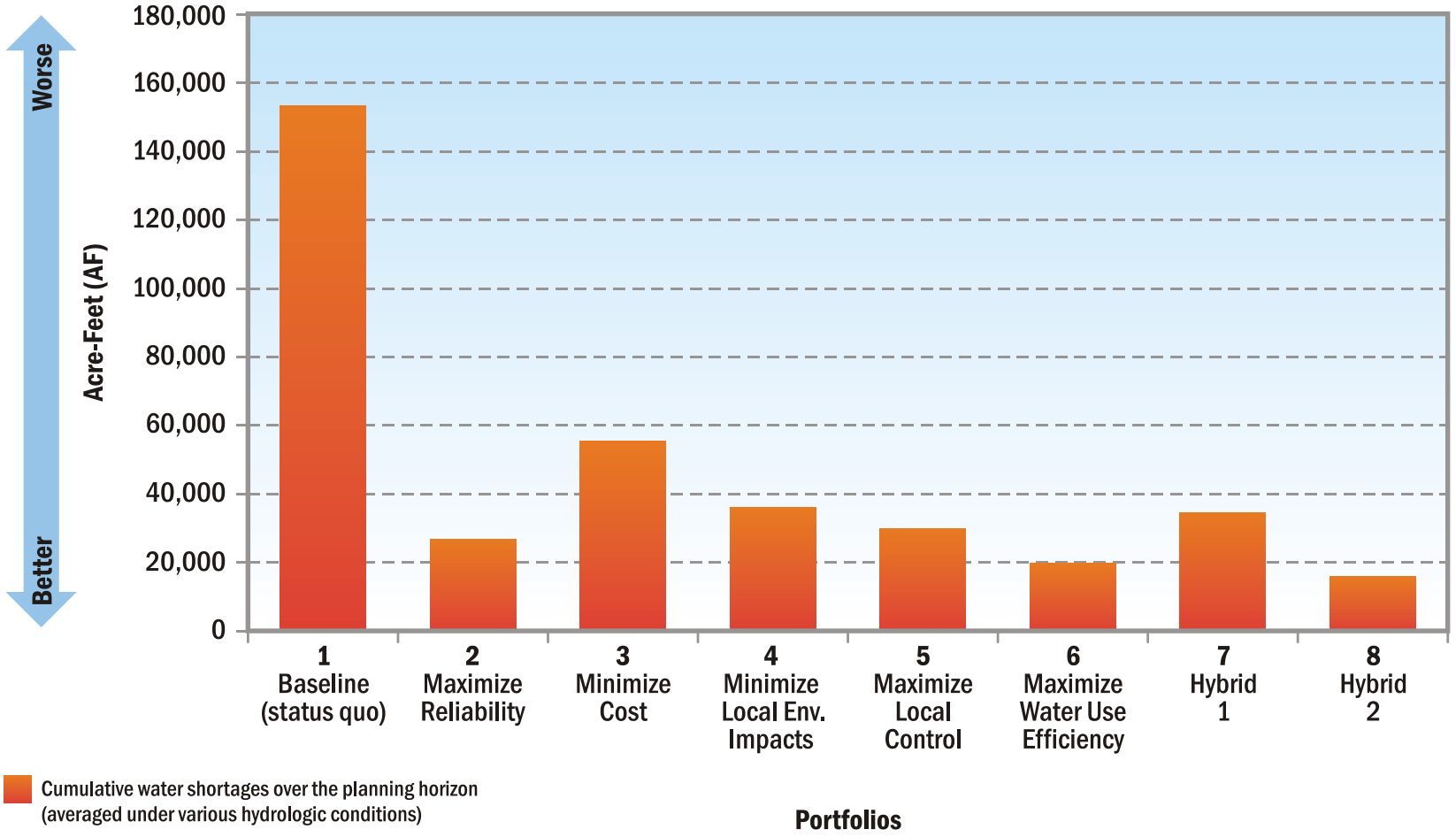
