RIVERSIDE PUBLIC UTILITIES

UTILITY 2.0

BOARD WORKSHOP - ROADMAPS

JULY 29, 2015

WATER | ENERGY | LIFE

CITY OF RIVERSIDE

PUBLIC UTILITIES

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RIVERSIDE PUBLIC UTILITIES - PLANNING DATELINE

WORKING THE PLAN

2014

General Manager Assessment

Q1 - 2015

February 12, 2015
Introduction to Utility 2.0

February 27, 2015
Utility 2.0 Feedback

Q2 - 2015

May 7, 2015
Joint Meeting #1
Utility 2.0
& Governance

Q3 - 2015

July 13, 2015
Utility 2.0
Infrastructure &
Workforce
Roadmaps

July 29, 2015
Utility 2.0
Resource Supply
Thriving Financially
Roadmaps

August 11, 2015
City Council
to discuss
Performance Audits
Fiscal and Reserves
Policy

August 28, 2015
Joint Meeting #2
Utility 2.0 - Roadmaps
& Governance

September 1, 2015
Council Workshop
RPU
Finance 101

Q4 - 2015

October 2015
Fiber Optic Plan
Northside Audit
Transactions
to Board and
Council

Oct.-Dec. 2015
Roadmap Feedback
Fiscal Policies Audit
Organizational Review
Thriving Financially
to Board and
Council

Q1 - 2016

Jan.-Mar. 2016
Draft Financial Plan
(5 year forecast)
Performance Audit
(next phase)
Detailed Finance Audit
to Board and
Council

COMPLETED

City Council | Board of Public Utilities | Joint Meeting Council Board | Reports to Board And Council

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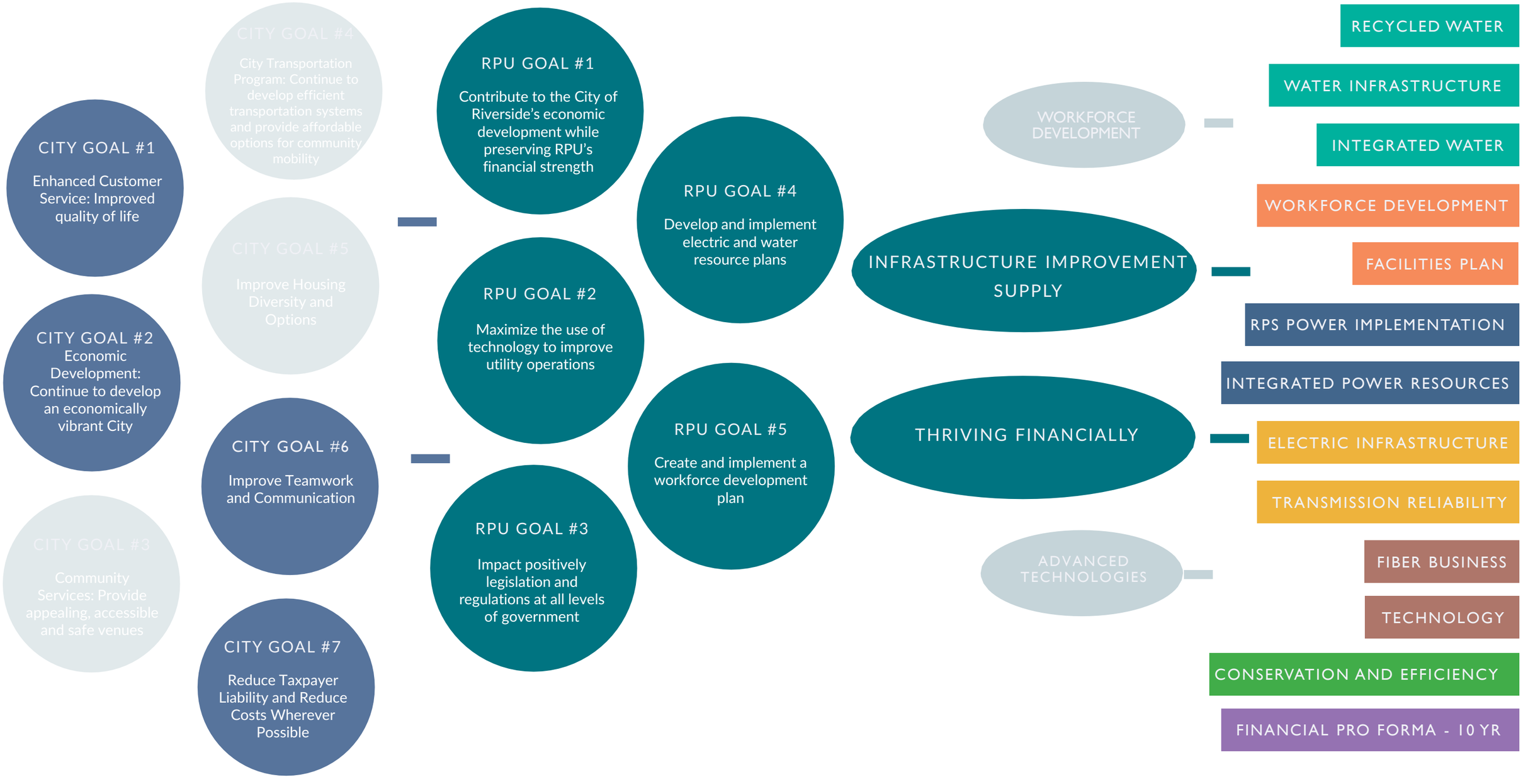
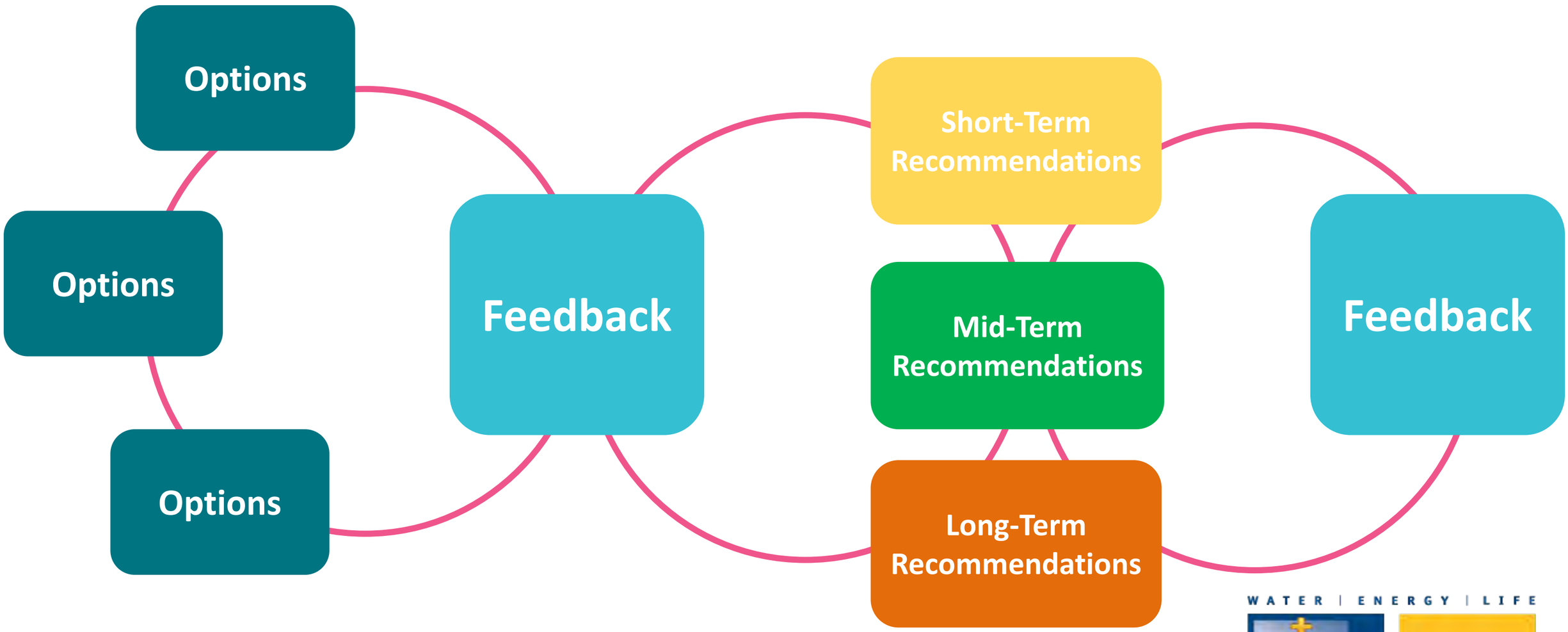
PUBLIC UTILITIES

HOW ROADMAPS SUPPORT OUR GOALS



FEEDBACK PROCESS



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RIVERSIDE PUBLIC UTILITIES

UTILITY 2.0

ELECTRIC INFRASTRUCTURE – RE-CAP

JULY 29, 2015

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ROAD MAPS – INFRASTRUCTURE IMPROVEMENT –
ELECTRIC RE-CAP

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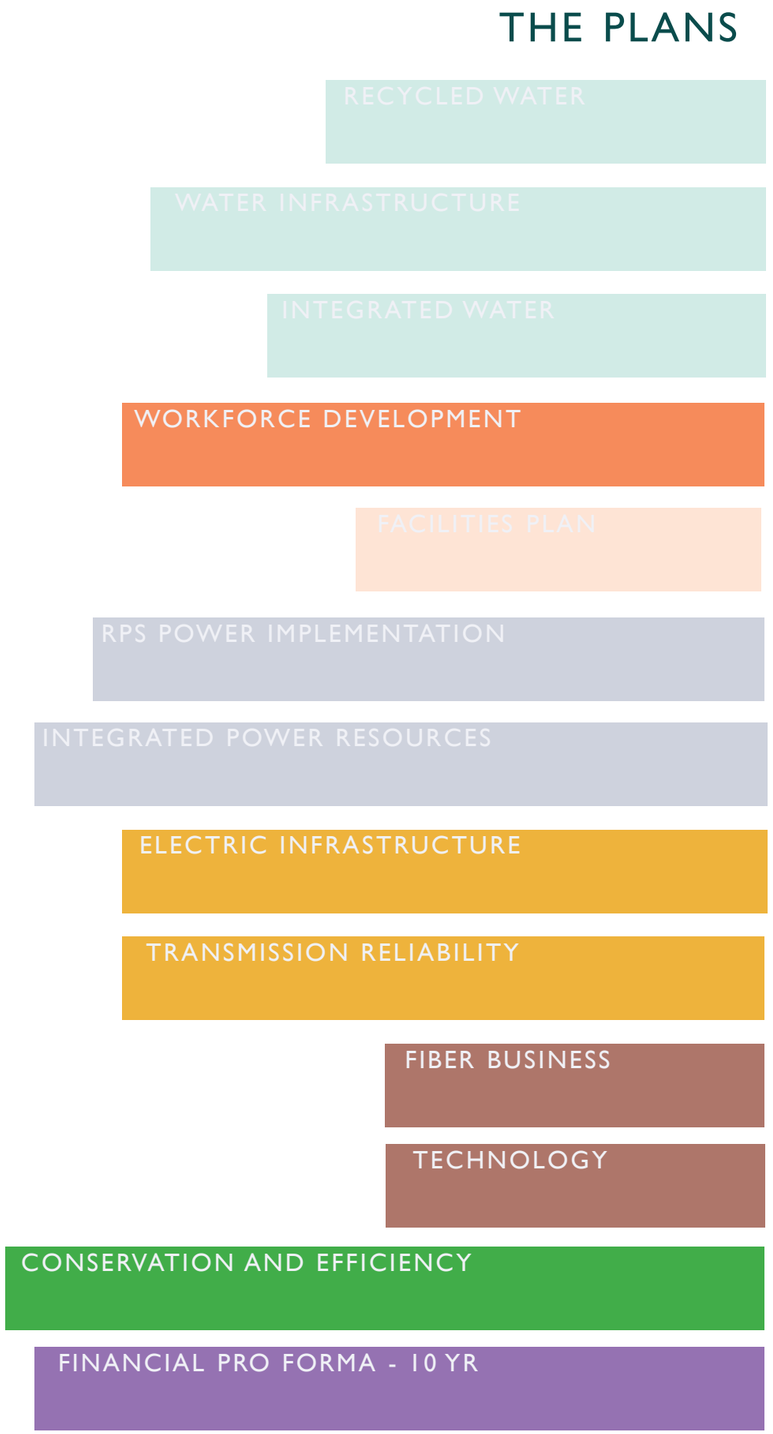
Background
Reliability
Technology
Overhead Assets
Underground Assets
Substations
Options – Selective Infrastructure
Discussion/Feedback

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC - GOALS

- Address aging infrastructure.
- Improve system safety and reliability.
- Increase the use of technology to inform future planning and increase conservation.
- Use financial pro forma to strike investment balance.



ROAD MAPS – INFRASTRUCTURE IMPROVEMENT - ELECTRIC

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT

BACKGROUND

THRIVING FINANCIALLY

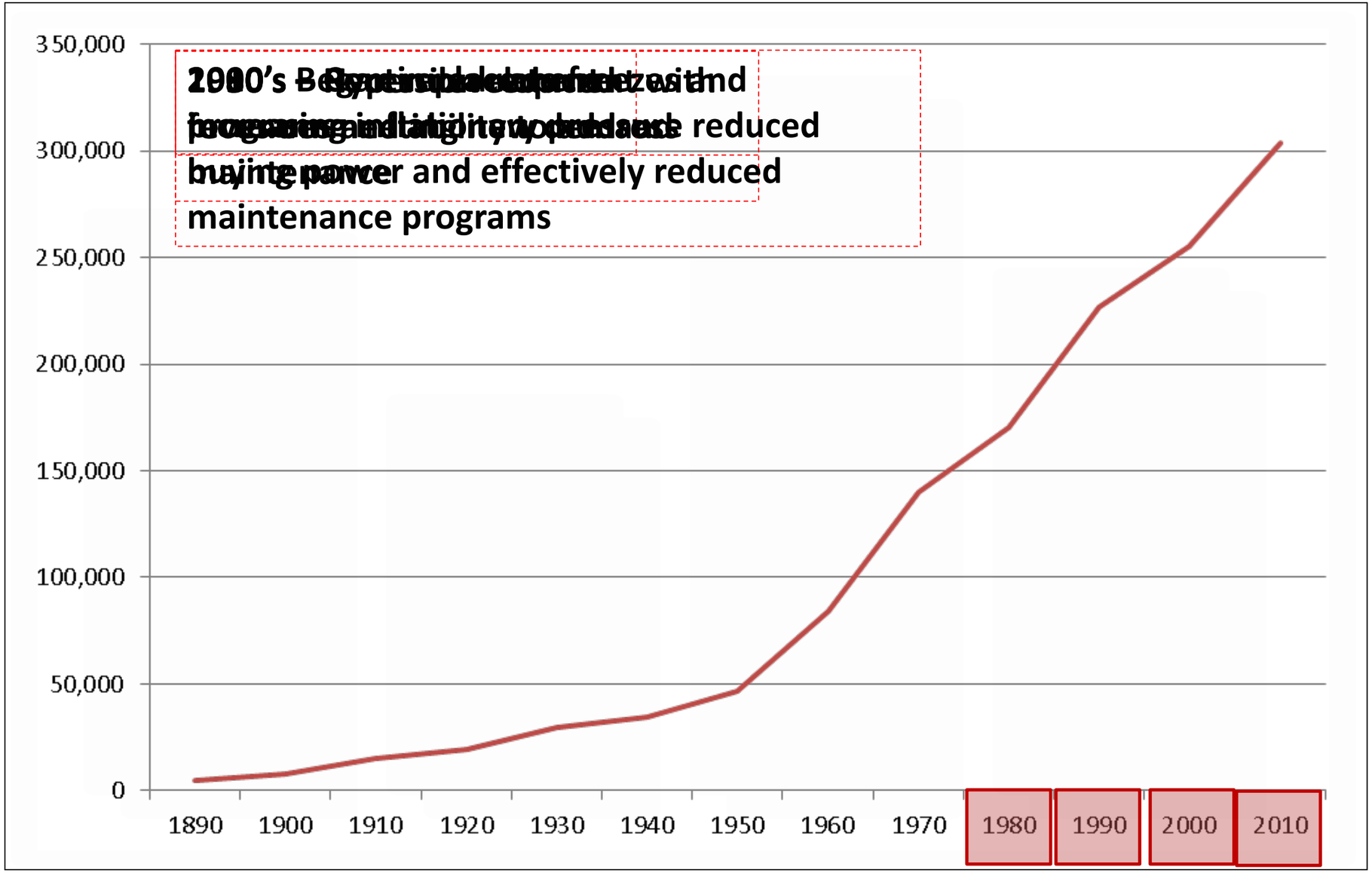
ADVANCED TECHNOLOGIES

Summary of Investment Options

Additional financial investment is required to address current backlog and improve maintenance.

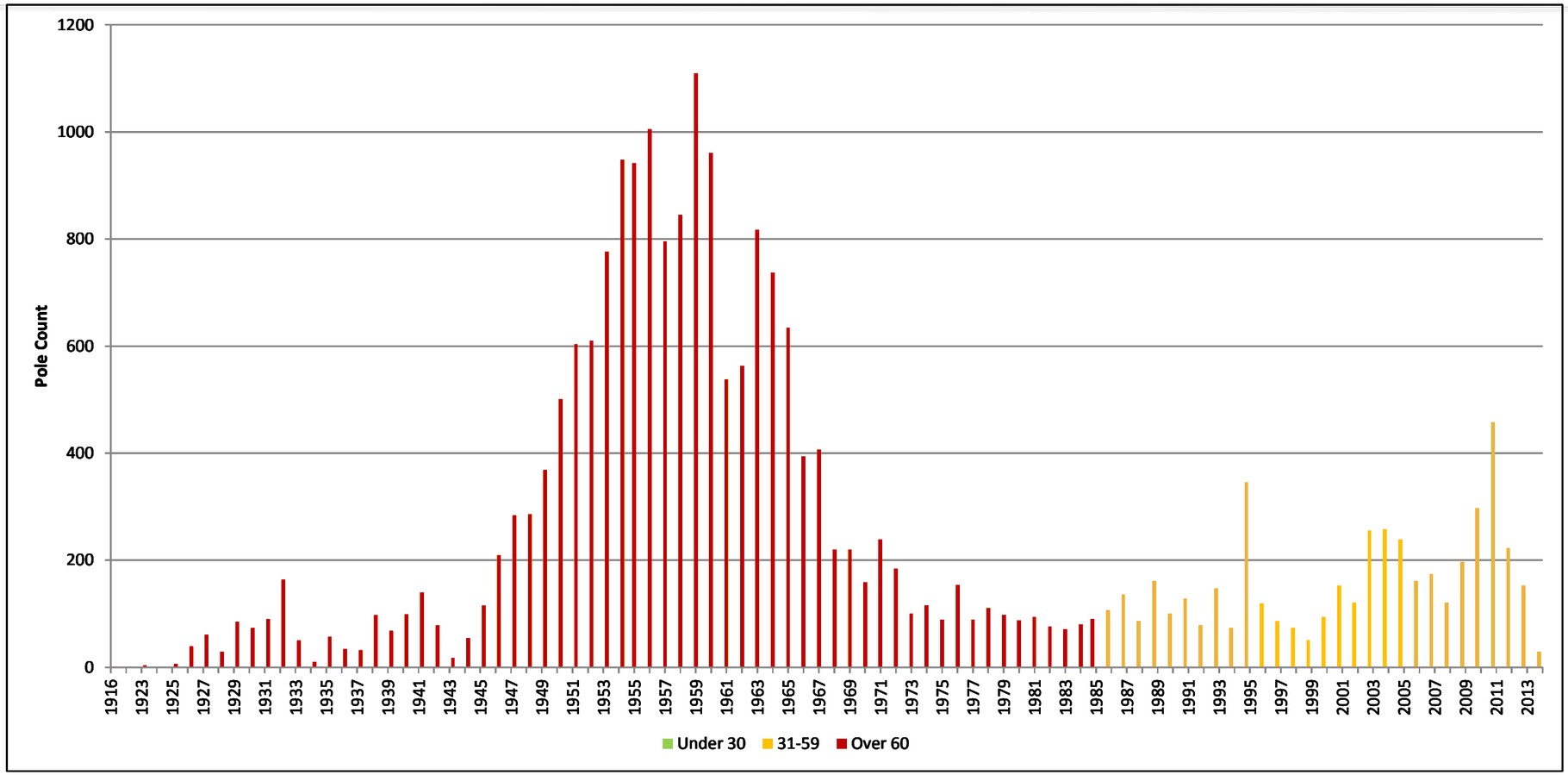
Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind (reactive)	Conduct Projected Repairs	Conduct Projected Repairs (proactive)	Highly Proactive
↓ ↑	↓ ↑	↓ ↑	↓ ↑
$171 – 206 million	**$317 – 381 million**	**$365 – 439 million**	**$519 – 623 million**

Infrastructure Maintenance on the back burner



RESCUE ROOTER
VOLTAGE
11/29/2006

Poles–Progression Over Time



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Infrastructure Maintenance Work Processes

- Technology incorporated into equipment needs
- Annual circuit patrol
- Solid inspection processes are vital

We are not alone…

- RPU is behind in technology
- Most utilities have AMI
- RPU 15% of poles need repair or replacement
- SCE 22% of poles
- LADWP 27% of poles, workforce issues

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT –
ELECTRIC RE-CAP

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
RELIABILITY

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

We made a plan…
2009 Electric System Master Plan

Maintain/Improve Reliability

- ✓ – Replace aged equipment prior to failure
- ✓ – Reduce equipment loading
- ✓ – Improve sectionalizing, transfer capacity, and outage response

Plan For Long-Term Growth and Annexations

- ✓ – Arlanza and Casa Blanca subs and new sub-transmission
- ✓ – Reinforce circuits to meet future load levels

Technology to Improve Operating Practices and Efficiency

- ✓ – Outage management, asset management, advanced metering, and smart grid

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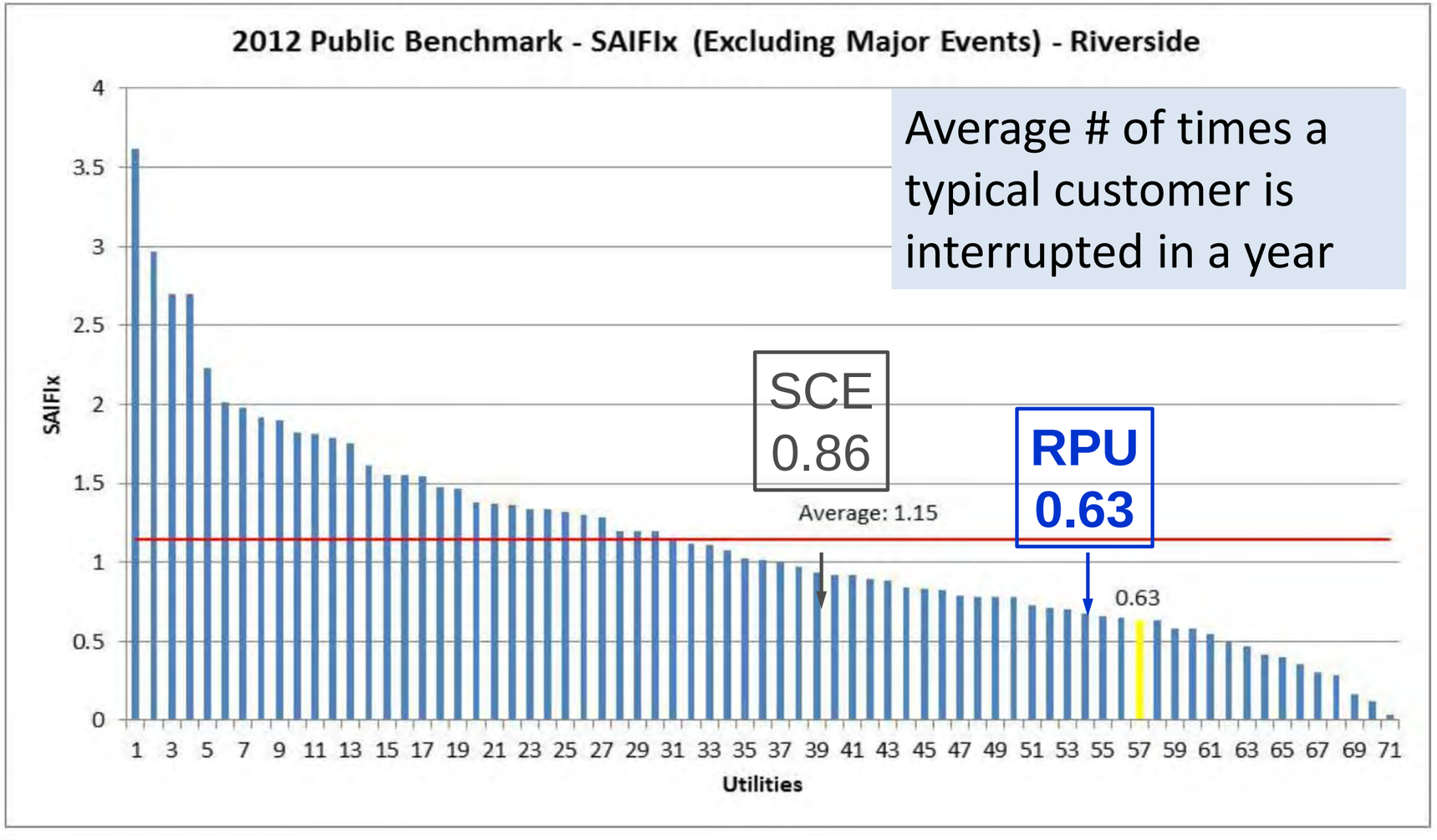
Recent work with more needed

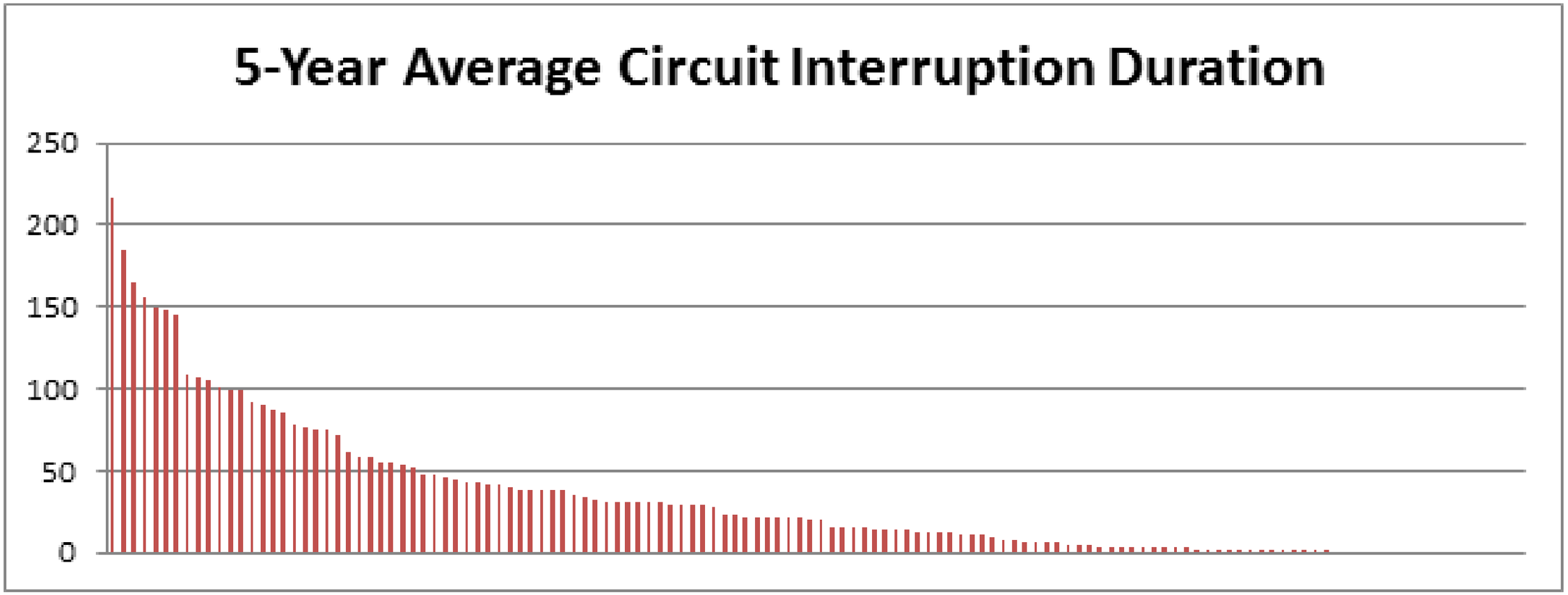
- 2009 Orange Crest Substation Capacity Addition $5M
- 2013 Casa Substation Rebuild $15M
- 2014 STP (Sub Transmission Project) $20M
- 2015 MPRP Magnolia Plaza Reliability Project $16M

Electric System Reliability

System Average Interruption Frequency Index (SAIFIx)



Circuits



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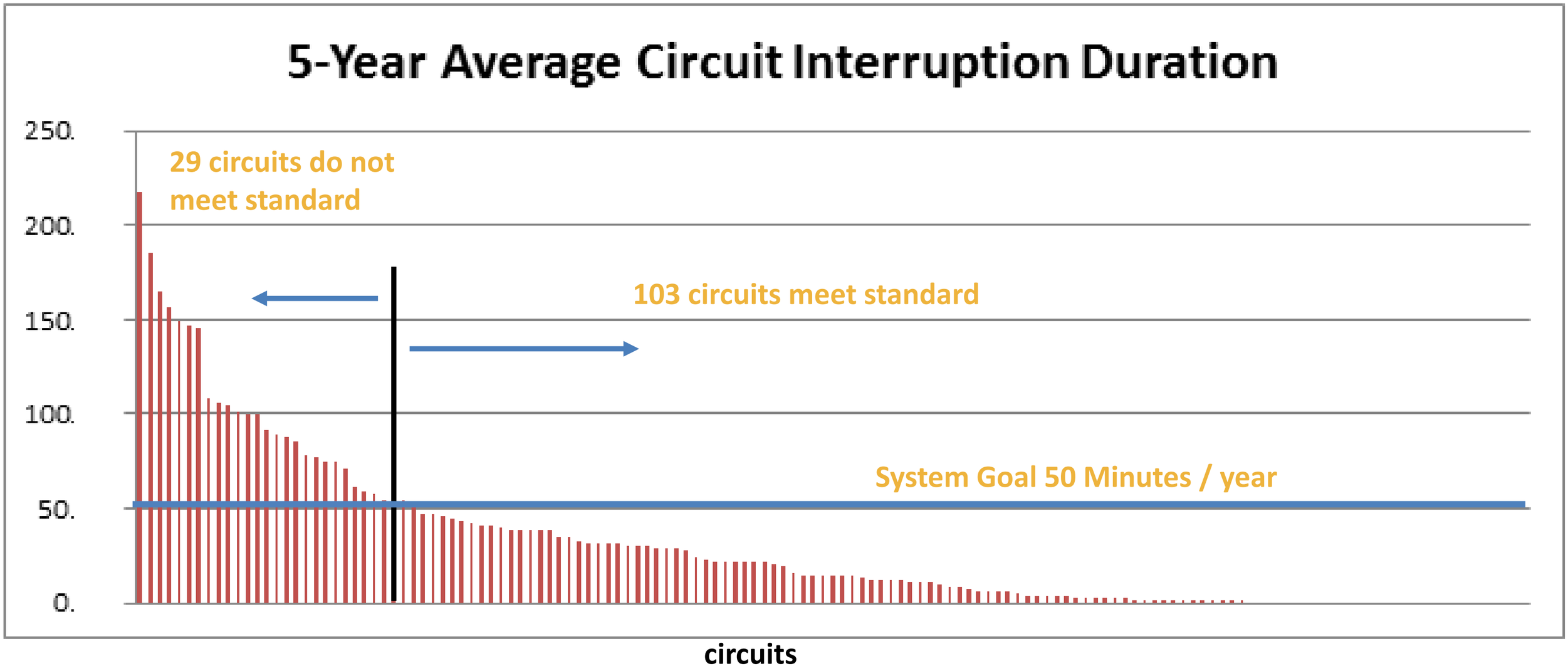
PUBLIC UTILITIES

Illustrating our Reliability



ROAD MAPS – INFRASTRUCTURE IMPROVEMENT –
ELECTRIC RE-CAP

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
TECHNOLOGY

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

How Applications work together with new Equipment

CUSTOMER FOCUSED — Directly influence customer experience and provide customer interaction

- Customer Information System (CIS)
- Customer Relationship Management (CRM)
- Customer Web Portal (CWP)
- Interactive Voice Recognition (IVR)

INFORMATION BASED — Decision and analysis, data management and process implementation based primarily on large databases

- Meter Data Management (MDM)
- Geographic Information Systems (GIS)
- Operational Data Management System (ODMS)
- Work Management System (WMS)
- Asset Management System (AMS)
- Warehouse Inventory System (WIS)

REAL-TIME OPERATIONAL — Used in real-time operations and control of water and energy delivery systems

- Advanced Metering (AMI)
- Automated Vehicle Loading (AVL)
- Network Communications System (NCS)
- Land Mobile Radio (LMR)
- Distribution Automation (DA)
- Substation Automation (SA)
- Outage Management System (OMS)
- Distribution Management System (DMS)
- Supervisory Control and Data Acquisition System (SCADA)

Applications and Equipment have a Conversation

Power Plants

Transmission Networks

Substations

Distribution Networks

Customers

Technology Options

Option 1	Option 2	Option 3	Option 4
DA Pilots SCADA Hardware AMR Rollout Mobile Radio In flight projects	Implement Technology Strategic Plan $1M/Yr EV infrastructure $15M LED Streetlight Change	--	--
Remain a follower	Implement anticipated technology needs for sustainability and resiliency	--	--
$25M	$85M	$85M	$85M

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT - ELECTRIC

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT

OVERHEAD ASSETS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

RESCUE ROOTER
VOLTAGE
11/29/2006

HIGH
HIGH
VOLTAGE
HIGH
VOLTAGE
VOLTAGE

San Bernardino
Los Angeles
San Diego
Indio
City Body & Frame
A COLLISION REPAIR CENTER
2756 E. La Cadena

Overhead Options

Option 1	Option 2	Option 3	Option 4
4kV x 12kV in 11 yrs 2,000 poles 300 Equipment	4kV x 12kV in 7 yrs 4,850 poles 600 Equipment	4kV x 12kV in 5 yrs 5,900 poles 720 Equipment	4kV x 12kV in 5 yrs 9,800 poles 1,200 Equipment
Increased likelihood of outages and damage	Maintain the system	Increased maintenance, decreased likelihood of outages and damage	Aggressive replacement, uncommon in the industry
$49M	$120M	$145M	$228M

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT -
ELECTRIC RE-CAP

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
UNDERGROUND ASSETS

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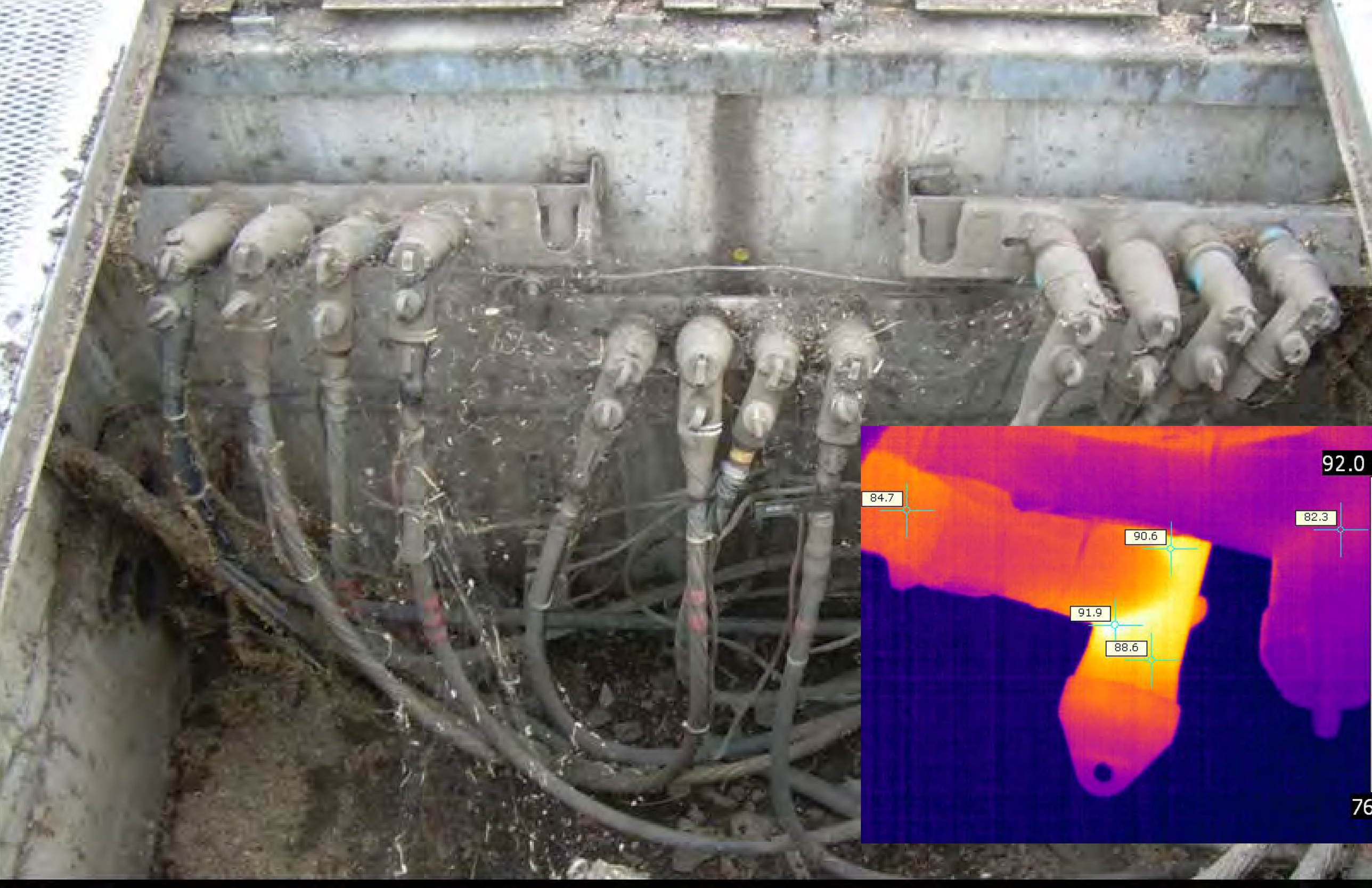
ADVANCED TECHNOLOGIES


92.0
84.7
82.3
90.6
91.9
88.6
76

Underground Options

Option 1	Option 2	Option 3	Option 4
54 Miles of Cable 170 Structures 100 Devices	64 Miles of Cable 270 Structures 120 Devices	77 Miles of Cable 320 Structures 145 Devices	128 Miles of Cable 540 Structures 240 Devices
Increased likelihood of outages and damage	Maintain the system	Increase maintenance, decrease likelihood of outages and damage	Aggressive replacement, uncommon in the industry
$80M	$106M	$126M	$208M

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT -
ELECTRIC RE-CAP

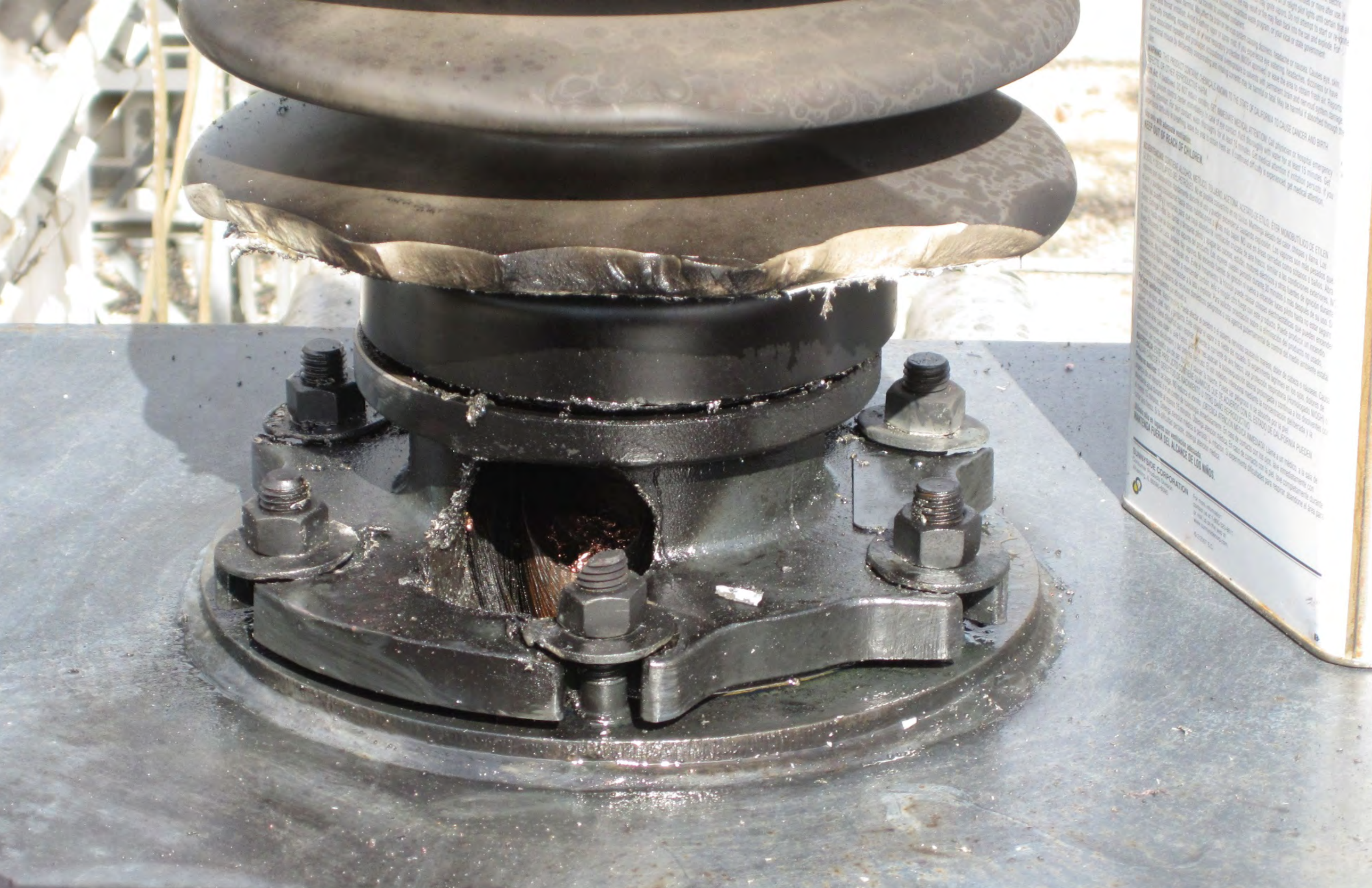
WORKFORCE DEVELOPMENT

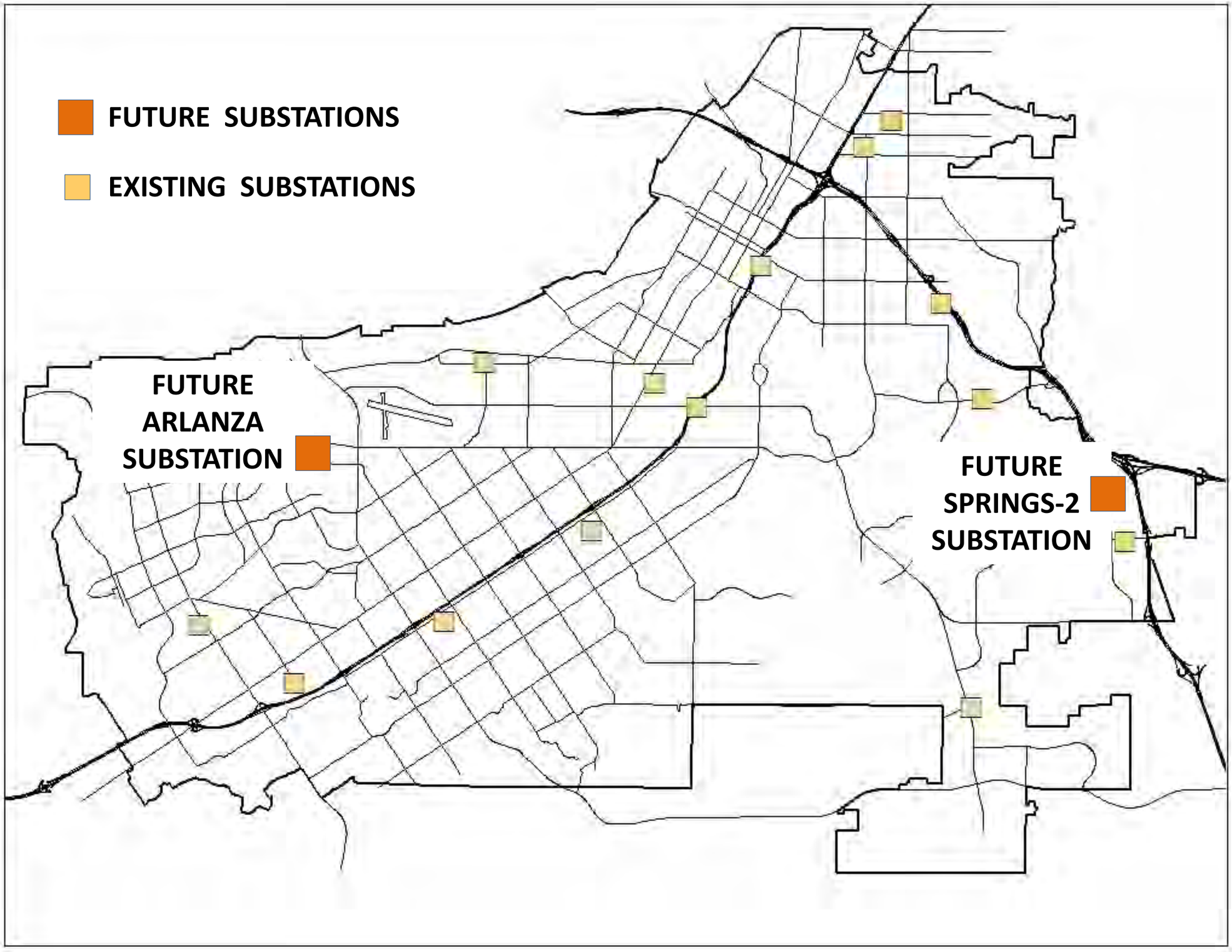
INFRASTRUCTURE IMPROVEMENT
SUBSTATIONS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Harvey Lynn T3 Before and After




FUTURE SUBSTATIONS
EXISTING SUBSTATIONS
FUTURE ARLANZA SUBSTATION
FUTURE SPRINGS-2 SUBSTATION

Substation Options

Option 1	Option 2	Option 3	Option 4
0 New substations 5 Transformers 3 Switchgears 45 Breakers 375 Relays	0 New substations 7 Transformers 4 Switchgears 70 Breakers 540 Relays	1 New substation 7 Transformers 5 Switchgears 70 Breakers 570 Relays	2 New substations 10 Transformers 6 Switchgears 85 Breakers 570 Relays
Increased likelihood of outages and damage	Increase replacements, decreased likelihood of outages and damage	New Arlanza substation, additional switchgear and relay replacement	New Arlanza and Springs(2) substations. Aggressivereplacement, uncommon in the industry
$45M	$65M	$79M	$102M

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT - ELECTRIC RE-CAP

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT OPTIONS OVERVIEW

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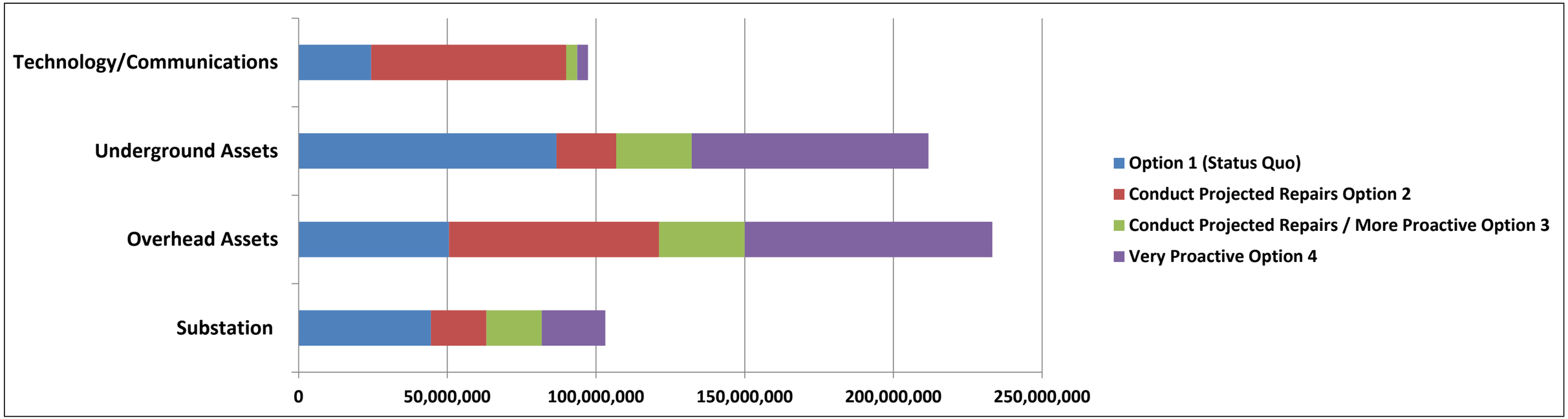
ADVANCED TECHNOLOGIES

- Options serve to enable discussion.
- There is a strong desire to preserve a sustainable and resilient utility.
- Aging infrastructure is an industry wide issue.
- Solid inspection processes are vital.

Options



Option 1: $171M – $206M 5.2% of Electric Fund Budget

Option 2: $317M – $381M 9.2% of Electric Fund Budget

Option 3: $365M – $439M 10.5% of Electric Fund Budget

Option 4: $519M – $623M 14.2% of Electric Fund Budget

Summary of Investment Options

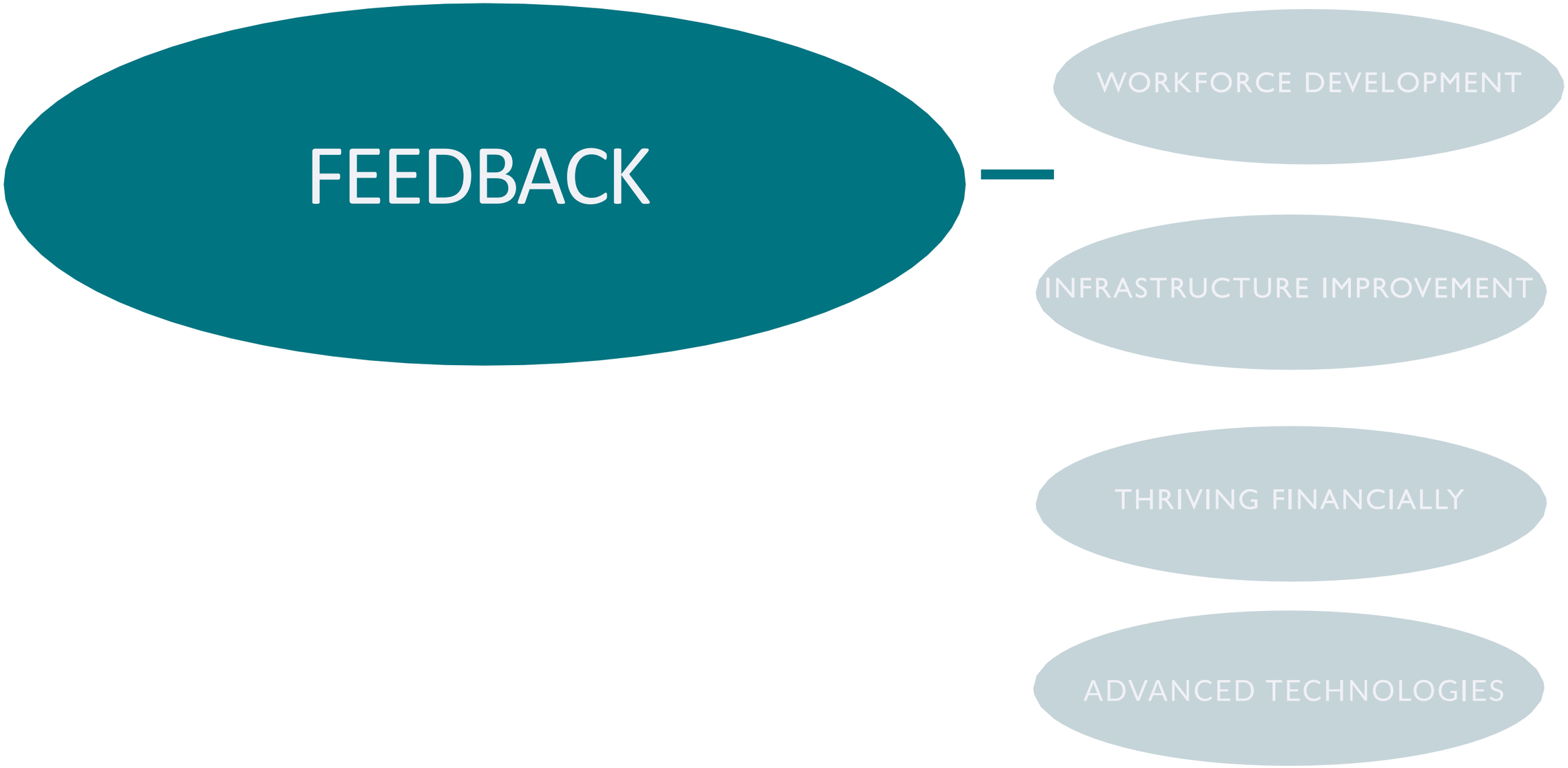
Additional financial investment is required to address current backlog and improve maintenance.

Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind (reactive)	Conduct Projected Repairs	Conduct Projected Repairs (proactive)	Highly Proactive
↓ ↑	↓ ↑	↓ ↑	↓ ↑
$171 – 206 million	**$317 – 381 million**	**$365 – 439 million**	**$519 – 623 million**

Next Steps

- Incorporate Comments
- Formulate Detailed recommendations
- Review
- Report Back

ROAD MAPS –


FEEDBACK
WORKFORCE DEVELOPMENT
INFRASTRUCTURE IMPROVEMENT
THRIVING FINANCIALLY
ADVANCED TECHNOLOGIES

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UTILITY 2.0

WATER INFRASTRUCTURE RE-CAP

JULY 29, 2015

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Feeback Answers
- SAFE W.A.T.E.R Plan
- Pipeline Replacement
- Treatment Plants
- Technology Options
- Investment Options

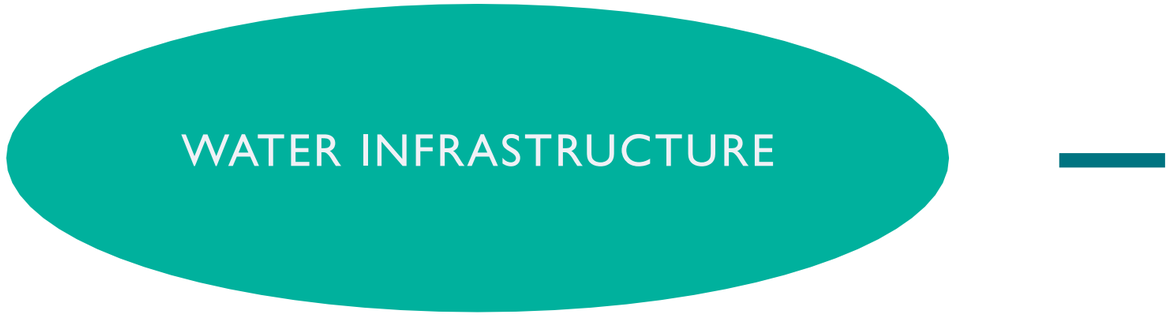
WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT EXECUTIVE SUMMARY

THRIVING FINANCIALLY

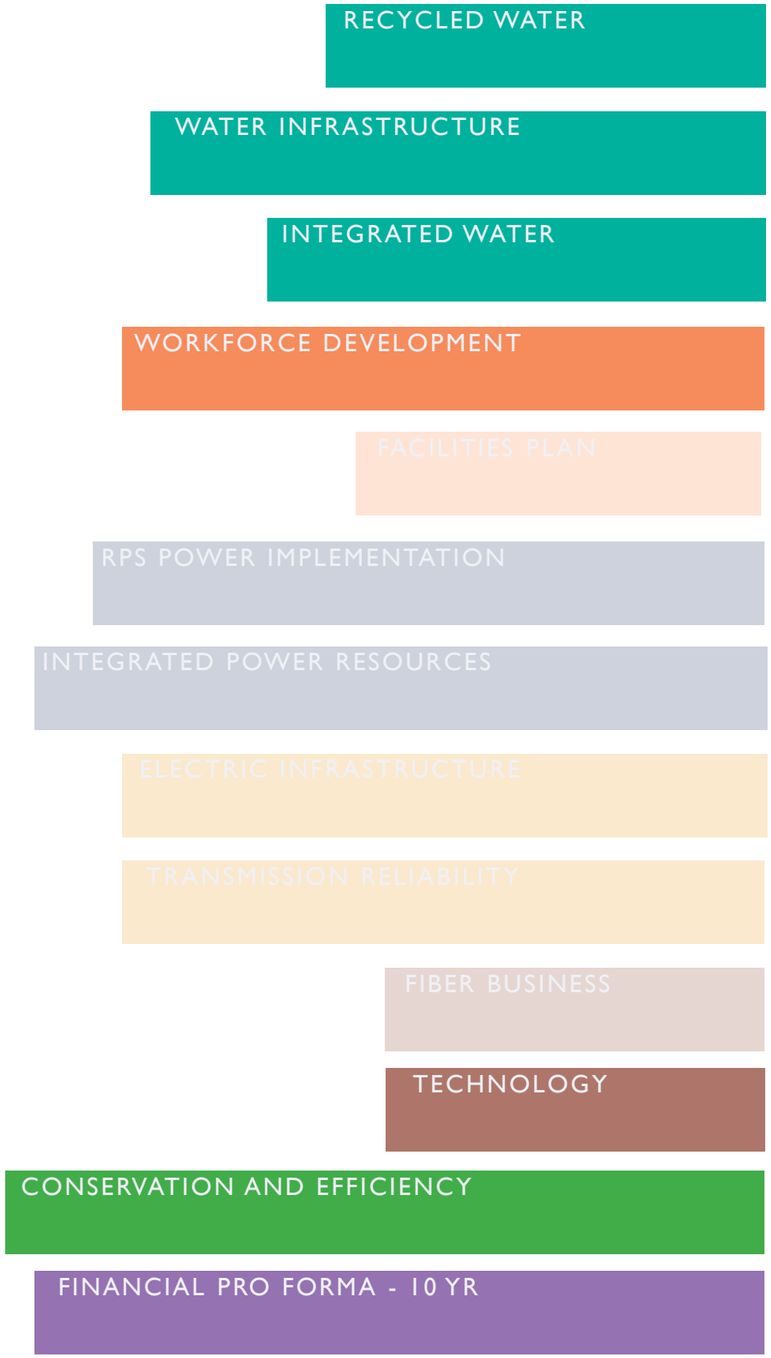
ADVANCED TECHNOLOGIES

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – WATER - GOALS



- Address aging infrastructure.
- Improve system safety and reliability.
- Increase the use of technology to inform future planning and increase conservation.
- Use financial pro forma to strike investment balance.

THE PLANS



Water Infrastructure Assessment

Water System:

- Significant improvement have been made through the CIP process, but areas of criticality remain.
- Significant pipeline replacement needed.

