Quantifying Water-Energy Savings

AWWA Cal-Nevada Section
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Big Picture Questions

- 2010 Embedded Energy in Water Study: Supply, treatment, and conveyance of water makes up 7.7% of statewide electricity use
- What is the potential for saving energy and reducing greenhouse gas emissions via the water sector in CA?
- When water efficiency programs save energy and reduce GHGs, how do we account for these savings?
- What is the value to energy and water ratepayers?
- What is the value to California?

The Current Energy Efficiency Portfolio aims to reduce Energy used for Water

Energy Efficiency programs

- "Industrial" Custom projects for water agencies/utilities/districts
- Local Government and Institutional Partnerships
- Agricultural: pumping & irrigation efficiency

Energy/Water Utility Partnerships

- Leak detection, water loss education, water-energy needs assessments.

- **Residential and low income programs** – IOU Pilots for faucet aerators, low flow toilets, etc.

City of Cerritos/SCG partnership – Water loss control program

Next Generation of Water-Energy Program Development

- Commission seeking to calculate "cost effectiveness" of water savings through an energy efficiency lens.

- $1 Billion Question: Of the ratepayer funds designated to save energy, how do we decide what water savings project are worthy of those funds?

Tehachapi Pass pumping station

Energy Efficiency Evaluated for Cost Effectiveness

In addition to "getting it right," evaluation ensures that EE portfolios meet cost effectiveness tests:

- Complex, challenging, contentious
- Rigorous
- "Free riders"

Basics of the Net-to-Gross Ratio

Accounts for non-program influences on participants' decisions.

Applied to both the cost and benefit components of the cost-effectiveness tests.

Key Factors Addressed:

- Energy-Related Free-ridership
- Other non-energy motivations (being "green," health and comfort, etc.)

CPUC Decision 15-09-023 – The Water Energy Nexus Decision (September 17, 2015)

- Created tools to quantify the benefits of water savings
- Avoided Water Capacity Cost Model
- Water-Energy calculator
- Addresses how to allocate program costs and benefits among program administrators.
- Addresses coordination with other cost effectiveness calculators

Avoided Cost and Cost Effectiveness Calculators

- **Avoided Pre-use Treatment Embedded Energy:** As users enter data into the cost calculator tool, the local energy intensity in water data will complement local energy analysis, and help target water, energy efficiency, and other measures.

- **Avoided distribution embedded energy** is the energy that it takes to move water from point of treatment to point of consumption.

- **Avoided wastewater treatment embedded energy** is the energy that it takes to move water from point of consumption through a wastewater treatment process.

- These all measure the cost effectiveness of cold water savings measures

Water-Energy Cost Effectiveness Calculator Demo

Program Parameters:

- Measure: Weather-based Irrigation Control
- Annual Water Savings: 160,000 Gallons/year
- Measure Life: 20 Years
- Rebate: $80

Steps to Put Tools into Action

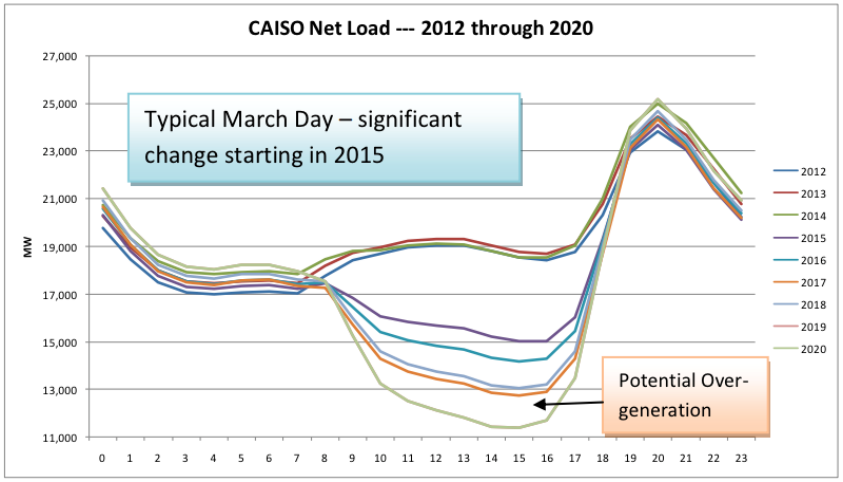
1. Partner with Investor-owned Utility
2. Use calculator to determine avoided water capacity
3. Use cost effectiveness calculator to arrive at cost effectiveness
4. Input number into E3 cost effectiveness calculator
5. Work with IOU to file findings in a Workpaper to be filed with the CPUC

The Water Energy Nexus Decision, Phase 2
Track 1: Advanced Meter Utilization

- Commission Requested proposals for utilizing water-energy Advanced (or “Smart”) Meters for water savings.
- Proposals received from all IOUs (which will be presented in this panel)
- Currently being considered

The Water Energy Nexus Decision, Phase 2
Track 2: Matinee Pricing Tariffs

- Commission requested proposals from large customers to use low water-use generation when it is most abundant on the grid.
- Proposals received from all IOUs, CA Large Energy Consumers.
- Proposals are currently being considered, focus on rate design



The Water Energy Nexus Decision, Phase 2
Track 3: Calculator 2.0

- Ruling asked stakeholders for ideas on improvements to the calculators
- Comments prioritized integration of the two calculators and the E3 cost effectiveness calculator
- Some comments also recommended GIS overlay of hydrologic regions, better user support, better instructions

The Water Energy Nexus Decision, Phase 2
Track 4: Water/Energy/Telecom Nexus

- Commission will explore potential of adding telecom to the nexus.
- Acknowledges that reliable broadband is necessary to operate water savings and water monitoring technologies
- Ruling to stakeholders for comments has not yet been issued

Questions?

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