EAST BAY MUNICIPAL UTILITY DISTRICT

Water & Energy Nexus

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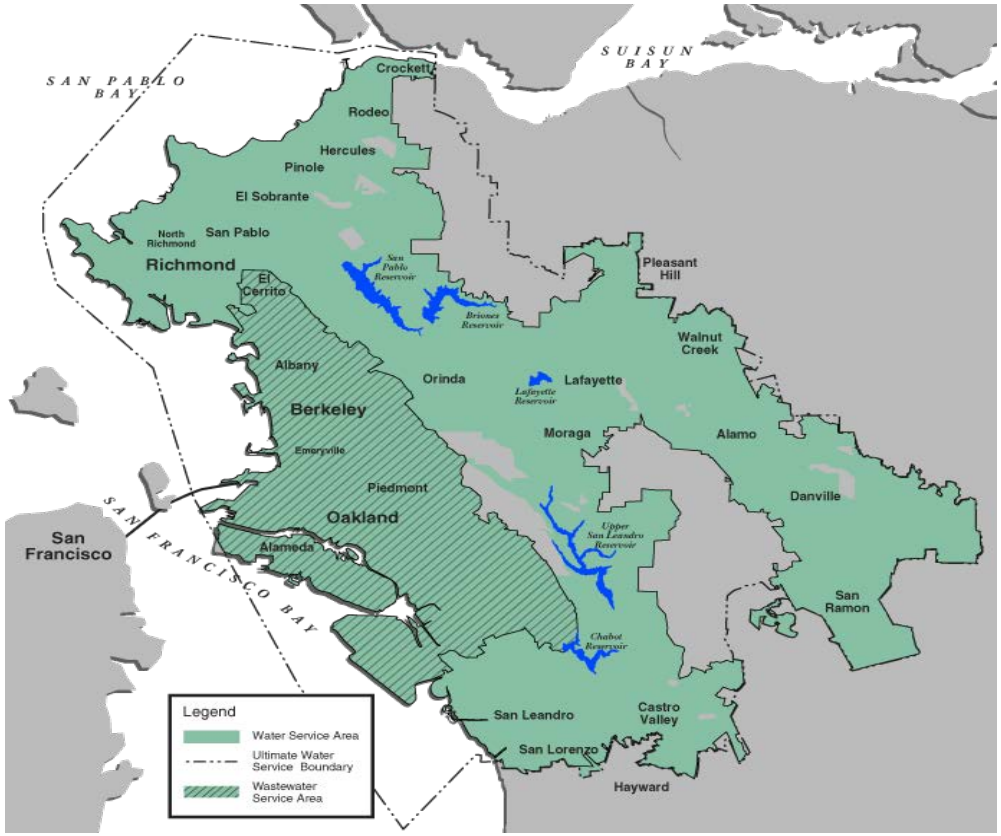
Bay Planning Coalition
Energy & Water Nexus Summit 4
September 28, 2015

EBMUD Service Area



- Service area includes 20 incorporated and 15 unincorporated cities and communities in two counties
- Provide water service to about 1.4 million people
- Provide wastewater service to about 650,000 people

