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ENGINEERING

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SUSTAINABILITY

While working on a water system sustainability engineering study for the City of Gladstone, something occurred to us: **What will a truly sustainable water system look like?**

A truly sustainable water system will operate entirely on renewable energy. By current standards, this is almost unthinkable. Moving millions of gallons of water around and using large amounts of chemicals require significant energy input—more energy than renewables can currently provide.

Therefore, either renewable energy technology will develop to a point where we can continue current practices, or, more likely, we will have to modify current practices to operate with a significantly smaller and more sporadic energy supply.

Water supplies have a few advantages with regard to utilizing renewable energy. Power requirements peak during summer days, as do the power outputs of photovoltaics and concentrated solar. Water supplies near rivers may be able to utilize hydropower. Elevated storage tanks provide a means to store energy, such that sporadic wind energy can be used to lift water, thus providing consistent pressure.

Overall, it is likely that municipal water supplies will scale back in order to become sustainable. Source waters will be aggressively protected in order to minimize treatment requirements. High-quality, treated water will be used

primarily for drinking and cooking, and we will harvest rainwater and collect graywater for non-potable applications. We will use and re-use all types of water more wisely, perhaps requiring only a small fraction of the hundred gallons we each use every day.

The inherent conflicts of using water distribution systems as both fire suppression systems and drinking water supply systems may intensify to the point where these systems become separate. Similar changes on the wastewater side of things will have an effect on water supply practice. Many major societal changes will take place as we conclude the era of cheap and plentiful energy.

While it is unclear exactly what a sustainable water supply in America will look like, we know what general direction it is in. We also know that we will get there someday, either gracefully by design or painfully by force.

Get moving!



[EPA: Sustainable Infrastructure for Water and Wastewater](#)