

R&A

Laboratory, and the National Energy Technology Laboratory.

DAC is one of the most mature carbon-removal technologies, but it is an energy-intensive (and thus costly) process that requires heat, electricity, and chemical processing of the captured CO₂. The systems need electricity to power fans, pumps, compressors, water cooling systems, and air separation units, as well as heat to drive the chemical reactions that regenerate the solvent or sorbent and concentrate the CO₂.

Leveraging carbon-free nuclear electricity and heat would allow DAC systems to be smaller and less expensive to operate since their emissions footprint would be smaller, compared with traditional systems powered by natural gas or the electric grid. Nonnuclear DAC systems need capacity to handle the emissions of their power sources, as well as any captured atmospheric CO₂.

The DOE's Office of Fossil Energy and Carbon Management has already awarded funding for DAC front-end engineering design studies at two nuclear power plants: Constellation's Byron (L-DAC) and Southern Company's Fargle (S-DAC).

Researchers analyzed S-DAC systems paired with nuclear heat and electricity and L-DAC systems paired with a combination of natural gas heat and nuclear electricity. The new study analyzed the potential performance of both systems with three reactor types—a pressurized water reactor (Westinghouse's AP1000), a sodium-cooled fast reactor (AFR-100, an Argonne-developed design), and a very high temperature reactor (HolosGen's helium-cooled micro-reactor)—and showed that both

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Department Head & Professor

Department of Nuclear Engineering

Applications are invited for the position of Head of the Department of Nuclear Engineering in the Tickle College of Engineering at the University of Tennessee. The expected start date is August 1, 2024. Primary responsibilities of the department head are: 1) to provide visionary leadership; 2) to encourage excellence and innovation in research, teaching, and service; 3) to advance the professional development of faculty, staff and students; 4) to promote productive relationships with all constituents including students, parents, alumni, industry, national laboratories, and government agencies; and 5) to foster productive interdisciplinary relationships with a variety of entities across the University community.

Application Process

Applications should be submitted to Interfolio at <https://apply.interfolio.com/132354>. The search committee will begin reviewing applications December 15, 2023, and continue until the position is filled. For more information, contact search committee co-chairs Mingzhou Jin (jin@utk.edu) and Paul Frymier (pdf@utk.edu).

The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ ADEA institution in the provision of its education and employment programs and services. All qualified applicants will receive equal consideration for employment and admission without regard to race, color, national origin, religion, sex, pregnancy, marital status, sexual orientation, gender identity, age, physical or mental disability, genetic information, veteran status, and parental status. I begin reviewing applications December 15, 2023, and continue until the position is filled. For more information, contact search committee co-chairs Mingzhou Jin (jin@utk.edu) and Paul Frymier (pdf@utk.edu).