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Senator Jean Shaheen, Chairman
Senator Mike Lee, Ranking Member
Senate Energy and Natural Resources Committee, Subcommittee on Water and Power
304 Dirksen Senate Office Building

and Ranking Member

Lee for providing the opportunity to comment

model building codes and standards used in the design, build and compliance process nationwide. Most U.S. communities and many global markets adopt ICCôs International Codes (I-Codes). Presently, all fifty states and the District of Columbia have adopted the I

through the development of

Tehachapi Mountains to users in the southern part of the state, is Californiaôs largest power consumer. Notably, future energy consumption for transporting water is likely to be even higher as population centers are forced to reach farther afield for sources of water. Treatment too draws significant amounts of energy, and future energy consumption is also likely to rise as water purveyors are forced to use lower quality sources. One extreme in this regard is desalination, which consumes significant quantities of energy using current technology.

Reduced demand for water resulting from water efficiency measures can provide immediate energy savings from both transport and treatment. Even modest water efficiency measures implemented on a community scale through green codes like ICCôs International Green Construction Code (IgCC) can produce measureable energy savings for water purveyors. They can also delay or eliminate the need for the construction of expensive new treatment and pumping infrastructure.

Opportunities exist for similar savings by utilizing more decentralized water sources and treatment. This involves the use of alternate onsite water sources such as collected rainwater, graywater, and HVAC condensate to offset or eliminate the need for conventional centralized supplies with their embedded energy. While these systems are promising, care must be taken to protect the health and safety of the consumer through the use of codes like the IgCC and science-based standards. Research and development is also needed to ensure that the implementation of alternate onsite systems community wide does not consume more energy than a comparable centralized system.

Point of Use Applications

It is the end use of water that determines the overall demand within a region, and therefore sets the total energy consumed by a centralized treatment system. Therefore, the less water consumed by homes, office buildings, industry, and agriculture, the less energy that will be consumed by water purveyors treating and pumping water.

There are many applications where reductions in water consumption directly reduce energy demand at the point of use. The majority of public supply water is delivered to commercial and residential buildings, and ICCôs model codes provide the basis for the construction of almost all of these buildings in the United States.

As a result, ICCôs model codes and standards are uniquely positioned to provide immediate and measurable savings when implemented in jurisdictions. For example, reductions in hot water consumption carries with it proportional energy savings, all other things being equal. If a traditional showerhead is replaced with a WaterSense certified showerhead consuming 20% less water, as required in the IgCC, 20% less energy is required to heat the water (assuming the duration and temperature of the water stay the same). Within ICCôs family of model building codes, such provisions aimed jointly at water and energy appear first in the base codes, like the International Building Code (IBC), International Residential Code(IRC), International Plumbing Code(IPC), and International Mechanical Code(IMC). High-performance model codes, such as the International Energy Efficiency Code (IECC) and the International Green Construction Code (IgCC), can provide even more savings.

Within ICCôs family of codes

to water or energy-related codes, and to take advantage of positive interactions between disciplines.

The IgCC, a new model code first issued as a 2012 edition, takes the water/energy relationship one step farther than traditional model codes, and seeks to balance the interactions between all elements of sustainability in a building. Developed in partnership with the American Institute of Architects and ASTM International, it features the ASHRAE/USGBC/IESNA 189.1 standard as an alternate compliance path. This model code takes a balanced approach to sustainability, and ICC recommends it as a framework for sustainability in federal facilities and future legislation.

Energy Recovery from Wastewater

The final category in the energy/water relationship involves the recovery of energy from wastewater streams. Here, thermal and nutrient energy contained within wastewater is treated as a resource to be utilized, rather than waste alone. At the point of use, drainwater heat recovery can be used to recover thermal energy in wastewater to preheat incoming water. Nutrients and chemicals in wastewater streams can be mined using various technologies to extract energy in various forms. This practice has already become common at wastewater treatment plants where the energy is used to power plant operations. New research and technologies aim to move that energy recovery closer to the waste source.

Unique among green building rating systems and model codes, the IgCC addresses the emerging technologies associated with energy from wastewater, and provides for tools to measure such energy

In summary:

> Promoting water efficiency for all users of public service water reduces pumping and treatment energy use and directly reduces energy use at the point of use.
> Modern, coordinated building codes are a vital means of reducing both energy and water consumption that is immediately available. These codes are essential to ensure that new technologies and systems are implemented in a safe and balanced manner. Federal efforts to encourage states to update codes can produce measurable savings.