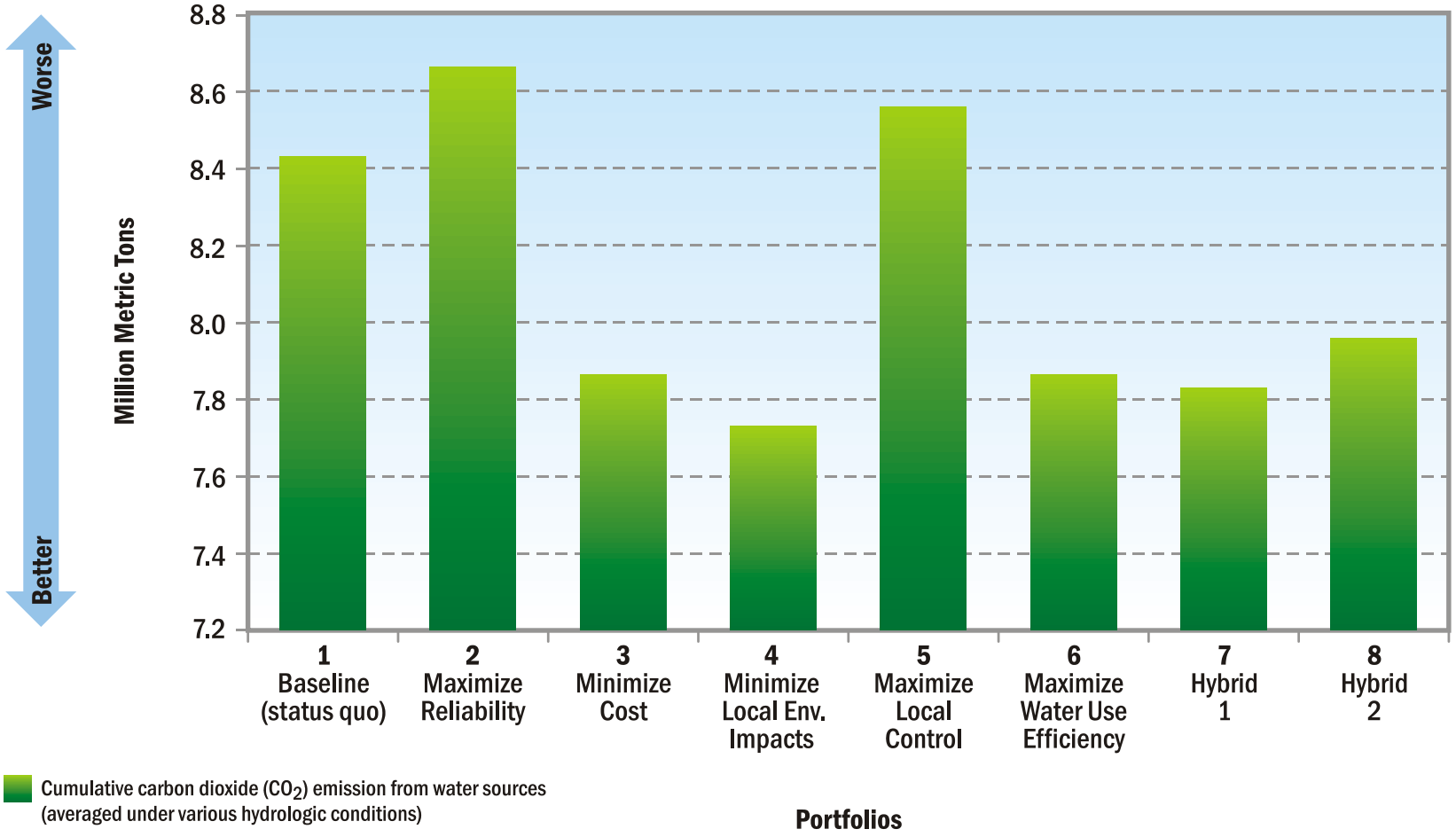
Definition of Portfolios

