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Creating a 'Collaboratory' Environment to Transcend Traditional Research Barriers: Insights from the United States

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Today's scientific endeavors often resemble a large lecture hall partitioned into separate sectors. Scientists, engineers and students study big questions largely in isolation. Local factors drive their activities, but the groups have overlapping interests and capabilities for tackling big questions about our planet's energy future.

If the walls were removed, the researchers could interact directly, identify mutual challenges, and form interdisciplinary and multi-institutional teams.

The Center for Advanced Energy Studies (CAES) fosters just such an environment. CAES aggregates researchers from multiple universities so faculty and students can interact, share resources and leverage the assets of the Department of Energy's Idaho National Laboratory. Its success has inspired recent federal legislation to replicate the model at other federal research entities.

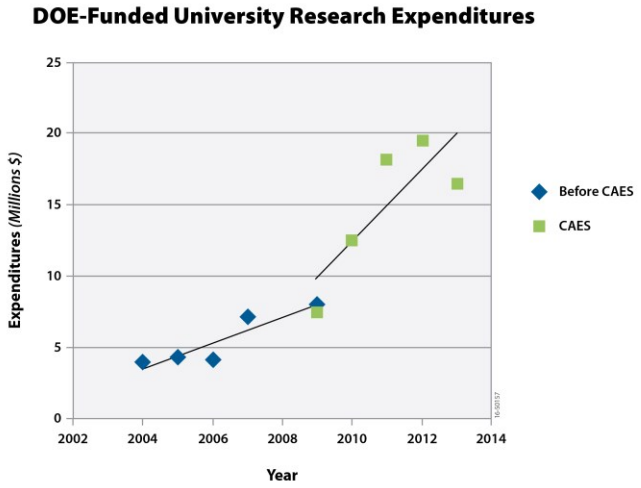
CAES is a unique 55,000-square-foot collaborative laboratory space ("collaboratory") providing state-of-the-art equipment that brings university faculty and students from the University of Idaho, Idaho State University, Boise State University and University of Wyoming together under one roof with INL scientists and engineers. Each university contributes financial resources, students and faculty. INL provides resources, students and staff, plus cutting-edge research equipment and keen understanding of national energy priorities.

Together, CAES members tackle our energy future's grand challenges to develop regional approaches with national and international impact. The consortium has broken down silos and replaced them with rich collaborative research and education opportunities.

Two pieces of federal legislation seek to replicate such a model by establishing "microlabs" within the National Nuclear Security Administration (via the National Defense Authorization Act) and at other DOE labs under the proposed Energy Policy Modernization Act.

CAES is funded by the states of Idaho and Wyoming, the DOE, INL and private industry. It collaboratively advances energy security by accelerating the pace of basic research and transitioning those outcomes to the private sector.

CAES has provided an impressive return on investment exemplified by the growth of competitive federal research funding won by the universities in the CAES consortium. Before CAES was established, total grant funding among the three Idaho universities was nearly flat and averaged $6 million to $7 million annually. Since CAES opened in 2009, competitive DOE funding at the Idaho universities has grown every year and now averages



around $20 million annually. The University of Wyoming joined the Consortia in October, 2014 and so is not included in this analysis. Over seven years of operation, CAES research projects have supported 1,300 undergraduate students and 860 graduate students, and resulted in 372 graduate degrees from member universities.

CAES also has fostered innovative collaborations with industry. For example, a DOE grant enabled the CAES Energy Efficiency Research Institute (CEERI) to launch a statewide industrial assessment center to conduct free energy efficiency assessments for regional companies and manufacturing plants. In the first year, teams conducted eight visits and submitted four reports that identified total projected energy savings of 1,003,464 kilowatt hours and a potential cost savings of $109,524.

By performing research linked to regional industry, promoting economic prosperity, and generating excellent jobs, CAES has broadened and deepened the universities' relationships with both industry and government. These private-public partnerships accelerate basic research and diversify workforce development programs.

Howard Grimes is director of Innovation in Industry Partnerships for the Center for Advanced Energy Studies.