

**House Committee on
Transportation and Infrastructure**

**"Examining How Federal Infrastructure Policy Could Help Mitigate and Adapt to Climate
Change."**

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**Testimony of
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Chairman DeFazio, Ranking Member Graves, and members of the Committee:

Thank you for the opportunity to testify about several issues that are vital to our nation's health, economy and security. During my career I have been privileged to help promote policies that will make our water infrastructure systems more resilient, secure, and efficient, working not only in my capacity as vice president of McWane, Inc., but also as a member of the executive committee of the BuildStrong Coalition, the corporate advisory council of the Blue Green Alliance, the Water Infrastructure Leadership Group (the "Ad Hoc Group"), the U.S. Water Partnership, Environmental Protection Agency's National Drinking Water Advisory Council, and co-chair of the U.S Chamber of Commerce's Business Task Force on Water Policy. It is great honor to have the opportunity to continue that work by appearing here today.

For almost 200 years McWane has proudly provided the building blocks for our nation's water infrastructure, supplying the pipe, valves, fittings and related products that transport clean water to communities and homes across the country and around the world. More recently we

have expanded our operations into the fields of infrastructure technology and electric power distribution. We employ more than 6000 team members who work in 25 manufacturing facilities in fourteen states and nine other countries.

Water infrastructure remains a core element of our business focus, and we obviously have great interest in ensuring its integrity. Despite its obvious importance, in the past “out of sight, out of mind” best described the nation’s attitude toward water infrastructure, and to a large degree that indifference has extended to discussions about climate change as well. But Congress and the public have started to come to grips with the reality that much of America’s drinking water, wastewater, and storm water infrastructure, including the more than one million miles of pipes beneath our streets, is nearing the end of its useful life and must be replaced. And a tragic aspect of that reality is that as much as 20-30% of the treated water that goes into our distribution systems leaks into the ground as it flows through pipes installed as many as 150 years ago. Those losses not only squander a vital and sometimes scarce resource, they represent an enormous waste of the energy and associated capital required to treat and pump that water. Approximately 4% of our nation’s total electricity consumption (as much as 19% in California) is related to water treatment, pumping, and recovery. Given the fact that much of our nation’s energy is still produced by traditional, carbon-based sources, that wasted energy also represents unnecessary and avoidable greenhouse gas emissions. In fact, EPA estimates that treating, pumping and recovering water accounts for more than 45 million tons of greenhouse gas emissions each year. Thus, adopting policies that foster more effective utility management, including the reduction of water leaks, would produce a cascading flow of benefits: reduced operating expenses for cash-strapped utilities, reduced water costs for consumers, the

conservation of scarce and vital resources, and significant reductions in energy consumption and greenhouse gas emissions.

In addition, the recent hurricanes, floods and wildfires have revealed the vulnerability of our distribution systems to natural disasters. We must harden our infrastructure before those events occur, taking advantage of mitigation opportunities, especially pre-disaster, that Congress recently created through reforms to the Stafford Act.

The solution to these challenges will of course require funding, and last year's America's Water Infrastructure Act ("AWIA") made significant strides toward addressing that need by fully authorizing long-term, low-cost supplemental loans for regionally and nationally significant projects in the Water Infrastructure Finance and Innovation Act ("WIFIA"), and increasing the authorizations for the State Revolving Funds ("SRFs"). We hope that Congress will finish that process by appropriating funds to those authorized levels this year. Similarly, the Disaster Recovery and Reform Act of 2018 ("DRRA") created significant new funding sources for cost-effective, risk-reducing pre-disaster mitigation projects.

But new funding alone cannot solve a problem of this magnitude. That investment must be deployed wisely and in a manner that realizes its full benefit, by fostering smarter, more efficient and effective utility management. One such avenue is to develop and use emerging technologies that can generate new forms of revenue and maximize existing sources, while lowering operational costs through proactive leak control, water conservation, better water quality management, reductions in energy consumption and costs, and less wear and tear on assets. Technology can also improve operational efficiencies via data-driven system management. Studies indicate that digital water networks can save utilities up to \$12.5 billion a

year. Moreover, the use of more resilient construction techniques can mitigate the impact of storms, earthquakes, wildfires and other disasters.