Portfolio Name	Portfolio Description
1. Baseline (Status Quo)	Heaviest reliance on imported water
2. Max. Reliability	Heaviest reliance on desalination and water purification
3. Min. Cost	Only includes options with lower unit costs than imported water
4. Min. Environmental Impacts	Includes options that have lowest greenhouse gas emissions and lowest impacts to receiving waters
5. Max. Local Control	Includes options that SDPUD have direct control over
6. Max. Water Efficiency	Heaviest reliance on conservation, reuse, rainwater harvesting, and graywater
7. Hybrid 1	Builds off the Min Cost Portfolio by adding Phase 1 Indirect Potable Reuse project
8. Hybrid 2	Builds off the Max Water Use Efficiency portfolio by subtracting most expensive reuse and graywater projects

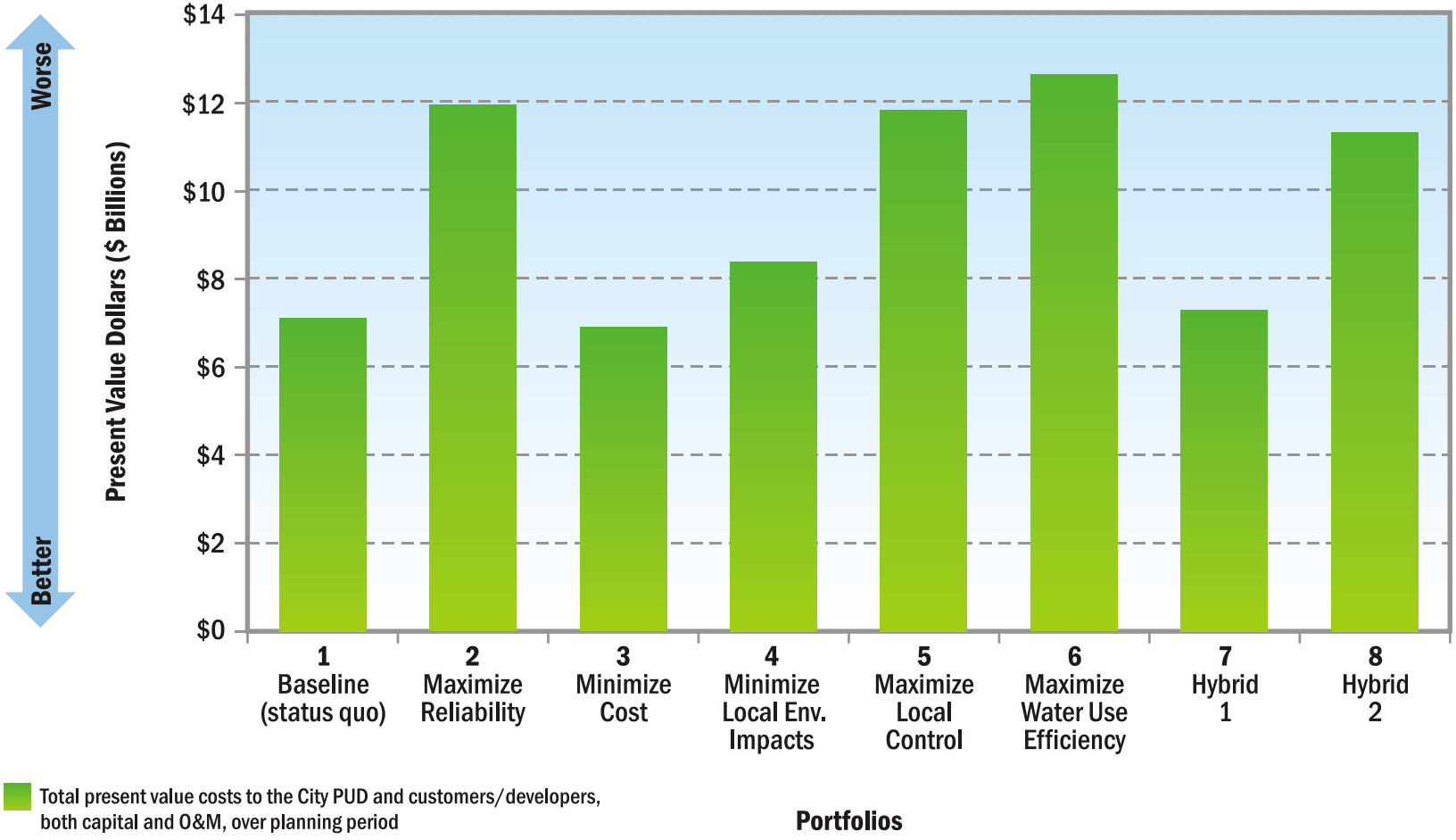
Systems Model Output: Future Water Shortages



