

# WATER & ENERGY IN COLORADO:

EMULSIFYING TWO GREAT CHALLENGES IN FOUR PARTS

## PROGRAM

### PART I: RESOURCE PROVIDERS

Tuesday, August 11, 2020; 10:00 to 11:30

#### I-1: Providing Drinking water to Colorado

**Laurna Kaatz, Ph.D.** — Denver Water; Director, Climate Science Policy, and Adaptation Program

Water in the west is a complex and convoluted issue. Wise and thoughtful planning is needed to balance the various needs of users and to ensure a secure water future. Meeting future water needs must be done in a manner that considers all solutions and fosters resilient thinking and investments. In this presentation you will hear about the challenges of providing drinking water in a rapidly growing semiarid region and how Denver Water, the largest and oldest water utility in the State of Colorado, is preparing to provide safe, high quality, and reliable drinking water continuously into the future. (99 words)

#### I-2: Building a Carbon-Free Future

**Jeff Lyng** — Xcel Energy; Director, Energy & Environmental Policy

Xcel Energy is the first major U.S. power company to announce a vision to deliver 100% carbon-free electricity by 2050 and a goal to reduce emissions 80% by 2030 from 2005 levels. The transition to clean energy is well underway with the Colorado Energy Plan, which state regulators approved in 2018. Greater deployment of renewable energy means less consumptive water use and, to date, Xcel Energy company-wide has reduced water consumption from electricity production 23% with greater savings expected as the transition continues. Importantly, achieving a carbon-free future demands new forms of 24/7, carbon-free generation, which the company is working to enable. (102 words)

#### I-3: West-Slope Water Use, Trends, and Issues in the Age of Climate Change

**Eric Kuhn** — Colorado River District; General Manager (retired)

Water use on Colorado's Western Slope began in the late-1800s with the construction of numerous small ditches and reservoirs that served bottomlands by gravity. By the 1920s most of these lands were under cultivation. In the 1950s development accelerated because of the construction of large new transmountain diversions, federally subsidized irrigation projects, and large coal-fired power plants. By the mid-1980s, water use again plateaued, but dreams of new big projects remain. Today, we understand that the warming climate is reducing the water available for all uses and the future of water use on the West Slope is uncertain. (98 words)

#### I-4: Reckoning

**Bruce Finley, J.D.** — Denver Post; Senior Staff writer

Utilities' mission of tapping nature to ensure availability of water and energy becomes difficult during a population growth and development boom. Factor in societal mandates—the shift away from fossil fuels toward solar and wind, and the protection of nature for the future—and the challenges intensify. Impacts of climate change from burning fossil fuels —rising temperatures, earlier snow melt, and extreme storms and wildfires—all increase uncertainty to the point that utility planners constantly are working through scenarios. Our extraction and delivery of the resources that nature provides may hit limits. Hard, value-laden questions that have been looming for decades, need to be addressed. To what extent must nature and natural processes survive given the growing numbers of people drawn to Colorado for access to nature? How many people can be crammed into dense, water-and-energy-efficient Front Range cities without triggering an unsustainable exodus that shifts burdens west, urbanizing mountain valleys? Can we co-exist with wildlife? What is the carrying capacity of the arid Southwest? (165 words)

## PART II: USER-COMMUNITY PERSPECTIVES

Thursday, August 13, 2020; 10:00 to 11:30

### II-1: Where the Need for Water in Communities and Businesses Meet

**Jan Kulmann** — Mayor, City of Thornton, Colorado

Growing municipalities need increased amounts of water for both domestic consumption and business sectors. The City of Thornton, located along the Front Range near Denver, has experienced a growth rate over 1000% since its incorporation in 1956 and is now the sixth largest city in Colorado. Thornton is committed to providing dependable and sustainable water resources for their customers, both now and into the future. This presentation will provide an overview of water needs in a growing municipality with a thriving business sector, and will focus on how those needs must be balanced to keep both successful. (97 words)

