

Irvine Ranch Water District. Energy & Greenhouse Gas Master Plan.

IRWD. A VISION FOR TOMORROW'S ENERGY.



Goal of Energy & Greenhouse Gas Master Plan:

To identify a portfolio of **cost-effective** projects to reduce IRWD's existing and future **energy costs** and, as required under future regulatory conditions, to reduce **greenhouse gas emissions**.

Five-step Process to develop Plan:

Step 1: Develop Baseline & Forecast Data

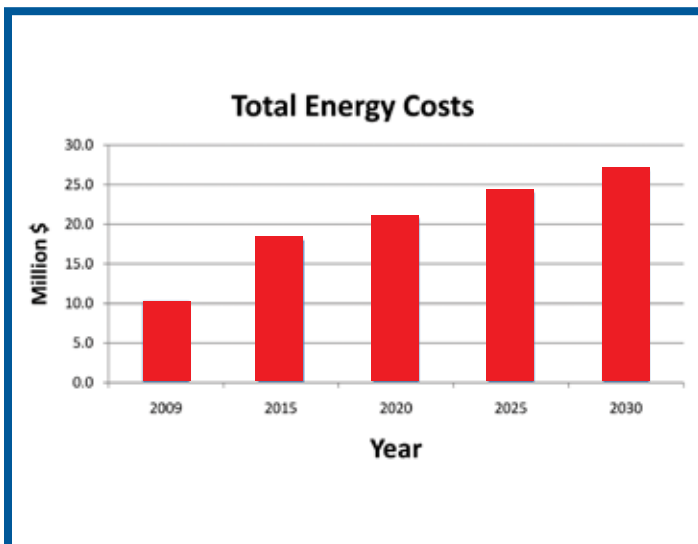
Step 2: Project Assessment

Step 3: Evaluation & Ranking

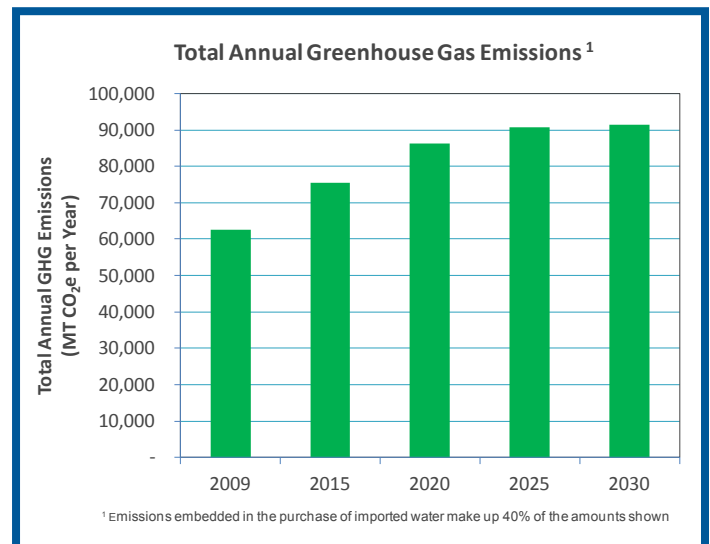
Step 4: Portfolio & Scenario Analysis

Step 5: Energy & Greenhouse Gas Master Plan Development

Step 1: Develop Baseline & Forecast Data



IRWD's energy costs are estimated to double by 2020 and continue to increase through 2030.



IRWD's existing and future GHG emissions.



Step 2: Project Assessment

A voting and ranking system was used to pare down the list of 64 potential projects to 12 projects chosen for more detailed analysis. From this detailed analysis, 10 projects were recommended.

Step 3: Evaluation & Ranking

Rank	Project Description	Net Capital Cost (\$)	Net Annual Savings (\$/Yr)	Net PV of Savings ⁽¹⁾ (\$)	Annual CO2e Reduced (MT)
1	#20 - Additional Water Conservation Activities	\$1,132,100	\$894,300	\$13,235,700	1,067
2	#9 - Accelerated Pump Efficiency Program	\$1,127,120	\$152,900	\$1,760,600	637
3	#10 - Energy Efficiency Measures	\$241,211	\$44,100	\$684,500	149
4	#12b - Solar PV Program - Land Lease Jackson Ranch	\$0	\$51,400	\$763,200	0
5	#14b - MWRP Phase 2 Operation	\$0	\$128,400	\$807,100	465
6	#15 - Process Energy Audit	\$5,500	\$22,100	\$319,100	54
7	#6 - San Joaquin Marsh Winter Pumping	\$0	\$26,000	\$219,800	118
8	#4 -LAWRP Automated Dissolved Oxygen Control at LAWRP	\$309,791	\$12,800	\$58,100	243
9	#3 - Accelerated Local GW Supplies	\$24,822,159	\$10,921,500	\$141,474,198	4,049
10	#8 - Food Waste-to-Energy	\$4,260,200	\$45,800	\$768,800	917
	Total Recommended Projects	\$31,898,080	\$12,299,300	\$160,091,098	7,699
	Total w/o #3 - Accelerate Local GW Supplies	\$7,075,922	\$1,377,800	\$18,616,900	3,650

Recommended projects potential costs and savings.

(1) Net PV of savings is after consideration of the capital costs.

Step 4: Portfolio & Scenario Analysis

The Master Plan analyzed **three regulatory scenarios** to provide guidance on how to respond to potential regulatory changes including air quality standards, GHG emissions and water quality standards. In addition, the Master Plan analyzed **three sensitivity scenarios** to evaluate the uncertainty associated with the parameters used to evaluate the recommended projects including future electricity prices, future imported water prices and continuation of the current Orange County groundwater basin management rules.

Results indicate the recommended projects are robust and can continue to **provide significant benefits** over a wide range of future costs and management strategies.

Step 5: Energy & Greenhouse Gas Master Plan Development



Recommended 10 projects
 Net average annual savings are:
 - \$12.3 million/yr for all 10 projects
 - \$1.4 million/yr without accelerated local groundwater supplies
 Annual CO2e reduced
 - 7,699 MT for all 10 projects
 - 3,650 MT without accelerated local groundwater supplies



For more Information:
 Please visit: www.irwd.com
 Call us: (949) 453-5500