

POLICY BRIEF

**RECOMMENDATIONS
FOR THE NEW
ADMINISTRATION**

Five Major Challenges to the Beneficial Use of Non-Fresh Water, Including Oil- and Gas-Produced Water

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Unconventional shale oil and natural gas extraction are important elements of the U.S. energy revolution. Increased domestic production has improved energy security while lower prices and more affordable energy have supported industrial expansion, created jobs, and fueled economic growth. Recent developments, however, have not been without challenges, two of which relate to water: 1) the industry's reliance on water as part of extraction by the method of hydraulic fracturing, and 2) the need to store, treat, and/or dispose of the large amount of "produced water" that is brought to the surface during production. At the same time, many states are coming to realize the potential for using produced water to meet growing water demand rather than injecting it into underground disposal wells.

This brief describes five high priority challenges that must be overcome to accelerate the beneficial use of produced and other non-fresh water sources. We also believe there is an active role for federal agencies, particularly the Department of Energy and its laboratories, to assist local, state, regional, and other stakeholders as they develop and adapt water policies and practices to convert produced and other non-fresh water supplies into a resource that is included in state water plans.

The volume of produced water in 2012 was approximately 2.4 billion gallons per day (bgpd), of which 75% was produced in California, Kansas, Oklahoma, Texas, and Wyoming. Although small compared with

the nation's total estimated water use of 355 bgpd, produced water can represent an important new water source, especially for more arid states. State water plans are already beginning to include the use of treated brackish and waste water. Treated produced water would add to this supply and further displace the use of fresh water, which would then be available for other purposes.

The Center for Energy Studies (CES) has actively engaged stakeholders, including government, industry, and academia, in this discussion. We have hosted workshops and conferences to clarify the challenges, share successful practices, and overcome barriers in produced water treatment and use. As a result, CES has provided insights to assist state and federal policymakers. Most recently, we partnered with the Ground Water Protection Council (GWPC), Interstate Oil and Gas Compact Commission, and National Rural Water Association (NRWA) to organize a National Produced Water Forum hosted by Oklahoma governor Mary Fallin. CES has also facilitated discussions on produced water and state water plans at the co-located September 2016 GWPC/NRWA Conference.

These discussions have convinced us that broad collaborative action is necessary to overcome challenges and successfully enable the beneficial use of non-fresh waters, especially produced water. CES also believes that federal participation in the following five high-priority challenges is essential in assisting local, state, regional, and other stakeholders as they develop and



There is the potential for treated oil and natural gas produced water and other non-fresh water sources to augment water supplies and displace the use of fresh water, which would then be available for other purposes in state water plans.

This policy brief is part of a series of recommendations from the Baker Institute for the incoming president's administration.

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adapt water policies and practices related to produced water and other non-fresh water supplies:

- Standardize approaches to verify and test new water analysis and treatment technologies that are supported by impartial and objective guidelines.
- Develop comprehensive modeling methods to calculate and compare the environmental impact, carbon intensity, risks, costs, and other characteristics of using produced water when compared to other water sources, and collect the data needed to support the models.
- Clarify produced water ownership and liability to encourage industry's participation in treating and putting produced water to beneficial use.
- Communicate with and educate the public and other end-users about the potential benefits of using non-fresh water sources, including produced water.
- Create forums for centralized discussions to share successful regional practices in treating and using non-fresh water, including produced water.

The Department of Energy has already taken steps consistent with these measures. The Water-Energy Nexus crosscutting initiative in the DOE's FY2017 Budget Request supports lower-carbon, lower-energy, and lower-cost water treatment technologies, such as advanced desalination techniques, to provide additional water supplies. We believe, however, that the DOE should increase emphasis on the five priority challenges above to help accelerate the beneficial use of non-fresh water, including produced water.

For example, independent testing of water analysis and treatment methods by national laboratories could give industry and municipalities confidence in the method's accuracy and reliability and thus accelerate adoption of uniform methods. Developing and adopting rapid test and analysis techniques to quickly determine treatment requirements or intended uses of produced water will reduce the need for above-ground storage and the associated impact on the environment.

National laboratories could also play an important role in developing acceptable water quality guidelines for different uses. These guidelines could help clarify the technical challenges of designing water treatments for specific applications, and focus policy discussions on removing barriers and accelerating progress.

In addition, by sharing its modeling expertise, DOE's Energy Information Administration and its national laboratories could provide guidance in expanding GWPC, U.S. Geological Survey, DOE and other databases to include water quality and quantity data, and intended use requirements. This would support advanced modeling to minimize environmental impact and the cost of storing, treating, transporting, and using/disposing produced water.

DOE and its laboratories are also trusted educators who could assist in educating potential end-users on the benefits of using non-fresh water sources; the importance of conservation and reuse; and the ability to treat non-fresh water so that it meets standards for oil and natural gas, agriculture, industrial and other sectors.

Finally, current water policies and regulations are often tailored to local conditions, which make them complex and difficult to navigate. This presents an opportunity for the new administration to leverage federal agencies as facilitating leaders that engage local, state, and federal stakeholders in cross-region and interstate forums where policies and regulatory reforms are discussed and successful practices shared, thereby accelerating and promoting the development of new water resources while ensuring appropriate environmental safeguards.

In summary, we encourage expansion of the Water-Energy Nexus crosscutting initiative in the DOE's FY2017 Budget Request to include more emphasis on the five high priority items above. We also encourage the DOE, EPA, USDA, the Bureau of Land Management, and other federal agencies to continue to cooperate and partner with local and state governments as well as industry, agriculture, academia, and water consumers to enable the beneficial use of this new and much needed source of water.