EBMUD Water Supply

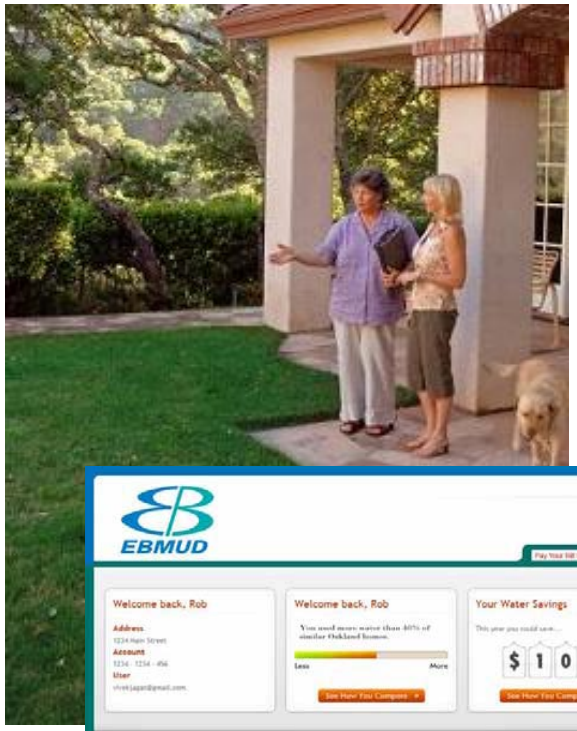
Water Energy Management Strategy

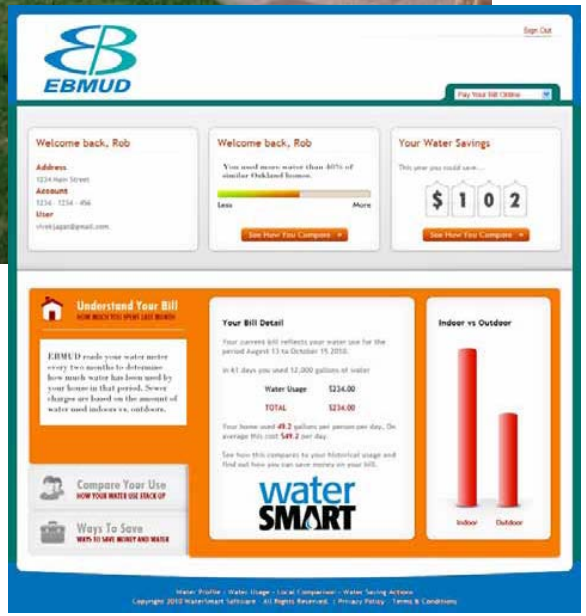
- Water Conservation
- Energy Management
- Research
- Partnerships

