Keynote Address: Introduction of Energy-Water Nexus White Paper
The Atlantic Council
May 6, 2014

Governor Huntsman, President Kempe, distinguished guests:

Good morning. First, I'd like to thank everyone here at the Atlantic Council – especially Mihaela Carstei and Blythe Lyons – for organizing this event. I appreciate the leadership the Council has shown throughout the years on a range of issues that are vitally important to our national security and overall wellbeing.

This Council is home to world-renowned centers and programs. Your initiative on the energy-water nexus is an example of one of the most important activities within your Energy and Environment Program. I also understand that just yesterday you held a roundtable meeting on the "Energy, Water, and Agriculture Nexus: Risks and Opportunities for the Private Sector" to discuss the inter-linkages and tradeoffs between water, food, and energy – which are all important aspects of the energy-water nexus.

My premise is that while there may not be much legislating taking place in the Senate this year, but we shouldn't stop our effort to think critically and forge consensus. So I have now released four white papers as follow-ons to my *Energy 20/20* blueprint, which debuted just over a year ago.

My first white paper discussed the global gas market and related opportunities the United States has right now to export liquefied natural gas. The second focused on enabling a wider array of energy exports by re-imagining and renovating the

architecture of relevant policies and approaches. The third examined how we can enable a more secure and robust electric grid, while at the same time securing and sustaining the supply of fuels that are required to reliably power it. The paper I am here to introduce today is the fourth in that series, and there are more to come, so stay tuned.

This paper, "The Energy-Water Nexus: Interlinked Resources That Are Vital for Economic Growth and Sustainability," was spurred by my long-standing interest in the intersections of water and energy – not, I promise, the heavy rains we saw last week at this time. Without water, and particularly freshwater, much of our energy, electricity included, could not be produced and our economy would come to a screeching halt. Water and its continued availability must not be taken for granted.

There are clear links between energy and water, and vice versa. About 41 percent of the freshwater withdrawals in the U.S. are attributed to cooling the vast majority of our power plants, which also consume roughly 6 percent of our freshwater. Water is routinely needed to produce the various energy resources we rely upon, such as oil, gas, coal, uranium, and biofuels. In fact, more than 12 billion gallons of freshwater are consumed daily for the combined production of fuels and electricity across the country.

We should not assume that water will always be available for these purposes. With a steady population increase and the resource needs of a modern economy, freshwater could well become a limited resource in many parts of this nation. Severe droughts in California and for that matter across most of the western U.S. only underscore the risks. Out West, hydroelectric power is a major contributor to

clean and cost-effective electricity generation, especially in Washington, Oregon, Idaho, and Montana. If rivers and reservoir run low, this generation will be at risk.

The recent and rapid expansion of our domestic energy production is very good for our nation, especially the growth in unconventional oil and gas production. It has created jobs, generated revenues, revived local economies, and done wonders for our energy security. The U.S. is now producing and exporting more energy than ever. Our net energy imports are at a 20-year low and projected to fall below 5 percent of total consumption by 2025.

With many new wells located in regions that have been already experienced some water shortages, producers are already taking steps to help assure there is sufficient water available for both their work and all other regional needs. New technological advancements and new methods to maintain a balanced use of freshwater resources have been continuously emerging. Some producers have begun using brackish, or saline, water to fracture wells. Others are recycling and reusing the water brought up during the fracturing process. In Texas, it has now been demonstrated that original freshwater demand could decrease by some 80 percent.

Over time greater market penetration for certain renewable energy resources could aid in an overall reduction of freshwater consumption. For the foreseeable future, the more likely sources of stable baseload power, however, are those that rely on thermoelectric generation. And the projected addition of new thermoelectric generation capacity across the country knows no distinction between drought-prone regions and other, more fortunate, ones.

The good news is that even in the case of conventional power generation stations, technological innovation and advances can assist in reducing, if not eliminating, the overall amount of water required for cooling purposes. These could include advances in dry cooling or hybrid cooling technologies, or cost reductions that clear the path for greater deployment.

Indeed, the key here is technology. Continued research and development is at the heart of innovation and advancement. I will speak more about that in just a moment.

First, I want to mention the other end of the spectrum – the energy we consume to meet our water needs, or "energy-in-water." According to the latest available data, some 410 billion gallons of water are being treated and transported across the U.S. on a daily basis. This effort requires energy – most of which is in the form of electricity. For example, a study in California found – and I quote – "water-related energy use consumes 19 percent of the state's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel every year – and this demand is growing."

