Guest opinion: A freshwater future -- powered by nuclear energy

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During my time in Congress, I've consistently stressed that clean water is my top priority. Florida's 19th District is full of beautiful canals, lakes, rivers, and ponds—and of course, world-class beaches.

Although water is plentiful in my district, many areas around the United States and across the globe have a sparse supply of potable water. In America alone, the Centers for Disease Control and Prevention (CDC) reveals that over two billion people currently lack access to safely managed drinking water in their homes. Additionally, over 1.1 billion people worldwide lack access to water, even though water covers 70% of Earth's surface. Moreover, the World Resources Institute (WRI) predicts that by 2025, approximately 3.5 billion people could experience water scarcity — which means the amount of portable and unpolluted water within a region can't meet the regional demand. Finally, WRI estimates that worldwide water demand could increase 30% by 2050.

With these facts and predictions in mind, one question comes about: should we be concerned about the future of freshwater supply?

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One may answer this inquiry in the affirmative — as water demands for irrigated agriculture, industrial processes, and municipality intake exceed current water supplies by over 80% on average each year.

Another reason for concern might stem from the fact that 97% of Earth's water is saltwater, 2% of Earth's freshwater is stored in glaciers, ice caps, and snowy mountain ranges, and only 1% of Earth's freshwater is available for daily water supply needs. However, as potable water demand, freshwater

scarcity, and future water stress intensifies, we must observe and embrace the innovative opportunity to “turn Florida-grown oranges into orange juice” and utilize the 97% of Earth’s water in a productive manner — through desalination — to help alleviate any concerns relating to the future freshwater supply.

To begin, desalination removes salt from seawater via an energy-intensive process that involves pumping water through filters to separate salt and other minerals to ultimately create freshwater for various purposes. Today, the United States accounts for 9% of the world’s desalination plants — which approximately 90% of the energy used for desalination comes from coal, oil, and natural gas.

With the current environmental movement seeking to decrease the amount of greenhouse gas emissions, the United States and the international community should consider and embrace alternative energy sources — such as nuclear

energy — to efficiently and reliably power energy-intensive desalination facilities. This is a rare opportunity for individuals with different political views to work together and provide other energy options, in addition to using fossil fuels, to provide a consistent and economically-sound strategy to address the world's freshwater-related challenges.

Although fossil fuel companies continue to implement innovative techniques to make their overall process cleaner and more efficient, the use of nuclear energy for desalination efforts provides inherent benefits like no other source of energy. For example, nuclear can provide carbon-free, baseload power twenty-four hours a day, seven days a week. Using nuclear is also intriguing due to the possibility of powering the desalination process at certain times, and easily diverting the stream of electricity to other parts of the grid when necessary — such as alleviating the energy-related challenges currently taking place in California.

Adopting nuclear as an alternative to fossil fuels is also intriguing from an economic perspective. To illustrate, desalination plants that rely on fossil fuels pay approximately 75% of their overall costs on fuel — which could increase or decrease based on the volatility of the global fossil fuel supply chain. In comparison, nuclear desalination plants only spend about 15% of their overall costs on fuel due to the inherent fact that nuclear plants don't refuel as often as fossil fuel powered desalination facilities.

Additionally, nuclear desalination is economically advantageous due to its ability to co-generate electricity — meaning the nuclear reactor can provide

both electricity and high-temperature heat simultaneously. Since nearly

46% of the world's nuclear power capacity is within fifty miles of a coast, the potential for nuclear powered desalination is fascinating.

From a national security and worldwide leadership perspective, the United States is already behind on utilizing nuclear energy for desalination efforts.

For example, Kazakhstan, India, and Japan have already constructed nuclear desalination plants —which further illustrates the potential for the United States. Additionally, nuclear desalination technology has been proven in the United States for decades since all nuclear-powered naval vessels routinely use nuclear energy to desalinate seawater. Finally, it's very intriguing that both conventional nuclear power plants and the next generation of advanced nuclear reactors have the ability to power desalination facilities depending on the specific geographical circumstance.

Moving forward, nuclear powered desalination facilities could be an attractive option when combating future freshwater-related challenges in the United States and around the world. The time is now to make nuclear energy a viable desalination option to provide clean, potable water and decrease the overall cost of water for generations to come.

Congressman Byron Donalds is U.S. representative for Florida's 19th congressional district.