



Water for a Brave New World: Accelerating High Impact Water Retrofits in Public Buildings with State EPCs

ESC Market Transformation Conference

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Water for a Brave New World

EPCs and Municipal Water Market Trends and Opportunities

Topics Covered by Presentation

1. Municipal Water Market Trends

- Water Scarcity and the West's Great and Growing Cities
- Potable and Waste Water Market Trends (Past, Present, and Future)

2. Performance Contracting and Water Market Study

3. High Impact Water Measures

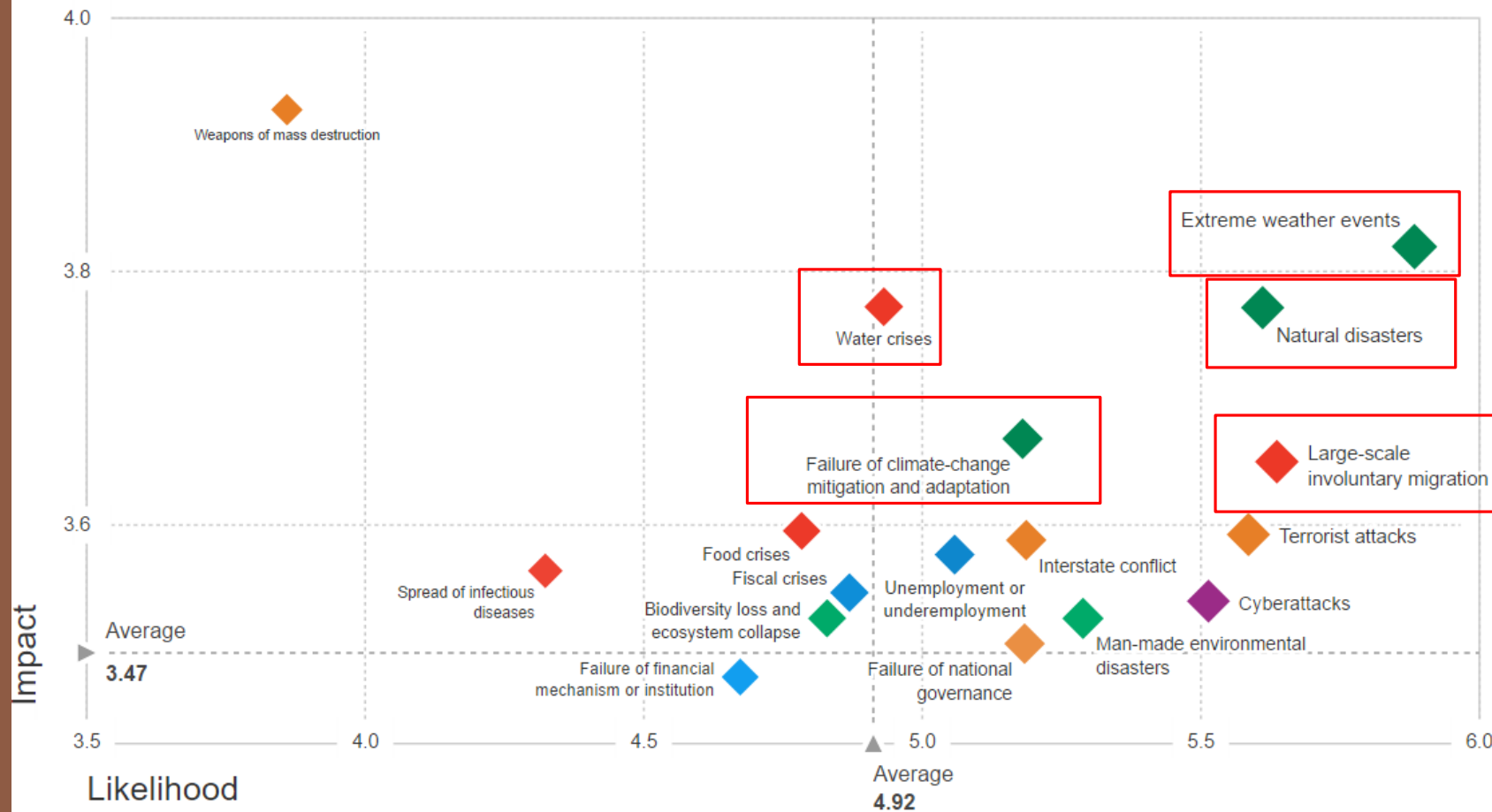
- Emerging Technologies
- Policy: Issues and Opportunities

The Big Picture: Framing the Challenge

Next 10 years

The Global Risks Landscape 2017

What is the impact and likelihood of global risks?