Technology:

- Leverage technology to realize increased efficiency and effectiveness.
- Improve SCADA and network communication to further enhance security.

Workforce:

- Workforce needs training to have Utility 2.0 skill sets.
- Knowledge transfer needed for aging workforce.

Financials:

- Strong Financial Position
- Continue efficiency improvements

Infrastructure Assessment

Asset	Criticality	Last 10 Years	Status	Next 10 Years
Wells		$20 Million	On target	$21-$29 Million
Treatment Plants		$30 Million	On target	$19-$27 Million
Distribution Facilities		$15 Million	On target	$6-$10 Million
Reservoirs		$45 Million	On target	$5-$7 Million
Transmission Mains		$35 Million	Deficient	$84-$102 Million
Distribution Pipelines		$90 Million	Deficient	$107-$198 Million
Technology		$15 Million	Deficient	$44-$64 Million

Criticality:	High		Moderate		Low	

Summary of Investment Options

Additional financial investment is required to address current backlog and improve maintenance.

Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind	Major Deficiencies	Operational Deficiencies	Aggressive Program
↓ ↑	↓ ↑	↓ ↑	↓ ↑
$170 – 206 million	**$226 – 293 million**	**$279-357 million**	**$342-437 million**

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WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT FEEDBACK ANSWERS

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ADVANCED TECHNOLOGIES

Feedback

- What did we get from the SAFE WATER Plan?
  - New Infrastructure
  - Additional Storage
  - Water Independence
- What is a sustainable rate of pipeline replacement?
  - Distribution Pipeline
  - Transmission Pipeline
- What about the North Waterman Treatment Plant?
- What are we doing about Technology?

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
SAFE W.A.T.E.R. PLAN

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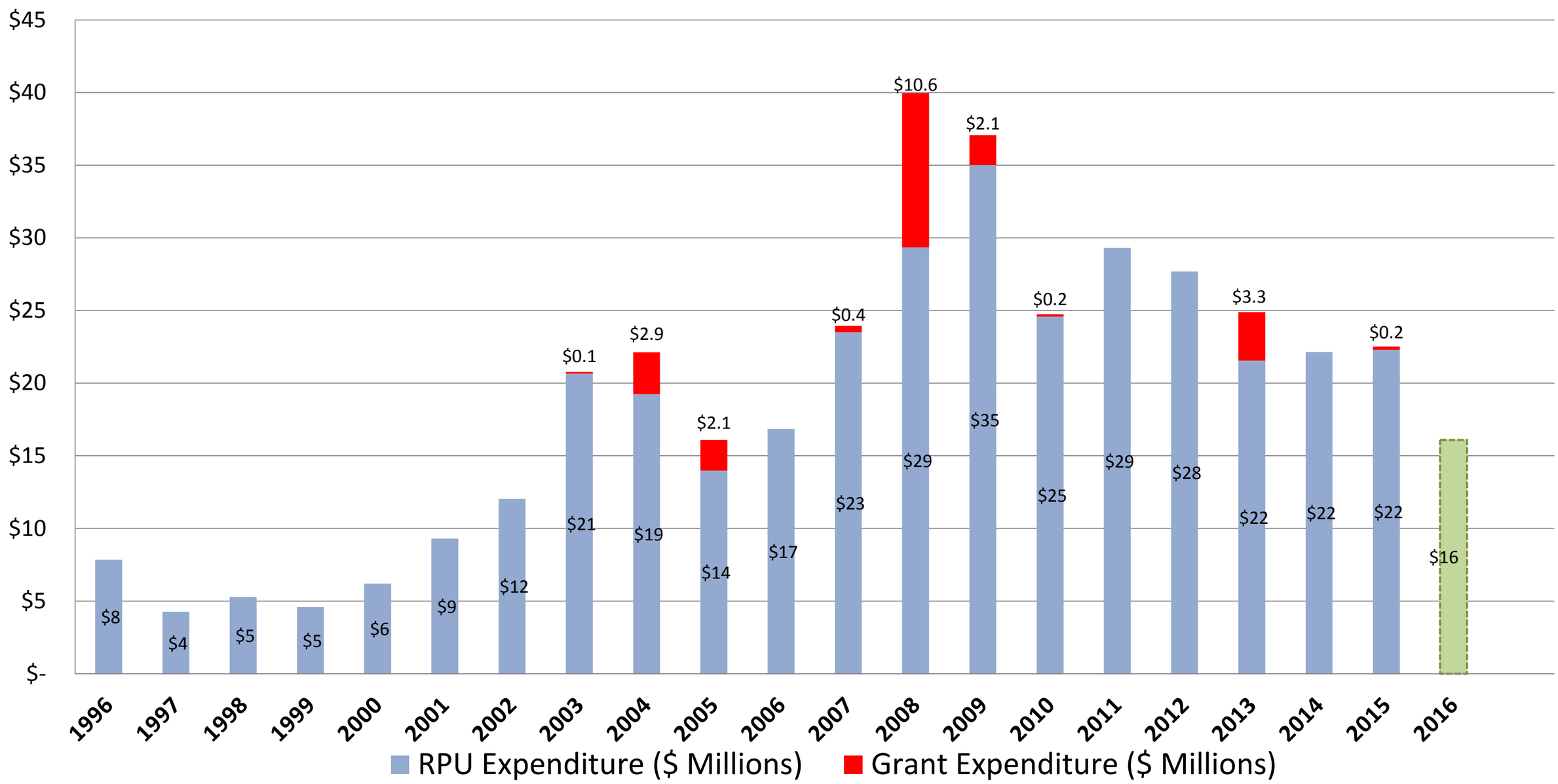
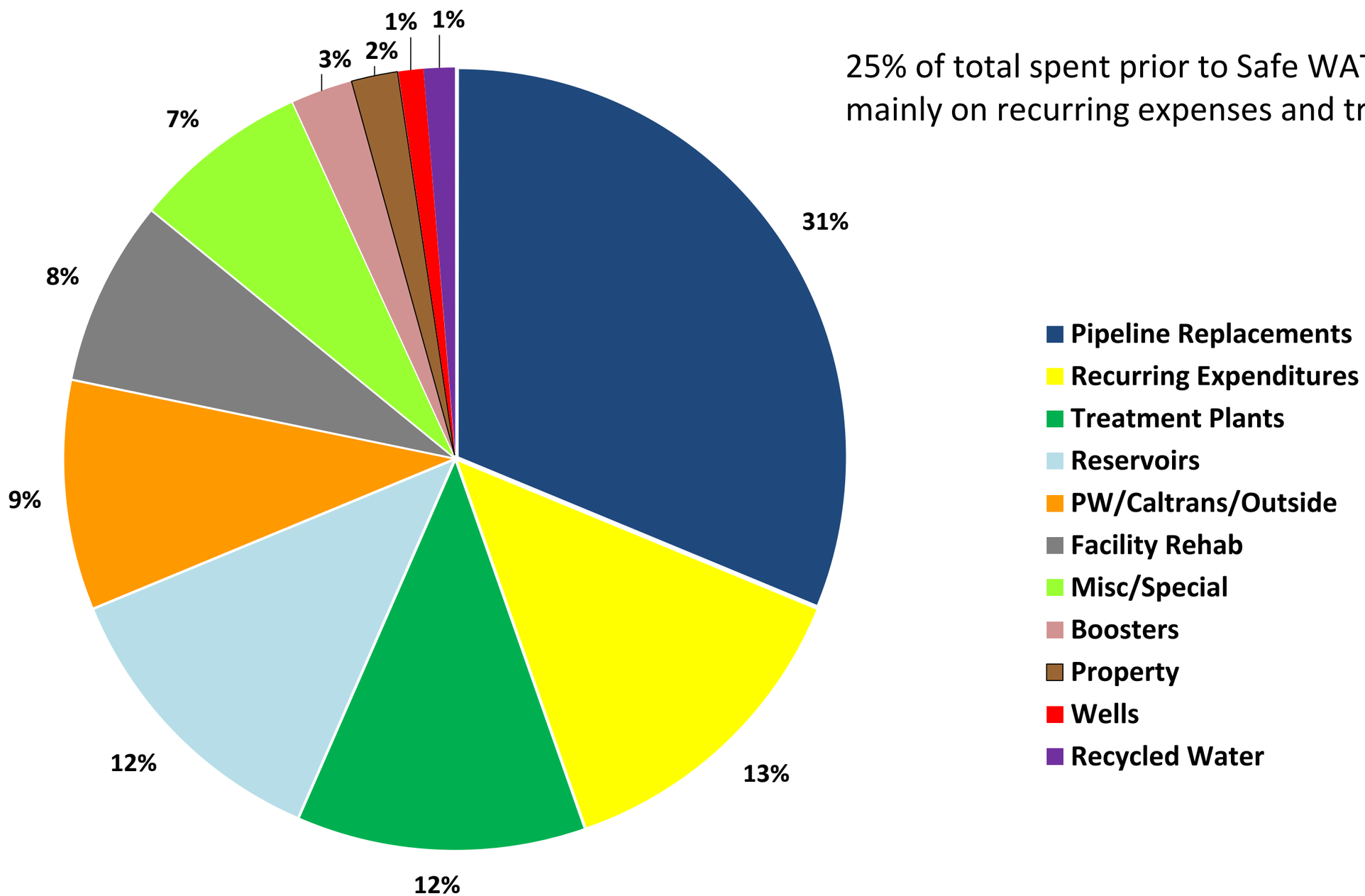
ADVANCED TECHNOLOGIES

CIP Expenditure by Fiscal Year



CIP by Category since 1996



25% of total spent prior to Safe WATER Plan, mainly on recurring expenses and treatment

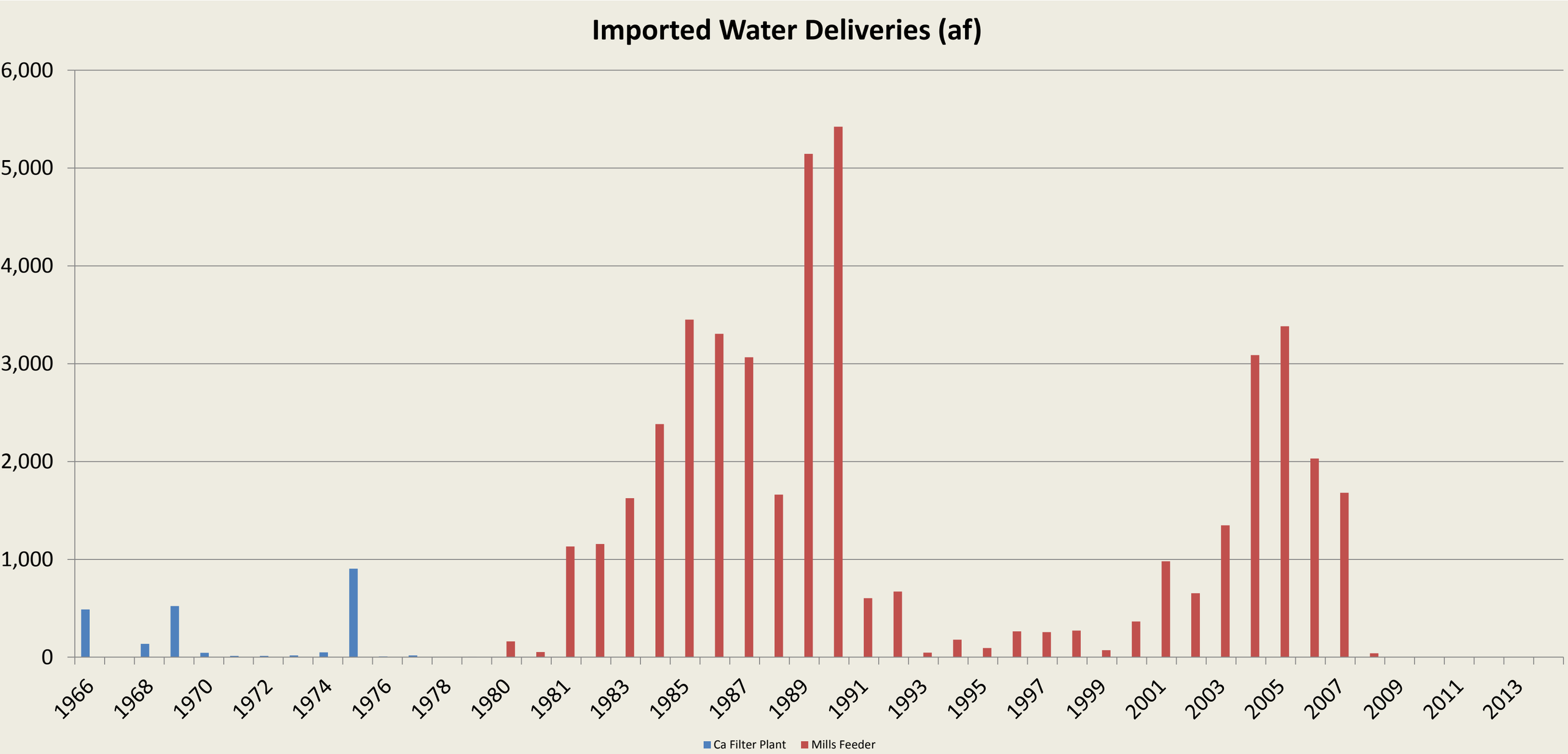
Safe WATER Plan

Water Facilities	Safe WATER Plan
49 Active Wells	Replaced 10 Wells
16 Storage Reservoirs (109 MG)	Restored 33 MG, added 8 MG
11 Treatment Plants	Added JW North
41 Booster Stations	18 new or rebuilt
27 Pressure Reducing Stations	14 new or rebuilt
64,000 meters	35,000 replaced
824 miles of distribution pipeline	62 miles replaced
132 miles of transmission pipeline	6 miles replaced

Safe WATER →Water Independence

- JW North
  - Converted irrigation wells to potable wells
    - Added 10% capacity
- Booster Station replacement/upgrades
  - Prior Booster Stations unable to maintain Campbell Reservoir
  - Replacements pushed water uphill during summer months
- Whitegates Reservoir Replacements
  - Increased storage from 1 MG to 9 MG
  - Provided added protection to 1200 zones

Imported Water Deliveries



Imported Water Savings

- Averaged 1,500 afa from 2000 to 2007
  - $1 to $2 Million per year
- A total of $7 Million to $10 Million saved from 2008-2015

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
PIPELINE REPLACEMENT

THRIVING FINANCIALLY

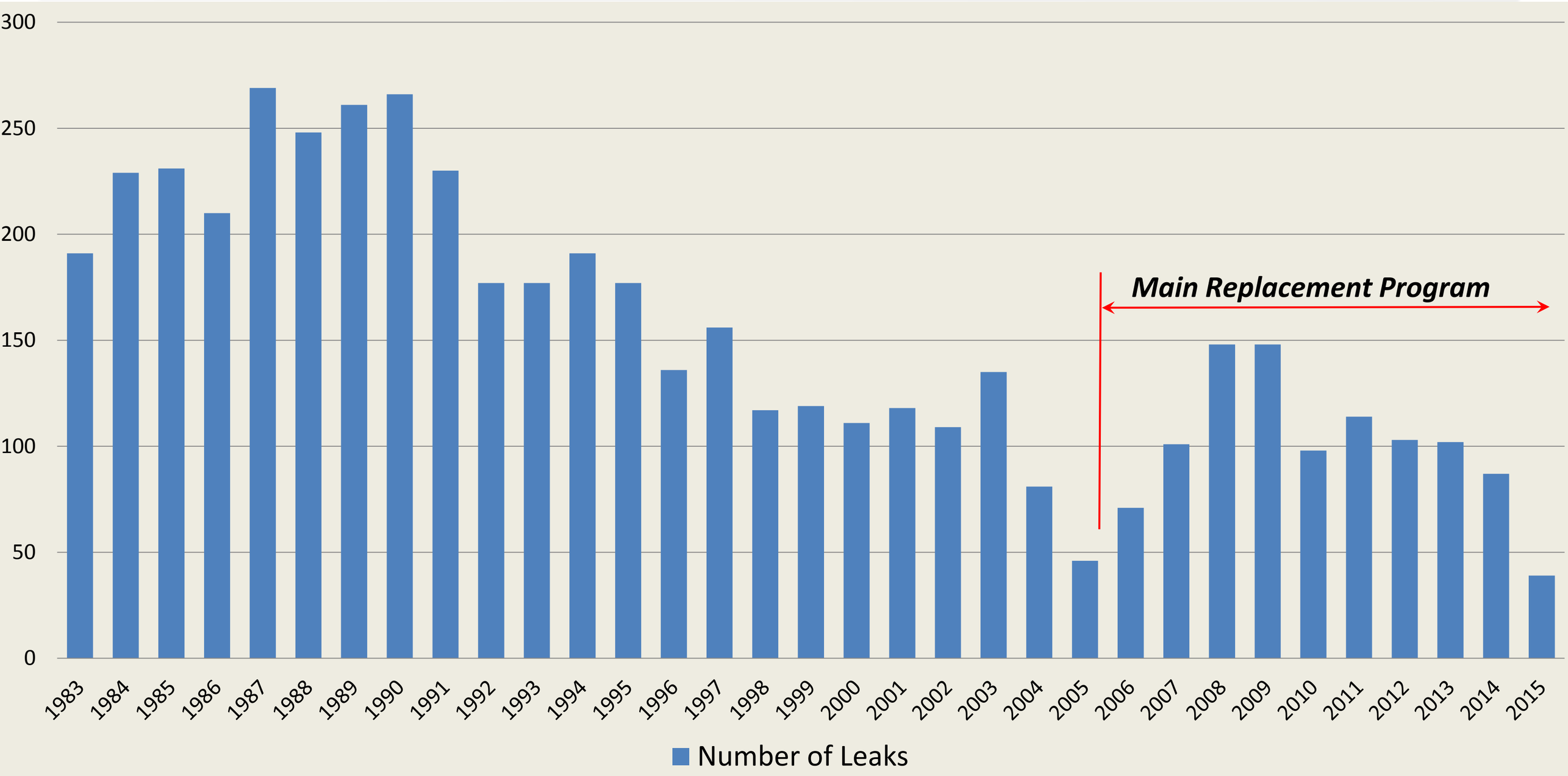
ADVANCED TECHNOLOGIES

Sustainable Pipeline Replacement

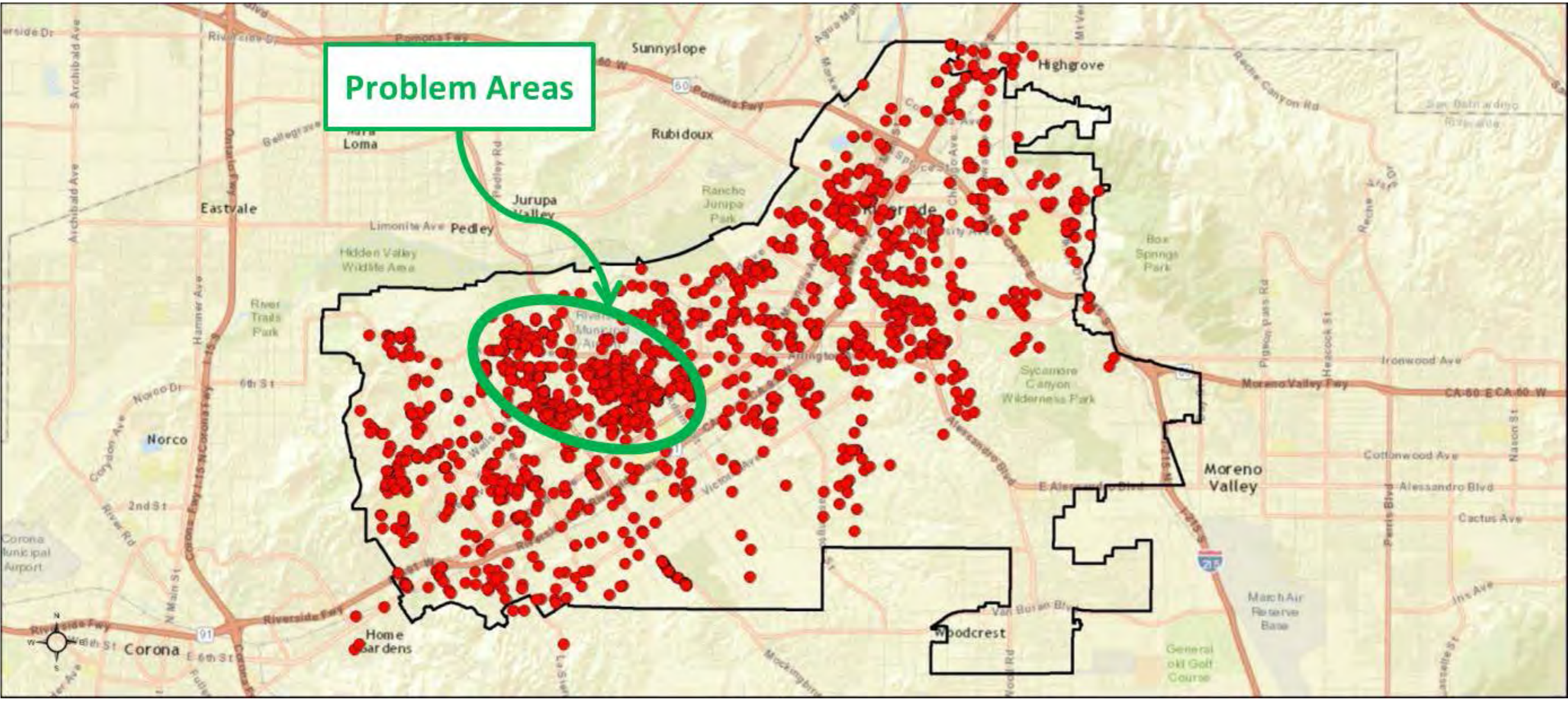
- Water Distribution Pipeline (smaller pipelines)
  - Leak rates
  - Expected Lifetimes

- Water Transmission Pipeline (larger pipelines)
  - Capacities
  - Internal inspections
  - Leak rates

Annual Distribution Line Leaks



Active Leaks Map

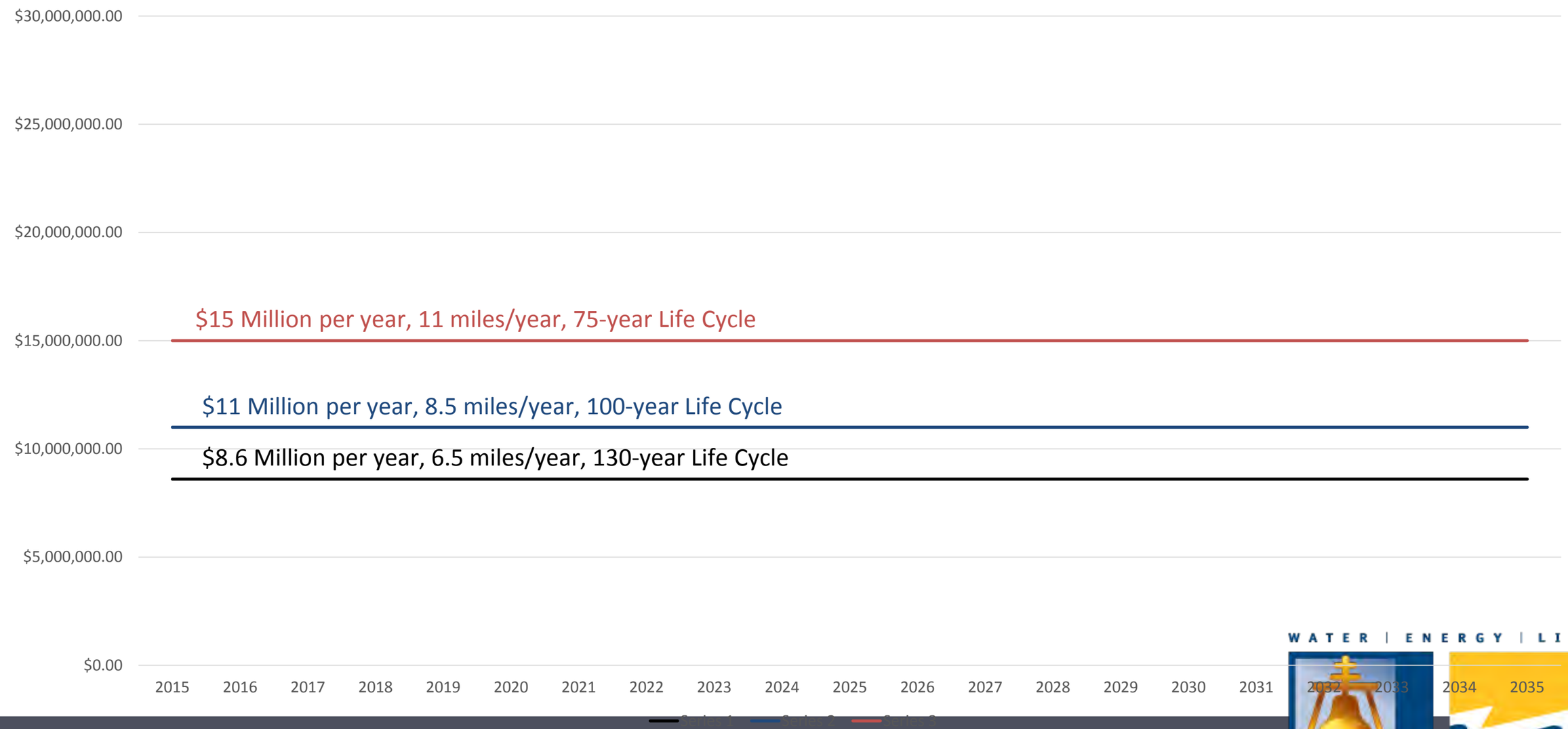


Premature Pipeline Failure

Failed Cast Iron Distribution mains removed from service December 2014. Installed c. 1950.

Distribution Pipeline Replacement Needs

2015 Dollars



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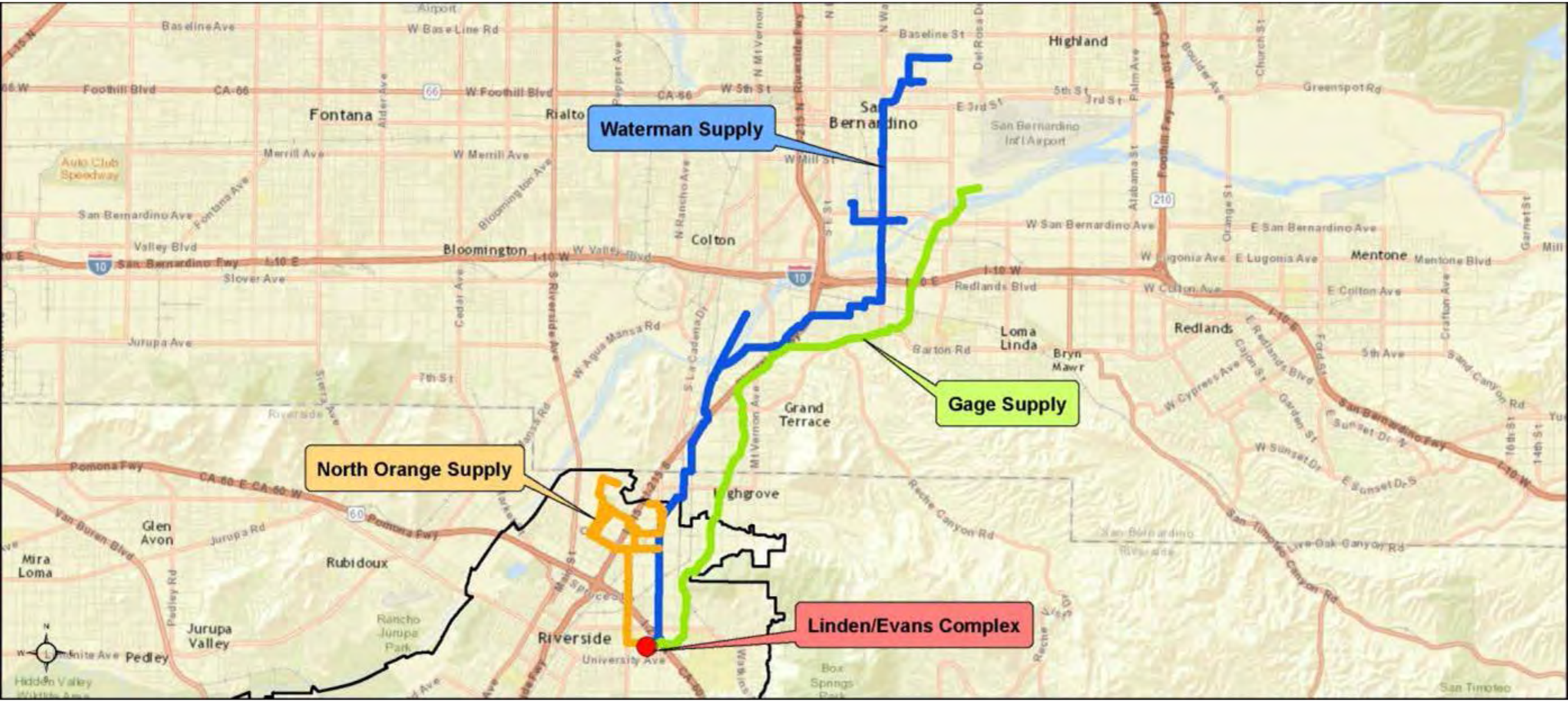
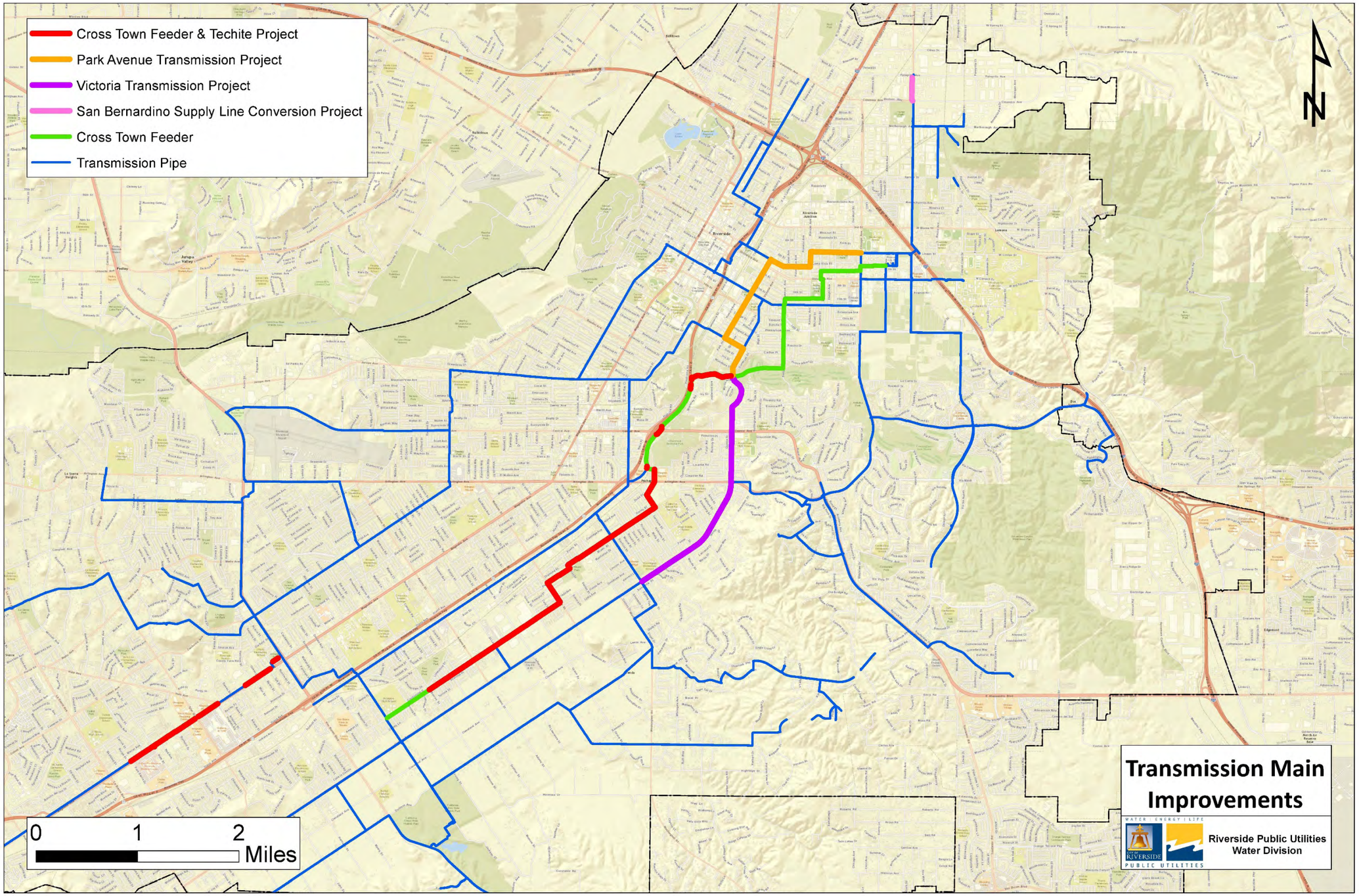
Distribution Pipeline Options

Option 1	Option 2	Option 3	Option 4
130-Year Life Cycle	100-Year Life Cycle		75-Year Life Cycle
Increased leaks and disruptions as Cast Iron pipe ages	Capture “tsunami” if Cast Iron Life Cycle is slightly longer		Capture DM “tsunami” if Cast Iron pipe Life Cycle is shorter
$86M	$110M		$150M

Supply Transmission Mains – Good Condition



Distribution TM – Undersized/At Risk



Transmission Main Pipeline Options

Option 1	Option 2	Option 3	Option 4
Handle TM projects driven by others (Street, Bridge and RR projects)	Address Techite Pipeline and replace in like and kind	Address major bottlenecks in TM system	Include moderate bottlenecks in TM system
Increased risk of major failure	Reduce major risk, retain system inefficiencies	In-lieu of $22M Reservoir project	Most projects can wait 10+ years unless major demand increase
$6M	$28M	$67M	$94M

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT
TREATMENT PLANTS

—

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

What about the North Waterman Treatment Plant?

- Higher levels of Perchlorate in North Waterman Wells
  - Levels expected to increase
- Possible changes to regulations
  - MCL could be reduced from 6 parts per billion (ppb) to 2 or 1 ppb
- Impacts to blending capacity
  - Without additional treatment, lose up to 20% of our supply

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Treatment Plant Options

Option 1	Option 2	Option 3	Option 4
J.W. North Treatment Plant Maintenance	North Waterman Treatment Plant		Riverside Canal Treatment Plant
Replace membranes on a regular basis	Address risk of rising Perchlorate levels and lower MCL		Improve water quality sent to the Gage Canal
$2.5M	$16M		$22M

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT TECHNOLOGY OPTIONS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Water and Technology

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- Work Management System (WMS)
- Asset Management System (AMS)
- Warehouse Inventory System (WIS)

REAL-TIME OPERATIONAL — Used in real-time operations and control of water and energy delivery systems

- Advanced Metering (AMI)
- Automated Vehicle Loading (AVL)
- Network Communications System (NCS)
- Land Mobile Radio (LMR)
- Distribution Automation (DA)
- Substation Automation (SA)
- Outage Management System (OMS)
- Distribution Management System (DMS)
- Supervisory Control and Data Acquisition System (SCADA)

Technology Options

Option 1	Option 2	Option 3	Option 4
Baseline OT projects, ODMS, Asset Management	Increased SCADA functionality and continue system automation	AMI System	
Mostly “In-Flight” projects	Increased water system efficiencies	Operational Efficiency, Improve customer outreach, Increased Conservation	
$36M	$41M	$55M	

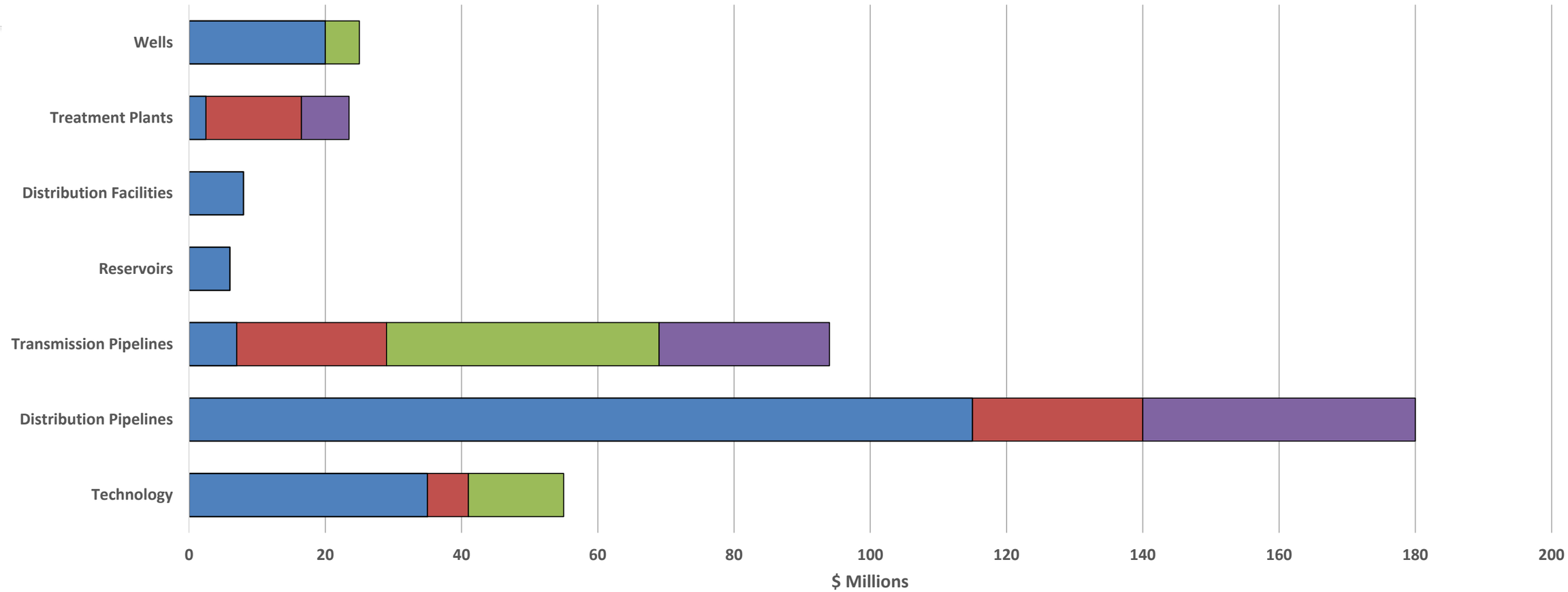
WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT INVESTMENT OPTIONS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Options



Option 1 = $170-$216 Million — **Stay the same with replacements, DM Replacement 130-Yr Cycle**

Option 2 = $226-$293 Million — **Address major TM Risks, DM Replacement 100-Yr Cycle, North Waterman Treatment**

Option 3 = $279-$357 Million — **Improve TM Operations, Install AMI**

Option 4 = $342-$437 Million — **DM Replacement 75-Yr Cycle, Additional TM, Riverside Canal Treatment**

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CITY OF RIVERSIDE PUBLIC UTILITIES

Summary of Investment Options

Additional financial investment is required to address current backlog and improve maintenance.

Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind	Major Deficiencies	Operational Deficiencies	Aggressive Program
↓ ↑	↓ ↑	↓ ↑	↓ ↑
$170 – 206 million	**$226 – 293 million**	**$279-357 million**	**$342-437 million**

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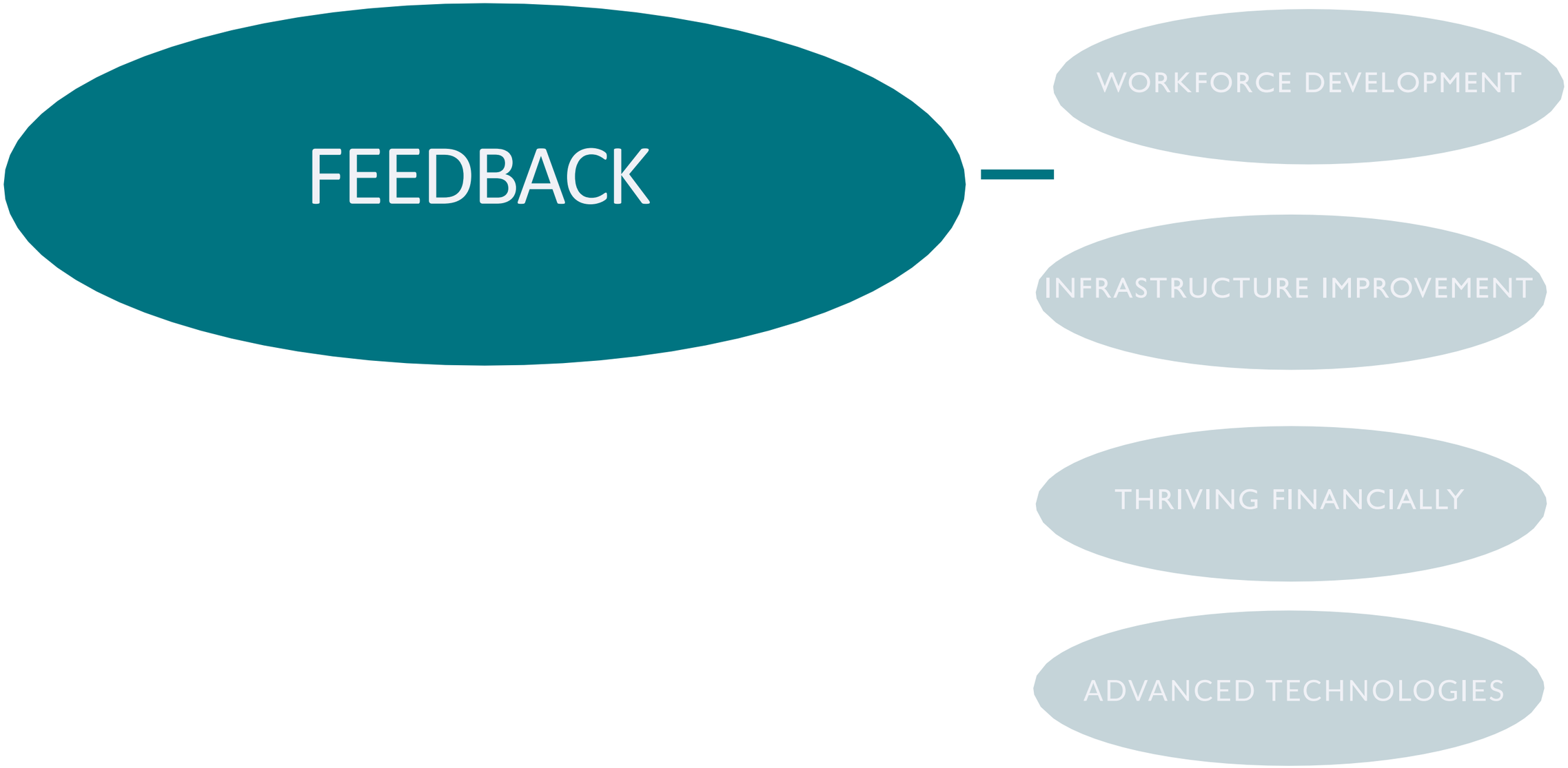
Next Steps

- Incorporate Comments
- Formulate Detailed recommendations
- Review
- Report Back

ROAD MAPS –


FEEDBACK
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UTILITY 2.0

WORKFORCE DEVELOPMENT ROAD MAP

JULY 29, 2015

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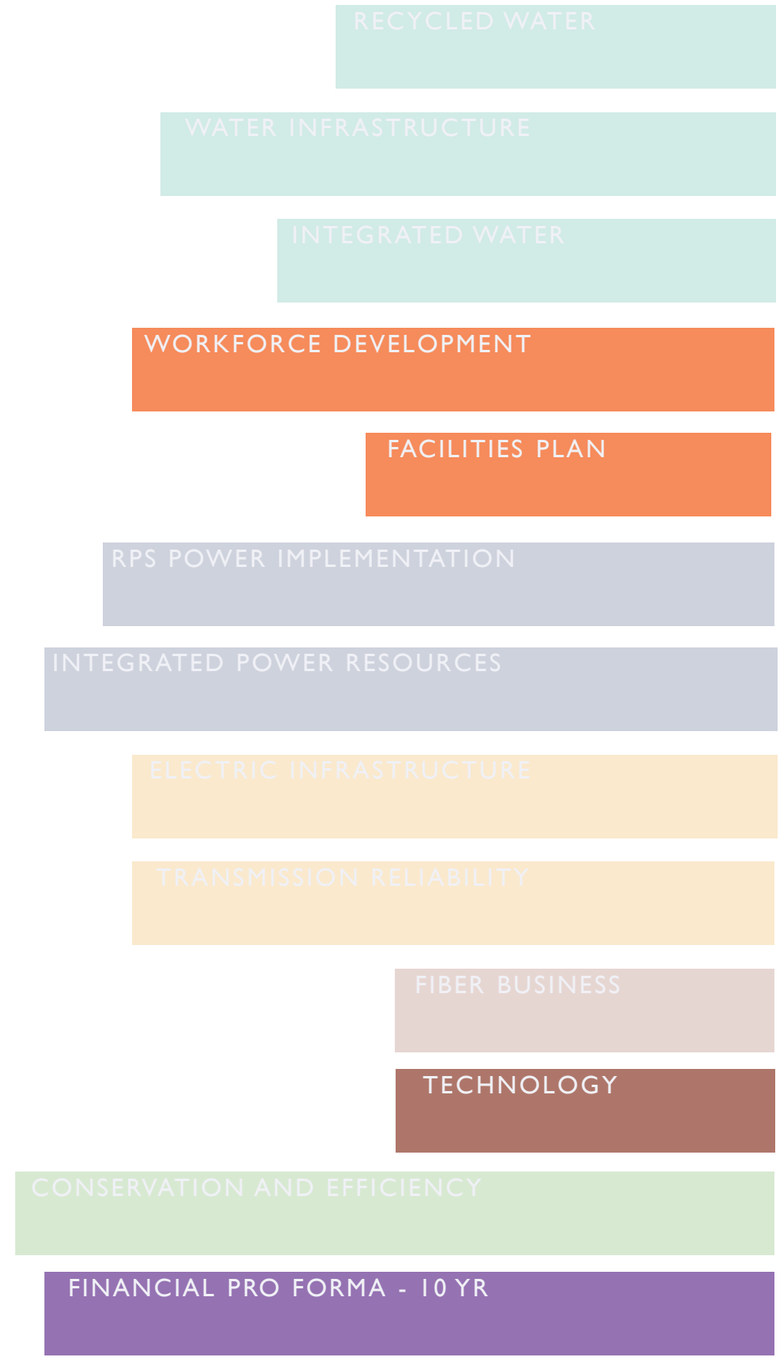
PUBLIC UTILITIES

RiversidePublicUtilities.com

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT –
WORKFORCE DEVELOPMENT GOALS

- Ensure ready labor force to implement Utility 2.0
- Address ongoing resource and skill requirements for RPU to function in the changing utility environment
- Promote and facilitate employee training and development
- Enhance customer service

THE PLANS



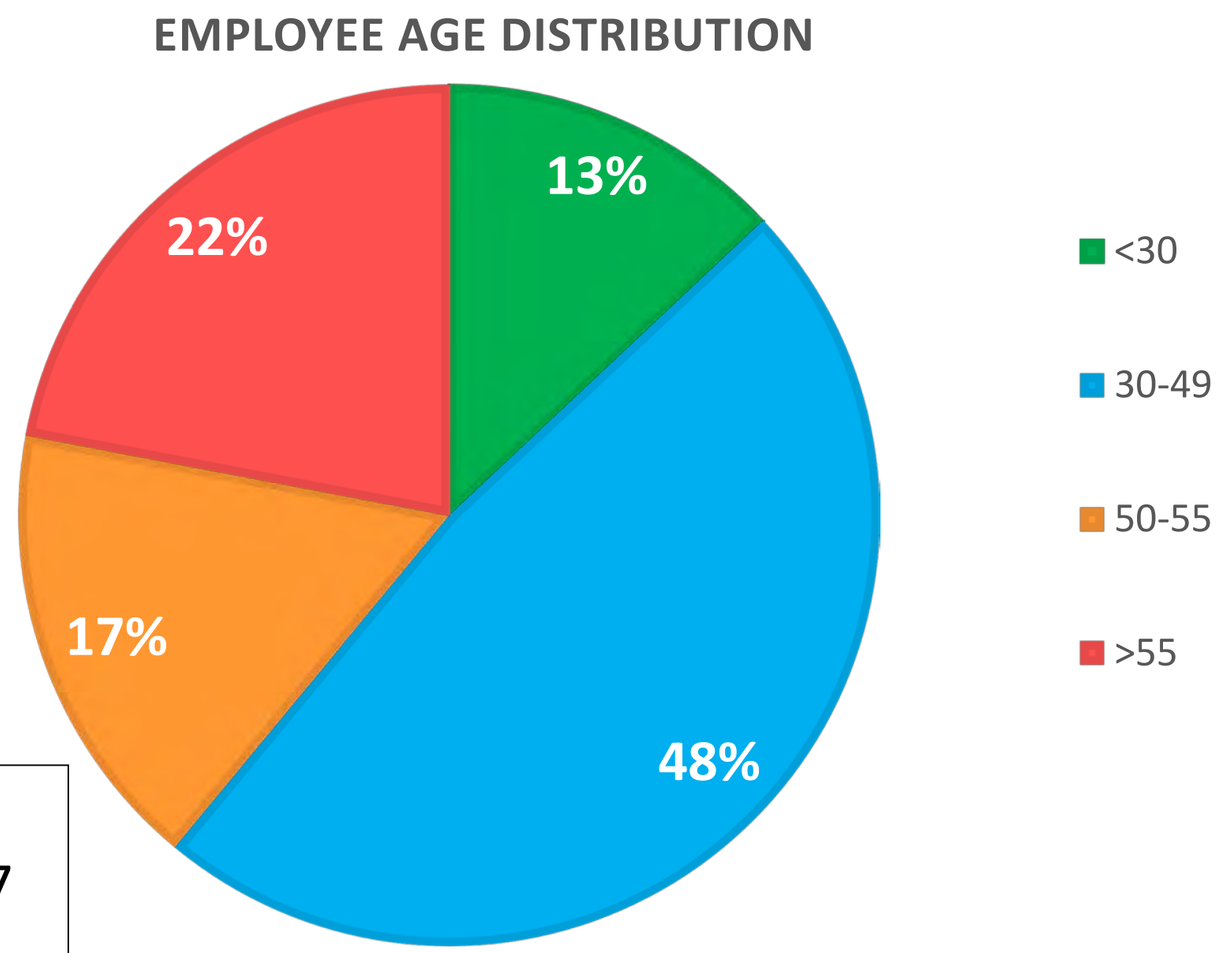
Workforce Development Objectives

- Identify, assess, and bridge competency gaps that result from workplace and technology changes
- Align workforce requirements with strategic plan and division "roadmaps"
- Address recruitment challenges in partnership with Human Resources Department
  - Aging workforce "Silver Tsunami"
  - Evolving job specifications
  - Expectations of millennials

Workforce Assessment
Current

- Strong competencies for today's needs
- Improved processes dictate new skill sets
- Lack of classifications for jobs of the future
- No formal tracking system for assessing and measuring employee competencies and skills growth
- Tuition reimbursement program not adequate to sustain today's workforce

RPU Workforce by Age



Utility Industry:
Industry Avg. Age – 47
RPU Avg. Age – 45

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RPU Retirement Projections

Industry Facts:

36% - 5 Years

55% - 10 Years

Workforce Structure

- 200+ Job classifications in RPU
  - 152 unique “Utilities” job classifications
  - 50+ city-wide classifications
- Two formal bargaining units
  - IBEW Local 47
  - SEIU Local 721
- Management Structure
  - Classified
  - Non-classified

Utility 2.0 Workforce Assessment

- Begin shift from organization of the past
- Embed workforce development staff within RPU
  - Specialized skills
  - HR of today not the same organization needed for future
- Staff support for needed for the future
  - Data analytics and visualization
  - Project and technology management
  - Business process analytics

Utility 2.0 Workforce Assessment

- Knowledge transfer needed for aging workforce
  - Bridge gap on legacy systems
  - Pass critical infrastructure and historic operating knowledge to next generation
- Training needed to prepare for Utility 2.0 competencies
  - No formal training program to prepare today's employees for the future
  - Tuition reimbursement not adequate to sustain tomorrow's workforce

Utility 2.0 Competency Map

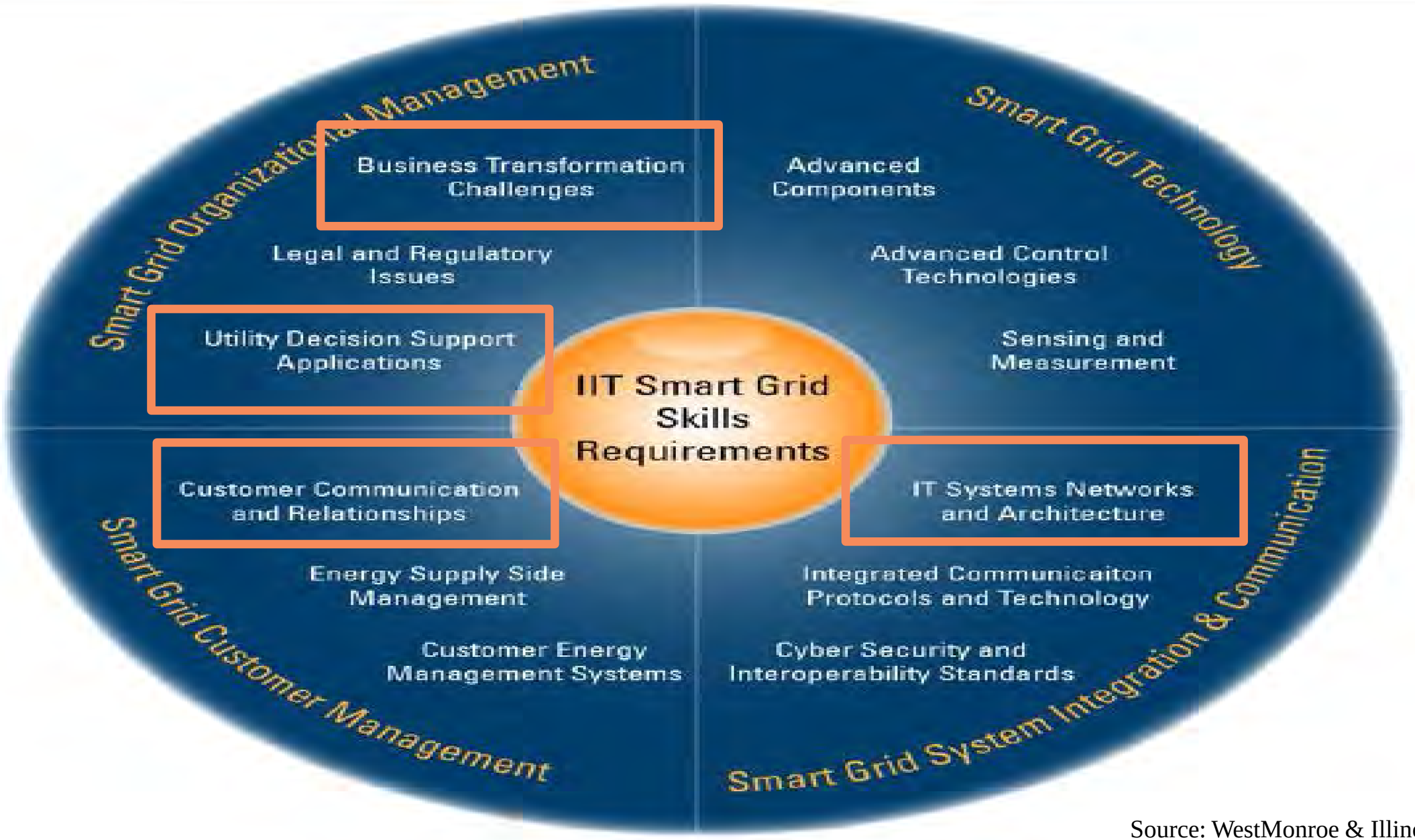


Figure 2: Smart Grid Skills Requirements

Source: WestMonroe & Illinois Institute of Technology

Utility 2.0 Workforce Strategy

Recruit/Promote

- Competencies
- Classifications
- Career ladders

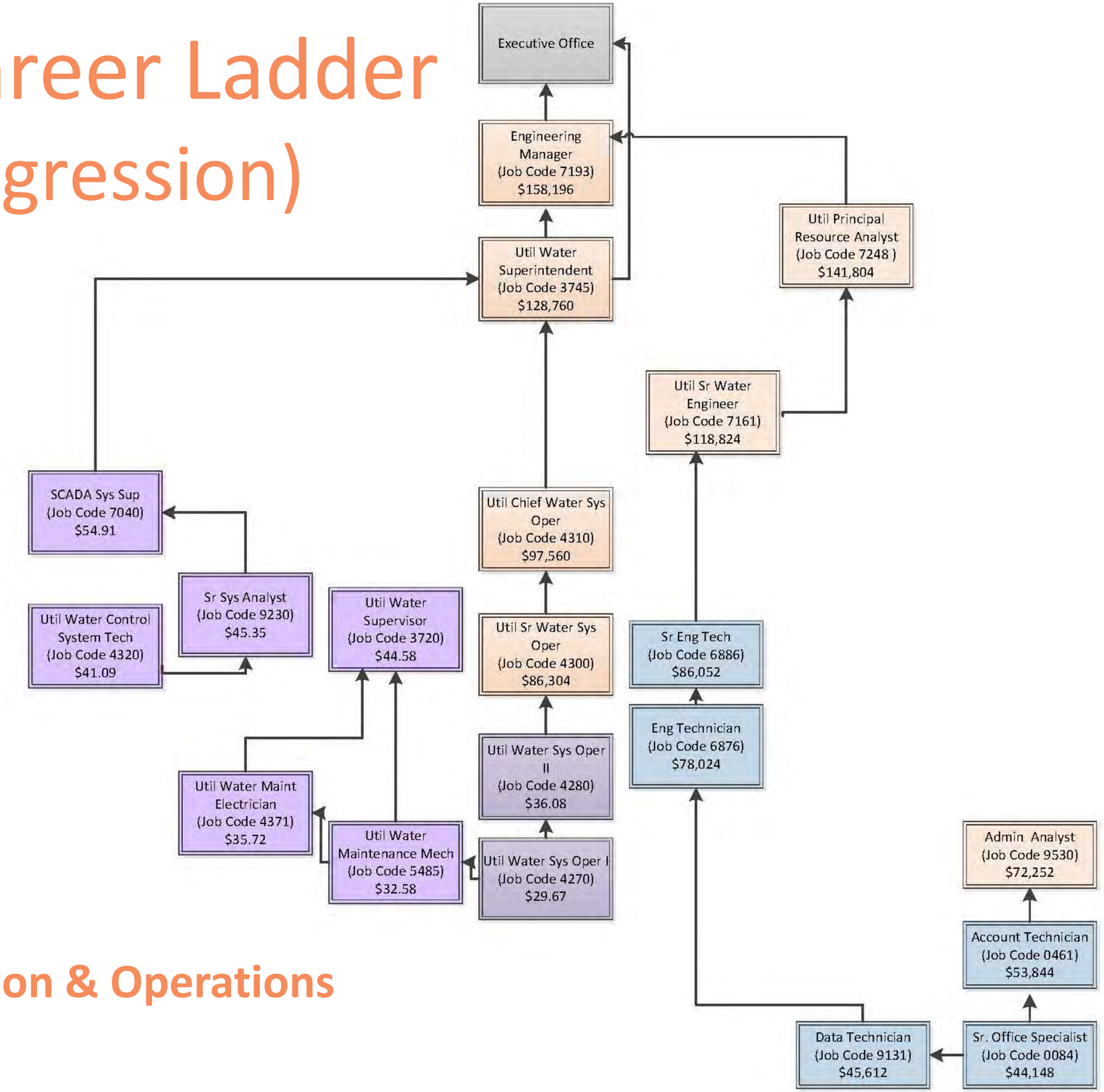
Training

- Education
  - contract
  - sponsorship
- Seminars
- Conferences
- Enrichment

Compensation

- Competitive Salary
- Benefits
- Hours/schedule

Sample Career Ladder (Career Progression)



Water Production & Operations

WORKFORCE DEVELOPMENT RECOMMENDATIONS

INFRASTRUCTURE IMPROVEMENT

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Summary of Recommendations

Partnership with Human Resources

People

- Develop new Utility 2.0 appropriate classifications
  - Analyze core competencies and reconcile to current classification
- Focus near-term recruitments on Utility 2.0 transformation
  - Project Management
  - Data Analysis and Visualization
  - Communication (Internal and External)
  - Business Analysis and Transformation
- Embedded workforce and operational technology support within RPU
- Implement formal job transition training programs
  - Contract Education (partnership with RCCD and HR)
  - RPU Education sponsorship program

Summary of Recommendations

Partnership with Human Resources

Process

- Career development plans/discussion
  - Annual with employee performance appraisal
  - Initiated by manager/supervisor
- Modify recruitment processes to be more nimble
  - Continue/Expand use of eligibility lists
  - Continued conversion of paper processes to automated processes
  - Enhance training for hiring managers
- Review compensation policies and levels more frequently
  - Develop standard process for salary reviews
  - Develop standard process for classification comparisons
  - Incorporate into annual budget process

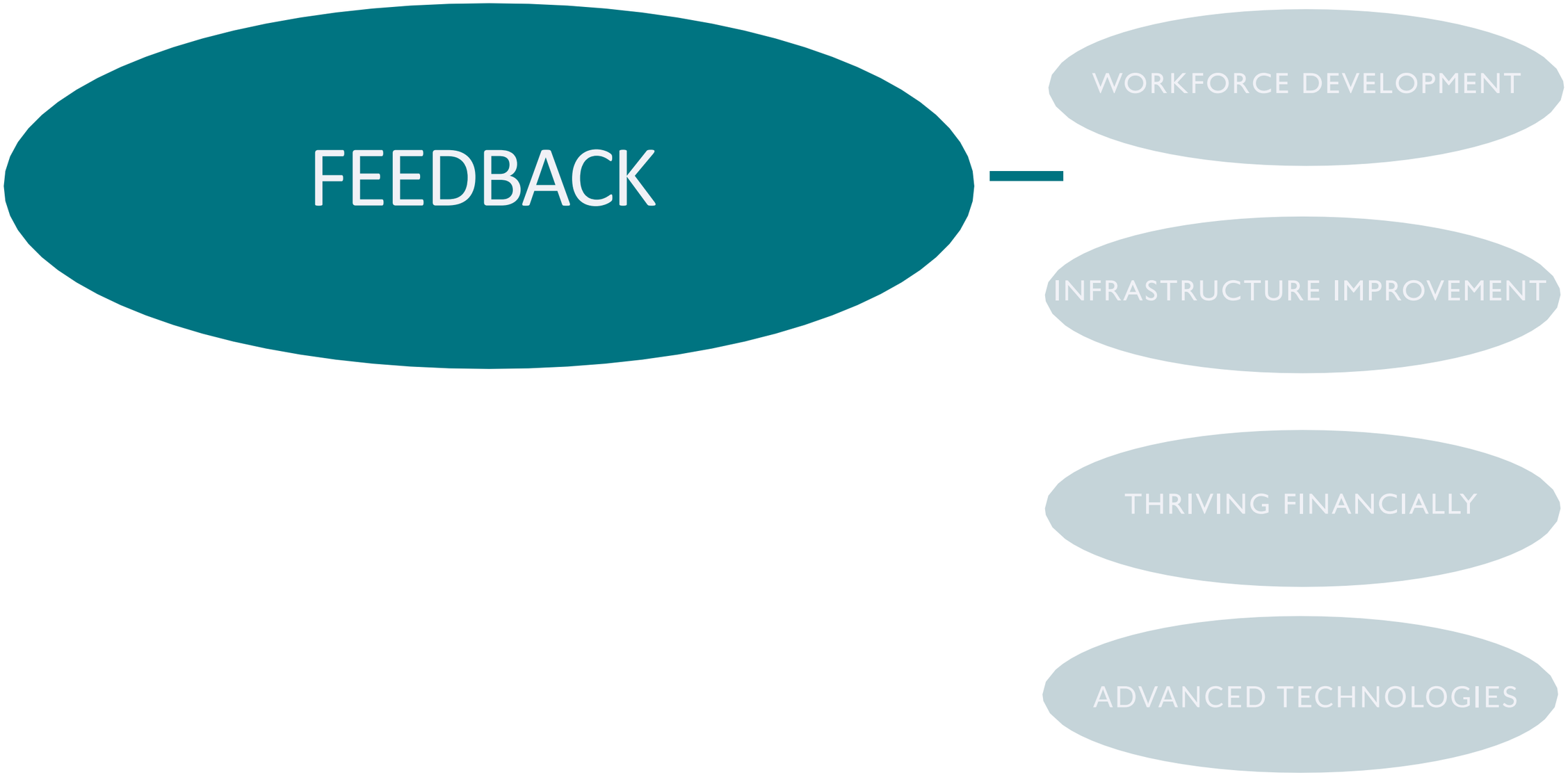
Summary of Recommendations

Partnership with Human Resources

Technology

- Implement Talent Management System
  - Knowledge capture and transfer
  - Track and monitor employee training and education
  - Project staff turnover

ROAD MAPS –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UTILITY 2.0

ELECTRIC INFRASTRUCTURE – POWER SUPPLY

JULY 29, 2015

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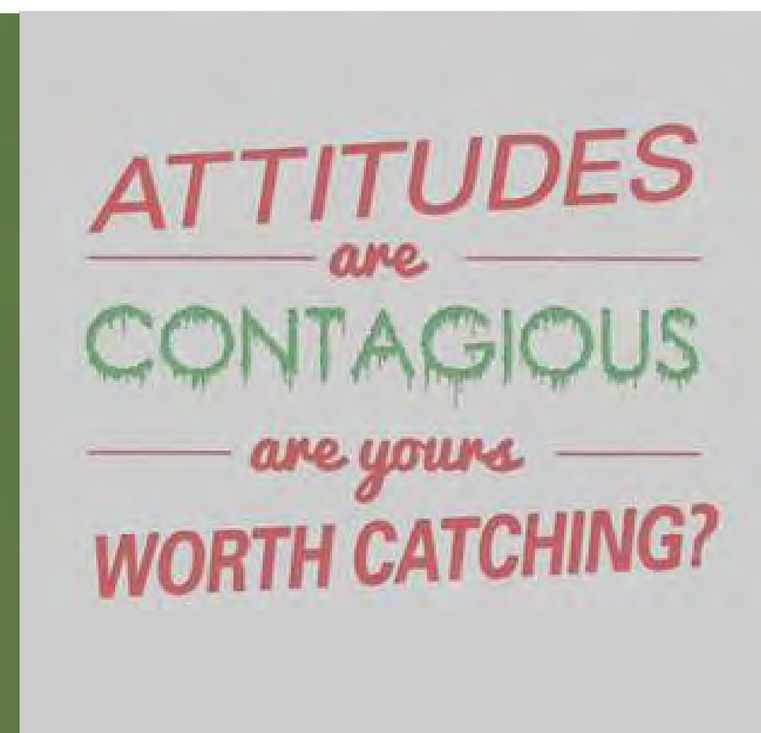
Employee Appreciation

Significant contributions were made by:

Bob Tang	Scott Lesch
Cindy Reeley	Roy Xu
Jeff Leach	Jarod Mayne
Andrew Parks	



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EXECUTIVE SUMMARY

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC - POWER SUPPLY GOALS

INFRASTRUCTURE IMPROVEMENT

- Address limited infrastructure.
- Improve system safety and reliability.
- Increase the use of technology to inform future planning and increase conservation.