### II-2: Indian Country and Access to Energy & Water

**Roger Fragua** — President, Cota Holdings, LLC

Indian Country is legally defined as the 577 Federally recognized American Indian Tribes that are located across 33 States in the U.S. with 2.5M American Indians growing at 4% per year or doubling every 20 years. The Tribes act as both sovereign governments and business units that are concerned about the health, wellness and wellbeing of its' Tribal members. Having access to reliable, affordable and accessible resources are paramount for Tribal Leadership. (72 words)

### II-3: Mounting pressures on food producers in a headwaters state

**Jayla Poppleton** — Water Education Colorado; Executive Director

Water issues are fundamentally critical to every aspect of Coloradan lives and livelihoods. Nowhere is that more true than for agricultural water, where 86 percent of the state's water supplies are used and where pressure grows every day from drought, climate change and competition from growing urban communities. Farmers and ranchers are working proactively and collaboratively with other stakeholders to figure out how to maintain their ability to grow food, while using the resource more efficiently and entering creative arrangements to help preserve streams and share water with

metro areas. This work is happening within the context of Colorado's role as the headwater for four major watersheds that collectively provide water to tens of millions of people in 19 states and Mexico. Everything we do here has an effect downstream and being the "water tower" of the West comes with responsibilities and limitations.

#### II-4: [Uniting and Dividing: How Water Can Bring Western Communities Together or Drive Them Apart](#)

**Luke Runyon** — Colorado Public Radio Station KUNC; Reporter

Conflict among water users is nothing new in the West. But for as many stories there are about people coming to blows over the resource, there are just as many about strange bedfellows working on interesting solutions and forming unique coalitions. That's true today, where water scarcity is driving a fair amount of conflict, but collaboration as well, as people try to figure out how to live with less. (69 words)

### PART III: TECHNOLOGY ADDRESSING CURRENT CHALLENGES

Tuesday, August 18, 2020; 10:00 to 11:30

#### III-1: [Technology Addressing Current Challenges: The Importance of Water Education](#)

**Thomas Cech** — One World One Water Center, MSU Denver; Co-Director

Population growth and climate change present challenges to maintain adequate water supplies while also protecting our environment. Technology can help mitigate some issues, but people need to understand and trust the basic science involved in protecting their drinking water, management of watersheds, and environmental protection. What can we do, as scientists, government officials, and academics, to improve and enhance the understanding of the delicate balance between energy development and consumption, and the preservation of limited water resources? (77 words)

#### III-2: [Innovation and Adaptation in Colorado's Oil and Natural Gas Industry](#)

**Christy Woodward** — Colorado Oil & Gas Association; Senior Director of Regulatory Affairs

For several years, housing expansion and development in the Denver-Julesburg Basin and other critical areas around the State has resulted in a rift between neighboring communities and the oil-and-gas industry (OGI) caused by much confusion and fear accompanying a plethora of misinformation. This has generated mistrust amongst critical stakeholders. The OGI is incredibly technical and innovative, allowing it to thoughtfully and carefully mitigate of a variety of concerns. However, it doesn't always communicate effectively and can be slow to respond in meaningful ways. As an Environmental Engineer who now focuses on rulemaking, I have a unique opportunity to foster these innovations and adaptations within our member companies and explain to the public how local communities in Colorado are provided with the cleanest molecules of energy in a truly sustainable way. It's "Tank to Table Energy" that will serve our society well into the future. (144 words)

#### III-3: [More Information About Water Diversions Faster Makes for Better Decisions](#)

**Tracy Kosloff** — Colorado Division of Water Resources; Assistant State Engineer

As part of the Colorado Department of Natural Resources, the Division of Water Resources (DWR) has the responsibilities of maintaining water diversion records and instructing water users to shut off diversions when there is not enough water to go around. DWR is improving these functions by continuously adding remote sensing stations that provide real-time data, and making water data available through mapping, graphing and bulk-data download as tools to help decision makers. The data shows that 90 percent of water diversions in Colorado are used to supply irrigation and municipal uses, while industrial diversions, including those related to energy production, are less than 1 percent of diversions. (107 words)

### III-4: Water Use and Production Associated with Oil and Gas Development: Understanding Volumes and Trends to Make Informed Decisions