- Ensure energy projects are prioritized based on best overall savings

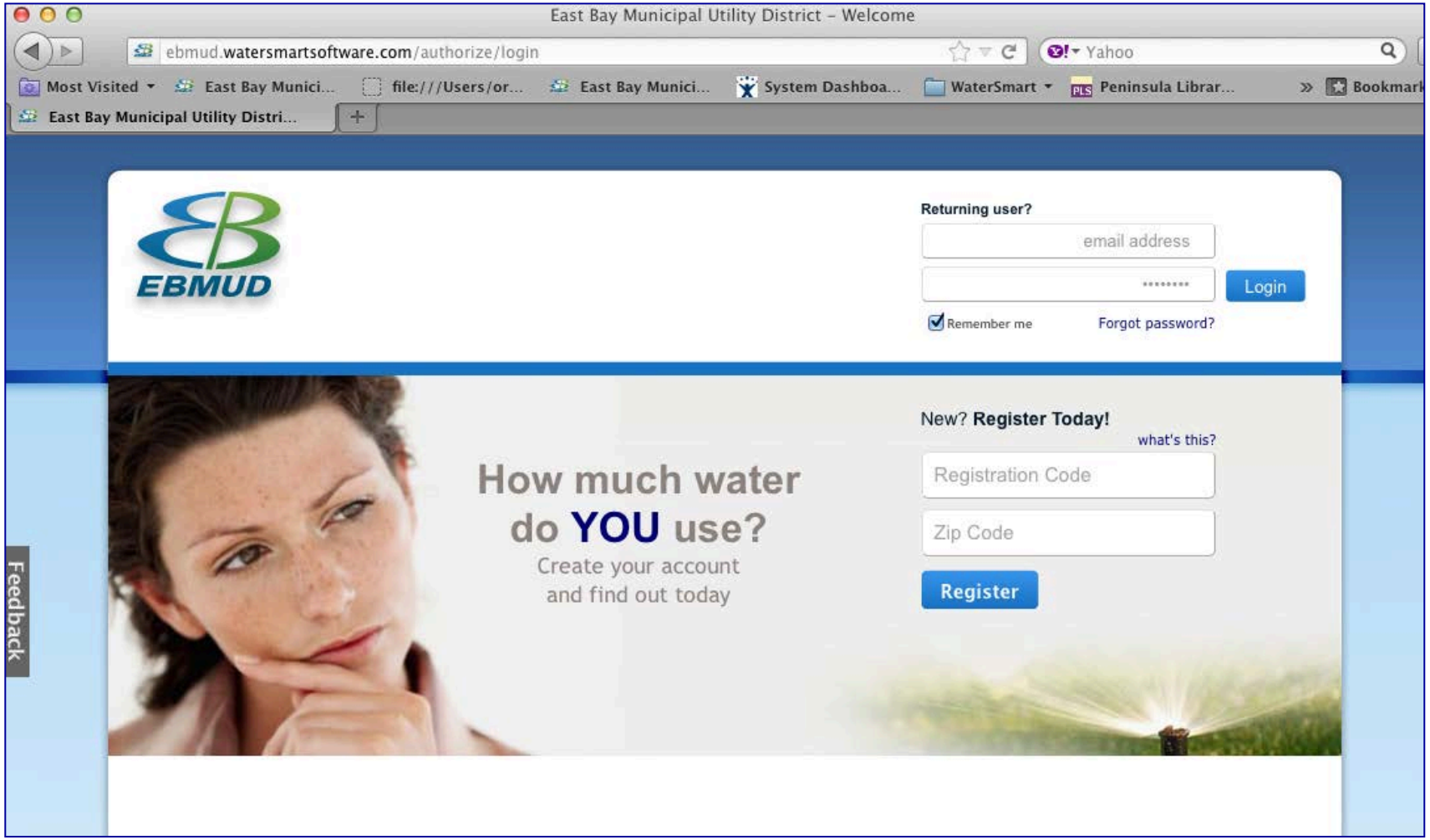
Water Conservation

- Less Water = Less Energy
- Demand Management
  - Home and business surveys and rebates
  - Education and information
  - New service regulations
  - Research on technology
- Water Loss Control (leak detection)