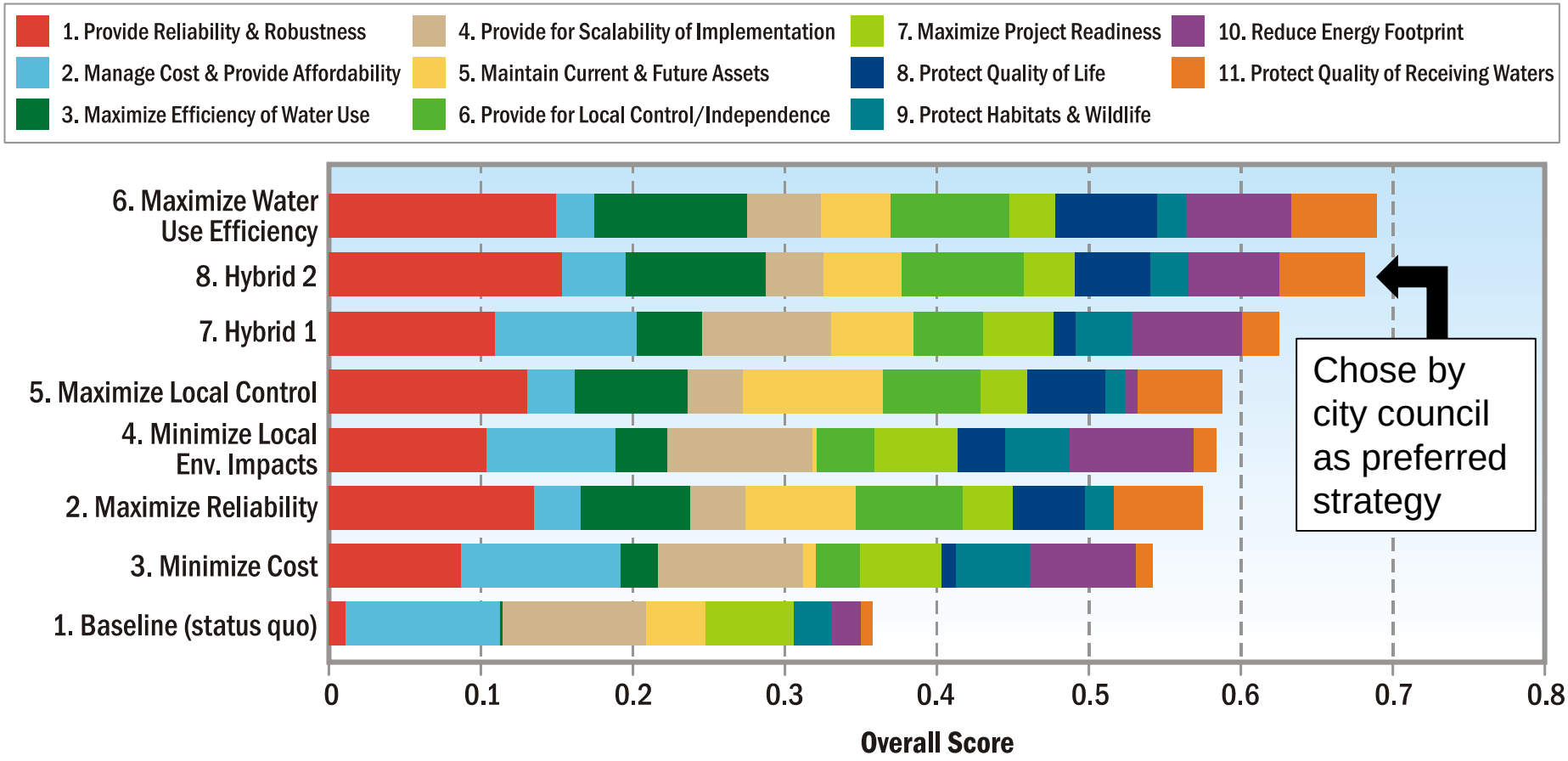
Systems Model Output: Greenhouse Gas Emissions