Using More Effective Water Utility Management and Deploying Technology to Reduce Climate Risks

Some examples of specific technologies that are available today, or are on the verge of deployment include:

- *Advanced metering infrastructure (smart meters) that can more accurately record and charge customers based on actual usage.* These systems use low-powered wireless communication devices to transmit water usage information over secure networks, reducing non-revenue water by eliminating unmetered consumption and apparent losses from inaccurate meters, unauthorized consumption, and billing errors. And real time water-usage reports increase conservation which mitigates the effects of water scarcity related to climate shifts while reducing energy consumption and the associated carbon emissions.

- *Remote, real-time leak detection and pressure management systems that identify problems before they become costly main breaks.* Early and accurate leak detection not only prevents wasted water and energy and reduces greenhouse gas emissions, it also reduces repair costs and the risk of contaminants infiltrating into water systems, which could put public health at risk. Such detection systems can also facilitate more effective disaster responses by enabling utilities to identify the location of damage to their systems so that they are able to restore service more quickly. New and effective methods of detection include wireless systems with acoustic sensors and leak-noise

correlators, satellite imaging, and sensors that can detect negative pressure waves. Many of these solutions can be simply and inexpensively added to existing and new infrastructure at hydrants and valve boxes.

- *Real time water quality monitoring.* Wireless nodes can accommodate sensors that monitor parameters such as pH and alkalinity and low residual disinfectant, that are markers for the conditions that can predict avoidable situations like Flint, Michigan, and allow utilities to adjust water chemistry before a crisis occurs.

- The water-energy nexus provides another source of efficiencies and opportunities. As much as 4% of our total annual electricity consumption (20% in some states, like California) is related to the treatment and transmission of water, which according to EPA equates to 45 million tons of greenhouse gas emissions each year. Indeed, for most water utilities energy is their second largest cost (35-40% of total costs on average), second only to personnel expenses. In addition to reducing consumption of energy as outlined above, new technologies can help utilities become generators of clean energy that can be used to operate systems. Waste sludges can provide a source of renewable fuel for power generation, and the vast expanses of land occupied by treatment plants are sometimes prime locations for solar panels. In addition, in-line hydroelectric systems can harness the flow of water through pipelines to generate electricity, particularly in distribution systems based upon gravity flows.

Despite these obvious benefits, utilities face numerous barriers to deploying these and other technologies. First, water utilities are naturally, and appropriately, risk averse. An

inadvertent disruption of treatment and distribution capabilities due to a technological failure could cause a catastrophic health crisis, put the environment at risk, or trigger regulatory action. Moreover, a failed deployment could trigger a financial crisis for the utility and perhaps even the community it serves.

Second, the upfront costs of implementing a system-wide technology project can be prohibitive for small utilities, which can preclude adoption even with the opportunity for greater long-term benefits.

The regulatory environment is another, frequently-cited barrier. Water quality and environmental regulations play a vital role in protecting public health. However, in many cases redundant, conflicting, or outdated regulations at the state and federal levels, and among the various states, can create lengthy, complex, and costly approval processes. These regulatory obstacles not only slow the approval of technology directly, but also impede the creation of partnerships that could provide a source of expertise and funding that would accelerate deployment.

Aggravating all of these factors is the diffuse nature of the water sector, which is comprised of more than 55,000 separate utilities, 85% of which serve fewer than 10,000 people. Through no fault of their own many small and rural utilities lack the resources and technical expertise required to evaluate the options, design and build the systems, and manage them after construction. Without coordination among neighboring communities, opportunities to overcome these gaps by sharing experience, expertise, best practices, and joint purchasing power are missed. This greatly increases the costs of adoption.

These issues present substantial obstacles, but there are measures that Congress could implement that would eliminate or reduce their adverse impact.

Appropriate Funding for WIFIA, the SRFs, and the New AWIA Programs at Their Authorized Levels. As noted above, fully appropriating the funding authorized for WIFIA and the SRFs in last year's AWIA bill would provide a significant beginning point. These programs can not only provide a source of funding for technology projects, they can also provide the technical assistance that small utilities need to evaluate, purchase, and implement projects. Similarly, sections 2005 (Drinking Water Infrastructure Resilience and Sustainability), 2007 (Innovative Water Technology Grant Program), 2012 (Asset Management), 2013 (Community Water System Risk and Resilience) and 2017 (Review of Technologies) of AWIA created several new programs designed to promote resiliency and technology. Fully appropriating those programs and directing that a significant portion of the funding go toward training and technical assistance for small utilities would also make a difference.

