



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Manager

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Office of Energy Policy and Systems Analysis
EPSA-60, QER Meeting Comments
U.S. Department of Energy
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Comments on the Department of Energy's Quadrennial Energy Review: Water-Energy Nexus

The Metropolitan Water District of Southern California (Metropolitan) is pleased to provide these comments to the U.S. Department of Energy (DOE) on issues surrounding water use in the energy sector and energy use in the water sector (water-energy nexus). Metropolitan is a consortium of 26 cities and water districts that provides drinking water to about 19 million people in parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura counties. Metropolitan is a water wholesaler and provides treated and untreated imported water supplies directly to its member agencies. Metropolitan's member agencies serve residents in 152 cities and 89 unincorporated communities throughout Metropolitan's 5,200 square mile service area. Metropolitan's mission is to provide its member agencies with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way.

Metropolitan has long recognized the important connection between energy and water. For decades, Metropolitan has actively promoted efforts to conserve water and energy through its pioneering region-wide programs in water conservation, water recycling, and groundwater recovery. Additionally, Metropolitan continually pursues energy efficiency in its facility operations to make certain water deliveries continue to our customers in an economical manner and has developed extensive renewable energy facilities, both hydroelectric and solar, in its service area.

Metropolitan staff attended the June 19, 2014, QER session on the Water Energy Nexus, has reviewed the accompanying memo and reports, and offers the following comments:

1. Resource "loading orders" will not work for the water industry and should not be imposed at the federal or state level

Two of the "key questions" DOE asks regarding water-energy nexus are: (1) "Are there specific policies, or policy gaps, that create issues in the water-energy nexus? Could these be addressed through specific executive or legislative action?", and (2) "What are some of the key data gaps, inconsistencies, and translation issues that impede coordination of the energy and water sectors?" DOE's June 18, 2014, Water-Energy Nexus QER Meeting Briefing Memo (Briefing Memo), p.10 (see attached). In response, Metropolitan points out that although "loading orders" may be

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useful for the energy sector, they are incompatible with the water sector. In the energy sector, California's "loading order" policy prioritizes investments in energy efficiency ahead of developing new power supplies. Although the concept of a loading order was not specifically included on the agenda for the QER's Water Energy Nexus meeting, it arose during the question and answer period with respect to a discussion on energy curves and supply curves for water. Metropolitan agrees with Alex Coate, General Manager, East Bay Municipal Utility District, who, as part of his presentation, explained why loading orders should not be applied to the water sector.

The water industry, unlike the energy industry, is wholly dependent upon the availability of its water sources and cannot "generate" water supplies upon demand. The water industry standard is to develop a diversified water resource portfolio to optimize available and stored water supplies. The portfolio approach considers many factors, including:

- Overall reliability and sustainability,
- Diversity of supply and operational flexibility,
- Changes in population and demand,
- Changes in climate and hydrology,
- Economic considerations and rate impacts,
- Environmental stewardship,
- Water quality regulations and treatment costs,
- Emerging technologies,
- Public engagement,
- System integration,
- Emergency response,
- Energy management, and
- Recreation.

Diversified resource portfolios are a fundamental concept underlying Metropolitan's long-term Integrated Resource Plan (IRP) for its service area. The IRP resource portfolio balances imported and local supplies, dry-year supplies and core supplies, and sets goals for conservation, recycling and other resources, including desalination. The resources identified in the portfolio complement each other as they are developed over time. The imposition of a loading order on water agencies would by its nature undermine benefits of a resource portfolio. Also, during periods of drought such as the one that the West is currently facing, it is more important than ever that water utilities have the ability and flexibility to draw upon diversified water supplies. Thus, while a "loading order" may apply to the energy industry, it is not applicable to the water industry, and should not be imposed by federal or state regulatory agencies.