THE PLANS

- RECYCLED WATER
- WATER INFRASTRUCTURE
- INTEGRATED WATER
- WORKFORCE DEVELOPMENT
- FACILITIES PLAN
- RPS POWER IMPLEMENTATION
- INTEGRATED POWER RESOURCES
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- CONSERVATION AND EFFICIENCY
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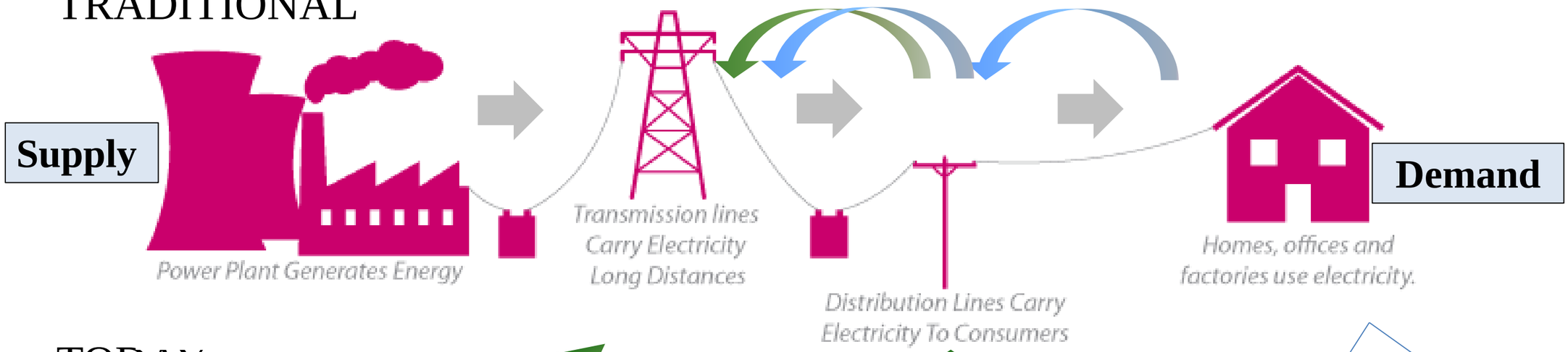
Utility 2.0

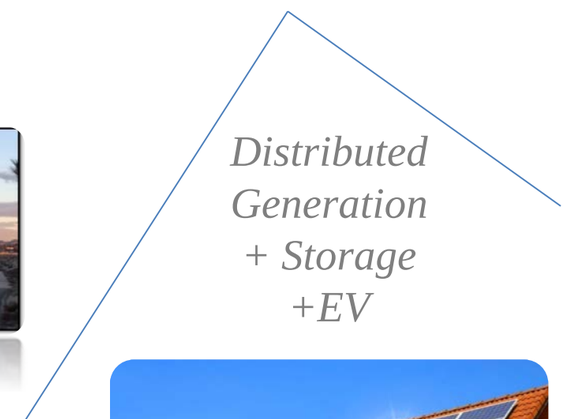
TRADITIONAL



TODAY

Renewable Generation

Local Generation

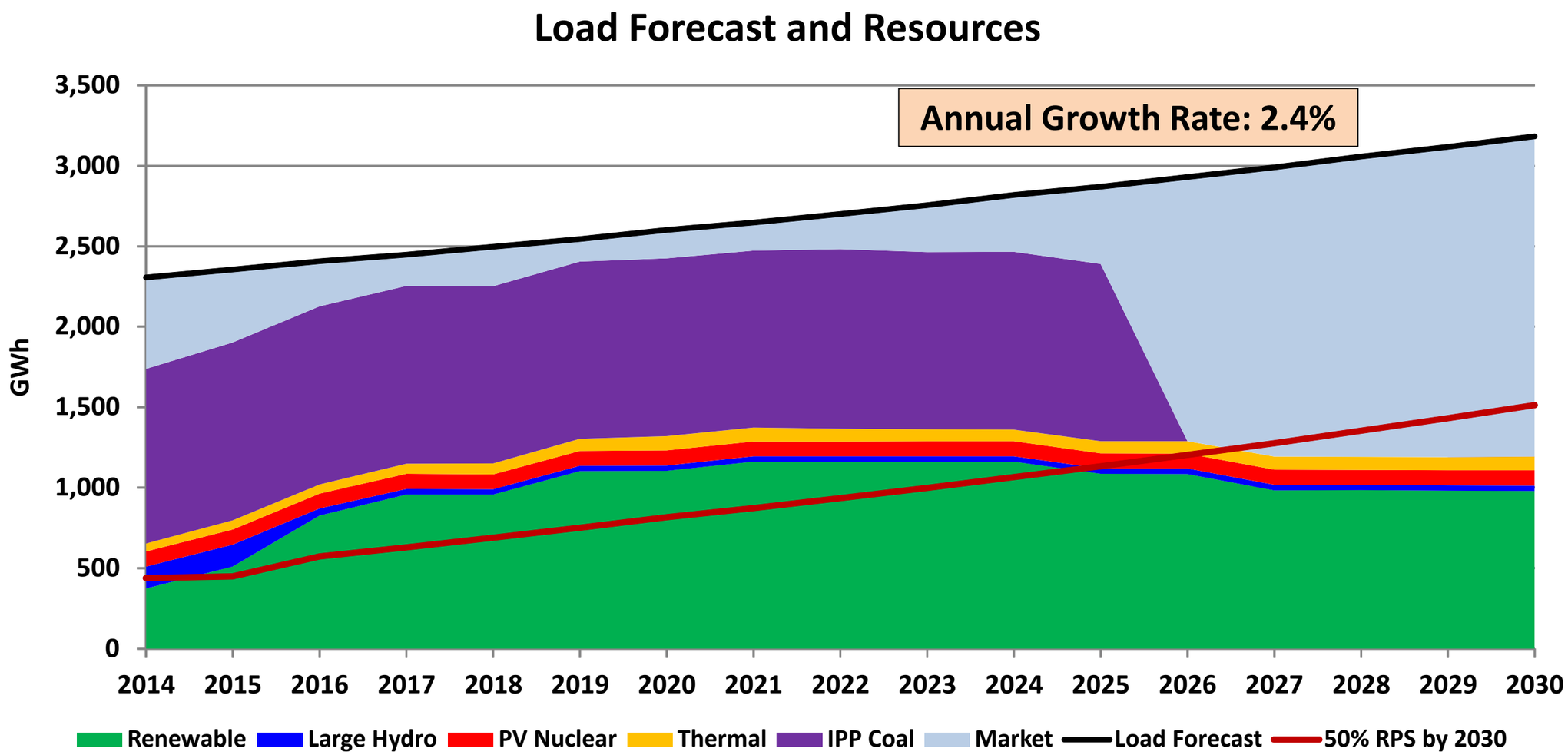


FUTURE

More Renewable Generation

Energy Storage

Balancing Customer Demand & Power Needs

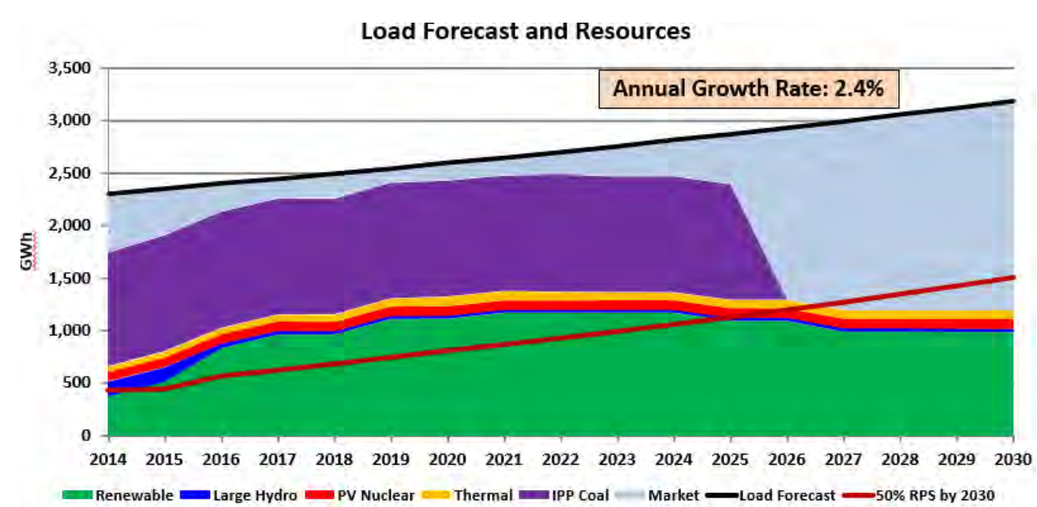


THE BIG PICTURE – 3 Major Issues of Today…

1. How will we replace IPP

2. How will we meet our RPS

3. How will we integrate demand and supply



WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT - SUPPLY

POWER MARKET HISTORY

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Evolution of CA. Power Market

HISTORICAL PAST (CY 1977- 1997) → **PAST (CY 1998-2008)** → **PRESENT (CY 2009-2015)** → **FUTURE (CY 2016-2030)**

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Evolution of CA. Power Market

HISTORICAL PAST (CY 1977- 1997) → **PAST (CY 1998-2008)** → **PRESENT (CY 2009-2015)** → **FUTURE (CY 2016-2030)**

HISTORICAL PAST:

Geography – Local Markets with SCE
Operation Model – SCE → ← Riverside; Bilateral Power Transactions
Contractual Arrangements – Integrated Operations Agreement (IOA) 150 pages
Power Supply Cost - $105 million
TRR Revenue – N/A
Product Complexity –
- Energy ; Demand

Settlements:
- Only 2 Charge Codes to settle every month
Staffing – Low - **19 FTE's**

Evolution of CA. Power Market

HISTORICAL PAST (CY 1977- 1997) → **PAST (CY 1998-2008)** → **PRESENT (CY 2009-2015)** → **FUTURE (CY 2016-2030)**

PAST:

Geography – CA Market
Operation Model – Power Transactions through CAISO; approx. 10 zones
Contractual Arrangements – Tariff 1,000 pages
Power Supply Cost – $151 million
TRR Revenue – $105 million
Product Complexity –
- Energy; Demand
- **~10 pricing points**
- **Hourly and Zonal differentiated prices**
- **Ancillary Services:**
  - **Regulation Down; Regulation Up**
  - **Spin; Non Spin**

Settlements:
- **Approx. 65 charge codes**
- **Absolute Value of Charges: $~$64 million**

Staffing – Significantly increased **– 33 FTE's**

Evolution of CA. Power Market

HISTORICAL PAST (CY 1977- 1997) → **PAST (CY 1998-2008)** → **PRESENT (CY 2009-2015)** → **FUTURE (CY 2016-2030)**

PRESENT:

Geography – Sub Regional Markets
Operation Model – Power Transactions through CAISO; approx. 3,000 Nodes
Contractual Arrangements – MRTU Tariff : 5,000 pages
Power Supply Cost - $138 million
TRR Revenue – $185 million
Product Complexity –
- Energy; Demand
- **~3,000 Pricing Points**
- Hourly and Zonal differentiated prices
- Ancillary Services
- **Resource Adequacy**
- **Flexible Capacity**
- **5-15 minute settlements at each node**
- **Dynamic Scheduling**

Settlements:
- **Over 80 charge codes**
- **Absolute Value of charges = ~$138million**

Staffing – Increased **to 37 FTE's**

Evolution of CA. Power Market

HISTORICAL PAST (CY 1977- 1997) → **PAST (CY 1998-2008)** → **PRESENT (CY 2009-2015)** → **FUTURE (CY 2016-2030)**

FUTURE:

Geography – Regional Centralized Markets
Operation Model – EVOLVING - more complex, more Distributed Power Grid?

Data, Data, Data, Data

Contractual Arrangements –
- CAISO Tariff: Approx. 5,000+ pages
- Distribution Grid Tariff – TBD

Power Supply Cost - $188 million
TRR Revenue – $334 million
Product Complexity – Continue to EVOLVE in complexity
Potential Emergence of Distributed Power Grid:
- **DG resources**
- **Micro-grids**
- **Demand Response**
- **Electric Vehicle (EV)**
- **Energy Storage**

Staffing – Increased to 37 FTE's

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC - POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT - SUPPLY

VIRTUAL TOUR

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Virtual Tour – Generation (decommissioned)

San Onofre Nuclear Generating Station (SONGS)

Technical Specs:

- Budget: approx. $18 M
- Fuel type: Nuclear (3,150 MW)
- Jointly Owned Project
- Riverside Share:
  - 1.79% or 38.5 MW
- Term: 1983/84 – 2024
- Riverside Investment: $165 M
- 14% of RPU Load
- June 7, 2013 – SCE unilaterally decides to shutdown SONGS
- Decommissioning Agreement approved by PUB/CC
- Decommissioning fully funded $76 M

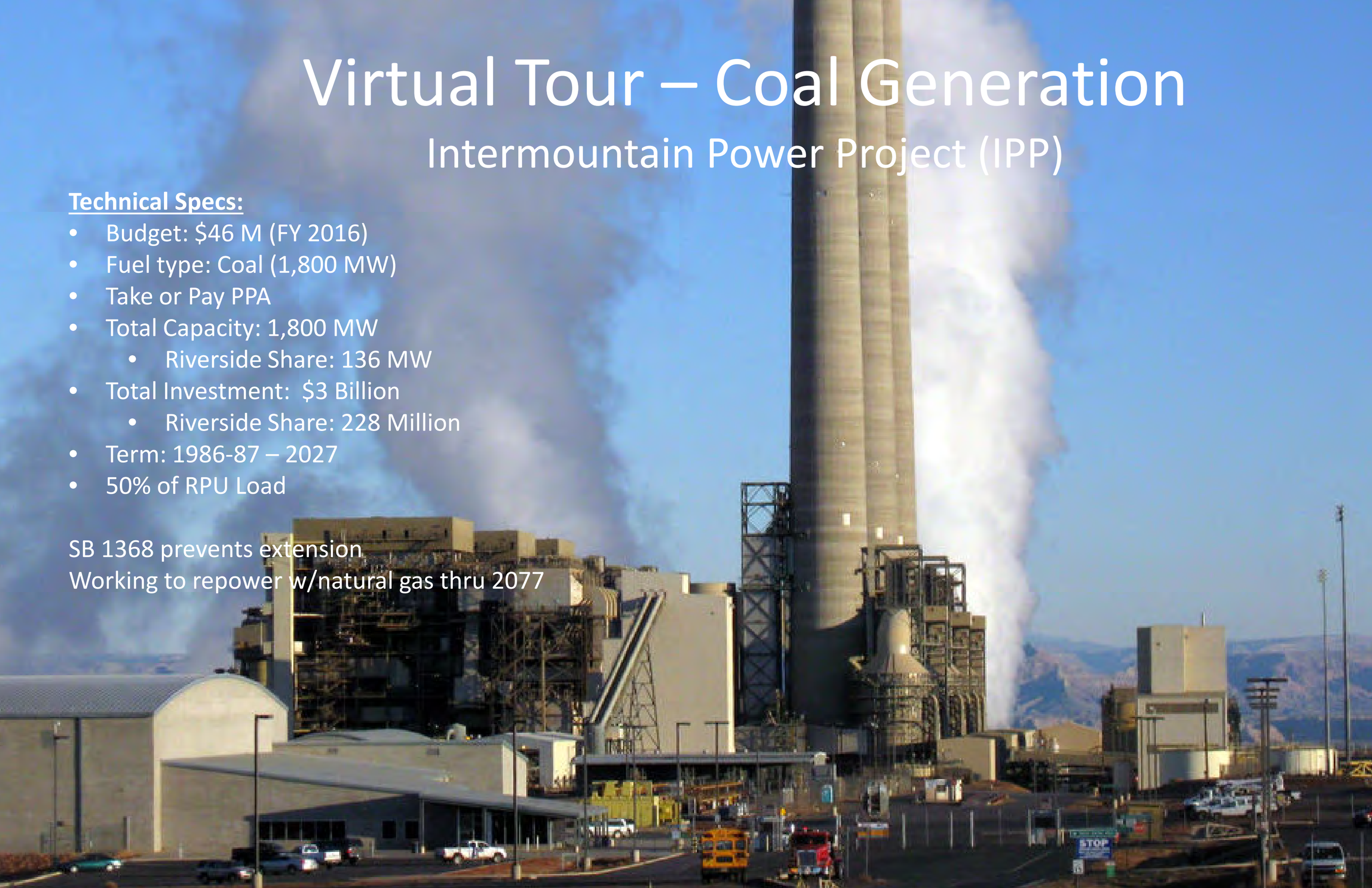
Virtual Tour – Coal Generation

Intermountain Power Project (IPP)

Technical Specs:

- Budget: $46 M (FY 2016)
- Fuel type: Coal (1,800 MW)
- Take or Pay PPA
- Total Capacity: 1,800 MW
  - Riverside Share: 136 MW
- Total Investment: $3 Billion
  - Riverside Share: 228 Million
- Term: 1986-87 – 2027
- 50% of RPU Load

SB 1368 prevents extension
Working to repower w/natural gas thru 2077



Virtual Tour – Transmission

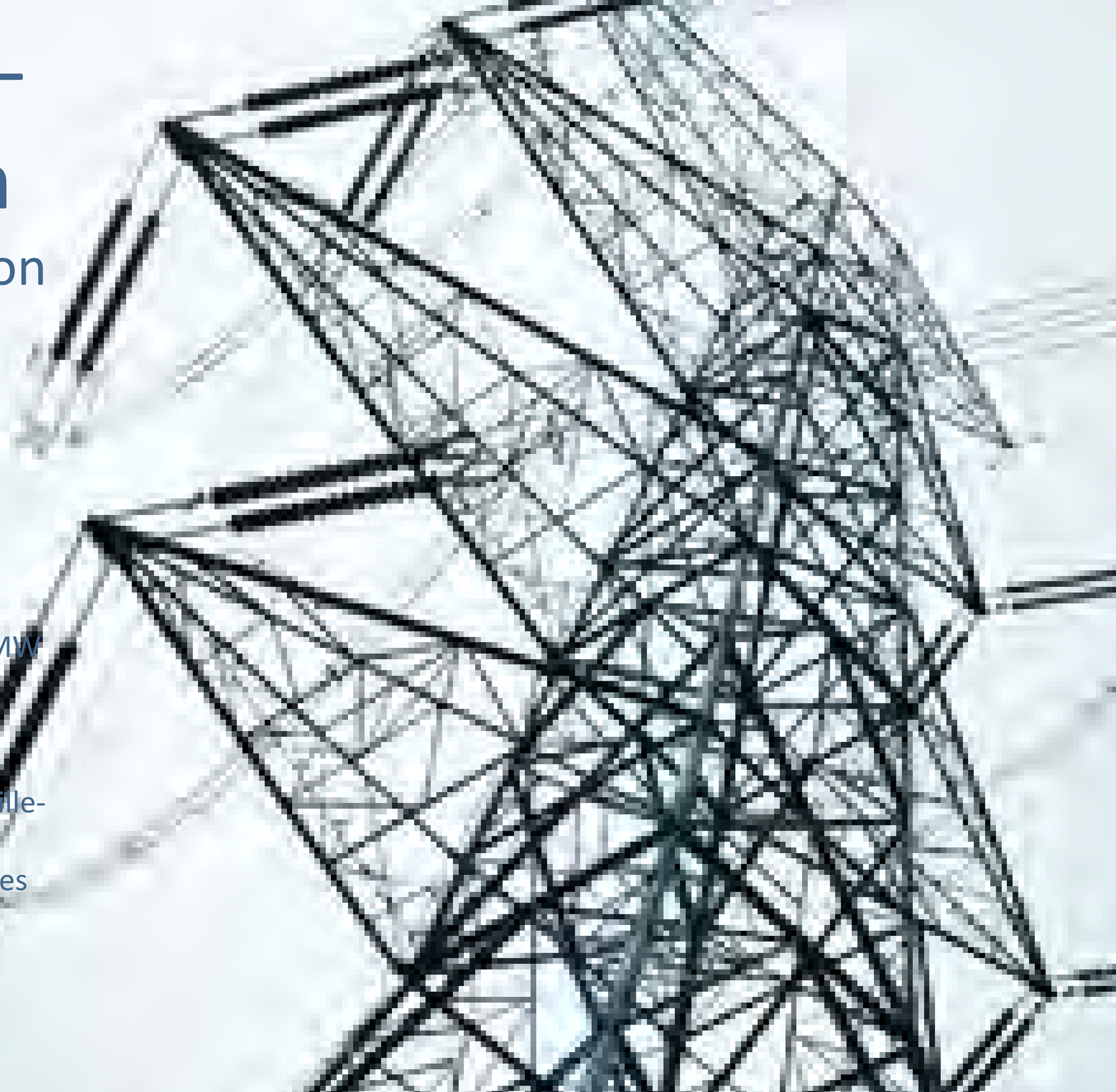
Southern Transmission System (SCPPA)

Technical Specs:

- Budget: $12 M (FY 2016)
- 256 mile transmission line
- Take or Pay Contract
- Transmission Capacity: 1,923 MW
  - SCPPA Share: 352 MW
  - Riverside Share: 18 MW
- Total Investment: $57 M
  - Riverside Share: $2.3 M
- AC transmission line from Westwing Substation in Phoenix to Marketplace Substation near Boulder City, Nevada

Virtual Tour – Transmission

Northern Transmission System (NTS)

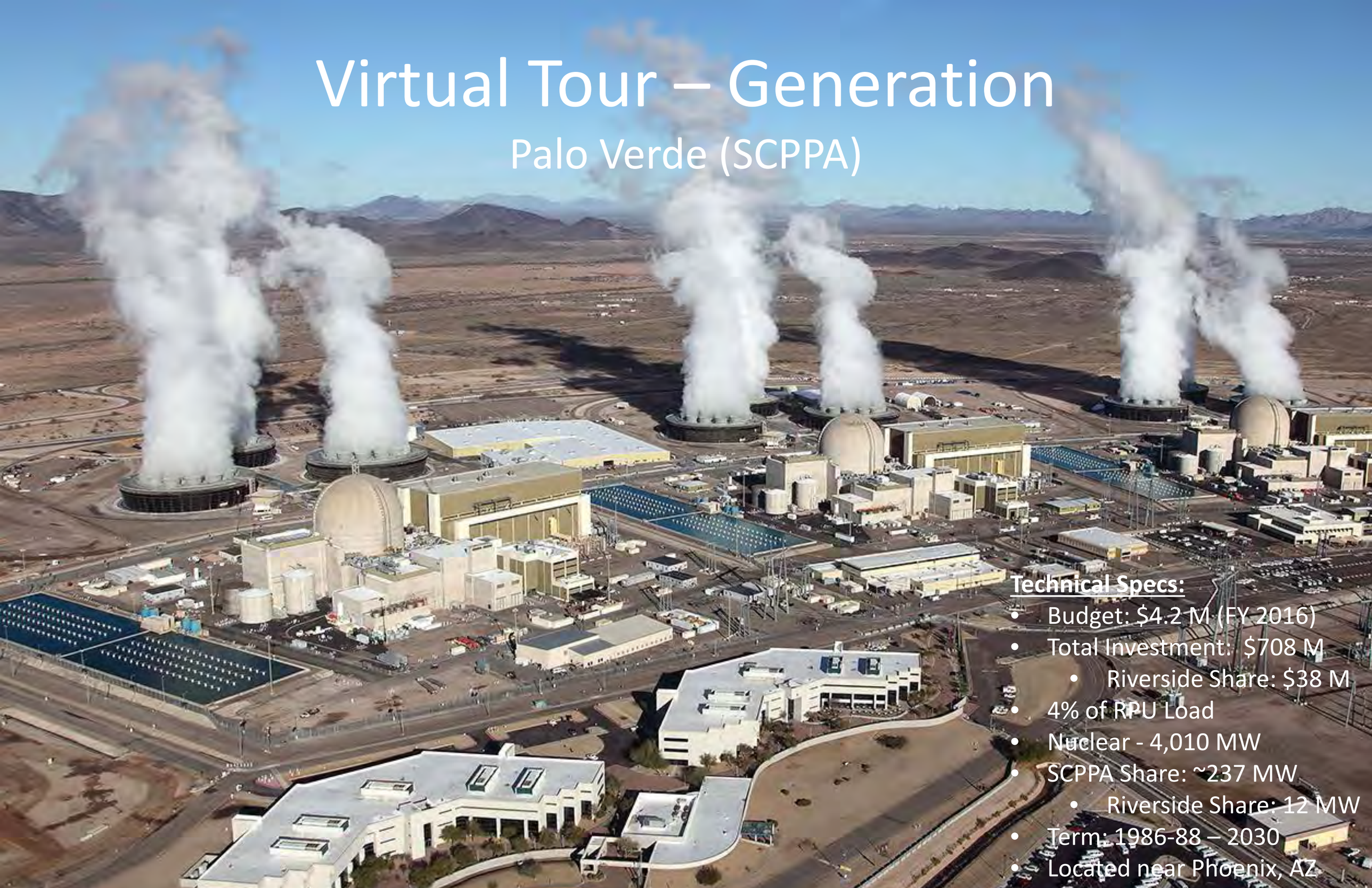


Technical Specs:

- Budget: $1.7 M (FY 2016)
- Project funded through bonds issued by the Intermountain Power Agency (IPA)
- 50 mile transmission line
- Transmission Capacity: 1,923 MW
  - Riverside Share: 157 MW thru a settlement with LADWP for transmission from Adelanto to Victorville-Lugo
- Two 345kV AC transmission lines from IPP Generation Station to Mona, Utah

Virtual Tour – Generation

Palo Verde (SCPPA)



Technical Specs:

- Budget: $4.2 M (FY 2016)
- Total Investment: $708 M
  - Riverside Share: $38 M
- 4% of RPU Load
- Nuclear - 4,010 MW
- SCPPA Share: ~237 MW
  - Riverside Share: 12 MW
- Term: 1986-88 – 2030
- Located near Phoenix, AZ

Virtual Tour – Generation

Hoover (SCPPA)

Technical Specs:

- Budget: $1.2 M (FY 2016)
- Fuel type: Large Hydro (1,951 MW)
- Take or Pay PPA
- SCPPA Share: 94 MW
  - Riverside Share: 30 MW
- Term: 1986 – 2017
- Hoover Power Allocation Act of 2011 extends to 2077
- Total Investment: $21 M
  - Riverside Share: $7 M
- 1% of RPU Load
- PUB/CC approval of new contact – mid 2016

Virtual Tour – Transmission

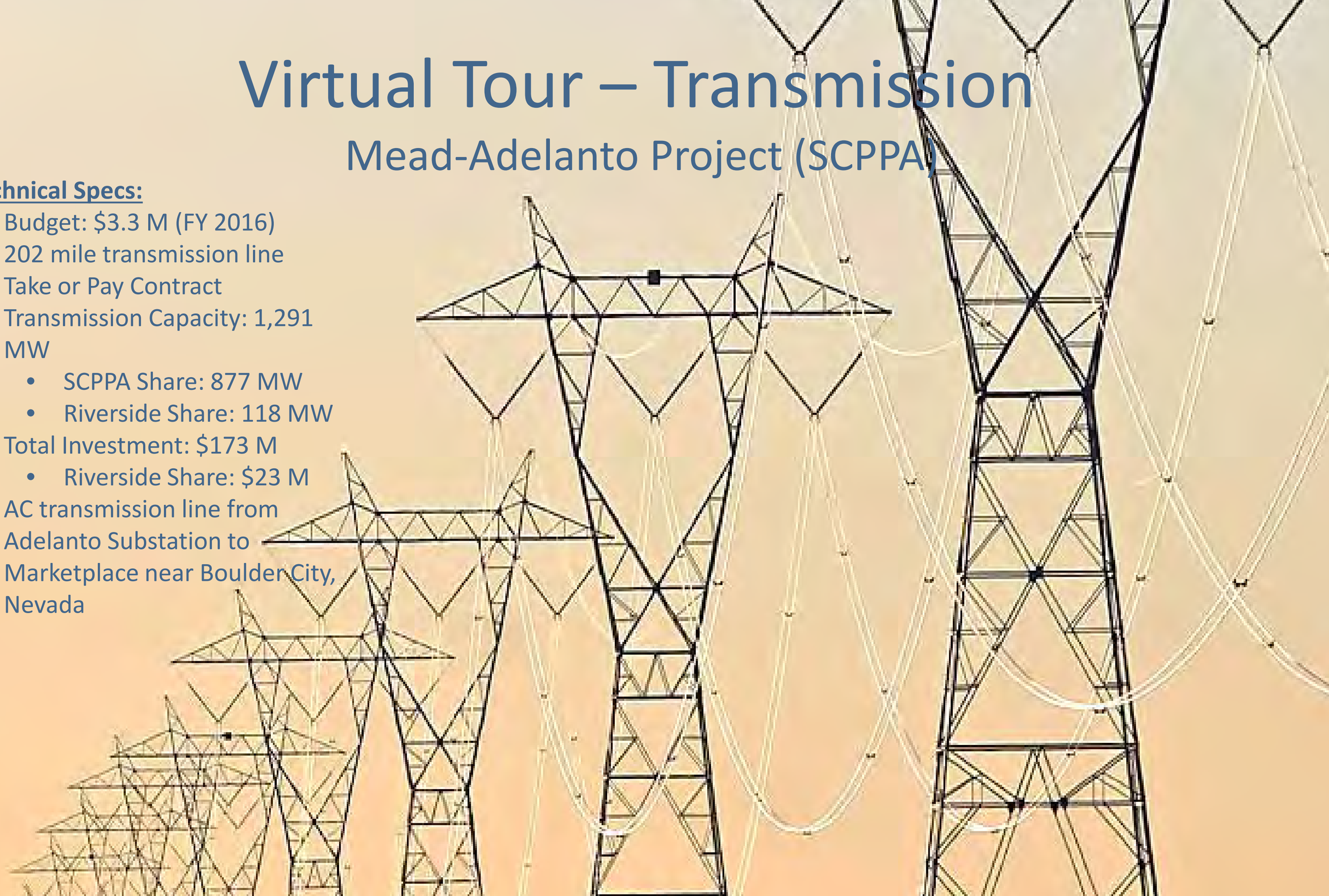
Mead-Phoenix Project (SCPPA)

Technical Specs:

- Budget: $300,000 (FY 2016)
- 256 mile transmission line
- Take or Pay Contract
- Transmission Capacity: 1,923 MW
  - SCPPA Share: 352 MW
  - Riverside Share: 18 MW
- Total Investment: $57 M
  - Riverside Share: $2.3 M
- AC transmission line from Westwing Substation in Phoenix to Marketplace Substation near Boulder City, Nevada

Virtual Tour – Transmission

Mead-Adelanto Project (SCPPA)

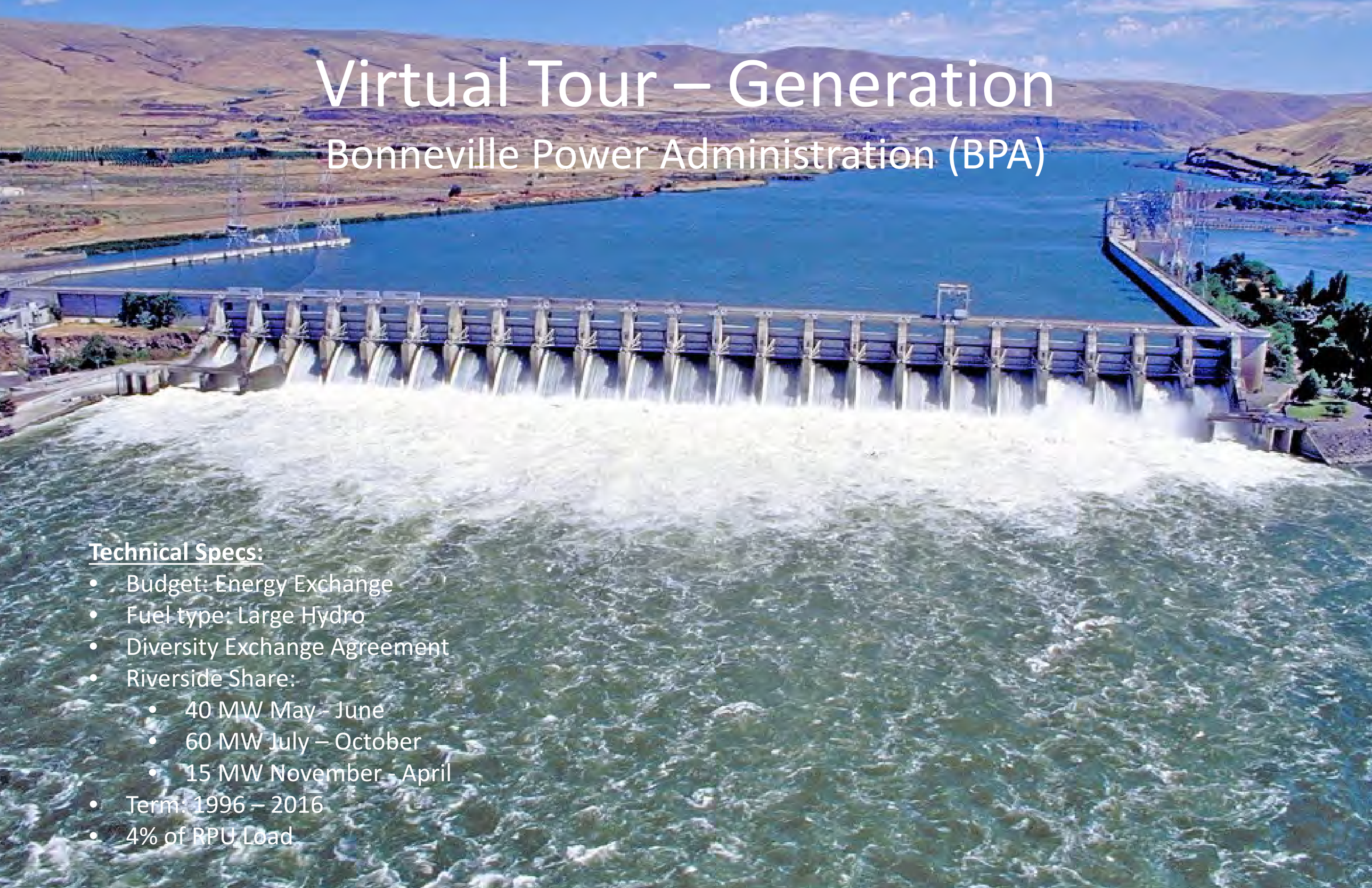


Technical Specs:

- Budget: $3.3 M (FY 2016)
- 202 mile transmission line
- Take or Pay Contract
- Transmission Capacity: 1,291 MW
  - SCPPA Share: 877 MW
  - Riverside Share: 118 MW
- Total Investment: $173 M
  - Riverside Share: $23 M
- AC transmission line from Adelanto Substation to Marketplace near Boulder City, Nevada

Virtual Tour – Generation

Bonneville Power Administration (BPA)



Technical Specs:

- Budget: Energy Exchange
- Fuel type: Large Hydro
- Diversity Exchange Agreement
- Riverside Share:
  - 40 MW May - June
  - 60 MW July – October
  - 15 MW November - April
- Term: 1996 – 2016
- 4% of RPU Load

Energy Crisis –Lessons Learned

2000-2001 CA Energy Crisis

- Investing in reliability
- PUB Goal—Add local Generation
- **$280 M investment in 268 MW Total**

- 14 of 21 FTEs are Veterans
- 80 Years of Service
  - 9 navy
  - 4 marines
  - 1 army

Virtual Tour – Internal Generation

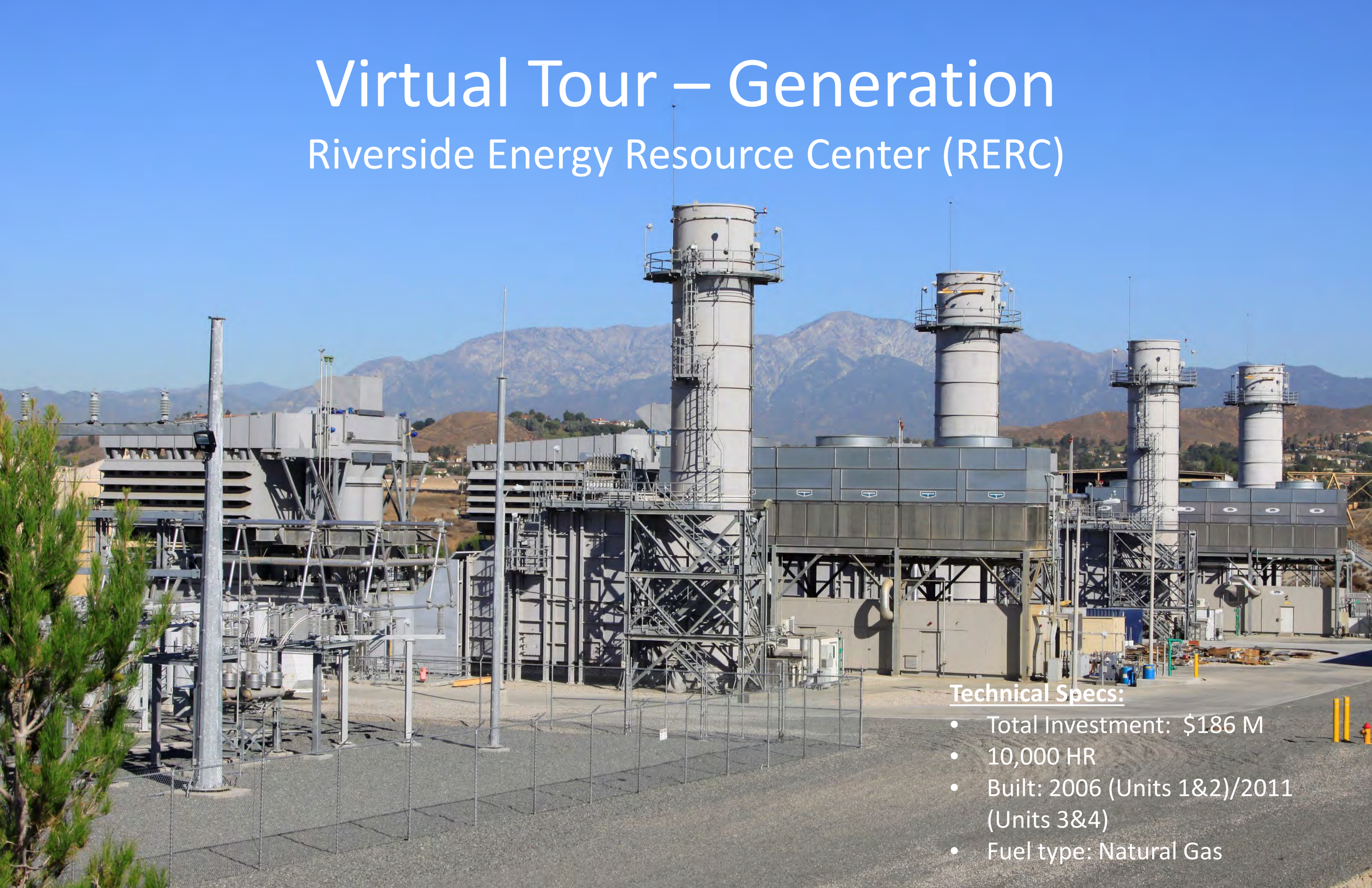
Springs

Technical Specs:

- Total Investment: $46 M
- 14,000 HR
- Built: 2003
- Fuel type: Natural Gas
- Four 10 MW Units (40 MW)

Virtual Tour – Generation

Riverside Energy Resource Center (RERC)



Technical Specs:

- Total Investment: $186 M
- 10,000 HR
- Built: 2006 (Units 1&2)/2011 (Units 3&4)
- Fuel type: Natural Gas

Virtual Tour – Internal Generation

Clearwater (Corona)

Technical Specs:

- Total Investment: $48 M
- 8,600 HR
- Riverside Purchased in 2010
- Fuel type:
  - Natural Gas Cogeneration
  - Combustion (Gas) turbine, HRSG and steam turbine

Virtual Tour – Geo Thermal Generation

Salton Sea

Technical Specs:

- Budget: $24.6 M (FY 2016)
- Take and Pay Renewable PPA
- Riverside Share:
  - 46 MW until 2016
  - 66 MW until 2019
  - 86 MW until 2039
- Term:
  - 2003 – 2020 Unit 5
  - 2017 – 2039 Portfolio
- 15.6% of 2016 RPU Load
- 21.2% of 2019 RPU Load
- 27.0% of 2020 RPU Load

Virtual Tour – Renewable

Wintec, Wagner, and Cabazon

Technical Specs:

- Budget: $5.9 M (FY 2016)
- Fuel type: Wind
- Renewable PPA
- Riverside Share:
  - 1.3 MW Wintec
  - 6.0 MW WKN
  - 39.0 MW Cabazon
- Term:
  - 2003 – 2018 Wintec
  - 2012 – 2032 WKN
  - 2015 – 2024 Cabazon
- 4% of RPU Load

Virtual Tour – Renewable

Columbia II (SCPPA)

Technical Specs:

- Budget: $2.3 M (FY 2016)
- Fuel type: Solar PV
- Renewable PPA
- SCPPA Project capacity of 15MW:
  - Riverside Share: 11.1 MW
  - Other SCPPA participants are Pasadena and Azusa.
- Term: 20 years expiring in 2034
- 1.46% of RPU Load
- Project Owned and Operated by Dominion

Virtual Tour – Renewables (Under Development)

Tequesquite Landfill Solar Project

Technical Specs:

- Budget: $1.2 M (FY 2017)
- Utility Scale (inside RPU)
- Fuel type: Solar PV
- Renewable PPA
- Project Size: 7.5 MW
- Term: 2016 – 2040
- Currently under construction with COD scheduled for September 2015.
- Project Owned and Operated by SunPower.

Virtual Tour – Renewables (Under Development)

AP North Lake

Technical Specs:

- Budget: $4.7 M (FY 2017)
- Utility Scale located in Hemet, CA
- Fuel type: Solar PV
- Renewable PPA
- Project Size: 20 MW
- Term: 25 years expiring in 2040
- Currently under construction with COD scheduled for July 2015.
- 2.42% of RPU Load
- Project Owned and Operated by SunEdison

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

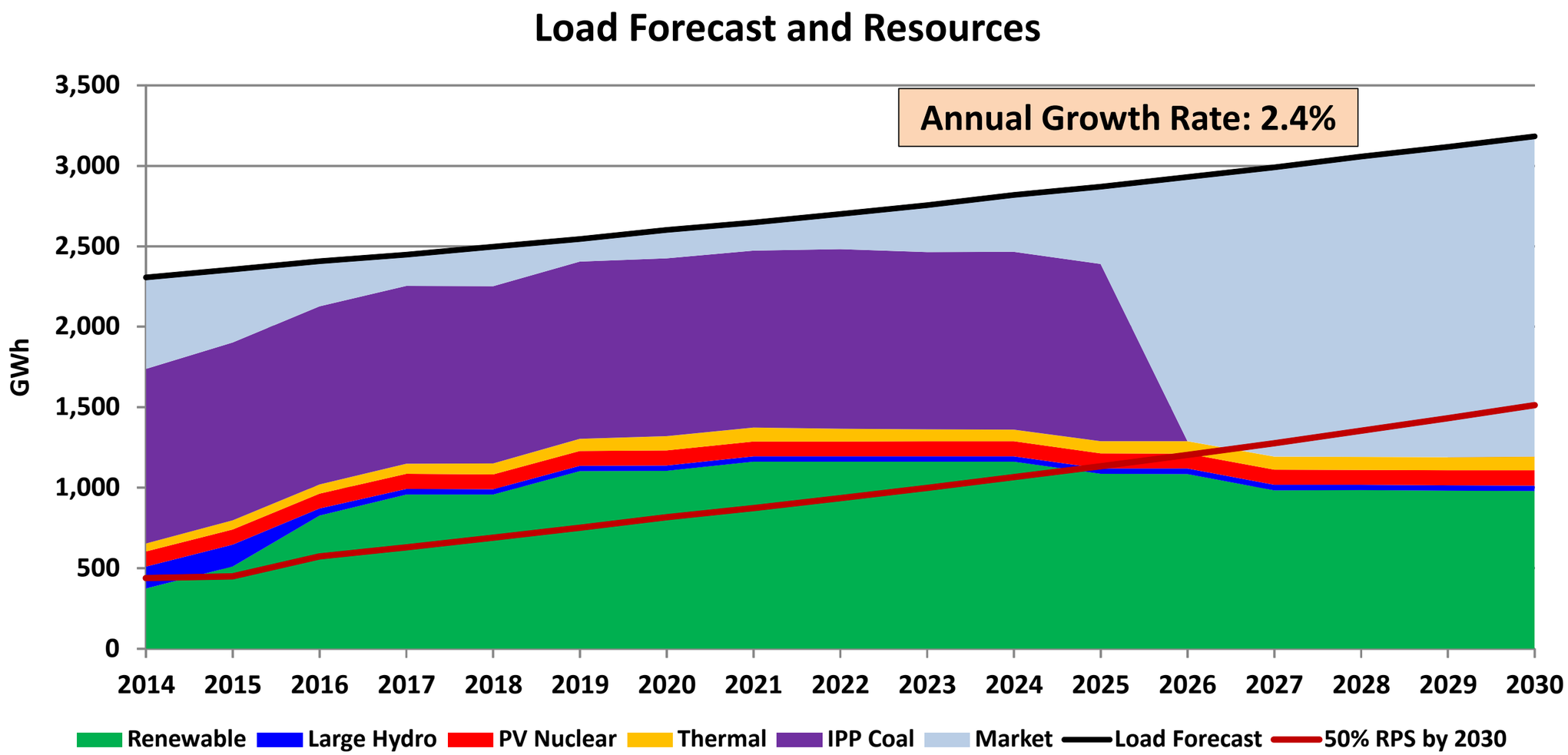
INFRASTRUCTURE IMPROVEMENT - SUPPLY

PLANNING FOR TOMORROW

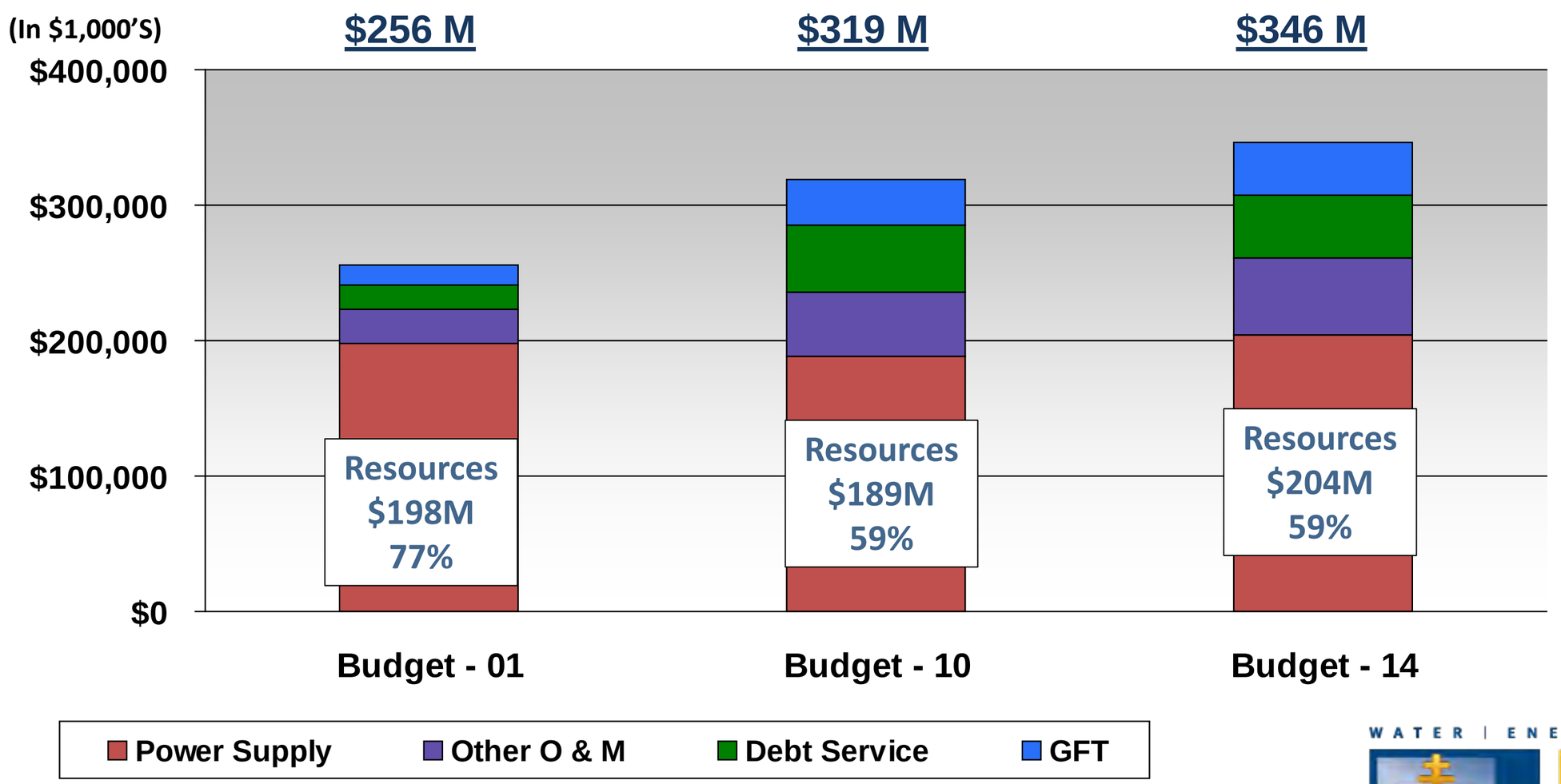
THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Balancing Customer Demand & Power Needs



