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The Climate Change Question

How Do We Protect Our Infrastructure?

West Virginia's ring has housed many opponents—unemployment, population loss, a struggling economy and an opioid crisis, just to name a few. However, like many other states, West Virginia's laundry list of needs includes another woe that doesn't receive nearly as much attention—outdated and neglected infrastructure.

While this is a vast and costly problem in and of itself, an outside force is bringing the Mountain State's—and the country's—aging infrastructure to the forefront of political, economic, scientific and community conversations: climate change.

Asking the Experts

On June 12, Spilman Thomas & Battle, PLLC hosted Conversations on Climate Change, a panel discussion focused on fostering a thought-provoking dialogue on man's role in the warming of Earth's atmosphere. Nicholas Preservati, member and co-chair of the energy practice group at Spilman, moderated the panel and presented opening remarks.

"This event is not a discussion or debate on the existence of climate change," he explained at the event. "The position we've asked our panelists to acknowledge is that climate change is real and has been real for millions of years. The question is, to what extent are man-made CO_2 emissions accelerating that process."

The panelists for the event were Dr. Judith Curry, president and co-founder of Climate Forecast Applications Network and former chair of the School of Earth and Atmospheric Sciences at Georgia Institute of Technology; Dr. Michael Mann, distinguished professor of atmospheric science at Penn State University and co-author of "The Madhouse Effect: How Climate Change is Threatening Our Planet, Destroying Our Politics and Driving Us Crazy;" Dr. Patrick Moore, co-founder and former president of Greenpeace Canada; and Dr. David Titley, professor and director of the Center for Solutions to Weather and Climate Risk at Penn State University.

Each of the panelists presented alternative views to man's role in rising CO_2 emissions and whether or not it is a cause for concern. Each side was also concerned with the effects of climate change on infrastructure—albeit not in the same way.

While infrastructure might call to mind roads, bridges and buildings specifically, it actually encompasses a wide array of areas, including banking, broadband, education, workforce development, health care and entrepreneurship. Mann and Titley discussed the negative effects and potential national security breach caused by the rise in sea levels, heavy rains and extreme heat, and Curry, Moore and Titley discussed the human and business costs of divesting in fossil fuels.

Weighing these costs is a huge burden on local, state and national leaders. According to Curry, the scientific community does not yet have a unified theory on climate variability and change that integrates all existing data and models in a predictive sense, yet the opinion of the Intergovernmental Panel on Climate Change (IPCC) is that the warming trend of the past century is dangerous and unprecedented.

Protecting Our Structures and Security

According to Mann, a highly cited researcher who has written for the IPCC, the level of CO_2 in Earth's atmosphere reached 410 parts per million in June, a significant and worrisome occurrence.

"This is the highest concentration ever measured, and based on evidence from ice cores and other paleoclimate archives, this level of CO_2 in the atmosphere appears to be unprecedented in at least 3-5 million years," he says. "That tells us that we are engaged in an uncontrolled and dangerous experiment with the only planet we know that can support us and other life."

This increase in temperature is thought to be the cause of many extreme weather events, including West Virginia's 2016 thousand-years flood, the aftermath of which serves as a recent example of the state's fragile infrastructure.

"Warmer air holds more moisture so you can get more intense rainfall and a greater likelihood of flooding events," says Mann. "The fact that we're seeing so many of these events now in West Virginia and elsewhere around the U.S. and the world tells us the impacts of climate change are no longer subtle. We see their damaging impacts playing out in real time."

In a small, economically challenged state, the question remains: how can West Virginia take on the necessary changes and costs associated with preparing its infrastructure for the effects of climate change?

"The state of West Virginia could convene a group of hydrologists and civil engineers, emergency managers, key

local officials and either state or regional climate experts to assess the greatest near-term threats as a combination of extreme weather, flooding and population or critical infrastructure assets exposed," says Titley. "That type of analysis allows the state to prioritize projects. As funds become available at the state, local or federal levels, they can work on those projects in priority order."

Preparing for Threat Multiple

According to Titley, a retired rear admiral for the U.S. Navy whose duties included serving as commander of the Naval Meteorology and Oceanography Command, climate change also presents a serious threat to the country's national security infrastructure.

