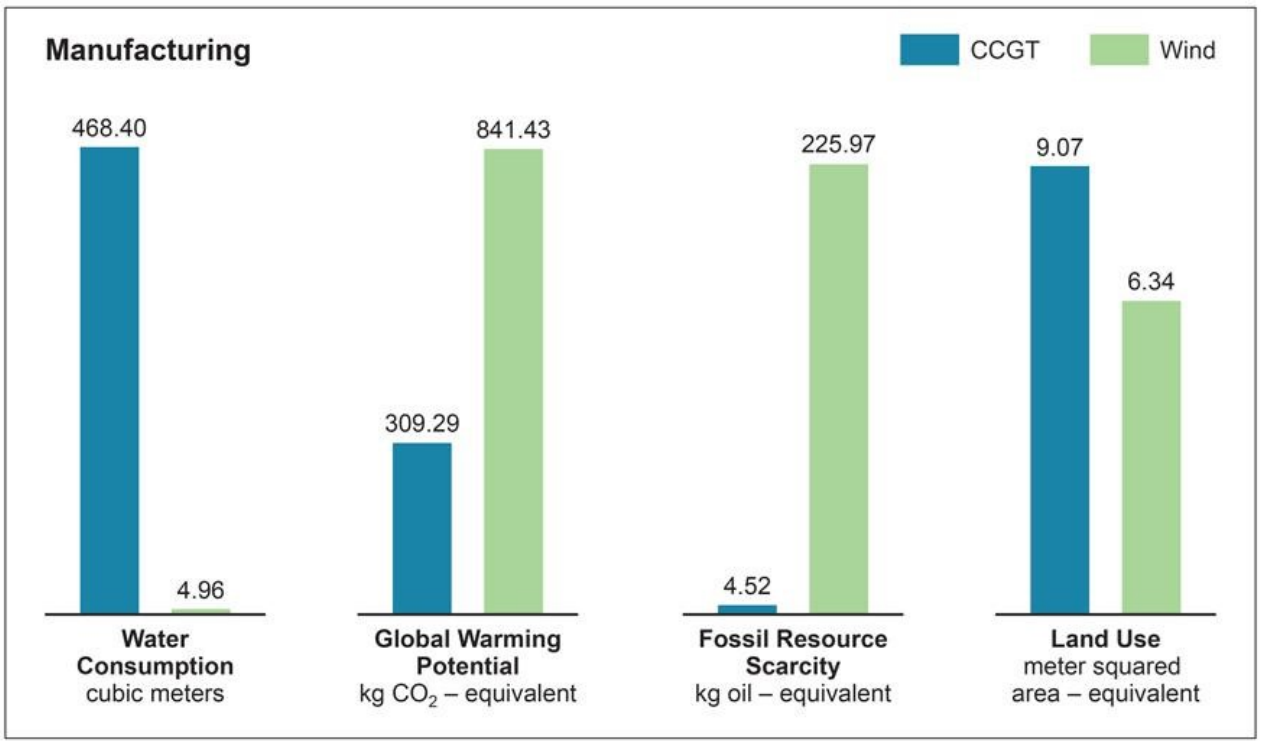

Examining the Unintended Consequences of Energy Transition

Bureau of Economic Geology launches Comparing Electricity Options consortium

May 2022 | Ken Milam, Explorer Correspondent

The global shift from greenhouse gas-intense, carbon-based fuels toward alternative energy sources and technologies sometimes produces unintended negative impacts.

Experts at the Bureau of Economic Geology at the University of Texas at Austin are mounting a major study of these effects – the Comparing Electricity Options research consortium – with the intention of helping to identify and mitigate such unintended outcomes.

“The audience for the research is relatively broad, and includes energy, mining and electrical equipment manufacturing industries as well as those involved in energy and environmental policy and regulation,” said Michael Young, a senior research scientist with BEG who is among the project leaders. “We want to highlight to industry where links in the supply chain are weak and need strengthening, inform O&G companies who are considering expanding their energy portfolios to the current landscape regarding life-

cycle analysis and how the outcomes might play into environmental, social and governance issues, and the risks to current operations."

Impacts Beyond Just GHG

Young elaborated, "We want to inform policymakers of the difficulties in conceptualizing energy transition as a greenhouse gas mitigation issue alone, because local and regional impacts on air, land and water resources from material extraction to meet the equipment manufacturing and construction needs of alternative technologies can be substantial."

When the study was announced, experts at BEG said, "Ideally, results from this project will include a flexible model that allows anyone to simulate a desired energy mix of gas, solar, wind, batteries and other technologies not initially covered in this research, such as nuclear. Results will provide a clearer picture of total environmental impacts over time, local and global, including differences in upstream impacts when sourcing materials from various locations (such as cobalt sourced from Canada, versus the Democratic Republic of the Congo, versus a new mine in the United States)."

The societal shift in electricity-generating technologies is extremely complex on a global scale, Young explained, hence the need for a research project like this.

Demand for minerals such as lithium, graphite, cobalt, copper, rare earths, and nickel, which are necessary for manufacturing wind, solar and battery equipment, is expected to grow seven to 40 times between 2020 and 2040, according to the International Energy Agency.

The literature on this transition includes life-cycle analyses conducted on various electricity-generation technologies, such as natural gas combined-cycle gas turbines, wind turbines and solar panels, as well as electricity storage technologies (batteries). These LCAs track potential environmental impacts along the supply chain of these technologies.