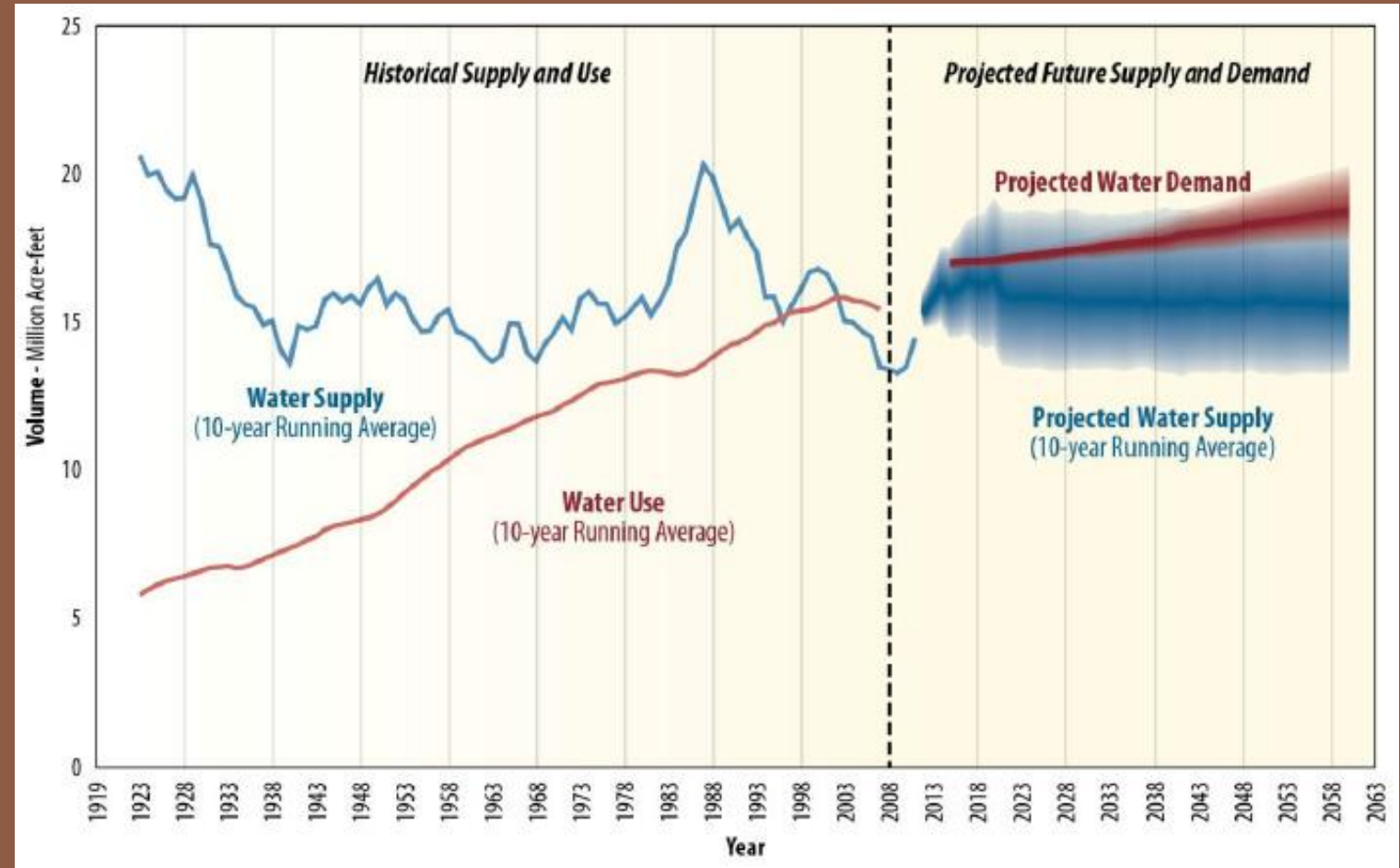


Risks that can cause significant negative impact to countries and industries (likelihood v. impact)