Encourage Cooperation Among Utilities and Partnerships. Congress should also encourage regional cooperation among utilities and remove barriers to the use of private capital as a supplement to public funding. Small systems should be encouraged to consider voluntary cooperative arrangements and partnerships with other entities who can help them develop the necessary financial, operational and technical scale and capacity to adopt the technology that will enable them to reduce their costs and more effectively manage their systems. Such arrangements allow the sharing of best practices, systems and technology and reduce the risk associated with new undertakings in addition to creating economies of scale that increase the availability of funding and reduce costs. There are many paths to such partnering arrangements,

including public-to-public, public-to-private, and private-to-private partnerships, cooperatives, concessions, operating agreements, or consolidation or regionalization of assets or services. But let me emphasize that all paths should remain available at the discretion of the local entity.

Specific means by which Congress or EPA might encourage such cooperation include prioritizing regional projects and consolidation costs for SRF and WIFIA funding and providing more technical assistance to small and rural systems, including assistance with the technical and legal aspects of cooperation. Removing the volume cap on private activity bond for water projects would also encourage more private capital to enter the market.

Establish a National Test Bed Network for New Technologies. A National Water Test Bed Network (“TBN”) to evaluate, demonstrate and approve innovative technologies would jump start adoption. Unless utility operators have the confidence that new technologies will work, they are reluctant to adopt or deploy them. But few utilities are willing to serve as the pilot program because of the demands on time and budget, and even pilot programs that do proceed can take years to complete. As a result, the deployment of workable, cost-saving and efficiency-creating technologies is unnecessarily delayed. A National Water Infrastructure TBN to coordinate and accelerate the water industry’s deployment of new technologies would bring together the broader water community (i.e., manufacturers, regulators, operators, consulting engineers, etc.), and engage them in demonstration efforts to raise confidence in innovative technologies. The TBN process, including a possible whitelist of proven technologies, would reduce the number of pilot projects otherwise needed and would also shorten the time needed to achieve commercial acceptance.

Streamline the Regulatory and Approval Process for Proven Technologies. Congress should also direct EPA to conduct a review of existing regulations to identify and address barriers to implementation of smart water solutions. EPA should encourage states to establish consistent and uniform permitting and certification programs and reciprocity, where possible, without compromising protections for public health and respect for state and local autonomy.

Establish a National Program for Collaboration and Sharing of Best Practices. A national program with a central focus on sharing best practices would help urban and rural utilities, regardless of size, to develop joint partnerships with public and private utilities, engage private sector expertise and technology, and access private capital markets and funding. In addition, this network would help small and distressed water systems find the technical capacity to comply with regulations and to undertake projects to improve or expand their services.

Encourage Effective Utility Management (“EUM”) and Best Practices, Including Water Leak Audits and Full-Cost Accounting. To succeed, every utility must have an accurate understanding of their financial condition, including the cost of providing water and waste water services. An accurate understanding of costs and their sources is also the essential foundation for conducting the cost-benefit assessments that provide the business case for the adoption of the technologies discussed previously. Yet a recent survey found that fewer than a third of water utilities have an accurate appreciation of their costs of operation, and only a similar percentage operate under rate structures that fully cover their costs. This situation creates severe constraints on the ability of utilities to finance their operations, attract outside investment, or justify technology projects.

One way to close this informational and operational gap is to help utilities identify the extent of water losses in their systems. Water is the “inventory” of a water utility, and an accurate understanding of inventory levels, losses, and production and distribution costs, including associated energy consumption and greenhouse gas emissions, is fundamental to understanding operational costs. An appreciation of those operational costs and their avoidability is, in turn, a vital prerequisite to demonstrating the benefits of deploying technology that would mitigate those losses. Potential partners will also require such information before committing their capital and resources to the rehabilitation of a failing utility.

A number of major water and wastewater associations (AMWA, NAWC, NACWA, AWWA, WEF, WERF, WRF, ASDWA and ACWA) and EPA have endorsed the ten attributes of EUM¹, asset management and financial viability. Asset management includes conducting leak audits to understand the true condition of a utility’s transmission and distribution systems. Financial viability includes an understanding of the full life-cycle cost of utility operations and value of water resources, which is heavily impacted by lost water and its embedded energy. Applicants for federal support should be encouraged to assess the total costs associated with constructing, operating, and maintaining their water, wastewater and storm water systems, including long-term capital costs. At the same time, EPA should provide more technical assistance to small utilities on how to conduct the audits and assess costs. Moreover, this information must be made more transparent and readily available for public review.

