Capital Construction Project:

The Engineering Complex

UW Trustee Report

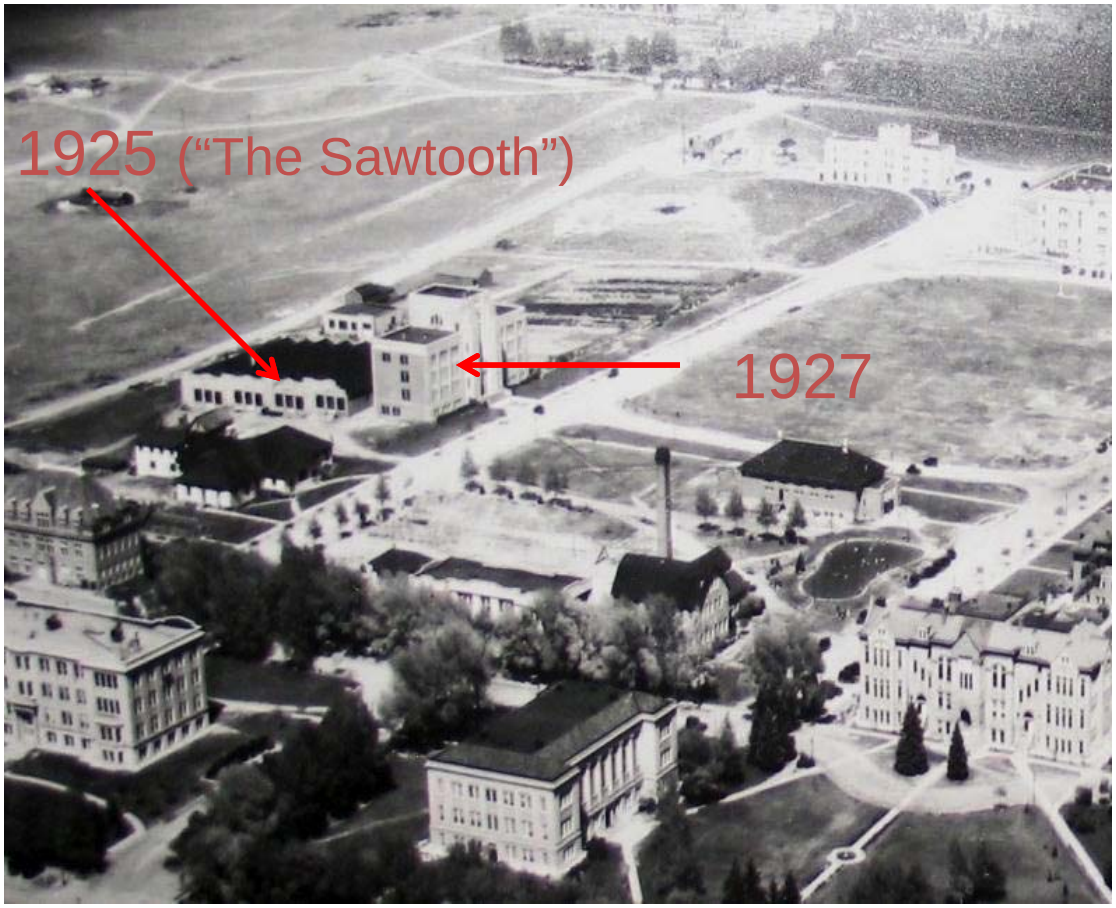
May 2012

UNIVERSITY OF WYOMING

Engineering Complex

- Current context
- Vision for the College
- Regional comparators
- A glimpse of the future
- Future activities

Engineering Building



circa: 1927

Engineering Building

1925 (“The Sawtooth”)

2012

The Sawtooth

- Coal gasification
- Composite materials fabrication
- Heat and mass transfer labs
- Hydraulics “teaching lab”
- College machine shop
- *Storage*

Sawtooth Problems

- Poor ventilation
- Leaking roof
- Power constraints
- A challenging sloped footprint for modifications