Source: World Economic Forum, 2017

The Perfect Storm: Water Scarcity and the Great and Growing Cities of the West

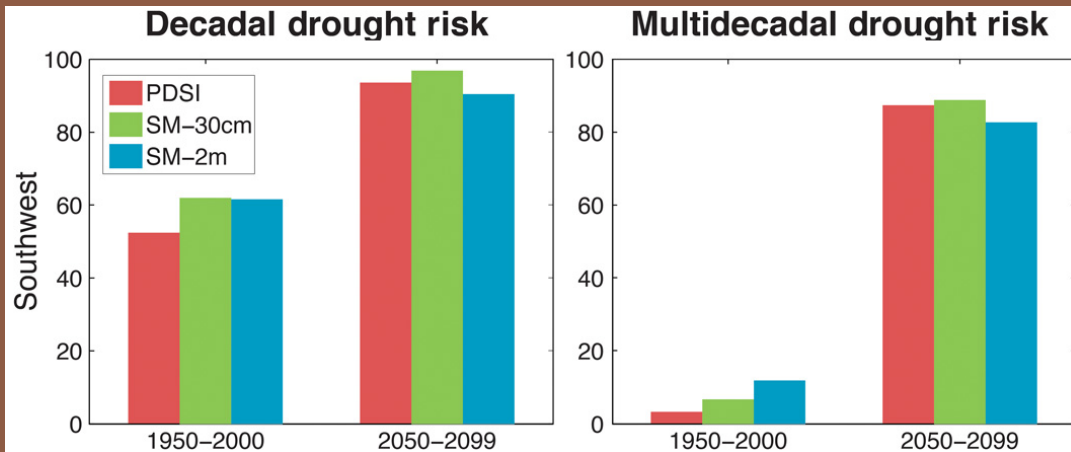
Projected Colorado River Supply-Demand Imbalance: greater than 3.2 million acre-feet by 2060



The Perfect Storm: Colorado River Water Supply and Demand Imbalance

STATE	POPULATION (JULY 2008)	POPULATION GROWTH (2000-2008)	RANK	PRECIPITATION (INCHES)	RANK
Nevada	2,600,167	30%	1	9.5	50
Arizona	6,500,180	27%	2	13.1	48
Utah	2,736,424	23%	3	11.9	49
Colorado	4,939,456	15%	7	15.5	45
New Mexico	1,984,356	9%	17	13.9	46
U.S. Average		8%		34.3	

Source: Western Resource Advocates, 2009



2050 and beyond

NASA: “Unprecedented Drought Risk in the American Southwest”

Source: Cook et al., 2015

Historical Trends

Long-term data reveals:

- Prices for water and sewer maintenance continue to rise at rate much higher than overall rate of inflation (CPI)
- Recent price trends for electricity generally tracking overall rate of inflation
- Recent price trends for natural gas fallen below the overall rate of inflation

Source:
Janice Beecher, Michigan State University,
Trends in Consumer Prices (CPI) for Utilities