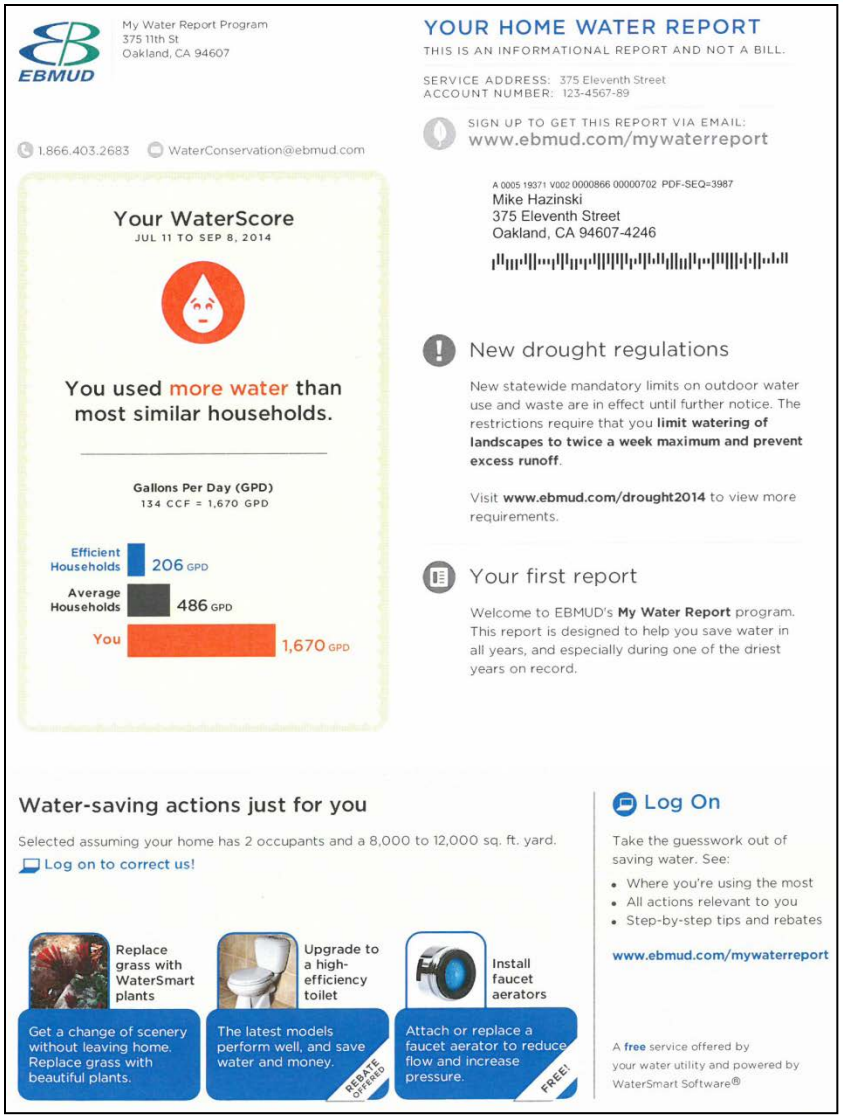
Online Customer Portals



Home Water Reports

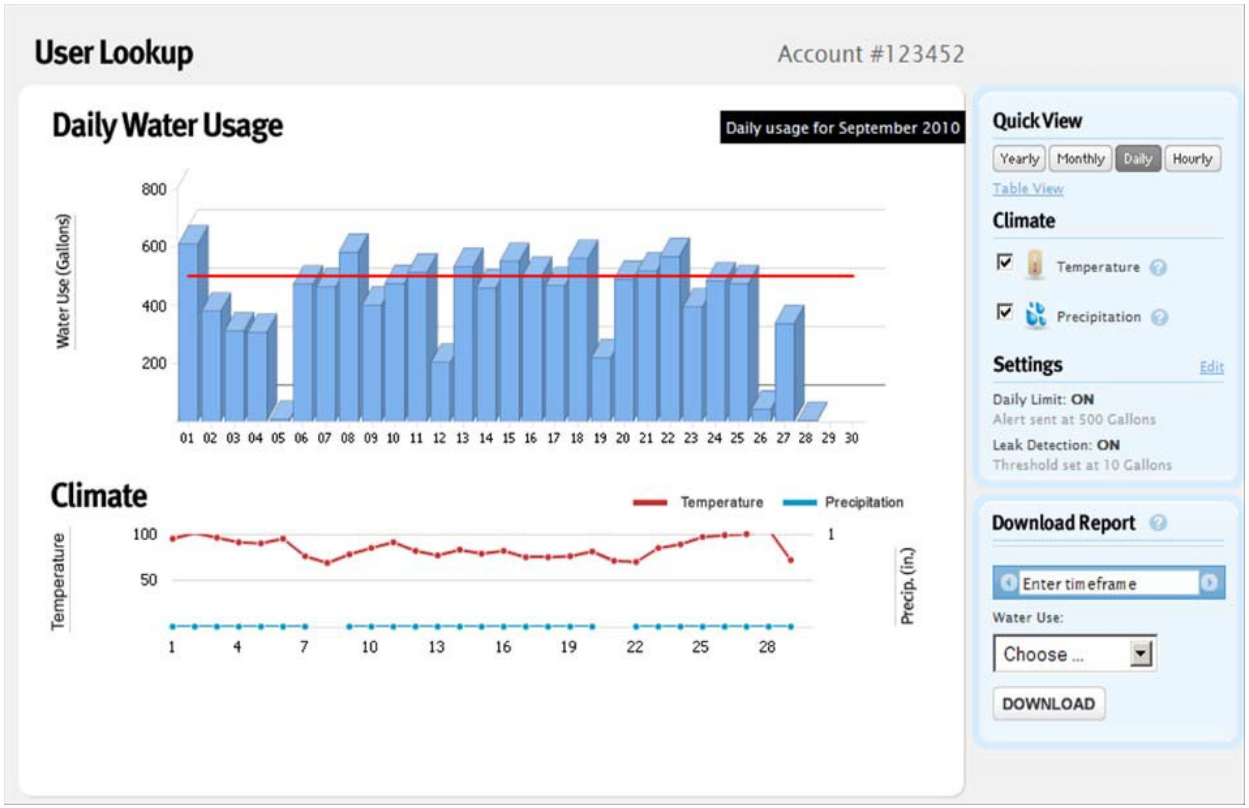
Comparison to similar households

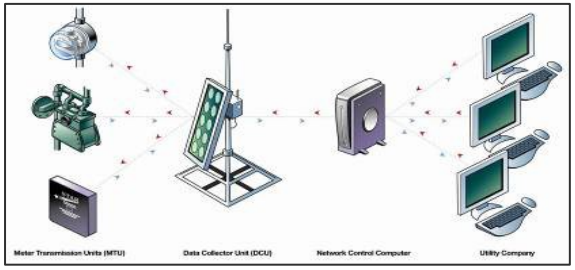
Personalized savings/offers



Modified messaging

AMI Customer Tools

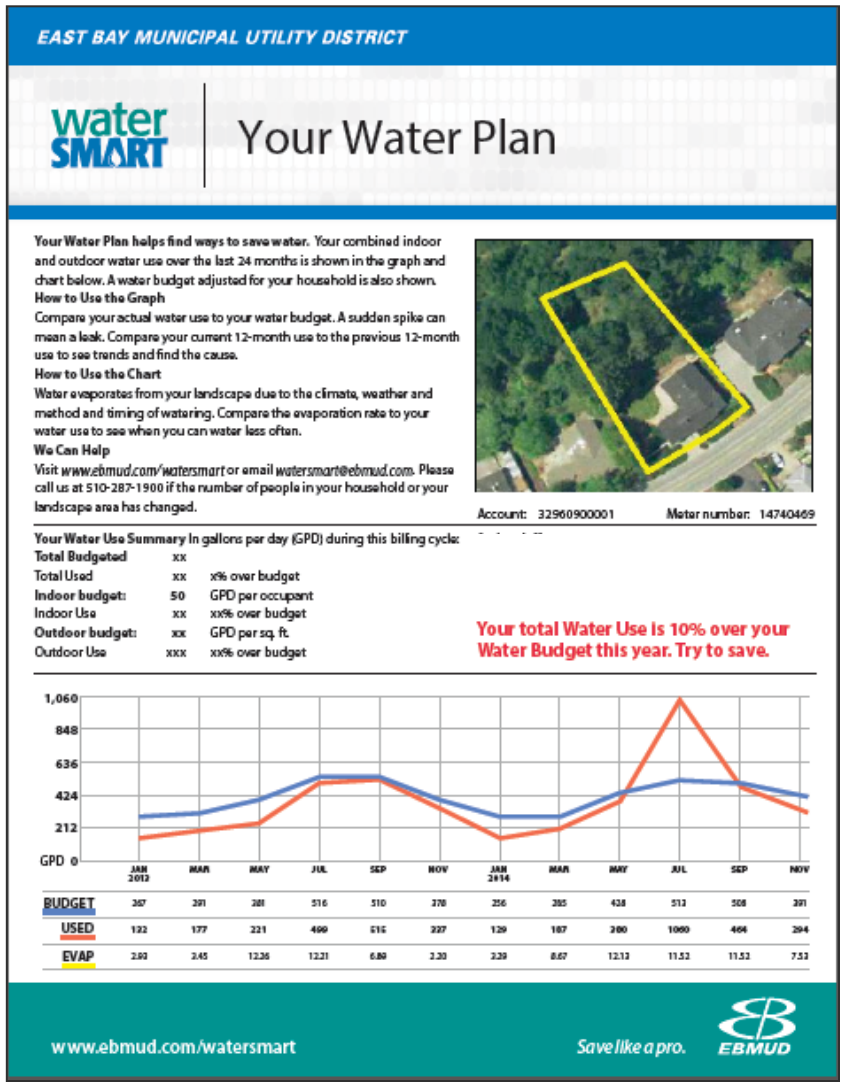




20x2020 Mapping Tools

- Create landscape water use budgets
  - >350,000 SF, MF and IRR accounts
  - 3 microclimate zones
  - Focused on >27,000 half-acre parcels
- Applications
  - High-resolution color + infrared imagery
  - Weather data integration
  - Customer reports with water and cost savings recommendations

Landscape Water Budgets



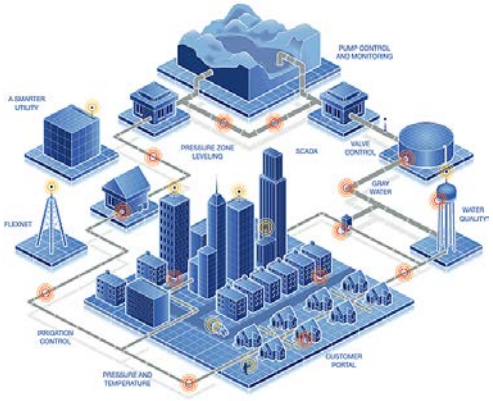
Technology Research

- Food Service and Hospitality
  - Self-contained food steamers
  - Pre-rinse spray valves
  - Air-cooled ice machines
- Health Care
  - X-ray film and photo processors
  - Steam sterilizers
- General Applications
  - Weather-based irrigation controllers
  - Hot water delivery systems
  - Laundry equipment
  - Car washing
  - Gray water systems

Water Loss Control Technology

- Acoustic leak detection
- Dynamic DMA
  - Understand real losses
  - Pressure management
- AMI

Dynamic DMA)



