

Testimony of Dr. Chuck Kutscher
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Good morning. I'm Dr. Chuck Kutscher. I was a researcher and manager at the National Renewable Energy Laboratory for 40 years until my retirement in 2018. I'm now a Fellow of the Renewable and Sustainable Energy Institute at the University of Colorado Boulder, and I'm currently teaching the Sustainable Energy course in the CU Mechanical Engineering Department.

It's been 34 years since Dr. Hansen's landmark testimony to Congress informing us that the burning of coal, oil, and natural gas was causing rapid climate change. We've seen the effects around the world in the form of heat waves, droughts, more intense rainfall events, flooding, on so on. We've also experienced it close to home. The three largest wildfires in Colorado history all occurred in 2020. In 2021 the Marshall Fire destroyed a thousand homes making it the most destructive wildfire in Colorado history and that occurred in the winter! The Southwest is experiencing the worst drought in 1200 years and the two largest reservoirs in the U.S., Lake Mead and Lake Powell on the Colorado River, are so low that they are now getting close to dead pool condition.

Back when Dr. Hansen testified, we didn't have very low-cost solutions, but today we do. In the last decade wind power has dropped in cost by over 70% and the cost of solar electricity has dropped by an astounding 90%, making them the cheapest sources of electricity at under 4 cents per kilowatt hour. The cost of batteries has dropped even faster, and many new utility-scale solar projects now incorporate 4 hours or more of battery storage. It's clear that the number one thing we must do is convert our electric grid to carbon-free sources as fast as possible. Thanks to a push from the Colorado State Legislature, Xcel is working to produce 80% of our electricity from solar and wind within just the next 8 years. But we need the federal government to enact a clean electricity standard that will require utilities across the country to be carbon-free by 2035.

The second thing we must do is electrify our transportation and buildings sectors to take advantage of a clean electric grid. This means converting cars, trucks, and buses from gasoline and diesel to battery electric vehicles and replacing the natural gas furnaces in our homes with today's high-performance, cold-climate heat pumps. My wife and I have done both of these things, and I can attest to the fact that our life is better as a result. Our electric car is quick, quiet, and gets filled up with electricity in our garage instead of at a gas station. The cost of powering our car with electricity is about a third the cost of gasoline, and maintenance consists of just rotating the tires and adding windshield washer fluid. Our heat pump efficiently heats our house in the winter and cools it in the summer. Thanks to our electric induction stove, we can boil water in seconds instead of minutes and the air in our kitchen is free of the nitrogen oxide pollutants that are emitted by gas stoves.

We need the federal government to accelerate electrification by requiring that all new buildings be all-electric as soon as possible and by providing incentives for installing heat pumps in

existing buildings. It's important that tax incentives for EVs continue and that a reliable, nationwide high-speed charging network be completed that includes megawatt-scale charging stations for electric trucks. It's also about time we put a price on carbon dioxide emissions commensurate with the widespread damages these emissions cause. And we need to finally eliminate the tens of billions of dollars in subsidies that still go to coal, oil, and natural gas—the very things that are causing climate change.

The good news about climate change is that it's not too late to act. Today's best scientific models show that after we stop burning fossil fuels, the Earth's temperature will quickly level off and begin to decrease. Weather conditions will start to improve instead of continuing to get worse. For this to happen, we have to reject the disinformation being circulated by those who want to keep making money the old polluting way and listen to what the scientists are telling us. If we do, not only will the climate improve but so will our air quality. And with those improvements will come healthier and happier lives. And, yes, this can be done without creating an economic burden. In fact, we'll see hundreds of billions of dollars of savings in healthcare costs alone. We have the solutions we need and we're already doing many of the right things. We need to have the courage to do them even faster.