LONG TERM Municipal Water Market Trends

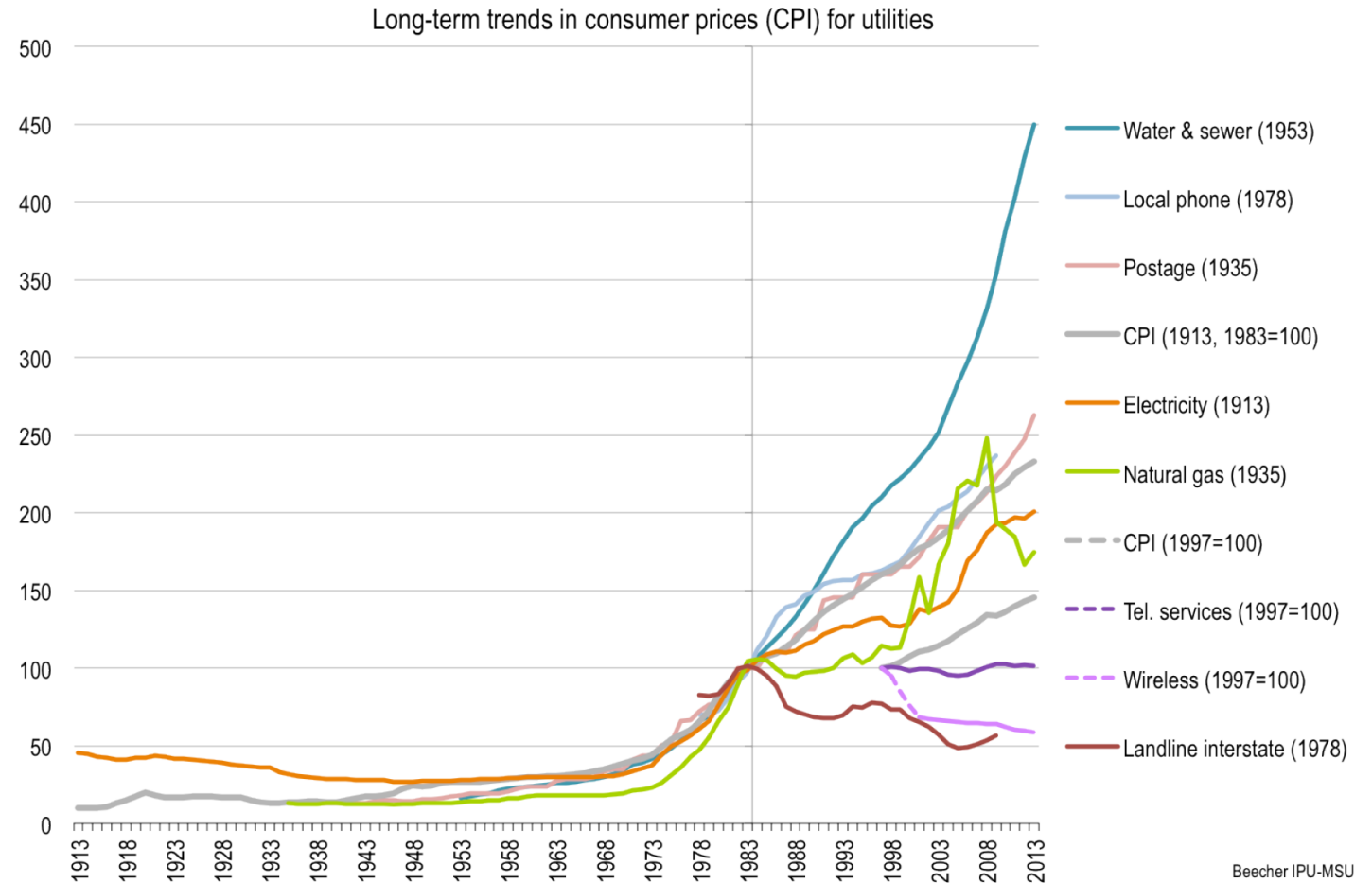


Exhibit 1. Long-term trends in the Consumer Price Index (CPI) for utilities (1913-2013). The index is set to 100 for 1982-1984 except for telephone and wireless services, where the index is set to 100 for 1997. Year (*) indicates start of series.