Systems Model Output: Lifecycle Cost



Use of Multi-criteria Software to Rank Alternatives

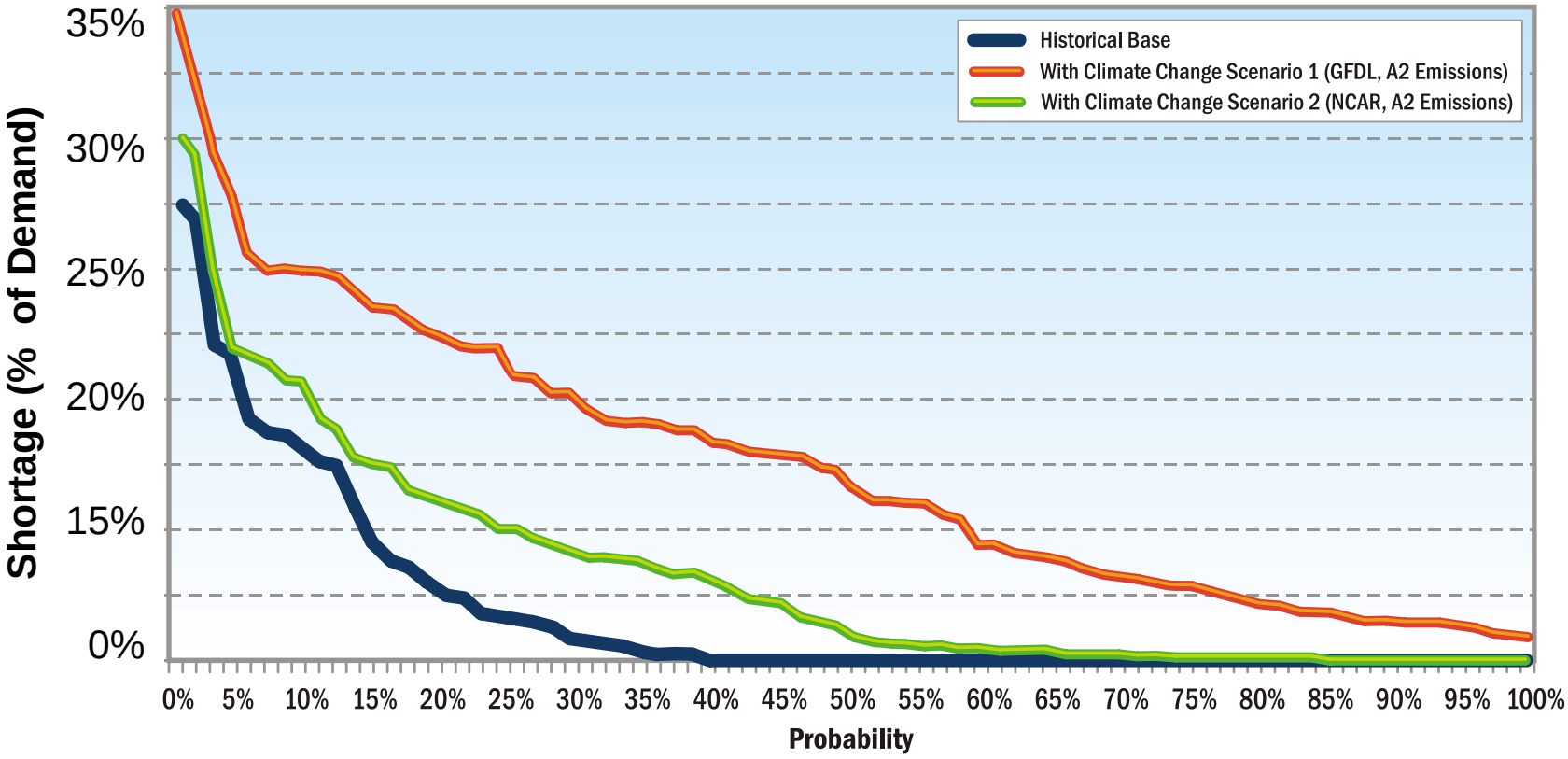


Summary of Climate Change Impacts

Impact by 2035	Climate Scenario 1 (GFLD)	Climate Scenario 2 (NCAR)
Local Temperature (change from historical average)	+5% ↑	+3% ↑
Local Rainfall (change from historical average)	+1% ↔	+13% ↑
Local Water Demands (increase from historical normal)	+3.8% ↑	+0.5% ↔
Local Surface Water (change from historical average)	-7% ↓	+20% ↑
Imported Water (change from historical *normal* year)	-14% ↓	-8% ↓
Imported Water (change from historical *wet* year)	-6% ↓	-3% ↓