¹ Effective Utility Management, A Primer for Water & Wastewater Utilities, <http://dev.watereum.org/wp-content/uploads/2017/04/Effective-Utility-Management-A-Primer-for-Water-and-Wastewater-Utilities.pdf>

Train a 21st Century Workforce. The Safe Drinking Water Act includes several set-asides related to operator certification and training for water systems from the funding authorized for the state revolving funds. Congress should buttress that authority by tasking the U.S. Department of Labor with developing a workforce development program that would provide American workers the skills and credentials needed to support the operation, maintenance, and improvement of the hi-tech water and wastewater systems of tomorrow.

Increasing Infrastructure Resilience through Pre-Disaster Mitigation

In 2018, the National Institute of Building Sciences (“NIBS”) released its “Natural Hazard Mitigation Saves: 2018 Interim Report”, concluding that:

- Adopting Model Building Codes Saves \$11 per \$1 Invested
- Federal Mitigation Grants Save \$6 per \$1 Invested
- Exceeding Codes Save \$4 per \$1 Invested
- Mitigating Infrastructure Saves \$4 per \$1 Invested

In recognition of these and other benefits of mitigation, particularly pre-disaster mitigation, this Committee introduced and passed the bipartisan DRRRA and other disaster recovery provisions in the Bipartisan Budget Act of 2018, which support and incentivize states and localities to adopt enhanced mitigation measures to protect lives and taxpayer dollars. On October 5, 2018, President Trump signed the DRRRA into law as part of the Federal Aviation Administration Reauthorization Act of 2018. These reforms amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act and:

- acknowledge the shared responsibility of disaster response and recovery,

- aim to reduce the complexity of the Federal Emergency Management Agency (FEMA), and
- build the nation's capacity for the next catastrophic event.

DRRA also established a new, permanent mechanism to provide substantial funding for cost-effective, risk-reducing pre-disaster mitigation projects. This represents a significant increase in reliable funding for grants for state, local, tribal and territorial governments, and communities that will enable them to better plan and execute cost-effective risk mitigation projects. This nationwide pre-disaster mitigation grant program will impact both public infrastructure and individual preparedness by increasing residential resilience through state-sponsored safe home grants. The competition for these resources will create an incubator for best practices, lessons learned, and great ideas for projects and programs that can be tailored at the state and local level to reduce the risks unique to those communities.

The critical next step for these pre-disaster mitigation programs is building capacity at the state level to identify risks and cost-effective projects, then facilitating the development of effective and efficient grant applications and awards. For its part, the BuildStrong Coalition has partnered with FEMA and the U.S. Chamber of Commerce to host a series of resilience summits across the country to help stakeholders and industry develop the capacity to apply for and implement these grants. The first summit will be May 2, 2019, in Washington, D.C. Future meetings will be held in Sacramento, CA, and Houston, TX. Further, through these partnerships we are working to align and leverage other federal resilience programs, such as Community Development Block Grant-Disaster Recovery (CDBG-DR) funds and resources from the Department of Energy and EPA.

Lessons Learned from the 2017 Storms—Risk Reducing Projects

Much of the discussion in Congressional hearings and other fora has focused primarily upon above-ground buildings, houses, and other structures. However, the risks to property and human lives and health arising from damage to infrastructure also require attention. For example, water is a critical element of most of our firefighting capabilities in the event of a natural disaster and is essential to the prevention of disease and other public health threats. However, earthquakes can rupture water distribution lines unless properly constructed, wildfires can destroy these vital lifelines and contaminate water supplies, and floods can jeopardize underground infrastructure in a manner similar to earthquakes as the ground becomes saturated and more fluid.

The damage to infrastructure during the major hurricanes of 2017 and the recent wildfires highlight the importance of building a resilient power grid. Most hospitals, water treatment plants, food services, communications, search and rescue operations, reconstruction, and other critical lifeline services depend upon access to electric power. However, power is almost always interrupted by such storm events; indeed, there are parts of Puerto Rico that remain without reliable electricity almost two years after Hurricanes Irma and Maria. Increasing the resilience of our power grids in these areas would significantly reduce the costs of post-disaster reconstruction and avoiding life-threatening power interruptions.