Electric Utility - Budget Comparison 2001-2014



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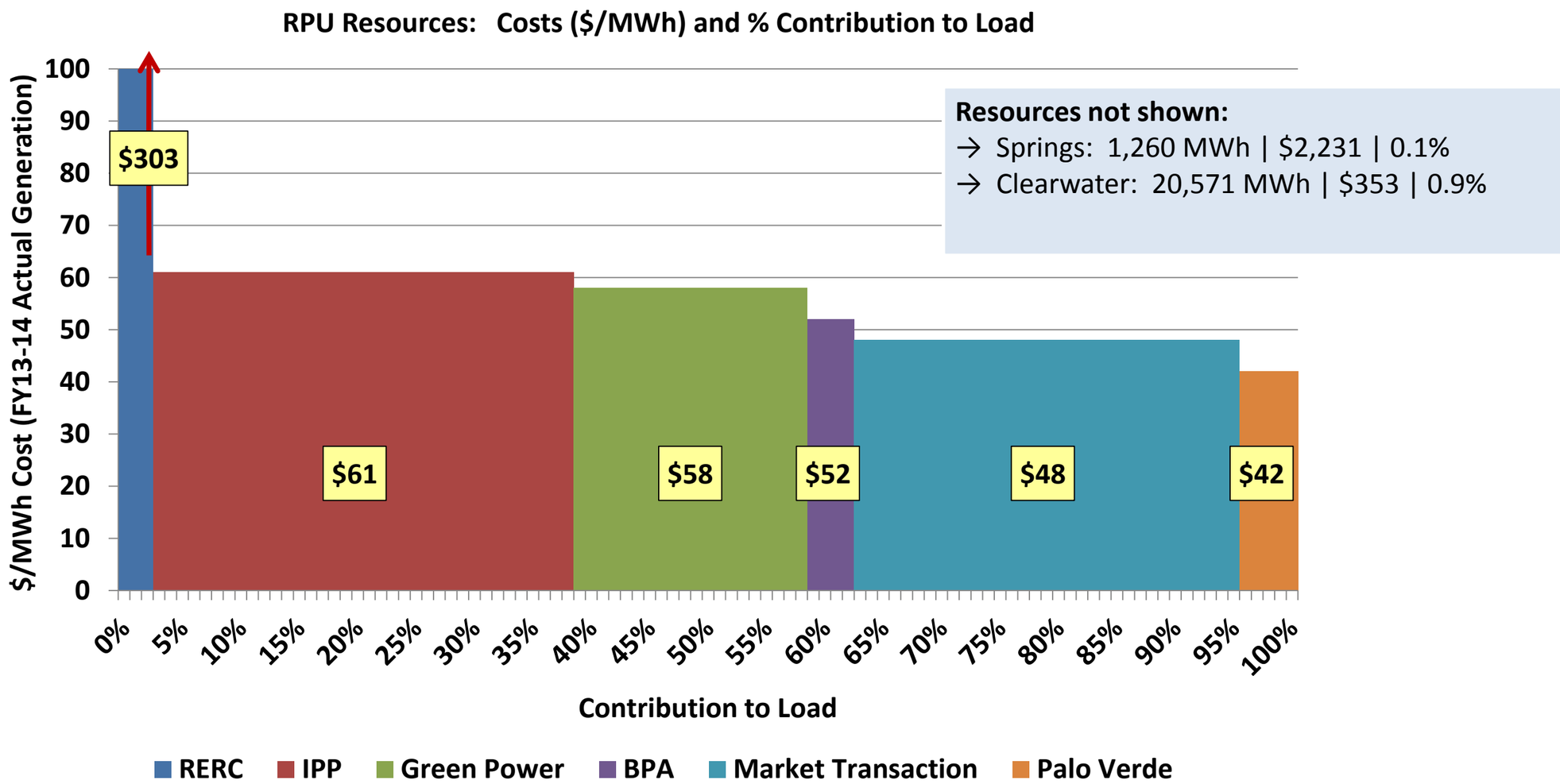
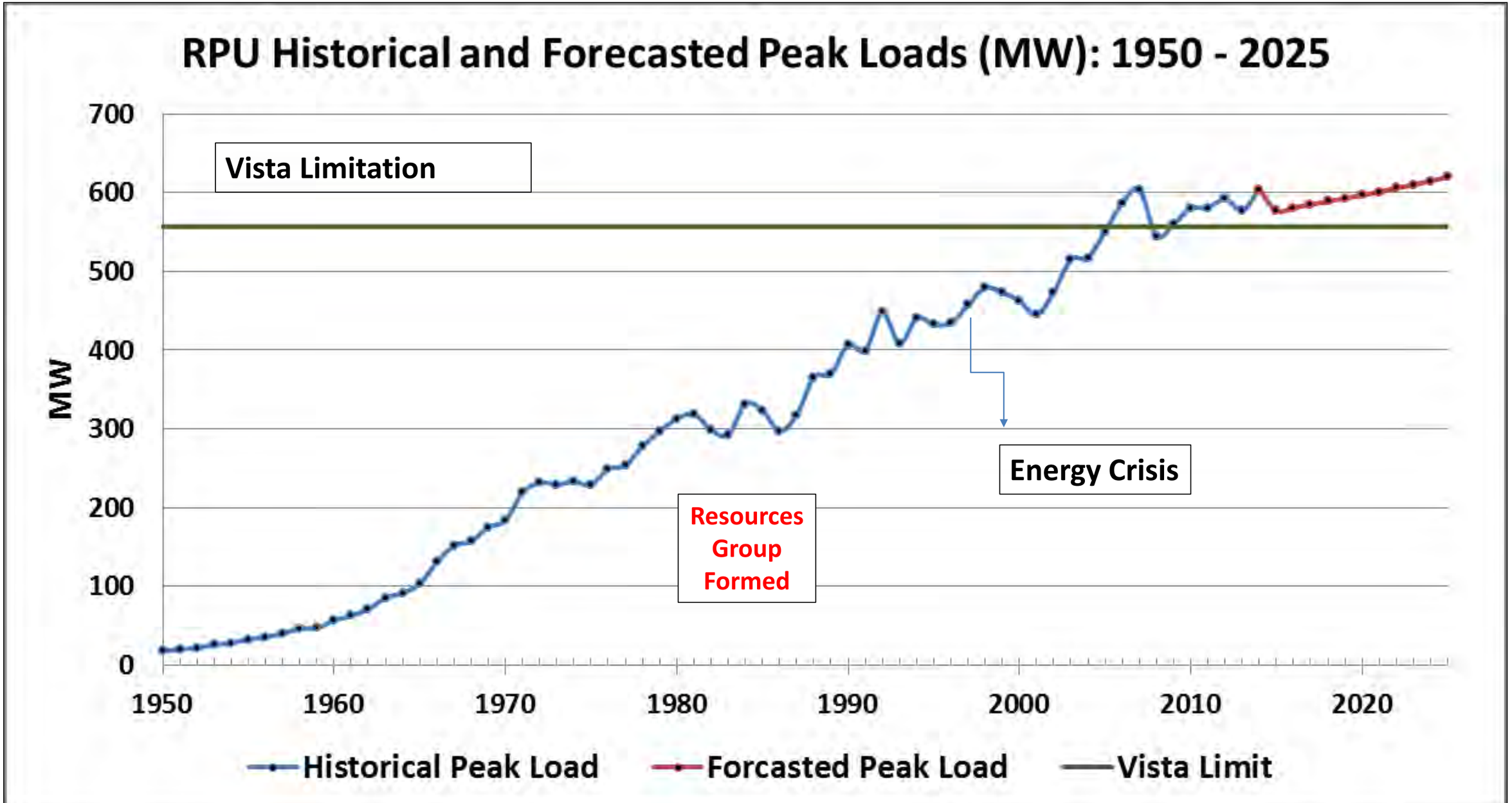
CITY OF RIVERSIDE
PUBLIC UTILITIES

RPU Resource costs ($/MWh) and % Contribution to Load

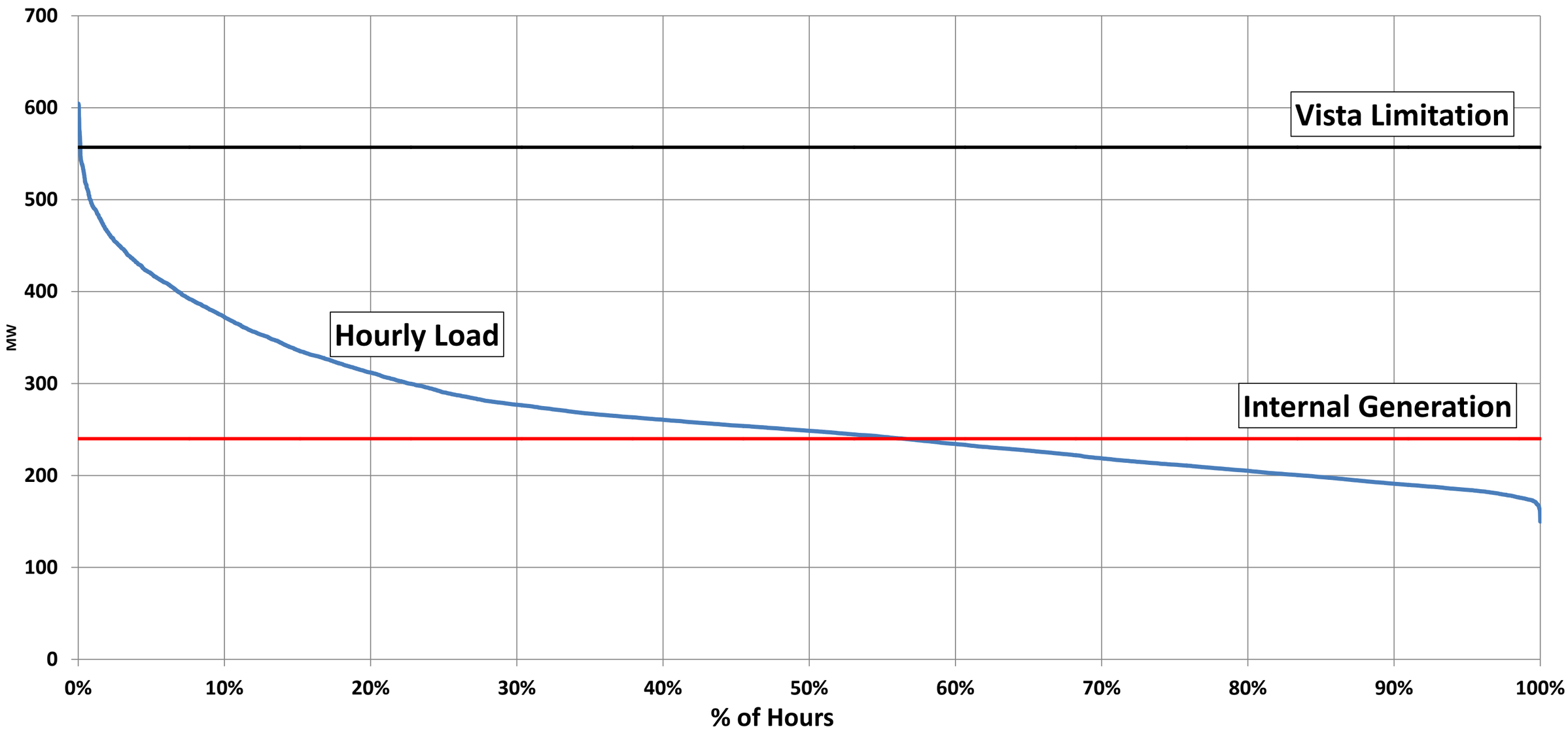


RPU's Power Needs Continues to Grow

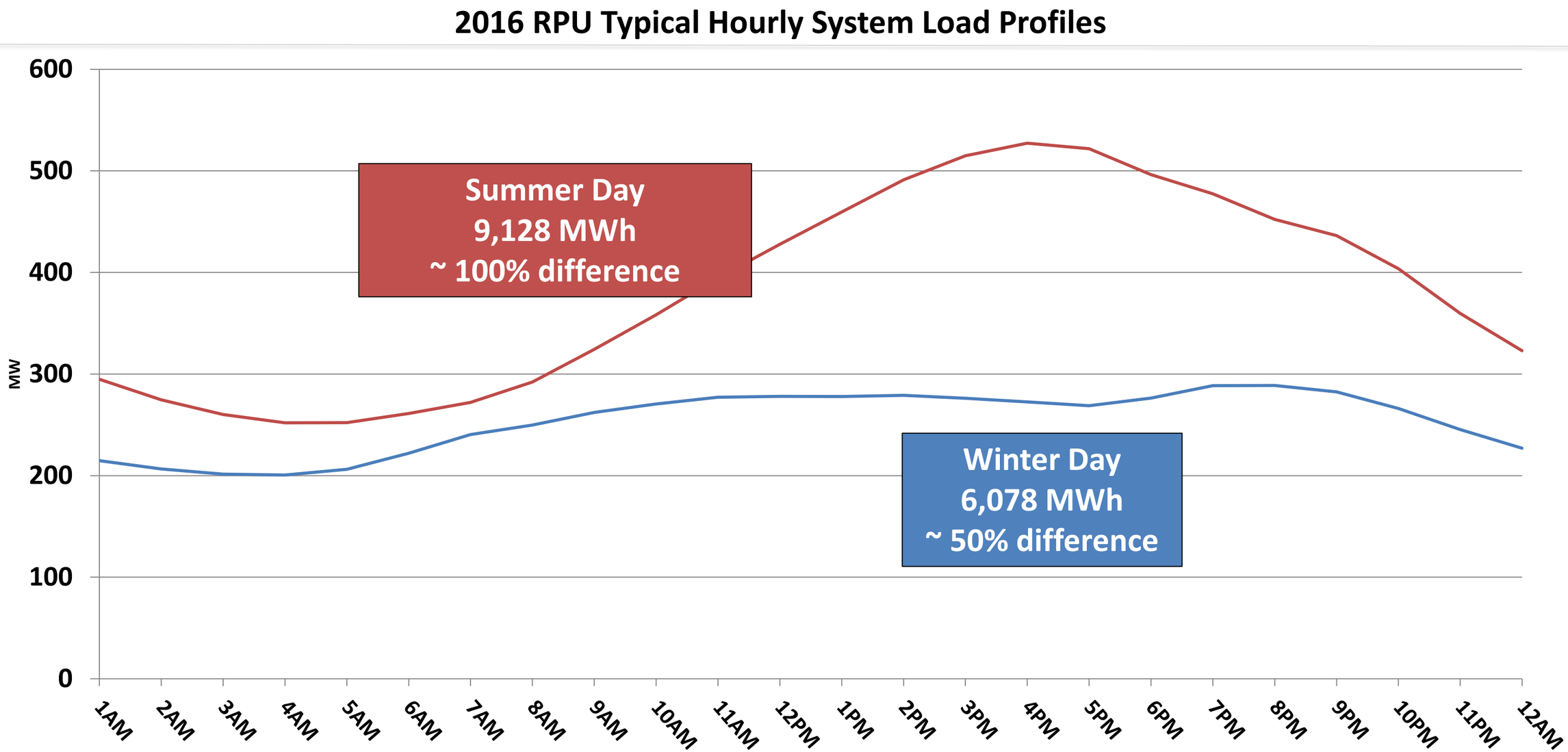


Customer Usage

Load Duration Curve for 2014



What the load looks like on different days



Planning -- Bringing it Together…

<u>What is an Integrated Resource Plan (IRP)?</u>

The IRP is used to guide decision making as RPU plans to meet its forecasted annual peak and energy demand (along with an appropriate reserve margin), using a combination of supply-side and demand-side resources over a period into the future.

- Work the plan or the plan won't work
- Periodic updates are required

Alphabet Soup of Mandates… More to Come??

Issues impacting RPU's planning process for future resource portfolio

- **2006 - AB 32: California GHG Reduction Mandate**
- **2006 - SB 1368: Emission Performance Standard**
- 2006 - AB 2021: EE/DSM
- 2010 - AB 2514: Energy Storage
- 2011 - SB X1-2: Renewable Portfolio Standard (RPS)
- 2011 - Distributed Generation (DG): Governor's executive directive
- 2013 - Flexible Resource Adequacy Criteria/Enhanced Must Offer Oblig. (FRAC/MOO & MIC)
- 2014 - CAISO/CPUC Joint Reliability Framework
- 2014 - Energy Imbalance Market (EIM) Initiative
- 2014 - FERC Order 764: 15 Minute Market Initiative
- 2015 – AB 350 (50% RPS, 50% more EE, 50% Transportation Electrification)
- 2015 – SB 32 – AB 32 Phase II
- More to come???

WIP ---Rules are frequently revised, requiring RPU engagement

Riverside's Renewable Procurement Early Adoption

- **PUB/City Council – EARLY ACTIONS**
  - Oct 2002 - PUB Strategic Plan - Add 25 MW renewables
  - 2003 - PUB/CC Adopt 15% RPS goal by 2015
  - 2003 & later: RECs, geothermal, landfill gas, wind, etc.,
  - 2007/2008 - PUB/CC revised RPS goal
    - 20% by 2010; 25% by 2015; 33% by 2020
- **2011 - First POU mandate (33% by 2020) CA SB X1-2**
- **Early action credit – Historic carryover (762,000 MWhs)**

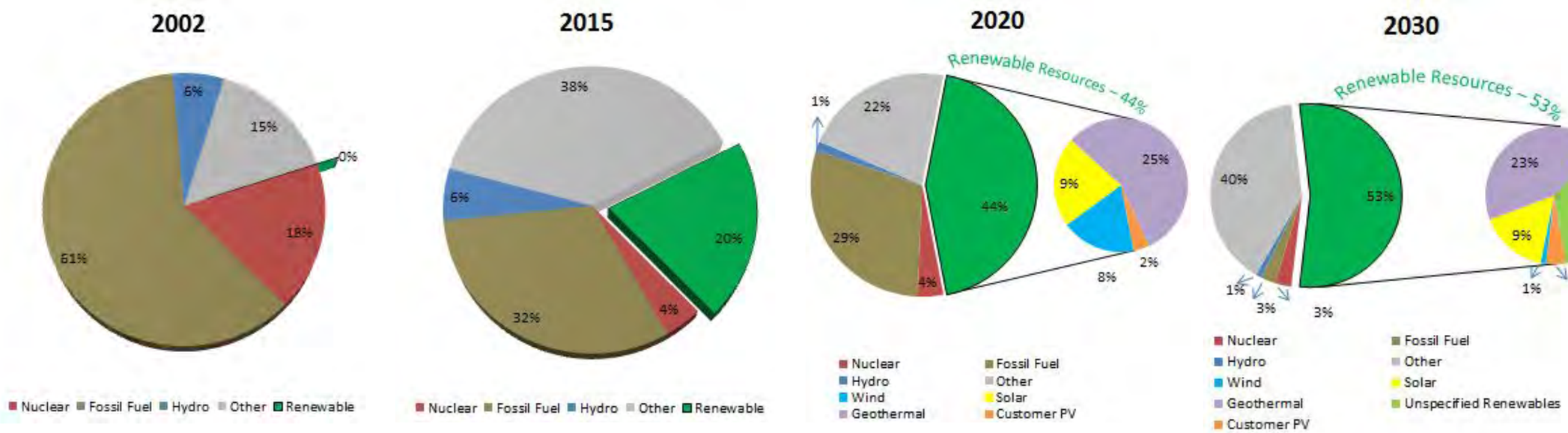
Early Actions—today's value $11.8 million

WATER | ENERGY | LIFE

CITY OF RIVERSIDE PUBLIC UTILITIES

Securing a Reliable, Sustainable Energy Future

PAST (CY 1995-2002) → **PRESENT (CY 2003-2015)** → **MED. TERM FUTURE (CY 2016-2025)** → **LONG TERM FUTURE (CY 2026-2030)**



Securing a Reliable, Sustainable Energy Future

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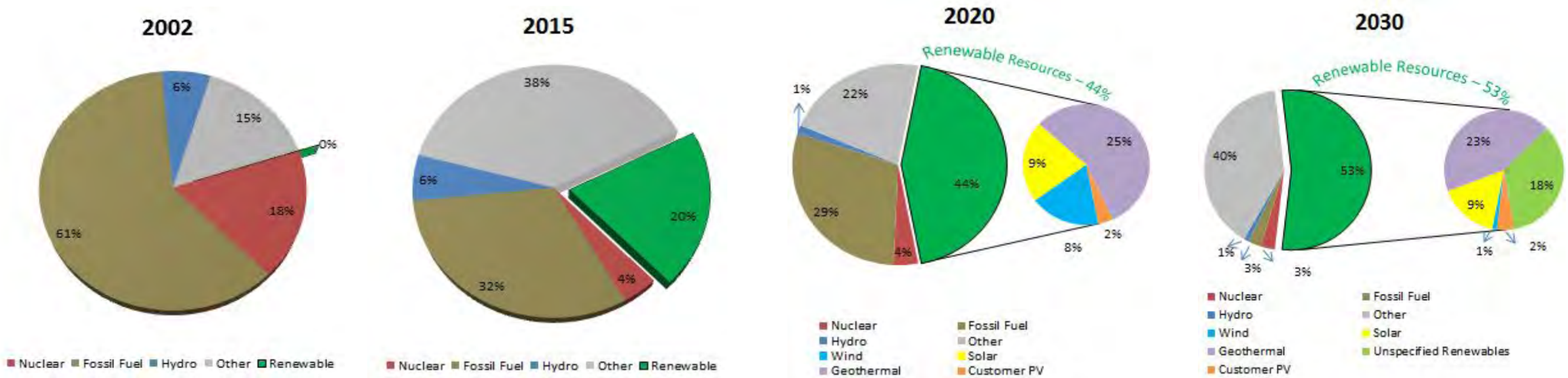

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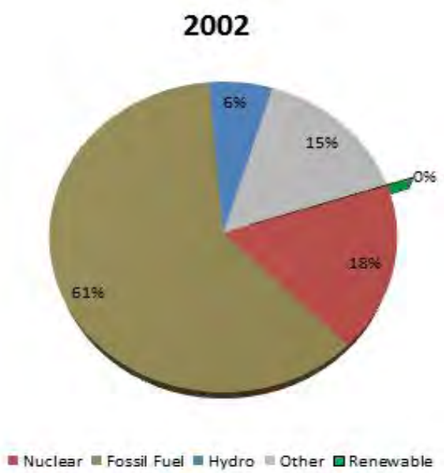

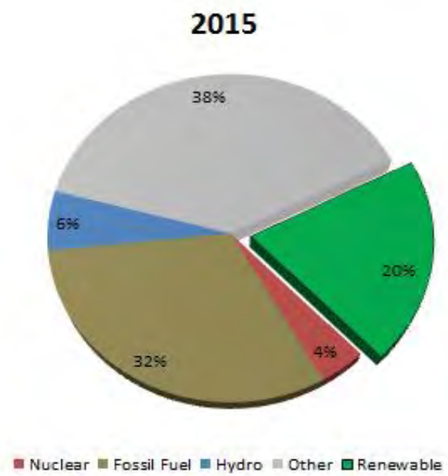

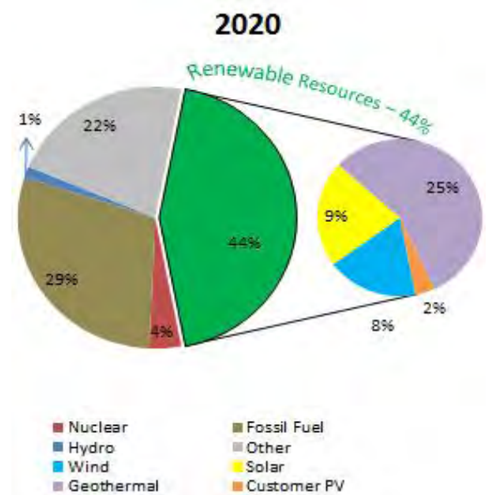

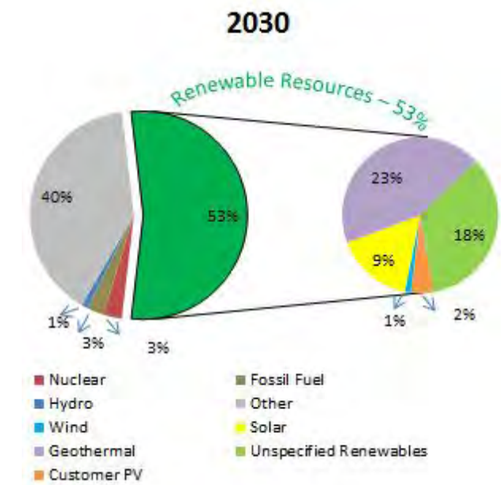

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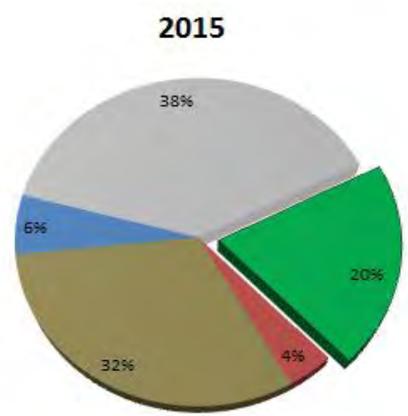

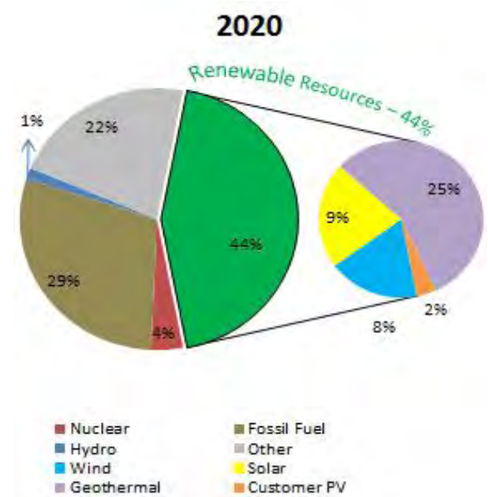

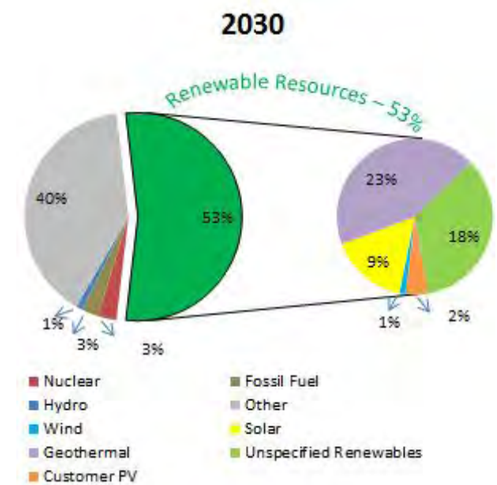

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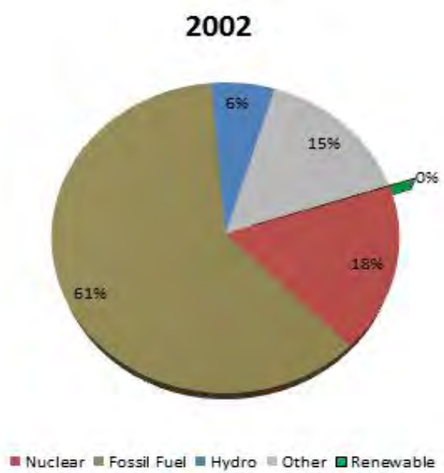
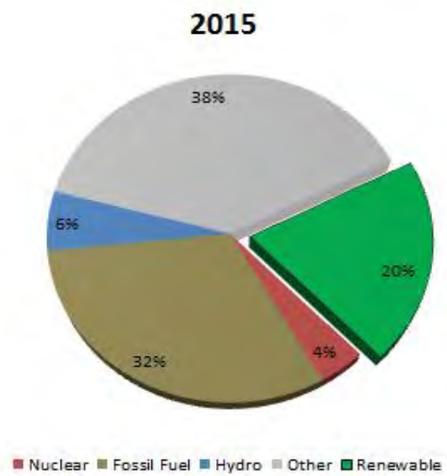
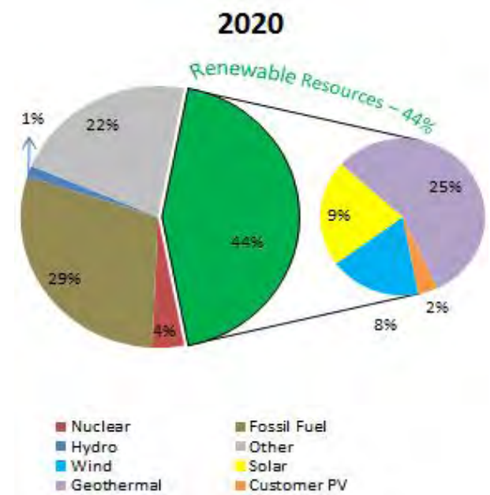
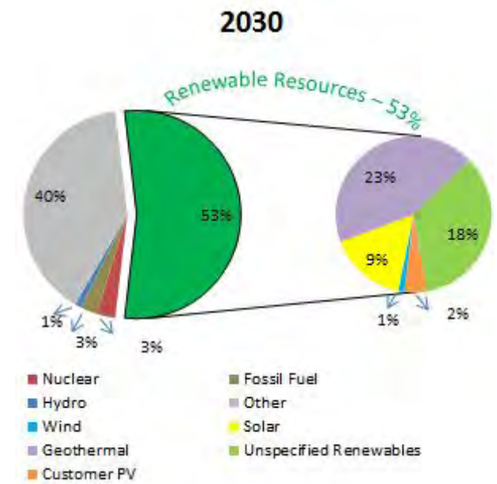
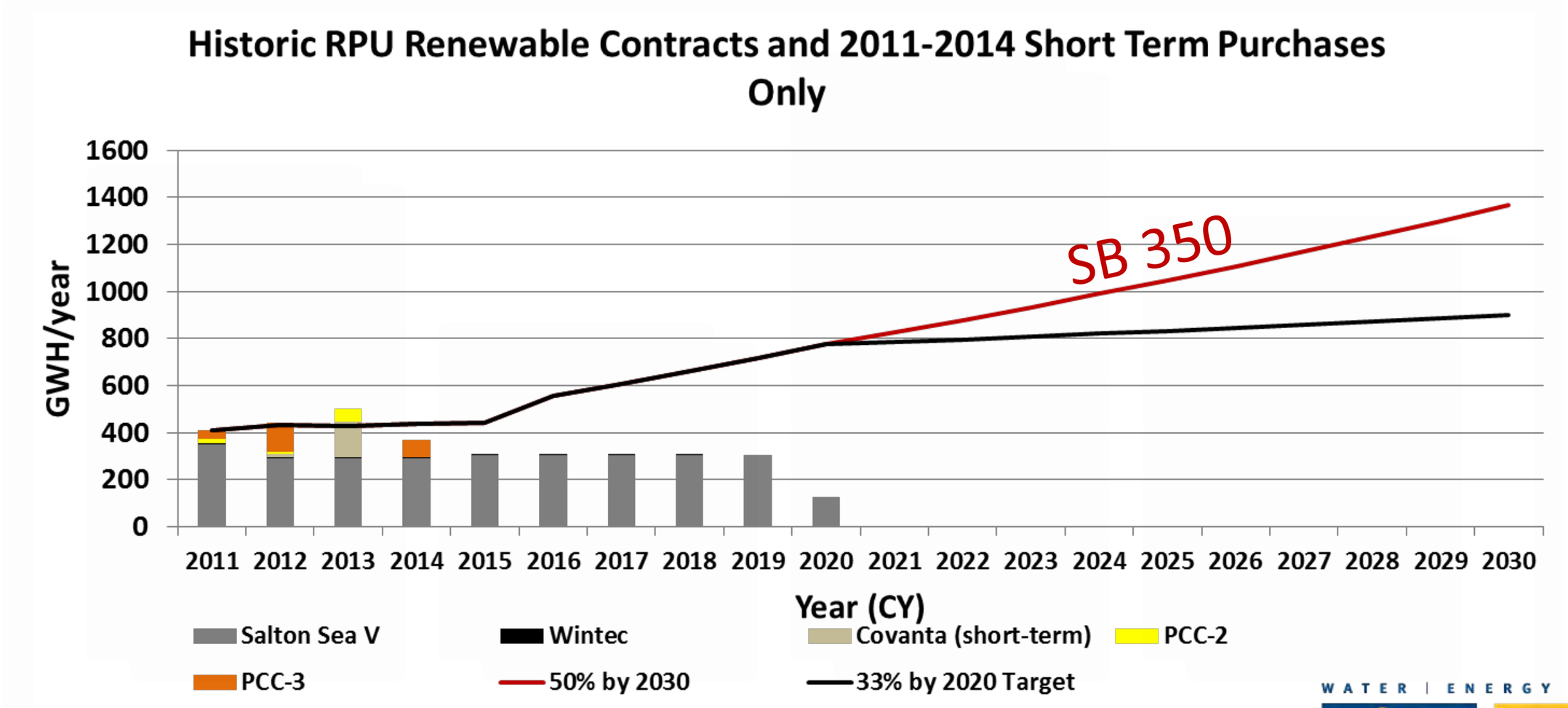








2011 – RPS Outlook



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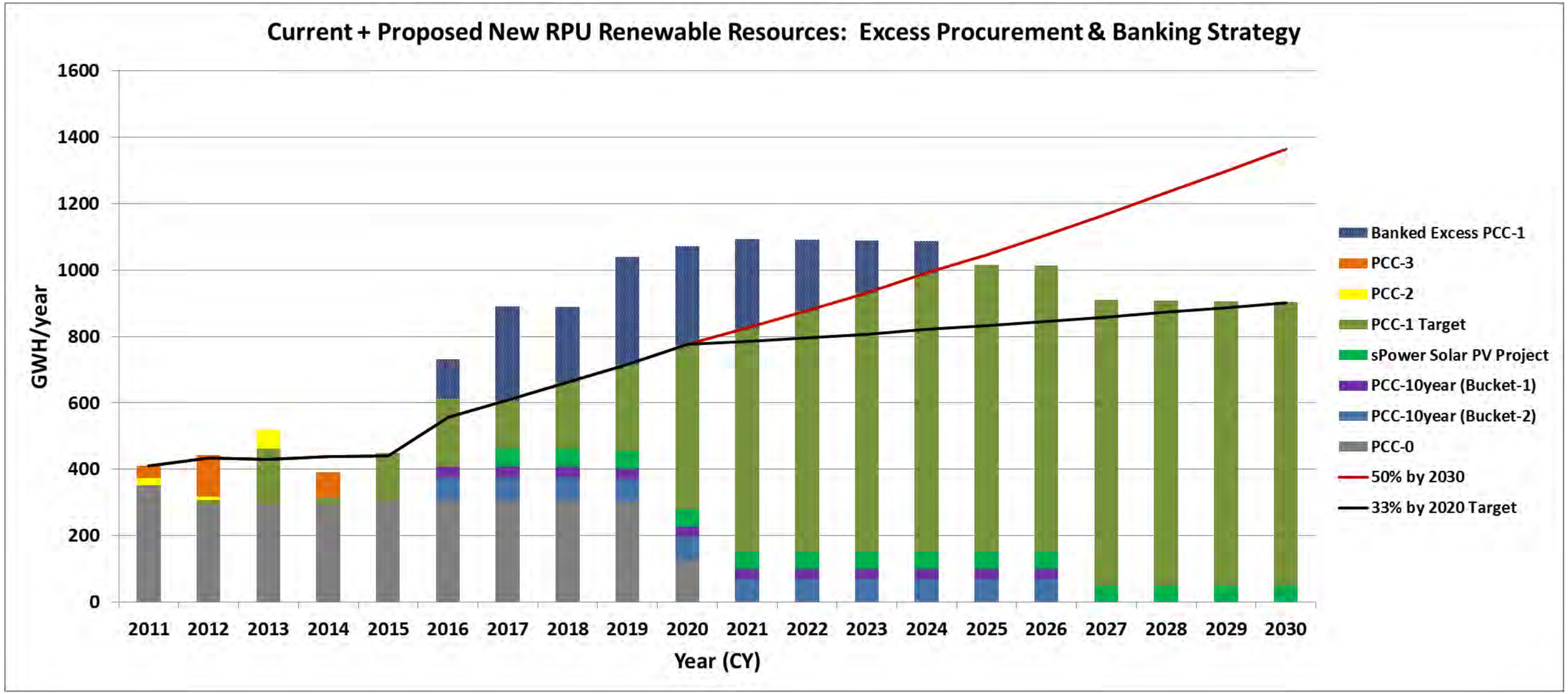
CITY OF RIVERSIDE PUBLIC UTILITIES

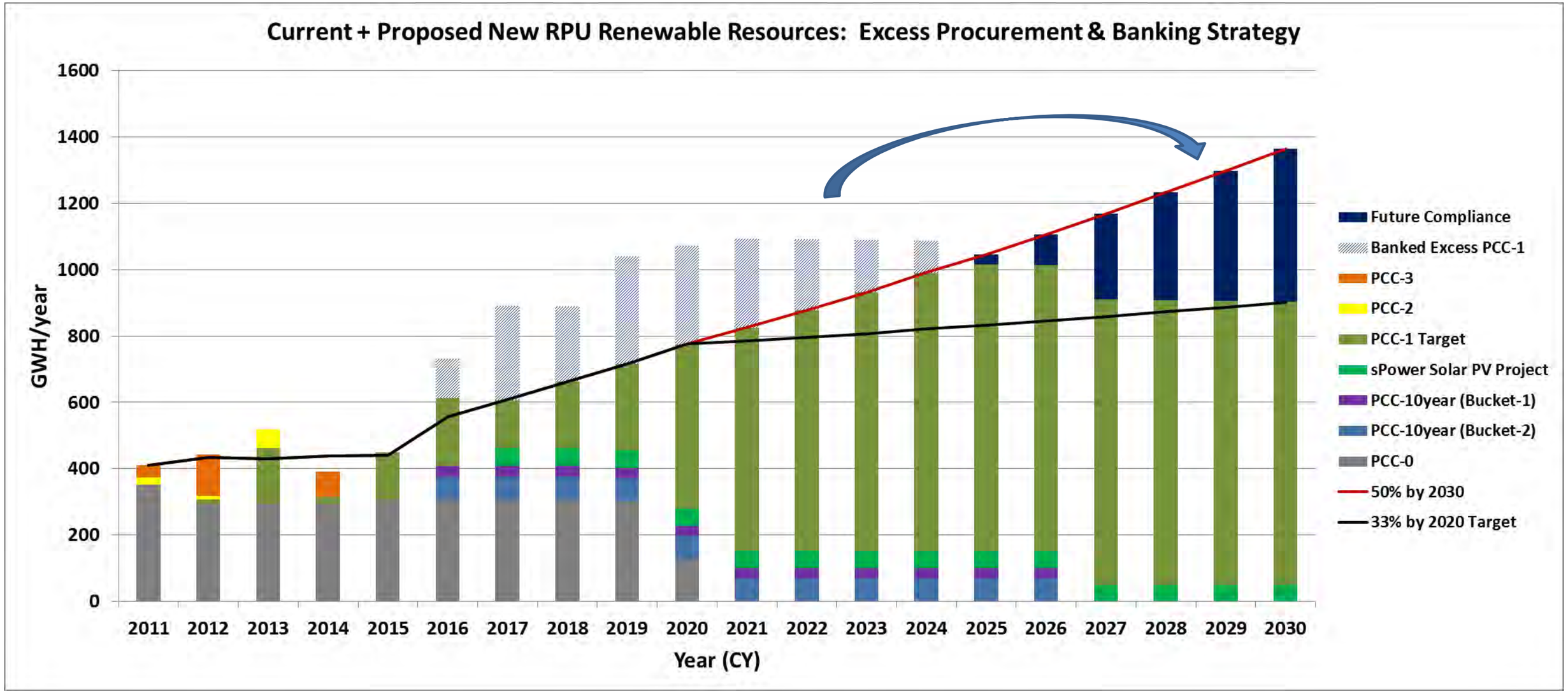
318 MW Renewable Resource Procurements Since 2012

Project	MW	COD	Type	End	PUB/CC	Contract Value
WKN Wind	6	2013	Wind	2032	2012	$27,771,000
Columbia II	11	2014	Solar PV	2034	2013	$39,259,000
Clearwater	14	2014	Solar PV	N/A	2013	N/A
Cabazon	39	2014	Wind	2025	2013	$29,472,000
North Lake	20	2015	Solar PV	2040	2012	$124,673,000
Kingbird B	14	2015	Solar PV	2035	2013	$46,750,000
Tequesquite	7.5	2015	Solar PV	2040	2014	$36,662,000
Silverado (Amended)	20	2016	Solar PV	2041	2014	$70,538,000
Cal Energy (Portfolio)	Up to 86	Various	Geothermal	2039	2013	$1,205,661,000
sPower	25	2016	Solar PV	2036	2015	$64,876,000
Iberdrola	Up to 75	2016	Wind	2027	2015	$64,357,000
					Total:	***$1,710,018,000***

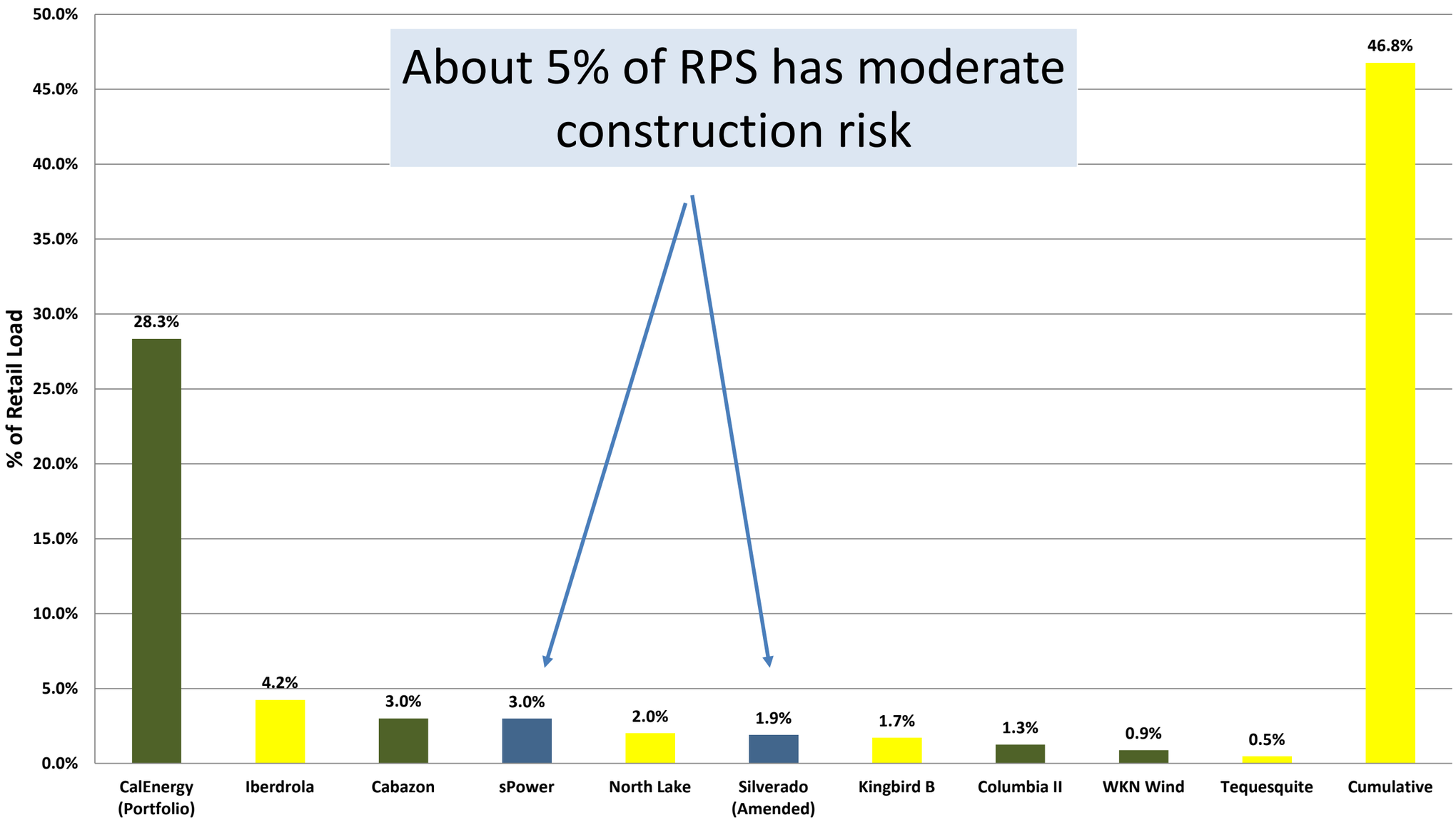
RPU's Current PCC-1 Excess Procurement Can Be "Banked"



“Banked” Excess - Used to Satisfy Future Compliance Obligations



Renewable Power - 2021



ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

IRP FINDINGS

–

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

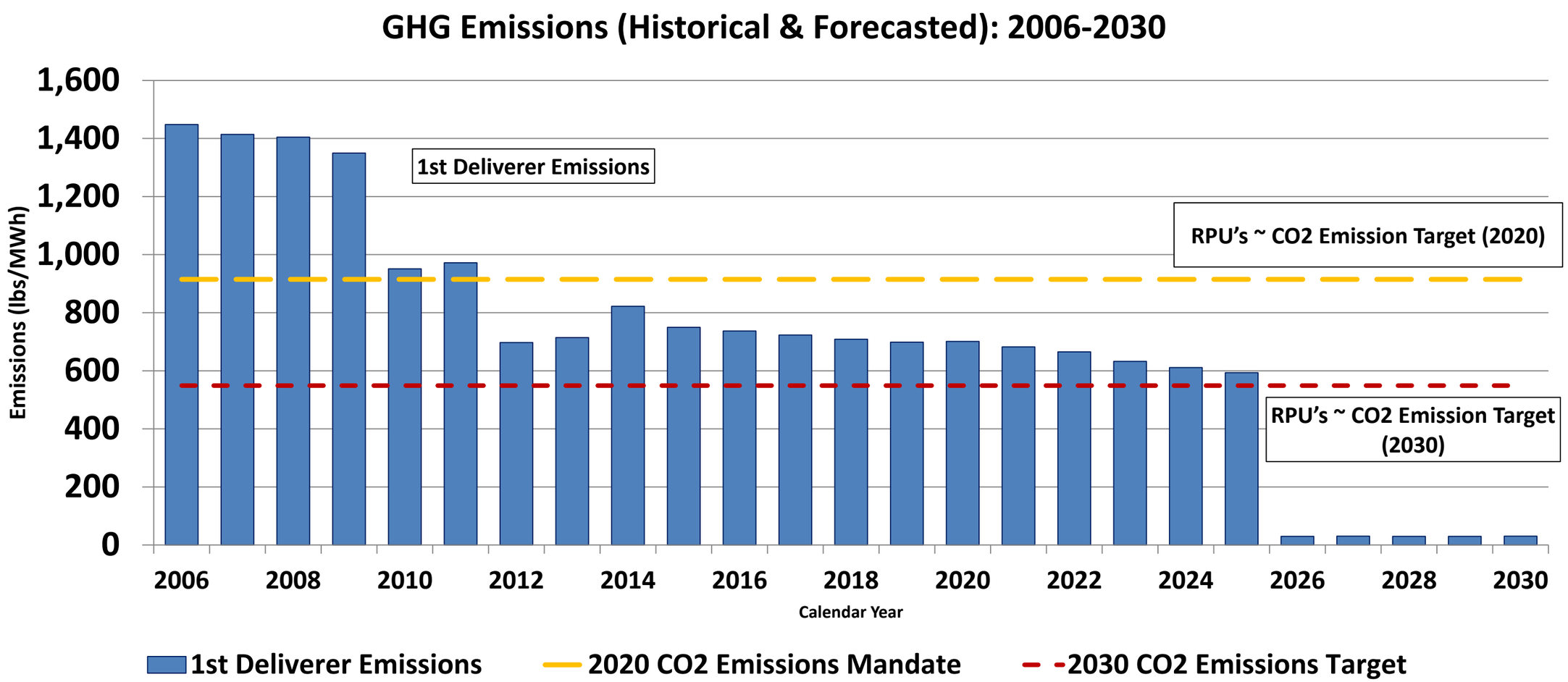
Finding (IRP): Renewable Mandates Will Likely Continue

Work towards 40% RPS by 2020

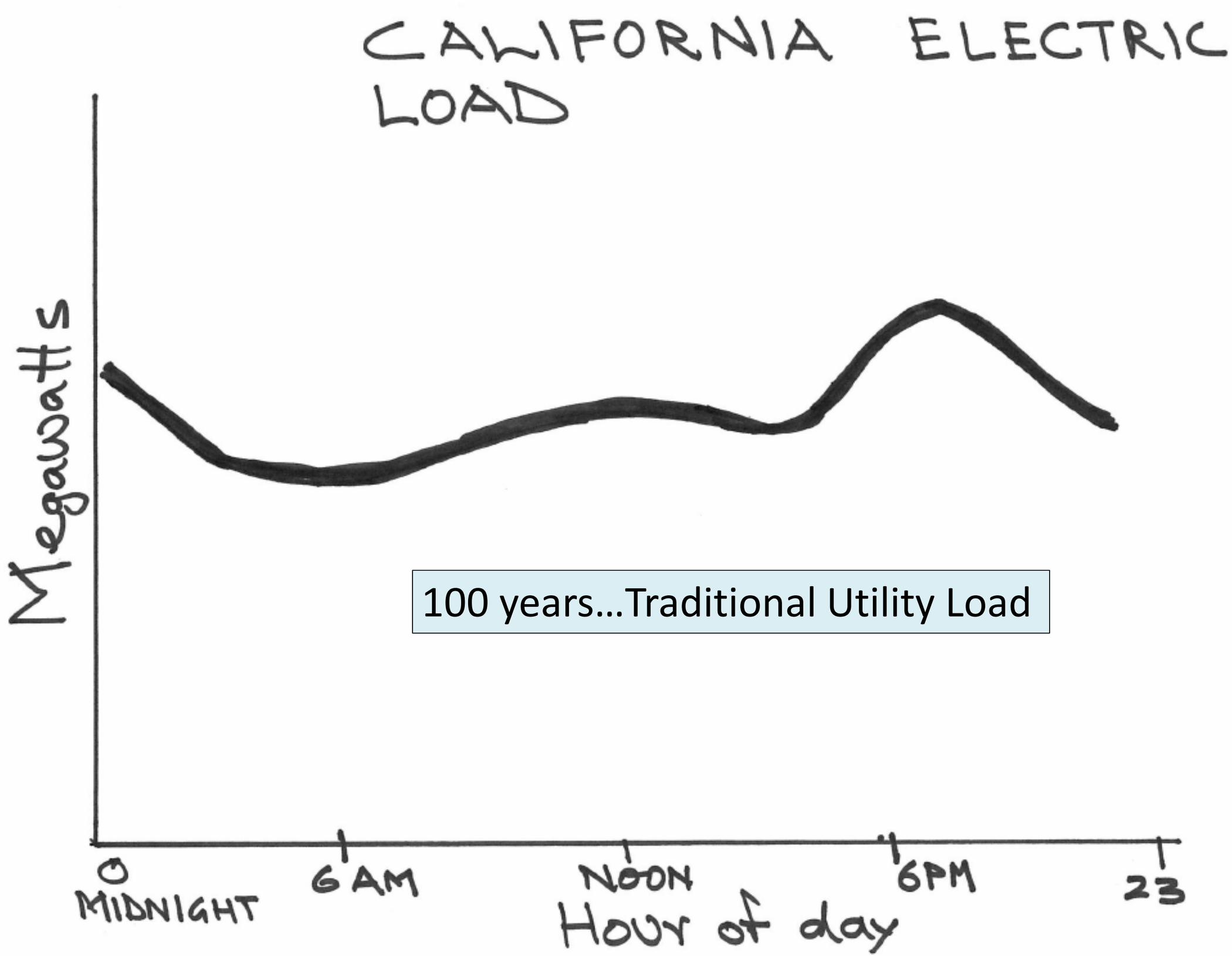
- Maximize cost-effective renewable procurement
- Ensure procurements meet “excess procurement” (no regrets) criteria

Executive Order – 50% RPS… mandated soon

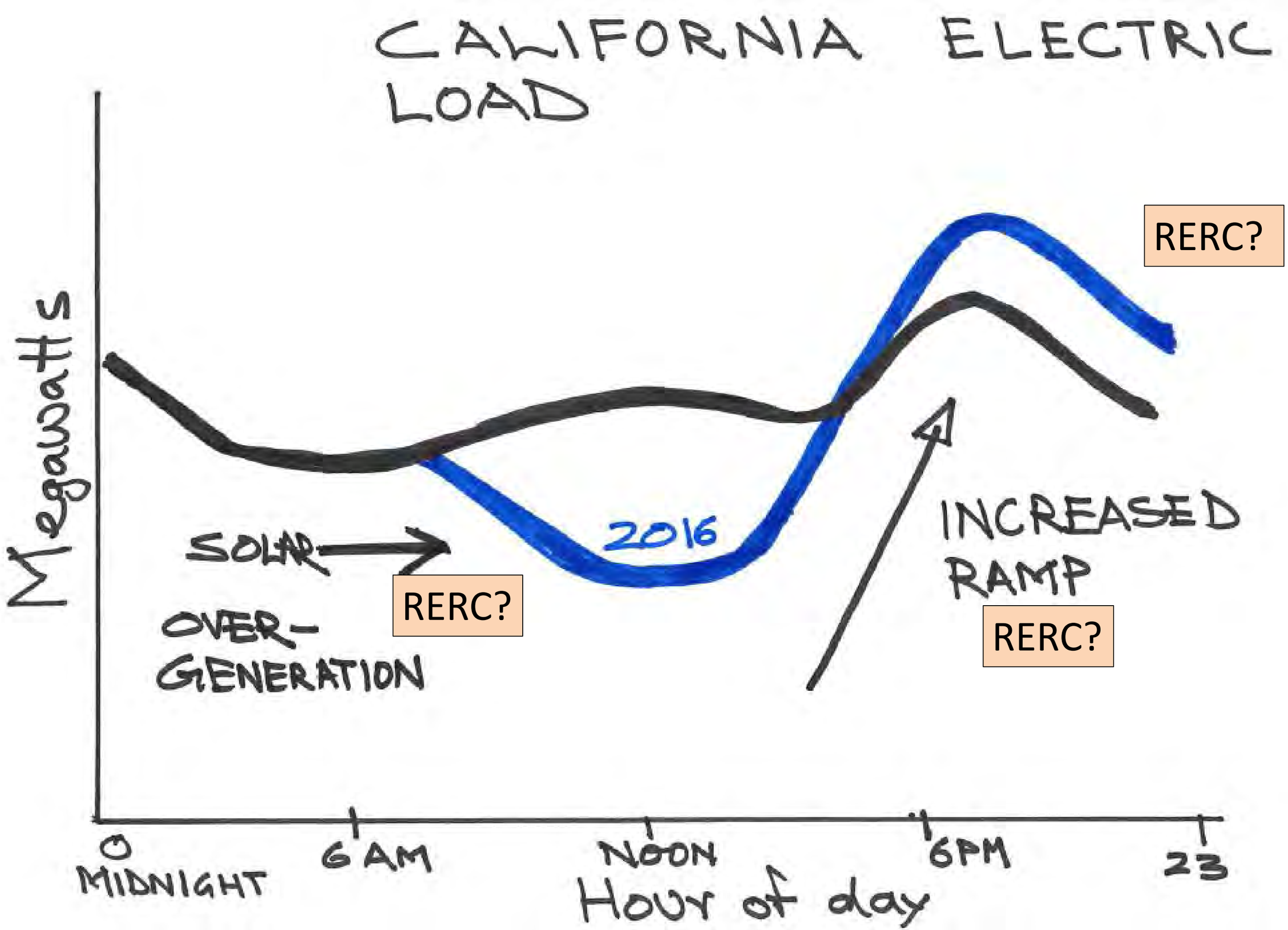
RPU's GHG Emission Profiles

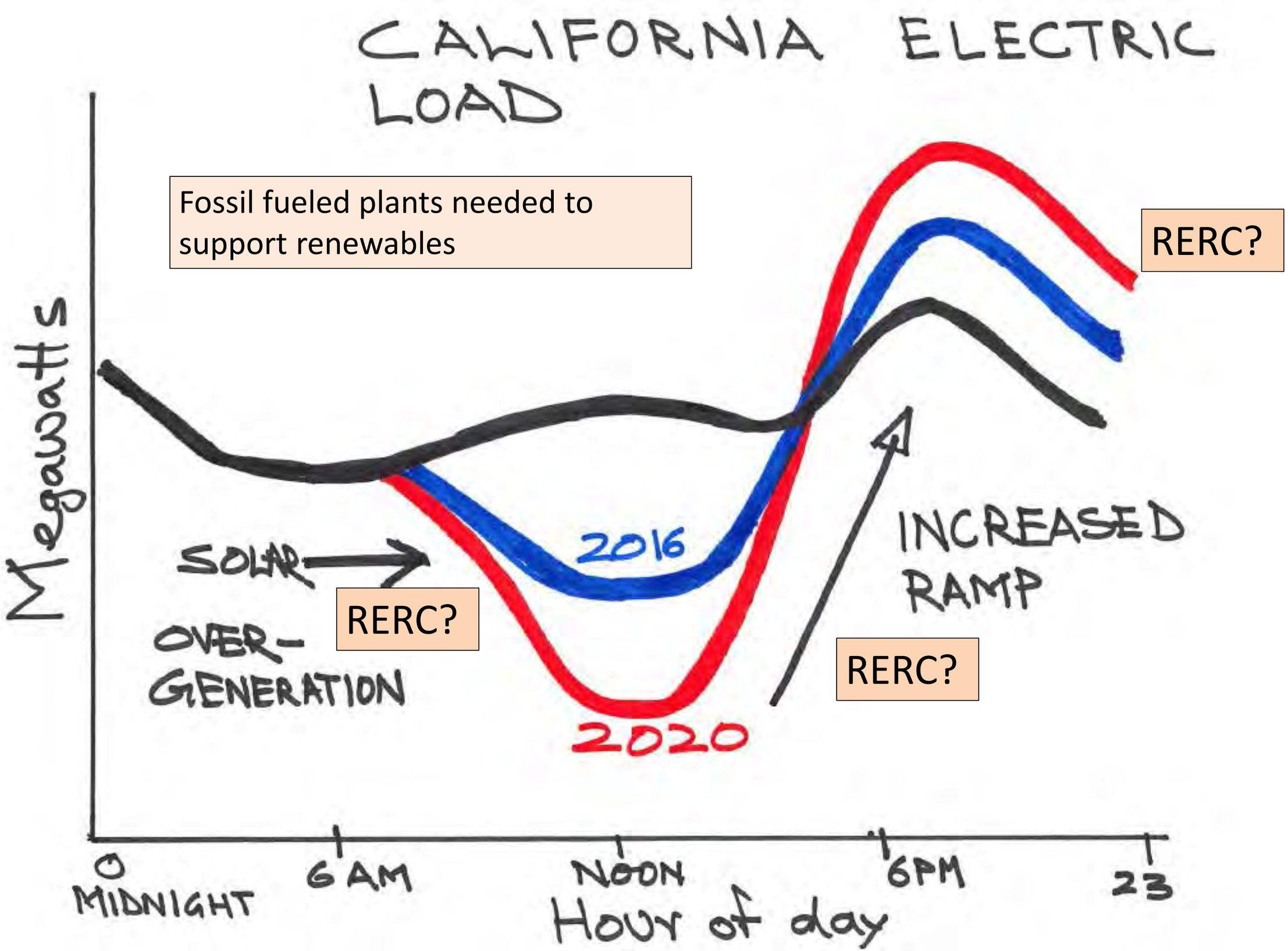


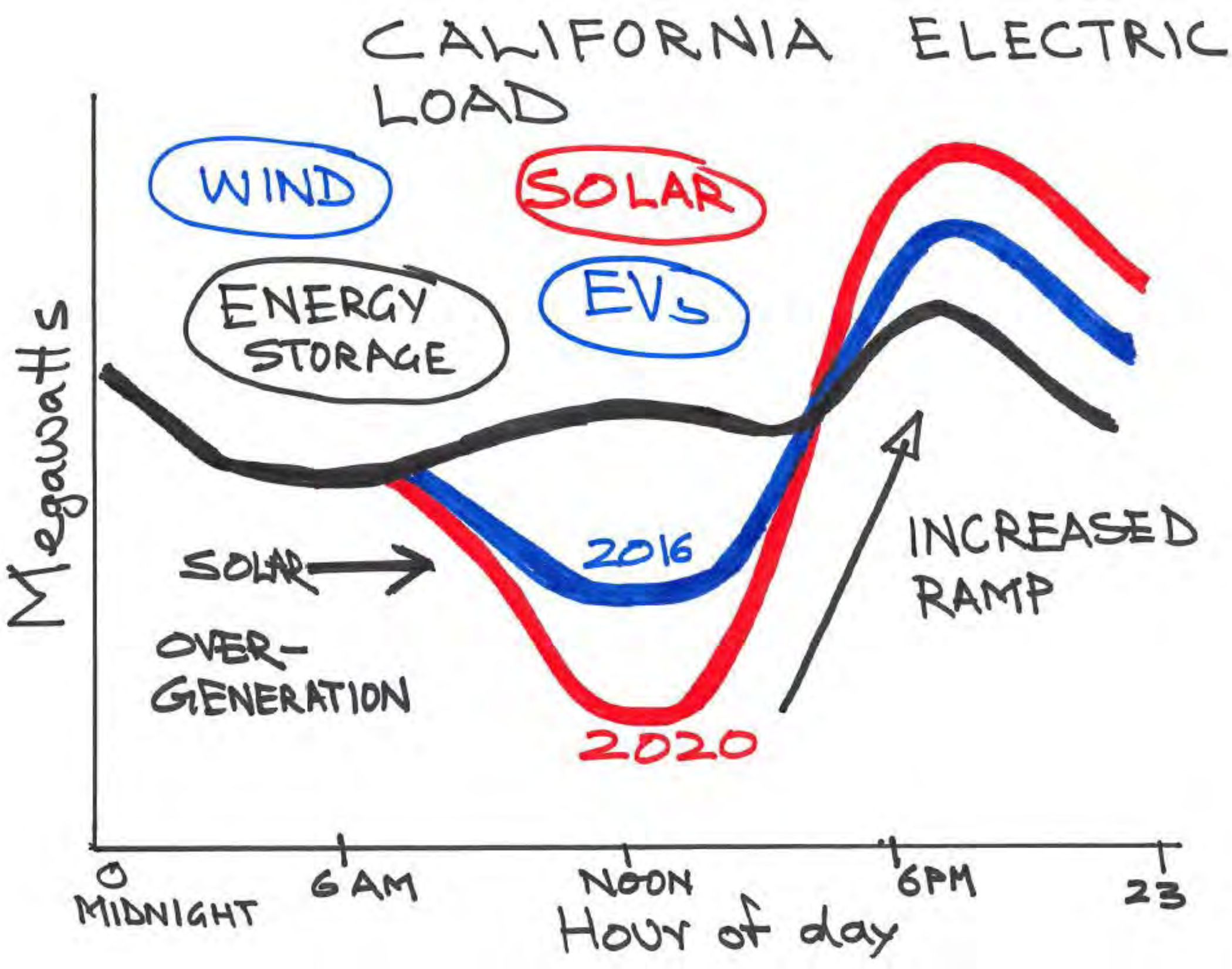
- RPU actively reducing GHG emissions profile since 2008
- Continue reducing GHG footprint, at least through 2020
- Most significant reduction when IPP contract terminates



