Phoenix heat, Tropical Storm Cindy show how climate change is a threat to our infrastructure

By Rachel Cleetus June 23

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Much of the Southwestern United States is reeling under a heat wave so severe that it has forced airlines to ground flight. On the Gulf Coast, millions of people were put on emergency alert ahead of Tropical Storm Cindy, which caused widespread flooding and power outages. Climate change is already affecting our economy and safety, with risks to critical infrastructure — roads, bridges, dams, water and energy infrastructure and military sites.

The nation's infrastructure is already in a precarious state, consistently earning a near-failing grade of D-plus from the American Society of Civil Engineers. Much of it was built assuming past climate and weather patterns, with some margin of safety. But now, climate change — in the form of more frequent and severe heat waves; floods exacerbated by sea-level rise and increased heavy rainfall; droughts; wildfires; and other impacts — is adding an extra layer of risk. Growing development in high-risk areas increases the potential damage. The number of billion-dollar weather and climate-related disasters are on the rise. Already this year, five events across the country have each caused losses exceeding $1 billion. The vulnerabilities in our infrastructure are evident and are likely to worsen without action. A few striking examples:

- Heat waves not only force airlines to cancel flights, as we're seeing in Phoenix. At higher temperatures, aircraft need higher takeoff speeds and longer runways to become airborne, especially at high altitudes. Their passenger and freight capacities also decline.

- Extreme heat and drought affect the availability of hydropower and the functioning of power plants that depend on water for cooling. During recent hot summers, nuclear power plants including Vermont Yankee, Millstone in Connecticut and Browns Ferry in Alabama have been forced to reduce power production or shut down because water temperatures got too high.

- In 2012, Super Storm Sandy left more than 8 million people in 21 states without power, shutting down or damaging at least 165 electric substations, several large power plants, 7,000 transformers, and 15,000 electrical poles.

- The approach to the new eastern span of the Bay Bridge in Oakland, across which more than 270,000 vehicles travel each day, was designed and built without consideration of sea-level rise. Parts of it would be permanently underwater with 3 feet of sea-level rise, a likely scenario by end of this century. So would most of New York's LaGuardia Airport, which served almost 30 million passengers last year.

- The Gulf Coast has many oil and gas operations on low-lying land extremely vulnerable to flooding from sea-level rise and storm surges. In 2005, Hurricanes Katrina and Rita shut down 23 percent of U.S. refining capacity, causing a significant drop in gasoline production and resulting in a spike in the weekly average spot price of conventional gasoline.

- Research from the Union of Concerned Scientists finds that many U.S. military sites are at risk from sea-level rise. Naval Air Station Key West in Florida; Joint Base Langley-Eustis and NAS Oceana Dam Neck in Virginia; and Marine Corps Recruit Depot Parris Island in South Carolina each could lose between 75 and 95 percent of their land area by the end of the century.

- Wildfires can threaten watersheds and damage infrastructure. In the summer of 2011, the Las Conchas wildfire in New Mexico threatened two high-voltage transmission lines that deliver electricity to some 400,000 customers and also forced the cities of Santa Fe and Albuquerque to shut down water-supply intake systems polluted by ash.

These current and likely future threats are a wake-up call. New long-lived infrastructure investments must be planned and built — and existing infrastructure upgraded — given the scientific projections for climate change. California's recently passed legislation provides a good example of how to get started. It establishes a working group of climate scientists, engineers and architects to develop recommendations for how to incorporate future climate impacts when designing and constructing infrastructure. Implementing federal flood risk management standards, which set protective design standards for federally funded infrastructure, is another opportunity. Limiting carbon emissions by reducing fossil fuel use is, of course, essential to contain the pace and magnitude of climate impacts. It's common sense to prioritize "two-fer" infrastructure investments that help cut emissions and make our country more resilient, such as investing in clean-energy technologies, energy storage and a modernized electrical grid.

President Trump and Congress have expressed strong interest in a multibillion-dollar investment in new and upgraded infrastructure. Businesses and communities need to know that they can depend on the reliable functioning of our transportation, water and electricity systems. And American taxpayers deserve to know their money will be invested wisely, with future climate change in mind.