Key Opportunities

The following recommendations are based on the results of both the primary analyses detailed above as well as additional research described in the full report.

Regulations

Enforceable policies and codes to drive customer engagement and compliance

- Enhance efficiency-oriented rate structure.
- Strengthen irrigation requirements to maximize water savings from lawn conversion.
- Make current City drought restrictions permanent.

Incentivizing Demand Reductions

Driven by BWP policies and programs that encourage customers to reduce their water demand through either outreach and education or financial incentives

- Prioritize water efficiency programs with lowest cost and highest water savings.
- Focus on minimizing water waste from over-irrigation.
- Expand funding and outreach of Green Home House Call program to increase customer engagement.
- Improve customer engagement in water efficiency programs through a data-driven analysis of demand.
- Incorporate spatial analysis and visualization by combining smart meter network and Geographic Information Systems.
- Identify high-volume efficiency opportunities for Commercial, Industrial, and Institutional water users.

Increasing Use of Local Water Supplies

Focuses on local supply enhancement to reduce dependence on imported water.

- Increase recycled water use to satisfy local potable and regional non-potable demand.
- Increase the ratio of local groundwater to pre-treated imports in the potable supply.
- Provide financial support and educational outreach to develop a residential greywater program.
- Engage in stormwater infiltration and indirect potable reuse to replenish San Fernando Basin groundwater levels.
- Focus on high-volume rain barrels and customer education.

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Front cover pictures: Left, Burbank WaterWise Gardening Guide Gallery; Right, Morguefile

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UNIVERSITY OF CALIFORNIA SANTA BARBARA

CITY OF BURBANK Water and Power Since 1913

The Development of a Sustainable Water Master Plan for Burbank Water and Power

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Project Brief | Spring 2015 burbank@lists.bren.ucsb.edu | www.bren.ucsb.edu/~burbankwater

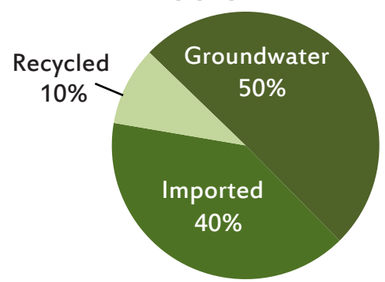
Taking steps to diminish reliance on imports, increase the utilization of local sources of supply, and reduce customer demand will enhance water sustainability in the City of Burbank. As ongoing drought, climate change, and population growth are increasing the pressure on Southern California's imported water supplies, Burbank Water and Power (BWP) remains committed to providing water service that is reliable, affordable, and sustainable. BWP is a progressive water agency that consistently supports innovative water efficiency programs, uses cutting-edge technology, and proactively adapts its supply portfolio. While these actions have enabled the agency to make considerable progress in addressing water supply challenges, significant opportunities remain to strengthen existing initiatives and increase the sustainability of BWP's operations.

Objectives

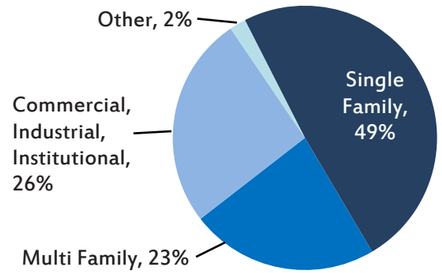
To provide Burbank with a portfolio of tools and analytically justified strategies to enhance water sustainability:

- **Decrease consumer demand** by identifying efficiency initiatives with the greatest potential for reducing consumption and implementing them through targeted marketing strategies
- **Increase supply reliability** by identifying opportunities to develop local sources and diminish reliance on imported water supplies

Burbank Supply 2010-2014



Burbank Demand 2014



Imported Water

Risks to the two sources of imported supply for Southern California water:

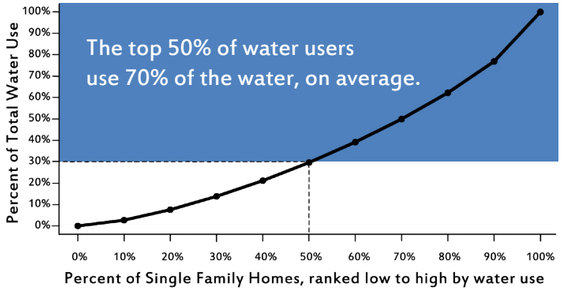
- **State Water Project, Sacramento-San Joaquin Delta is threatened by:**
  - Decreased snowpack
  - Sea level rise
  - Seismic risk
  - Rapid ecosystem decline
- **Colorado River Aqueduct and Basin face:**
  - 15 years of drought in the Southwest
  - Lake Mead, the largest reservoir in the country, is at less than 50% capacity
  - Conveyance costs are increasing

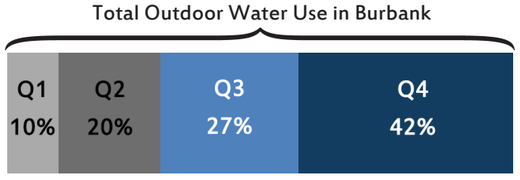
Customer Demand Assessment

An enhanced water demand assessment was completed to (1) analyze the distribution of water demand among single family accounts and (2) develop opportunities to target different customer groups based on their consumption patterns.

Statistical analysis used to:

- Disaggregate single family home water demand to see how each customer contributes to the overall total demand
- Estimate outdoor water use by the difference between winter and summer average use, by address





Estimated Percent Share of Outdoor Water Use, by Quantile

The line chart (left) depicts the percent of single family homes ranked from lowest to highest water use on the x-axis, compared to their cumulative water use on the y-axis. The bar above shows that high volume water users consume a disproportionately high quantity of water for outdoor use, which was determined by taking the difference in water use between summer and winter months.