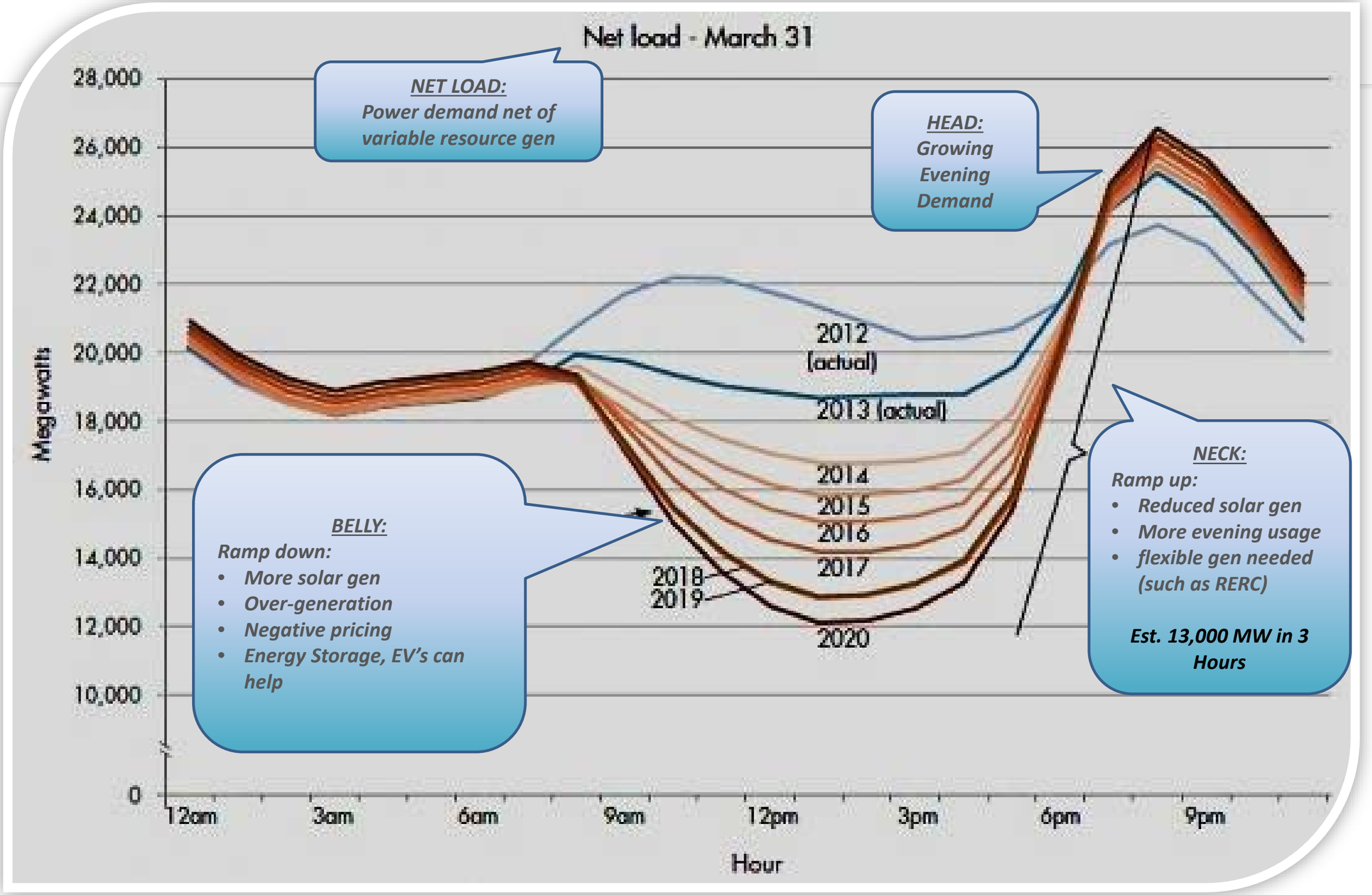
100 years…Traditional Utility Load


CALIFORNIA ELECTRIC LOAD
RERC?
Megawatts
2016
SOLAR
RERC?
OVER-GENERATION
INCREASED RAMP
RERC?
0 MIDNIGHT
6AM
NOON
6PM
23
Hour of day


CALIFORNIA ELECTRIC LOAD
Fossil fueled plants needed to support renewables
RERC?
Megawatts
SOLAR
RERC?
OVER-GENERATION
2016
2020
INCREASED RAMP
RERC?
0 MIDNIGHT
6 AM
NOON
6PM
23
Hour of day


CALIFORNIA ELECTRIC LOAD
WIND
SOLAR
ENERGY STORAGE
EVs
Megawatts
SOLAR
OVER-GENERATION
2016
2020
INCREASED RAMP
0
MIDNIGHT
6AM
NOON
6PM
23
Hour of day

UTILITY 2.0 - CAISO "Duck Curve "



ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

IRP FINDINGS

–

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Finding (IRP): Future – More Integration of Demand & Supply Resources

Search for Energy Storage / Demand Side Management (DSM) synergies

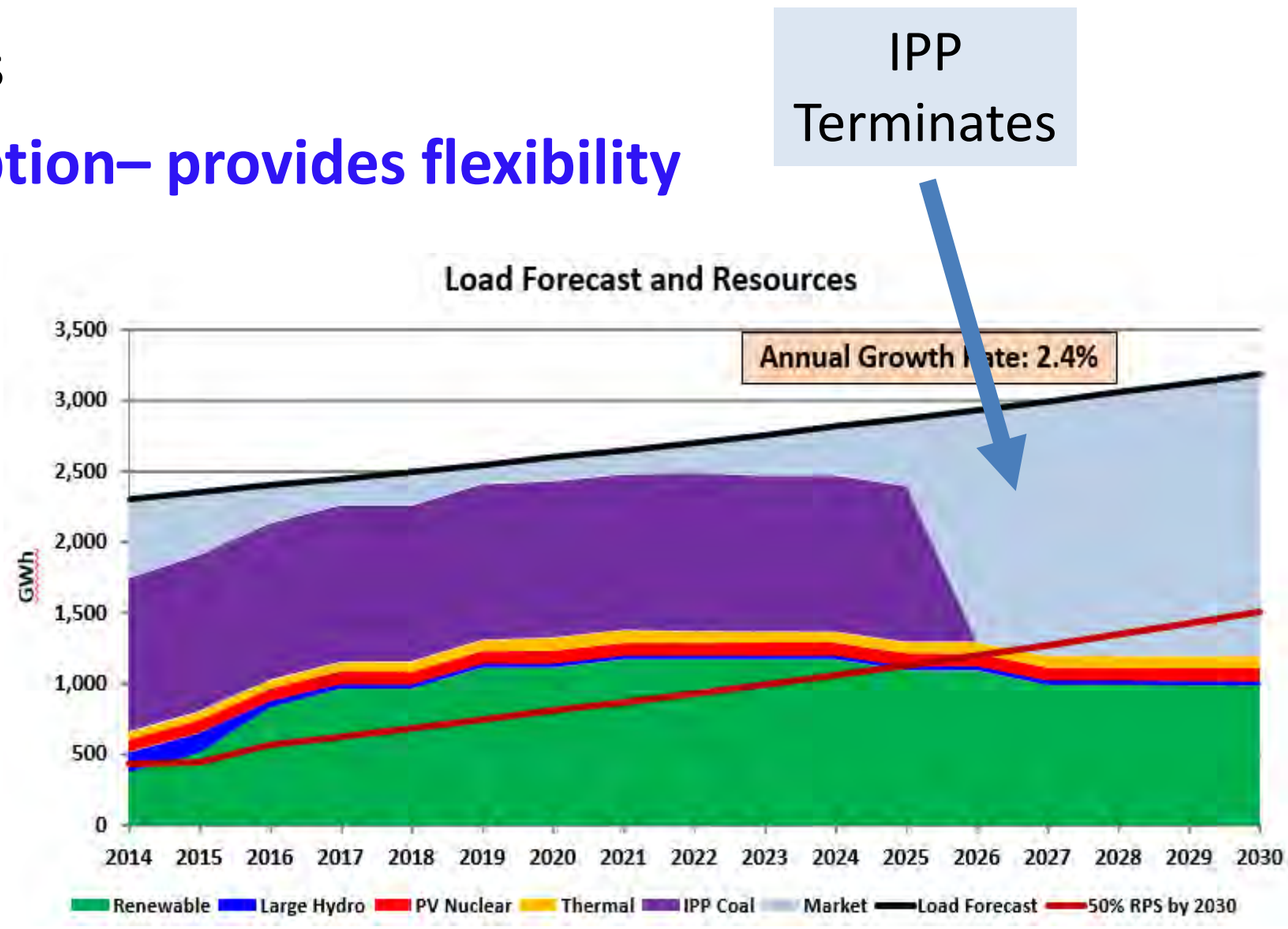
- Look at cost effectiveness for all RPU customers
- Demand response pilots, energy storage, DSM, DG
- Local Reliability considerations – RTRP, more generation

How Will Riverside Replace IPP???

(Expires 2027)

Project Consists of:

- City of Riverside ("COR") share 7.617% - 136 MW
- Provides 35 – 45% of energy needs
- **2019 Repower from coal to gas option– provides flexibility**



Additional IPP Replacement Options

(see Chapter 11 of RPU IRP)

Scenario	Capacity (MW)	Location	Description	Dispatch Flexibility	Permitting challenge	% Increase to Net COS in 2030
Baseline	150	n/a market	Forward hedged market power contracts	None	n/a (None)	-
Ext.Gen	50*	Delta, UT	IPP Repower NatG CC	Moderate	Moderate	0.0%
Int.Gen	46.5*	Riverside, CA	ICE Wartsila Units	High	High	2.3%
Int.Gen	100*	Riverside, CA	GE LMS-100 NatG SC	High	High	3.4%
Green Power	75*	CA	PPA for new base-load renewable asset	Low	Low	6.0%

* L/T power hedges added (total 150MW) for scenario comparison purposes
IRP Chapter 11 - Extensive information concerning each Alternative

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

IRP FINDINGS

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ADVANCED TECHNOLOGIES

Finding (IRP): Future of IPP Offers Many Options

Continue to examine all viable IPP Alternatives

- Pursue multiple alternatives;
- Maximize future flexibility for reliability and regulatory mandates
- When rules stabilize, quantify ancillary services/benefits
- Follow up studies for local reliability benefits

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CITY OF RIVERSIDE PUBLIC UTILITIES

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

IRP FINDINGS

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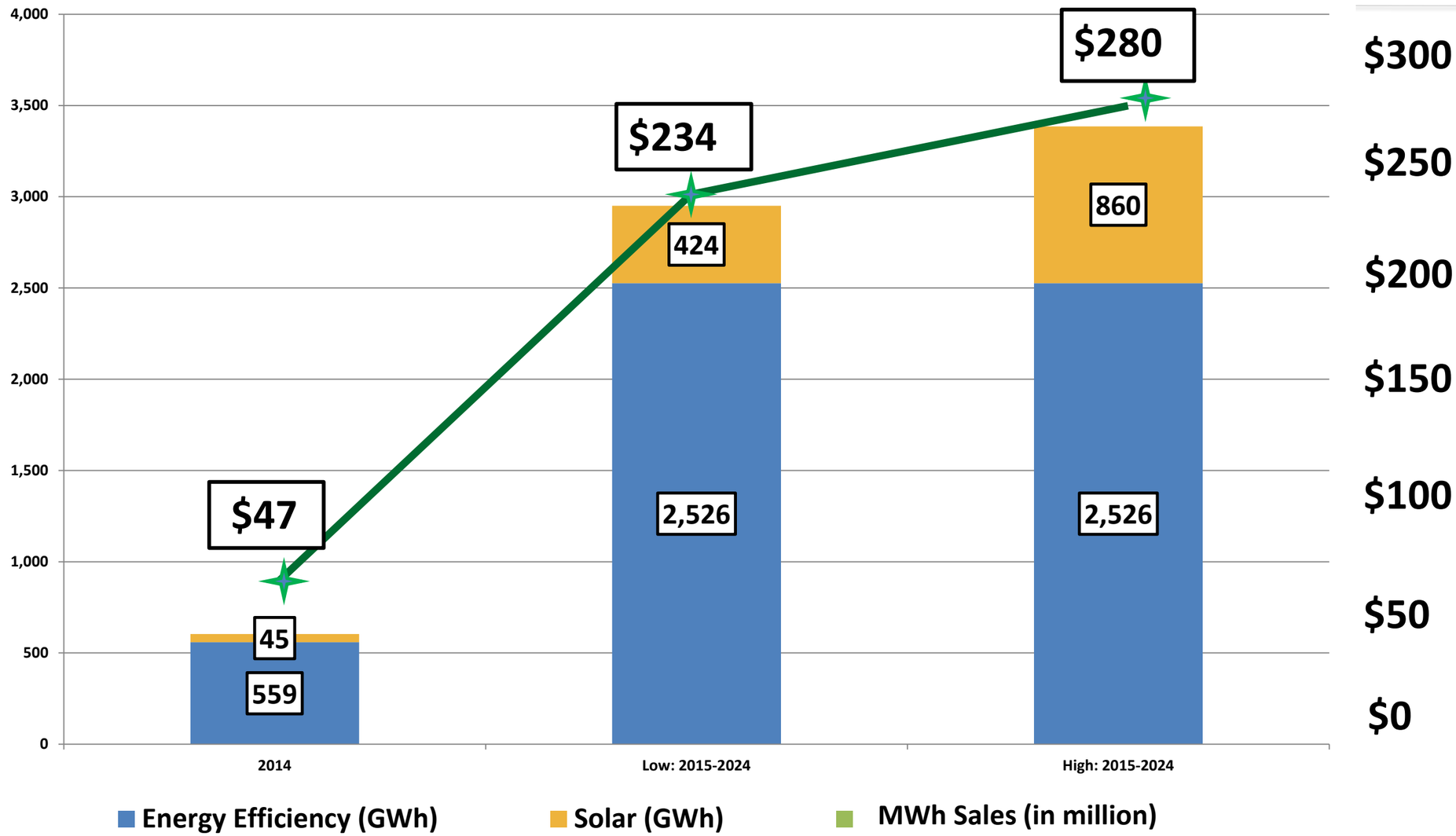
ADVANCED TECHNOLOGIES

Finding (IRP) – Material Effects of Solar and Energy Efficiency

Monitor Customer Solar PV penetration levels

- Current rate structure must change – fairness/equity
- Unbundled rates, time-or-use, adjustment clauses, etc.,
- Today -14MW; expect 33 MW by 2033
- Today's subsidy $10.70/yr; Expect $36/yr by 2033

Lost Revenues
Solar and EE Challenges w/Current Rates



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WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

IRP FINDINGS

–

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Finding (IRP) : Future CAISO Markets Will be More Complex

Maintain flexibility in the CAISO Markets

- Participate in stakeholder processes (FRAC/MOO, Import Capacity, etc.)
- CAISO collaboration
- Alternatives to current operations
- Minimize cost exposure (RPS/ES/DG/ renewable integration costs)

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

OTHER FINDINGS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

SONGS - NRC Decommissioning Requirements
Three Phases – (end date unknown)

Decommissioning Planning (2014-2015)	Major Decommissioning Activities (2014-2032)	License Termination (In Perpetuity or until permanent repository)
SONGS ceases operations and notifies NRC	Initiate activities, per the Post-shutdown Decommissioning Activities Report	Conduct final status survey and submit reports
Su **Done** t-shutdown Decommissioning Activities Report	NRC co **In Process** nspections	NRC conducts confirmatory surveys and reviews report
NRC reviews Post-shutdown Decommissioning Activities Report	Submit license termination plan	NRC approves final status survey report and modifies license
	activities	Dry Fuel Storage Part 50 license remains
	hnical and ws of license approves plan	

2014 $4.4B Funding:	2014$	%
SCE	$3.05B	91%
SDGE	$0.86B	97%
APU	$0.13B	118%
RPU	**$0.08B****	**100%**
Total	$4.1B	93%

** Per 2014 DCE-- future unknowns could impact funding levels

Recommendation—Significant Uncertainty - Keep funding decommissioning – restrict funds (internally)

R

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CITY OF RIVERSIDE PUBLIC UTILITIES

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

OTHER FINDINGS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Other Finding: Resources Already Uses Advanced Technology

Production Cost Modeling Software

Energy Platform software

(Hourly CAISO energy, pricing and CRR information)

Deal Capture and Settlement Suite Software

High end Analytical and Business Intelligence software

Best Practice - Expand analytical capability and make data available to other divisions

WORKFORCE DEVELOPMENT

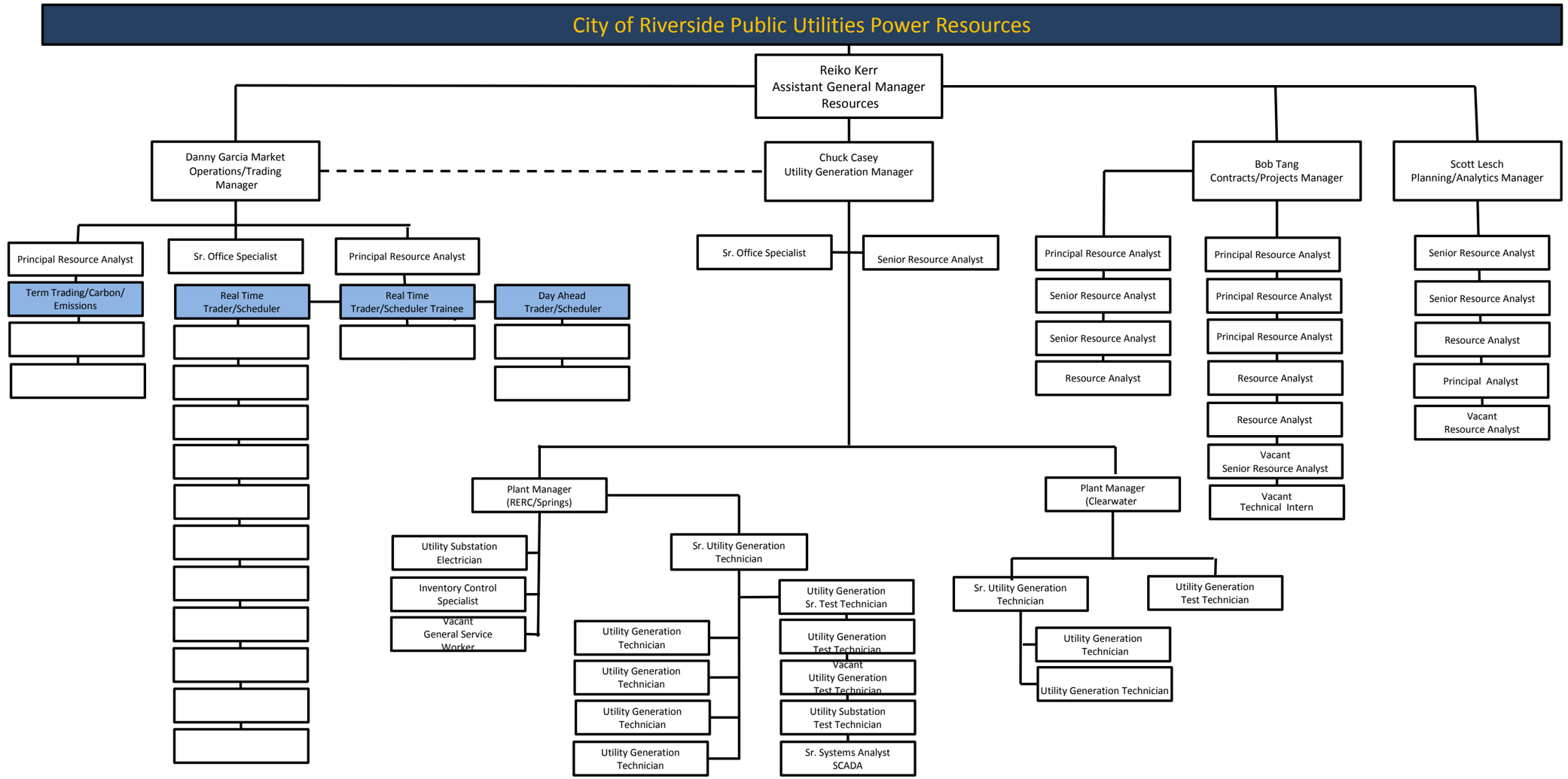
INFRASTRUCTURE IMPROVEMENT – SUPPLY

OTHER FINDINGS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Other Finding: Resources has Workforce Challenges

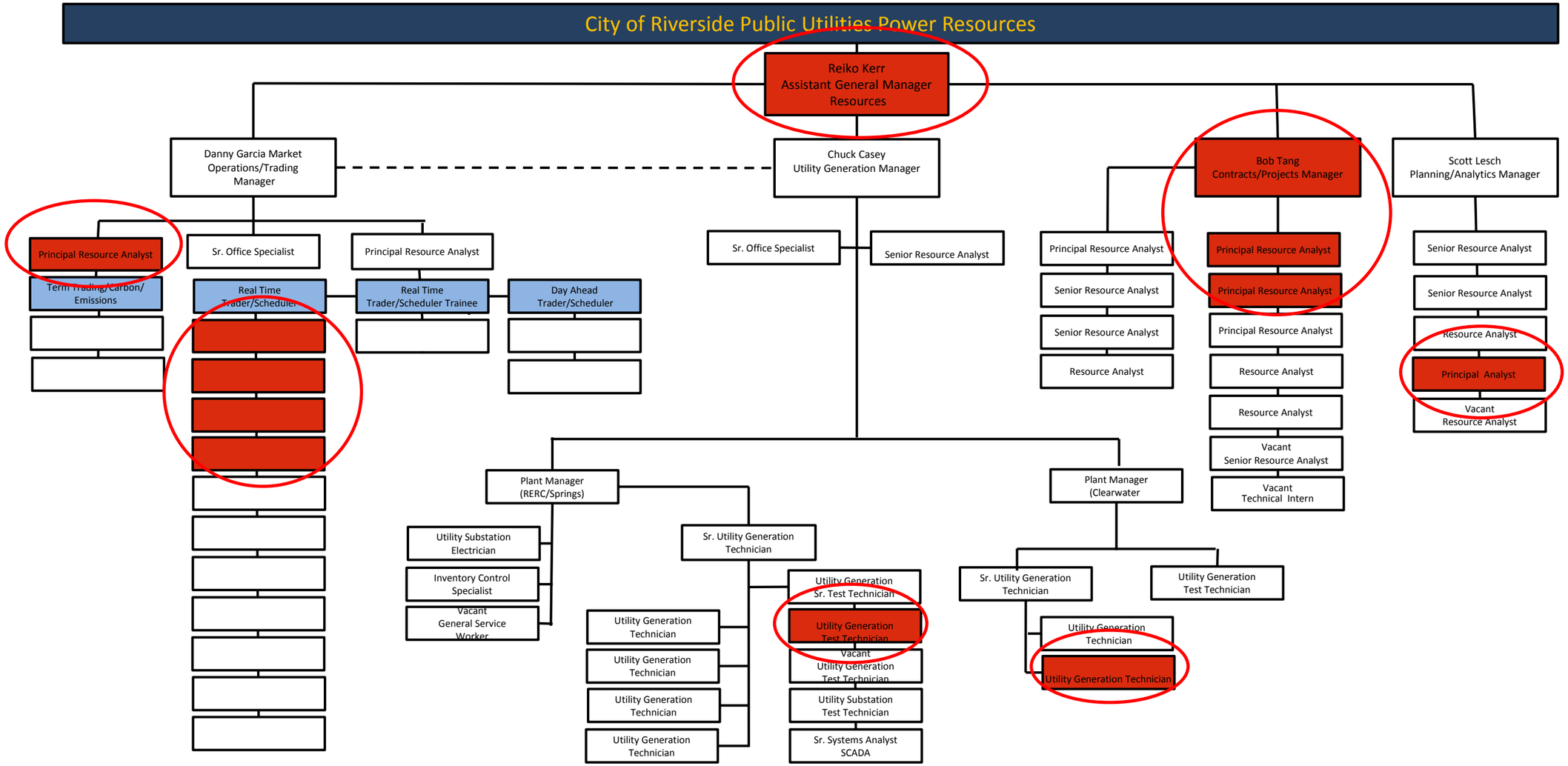


Legend
- Eligible for Retirement (12)
- Near Retirement (12)
- Future Stars/vacancies

- **Pending retirements of Resource Managers & Principals**
- **Retaining well trained staff is/will be a primary challenge**
- **Expanding analytical capabilities Department wide**

Updated 7/9/2015

Other Finding: Resources has Workforce Challenges



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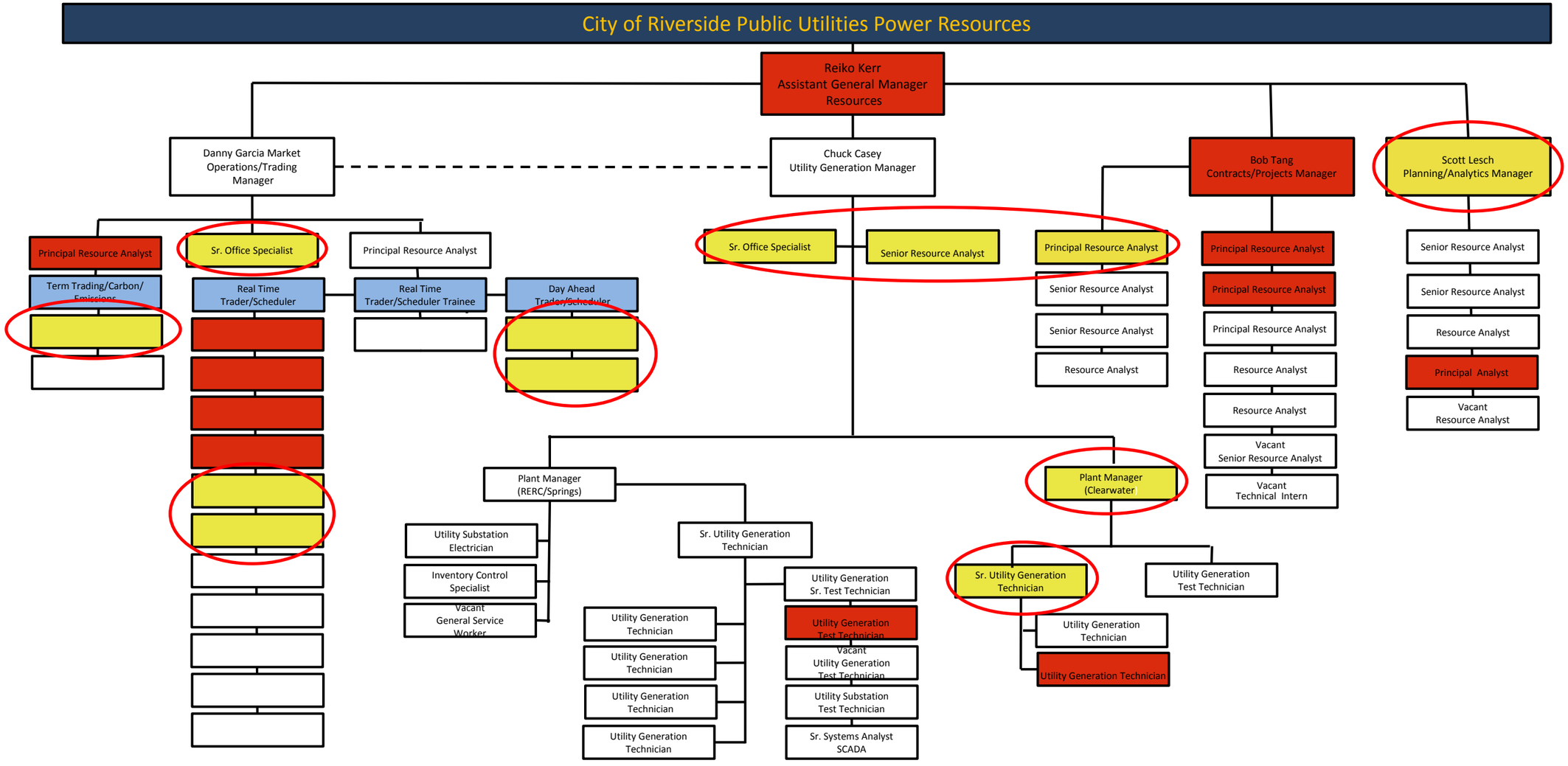

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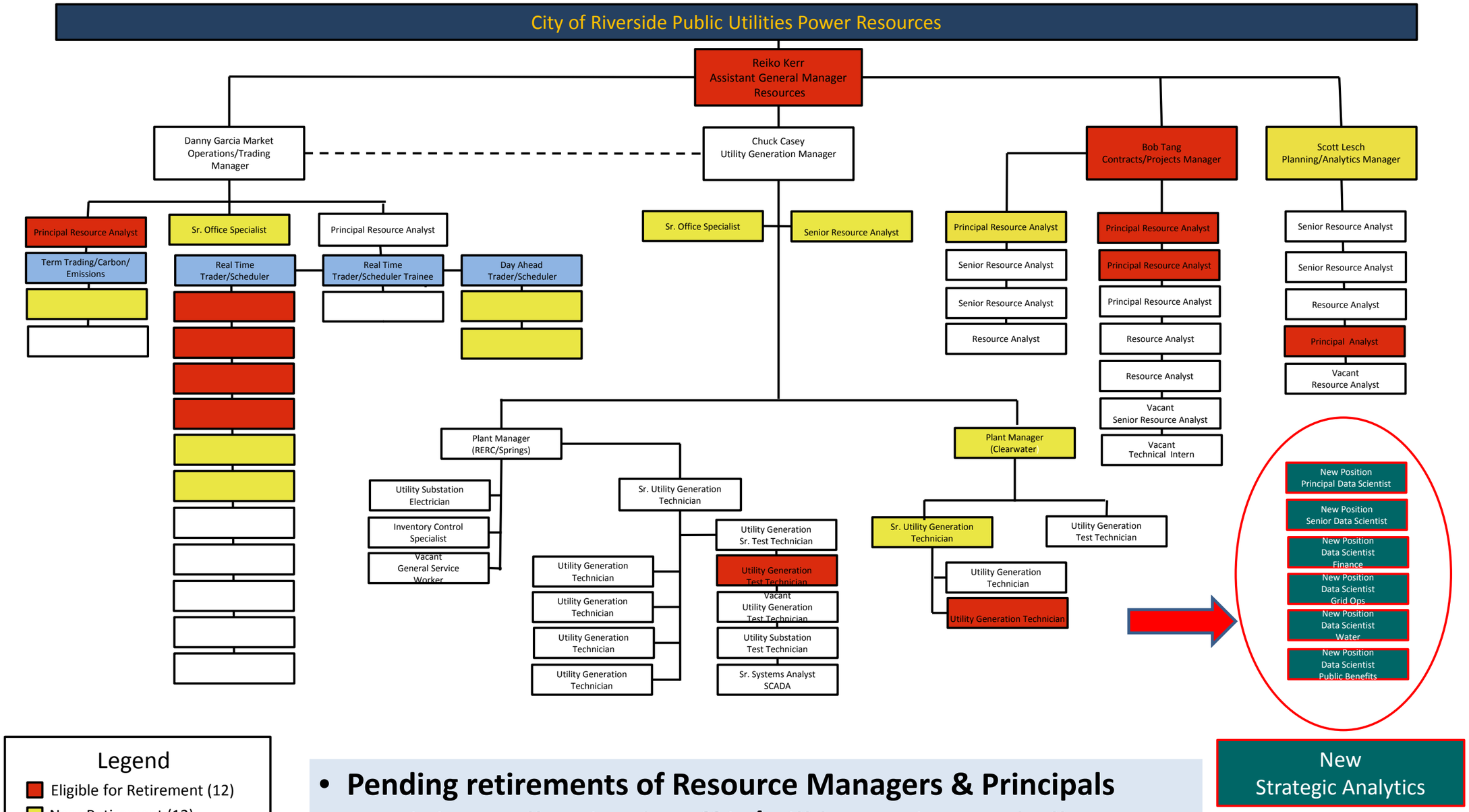
Updated 7/9/2015

Other Finding: Resources has Workforce Challenges



Legend

- Eligible for Retirement (12)
- Near Retirement (12)
- Future Stars/vacancies

- **Pending retirements of Resource Managers & Principals**
- **Retaining well trained staff is/will be a primary challenge**
- **Expanding analytical capabilities Department wide**

New
Strategic Analytics

Updated 7/9/2015

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – ELECTRIC – POWER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

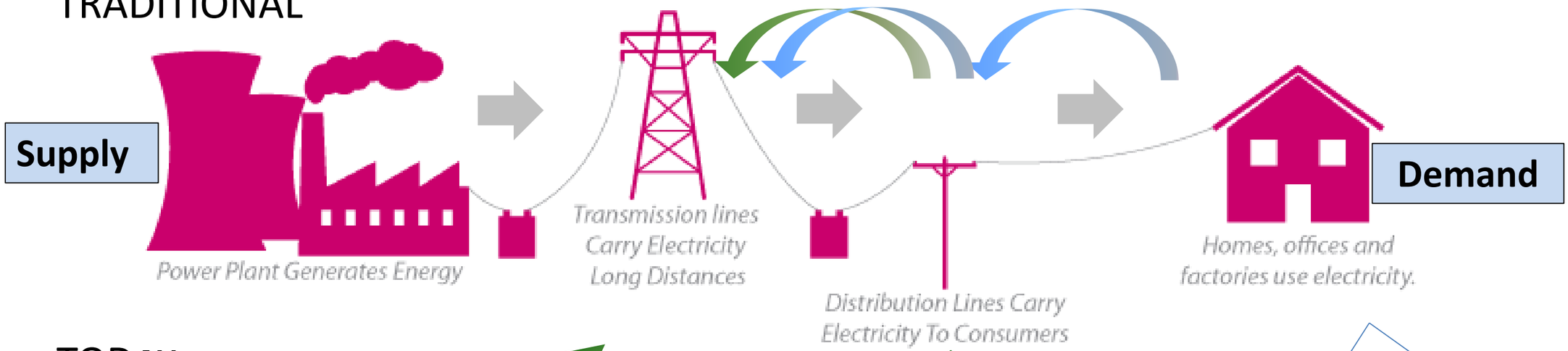
OPTIONS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Utility 2.0

TRADITIONAL



TODAY

Renewable Generation

Local Generation

Distributed
Generation
+ Storage
+EV

FUTURE

More Renewable Generation

Energy Storage

THE BIG PICTURE:
Critical Issues - Future Direction

How will we replace IPP

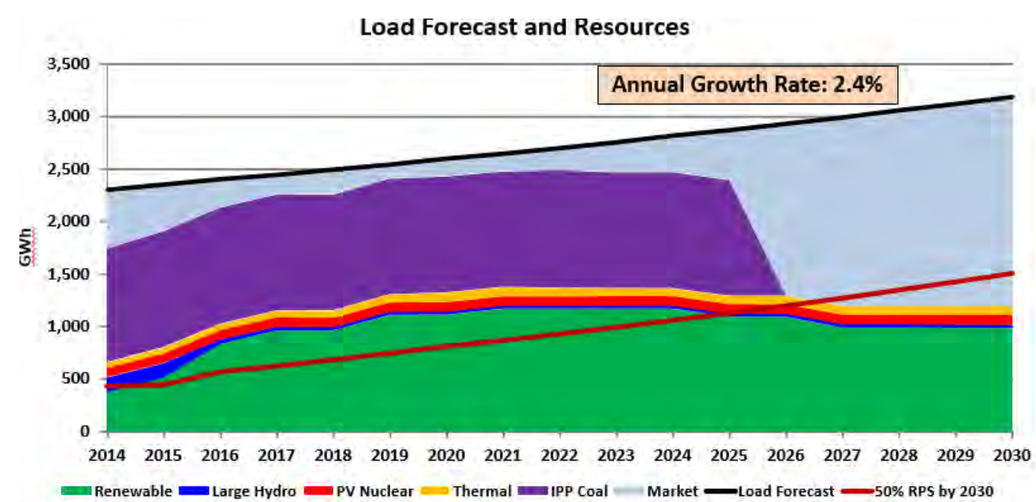
- **Explore all options, remain engaged**

How will we meet our RPS

- **On Track to meet 50% by 2030**

How will we integrate demand and supply

- **Work-in-Process - Collaboration, analytics, communication, advanced technology**
- **RTRP, DG, more generation, local reliability**



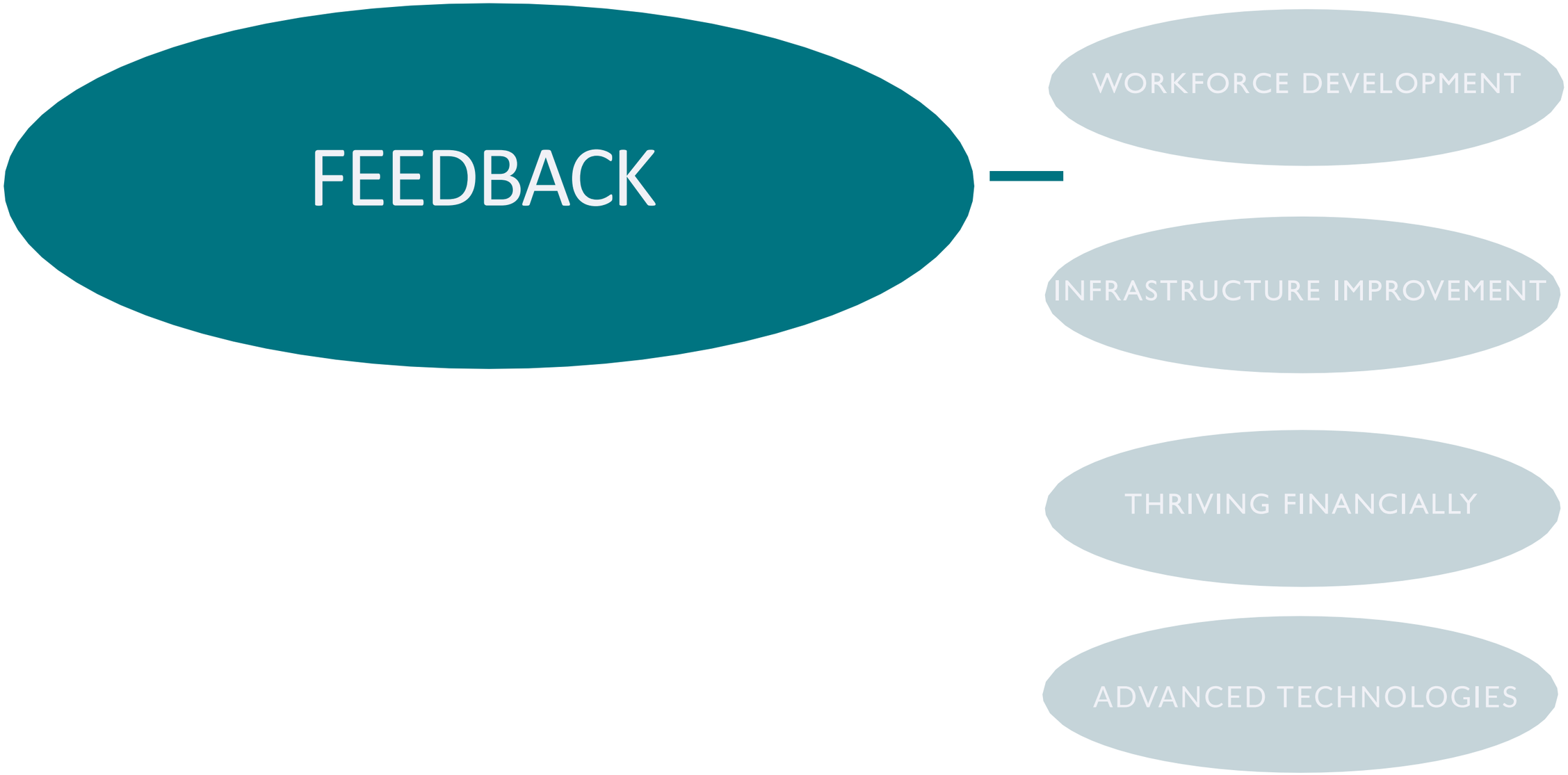
Future Options & Direction

Status	ISSUE	ACTION REQUIRED
■	Intermountain Power Project	Maintain flexibility – 2019 exit option
■	Renewable Portfolio Standard (RPS)	Increase RPS targets to 50% by 2030; monitor development activity
■	San Onofre Nuclear Generating Station (SONGS)	Monitor decommissioning activity and projected costs
■	Integration Demand & Supply	ED, PB, Resources collaborations, RTRP, internal generation, local reliabilty
■	Analytic/Statistical Support	Expand Analytic team/support to other divisions
■	Regulatory	Remain engaged in Regulatory issues impacting RPU
■	CAISO	Remain engaged – Resolve FRAC/MOO & MIC, prepare for alternate operations
■	Solar	Address RPU integration challenges (rates, subsidy, etc.,)

■ In-Progress

■ On-going

ROAD MAPS –


FEEDBACK
WORKFORCE DEVELOPMENT
INFRASTRUCTURE IMPROVEMENT
THRIVING FINANCIALLY
ADVANCED TECHNOLOGIES

Next Steps

- Incorporate Comments
- Formulate Detailed recommendations
- Review
- Report Back

RIVERSIDE PUBLIC UTILITIES

UTILITY 2.0

WATER INFRASTRUCTURE SUPPLY

JULY 29, 2015

WATER | ENERGY | LIFE

CITY OF RIVERSIDE

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Executive Summary

Details

- System History/Background
- System Assessment
- Findings
  - Infrastructure
  - Technology
  - Workforce
- Investment Options
- Sample Recommendations

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT - SUPPLY

EXECUTIVE SUMMARY

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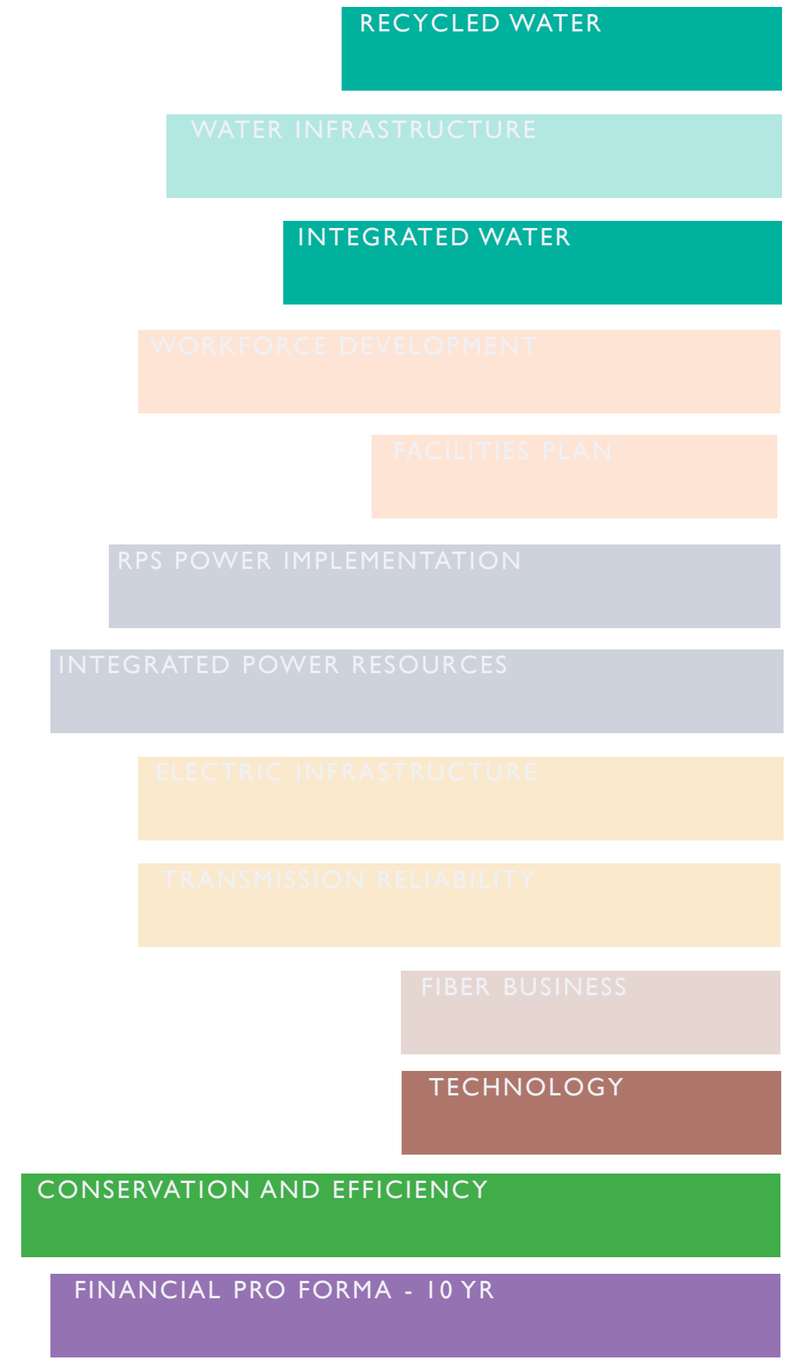
ADVANCED TECHNOLOGIES

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT –
WATER SUPPLY - GOALS

WATER INFRASTRUCTURE - SUPPLY

- Minimize operational reliance on imported water.
- Annually exercise groundwater export rights.
- Conjunctive management of water supply.
- Monetize unused and expiring local water rights.
- Ensure water supply availability.

THE PLANS



100%
Independent

Water Supply

- RPU Independent from imported water
  - Starting in 2008 after more than 40 years
  - Historically about 5 percent of annual supply
- Sufficient groundwater supply for current needs
- A potential resource gap has been identified
  - **30,000** acre feet annually
- Solutions to address the gap
  - **16,000** - Storm Water Capture
  - **4,000** - Recycled Water
  - **10,000** - Increased Conservation
- Opportunities to monetize excess water rights

Water Supply Principles

Considered and Approved

- RPU Board, August 1, 2014
- City Council, October 28, 2014

1. Riverside recognizes its important role as **stewards** managing a **publicly owned resource** for the benefit of a diverse community of agricultural, commercial, institutional and residential stakeholders

Water Supply Principles

2. Riverside will plan water supply projects to **minimize** its operational **reliance on imported water** and insulate the community from external pressures faced by other communities dependent on the Bay-Delta water conveyance facilities while appropriately advocating for a viable state water supply system

Water Supply Principles

3. Riverside will strive to **annually exercise** its maximum allowable groundwater production and **export rights** under the 1969 Western Judgment
   - To exercise its rights, Riverside will preferentially produce water at the lowest cost, while ensuring acceptable water quality, best practices for basin management and compliance with agreements, judgments and other restrictions

Water Supply Principles

4. Riverside recognizes the critical role that **conjunctive management of surface, recycled and groundwater supplies** play in the protection, reliability and sustainability of local, regional and statewide water supplies for water users and the environment
   - In recognizing such, Riverside will work cooperatively with regional and wholesale water agencies to purchase and "bank" **imported water** when economically and physically feasible
   - Riverside will continually evaluate the economic feasibility of using imported water to extend recycled water supplies when used for groundwater recharge

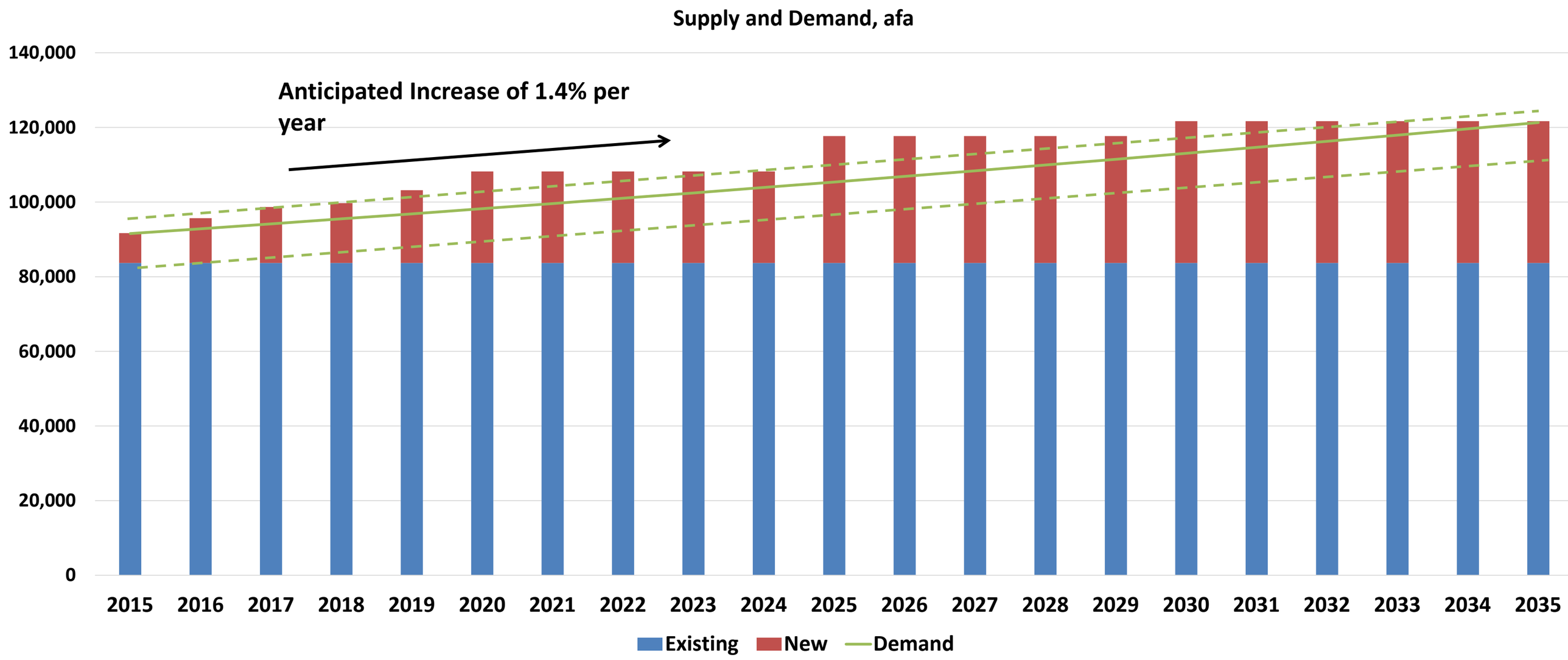
Water Supply Principles

5. Riverside will strive to appropriately **monetize unused and potentially expiring local water production and export rights** through pre-planned and pre-executed water sales agreements

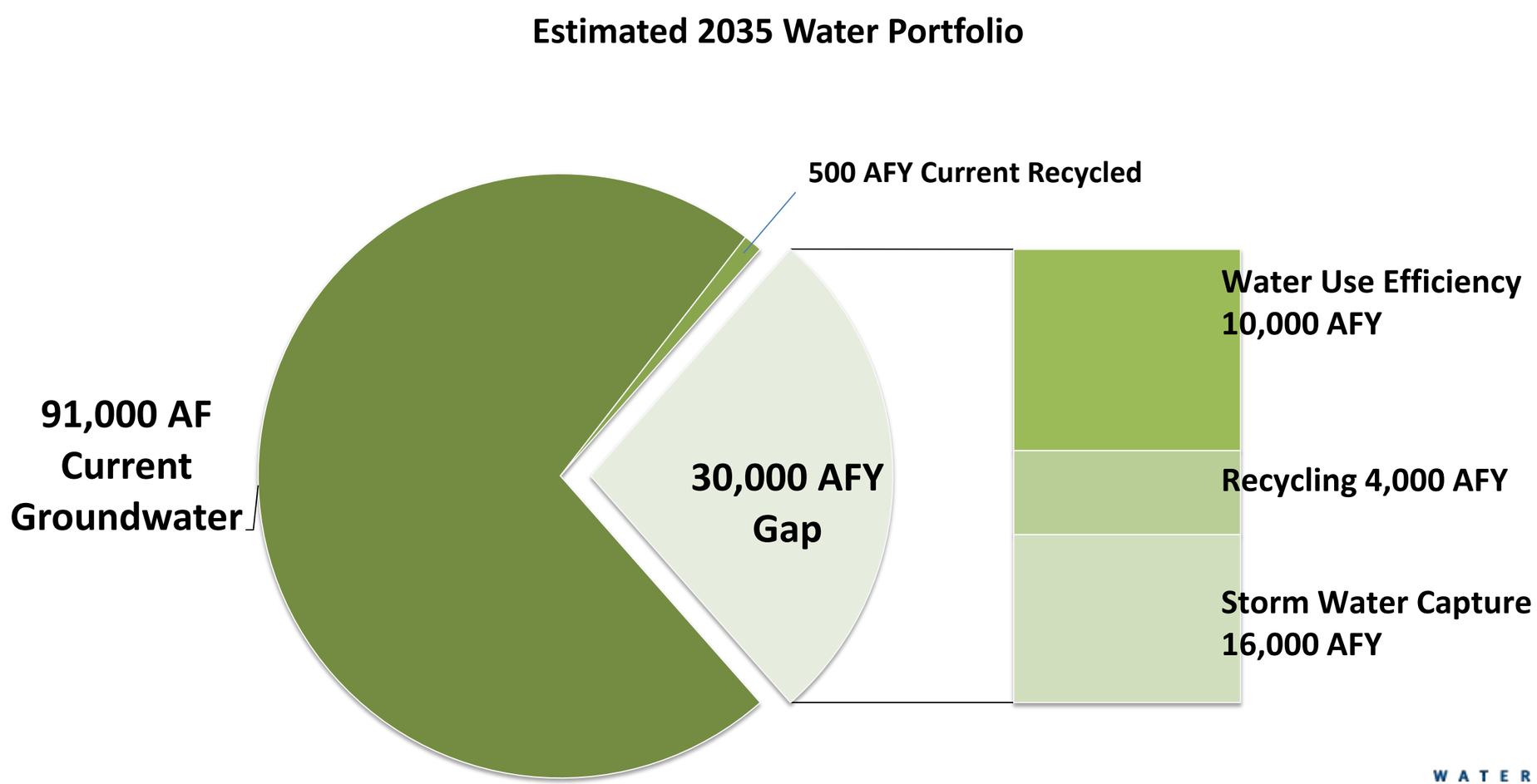
Water Supply Principles

6. Riverside will **ensure water supply** availability for its customers through appropriate and economically balanced local and imported water supplies, conservation and water use efficiency, and demand management measures

Supply Versus Demand



RPU Future Water Supply

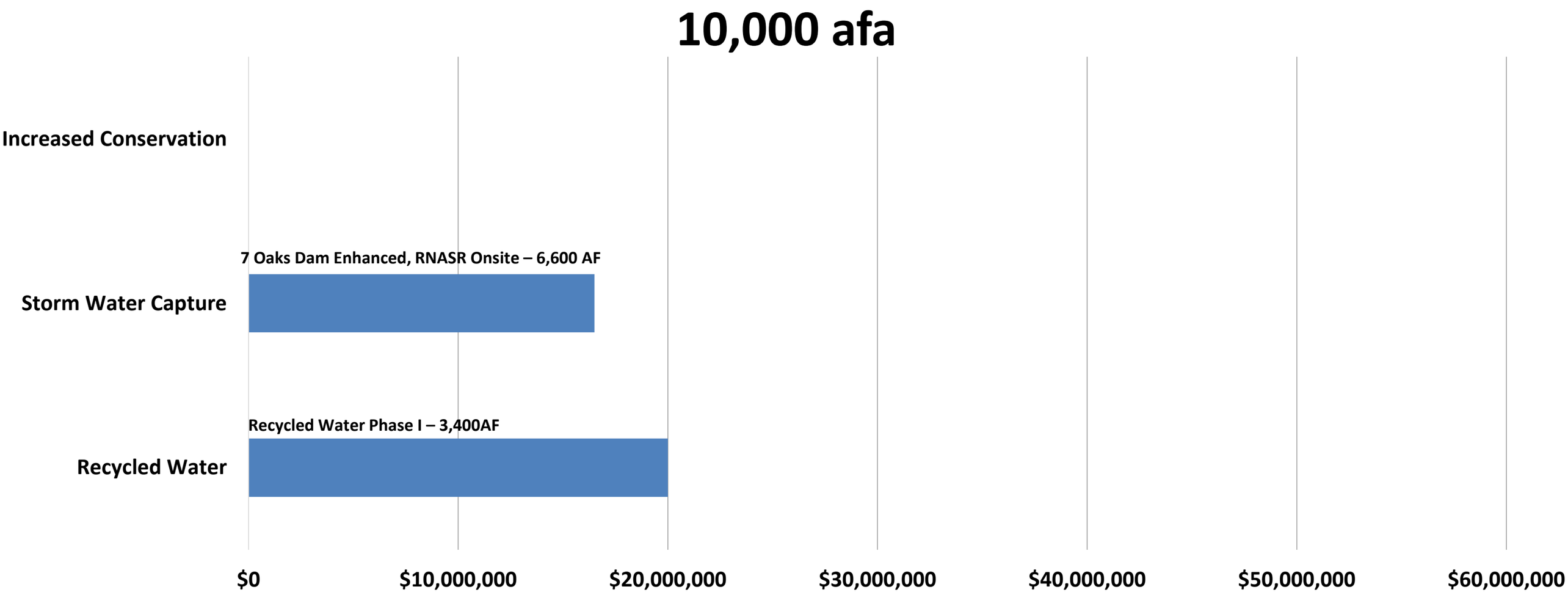


16,000 AF

4,000 AF

10,000 AF
Less Water, More Color

Tier 1: In-Flight Projects, First 1/3 of New Supply



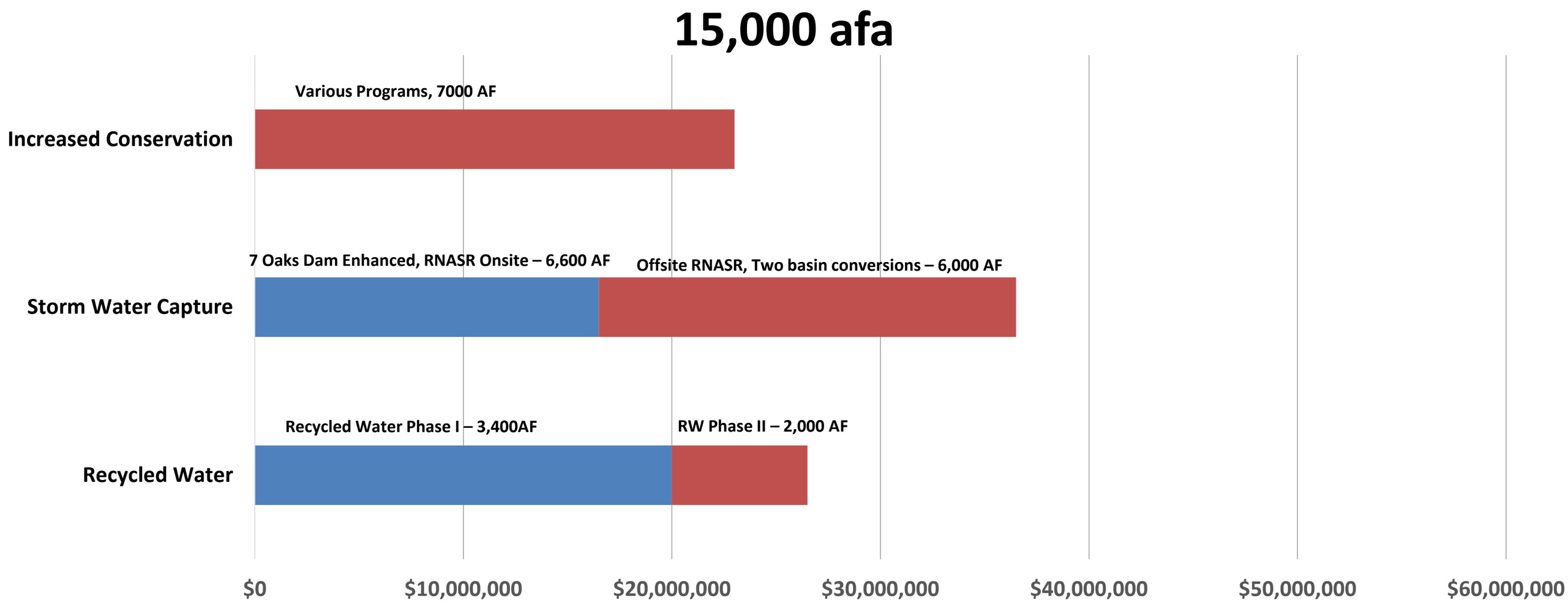
Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $99-124 Million

Projects that are currently underway: Seven Oaks Dam Enhanced Recharge, RNASR (Rubber Dam), Recycled Water Phase I

Tier 2: Next ½ of New Water Supply Projects



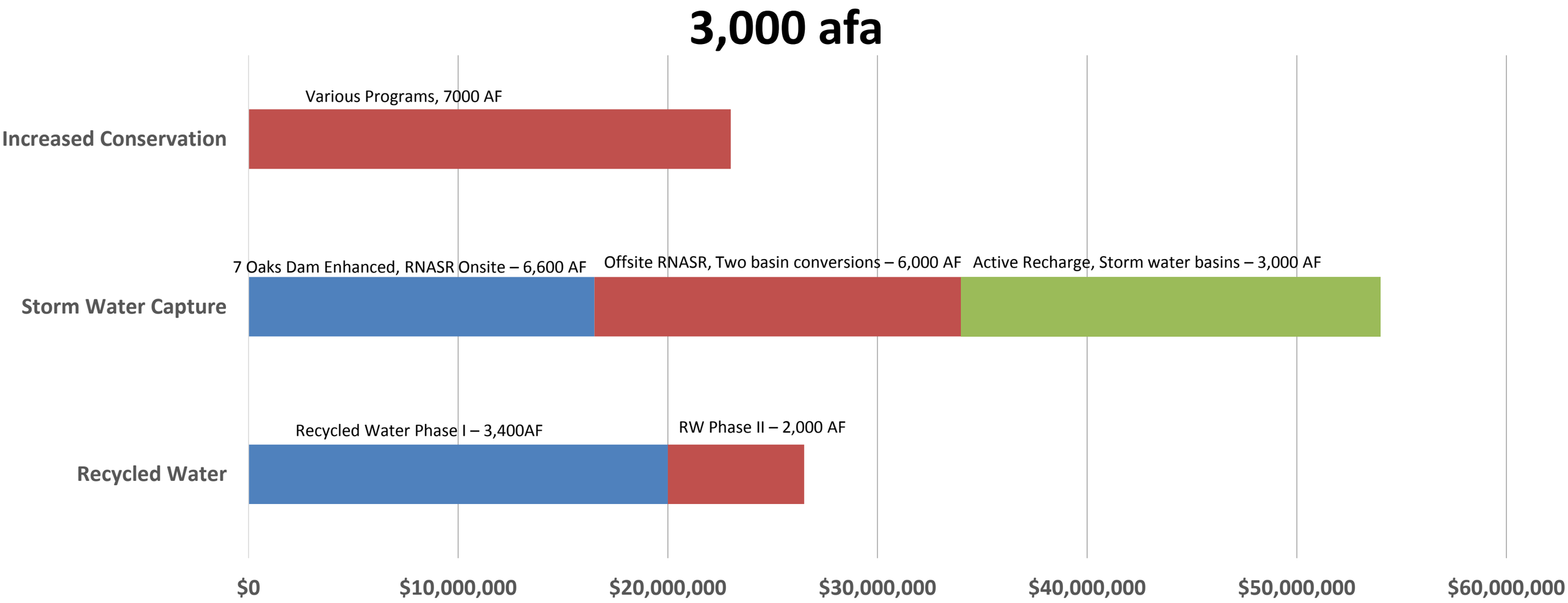
Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $102-124 Million

Includes various water conservation programs, Recycled Water Phase B, RNASR (Rubber Dam) offsite storage and conversion of two storm water retention basins to storm water capture.

