

Agency 365 – Washington State University  
2009-2011 Operating Budget Request

The Land Grant University for the 21<sup>st</sup> Century  
Performance Level Decision Package – Policy Level “CT”

## Clean Technology Initiative, Phase 1 Buildings & Architecture

### Agency Recommendation Summary:

Washington State University proposes a \$2 million research, instruction and public outreach program which partners with local government and businesses to accelerate energy efficient building practices for this state’s homes and businesses.

This state budget request would launch what is likely the broadest energy efficiency strategy for buildings ever invested by the Legislature. It combines both new and existing faculty and staff from many disciplines, supported by several funding sources, into a unified WSU effort for the state of Washington:

- Both WSU basic and applied research efforts in energy efficiency are expanded and integrated in architecture and engineering.
- Hundreds of building professionals will receive continuing education programs in building efficiency from WSU.
- WSU students in professional programs like engineering and architecture will now graduate with more expertise in energy efficiency for buildings.
- Expert WSU assistance offered to many local governments in the country will now be made available to Washington counties and cities.

The increase in expertise in the workforce created by the education programs, coupled with an outreach program to transfer the benefits of research to the development of state and local policies, will result in more energy efficient buildings in the state of Washington. Energy efficiency will make the state more competitive in the future. WSU has experts working on the various components of sustainable design that are spread across many disciplines. These individuals are located in the academic areas that assist with: use the building site; designing the form, function, and operation of buildings; producing building materials with recycled and renewable resources; and assessing the level of sustainability.

When combined with the new energy specialists outlined in this request, these experts will provide the support required by our state to navigate complex energy challenges.

**Fiscal Details:**

	2009-10		2010-11		2009-11 Biennium
By Fund	FTE	Dollars	FTE	Dollars	Dollars
General Fund State	4.5	822,974	7.0	1,177,026	2,000,000
<b>Total</b>	<b>4.5</b>	<b>\$ 822,974</b>	<b>7.0</b>	<b>\$ 1,177,026</b>	<b>\$ 2,000,000</b>

**Package Description:**

This request creates seven university teaching, research and public service positions that will develop new energy strategies and assist local governments with aggressive new programs to encourage energy conservation. At least 500 industry professionals will receive continuing education on advanced building codes. Teaching research faculty will produce WSU graduates who will be expertly prepared to enter a workforce that improves building efficiency. This 2009-2011 state operating biennial budget request is designed to coordinate the extensive assets of WSU that currently are applied broadly to the nation and to then provide an initial focus of improving the efficiency of buildings exclusively in the state of Washington.

**Specifically, the budget request is for:**

- Two non-faculty research and extension staff members who will advance building efficiencies beyond the energy code and support energy performance improvements through WSU training and leadership.
- Two public service experts in energy codes and standards who will offer assistance to local governments, train 500 industry professionals on new code requirements, and promote construction of buildings that will meet or exceed the minimum code efficiency standards.
- One faculty member who will focus on research, instruction and outreach on energy loads and heat transfer within the building areas (how heat and air moves from room or room or within large areas inside the building).
- One faculty member who will focus on research, instruction and outreach on the performance of the building envelope (walls, windows, roof, etc).
- A Life Cycle Analysis expert with faculty credentials and an emphasis on assessing the energy and environmental requirements to manufacture building materials and the energy expended in the construction process itself. Life Cycle Analysis is used to quantify the total energy consumption and the cumulative effects on the environment over the life of the building. This information can be used to perform a cost-benefit analysis.

**Narrative Justification and Impact Statement:**

For buildings, basic and fundamental decisions are made in design that determine whether the building is in cooperation or competition with the climate, which then dictates energy requirements. These decisions involve the building form and orientation, interior treatments and landscaping to shade and protect. From a discipline standpoint, architects, landscape architects and interior designers make these design decisions, which are then enabled by civil and environmental engineers and finally implemented by construction managers.

## University Assets

WSU has assets in building energy conservation all over the state. On its Pullman campus, WSU is a pioneer in the development of new renewable building materials and it has promoted the use of these materials in homes and small commercial buildings. There is considerable energy efficiency teaching and research expertise in construction management, engineering and design disciplines. In Olympia, there are more than 60 WSU employees, not directly supported by state funding, that work through the university's Extension Energy Program office. The work of all 60 employees is focused on increased energy efficiency in many arenas, especially buildings. On the Spokane Riverpoint campus, the Interdisciplinary Design Institute focuses on solving problems with buildings and communities that bridge across the design disciplines (landscape, interior design, building architecture, etc). These efforts are producing outcomes that have the potential to develop building designs and interior treatments that improve natural day lighting and reduce lighting costs.