Water transport and conveyance in California are vastly greater in magnitude than most other states, but illustrates nevertheless just how much energy it can take to move and treat water that is so essential to our economic growth and overall wellbeing. And in another study on a national scale, researchers found that direct water-related energy consumption amounted to more than 12 percent of domestic primary energy consumption in 2010. That is equivalent to the annual consumption of about 40 million Americans.

Wastewater treatment processes also demand quite a bit of energy. One of the more energy-intensive water treatment processes relies on the desalination of brackish or seawater to produce potable water and other grades of water for various purposes. Ocean water desalination in California, for example, consumes more energy per gallon of water than pumping and water conveyance across the state.

In my home state of Alaska, many are all too familiar with the adverse effects that a lack of access to affordable energy can have on access to clean water supplies. Those living in remote locations often experience difficulties in accessing freshwater on a daily basis. Water and sewer systems are often the single-largest consumer of energy in many villages. Heating fuel, glycol, heat tape, and electricity – all of which can be prohibitively costly in remote regions – are needed to avoid freeze-ups. In fact, a recent study found that service rates for water access in some places have risen to as much as $150 per month, and households that cannot pay those fees are disconnected from the network in the summer. This is yet another example of how energy insecurity can adversely affect human health, quality of life, and overall wellbeing – and it is certainly not unique to Alaska.

So, what does this all mean? The questions before us are: what can we do to ensure an adequate supply of water? And, how can we responsibly minimize the amount of water used for energy, and energy used for water?

Conservation can help reduce demand from both water-for-energy and energy-for-water activities. But it can only go so far. As I mentioned before, innovative energy and water use strategies, coupled with advanced technologies, are equally important when trying to optimize our limited supplies.

I call on all stakeholders, both in government and in the private sector, to support research, development, and demonstration of new technologies that can greatly reduce energy and water consumption. The genesis and sustainability of such efforts are highly reliant on open and continuous information exchange between all parties. This sometimes includes the collection and sharing of sensitive data on energy and water use, especially that which resides with industry. We can and must respect proprietary concerns, but there appear to be ways to overcome those issues.

The federal government can and should facilitate this exchange of information on a national scale. And it can do that by forming a genuine partnership with all stakeholders, including industry, utilities, and academia. All can team up to advance a better understanding of the energy-water nexus, adopt better practices through technological innovations, and learn from each other about procedures and implementation strategies.

Technological advancements and years of experience can also be found overseas – so it will be important for us to collaborate across borders, as well. Australia, the Gulf countries, Israel, and Singapore are all very interested in these issues, especially due to their own water shortages. Researchers and technology developers in those and other countries have been engaged for quite a while now in efforts to reduce the costs and operational challenges of desalination systems. Their experiences and expertise should be leveraged into any future national effort here in the U.S. The development of new and improved technologies can answer the needs of both the domestic and international energy-water markets. This could mean opportunities for job creators in high-tech, R&D and manufacturing.

Again, I am advocating for better planning and collaboration – not a top-down approach, and not another set of binding rules or mandates. I am certainly not advocating for the forceful implementation of any new policies or directives to use certain technologies. The adoption of best practices should always be on a voluntary basis. But having said that, I do believe that if we can demonstrate savings and efficiencies from new technologies and better resource management approaches, stakeholders will realize this is a win-win for their own bottom-lines and for their customers.

Along those lines, I have introduced energy-water legislation along with Senator Ron Wyden of Oregon. Our bill is S. 1971, the *Nexus of Energy and Water for Sustainability Act of 2014*, or the "NEWS Act" for short. It features a number of common-sense policy improvements. It directs the Office of Science and Technology Policy to establish a committee or a subcommittee under the National Science and Technology Council, to coordinate and streamline the energy and water nexus activities of all federal departments and agencies. This new panel, co-chaired by the Secretaries of Energy and Interior and populated by representatives from other federal agencies, will identify all relevant energy-water nexus activities across the federal government; enhance the coordination of effective research and development activities; work to gather and disseminate data to enable better practices; and explore relevant public-private collaboration. Our bill also calls for the Office of Management and Budget to submit to Congress a "cross-cut" budget detailing federal expenditures related to energy-water activities. Our goal is to streamline those efforts – to save not just water, and not just energy, but also taxpayer dollars.

I want to thank you all for having me here today. I appreciate your interest in this

important topic and the opportunity to tell you more about my new white paper, which is also now available on energy (dot) senate (dot) gov. I hope I can count on your support for the NEWS Act, and I very much look forward to working with you to formalize a national platform for the energy-water nexus.

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