Tier 3: Last 10% of New Water Supply



Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $102-124 Million

Includes Active Recharge program, conversion of two storm water retention sites to storm water capture and the creation of two storm water capture sites.

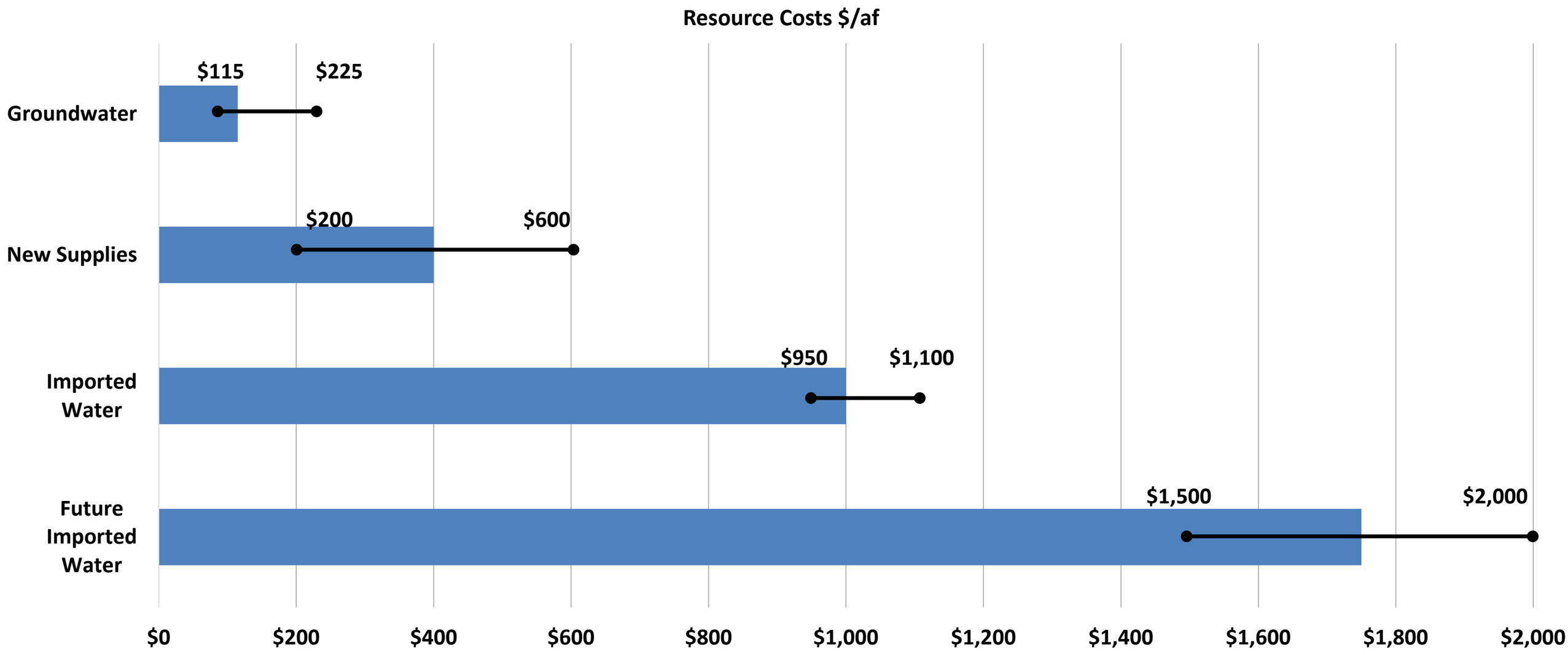
Summary of Investment Options

Water Supply

- Additional financial investment is required to secure additional water supplies

Tier 1	Tier 2	Tier 3
10,000 afa	Additional 15,000 afa	Additional 3,000 afa
↓ ↑	↓ ↑	↓ ↑
$34-$38 million	$74-$93 million	$102-$124 million

Resource Costs



Sample Short-Term Recommendations – Year 1

Storm Water Capture	• Continue processing RNASR (Rubber Dam) EIR and requisite permits • Continue development of Seven Oaks Dam Enhanced Recharge
Recycled Water	• Design, permit and begin construction of Recycled Water – Jackson Street alignment
Conservation	• Increase participation in Waterwise landscaping • Continue other ongoing water conservation projects

Sample Mid-Term Recommendations – Years 2-5

Storm Water Capture	• Complete RNASR (Rubber Dam) project, onsite facilities • Complete Seven Oaks Dam Enhanced Recharge
Recycled Water	• Complete Recycled Water – Jackson Street alignment
Conservation	• Continue water conservation programs

Sample Long-Term Recommendations – Years 6-10

Storm Water Capture	• Complete RNASR (Rubber Dam) offsite facilities • Participate in additional storm water capture projects as needs and/or opportunities arise
Recycled Water	• Expand Recycled Water System - Arlanza area
Conservation	• Continue Water Conservation projects

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – WATER SUPPLY

WORKFORCE DEVELOPMENT

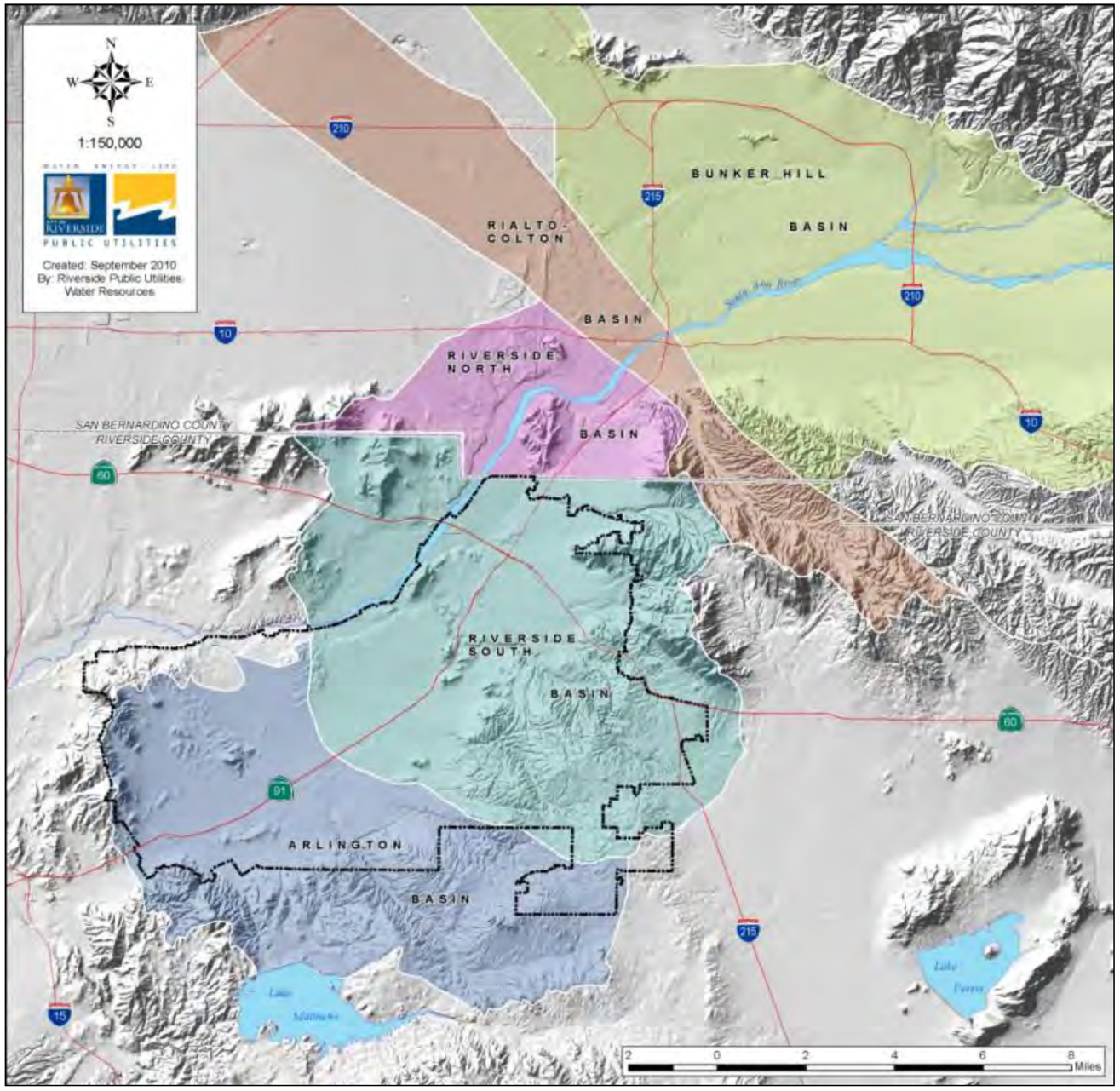
INFRASTRUCTURE IMPROVEMENT - SUPPLY

BACKGROUND

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

WATER RIGHTS SUMMARY BY BASIN



Appe

Extraction/Export Rights

Bunker Hill

- 55,145 AFY Export

Colton

- 2,728 AFY Export

Riverside North

- 11,351 AFY Export

Riverside South

- 16,880 AFY Extraction

86,104 AFY Total

Basin Characteristics

Groundwater Basin	Surface Area (acres)	Storage Capacity (acre-ft)	Depth to Bedrock (ft)	Estimated Safe Yield (acre-ft/yr)	Safe Yield % of Storage Capacity
Bunker Hill	89,600[C]	5,976,000[C]	> 1,200[B]	232,100[A]	4%
Rialto-Colton	30,000[C]	2,517,000[C]	> 1,000	17,675	1%
Riverside	39,680	1,646,000	400 to 700	62,300[D]	4%
Total	159,280	10,139,000	---	---	---

A) Western-San Bernardino Judgment
B) USGS Open-File Report 2005-1278
C) DWR bulletin 118
D) Riverside-Arlington Groundwater Flow Model

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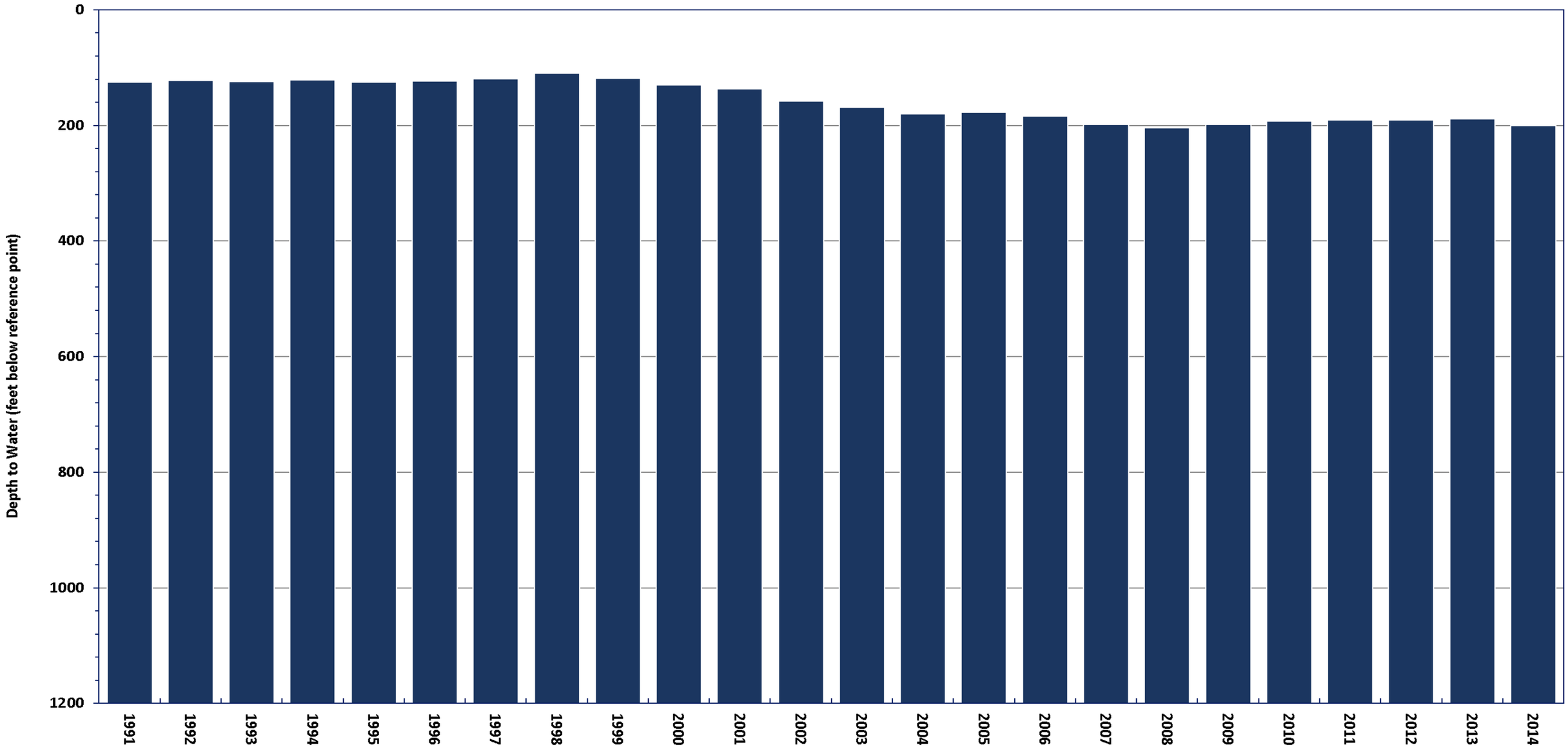
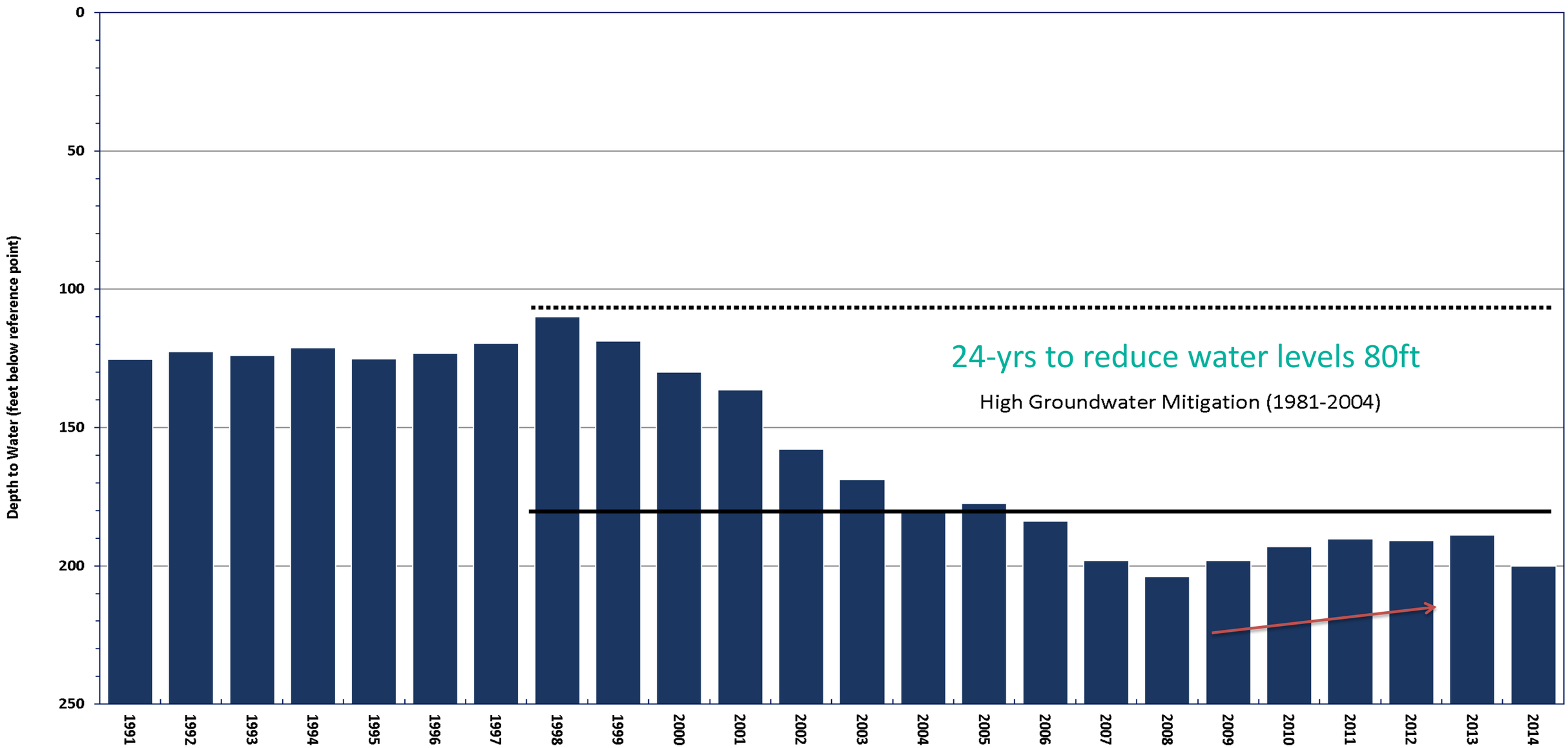
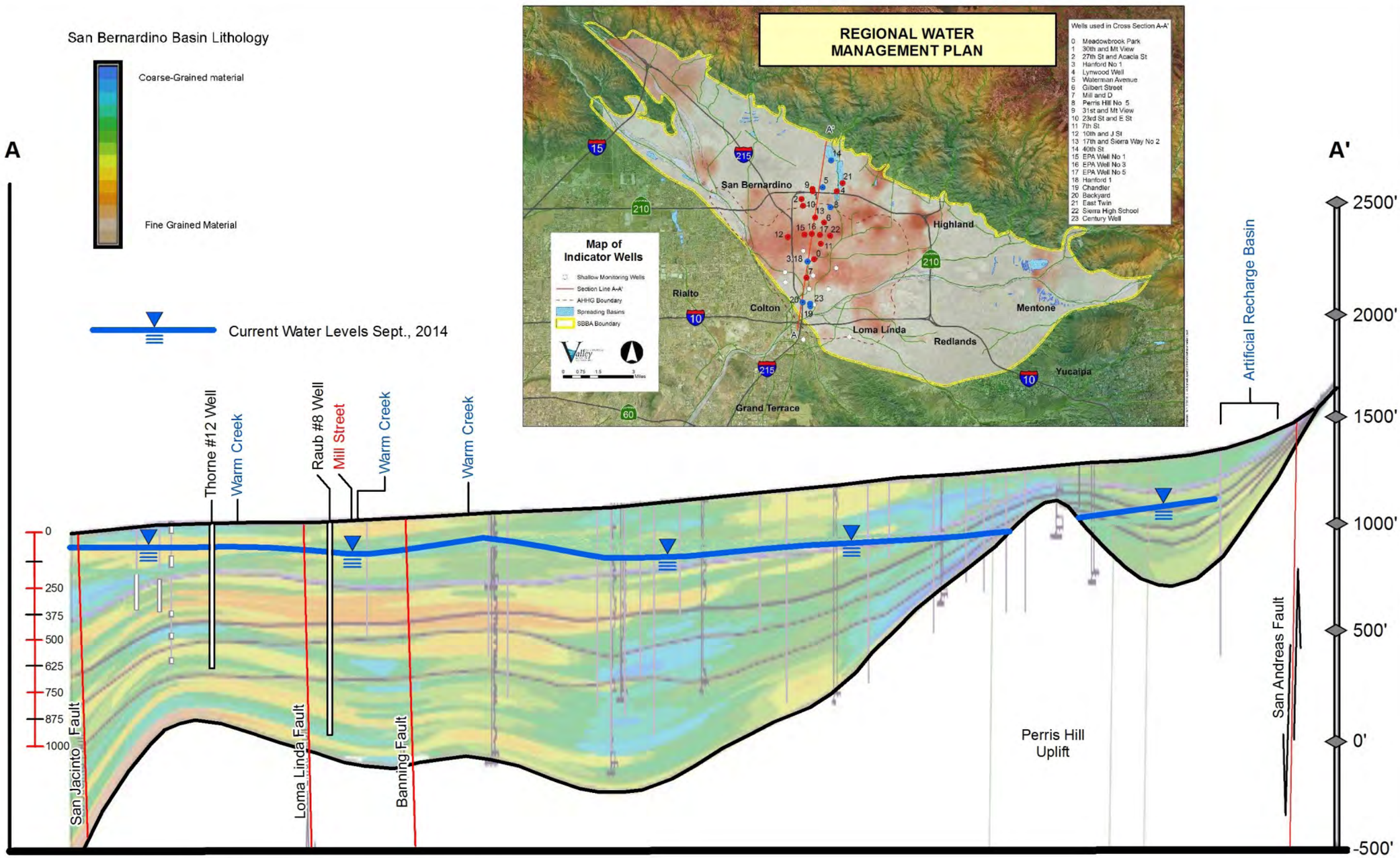
Bunker Hill Water Levels



Bunker Hill Water Levels



Levels trended upward from 2008 to 2013, during a time of below average hydrology



Section A-A' and stratigraphic base from Numeric Solutions, LLC.

Well construction and water level data from the SBVMWD Water Resources Database

Created by: Riverside Public Utilities
On: June, 2015

Water Resources

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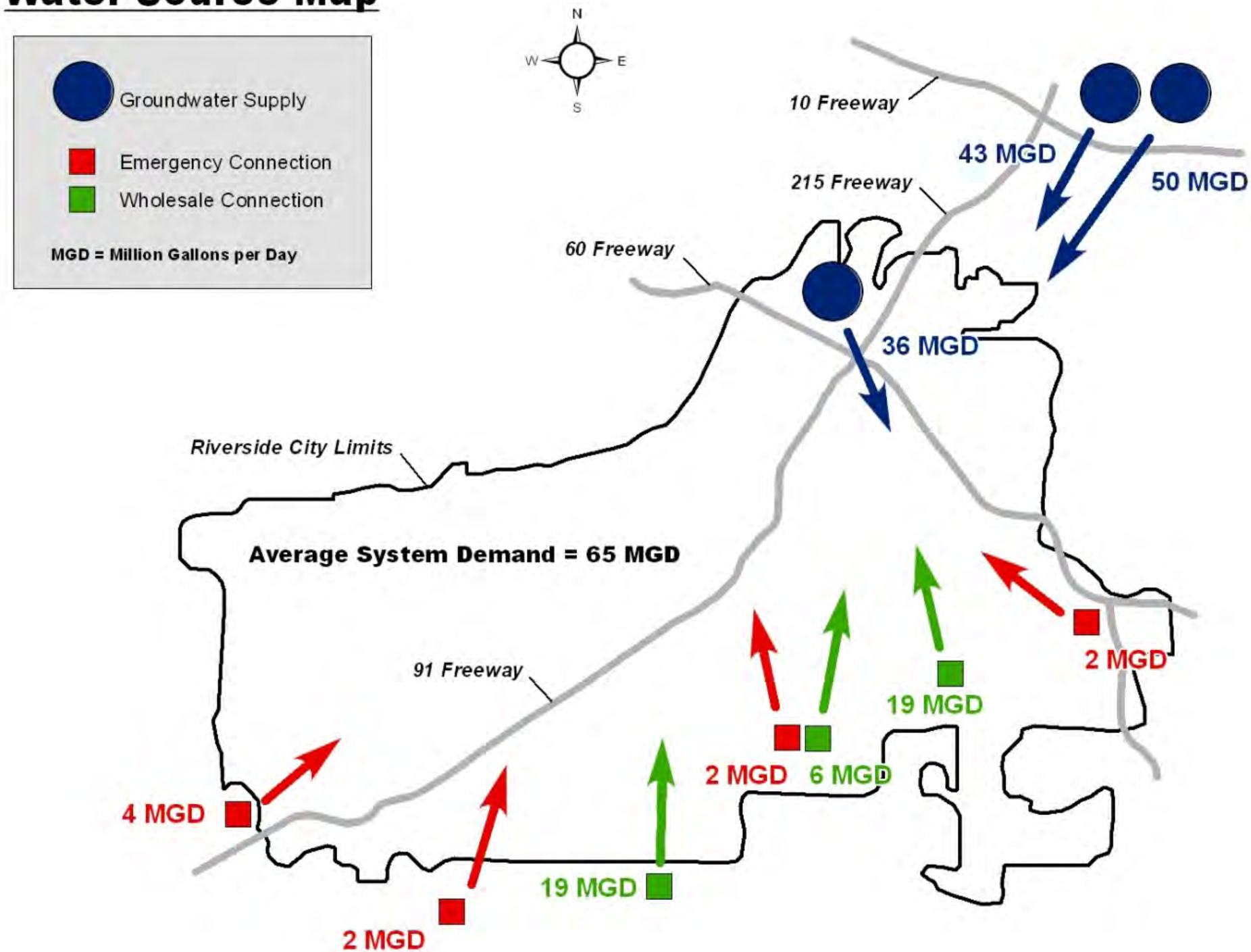
Water Source Map



ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – WATER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT - SUPPLY

ASSESSMENT

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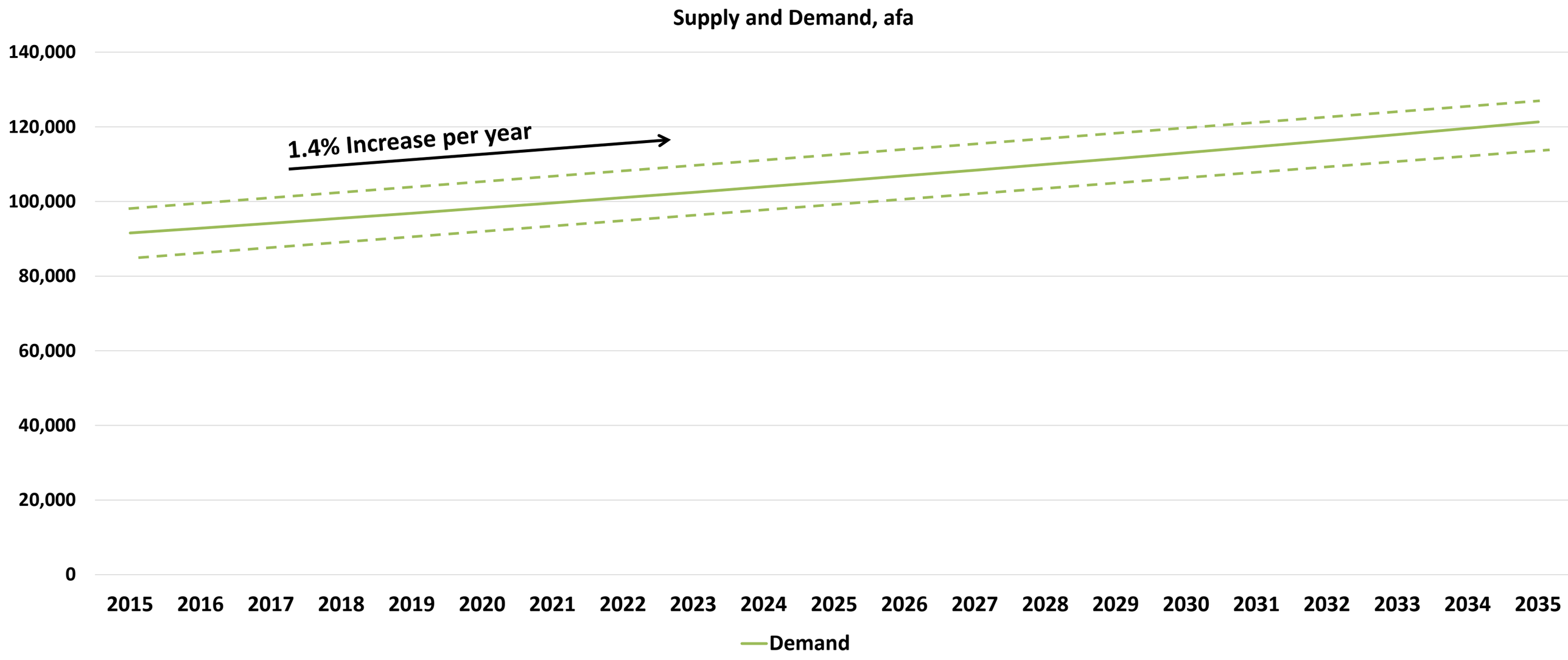
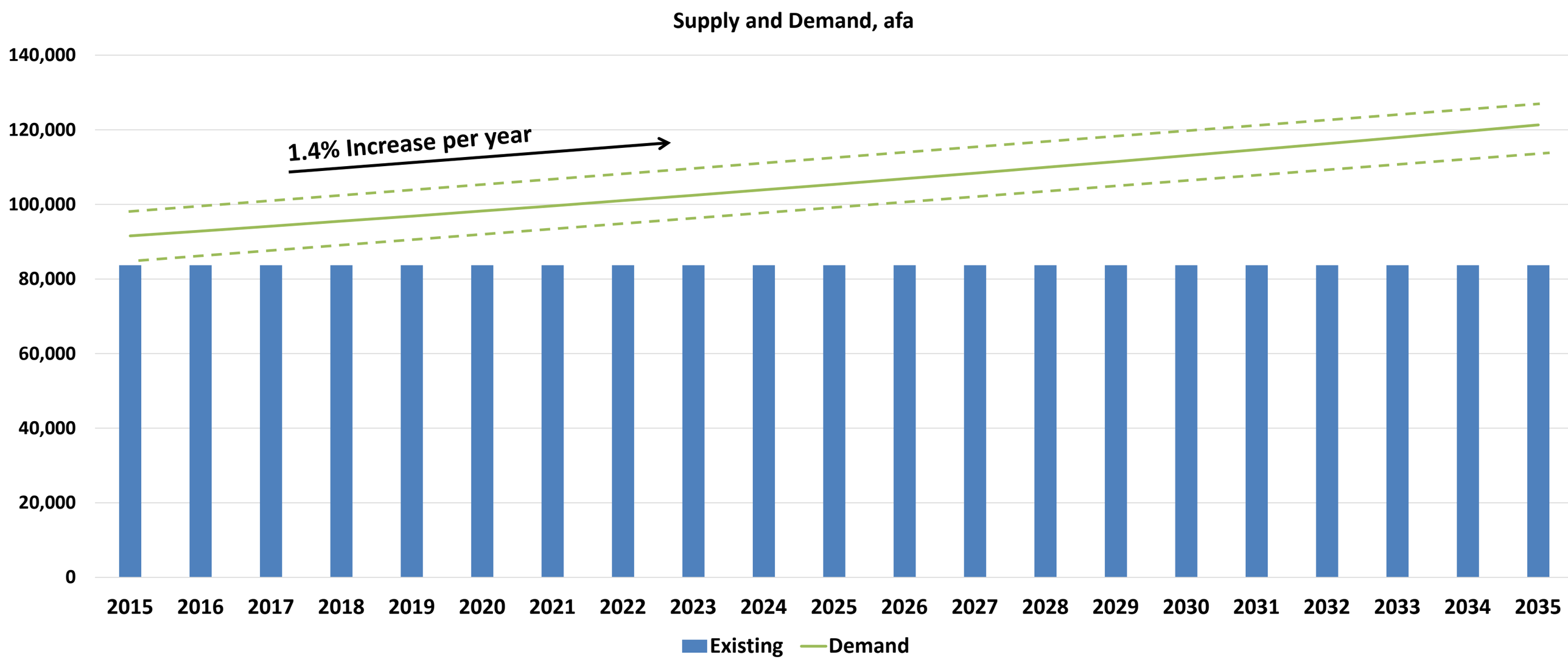
ADVANCED TECHNOLOGIES

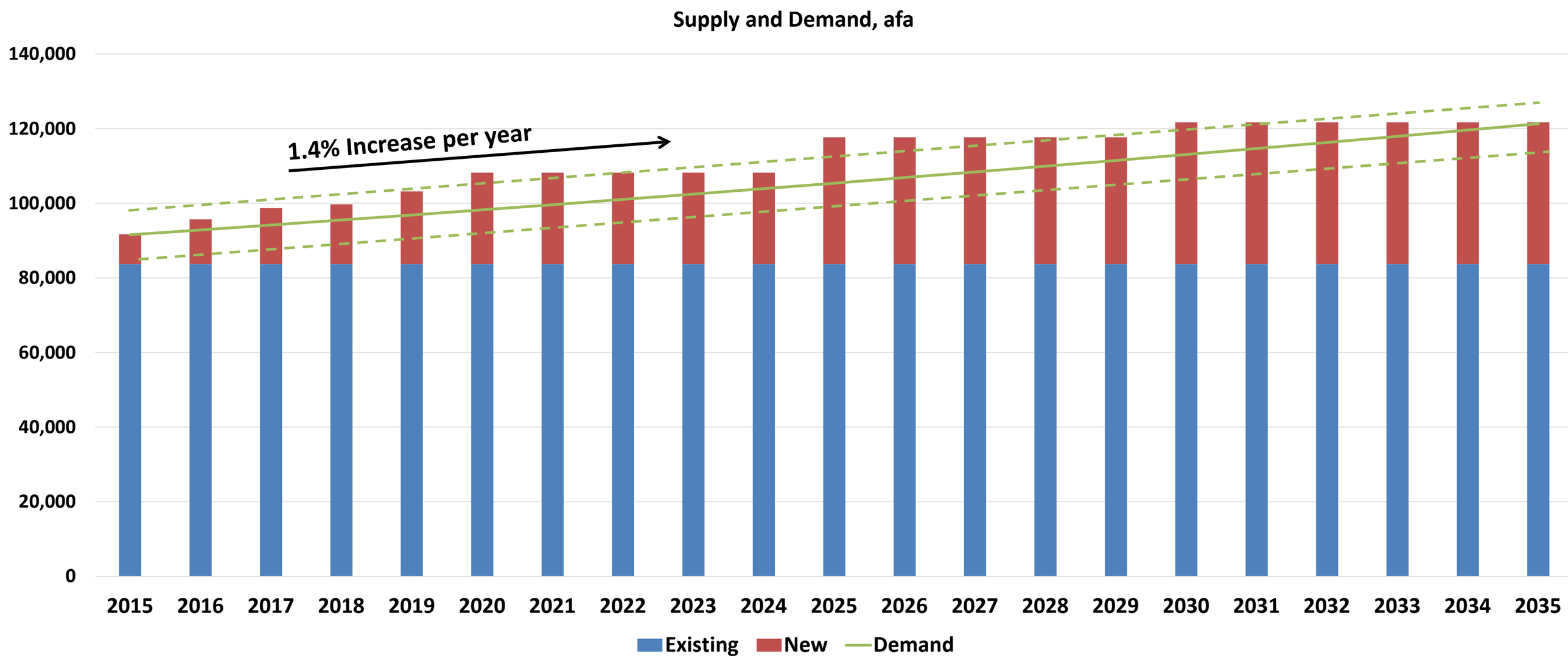
Supply Versus Demand



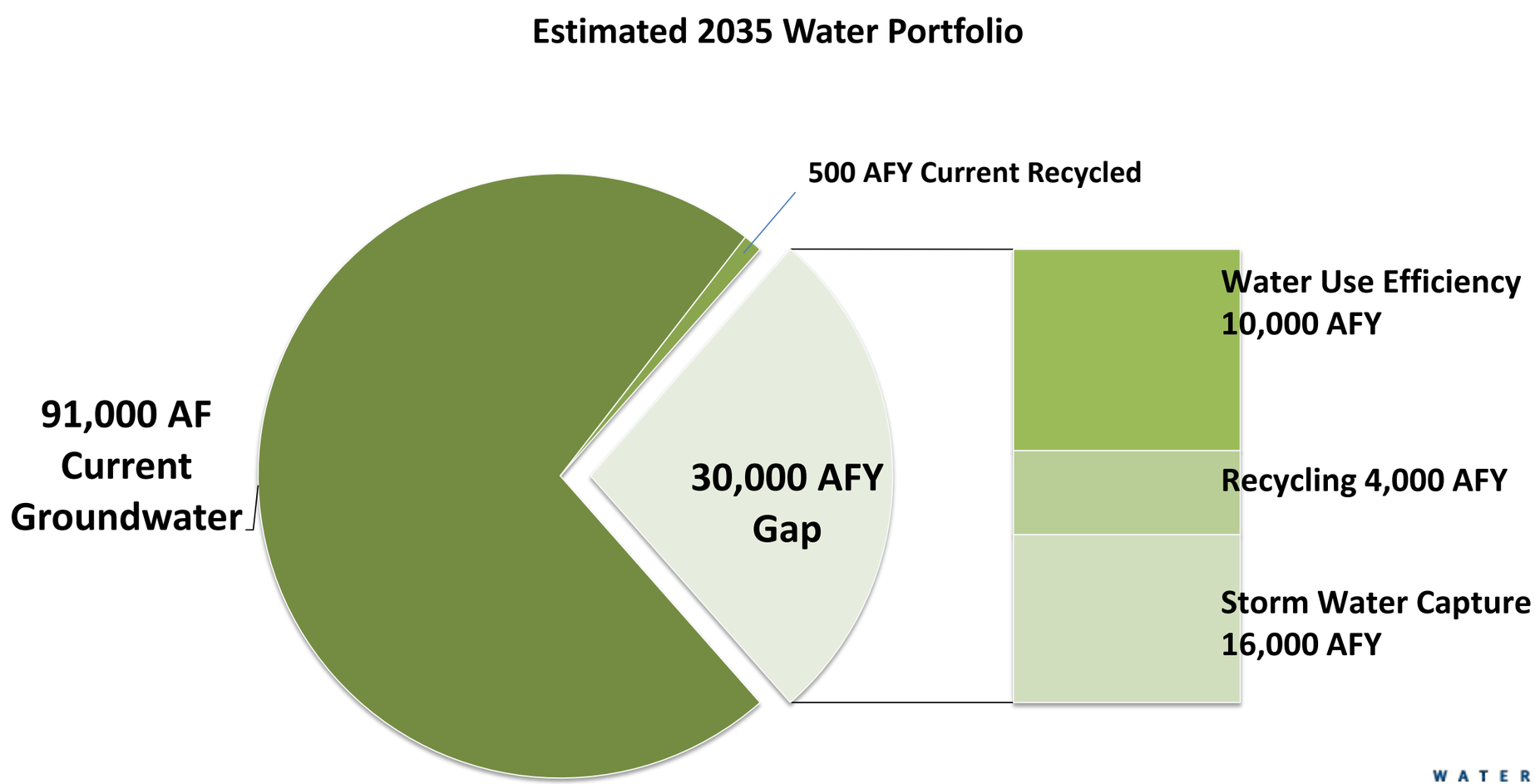
Supply Versus Demand



Supply Versus Demand



RPU Future Water Supply



16,000 AF

Storm Water Capture

- Slow down or retain storm water to allow for recharge
  - Dams
  - Diversion structures
  - Basins
  - Sand and gravel beds
  - “Recoverable”

Storm Water Capture, 53% of Future Supply

- Large Scale
  - Riverside North ASR (Rubber Dam Project) 3,500 afy and 4,600 afy
  - Seven Oaks Dam (Enhanced Recharge Project) 3,000 afy
  - Active Recharge Project 2,000 afy
- Mid Scale
  - Conjunctive use of storm water basins 2,500 afy
- Small Scale
  - Urban projects 400 afy

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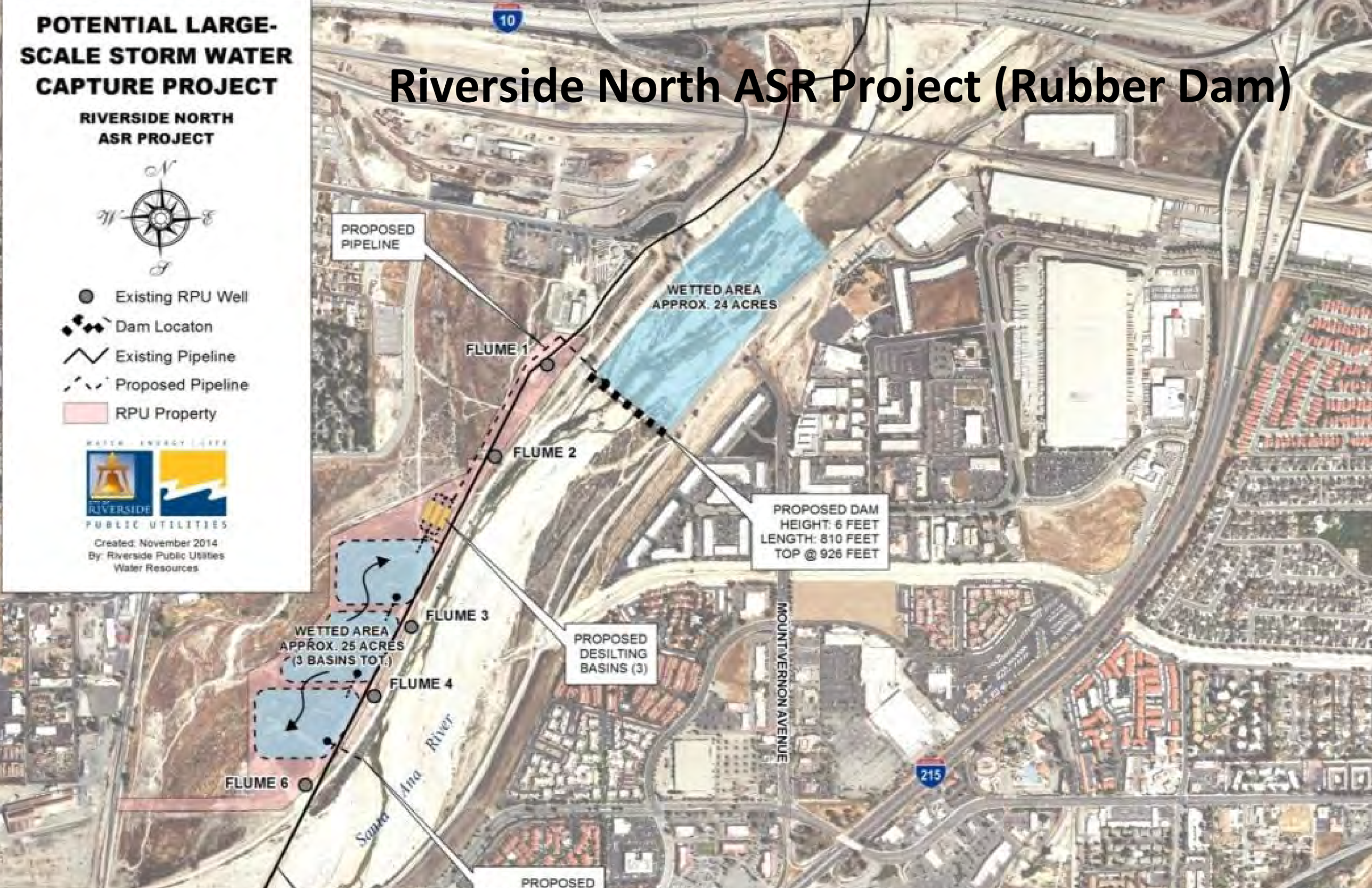
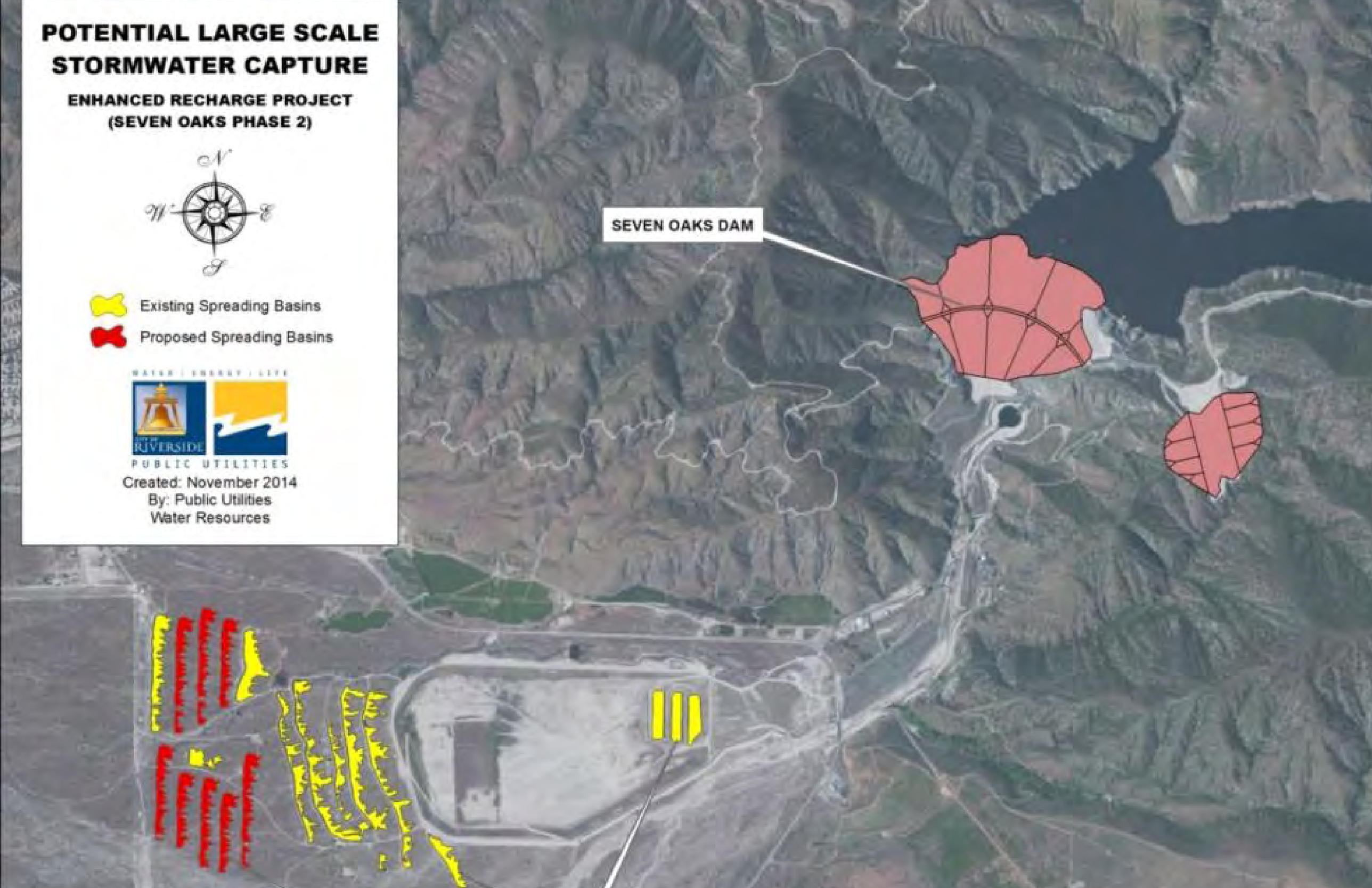
Riverside North ASR Project (Rubber Dam)



Seven Oaks Dam

POTENTIAL LARGE SCALE STORMWATER CAPTURE

ENHANCED RECHARGE PROJECT (SEVEN OAKS PHASE 2)



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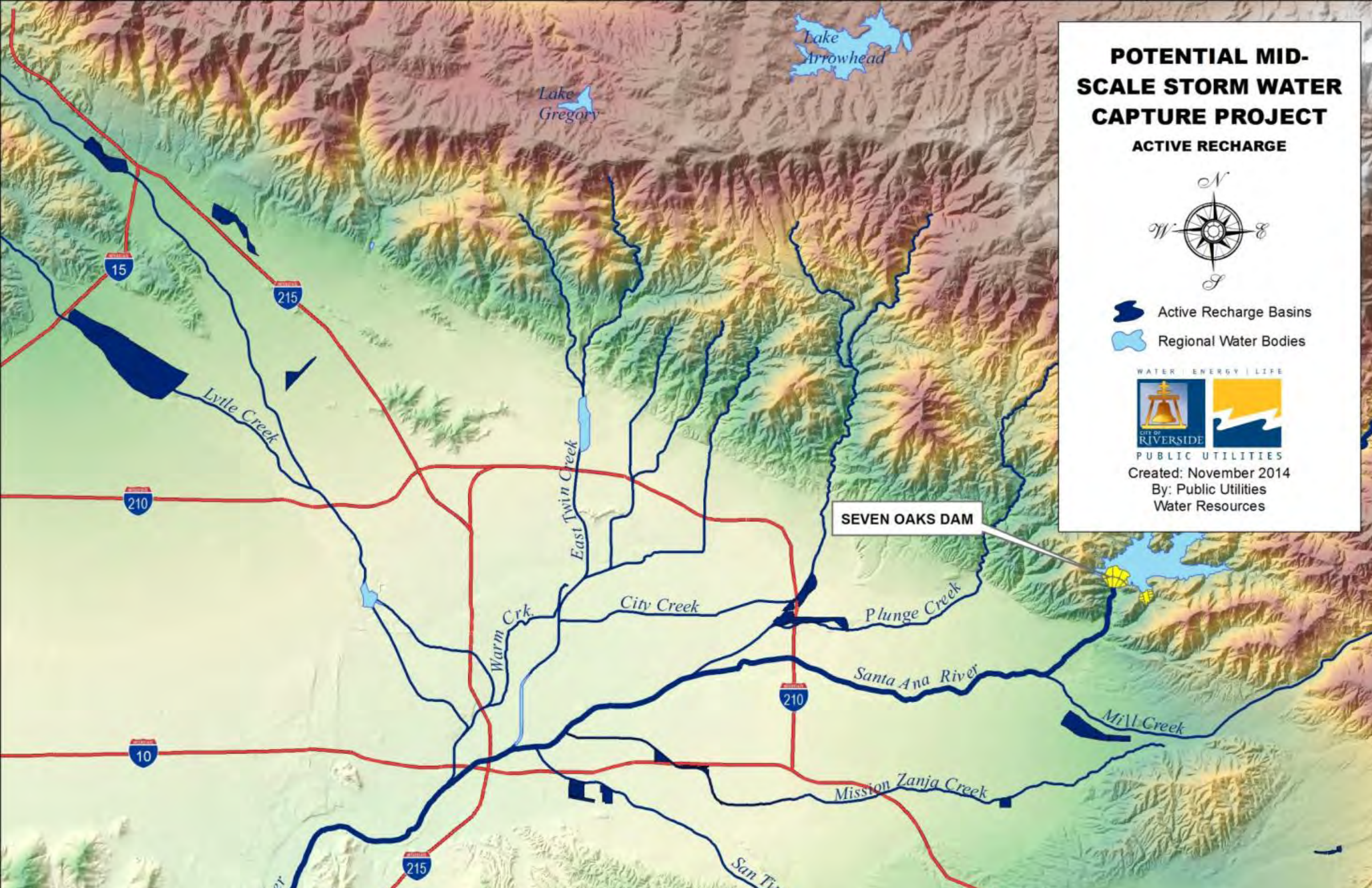
Water Resources


POTENTIAL MID-SCALE STORM WATER CAPTURE PROJECT
ACTIVE RECHARGE
N
W
E
S
Active Recharge Basins
Regional Water Bodies
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CITY OF RIVERSIDE
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Created: November 2014
By: Public Utilities
Water Resources
Lake Arrowhead
Lake Gregory
SEVEN OAKS DAM
Lytle Creek
East Twin Creek
Warm Crk.
City Creek
Plunge Creek
Santa Ana River
Mill Creek
Mission Zanja Creek
15
215
210
10

MID-SCALE CAPTURE PROJECTS

CAPTURE PROJECT ACTIVE RECHARGE

N
W E
S

Riverside Country Flood Control Facilities
Riverside Canal
Gage Canal
Santa Ana Valley Pipeline