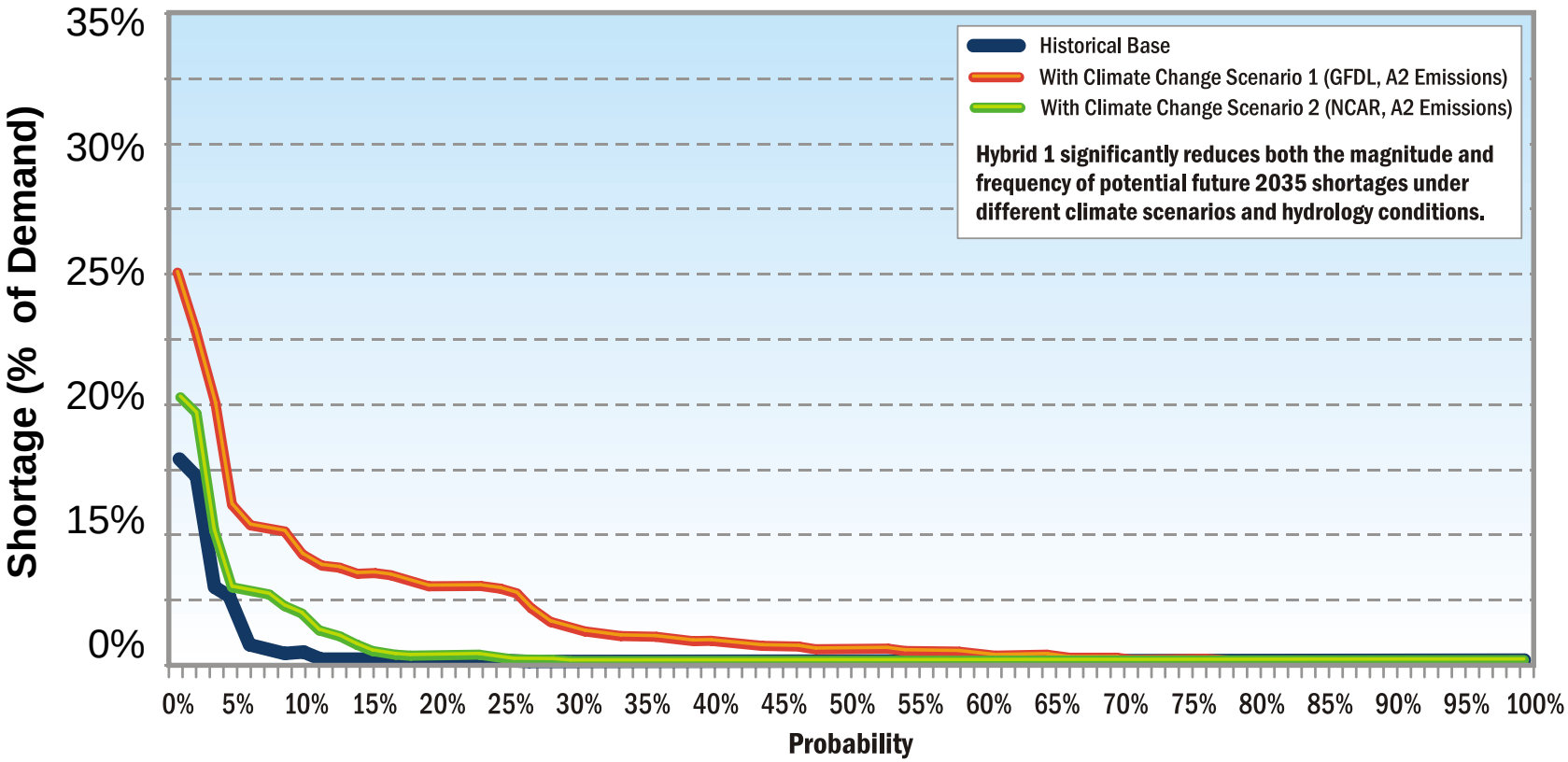
Bad Outcome Neutral Outcome Good Outcome

Impacts of Climate Change on Reliability: Baseline (Status Quo)