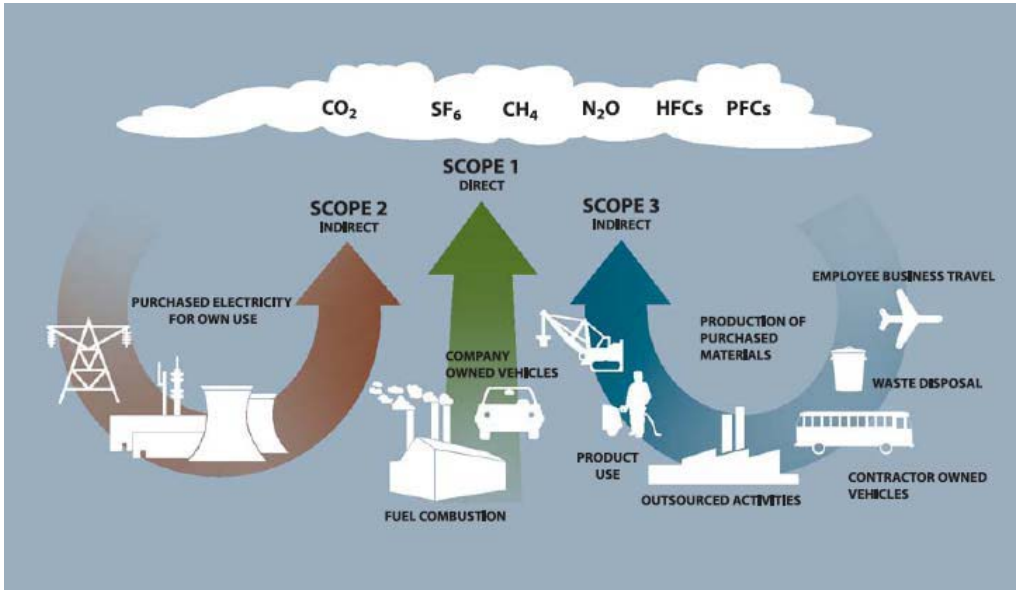
AMI/AMR

EBMUD Energy Management Strategy

- Reduce GHG emissions
- Diversify our energy supplies
- Minimize energy costs
- Minimize energy use
- Educate our employees and customers

Energy Policy

- Comprehensive policy to address all energy sources
- Establish a new GHG emissions goal for 2040
  - Indirect Emissions: Carbon-free by 2040
  - Direct Emissions: 50% reduction by 2040



Hydropower

- Two Hydropower Plants
  - Pardee 30 MW
  - Camanche 10 MW
- Average Annual Generation 185,000 MWh
- Average Annual Energy Use 100,000 MWh
- Net energy producer for water

Wastewater Cogeneration

- Generates over 6 MW of renewable energy from biogas
- Approximately 4.5-5.0 MW is required to operate the wastewater treatment plant

PV Power Purchase Agreements

- District-Owned
  - 470 kW (WTP and Administration Buildings)
  - $850,000 savings over 25 years
- Power Purchase Agreement
  - Purchase electricity from a third party owned & operated system on District property
  - 775 kW (WTPs and Service Yard)
  - $900,000 savings over 20 years

Minimize Energy Costs

Project	Description	Savings/Year
Raw Water System Optimization	Maximize gravity flow on Moklumne Aqueducts and optimize operation of raw water pumping	$500,000
San Ramon Valley Energy Management	Optimization – shift energy use from peak to part peak and off peak	$370,000
Demand Response	PG&E's Peak Demand Pricing Program	$100,000
Natural Gas Contract	Gas purchases from California's Dept of General services for microturbines	$65,000

Minimize Energy Use

Project	Description	Savings/Year
Natural Gas Microturbines	600 kW @ admin building	$125,000
WTP Lighting Upgrades	High efficiency lighting replacement at Lafayette, Orinda and Sobrante WTP	$44,000
Hybrid Fleet	Toyota hybrid fleet	$35,000

Water Energy Nexus Research

EBMUD

- Estimate energy intensity (EI) of water
- No one-size-fits all EI number that can be given a gallon of water
- Need to consider seasonal and spatial effects on energy

UCDAVIS
CENTER FOR WATER-ENERGY EFFICIENCY

EBMUD-PG&E Partnerships

- Water and energy rebates for clotheswashers
- Joint customer water-energy audits/referral program
- Joint technology research
  - Ice machines
  - Connectionless steamers
  - Pre-rinse spray valves
- Energy rebates for utility scale projects (PV, micro-turbines, biodiesel, in-conduit hydro)

RARE Water Project

- A Public-Private Partnership to Conserve Water

Summary

- Water conservation important strategy
- EBMUD is a net energy producer
- EBMUD has aggressive GHG reduction goals
- Conveyance and distribution require significant energy
- EBMUD leverages every opportunity to save water, energy and money.