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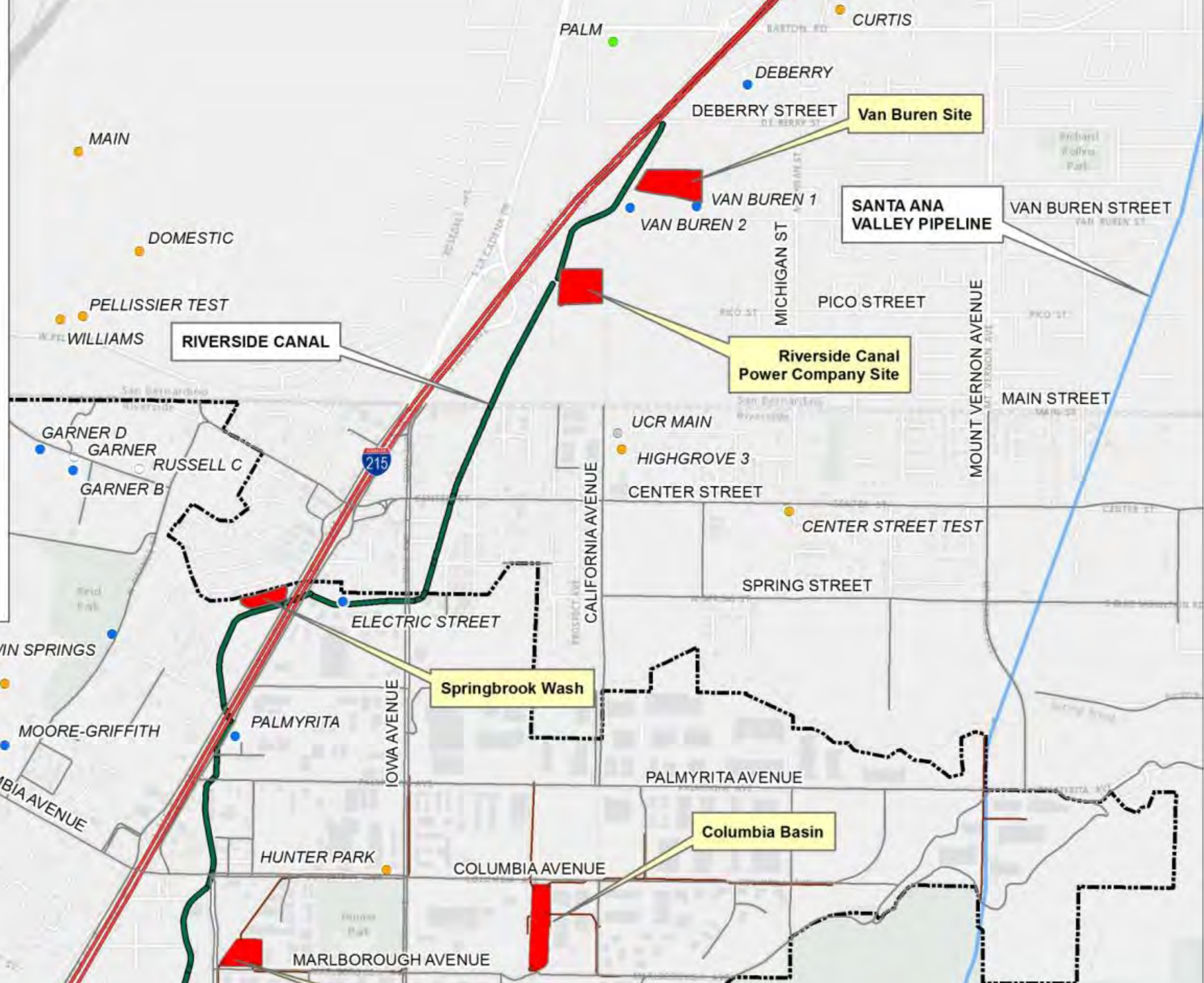
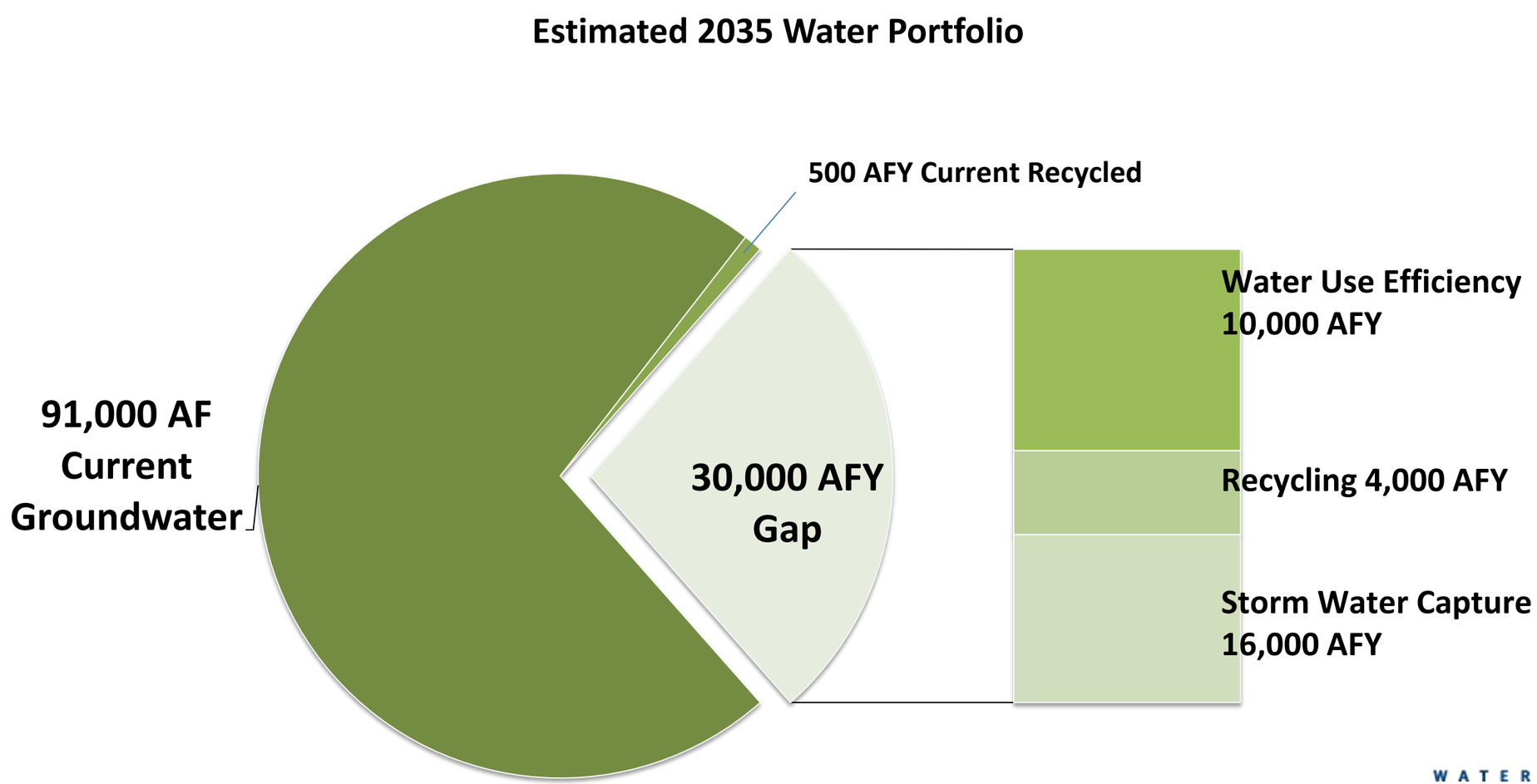
Water Resources



Small Scale Projects

RPU Future Water Supply

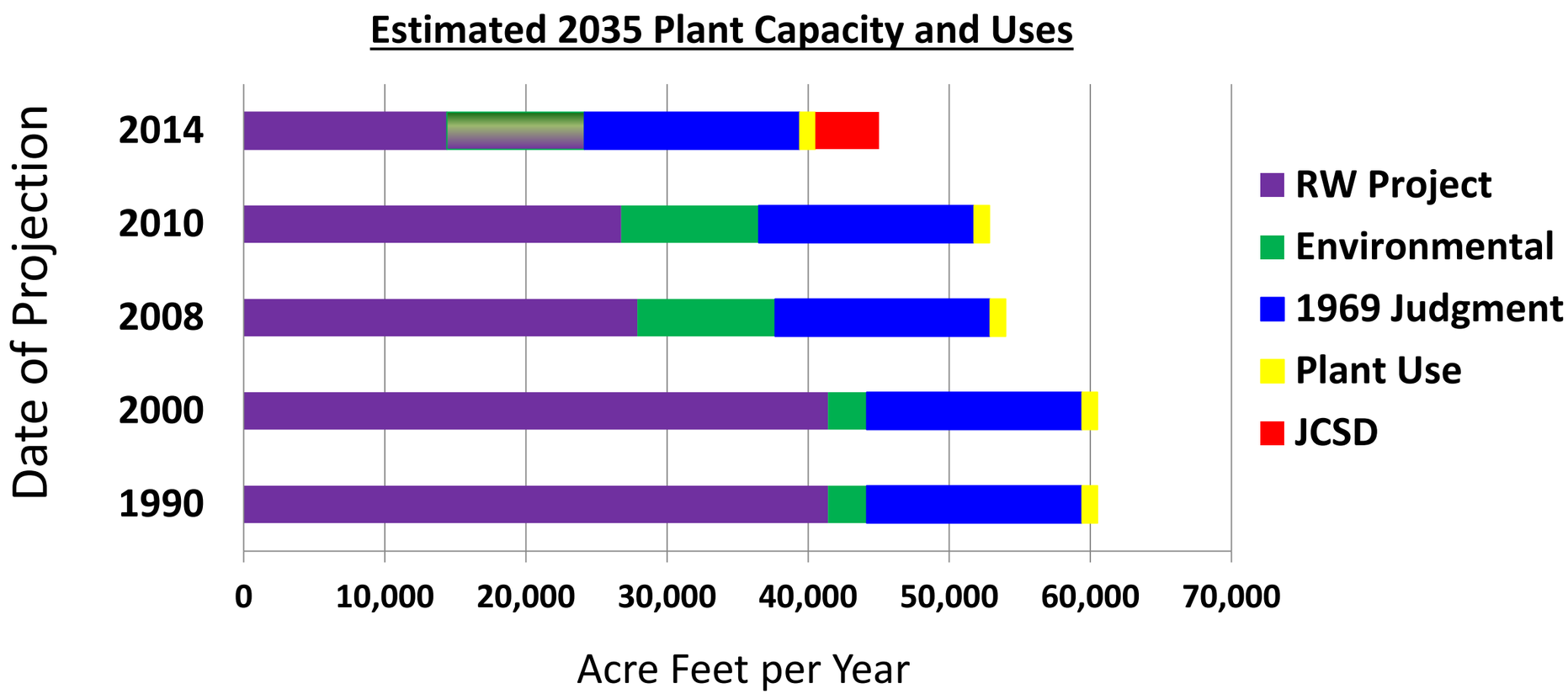


4,000 AF

Recycled Water, 13% of new Supply

- Began considering in 1991
  - Multiple configurations
- 4,000 afa
- Small customer base
- Reliable

Recycled Water – Lowered Estimates



Current yield available ≈ 7,500 AFY

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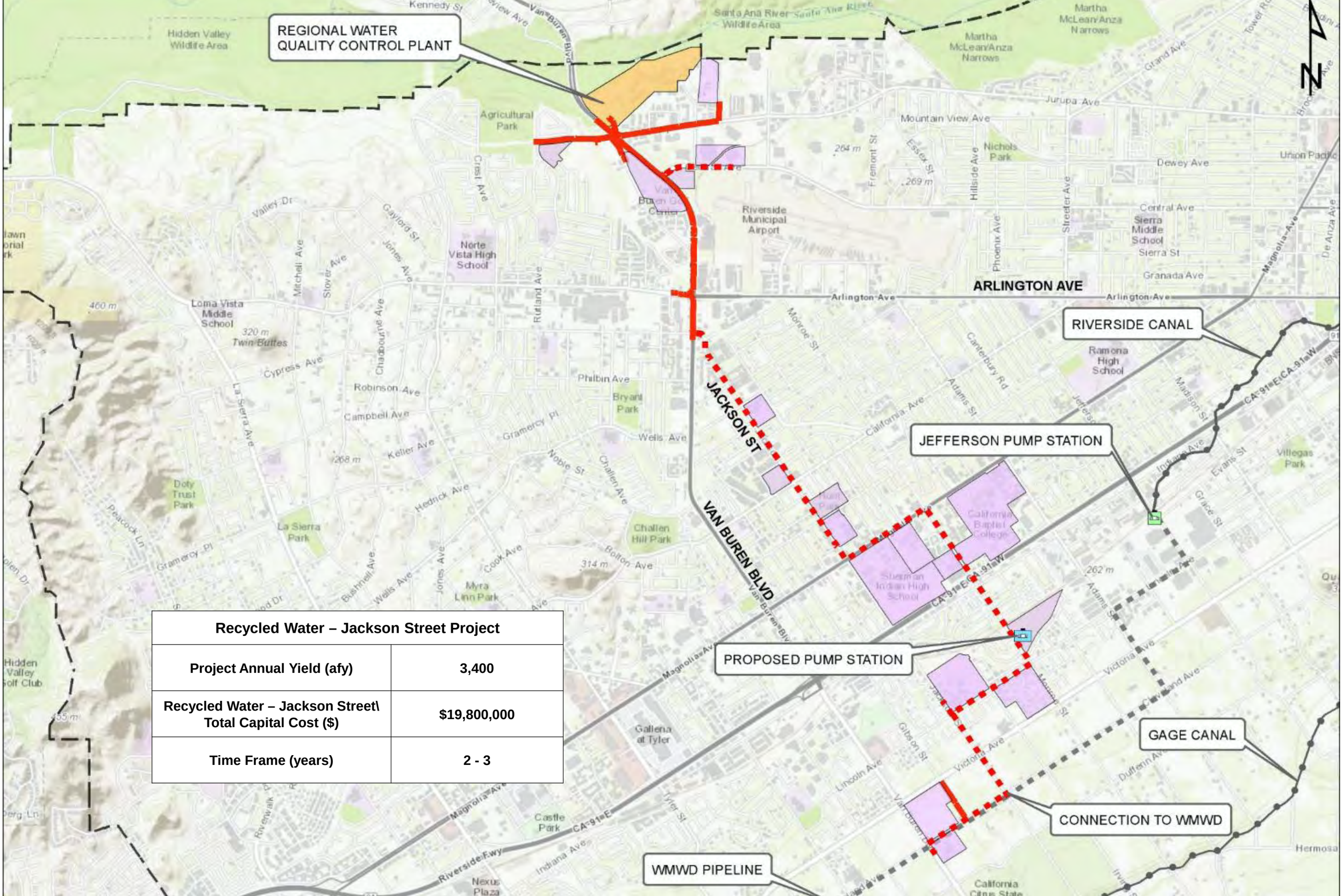
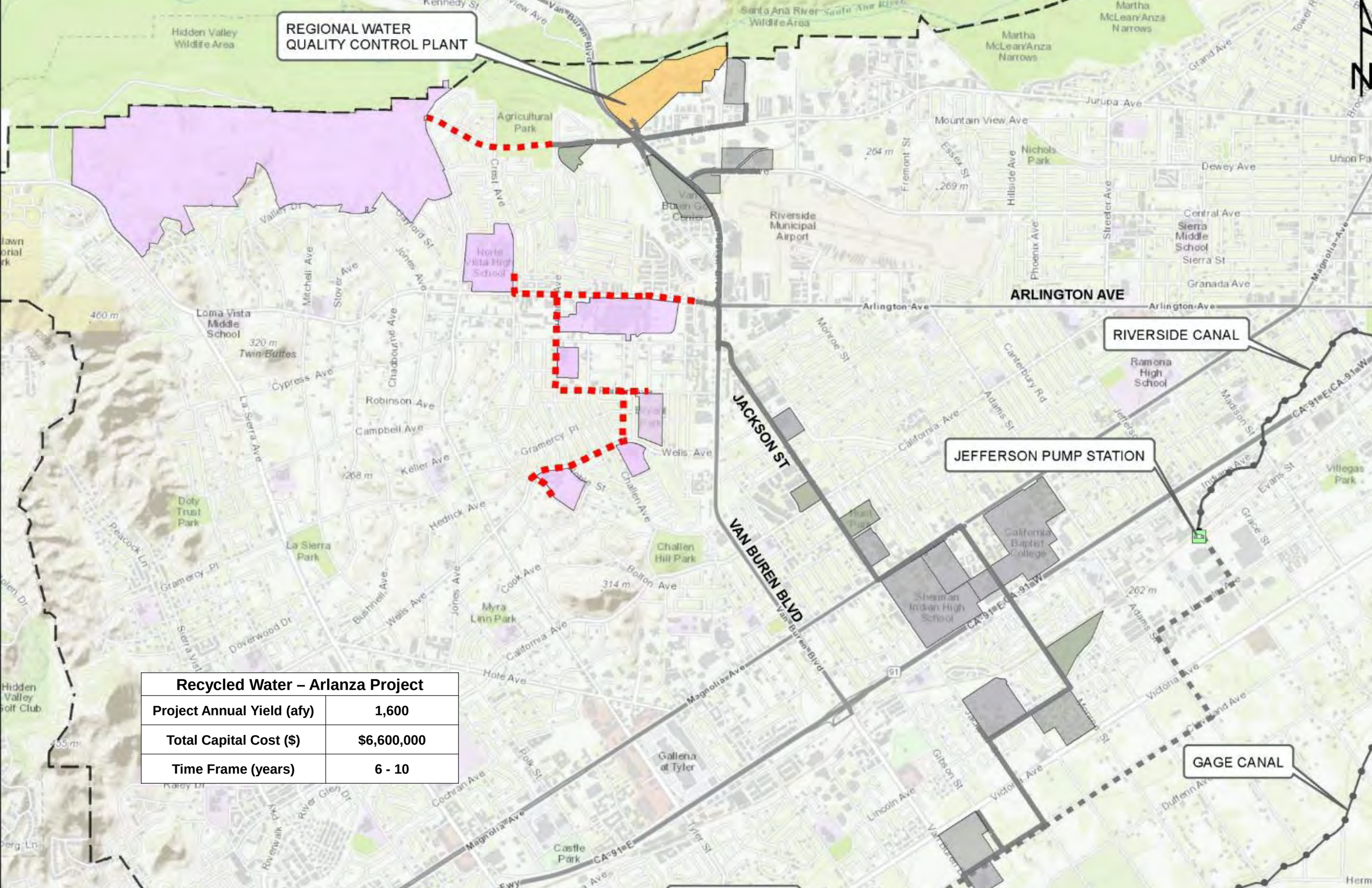


Recycled Water – Jackson Street Project	
Project Annual Yield (afy)	3,400
Recycled Water – Jackson Street\ Total Capital Cost ($)	$19,800,000
Time Frame (years)	2 - 3



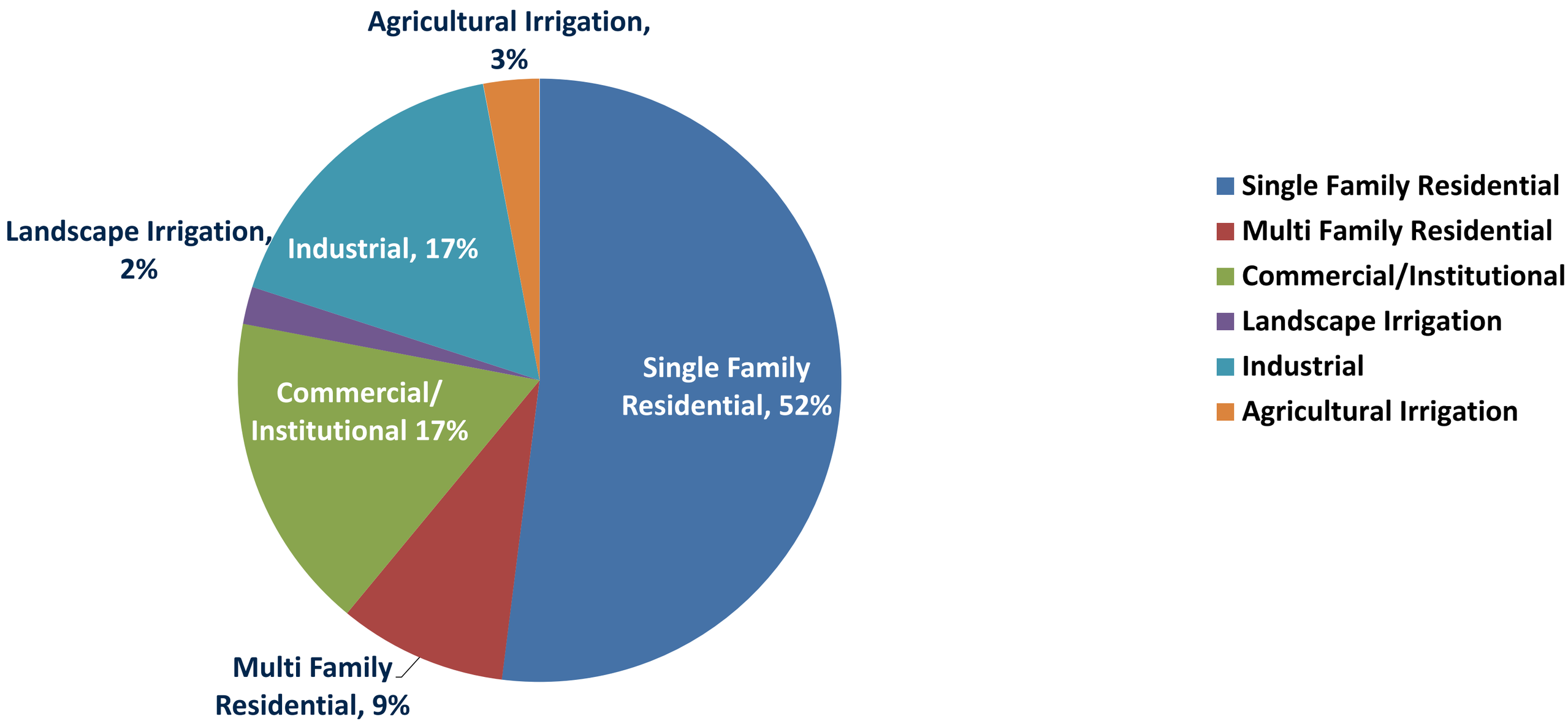
Recycled Water – Arlanza Project	
Project Annual Yield (afy)	1,600
Total Capital Cost ($)	$6,600,000
Time Frame (years)	6 - 10

10,000 AF
Less Water, More Color

Water Conservation, 33% of Future Supply

- Already gaining benefits of conservation
  - Existing programs
  - Turf removal
  - Culture shift
- Approximately 35% of all water is used indoors
  - 10% during winter months
  - 40% during summer months

Water Demand by End User

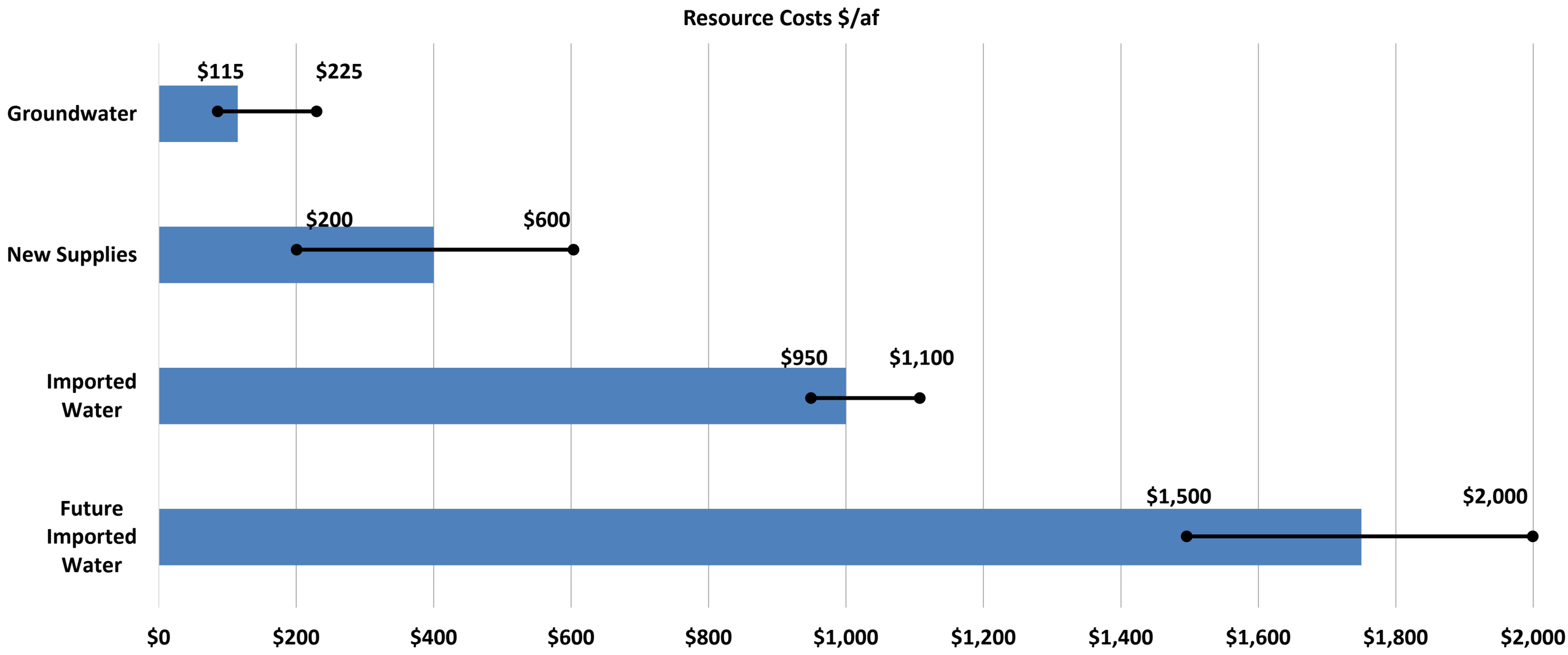


Water Conservation Measures

Measure	Annual Water Savings (AF)	Unit Cost ($/AF saved)
SFR Surveys (5%)	500	$356
Precision Nozzles	1,000	$264
Toilet Rebates	400	$485
Irrigation Surveys (large landscapes)	800	$434
CII Surveys & Controllers (5%)	900	$187
CII Precision Nozzles	300	$265
CII Clothes Washer Rebates	200	$158
CII Toilet Installs	300	$347
System Efficiency	1,000	No Change
SFR Surveys (5-10%)	300	$630
SFR Clothes Washer	300	$575
CII Surveys & Controllers (5%)	300	$801
CII Performance Based Program	700	$782
	7,000	$350 (weighted)

A lot of little things add up!

Resource Costs



Water Supply Assessment

- Demand Uncertainty
- Current supply adequate for current need
- Projects identified for future needs
  - Consider projects that cost less than imported water
- New projects increase reliability
- $102-$124 Million
  - Cost sharing and Grants
  - Reduce risk by monetizing excess water supplies

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – WATER SUPPLY

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT – SUPPLY

OPTIONS

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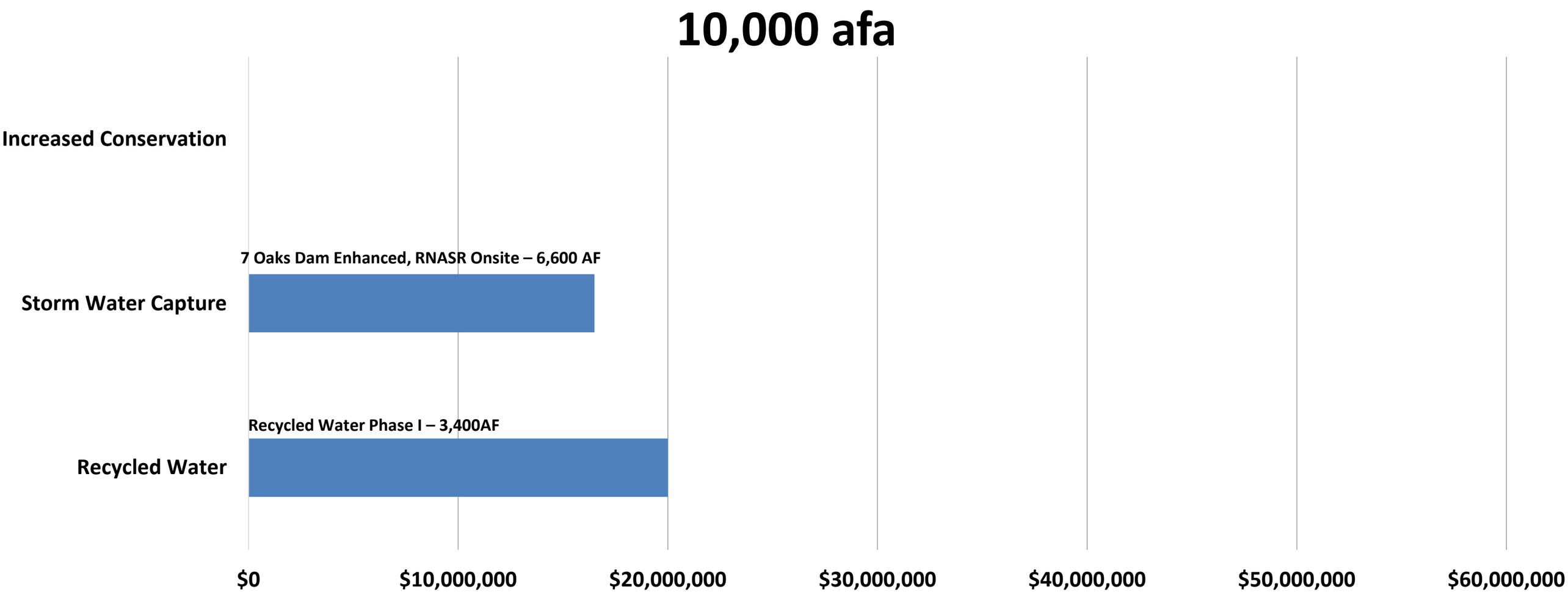
ADVANCED TECHNOLOGIES

Tier 1: In-Flight Projects, First 1/3 of New Supply



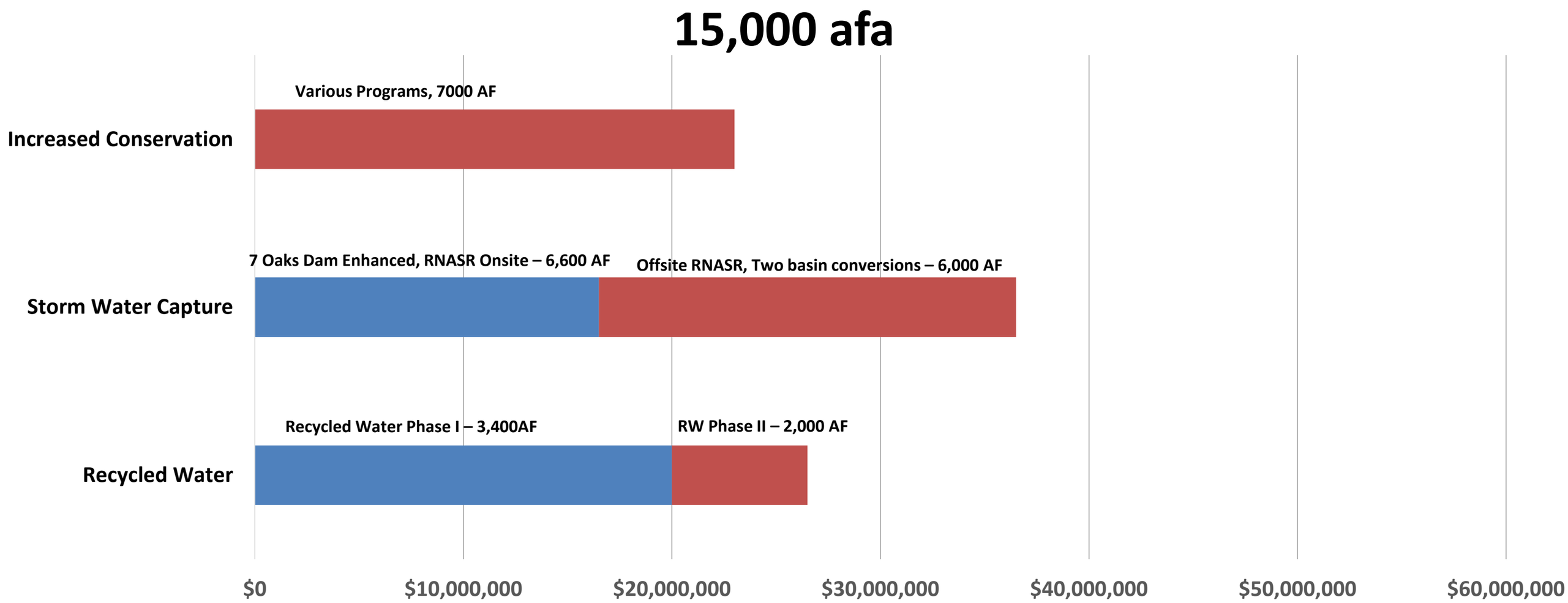
Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $99-124 Million

Projects that are currently underway: Seven Oaks Dam Enhanced Recharge, RNASR (Rubber Dam), Recycled Water Phase I

Tier 2: Next ½ of New Water Supply Projects



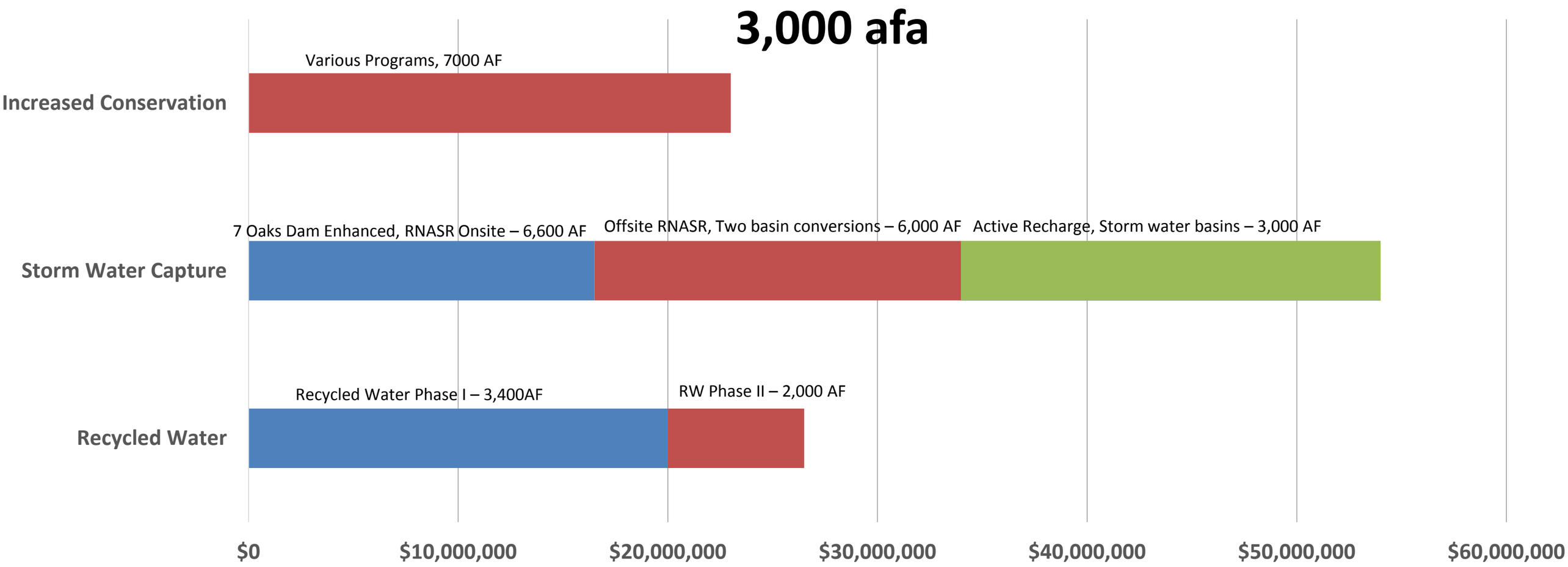
Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $102-124 Million

Includes various water conservation programs, Recycled Water Phase B, RNASR (Rubber Dam) offsite storage and conversion of two storm water retention basins to storm water capture.

Tier 3: Last 10% of New Water Supply



Tier 1: $34-38 Million

Tier 2: $74-93 Million

Tier 3: $102-124 Million

Includes Active Recharge program, conversion of two storm water retention sites to storm water capture and the creation of two storm water capture sites.

Summary of Investment Options

Water Supply

- Additional financial investment is required to secure additional water supplies

Tier 1	Tier 2	Tier 3
10,000 afa	Additional 15,000 afa	Additional 3,000 afa
↓ ↑	↓ ↑	↓ ↑
$34-$38 million	$74-$93 million	$102-$124 million

WORKFORCE DEVELOPMENT

INFRASTRUCTURE IMPROVEMENT - SUPPLY

RECOMMENDATIONS

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Sample Short-Term Recommendations – Year 1

Storm Water Capture	• Continue processing RNASR (Rubber Dam) EIR and requisite permits • Continue development of Seven Oaks Dam Enhanced Recharge
Recycled Water	• Design, permit and begin construction of Recycled Water – Jackson Street alignment
Conservation	• Increase participation in Waterwise landscaping • Continue other ongoing water conservation projects

Sample Mid-Term Recommendations – Years 2-5

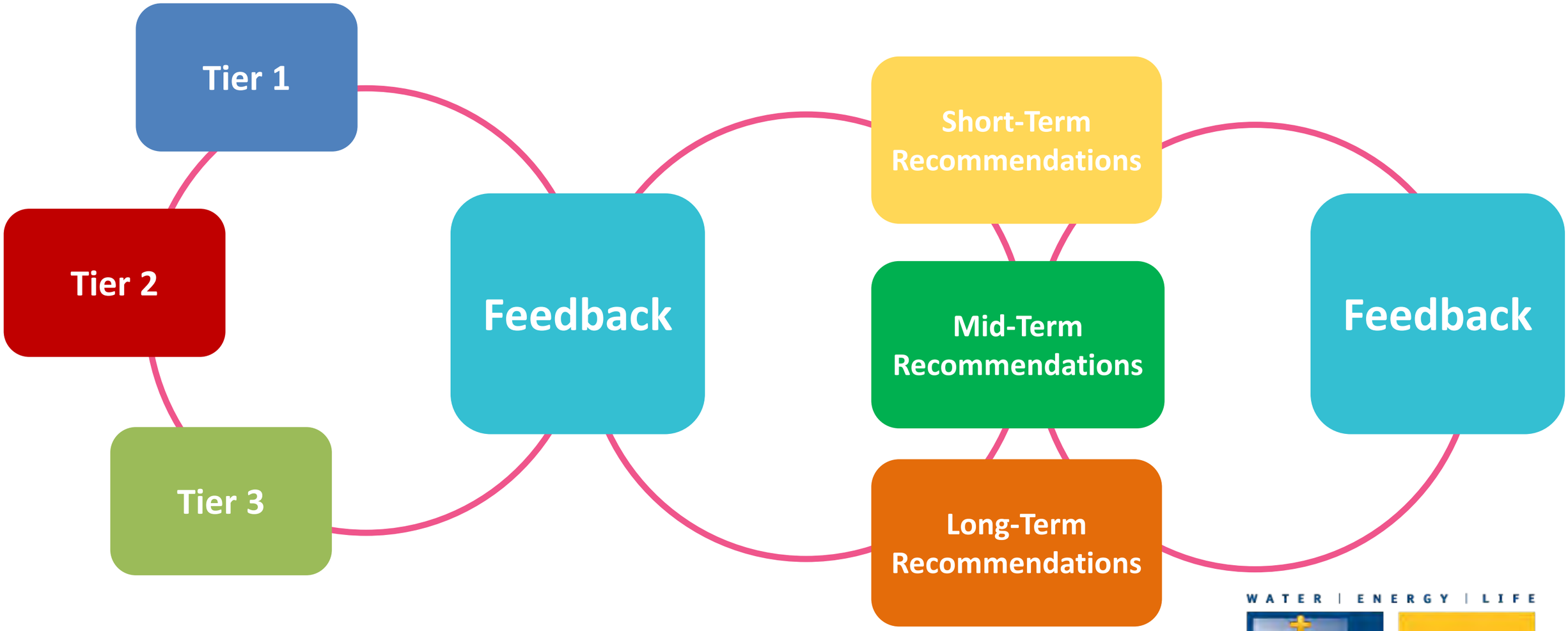
Storm Water Capture	• Complete RNASR (Rubber Dam) project, onsite facilities • Complete Seven Oaks Dam Enhanced Recharge
Recycled Water	• Complete Recycled Water – Jackson Street alignment
Conservation	• Continue water conservation programs

Sample Long-Term Recommendations – Years 6-10

Storm Water Capture	• Complete RNASR (Rubber Dam) offsite facilities • Participate in additional storm water capture projects as needs and/or opportunities arise
Recycled Water	• Expand Recycled Water System - Arlanza area
Conservation	• Continue Water Conservation projects

100%

Options & Recommendations Decided from Feedback



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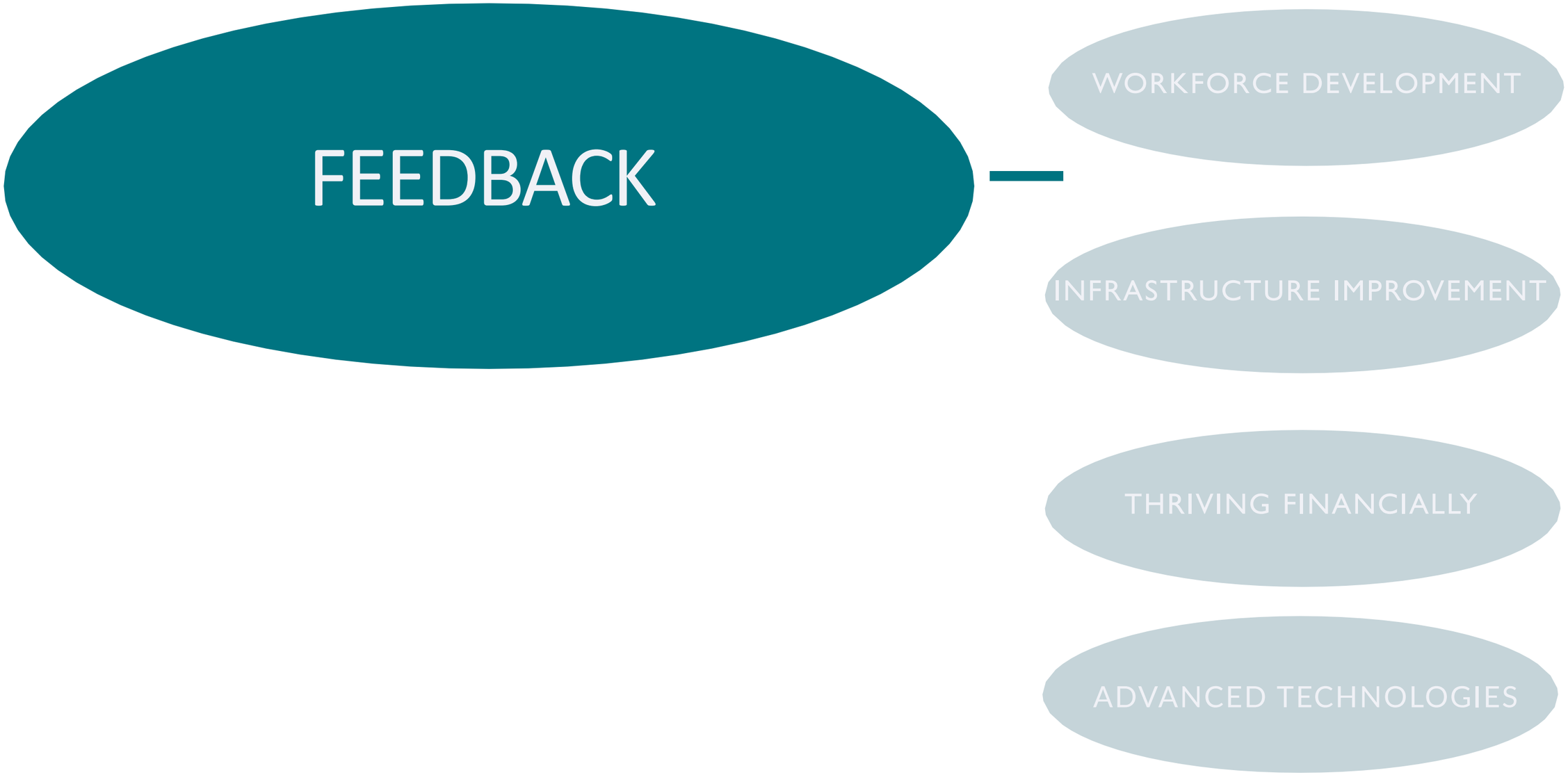
Next Steps

- Incorporate Comments
- Formulate Detailed recommendations
- Review
- Report Back

ROAD MAPS –


FEEDBACK
WORKFORCE DEVELOPMENT
INFRASTRUCTURE IMPROVEMENT
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ADVANCED TECHNOLOGIES

RIVERSIDE PUBLIC UTILITIES

UTILITY 2.0

THRIVING FINANCIALLY ROADMAP

JULY 29, 2015

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PUBLIC UTILITIES

RiversidePublicUtilities.com

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- History
- Ratemaking Principles
- Design
- Impacts/Issues
- Rate Structure – next steps

Financial & Reserve Policies Overview
Debt
10 Year Pro Forma
- Investment Options (Roadmaps)
- Pro forma Examples

Other Finance Items

ROAD MAPS – INFRASTRUCTURE IMPROVEMENT – THRIVING FINANCIALLY – MISSION/GOALS

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This roadmap supports the changes that are needed for our infrastructure and workforce to reach Utility 2.0.

- Creating a planning tool/model
- Establishing key financial components and targets
- Assessing issues and impacts to rates, reserve levels and bond coverage ratios
- Developing options/alternatives for future pricing models

THE PLANS

- RECYCLED WATER
- WATER INFRASTRUCTURE
- INTEGRATED WATER
- WORKFORCE DEVELOPMENT
- FACILITIES PLAN
- RPS POWER IMPLEMENTATION
- INTEGRATED POWER RESOURCES
- ELECTRIC INFRASTRUCTURE
- TRANSMISSION RELIABILITY
- FIBER BUSINESS
- TECHNOLOGY
- CONSERVATION AND EFFICIENCY
- FINANCIAL PRO FORMA - 10 YR

RPU Initiatives - Four Critical Areas

Replace
Aging Water and Electric Infrastructure
while balancing cost impacts.

Develop our Workforce
such that it addresses the need for changing skill sets.

Utilize
Advanced Technology
in all areas of out business to provide more efficient and better customer service, both behind and in front of the meter.

Thrive Financially
by ensuring costs are recovered and **develop a new business model to** adapt for the future.

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PUBLIC UTILITIES

WORKFORCE DEVELOPMENT

THRIVING FINANCIALLY
RATES

–

THRIVING FINANCIALLY

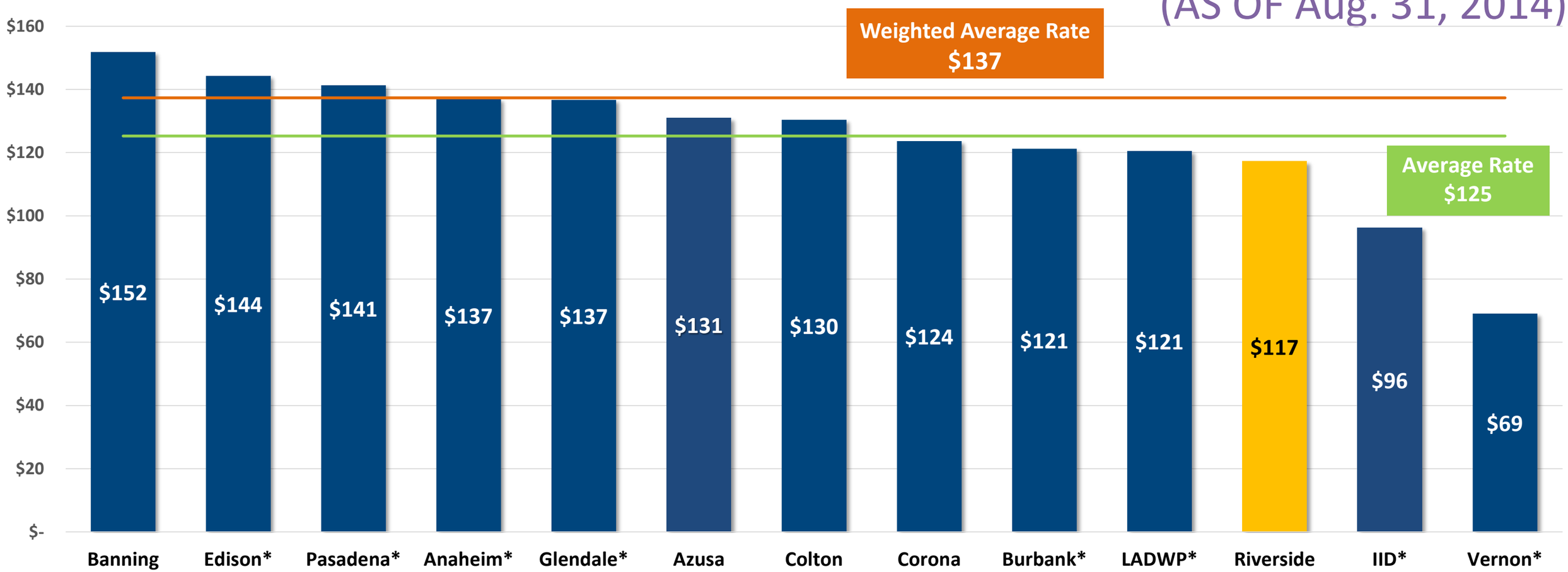
ADVANCED TECHNOLOGIES

RPU Current Rates

Rate Type	Electric		Water	
	Residential	Other	Residential	Other
Residential / Domestic	X		X	
Domestic Time of Use	X			
Commercial / Industrial / Contract		X		X
Economic Development / Business Retention / Temporary Economic Development		X		
Net Energy Metering	X	X		
Feed-In Tariff		X		
Street / Outdoor Lighting		X		
Agricultural & Pumping / Wind Machines		X		
Stand-By-Service		X		
Traffic Control Service		X		
Irrigation / Grove Preservation			X	X
Riverside Water Company Irrigators / Greenbelt Irrigation				X
Special Landscape				X
Fire Protection / Fire Hydrants / Temporary Service				X
Recycled Water				X

Electric – Rate Comparison

AVERAGE RESIDENTIAL RATE FOR 750 KWH PER MONTH (AS OF Aug. 31, 2014)



* Rate increase subsequent to comparison

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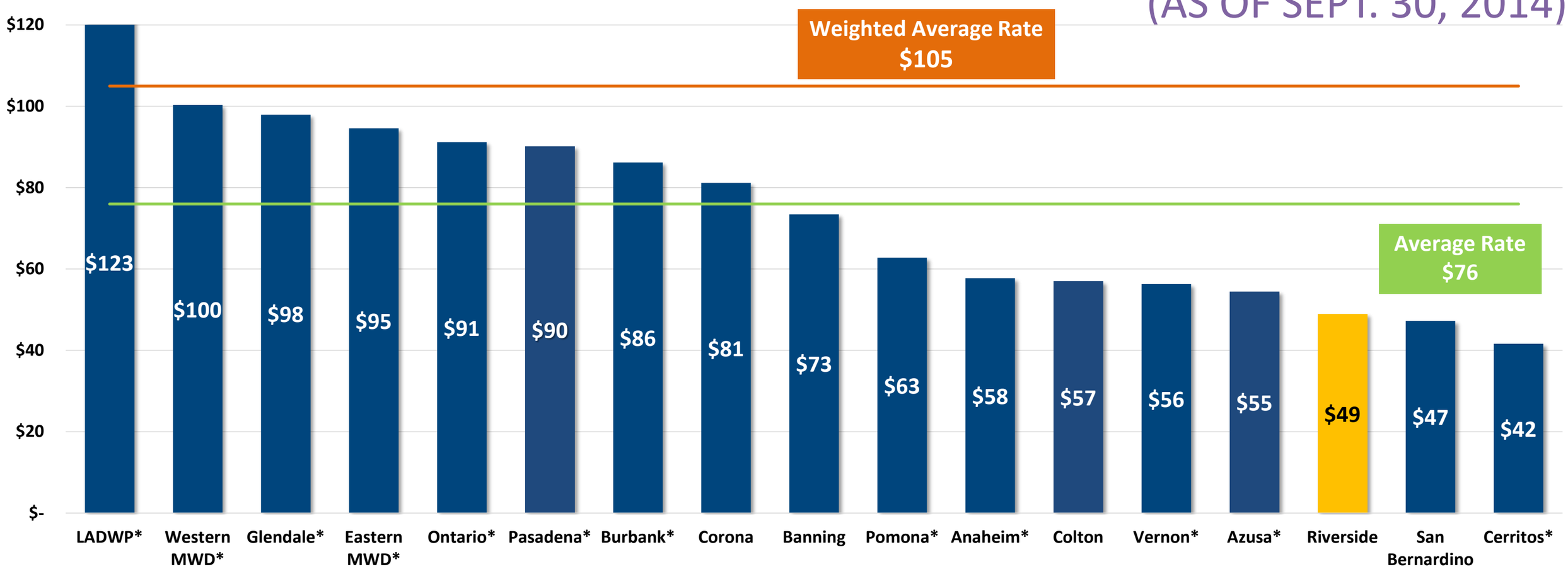
CITY OF RIVERSIDE PUBLIC UTILITIES

Water – Rate Comparison

AVERAGE RESIDENTIAL RATE FOR 25 CCF PER MONTH (AS OF SEPT. 30, 2014)



* Rate increase or drought rates implemented subsequent to comparison

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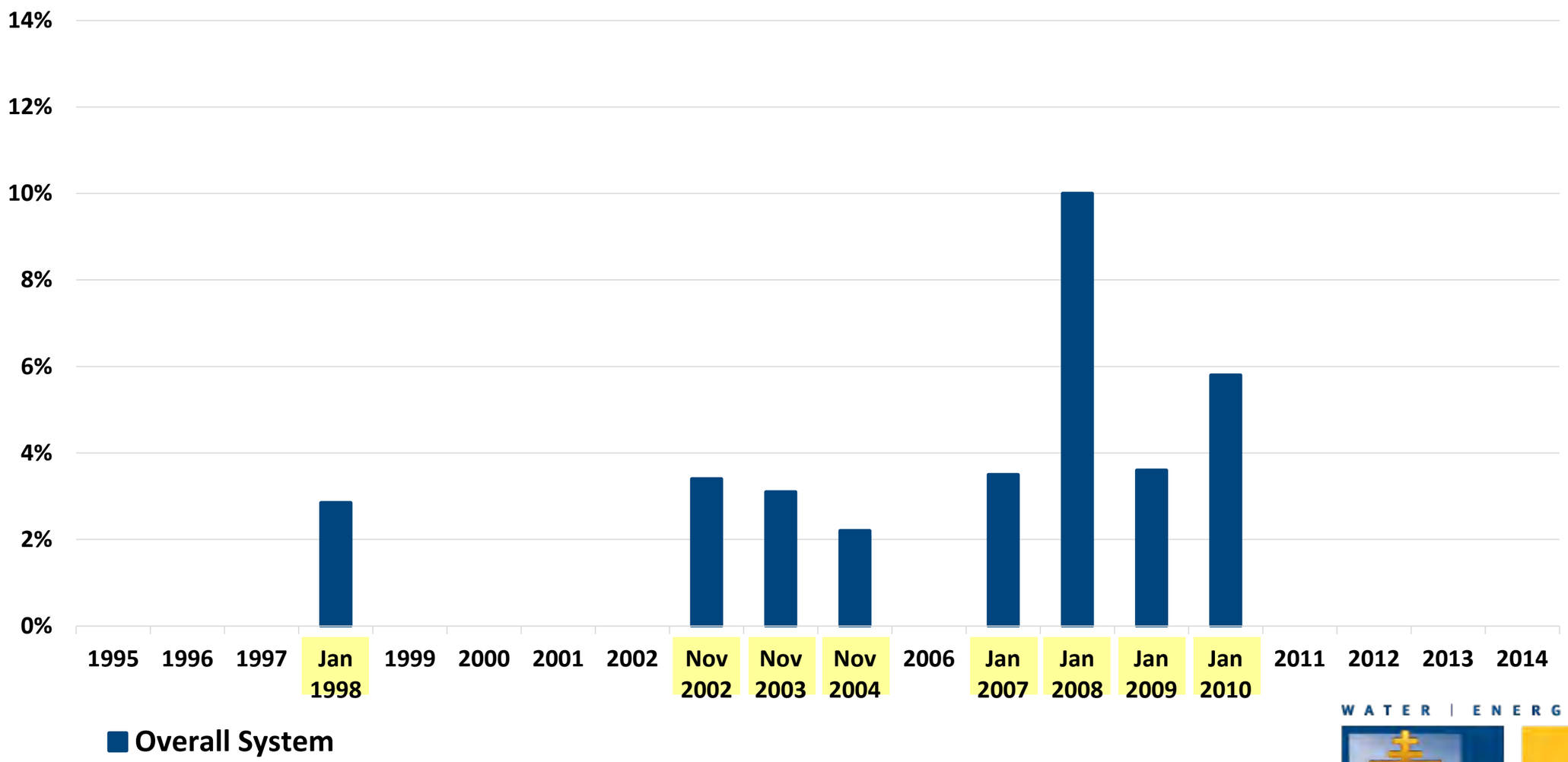
Electric Rate Increases - Last 20 Years



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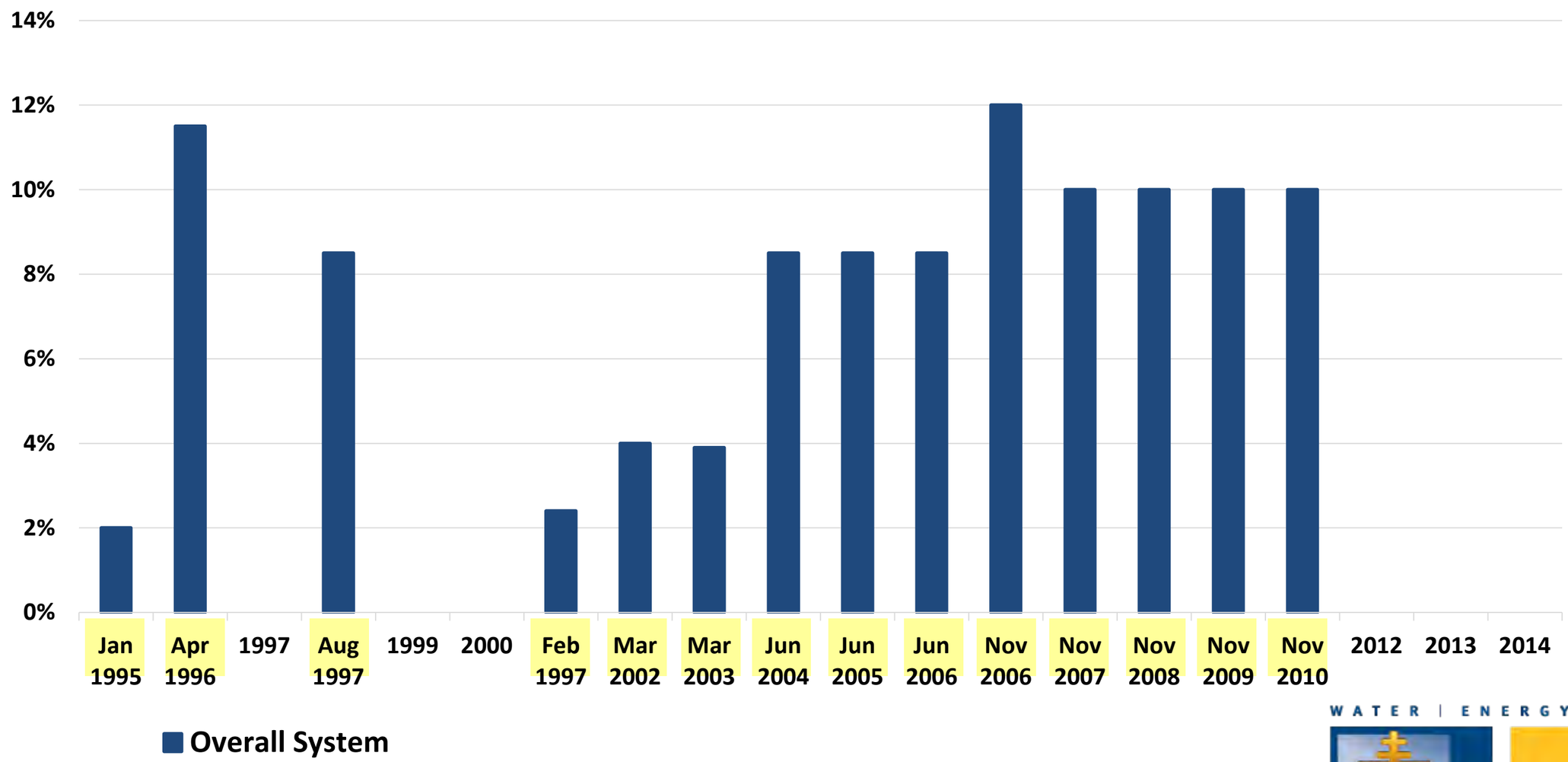
Water Rate Increases - Last 20 Years



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CITY OF RIVERSIDE PUBLIC UTILITIES

What projects that Electric Rate Plans supported in the last 20 Years

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percentage of Rate Increase																			
			2.85%					3.4%	3.1%	2.2%		3.5%	10.0%	3.6%	5.8%				
			State Mandated Public Benefits Charge					3 Year Rate Plan				4 Year Rate Plan				Electric Rate Freeze through January 2014			

Prior Rate Plans

- SONGS Capital Improvement
- Springs Generating Plant
- Transmission Line

- SONGS Capital Improvement
- Expanded Overhead / Underground Conversion
- Cable & Structure Replacement Program
- Substation Bus & Upgrades
- Substation Power Transformers
- Major Feeders
- Major 4/12kV Conversion

- RERC 1, 2, 3 & 4
- SONGS Steam Generator Replacement
- RTRP/STP
- Clearwater
- Meter Replacement Program
- CIS Replacement
- Replacing low cost power contracts

What project that Water Rate Plans supported in the last 20 Years

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percentage of Rate Increase																			
2.00%	11.50%		8.50%			2.4%	4.0%	3.9%	8.5%	8.5%	8.5%	12.0%	10.0%	10.0%	10.0%	10.0%			
Water Rate Increase	Water Rate Increase		Water Rate Increase			3 Year Rate Plan			3 Year Rate Plan & Water Conservation Surcharge			5 Year Rate Plan							Water Cons. Surcharge (Renewal)

- Expanded Main Replacement

- Tilden Reservoir

- Expanded Main Replacement

- Expanded Main Replacement
- Transmission Mains
- Water Supervisory Control and Data Acquisition (SCADA) System

- Expanded Main Replacement
- Waterman Pipeline Replacement
- Mockingbird Canyon Dam

- Expanded Main Replacement
- JW North
- Street Improvements
- Transmission Mains
- Facility Rehab.
- Pump Station Replacements
- Whitegates I & II Reservoirs
- Evans Reservoir
- Seven Oaks Dam

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CITY OF RIVERSIDE PUBLIC UTILITIES

Example Ratemaking Principles

1) Provide Adequate Revenue
   - Collect sufficient revenues to fund:
     - Current O&M & capital expenditures
     - Future infrastructure needs
     - Reserves
   - Provide revenue stability for efficient operations
   - Provide year-to-year consistency for customers
     - Gradual increases in rates
     - Advance notice of rate increase

Example Ratemaking Principles

2) Consider Equity
   - Reflect cost of service
   - Unbundle components of the revenue requirement
     - energy/production, transmission, distribution, etc.
   - Align:
     - fixed revenue covers fixed costs
     - variable revenue covers variable costs
   - Customer classes are treated fairly and equitably

Example Ratemaking Principles

3) Send Appropriate Price Signals to Customers
   - Simple to understand & administer
   - Sophisticated enough to promote certain customer behavior
     - Tiered rates to discourage waste
     - Summer and winter seasonal tiers to reflect costs
     - Time of Use when applicable
   - Unbundle fixed and variable costs to encourage customer adoption of conservation, efficiency, and distributed generation while preventing subsidies

Example Ratemaking Principles

4) Reflect Community's Social Priorities
   - Public Benefits Surcharge
     - Low income assistance, energy efficiency rebate program, solar rebates
   - Water Conservation Charge
     - Rebates for conservation and water use efficiency
   - Commercial economic development incentives
5) Strive to be Competitive
   - Lower than rates of equivalent customer classes in neighboring communities

What goes into Rate Design?