Current and Future Municipal Water Market Trends

Recent Trends

Water Research Foundation, 2014

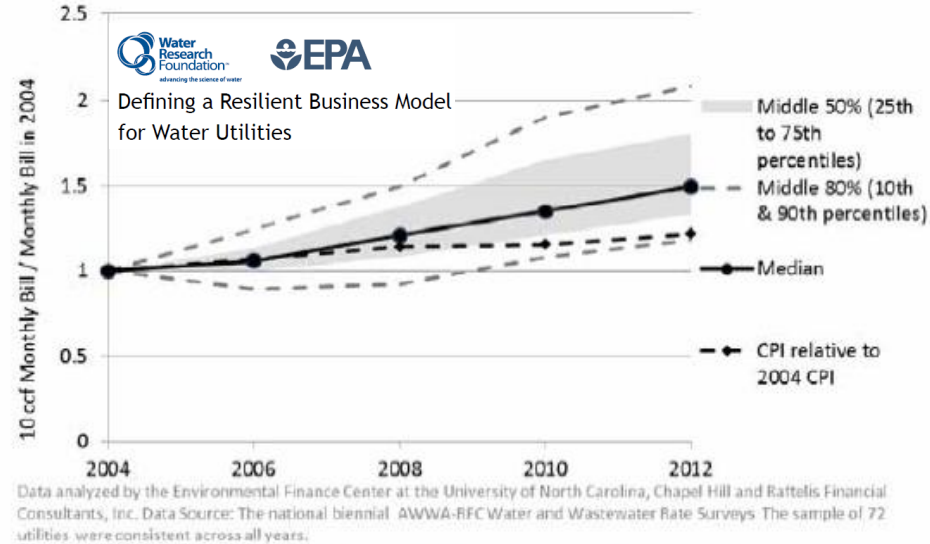
Median increase in nominal monthly bills 2004-2012 was 50%, compared to cumulative increase in CPI of 22% in same period

Next 25 Years

American Water Works Association, 2012

Buried No Longer Report's Key Findings,

1. Nationally, investment needs for water infrastructure **more than \$1 trillion** over next 25 years.
2. Water bills will go up



Monthly charge for 10 ccf relative to 2004 charge for 72 nationwide utilities

BURIED NO LONGER:
Confronting America's Water Infrastructure Challenge

Water and Energy EPC Market Study Results

Potential Savings via Market-Based Solutions in the Colorado River Basin States*

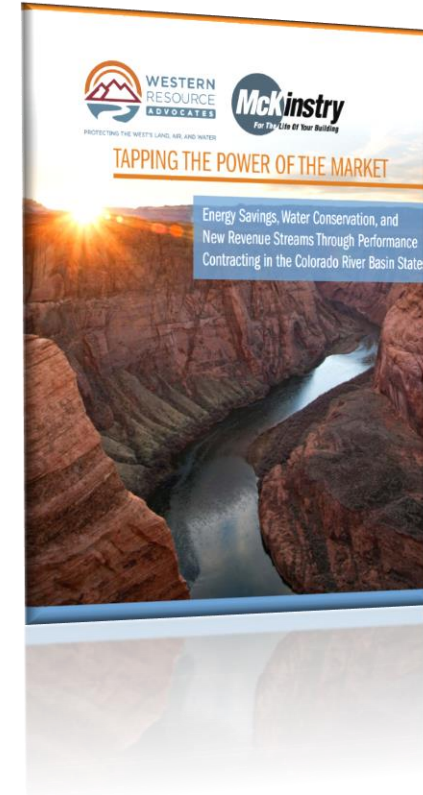
Savings Type	Total Savings Potential
Electricity	6,400,000 MWh
Natural Gas	4,200 MCu. Ft
Water	104,000 AFY
\$\$\$	\$975,000,000

Public Facilities

Public Water Systems

Public Wastewater Systems

*Calculations from Western Resource Advocates and McKinstry, Inc. 2015, and subsequent ground-truthing verifying the study's data and assumptions.



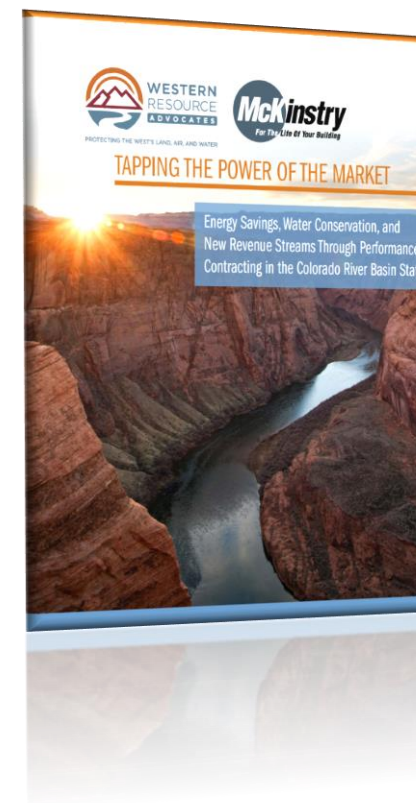
Energy-Water Market Based Solutions

Energy Performance Contracts (EPCs)