The analysis found that:

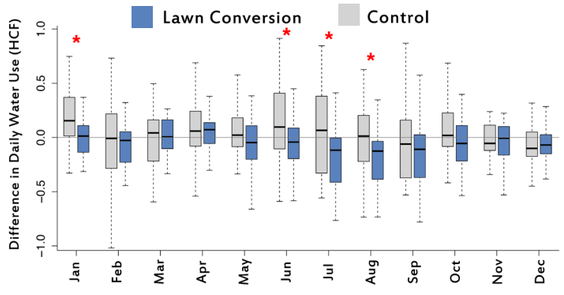
- Single family home water use in Burbank is unevenly distributed; some water users are using 10 times the median
- Top water users also have disproportionately higher outdoor water use

Statistical Analysis of Outdoor Water Efficiency

Quantification of water savings attributable to BWP's Go Native! Lawn Replacement program improves the accuracy of water-savings projections and provides insight into potential program improvement.

- Consumption data for turf replacement customers and a control group were collected and analysed
- Factors considered:
  - Pre-existing differences between the turf removal and control group
  - Landscape size, degree of landscape shading, and irrigation type
  - Pool ownership, home value, number of bedrooms, and other additional property characteristics

While BWP's program was found to save water, the quantity saved is about 20% less than the assumed water savings of 43.8 gallons per square foot (gpsf) and well below the 60 gpsf savings found elsewhere. This suggests that there are additional savings that could be achieved through continued program evaluation and development.



*'s indicate months with significant water use change between groups.

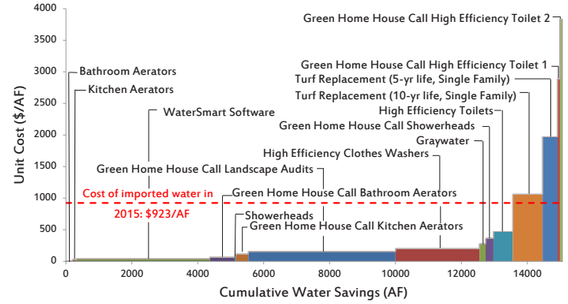
The analysis reveals that:

- Participation in the lawn conversion program results in average annual water savings of 35.0 gallons per square foot of lawn converted
- The majority of water savings accrue in summer, identifying outdoor water consumption as the primary driver of observed differences between lawn conversion participants and the control group
- The post conversion irrigation system is an important factor in determining program success

Cost-Benefit Analysis

A cost-benefit analysis of both current and proposed water efficiency programs was conducted in order to determine the long-term financial costs of implementing these programs relative to their total water savings potential.

- Used the Alliance for Water Efficiency's Water Conservation Tracking Tool (industry-standard model)
- Efficiency programs were compared on the basis of:
  - Water savings potential
  - Implementation costs
  - Financial savings that accrue over a 20-year planning period



The primary result from this analysis was a unit cost curve (pictured below, left), depicting the costs of each efficiency program normalized by the total quantity of water saved over a 20-year planning horizon. By choosing programs that achieve the highest water savings at the lowest cost, BWP can maximize the quantity of water saved given a fixed budget for efficiency programs. Every program that is less expensive than imported water (i.e. individual bars that are shorter than the dashed red line) can be considered cost-effective: it costs BWP less to acquire a given quantity of water through efficiency savings than to purchase that same quantity of imported water.

The analysis found that:

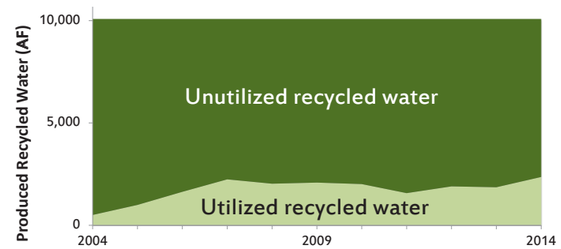
- 26 out of 30 efficiency programs are cost-effective
- Programs found to be more expensive than the current price of imports reveal opportunities for improvement
- Software that uses social norms of water use to encourage efficiency represents a particularly significant opportunity for water savings at a low cost to BWP

Water Supply Analysis

A qualitative and quantitative assessment of BWP's current sources of water was carried out in order to identify opportunities for local supply enhancement.

The potential for enhancing the utilization of locally produced recycled water and groundwater was evaluated on the basis of:

- Technical capabilities of existing groundwater pumping and water reclamation facilities and infrastructure
- Current end uses of recycled water supplies
- Water quality
- Permitting, legal, and regulatory considerations



Recycled water is BWP's largest underutilized local source of water supply. 83% of the water that undergoes tertiary treatment at the Burbank Water Reclamation Plant is subsequently discharged into the Burbank Channel, and not put to beneficial use. Engaging in indirect potable reuse (IPR) would allow BWP to convert 100% of recycled water into potable supplies. IPR has the additional benefit of assisting with aquifer replenishment: an essential component to mitigating legal and physical constraints on BWP's access to San Fernando Basin groundwater.

The analysis reveals that:

- BWP has the physical and technical capability to meet all demand using locally sourced water
- Enhance local supplies:
  - Increase recycled water put to beneficial use
  - Increase aquifer replenishment
  - Increase groundwater pumping rate at existing facilities
- Low concentrations of nitrate and chromium in groundwater satisfy the regulatory requirement to blend local supplies with pre-treated imports