The WSU Wood Materials and Engineering Laboratory, and WSU's faculty in civil engineering have expertise which ranges from materials discovery to structural building design and codes. Although this group currently works with industry worldwide, most of its efforts are focused on the structural, rather than the energy performance of these new building materials and systems. Coordinated efforts between wood materials researchers and architecture faculty yielded award-winning building designs. Additional faculty positions contained in this proposal for building envelopes and life cycle analysis will integrally connect these efforts to new materials and building systems with improved energy performance.

The WSU Extension Energy Program is funded by the U.S. Department of Energy and other federal government agencies, federal power marketing agencies, the nonprofit Northwest Energy Efficiency Alliance, by electric or gas utilities and others in the private sector. Because of the funding sources, the benefits of the work of these employees, located in Olympia and Spokane, are often not directed specifically at communities within this state. WSU manages and operates the national energy efficiency and renewable energy information center on behalf of the U.S. Department of Energy. The center answers energy efficiency questions, including intricate engineering inquiries, from large industrial corporations and others from all over the United States and its territories. WSU also operates the federal government's Northwest Building Efficiency Center. The center serves Washington, Oregon, Idaho, Montana, and Alaska and provides experts to answer questions from building managers and other facilities workers in the region. The university participates in the Building America program – the federal research, development and demonstration program focused on advanced energy efficiency strategies for housing. While some states purchase WSU support for development, analysis or implementation of energy codes, the state of Washington has not provided such funding to support its local governments.

This budget request is intended to fill key gaps facilitating the university's ability to serve as a unique resource in education, research and outreach activities. Most importantly, this proposal is intended to point many more of those energy-saving WSU assets – currently tied largely to national funding sources – to buildings in the state of Washington.

**Outcomes:**

1. New energy faculty members will provide instructional support that will give WSU's civil engineering, construction management and architectural graduates expertise in designing and implementing advanced energy-efficient building codes. Current enrollment in these programs is about 1,000 students.
2. The new faculty positions will complete the expertise necessary for a WSU Institute for Sustainable Design that will generate \$14 million more in external funding. The institute will include academic areas such as civil engineering, construction management, architecture, interior design, landscape architecture, mechanical engineering.
3. All seven faculty and staff positions requested will have public outreach responsibilities to provide direct expert consultation to local governments, manufacturers, design firms, small businesses, etc.
4. By 2011, at least 4,000 homes in Washington State will be built to Energy Star Standards because of this program. That would be up from less than 1,500 homes in 2007.
5. Washington is likely to consider adopting a statewide code that would lead to stricter energy building standards. The analytical support provided by this request would expedite implementation of the approved advanced code proposals which are likely to be 30 to 50 percent beyond current code levels.
6. 500 existing builders and industry professionals in Washington will be trained on new code compliance.
7. New support materials on code implementation will be provided to professionals and the general public.
8. At least 750 homes will be built to the Department of Energy's Builder's Challenge levels during the next biennium. Less than 10 certifications were made in the last fiscal year.
9. At least 12 training sessions will be provided for builders and professionals that support builders on advanced building design and operations for non-residential buildings.

Calculations:

FISCAL DETAIL TABLES - CLEAN TECHNOLOGY INITIATIVE - Phase 1					
BUILDINGS & ARCHITECTURE					
	2009-10		2010-11		2009-11 Biennium
By Program	FTE	Dollars	FTE	Dollars	Dollars
Instruction	0.7	167,285	1.5	291,575	458,860
Research	0.8	167,286	1.5	291,575	458,861
Public Service	3.0	488,403	4.0	593,876	1,082,279
Primary Support	-	-	-	-	-
Libraries	-	-	-	-	-
Student Services	-	-	-	-	-
Institutional Support	-	-	-	-	-
Plant	-	-	-	-	-
<b>Total</b>	<b>4.5</b>	<b>\$ 822,974</b>	<b>7.0</b>	<b>\$ 1,177,026</b>	<b>\$ 2,000,000</b>
<b>By Object</b>					
Salaries	-	-	-	-	-
Faculty	1.50	225,000	3.00	450,000	675,000
AP	3.00	231,000	4.00	308,000	539,000
TA/GA	-	-	-	-	-
Classified	-	-	-	-	-
Benefits	-	202,482	-	313,026	515,508
Goods/Services	-	54,000	-	72,000	126,000
Travel	-	24,500	-	34,000	58,500
Equipment	-	85,992	-	-	85,992
<b>Total</b>	<b>4.5</b>	<b>\$ 822,974</b>	<b>7.0</b>	<b>\$ 1,177,026</b>	<b>\$ 2,000,000</b>

*For more information, contact Larry Ganders, Assistant to the WSU President, Olympia at 360-534-2333*