

## **NM has role in addressing gigaton climate issue**

**By Melanie A. Kenderdine**

In 2019, carbon dioxide emissions from human activity totaled around 33 gigatons. That's 33 billion tons of CO<sub>2</sub> in a single year — and cumulative emissions from the industrial age are almost 1,000 gigatons. One result: Last year, NOAA concluded that atmospheric CO<sub>2</sub> levels were their highest in at least the last 800,000 years.

For most New Mexicans, the changing climate has long been obvious. This is equally apparent around the country and world. Recent California wildfires forced electricity system blackouts across the state. Sea level rise in the Gulf of Mexico could put half of the region's power substations under water.

Farther afield, melting glaciers in the Andes threaten electricity supplies for countries that are heavily dependent on hydropower. Last May, Baghdad's temperature hit a record-shattering 125 degrees. UNICEF reports that nine Southern African countries are experiencing emergency levels of food insecurity due to climate-related drought. India — the second-most populous country in the world — is experiencing heatwaves with corresponding rises in mortality and death.

In response, a growing number of countries, states, cities and companies are setting “net zero” targets. These mean keeping greenhouse gas emissions — GHGs — from being released as much as is technically possible, then cleaning the remainder from the atmosphere with “carbon dioxide removal” technologies that are in early stages of development.

One place where New Mexico can make a major contribution, both within the state and beyond its borders, is by mitigating methane emissions from its oil and gas sector. While only 9.5% of U.S. GHGs, methane is a much more powerful radiative forcer than CO<sub>2</sub>. On the flip side, methane's residence in the atmosphere is only 10–12 years compared to at least a thousand for CO<sub>2</sub>. Translation: methane management means early mitigation gains — “buying time” to develop new technologies we will need to achieve net zero targets.

The Obama administration adopted regulations for oil and gas system methane leaks, the Trump administration halted them, and President Biden intends to reinstate them — a good move for the planet and, from a technical perspective, manageable for New Mexico's industry. It's important to remember however, that oil/gas system methane emissions are only around 30% of the total. Reducing methane leaks from agriculture and landfills — making, for example, “renewable gas” from this methane — will help with the other 70% while creating useful and valuable products.

CO<sub>2</sub> is the more intractable problem. Its long atmospheric residence and gigaton-scale emissions mean it's compounding in the atmosphere. Mitigation demands early action — rapidly deploying existing technologies such as carbon capture and storage (CCS), massive energy efficiency, renewable generation, clean firm power, and electric vehicles. At the same time, we need new technologies for longer-term reductions such as green hydrogen, long duration electricity storage, direct air capture and advanced nuclear.

We also need policy support to help ensure rapid technology development and deployment, adequate infrastructure and the availability of materials — the metals, minerals and processes — needed for a clean-energy future. Direct-drive wind turbines, for example, use large amounts of copper and neodymium, a rare earth mineral.

These are areas where New Mexico, with its strong policy foundations and commitment to zero emissions electricity, can lead the nation. The skills of its oil and gas workforce translate into those needed for CCS. Reducing methane emissions from energy production will set a marker for other producing states. Its national laboratories are engines of clean-energy innovation. Its abundant mineral resources can support the technologies needed for deep decarbonization, create jobs and provide New Mexico with an opportunity to be a leader in demonstrating net-zero mining practices.

Gigaton-scale problems require commensurate solutions. The list of climate change impacts is getting longer, while critical response times are getting shorter. New Mexico can play a key role in addressing climate change, helping to tackle one of the world's most critical challenges as the United States seeks to resume its leadership role in the community of nations.

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