2. Significant energy reductions can be achieved by targeting energy intensive water end uses

Water use by its nature is energy intensive, and it is widely communicated that California's "Water Sector" uses 19 percent of the state's electricity. This figure was discussed during the June 19 Water Energy Nexus panel (Meeting Transcript, page 43, see also Briefing Memo, p.6

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“Conveyance, Purification, and Treatment of Water Consumes Significant Amounts of Energy”). This is a significant number, but it is often taken out of context, with only partial information provided. Based on the California Energy Commission’s 2005 “California’s Water – Energy Relationship” report (CEC-700-2005-011-SF, November 2005), of the 19 percent of the electricity used by the water sector, about 3 percent of the electrical load is associated with urban water agency conveyance, treatment and distribution, 0.8 percent is attributed to wastewater treatment, and 4.2 percent is associated with agricultural use. The remaining 11 percent is due to customer end uses – heating and cooling water.

This distinction is essential to determining the energy savings potential of water conservation programs. Implementation of loading orders for water resources in California will not address the 11 percent of the electricity and the natural gas usage tied to consumer water end uses. Metropolitan believes a more productive approach would be to expand existing and develop new water conservation strategies targeting the energy-intensive end uses. The benefits of this approach include the ability to assign location-specific end use energy savings to energy utilities and the fact that energy utilities and water agencies have experience in leveraging each other’s conservation programs. The EPA’s EnergyStar and WaterSense product labeling programs provide fundamental guidelines for many water agency and energy utility conservation programs. Metropolitan supports expanding these programs to reduce water-related energy used by consumers.

3. Desalination and potable reuse technology research should be encouraged and incentivized

As recognized in the DOE’s Briefing Memo, “[T]argeting nontraditional waters for human, industrial, and agricultural consumption will be increasingly important” in an era of water scarcity (Briefing Memo, p.7). Southern California’s future water resource portfolio includes new supplies such as the desalination of brackish groundwater and seawater, as well as advanced treatment of recycled water for potable reuse. Within Southern California, Metropolitan funds the development of new technology through its Foundational Action Funding program, which is designed to lay the groundwork for accelerating the development of new technologies and approaches for desalination, recycling, groundwater management, and storm water supplies. Metropolitan’s Innovative Conservation Program performs the same function for new conservation technologies.

Ultimately, these new water supplies have become viable in part due to investments in research and technology by Federal agencies including the Bureau of Reclamation (USBR) and the DOE’s own national laboratories. Metropolitan supports additional funding to build upon these successes and to further reduce the energy required by desalination and recycling processes. This includes continued funding of USBR’s Brackish Groundwater National Desalination Research Facility and associated research into desalination powered by renewable energy. Metropolitan also supports expanding DOE laboratory research to accelerate the advancement of forward osmosis, graphene membranes, and other new technologies with the potential to significantly reduce the energy required to treat impaired water sources.

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4. Funding should be provided for climate change adaptation and mitigation programs

Metropolitan agrees that “[t]he effects of climate change on U.S. energy and water use will be profound” and that “water scarcity is a significant issue for all states in the Southwest” (Briefing Memo, p.8). For example, California relies on the Sierra snowpack as the state’s largest reservoir. As the snowpack slowly melts, it is captured by a complex network of local, state, and Federal water supply reservoirs and conveyance systems. However, if the precipitation falls as rain instead of snow and the timing of runoff from the snowpack shifts, our water supply systems may face additional challenges. Another likely consequence of climate change is sea level rise. Sea level rise has the potential to intensify seawater intrusion impacts in heavily used coastal groundwater aquifers, as well as compromise the stability of levees that protect the State and Federal water supplies transported through California’s Bay Delta. These are just a few of serious long-term climate change threats to California’s water resources. In order to manage the consequences of climate change, water utilities will need to reexamine their infrastructure and develop drought-resistant supplies that are resilient under changing weather patterns. Groundwater basin cleanup, ocean and brackish water desalination, water recycling, improved stormwater capture, and conservation may all be part of the solution. As indicated above, Metropolitan supports additional state and federal funding to help the water industry develop resilient and adaptive strategies and technologies in response to climate change.

Thank you for the opportunity to comment on the Quadrennial Energy Review. Metropolitan has long recognized the important nexus between water and energy as demonstrated by its decades-long efforts to conserve water and energy as a water sector leader in the development of diverse water supply portfolios. We look forward to the next steps of this important effort and assisting the DOE if needed. If you have any questions, please contact Mr. Warren Teitz of my staff at (213) 217-7418 or via email at wteitz@mwdeh2o.com.

Yours truly,



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