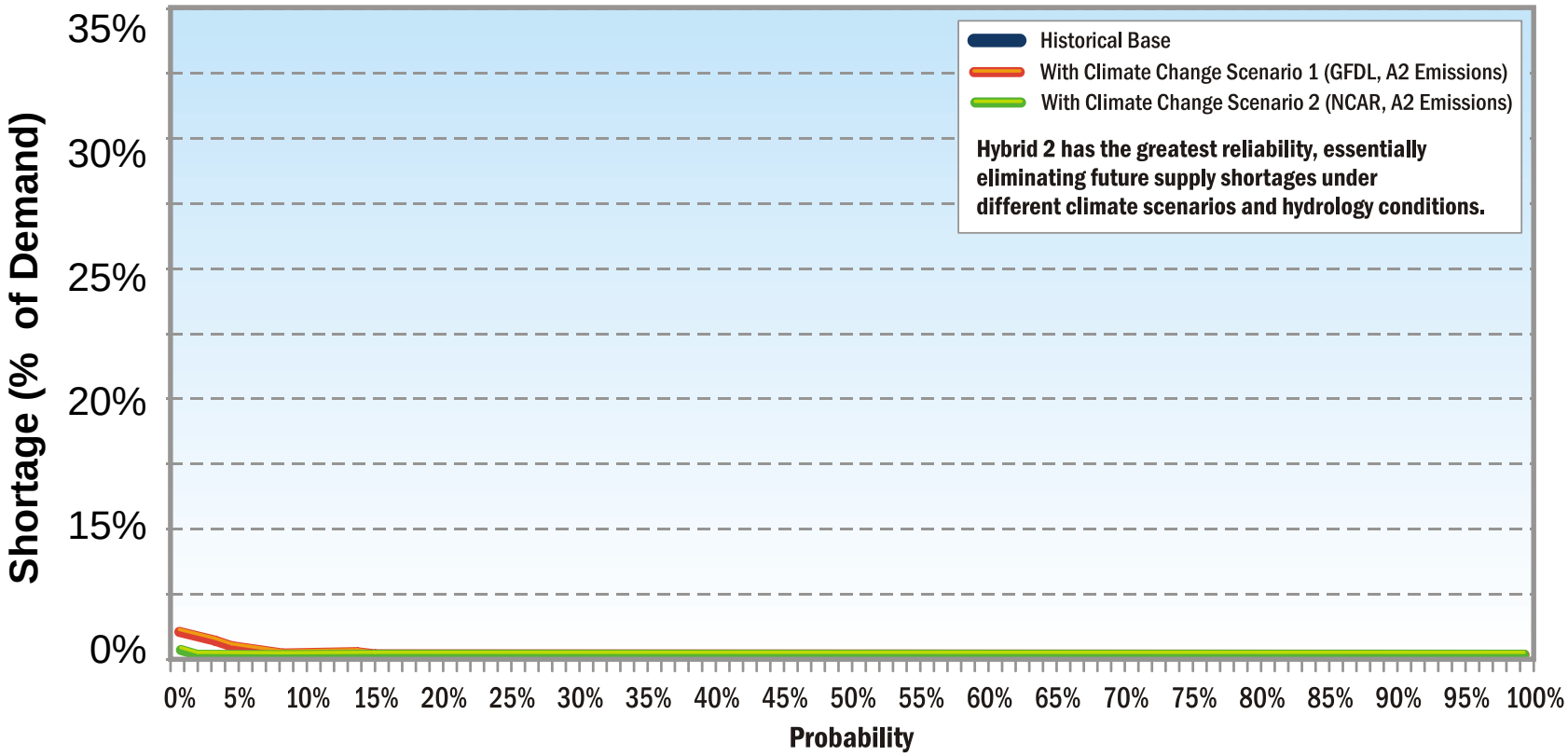


Note: Projected shortages for all probabilities are shown; therefore once the probability of zero shortage is reached, the line extends along the x-axis.

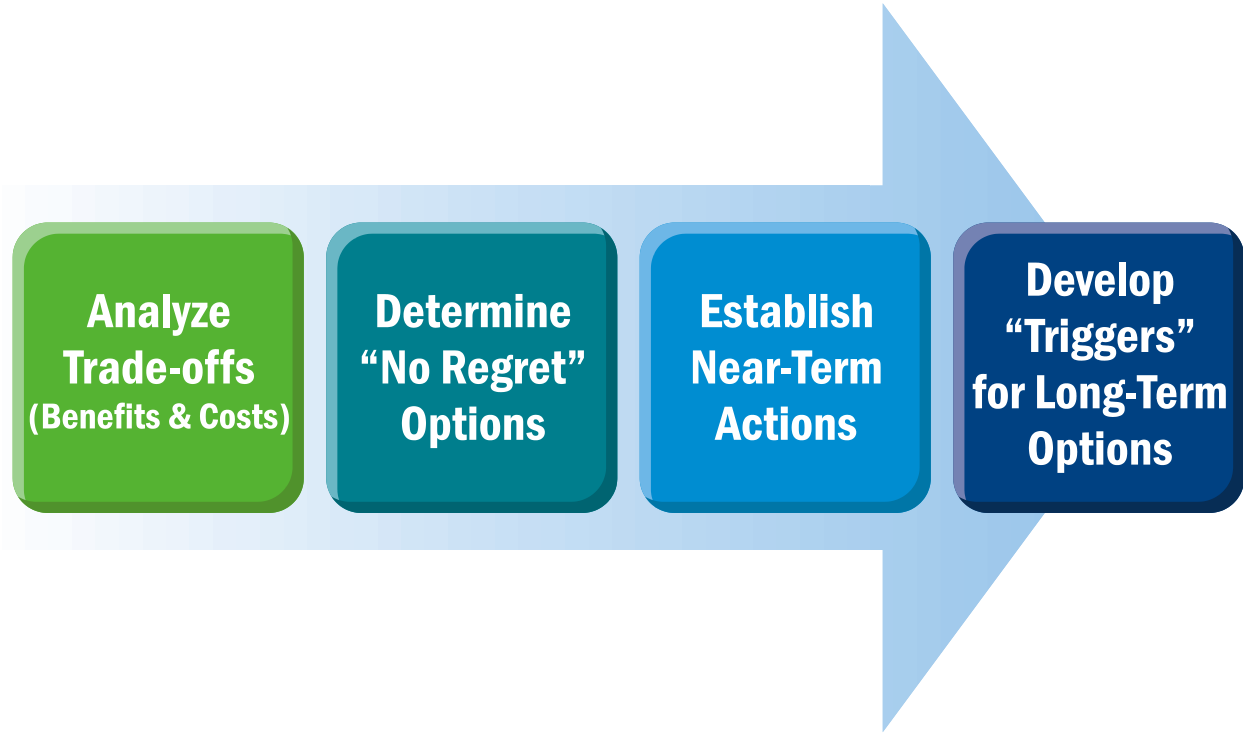
Impacts of Climate Change on Reliability: Hybrid 1 Portfolio



