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# Renewables, nuclear, CCS to play role in decarbonized economy: experts

## Highlights

Carbon capture can ease transition

Nuclear project costs can be cut

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Austin, Texas — Renewables, nuclear power and carbon capture and sequestration each have a role to play in a decarbonized economy, experts said at during an afternoon panel discussion as part of the University of Texas Energy Week conference in Austin.

Citing the massive growth of wind generation across the nation's mid-section over the past 10 years, Mike Jacobs, senior energy analyst at the Union of Concerned Scientists' Climate and Energy program, said, "you haven't seen a lot of headlines across the country about blackouts due to those wind farms."

David Petti, director of the Idaho National Laboratory's Nuclear Fuels and Materials Division, said a recent Massachusetts Institute of Technology study he co-authored, "The Future of Nuclear Energy in a Carbon-Constrained World," shows that, for example, a near-zero-carbon electricity generation mix in New England that features a significant role for nuclear power is about half as expensive as one without a nuclear component.

"Having nuclear in the mix keeps costs low," Petti said. "Nuclear and renewables work very well together."

## **THE ROLE OF CARBON CAPTURE**

Vanessa Nunez-Lopez, research scientist at the Gulf Coast Carbon Center and UT's Bureau of Economic Geology, said that to mitigate the negative effects of anthropogenic climate change, "we need to act very, very fast, but we still need fossil fuels."

To help with the transition period, the use of man-made carbon dioxide in enhanced oil recovery can help take greenhouse gases out of the atmosphere.

"As much as 50% of the carbon dioxide in enhanced oil recovery doesn't escape the well -- it is captured," Nunez-Lopez said. "It's very valid to say you are reducing greenhouse gas emissions."

A study of the most common ways of using carbon dioxide in EOR -- combined with water -- shows a net decrease in carbon dioxide emissions through the first seven or eight years of production from a well.

While enhanced oil recovery techniques also produce more oil, which is refined and burned, the use of post-manufacturing CO<sub>2</sub> does reduce net emissions, she said.

Asked about the viability of using CO<sub>2</sub> from coal-fired generation in carbon capture and sequestration, Nunez-Lopez said, "the limitations are not technical, they're economic and regulatory."

## **NUCLEAR PROJECT COSTS**

Noting the budget- and schedule-busting record for new nuclear projects in South Carolina and Georgia in the 21st Century, an audience member suggested that the economy is more likely to adopt technologies -- such as rooftop solar, wind generation and battery storage -- that can be added incrementally, rather than fund major new central generation sites.

But renewable resources require large blocks of land, which is simply not available in much of the world, such as Europe or Japan, Petti said.

"We agree ... [that] the industry has a lot of work ahead in the cost area," Petti said, but developments in Korea, China and France show that new approaches, particularly with regard to the concrete shell around the nuclear generation, can substantially and safely cut expenses.

Nuclear project developers can cut the cost of new plants 15% to 20% by adopting new technologies for reactor foundations and protective shells and by moving toward small modular reactors, Petti said.

One issue that limits the development of such projects in the US is the relatively stagnant power demand growth, while the fastest demand growth is happening in China and India, Petti said.

"They need to move their populations to a better standard of living, and they're doing it," Petti said. "In China, they went from burning dung in their stoves to burning coal and extended their life expectancy tremendously."

But moving to the next stage remains challenging.

Asked whether the world economy can become decarbonized and, if so, when, the Union of Concerned Scientists' Jacobs smiled and said, "my understanding of history and physics is that the problem will be resolved one way or another."

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