Consumption-based fixed water rates: a novel conservation-oriented rate structure

Frank Loge, Ph.D.

Issue

California law requires water utilities to reduce per capita urban water use by 20% by December 31, 2020. Under existing rate structures, the most effective way to do this is to increase the cost of water consumed, sending a “price signal” to customers to conserve. Owing to state constitutional requirements, however, this means utilities must reduce their fixed charges to offset these volumetric water costs. When consumers respond to the price signal by reducing water consumption, the utility’s revenues are disproportionately reduced.

Research Findings

We analyzed several different rate schemes in use around California and beyond. All rate structures that encouraged conservation, we found, had the same flaw: though conservation pricing is effective, it has the unintended effect of imposing a structural deficit on water utilities. If a water utility has high fixed costs, recovering these fixed costs with high metered water rates means that water efficiency cuts hard into operating revenues. Water utilities caught in this trap must raise water rates to make up for lost revenues, which ratepayers see as a perverse “reward” for their virtuous conservation.

We devised a novel rate plan, consumption-based fixed-rate pricing (CBFR), which solves this problem while conforming to California’s strict requirements under Proposition 218. By measuring ratepayers’ use of the water system during summer peak months, we establish their “share” of the water utility’s infrastructure. In the subsequent billing year, the ratepayer is billed for his or her percentage of the water utility’s total fixed costs, plus a much lower metered charge for water consumed. This eliminates structural deficits, ensures 100% recovery of fixed costs, and provides rational market incentives to ratepayers to conserve. Conservation is directly rewarded through lower bills, while rate increases due to lost revenue are diluted over the entire ratepayer base, once again, based on the ratepayer’s use of the water system.

Policy Implications

For all its environmental and technological leadership, California lags other water-scarce regions in the developed world in water conservation. Many aggressive, creative water-conservation strategies are not in play because rate-setting water utilities fear they cannot promote conservation, conform to Proposition 218’s strict requirements, and maintain even balance sheets. With CBFR lifting the threat of conservation-driven financial hardship, water utilities will be able to pursue novel, effective water conservation measures. This new freedom may be of special interest to engineering service companies, which profit from collaboration with utilities to promote conservation.

Davis is the first city to have elected to implement CBFR, which will be in full effect in January, 2015. We look forward to the opportunity to study CBFR as it is brought into service. Reasonable courses of study include its effect on conservation as well as its political and economic aspects.

1 http://www.water.ca.gov/wateruseefficiency/sb7
Further Reading


Contact:
William Abernathy: wabernat@ucdavis.edu