- Power Supply Costs – Electric
- Supply/Distribution Costs – Water
- Personnel Costs/Workforce Development
- Other Operating and Maintenance
- Additional Operating and Maintenance for Capital Improvement Program & Advanced Technology
- Debt Service Requirement
- General Fund Transfer

Revenue Requirement (Expenses)

Key Issues Affecting Rates

Electric & Water:

- Fixed vs. Variable Revenues & Expenses
- Conservation & Efficiency

Electric:

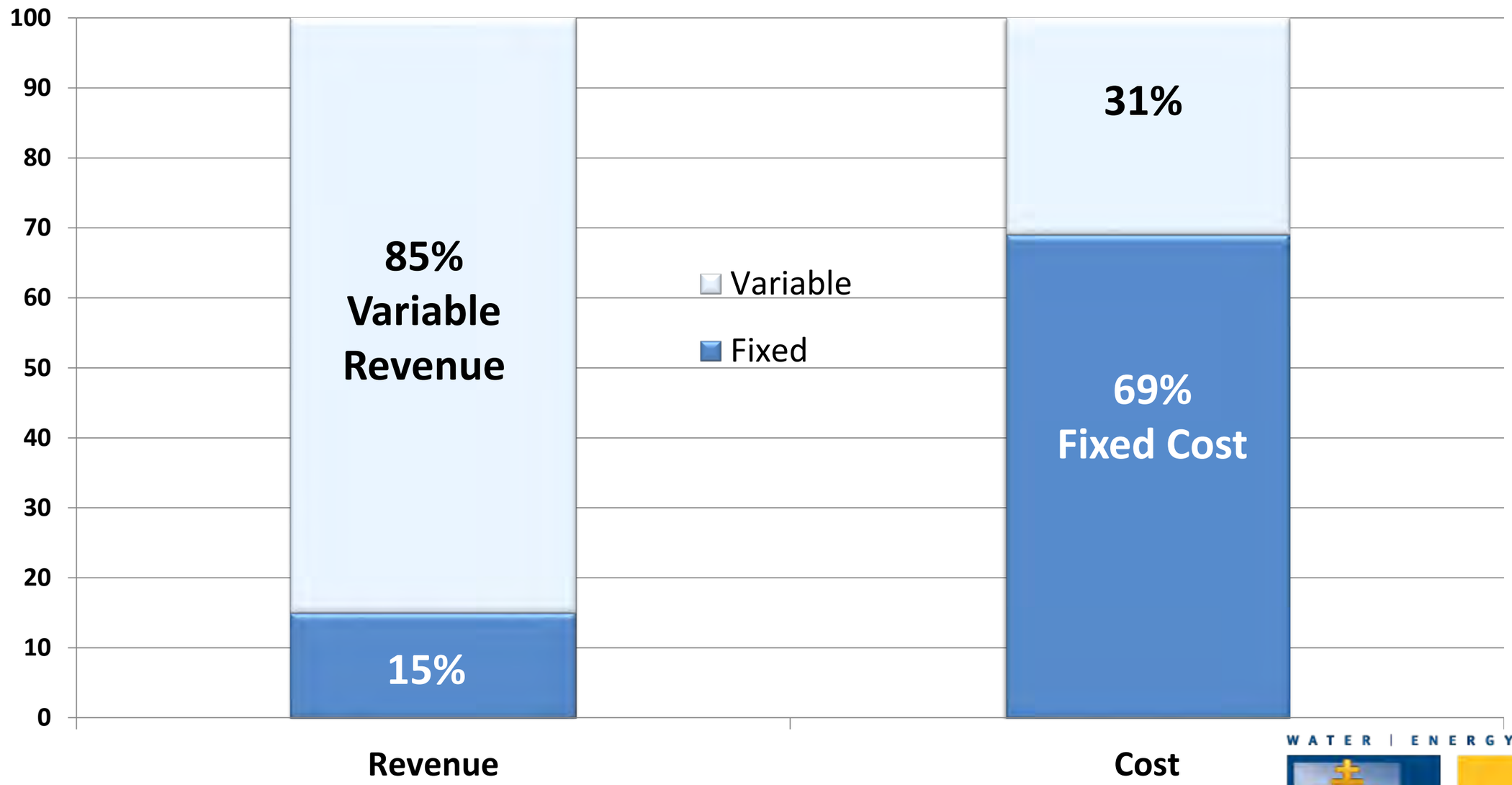
- Distributed Generation – Solar PV

Water:

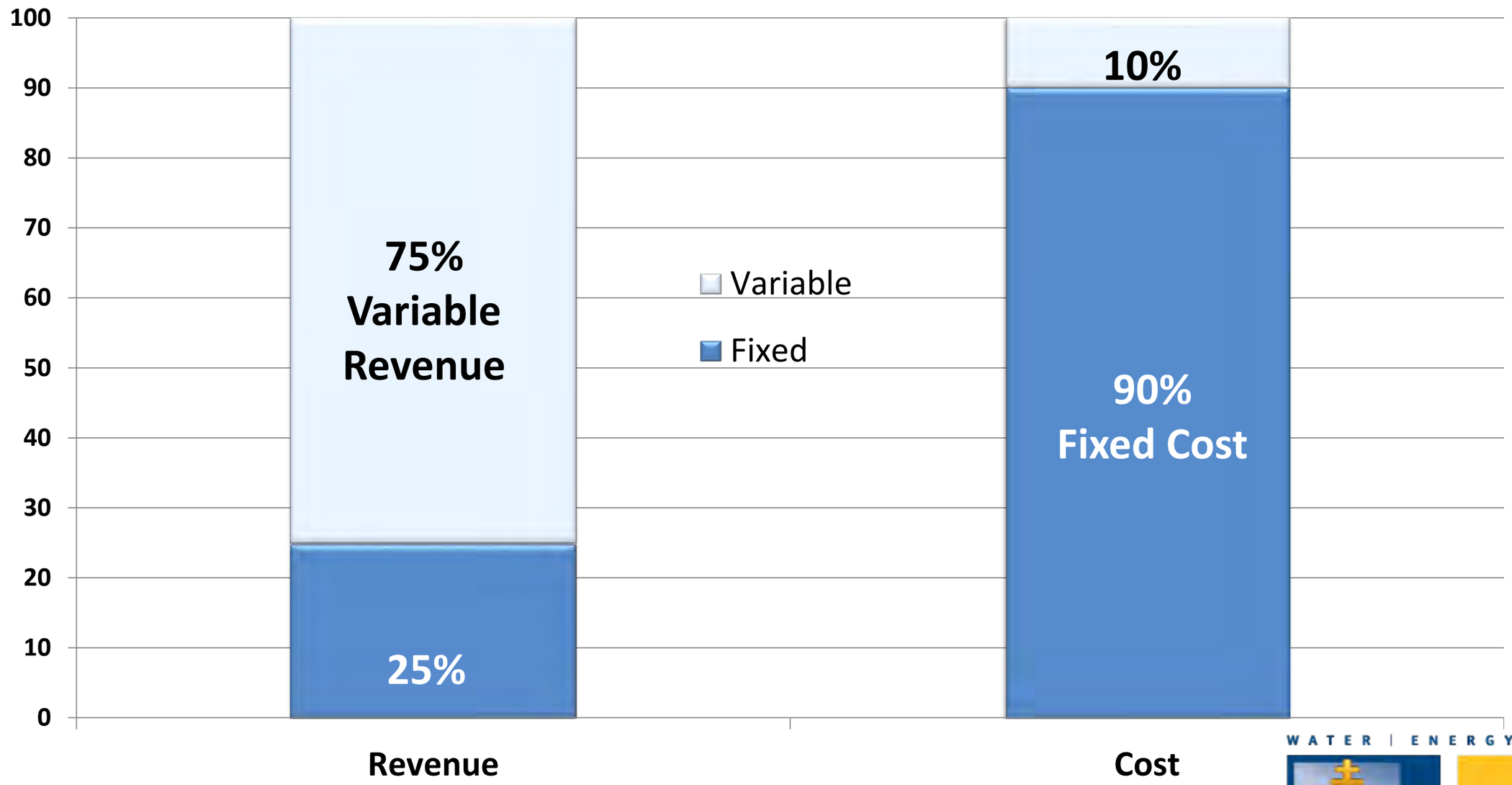
- Mandatory Drought Restrictions

Financial Security Fixed/Variable Balance

Electric Fixed vs. Variable Revenues and Expenses



Water Fixed vs. Variable Revenues and Expenses



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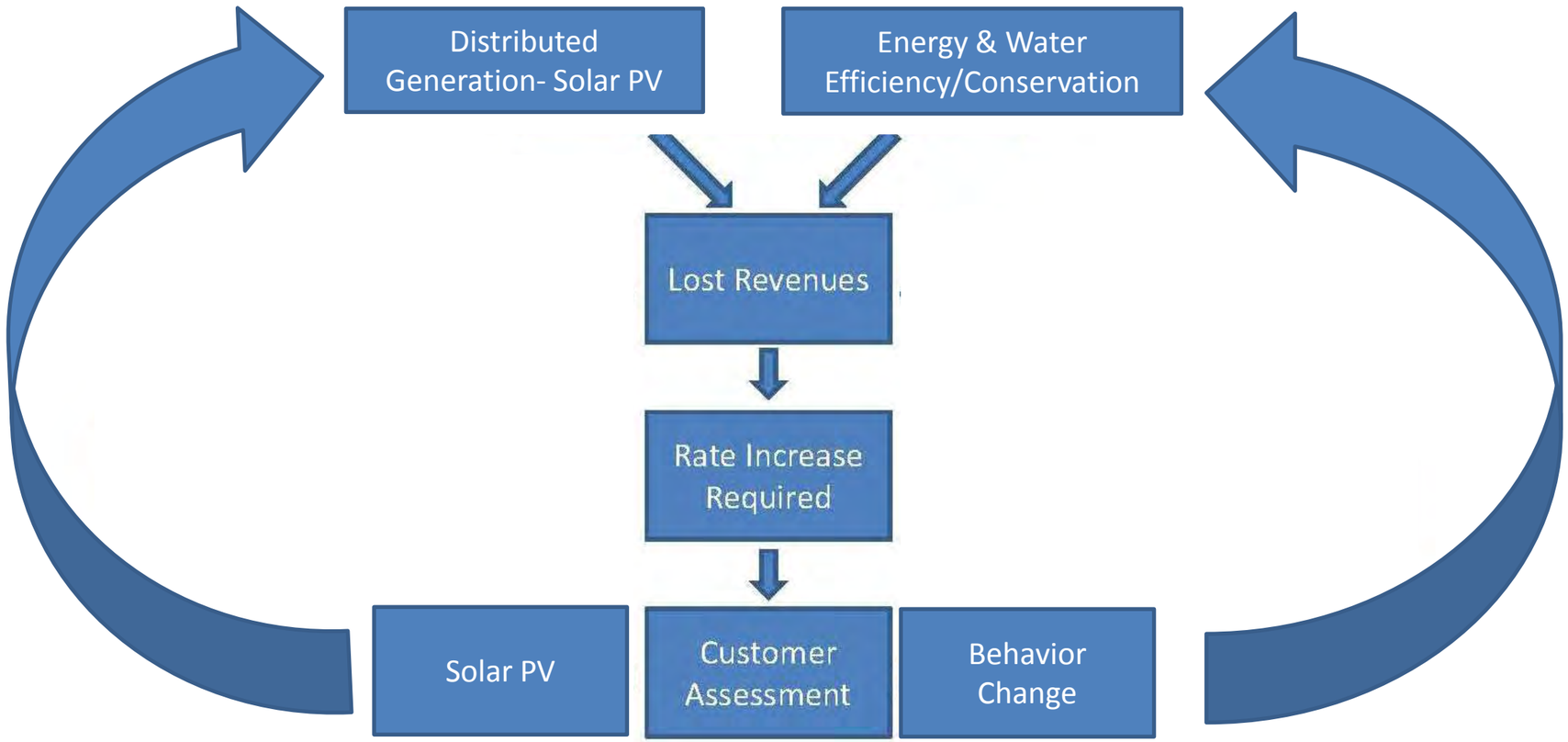
How RPU Loses Revenues



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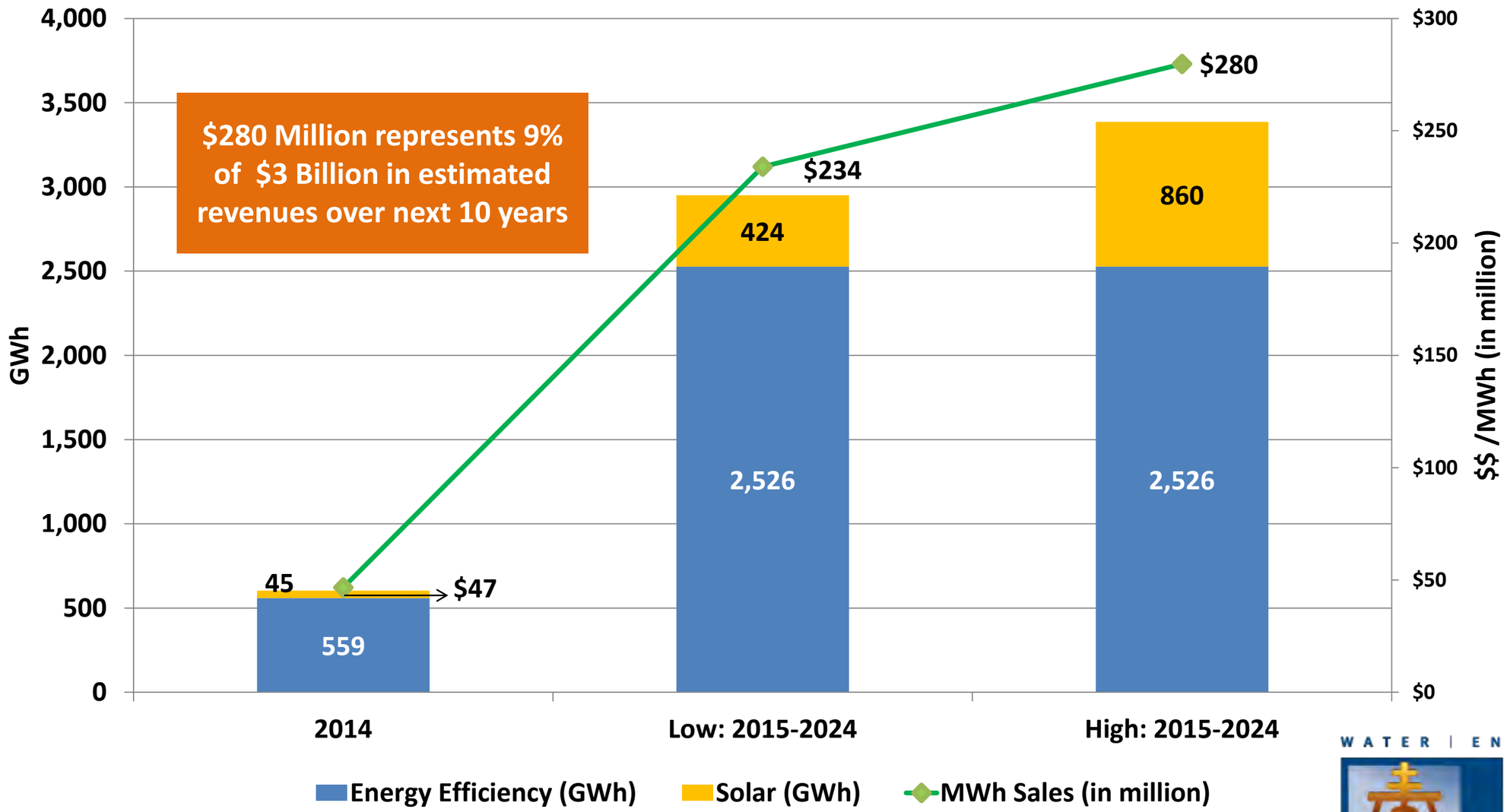
How rooftop solar and energy efficiency can impact revenue



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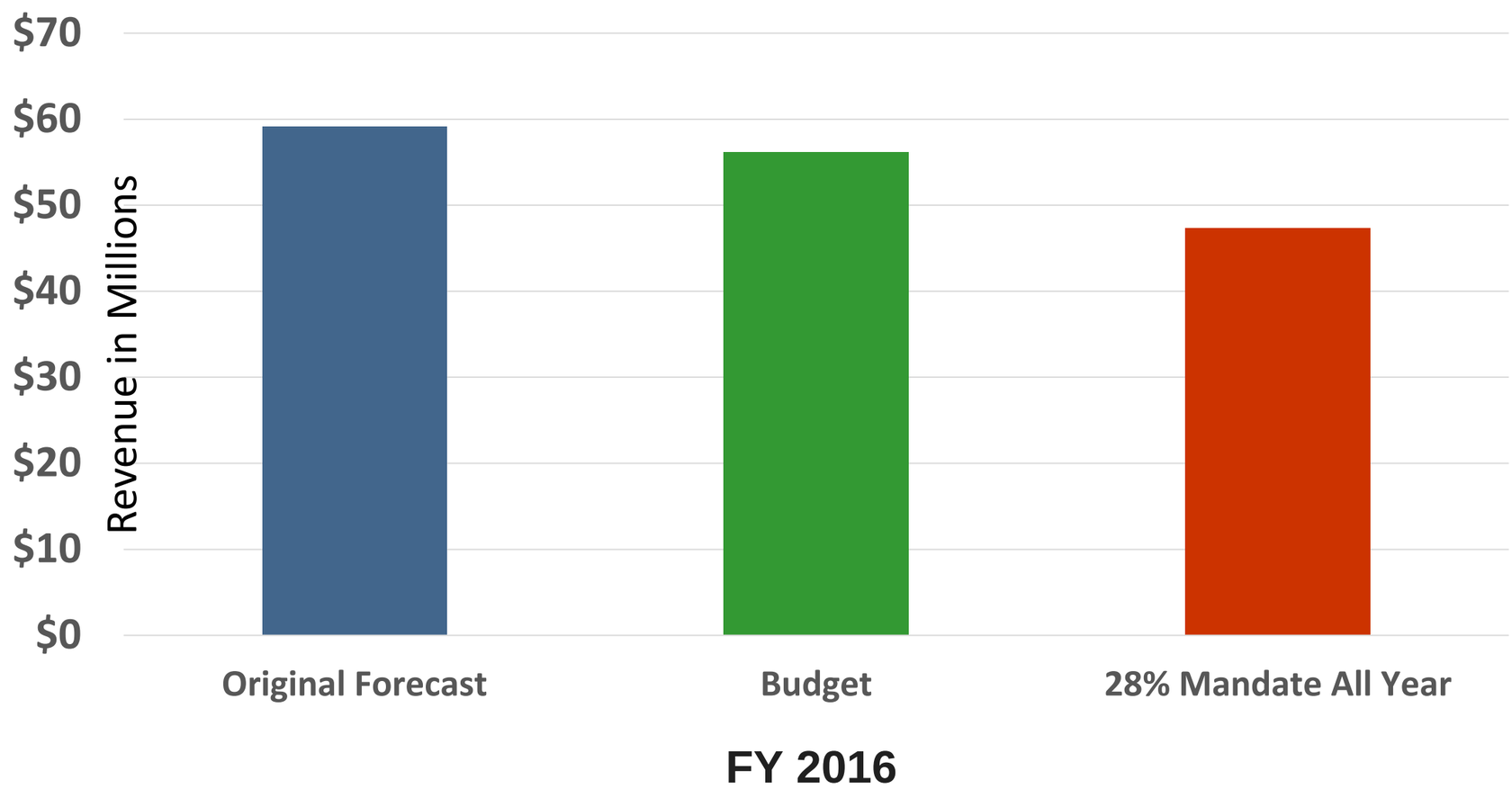
How revenue is lost due to Mandatory Drought Restrictions (current rates)

28% decrease for entire FY 2016 results in $9 M loss of Revenue



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Rate Structures- Next Steps

- Complete Water and Electric Cost of Service Analysis and Unbundle Revenue Requirement
- Provide Proposed Ratemaking Principles to Board for Feedback
- Develop Rate Structures and Multi-year Rate Plans
- Board Rate Plan Workshops - January/February 2016

WORKFORCE DEVELOPMENT

THRIVING FINANCIALLY

FINANCIAL & RESERVES POLICIES

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

Goals of Financial Policies

- To mitigate risk
  - Rate / Revenue instability
  - Emergency with asset failure
  - Volatility in working capital
- To achieve/maintain a certain credit rating
- To determine most opportune time to issue debt

Importance of Financial Policies

- To maintain financial solvency
  - Provide a basis for coping with fiscal emergencies (revenue short-falls, asset failure, emergency, etc.)
- To provide guidelines for sound financial management with an overall long-range perspective
- To enhance financial management transparency
  - Improve public's confidence and elected officials' credibility

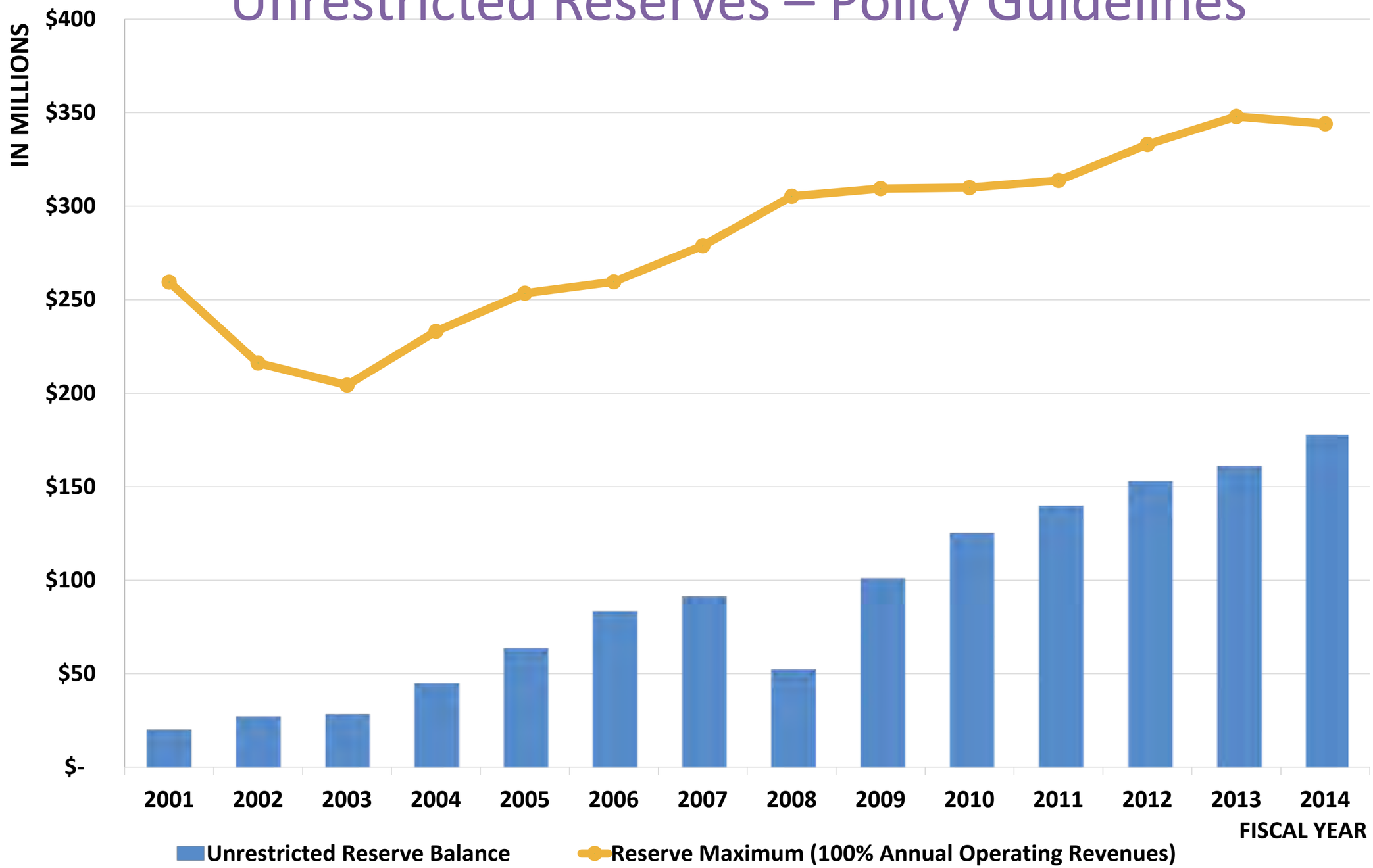
Why Do We Need Reserves?

- Nature of municipal utility system
  - Capital intensive
  - Highly fluctuating capital costs
  - Risk and liability → unknown liability costs
- Healthy reserve level → better credit ratings → lower interest rates for future debt

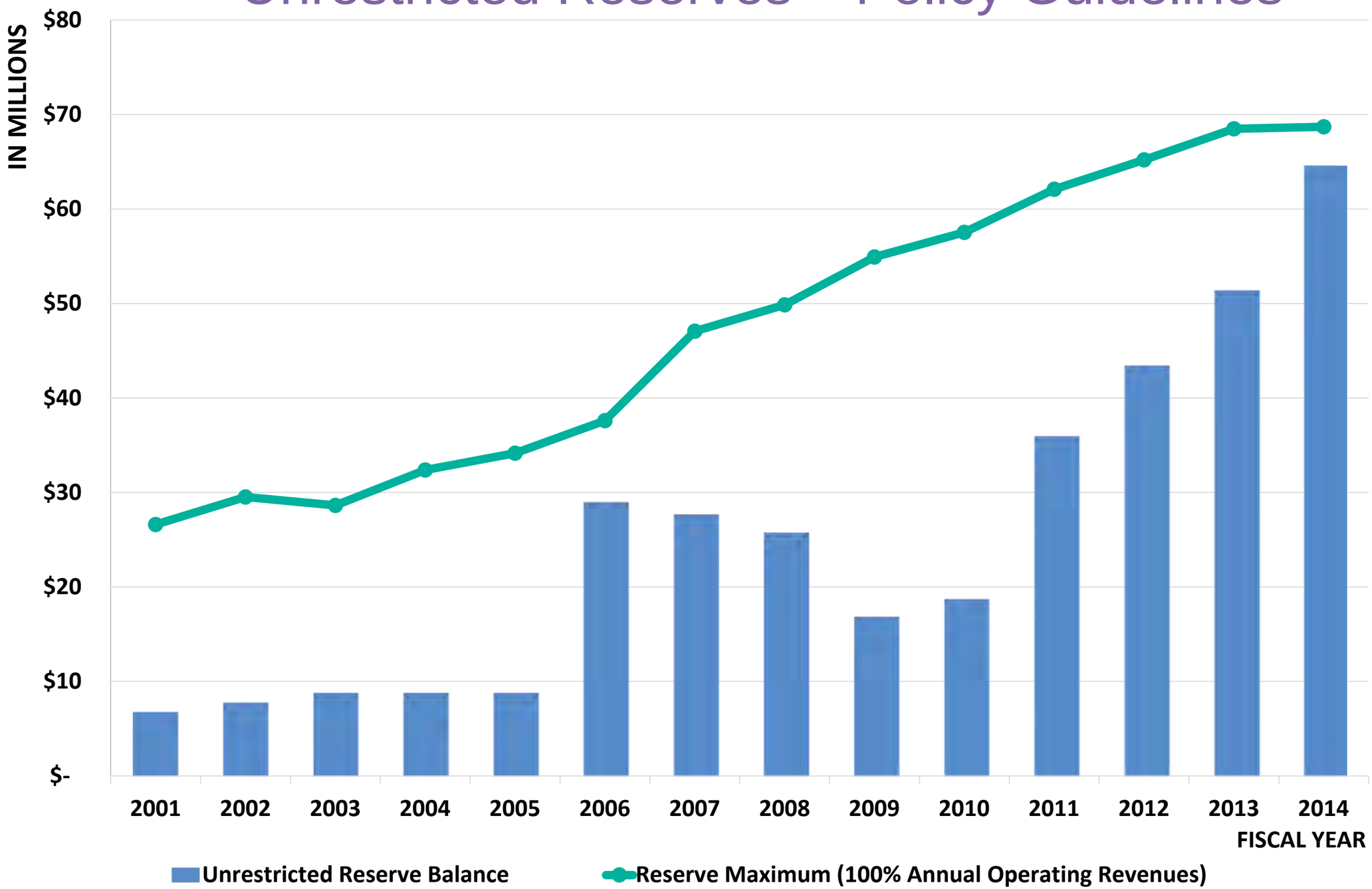
Current RPU Reserve Policy

- Approved by City Council in June 2001
  - Minimum Reserves – At least 3 months operating expenses
  - Maximum Reserves – One year of operating revenues
  - Reserve levels reviewed annually.
- In 2003 – City Council approved establishing Electric Fund internally restricted reserves: Operating, Regulatory Risk, Energy Risk Management
- In 2005 – Board of Public Utilities discussed reserving proceeds from sale of property to future purchases of property or other long-term capital assets.

Electric Fund
Unrestricted Reserves – Policy Guidelines



Water Fund
Unrestricted Reserves – Policy Guidelines



Reserve Policy – Best Practices

- Mitigate Risk – Risk Assessment
  - Predictable, unpredictable and unknown
- Risk mitigation is very entity specific
- Identify specific reserve types/needs
  - Working capital - Rate stabilization
  - Capital improvements - Asset / liability balances
  - N-1 contingency - Market risk
  - Emergency - Regulatory risk
- Determine and set minimum reserve level

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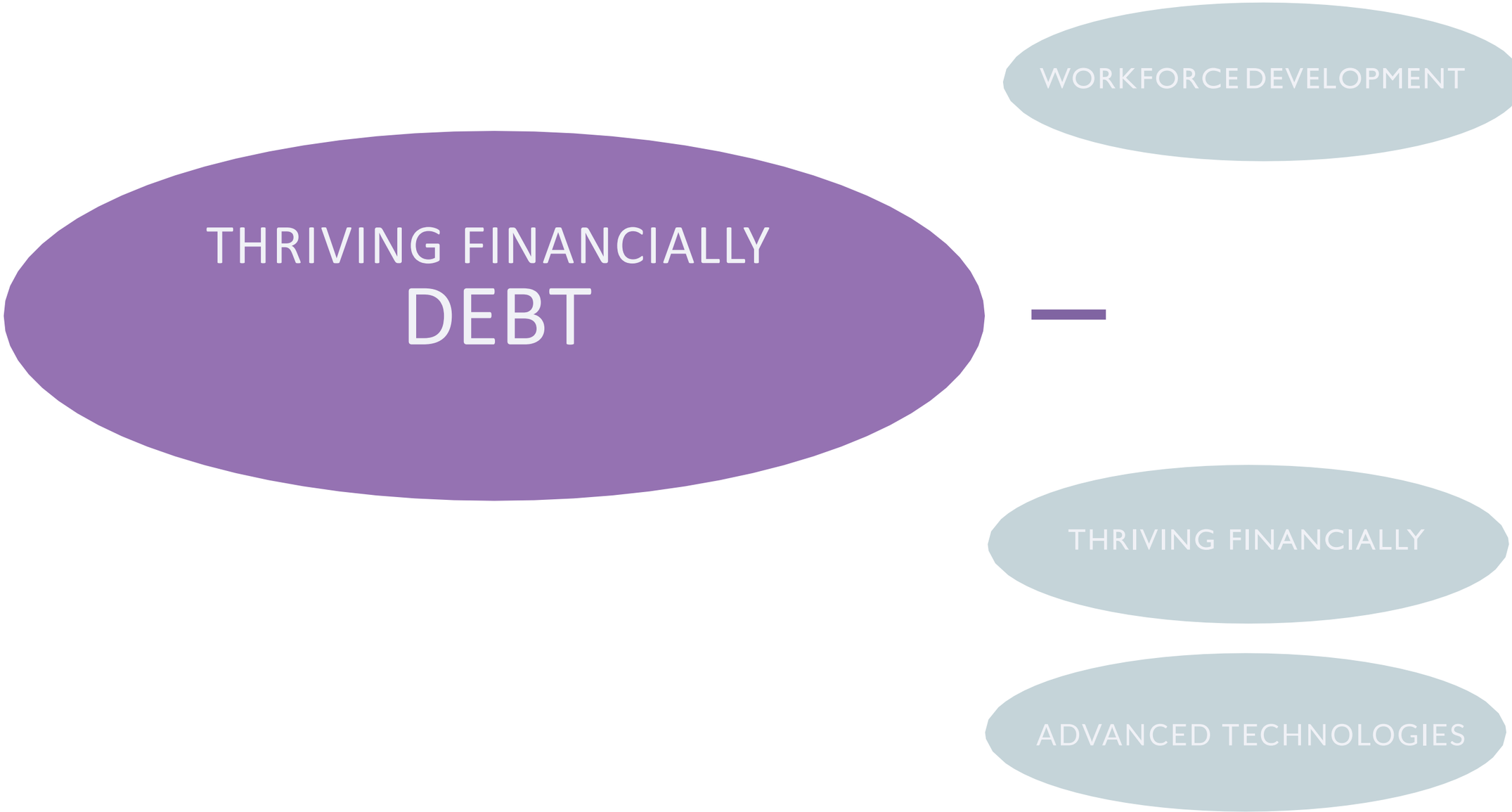
CITY OF RIVERSIDE
PUBLIC UTILITIES

Evaluation Process for New Reserve Policy – Minimum Reserves

Risk Mitigation Evaluation	Type of Reserves
Time lag between when operating expenses are incurred and revenues are received	Operating and Maintenance Reserve
Power resource cost uncertainty: Variation from load forecast; Uncertainties in transmission costs and resource adequacy; Fluctuation in market prices	Power Supply Reserve
Unexpected significant decreases in sales or increases in operating costs (drought restriction, new regulatory mandates, etc.)	Rate Stabilization
Aging capital assets and infrastructure (Springs, RERC, Clearwater, technology, utility vehicles, substations, etc.)	Capital Replacement and Refurbishment
Emergency capital needs and catastrophic events	Capital and Emergency Reserve
Carbon emissions, Water quality standards, Renewable standards, other regulatory mandates	Regulatory Reserve


WORKFORCE DEVELOPMENT
THRIVING FINANCIALLY
DEBT
–
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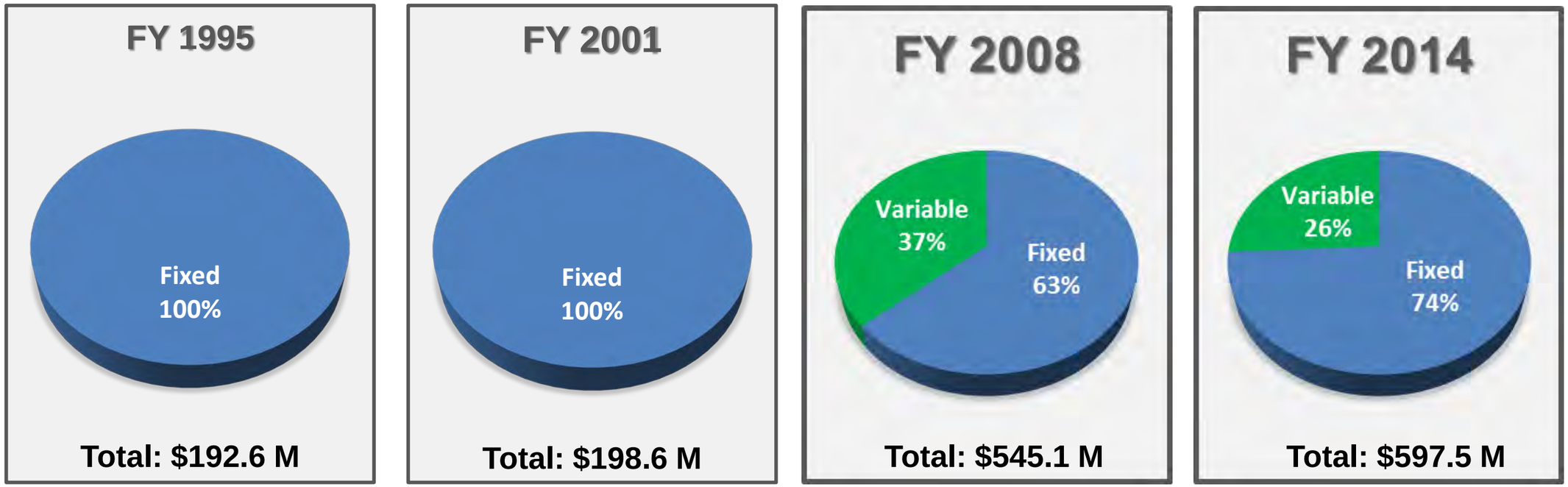
ADVANCED TECHNOLOGIES

20 Year History Electric Fund Debt



	FY 1995	FY 2001	FY 2008	FY 2014
Fixed	$ 192.6 M	$ 198.6 M	$ 346.0 M	$ 443.1 M
Variable	-	-	$ 199.1 M	$ 154.4 M

Fixed Variable

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CITY OF RIVERSIDE PUBLIC UTILITIES

$280M to fund 268MW in new local generation – Increased Reliability!

RIVERSIDE ENERGY RESOURCE CENTER (RERC)

A power generation plant on 16 acres, located on Acorn Street. The 192MW gas-fired power generation plant to be used to offset power shortages during peak demand.

There are four 48MW units, two came on line in 2006, and two more in 2011.

Total project cost: $113 million financed by issuing revenue bonds to be paid back over 25 years.

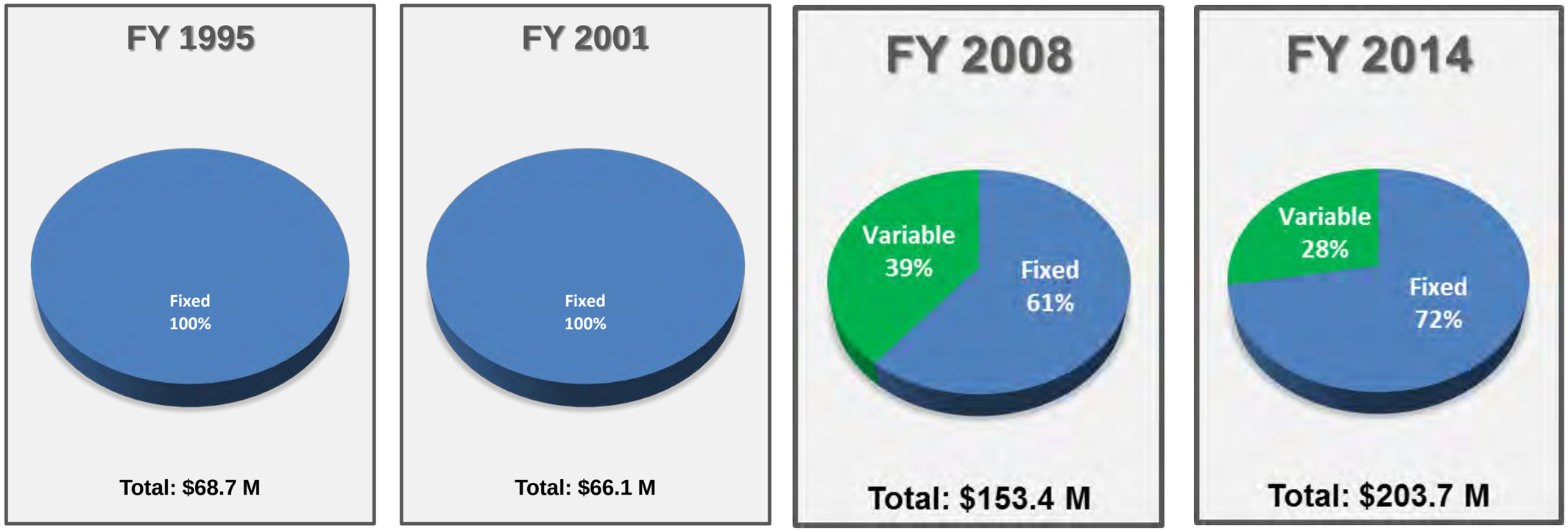
SPRINGS GENERATION PLANT

A power generation plant located in Riverside, that came on line in 2002, providing 36MW of power to be used during times when peak energy is needed, most typically the hottest days of each summer.

CLEARWATER CO-GENERATION PLANT

A power generation plant purchased from Corona, California that provides 38MW of gas-fired power used to offset power shortages during peak demand.

20 Year History Water Fund Debt



	FY 1995	FY 2001	FY 2008	FY 2014
Fixed	$ 68.7 M	$ 66.1 M	$ 93.1 M	$ 147.2 M
Variable	-	-	$ 60.3 M	$ 56.5 M

Fixed Variable

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CITY OF RIVERSIDE
PUBLIC UTILITIES

EVAN'S RESERVOIR REPLACEMENT

A cast-in-place reinforced concrete reservoir with 16 million gallon capacity. Originally built in 1968 and was designated for replacement after seismic vulnerabilities were determined through engineering studies. Before replacement the reservoir was operated at lower water levels to reduce likelihood of structural failure during an earthquake.

Total Project Cost: $25 million

Water Independent!

$118M to fund

- 62 miles of new pipeline
- Improved Evans reservoir to ensure reliability
- Added 8 million gallons of reservoir capacity
- Increase potable water supply

J.W. NORTH TREATMENT PLANT

Total Project Cost: $24 million
(50% grant funded)

WATER SYSTEM - WATER SUPPLY MAINS

TRANSMISSION PIPELINES

DISTRIBUTION PIPELINES

Miles of pipeline:	954
Miles of canal:	14
Number of fire hydrants:	7,754

Total System Value: $1.562 billion

WATER SYSTEM - RESERVOIRS

Number of active reservoirs:	16
Total reservoir capacity (gallons):	108,500,000
Total System Value:	$109 million

WORKFORCE DEVELOPMENT

THRIVING FINANCIALLY
10 YEAR PRO FORMA

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

New 10 Year Pro-forma

Key Financial Targets	• **Debt Service Coverage (Debt)** • **Days Cash on Hand (Reserves)**
Key Components	• **Projected Revenues** • **Revenue Requirement (Expenses)** • **Capital Improvement Program**

Source of Funding	• **Rates**
	  • Bonds
	  • Reserves
	• **Others**

How we use the Pro Forma

- Provide Infrastructure and Supply Options for Planning and Decision Making
- Evaluate Impact of Options
  - Potential Rate Increase
  - Potential Debt Issuance
  - Projected Use of Reserves
  - Projected Financial Ratios (Days Cash / Debt Service Coverage)
- Incorporate Directions from City Council and Board

Electric Infrastructure Investment Options

Additional financial investment is required to address current backlog and improve maintenance.

Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind (reactive)	Conduct Projected Repairs	Conduct Projected Repairs (proactive)	Highly Proactive
↓↑	↓↑	↓↑	↓↑
$171 – 206 million	**$317 – 381 million**	**$365 – 439 million**	**$519 – 623 million**

WATER | ENERGY | LIFE

CITY OF RIVERSIDE PUBLIC UTILITIES

Water Infrastructure
Summary of Investment Options

Additional financial investment is required to address current backlog and improve maintenance.

Option 1	Option 2	Option 3	Option 4
Status Quo Fall Behind	Major Deficiencies	Operational Deficiencies	Aggressive Program
↓↑	↓↑	↓↑	↓↑
$170 – 206 million	**$226 – 293 million**	**$279-357 million**	**$342-437 million**

WATER | ENERGY | LIFE

CITY OF RIVERSIDE PUBLIC UTILITIES

Water Supply
Summary of Investment Options

Water Supply

- Additional financial investment is required to secure additional water supplies

Tier 1	Tier 2	Tier 3
10,000 afa	Additional 15,000 afa	Additional 3,000 afa
↓ ↑	↓ ↑	↓ ↑
$34-$38 million	$74-$93 million	$102-$124 million

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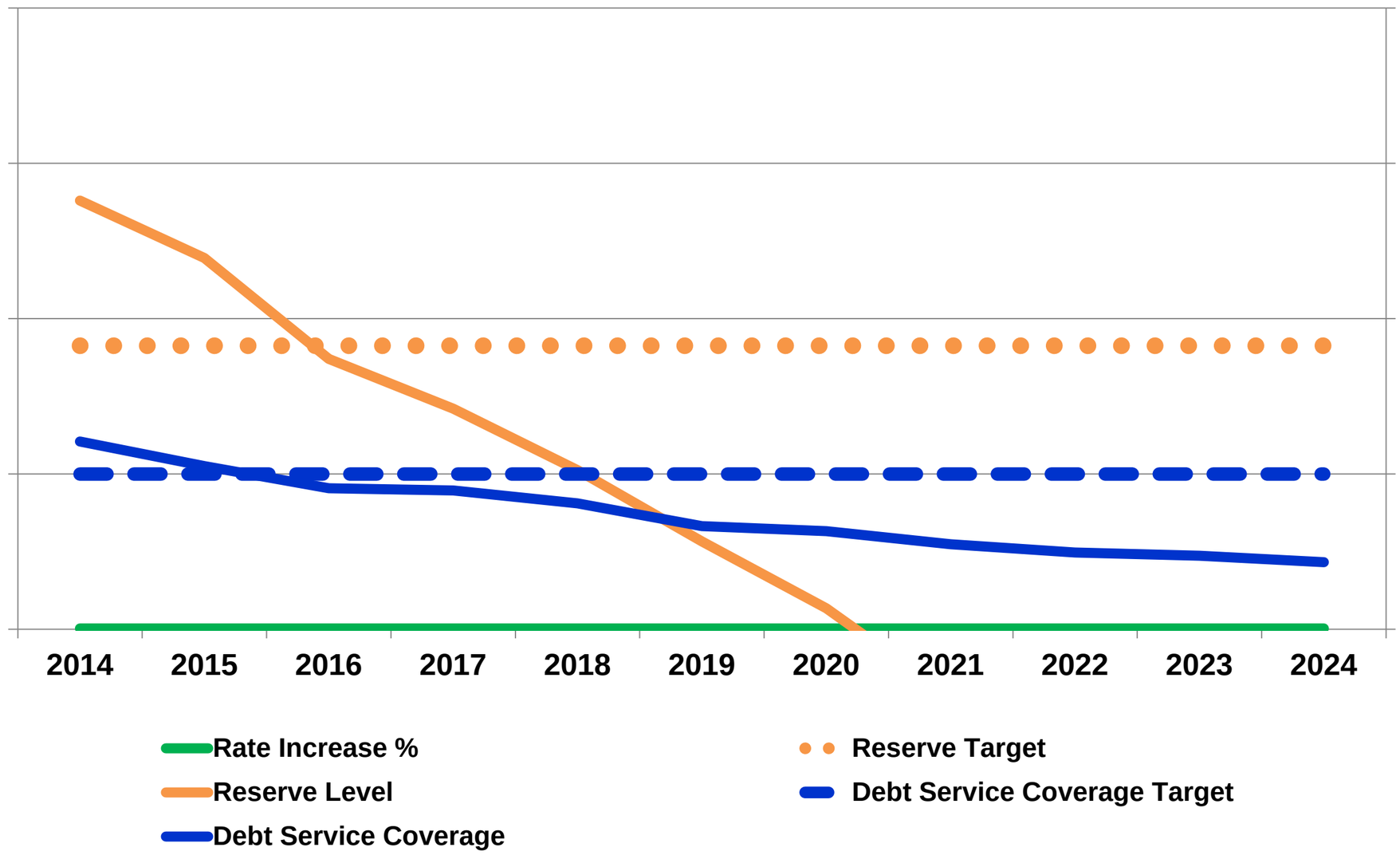
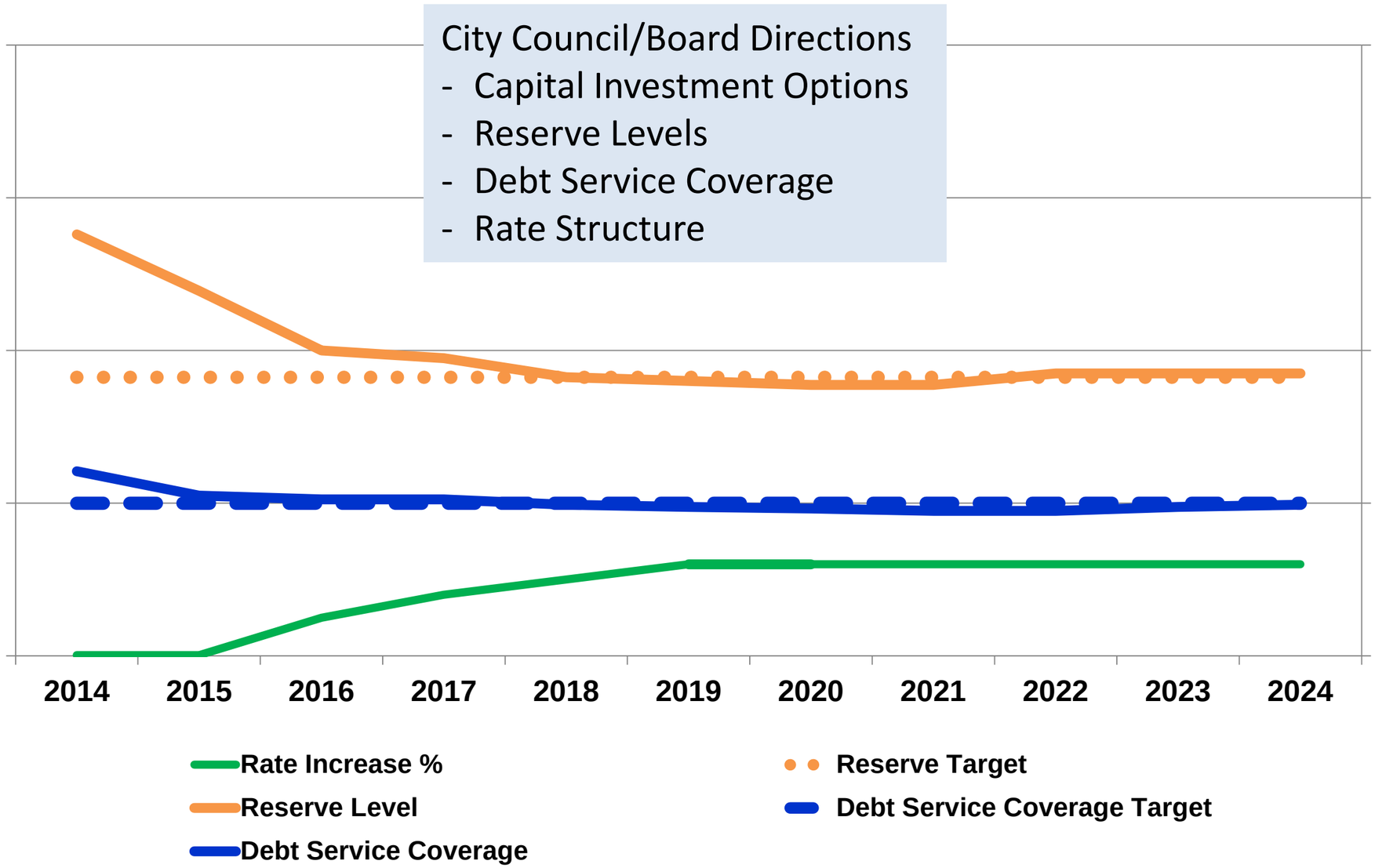
CITY OF RIVERSIDE
PUBLIC UTILITIES

Pro-forma Results Example
Current Rate Plan



Pro-forma Results Example
Updated Rate Plan



Pro-forma and Policies - Next Steps

- Incorporate City Council/Board Directions on Roadmaps into 10 Year Pro-forma
- Update Financial Policies to Current Best Practices

WORKFORCE DEVELOPMENT

OTHER
FINANCE
RELATED ITEMS
COMING

THRIVING FINANCIALLY

ADVANCED TECHNOLOGIES

RPU Audits

Baker Tilly Examination and Performance Audit

- Examination of Northside Properties, Financial Policies, Cost Allocation. Report to Board/CC (August – December 2015)

Hometown Connections Operational Audit

- Interviews with key utility personnel addressing various operational areas. Report to Board/CC (August – December 2015)

CMO Office – Deep Dive Financial & Performance Audit

- TBD – August 11th City Council Meeting (Audits will commence Jan. 2016)

City Council Workshop - RPU Finance 101

- September 1, 2015
- Topics to include:
  - Financial Policy Outline
  - Rates/Reserves
    - History of Rate Plans – what did we get?
    - What is currently impacting rates?
    - Risk Quantification for Reserves
  - Debt
  - Financial Planning

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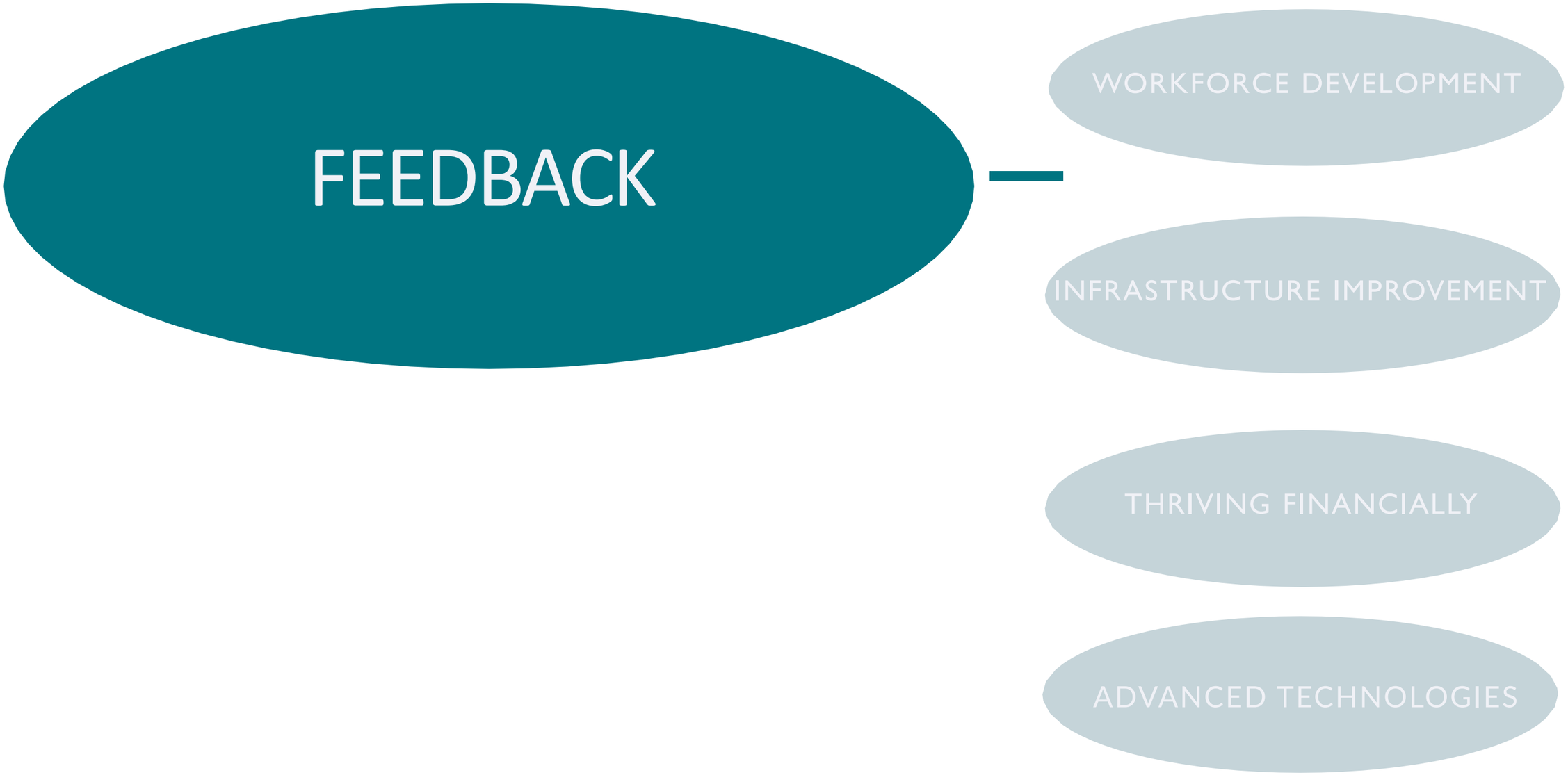
CITY OF RIVERSIDE PUBLIC UTILITIES

Future Outcomes

Thrive Financially
by ensuring costs are recovered and **develop a new business model to** adapt for the future.

- Cost recovery through rate structure and rate plans
- More robust financial and reserve policies
- Targeted use of reserves and debt
- Accountability through audits
- More frequent communication of financial performance

ROAD MAPS –


FEEDBACK
WORKFORCE DEVELOPMENT
INFRASTRUCTURE IMPROVEMENT
THRIVING FINANCIALLY
ADVANCED TECHNOLOGIES

WRAP UP & NEXT STEPS

- WORKFORCE DEVELOPMENT
- INFRASTRUCTURE IMPROVEMENT
- THRIVING FINANCIALLY
- ADVANCED TECHNOLOGIES

RIVERSIDE PUBLIC UTILITIES - PLANNING DATELINE

WORKING THE PLAN

2014

General Manager Assessment

Q1 - 2015

February 12, 2015
Introduction to Utility 2.0

February 27, 2015
Utility 2.0 Feedback

Q2 - 2015

May 7, 2015
Joint Meeting #1
Utility 2.0
& Governance

Q3 - 2015

July 13, 2015
Utility 2.0
Infrastructure &
Workforce
Roadmaps

July 29, 2015
Utility 2.0
Resource Supply
Thriving Financially
Roadmaps

August 11, 2015
City Council
to discuss
Performance Audits
Fiscal and Reserves
Policy

August 28, 2015
Joint Meeting #2
Utility 2.0 - Roadmaps
& Governance

September 1, 2015
Council Workshop
RPU
Finance 101

Q4 - 2015

October 2015
Fiber Optic Plan
Northside Audit
Transactions
to Board and
Council

Oct.-Dec. 2015
Roadmap Feedback
Fiscal Policies Audit
Organizational Review
Thriving Financially
to Board and
Council

Q1 - 2016

Jan.-Mar. 2016
Draft Financial Plan
(5 year forecast)
Performance Audit
(next phase)
Detailed Finance Audit
to Board and
Council

COMPLETED

City Council

Board of Public Utilities

Joint Meeting Council Board

Reports to Board And Council

WATER | ENERGY | LIFE
CITY OF RIVERSIDE
PUBLIC UTILITIES