To address these issues, the BuildStrong Coalition has proposed several possible solutions that should be encouraged in soliciting and reviewing applications for pre-disaster mitigation

funding, each of which would be implemented at the state and local levels and would reduce the risk of loss in a disaster event.

One example is focusing standards that could improve the resilience of our electric power distribution systems in disaster prone areas. The National Electric Safety Code establishes standards for the construction of transmission and distribution utility poles. Section 25 defines the strength standards required for different areas of the country, based upon, among other things, loading maps from the American Society of Civil Engineers- *ASCE 74-2010*. ASCE wind maps have been widely adopted by the International Building Code (IBC), International Residential Code (IRC), and International Existing Building Code (IEBC).

The ASCE 74 maps show values for wind speed and ice thickness that are expected to be exceeded every 50 years², identify the weather risks associated with those areas, and specify the wind speeds that the poles must withstand. Puerto Rico, the Virgin Islands, Florida, and certain other island and mainland coastal areas are designated as extreme wind areas, and other areas in the U.S. are considered “high risk” for wind and ice accumulation. Section 250C sets the strength standards for extreme wind, and 250D for extreme wind and ice. However, both standards exempt poles of under 60’ in height from compliance with the extreme wind performance criteria, even though the wind measurements used to designate the wind loads are taken at 33 feet. As an additional point of reference, an estimated 90% of all poles in use in the U.S. are under 60’ in height.

This 60’ exemption results in a significant reduction in the size and strength of poles for many vulnerable and heavily populated coastal areas. Indeed, even though ASCE 74 would

² 2017 NESC Handbook Premier Edition.

require a wind tolerance of 145 mph in these areas under the exemption the southern U.S. and the Caribbean territories need only design their systems to withstand a Category 2 hurricane (114 MPH), and the Mid-Atlantic and Northeast to withstand a tropical storm (75 MPH). Nine hurricanes above Category 2 have hit the U.S. since 2000³, including Hurricanes Irma and Maria, with winds measured at over 200 MPH and 145 MPH, respectively.

Thus, although Puerto Rico and other southeastern coastal areas have the highest wind loading in the United States, 90% of the utility poles in those areas are exempt from compliance with the extreme wind standard in Section 25 of the NESC. The impacts of Hurricanes Irma and Maria vividly demonstrated the consequences of this exemption. According to news reports, more than 50,000 utility poles were destroyed in Puerto Rico during those storms, and another 20,000 were lost in Florida⁴. There was widespread loss of power, which cost an estimated \$5 billion to restore. Had all those poles been installed in accordance with the high wind loading requirements of NESC 250C, including those under 60', there is a high probability those losses would have been much lower.

There are many options available to utilities to meet the extreme wind loading requirements of section 250C and 250D. Wood poles of a larger size can comply, as can engineered poles made of steel, ductile iron and concrete. Enforcement of these standards without the exemption will not exclude poles made from any particular material.

Florida serves as a good example of the benefits of storm hardening. After the storm seasons of 2004-2005, the Florida Public Service Commission mandated that investor-owned

³ <http://www.aoml.noaa.gov/hrd/tcfaq/E23.html>

⁴ <https://www.tdworld.com/overhead-distribution/ground-after-hurricane-harvey>

utilities, and recommended that municipalities and cooperative utilities, inspect all poles every eight years and replace all obsolete poles, including those below 60 feet, with poles that meet the high wind loads in ASCE 74. In 2018, the Florida Public Service Commission declared that the storm hardening programs in Florida are working. Outages from 2017's Hurricane Irma were much less significant than those in 2004-2005 storm season, and the adoption of more resilient poles reduced the construction man-hours required to restore hardened feeders by 50 percent. At Florida Power and Light, Florida's largest utility, non-hardened poles were 10 times more likely to fail than hardened poles⁵. As a more specific example, more than 1,000 Section 250C-compliant poles under 60' in height were in service in the Florida Keys when Irma and Maria made landfall. Not a single such pole was lost, while approximately 1,000 nearby wooden poles that had been installed under the 60' exemption failed. A video describing that experience can be found at: <https://t.co/YRHdrkVpuD>.