"Climate change changes the physical operating environment in which our soldiers, sailors, airmen and Marines operate; threatens the infrastructure of our bases and training ranges, many of which are either on the coast or in the southwestern U.S.; and, when combined with poor or ineffective governance, can tip a bad situation into a catastrophic one with unknowable but usually negative implications for regional or global stability," he says.

This threat to national security in the U.S. is labeled as a threat multiple, meaning it takes existing tensions and conflicts and exacerbates them. Rising sea levels and extreme heat have the ability to affect physical infrastructure, food production and transportation networks, and the U.S. military is actively working with allies around the world to study potential weather-related threats and preparing to deploy as needed.

"There is much we can do to be more resilient," says Mann. "As a country, we need to adapt our infrastructure to better deal with extreme rainfall and flooding events, more intense heat waves and other climate change impacts. This can provide jobs."

Mann believes that as the country moves forward in its goal to combat climate change, West Virginia must also look to the future.

"Coal is increasingly automated and provides few jobs," he says. "Renewable energy like wind and solar can provide far more jobs, and the state must support job training programs and other incentives to help the population pivot away from fading industries to new ones. West Virginia can be both part of the climate change solution and grow its economy at the same time."

While Titley acknowledges the serious human cost of economic dislocation and moving beyond coal and other fossil fuels, he also believes the state should transition to new industries.

"I've seen economic dislocation, and it hurts," he says. "West Virginia, like all states, should be preparing its population and workforce for successful careers and prosperous living standards in a non-carbon-based energy economy, even if that economy is still several decades away. While change is hard, ignoring the change will only make it harder to transition job skills. It will require vision and leadership, but the alternative is irrelevance and lost decades."

At the end of the day, Titley says we have only two choices—suffer through the changing climate or improve our quality of life by reducing our output of greenhouse gases—and to him, the right choice is clear.

"We can minimize the change and save trillions of dollars and untold human suffering," he says. "At the end of the day, the climate doesn't care about the pseudo-debate about its causes or how many scientists do or do not agree. The ice doesn't care who is in the White House or who controls the Congress. It just melts."

Assessing the Human Cost

While threats to security and physical infrastructure are pressing and motivating, just as great are the threats to human and business infrastructure in the shape of jobs in the energy sector—especially in the Mountain State.

Curry and Moore presented a different set of suggestions at the panel in terms of what is most important for West Virginia and the country in reacting to climate change. While they agree that surface temperatures have increased, humans are adding CO_2 to the atmosphere and CO_2 and other greenhouse gases have a warming effect on the planet, they do not think this warming has been dominated by human causes or that it is detrimental to human life. Curry believes that working to lower or eliminate CO_2 emissions will result in minimal changes to the overall temperature and come at a high cost, both in terms of funding and human capital.

"What makes the most sense to me is climate pragmatism," she says. "Climate pragmatism has three pillars: accelerate energy innovation, build resilience to extreme weather and no-regrets pollution reduction. These policies provide near-term socioeconomic and environmental benefits and have justifications independent of mitigation and adaptation."

Curry believes this approach is best because it does not require an agreement on climate science or risks of uncontrolled greenhouse gases and focuses on resilience, keeping economies strong and ensuring everyone has access to energy. It also avoids political gridlock and costly policies.

According to Moore, well over 80 percent of the world's energy comes from fossil fuels, including coal and oil and natural gas, West Virginia's most abundant natural resources. He says cutting out these energy sources would destroy human civilization. Other countries seem to be onboard with this line of thinking, as there are currently 1,600 new coal-fired plants under construction or planned in 62 countries across the globe.

"The fact is, fossil fuels are 100 percent organic, as in the scientific definition of organic," says Moore. "They are produced with 100 percent solar energy, and they are a product of life. They produce the two most important foods for life when they're burned—CO_2 and water—and they are the largest storage battery of energy on this planet. So I say celebrate CO_2. It is the most life-giving substance, along with water, on this planet, and it's doing the world a lot of good."

For over 150 years, West Virginia's mountains have been a fortress, protecting the state—and at times, isolating it—from what often seem like outside concerns. The Mountain State is now facing a critical choice: address a crumbling infrastructure in light of increased floods and storms or protect jobs and sustain affordable energy for people around the world. Perhaps the answer lies in the stewardship of both—balancing the needs of the people with caring for the state's incredible natural beauty. Mountaineers have always been dedicated to protecting the people and the place they love. In this case, only time will tell. ■