

WASHINGTON STATE UNIVERSITY

Clean Technology Laboratory

2009 – 11 Request:	\$5,800,000	Project Type:	Research
Institution Priority:	#14	Project Phase:	PreDesign / Design
		Gross Square Ft:	85,000 gsf

Pre-design and design funding of \$5,800,000 is requested for a major capital construction project for the College of Engineering and Architecture that will replace 60-year old facilities with high-technology laboratories to address state research and instruction priorities in renewable energy, biofuels, and the environment.

The research conducted in the Clean Technology Laboratory will include air quality research; environmental engineering research; materials engineering research emphasizing renewable energy; and bio-products and bio-energy engineering research.

The Clean Technology building replaces the Thermal Fluids Research Building (TFRB), built in 1948. It also replaces a small, adjacent Quonset hut. The proposed Clean Technology building will not only be state of the art, but will include high bay research space that will accommodate an overhead crane, a requirement of the Center for Materials Research which currently has space in the TFRB.

Occupants of the proposed Clean Technology building include the Laboratory for Atmospheric Research (a group from civil engineering); the Center for Environmental, Sediment, and Aquatic Research (an interdisciplinary group that includes faculty members from civil engineering, chemical engineering, and biological systems engineering); the Water Research Center (a statewide research center); the Materials Engineering faculty, including the Center for Materials Research; and Pullman-based researchers for the Center for Bio-products and Bio-fuels (CBB) faculty (an interdisciplinary group that includes faculty from biological systems engineering and chemical engineering in Tri-Cities and Pullman.)



Collectively, programs relocated to this building include at least 23 faculty members, 11 staff members, approximately 40 undergraduate students, and 60 graduate students. Because of the strategic priority of these research topics, these numbers are expected to increase by 50% by the 2010-2012 biennium and by 100% by biennium 2013-2015. The current external funding level for these programs is conservatively \$5 million per year in sponsored research. Two of the four National Science Foundation-sponsored “Research Experience for Undergraduates” grants in the College of Engineering and Architecture are in areas falling under the umbrella of Clean Technology. The grants are in materials engineering, and air pollution. This building provides hands-on experience to undergraduate and graduate students outside of a classroom setting in laboratories. This serves to improve retention in these fields for outstanding undergraduate students as well as offering an important recruiting tool for bringing graduate students into premier research programs.

In the renewable energy area, WSU materials engineers are working with solar energy companies in the state. Several WSU engineering faculty recently started collaborations with the Boeing Corporation under Boeing’s *Aviation and the Environment* initiative.

The Center for Bioproducts and Biofuels programs that are located in Pullman are extremely short of space, and participating faculty members are scattered around campus, making it difficult to share equipment. Centralizing these programs will allow for collaboration, and sharing of facilities. The result will be larger, externally-funded research programs that will benefit the environment, economic development and student instruction.

The Laboratory for Atmospheric Research and the materials engineering programs represent the two most productive research groups in WSU's College of Engineering and Architecture. Much of their work is conducted in substandard space currently in Dana Hall, and neither group has space available for growth (either laboratory or office space).

The Water Research Center and faculty working in related areas has been enhanced by a recent "cluster hire" of four new faculty members. Shared laboratory facilities for these faculty will be located in the new Clean Technology Laboratory building to further promote collaboration and productivity.

Current building and accessibility codes, energy standards and other regulations require more sophisticated laboratories, utilities, services, and environments to produce the applied research and engineering graduates demanded by some of Washington state's most critical industries, including the clean technology industry sector.

The 30,000-square-foot TFRB has outlived its usefulness and is only marginally utilized. The old building houses a machine shop, and provides low quality space for student club activities, as well as some low quality, high bay research space. The Quonset hut is used for long-term storage. In this project, the outdated TFRB and the Quonset hut will be removed and replaced with a highly functional and cost-effective engineering research laboratory, to both increase the amount of research space in the college and to provide modern laboratory, office, and communications (i.e., internet and teleconferencing) facilities. Replacement of these buildings with an 85,000 GSF building will also result in much better site utilization consistent with the capacity needs of the college.

This revised proposal for engineering was moved ahead of the Dana Hall project that has been in the 10-yr capital plans for WSU since 1981. WSU determined that the most immediate need in engineering is for additional, high quality research space, beyond that which would be provided by the renovation of Dana Hall alone.

This project directly addresses four stated priorities of Governor Gregoire:

1. Reducing dependence on foreign oil;
2. Concern for our environment;
3. Educating to compete – educating the best-prepared, highly skilled workforce for the state; and
4. Building prosperity through faculty-industry interactions and technology transfer.

The research areas to be accommodated in the Clean Technology Laboratory are also consistent with the university-wide strategic priority area in Sustainability and the Environment, which includes renewable bio-fuels, advanced materials for renewable energy, sustainable design, clean power, and the environment. These research groups are also major components of two of the six university-wide research areas of preeminence: (1) Advanced Materials, and (2) Advanced Energy Technologies.