Our Water System infrastructure:

- Service Area (473 sq. miles)
- About 697,100 water service accounts
- About 7,260 miles of distribution mains
- 114 local tanks / reservoirs
- 9 LAA reservoirs
- 88 pump stations
- 421 regulator stations
- 23 chlorination stations
- 7 fluoridation stations
- 60,400 fire hydrants
- Advanced water treatment facility uses ozone as disinfectant
Much of the hydraulic head required for water distribution is provided by gravity.

The average energy intensity for LADWP water distribution is approximately 196 kWh/AF.
To Date:

- Use of energy efficient pumps and motors
- Planned start-up and testing to reduce grid and bill impacts

The Future:

- Optimizing equipment selection
- Time of day pumping
- Set realistic pricing structures
- Reduce overall water usage
The 233-mile long LAA provides water from the Eastern Sierra watershed and is entirely gravity fed.

14 Hydro-generation plants along the aqueduct system. On average, the LAA system generates approximately 2,456 kWh/AF
Water supplies are conveyed along the 444-mile California Aqueduct.

- Energy intensity of the West Branch is **2,614 kWh/AF**.
- Energy intensity of the East Branch is **3,263 kWh/AF**.

Highest Single Pump Lift: 1,926 ft.

1,500 ft. elev.
Colorado River Aqueduct (CRA)

- Water supplies are conveyed along the 242-mile CRA Aqueduct
- CRA Energy Intensity is 2,027 kWh/AF

Net Pump Lift: 1,617 ft; Highest Single Lift 441 ft. at Hinds PP.

Lake Matthews, 1,390 ft. elev.  Colorado River, 450 ft. elev.
LADWP Imported Supplies
Water Conveyance Energy Profile

- **LAA (Hydro Generation)**
- **MWD Supplies (Consumption)**

![Graph showing energy profile from 2003 to 2013](image)
- City has 115 groundwater production wells.
- More than 50% of the wells are inactive due to GW contamination.
- The average energy intensity is approx. 580 kWh/AF.
Power costs can be a key component of water costs, depending on source.

Most local and sustainable sources come with energy costs.

Sustainability in Water and Power resources can oppose each other when it comes to energy usage.
LADWP Water Supply Energy Consumption

- MWh (Local and MWD supply)
- 10-year rolling average

Year 1980 - 2014

Energy (MWh)

- 260% increase
Local Water Supply Goals

FYE 2012 - 2013 Average
Total: 568,694 AFY

- LA Aqueduct: 113,411 (20%)
- MWD: 388,402 (68%)
- Local GW: 61,252 (11%)
- Recycled Water: 7,513 (1.5%)
- Conservation: 2,122 (0.5%)

Fiscal Year 2023 - 24
Total: 658,214 AFY

- LA Aqueduct: 248,188 (38%)
- MWD: 161,017 (24%)
- Local GW: 111,500 (17%)
- Recycled Water NPR: 20,686 (3%)
- Recycled Water IPR: 30,000 (5%)
- Conservation: 46,823 (7%)
- Water Transfers: 40,000 (6%)

- Conservation: 2,122 (0.5%)
Cumulative water conserved from FY 2007/08 to FY 2013/14 by LADWP customers is 578,141 acre-feet.

Equivalent to:
- Powering over 308,000 homes in L.A. for 1 year
- Eliminating 1.48 billion pounds of CO2 emissions
- Eliminating 134,772 passenger vehicle emissions for 1 year
- Avoiding GHG emissions by recycling over 244,000 tons of waste instead of sending it to the landfill
Summary Comparison of Energy Intensity

**FY 2014 Energy Intensity***

- Los Angeles Aqueduct: 34 kWh/AF
- Local Groundwater: 580 kWh/AF
- Recycled Water: 1,347 kWh/AF
- Colorado River Aqueduct: 2,027 kWh/AF
- State Water Project - West Branch: 2,614 kWh/AF
- State Water Project - East Branch: 3,263 kWh/AF

**FY 2035 Projected Energy Intensity***

- Los Angeles Aqueduct: 62 kWh/AF
- Local Groundwater: 580 kWh/AF
- Recycled Water: 2,078 kWh/AF
- Colorado River Aqueduct: 2,031 kWh/AF
- State Water Project - West Branch: 2,642 kWh/AF
- State Water Project - East Branch: 3,267 kWh/AF

*Including treatment
In contrast to other forms of energy efficiency typically addressed by local or state governments, meaningful savings in the water sector brings into question:

- Large scale energy efficiency
- Reliability of energy supply
- Substantial cost impacts to an historically cheap commodity
- Absorbing energy needs of new water sources
LADWP directly receives recycled water from three WW treatment plants operated by the City of Los Angeles, Bureau of Sanitation (LASAN).

The weighted average of recycled water energy intensity is approximately **1,347 kWh/AF**.
LAA and SWP (west branch) water is treated at the Los Angeles Aqueduct Filtration Plant (LAAFP)

The average LAAFP treatment energy intensity is 37 kWh/AF
Projected Water Supply Energy Demands

**Status Quo**
Based on 2010 UWMP Projections (average hydrologic conditions)

Based on ED5 goals (average hydrologic conditions)

* including MWD estimates
LADWP – Power System
Increasing Renewable Energy and Energy Efficiency

**2013**
- Renewable: 23%
- Natural Gas: 16%
- Coal: 42%
- Nuclear: 10%
- Hydro: 4%
- Other: 4%
- Energy Efficiency: 1%

**2020**
- Renewable: 33%
- Natural Gas: 16%
- Coal: 23%
- Nuclear: 9%
- Energy Efficiency: 15%
- Hydro: 4%

**2030**
- Renewable: 40%
- Natural Gas: 34%
- Coal: 0%
- Nuclear: 7%
- Energy Efficiency: 15%
- Hydro: 4%
Less Obvious Energy Savings In Operations

- Filtration Media
- Data Mining and Operational Intelligence
Remote Testing & Monitoring

[Images of testing equipment and personnel]
Shade Balls
Conclusions