Facilitating applications for upgrading the power distribution system, and eliminating the 60-foot exemption as a prerequisite for approval, would incentivize states to reform this aspect of disaster procurement by requiring that all newly installed or repaired electric distribution poles conform to the requirements of NESC 250C and 250D without regard to height. This approach would not create any preference among available materials- all can bid so long as their products meet the performance standard- but such a measure would greatly reduce the risk and costs to the U.S. taxpayers.

⁵ Florida Public Service Commission. Docket No. 20170215- EU - Review of electric utility hurricane preparedness and restoration actions, July 24, 2018.

Similar issues arise in wildfire situations. News reports indicate that one of the recent wildfires in California was caused when a transformer exploded on a flammable, wooden pole. In addition, as the fires spread other flammable poles caught fire with resulting damage to the distribution systems. Thus, using pre-mitigation grant funding to encourage the replacement of electrical distribution poles in wildfire-prone areas with poles made of non-flammable materials could reduce damage, interruptions, and reconstruction costs.

Although the upfront costs of more resilient poles might be slightly higher, the long-term savings would be dramatic. For example, there is an approximately \$500 difference between the cost of a wooden pole that does not conform with section 250C extreme wind standard and a wooden pole that does. Similarly, the cost difference between a non-compliant wooden pole and an engineered pole is less than \$2,500. But the typical life expectancy of an engineered pole is three times that of a wooden pole, and a pole replacement under emergency conditions can cost more than \$10,000. Thus, in a single major hurricane like Maria, during which 50,000 poles were destroyed in Puerto Rico, the net savings to communities and the taxpayers could be more than \$500,000,000 from repair costs alone. Those savings would be many times greater if one assumes a larger geographic impact than one state or territory, and that more than one such event will occur over the 30-year lifespan of a typical, non-250C high wind compliant wooden pole.

Reducing Climate Risks While Preserving American Jobs and Communities

In addition to these improvements, Congress can reduce greenhouse gas emissions, while at the same time preserving and creating American jobs, through the maintenance and expansion

of domestic preferences for iron and steel products used in infrastructure projects. U.S. producers have invested heavily to modernize their U.S. operations conform to the world's most robust environmental standards. We at McWane are proud to say that our plants are among the safest and most environmentally sound in the world, but every day we must compete against foreign, state-owned or subsidized foundries and mills that regularly flout international trade laws, have no regard for worker safety, the environment, or public health and are not required to operate by standards comparable to those with which U.S. manufacturers must comply.

In fact, the foreign producers with whom U.S. iron and steel producers most often compete are also the most polluting. According to the International Iron and Steel Institute (IISI), Chinese steel producers emit 2.5 tons of CO₂ for each ton of steel manufactured in China. For the global steel industry, IISI reports that average CO₂ emissions were 1.7 tons for each ton of steel produced. The American Iron and Steel Institute (AISI) and the Steel Manufacturing Association (SMA) suggest that the figure of 2.5 tons per ton of steel understates the actual level of Chinese steel CO₂ emissions, and that the true number is closer to four tons of emissions for each ton produced in China, compared to the worldwide average of 1.7 tons per ton of steel. Similarly, a typical plant in China emits more than 20 times the particulate (9.4 lbs. per ton versus 0.4 lbs. per ton) and nearly 35 times the carbon monoxide (149.4 lbs. per ton versus 4.4 lbs. per ton) than are emitted by a typical U.S. plant. As a 2014 report from the National Academy of Sciences, "China's international trade and air pollution in the United States," observed:

As the Chinese economy has grown, the economic structure has also changed, transitioning from a net importer to a large net exporter of energy-intensive industrial products. The energy needed to support this economic growth and transformation has come from combustion of fossil fuels, primarily coal, which has contributed to a global increase in emissions of carbon dioxide (CO₂). At the same time, increased combustion of fossil fuels, relatively low combustion efficiency, and weak emission control measures

have also led to drastic increases in air pollutants such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), black carbon (BC), and primary organic carbon (OC). Indeed, fossil-fuel-intensive manufacturing, large manufacturing volume, and relatively weak emission controls have meant that China emits far more pollutants per unit of gross domestic product (GDP) than countries with more advanced industrial and emission control technologies. Per unit of GDP in 2006, China emitted 6–33 times as much air pollutants as the United States.