Revenue Increase and Reductions in Apparent Water Loss Potential for New Water Meter Projects in the Colorado River Basin States

State	Apparent Water Loss Reductions (acre-feet per year)	Increase in Revenue (\$Million per year)	DWSRF FY2014 Allotments
Arizona	56,050	\$53	\$14.4
California	289,750	\$437	\$75.1
Colorado	38,950	\$34	\$13.9
Nevada	26,600	\$30	\$11.3
New Mexico	13,300	\$11.4	\$7.9
Utah	31,350	\$22.8	\$8.3
Wyoming	4,750	\$3.8	\$7.9
Total	460,750	\$592.8	\$138.8

Source: Western Resource Advocates and McKinstry Inc., 2015



High Impact Water Conservation Technologies and Strategies for Municipal Sector

■ Public Buildings

Consumptive Use Reduction Measures

- Cooling Towers
- Outdoor Irrigation
- Turf Conversion

■ Public Water Systems

Water Loss Control

- Automated Meter Readers
- Advanced Metering Infrastructure

Policy: Issues and Opportunities

Executive Orders

OUTDOOR IRRIGATION

Smart Water Application Technologies (SWAT) Initiative

○ **Weather-Based Controllers**

○ **Soil Moisture-Based Controllers**

○ **Rain Sensors**

State Legislation

Market Incentives

and Synergistic Partnerships

M&V and EM&V

Water, State EPCs, and M&V Project (2017) | Steering Committee

State Officials

- Harold Trujillo, New Mexico Energy Technology and Engineering Bureau Chief, New Mexico EPC Program
- Kelly Thomas, Energy Program Manager, Nevada Governor's Office of Energy, Nevada EPC Program
- Taylor Lewis, Program Engineer, Colorado Energy Office Colorado EPC Program

Utilities

- Patrick Watson, Conservation Services Administrator, Southern Nevada Water Authority (SNWA)
- Carlos Bustos, Water Conservation Program Manager, Albuquerque Bernalillo County Water Utility Authority
- Frank Kinder, Senior Conservation Specialist, Colorado Springs Utilities

Stakeholder-Based Organizations

- Donald Gilligan, President, NAESCO
- Mary Ann Dickinson, President and CEO, Alliance for Water Efficiency
- William D. Taylor, Private Sector Co-Chair, ESC Nevada Chapter
- Oscar Rangel, Private Sector Co-Chair, ESC Nevada Chapter
- Scott Griffith, Private Sector Co-Chair, ESC Mexico Chapter

Federal Officials

- Paul Matusca, Water Accounting and Verification Group Manager US Bureau of Reclamation

Performance Contracting Consultants

- John Canfield, President, Trident Energy Services
- Chris Halpin, President, Celtic Energy

Water, State EPCs, and M&V Project

Purpose and Objective

Transparency, feedback on draft protocols, buy-in

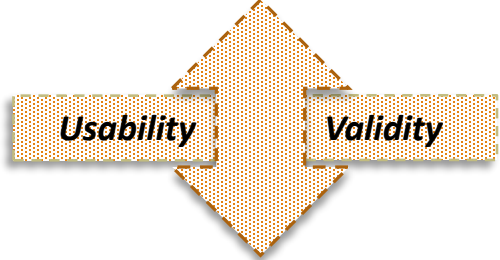
**Stakeholder Review Process
(Energy Service Coalition)**

Feedback on process and work plan; high-level review; education and buy-in

Steering Committee

Protocol Development

Measure Protocols



Usability, validity, consensus

TAG 1: Outdoor Irrigation TAG 2: Turf Conversion TAG 3: Cooling Towers
Technical Advisory Groups

- Co-Leads and Facilitators
WRA
Colorado EPC Program
- Lead
PNNL
- TAG Facilitator
WRA
- Senior Advisors of Project
NREL
9Kft Strategies in Energy



THANK YOU!

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**WESTERN
RESOURCE
ADVOCATES**

PROTECTING THE WEST'S LAND, AIR & WATER