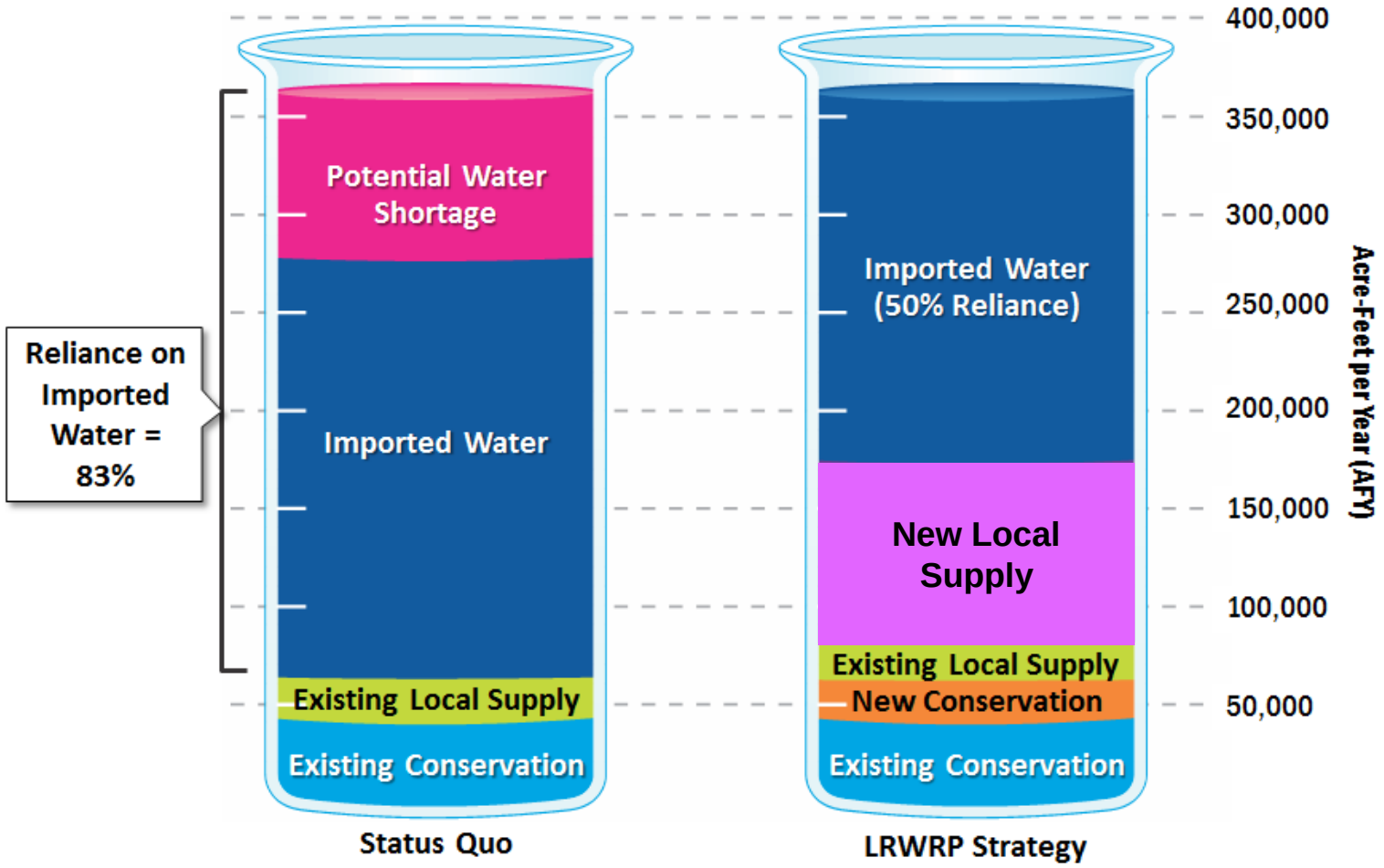
Impacts of Climate Change on Reliability: Hybrid 2 Portfolio



Adaptive Management Can Be Used to Phase-In Implementation Based on Need



Preferred Strategy Reduces High Reliance on Imported Water



Preferred Strategy is Balance of All Three Sustainability Principles

- ✓ **Social**
  - Near perfect supply reliability, even under climate change
  - Maintains high quality of life
  - Gives city significantly more local control over resources
- ✓ **Economic**
  - Affordable—not cheapest or most expensive alternative—but when factoring the "value" of high reliability, it is best performing from a "total economic" perspective
  - Projects are scalable and build off of existing assets well
- ✓ **Environment**
  - High levels of water efficiency and reuse
  - Improves receiving water quality and salinity of water supply
  - Reduces greenhouse gases and energy footprint

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Questions?

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