**Seth Haines, Ph.D.** — U.S. Geological Survey; Research Geophysist

Strong opinions often dominate discussions of the role of water in oil and gas development rather than hard data. By studying trends in oil-and-gas-related water use (mainly for hydraulic fracturing) and water production, we can gain insight into the considerable variability in both categories of water volumes across both space and time. We can also consider how these volumes relate to the broader hydrologic system in a given area. I suggest that these sorts of analyses can support decision making that allow mitigation of conflicts and result in informed resource planning. (91 words)

## PART IV: FUTURE PATHWAYS

Thursday, August 20, 2020; 10:00 to 11:30

### IV-1: Where Do We Grow from Here?

**Elizabeth Garner** — Colorado State Demography Office; Department of Local Affairs

Population growth throughout the state of Colorado has varied over the last decade. There are demographic, economic, and political shifts taking place that will slow growth in the U.S. and in Colorado. It is important to understand what is driving population growth and where it is likely to occur in order to successfully plan for the future. The State Demography Office creates population forecasts and associated components by age and by county through the year 2050. These can be used to develop scenarios and plans for resource use across the state. (91 words)

### IV-2: The Colorado Water Plan: Where We've Been and the Path Forward

**Russ Sands** — Colorado Water Conservation Board; Senior Program Manager of Water Supply Planning

The 2002-2003 drought created a renewed drive for understanding water needs in the State of Colorado and led to the development of many water-planning efforts. Ultimately, those efforts led to the creation of the Colorado Water Plan (Water Plan). This year, the Water Plan celebrates its 5th anniversary just as the State and countless stakeholders across Colorado are involved in updating many aspects of the Plan. From incorporating the effects of climate change and scenario planning, to evaluation of observed trends and recognizing where better data are required, understanding our future water needs has never been more important. (98 words)

### IV-3: Groundwater Resources in Colorado: An Online Atlas

**Peter Barkmann** — Colorado Geological Survey; Senior Hydrologist

Over-appropriation of surface-water resources, combined with increased demand and a lack of new storage reservoirs, has directed attention to Colorado's groundwater, which currently supplies ~18% of the State's freshwater needs. Groundwater is also tied to many energy resources and policy issues. Geologic formations may be aquifers near the surface but oil and gas reservoirs at depth, or may host uranium deposits. Groundwater is used and produced as part of normal oil and gas operations, removed from coalbeds to produce methane, or pumped to allow mining. Assessment of groundwater resources is an important task for the Colorado Geological Survey, the State's non-regulatory source for groundwater information. A recently completed revision of their 2003 Groundwater Atlas of Colorado is now available online to a wide public audience. The Atlas adds new data and revises information based on expanding scientific knowledge of Colorado's complex hydrogeologic setting. (143 words)

### IV-4: Transformation of Colorado's Energy Sector

**Jordan Macknick** — USDOE National Renewable Energy Laboratory; Lead Energy-Water-Land Analyst

The energy sector is closely integrated with other sectors of the economy and society. As innovations lead to changes in individual energy technologies and broader energy systems, other parts of society will co-evolve, leading to new challenges and opportunities. The National Renewable Energy Laboratory (NREL) is at the forefront of developing new energy-efficiency, energy-generating, and energy-storage technologies that could drastically alter the nation's and the state's energy sectors. These advancements are closely tied to the changing needs of the agricultural, mining, manufacturing, buildings, water treatment, and transportation sectors. Systems-level perspectives can help us better understand how technological innovations can be best integrated into existing infrastructure, or when more significant transformations are necessary. (112 words)

### IV-5: Is There a Future for Nuclear Energy in The Mountain West?

**Mark Jensen, Ph.D.** — Colorado School of Mines; Department of Chemistry, Professor

The lifecycle greenhouse gas emissions of nuclear energy are among the lowest of any energy source. However, the current commercial model for electricity generation with nuclear energy is based on gigawatt-scale, multi-billion-dollar plants that take a decade to build and are only economically competitive in certain markets. A new generation of smaller nuclear plants is currently being licensed by the NRC and construction and testing are expected to begin in the next few years. Could the advantages of these new reactor designs make them important in a low carbon energy future for Mountain West states like Colorado? (98 words)