In addition to the harm to the environment, these disparities create significant cost and competitive disadvantages for American producers, that have led to lost sales, closed plants, lost tax revenues, lost jobs, and more carbon emissions. Communities across the country are in decline because the factories that once built our nation's infrastructure have disappeared, depriving them of the vital tax revenues and rate payers needed to operate and maintain their water systems and other public services.

Because carbon emissions impact the global climate system to the same degree regardless of their country of origin, policies that encourage the sourcing of materials from better-performing countries can reduce those emissions. An example of just such a successful policy is the American Iron and Steel ("AIS") preference to the Drinking Water SRF, the Clean Water SRF, and WIFIA. AIS is critical to U.S. iron and steel producers. It has provided producers with important incentives to preserve production capacities in the United States, make significant capital investments to improve manufacturing capabilities, and maintain workforces that sustain the communities around them. I can say with pride and relief that AIS has saved at least one of our plants from closure, preserving hundreds of jobs in an economically depressed area.

By 2008, our waterworks fittings plant in Anniston, Alabama was the last surviving domestic manufacturer of those products. At one time there were as many as a dozen such plants in the United States, but all, including our other fittings plant in Texas, fell victim to the

unfair foreign competition I described previously. Even that lone survivor was at risk of closure when the great recession hit, operating at around 30% of its production capacity. But with the application of AIS to the SRF's, first in ARRA and later through WRDA and the annual appropriations process, that plant has increased its capacity utilization to almost 70%, added product offerings, and, more importantly, more than doubled the number of jobs. But the benefits of AIS are not limited to our operations. Because of AIS some of the same foreign companies who drove the near destruction of the American fittings industry have now moved their production to the United States, first using existing foundries struggling for work, and more recently purchasing their own production facility. They have done this specifically in response to AIS. It is hard to conceive of a more concrete example of AIS's job-creating impact.

AIS was first enacted for both the DWSRF and the CWSRF in the Consolidated Appropriations Act, 2014. Later in 2014, the Congress enacted permanent AIS statutes applicable to the CWSRF as well as WIFIA as part of the 2014 Water Resources Reform and Development Act. Congress has continued to apply the policy annually through the appropriations process to the DWSRF for Fiscal Years 2015, 2016, 2017, and 2018, and in AWIA Congress extended AIS to the DWSRF for five years. While those of us who make products domestically are very grateful for these actions, we urge Congress to enact a statute to permanently apply the AIS procurement preference policy to the DWSRF in any upcoming authorizing legislation, to bring that program into line with the others, to secure the benefits of AIS for future generations, and to eliminate the possibility of a lapse of AIS for the DWSRF, which would burden EPA with administering overlapping programs subject to conflicting standards.

Moreover, many other water-related programs have no domestic content requirement, which not only shifts the production of products for those programs to sources that produce more greenhouse gas emissions and deprives the economy of the benefits of AIS, it also creates administrative inconsistencies and inefficiencies. The programs with no Buy America requirement include the U.S. Department of Agriculture's Rural Utilities Services' Water and Waste Disposal Program, the U.S. Department of Housing and Urban Development's Community Development Block Grant program, the U.S. Bureau of Reclamation's Rural Water Supply program, the Economic Development Administration's Public Works and Economic Development Program, and the Indian Health Services, Facilities and Environmental Health program.

Until Buy America preferences like AIS are made permanent and applied across the spectrum of taxpayer-funded infrastructure programs, the thousands of jobs that have been created and supported by this successful policy are always at risk. It is time to build on what is already a successful program, and to make AIS permanent for the DWSRF and other water and DRRA programs as it is for the CWSRF, WIFIA, and most of the other non-water federal-aid infrastructure programs. Further, by encouraging production of materials by high-performing American facilities instead of more polluting and energy-intensive facilities in China and elsewhere, application of Buy America policies will ensure that the carbon emissions associated with production for infrastructure projects will be as small as possible.

Conclusion

These are only a few of the issues and solutions that merit discussion. The key takeaway, however, is that we can solve a range of problems- economic, environmental, and climate-

related- by tailoring our federal policies to take advantage of the technologies of the 21st century and the efficiency, productivity and commitment of American workers and industry. And when considering federal resources, we must make resilient, cost-effective investments. We at McWane are glad to have the opportunity to contribute to that process.

Thank you for your time and consideration.