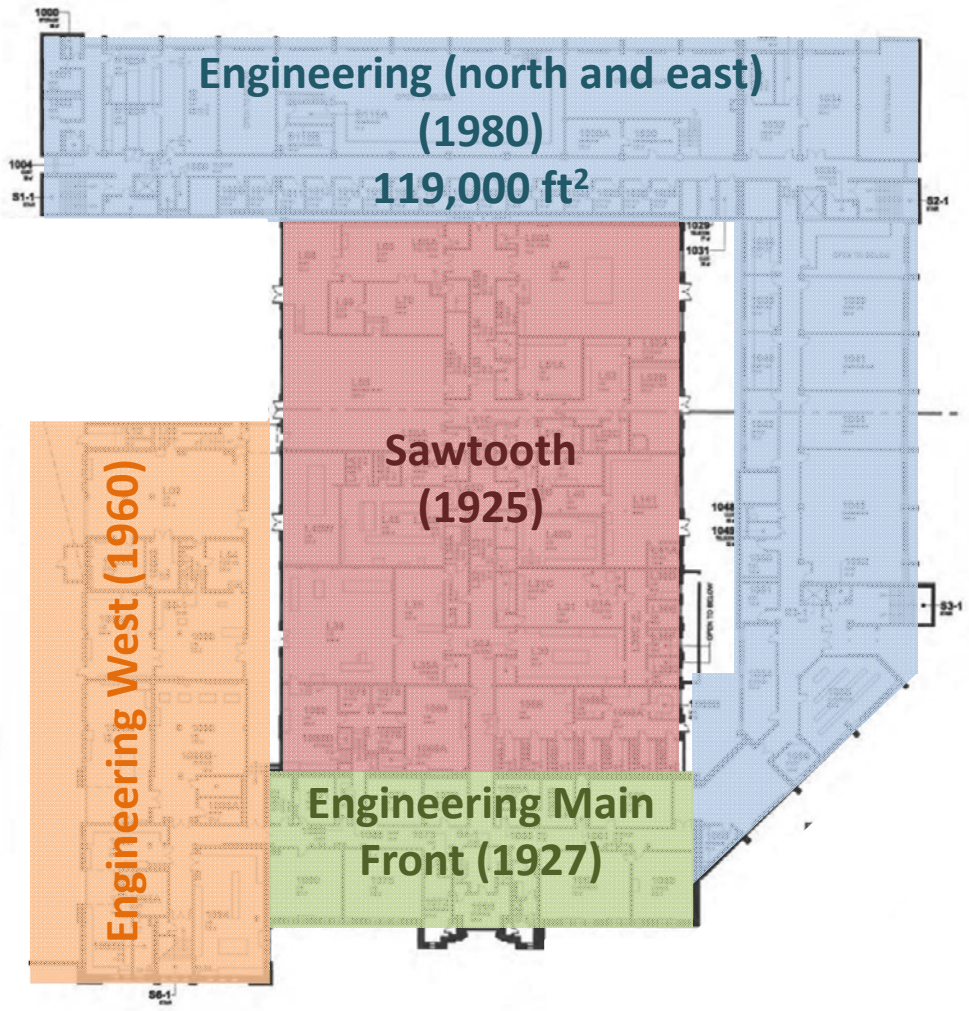
Engineering Facility Needs

Teaching and research laboratories

Facility Needs

- **Sawtooth 87 yrs old**
- **Eng. Main 85 yrs old**
  - **>25% of space**
- **Eng. West 52 yrs old**
- **Eng. North & East: 32 yrs old**

Laboratories comprise 55% of space in the facilities



UW Engineering is Laboratory Space Constrained

Impacts

- Current experimental oriented faculty have no lab space

- Current teaching is impacted
  - Some engineering teaching labs are 25% of needed size
  - Drilling simulator temporarily housed in the SER (energy) building
  - Teaching labs with the newest technology are simply unavailable

- Faculty hiring decisions are impacted by available lab space

Laboratory Development today:

Encana 3-Phase Flow Lab (2006)

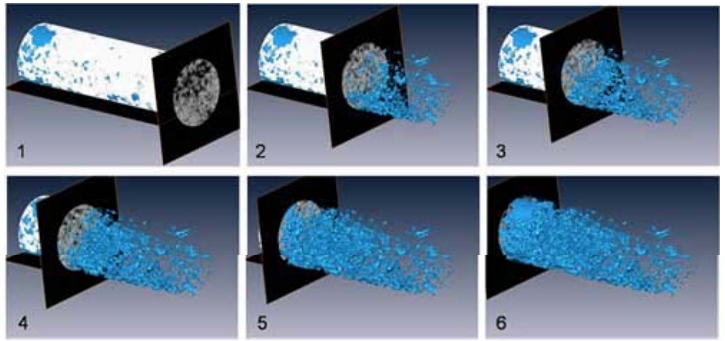
½ of Chemical Engineering Unit Operations Lab

Encana 3-Phase Flow Lab (2012)

Unique world-wide

Warning: Undergraduate enrollment in Chemical Engineering has jumped by 54% since 2006.

➔ Student lab space is a challenge!



UW Wind Tunnel Facilities

- Cramped conditions
- Off-campus space

VISION:

UW seeks to become a Tier 1 Engineering Institution

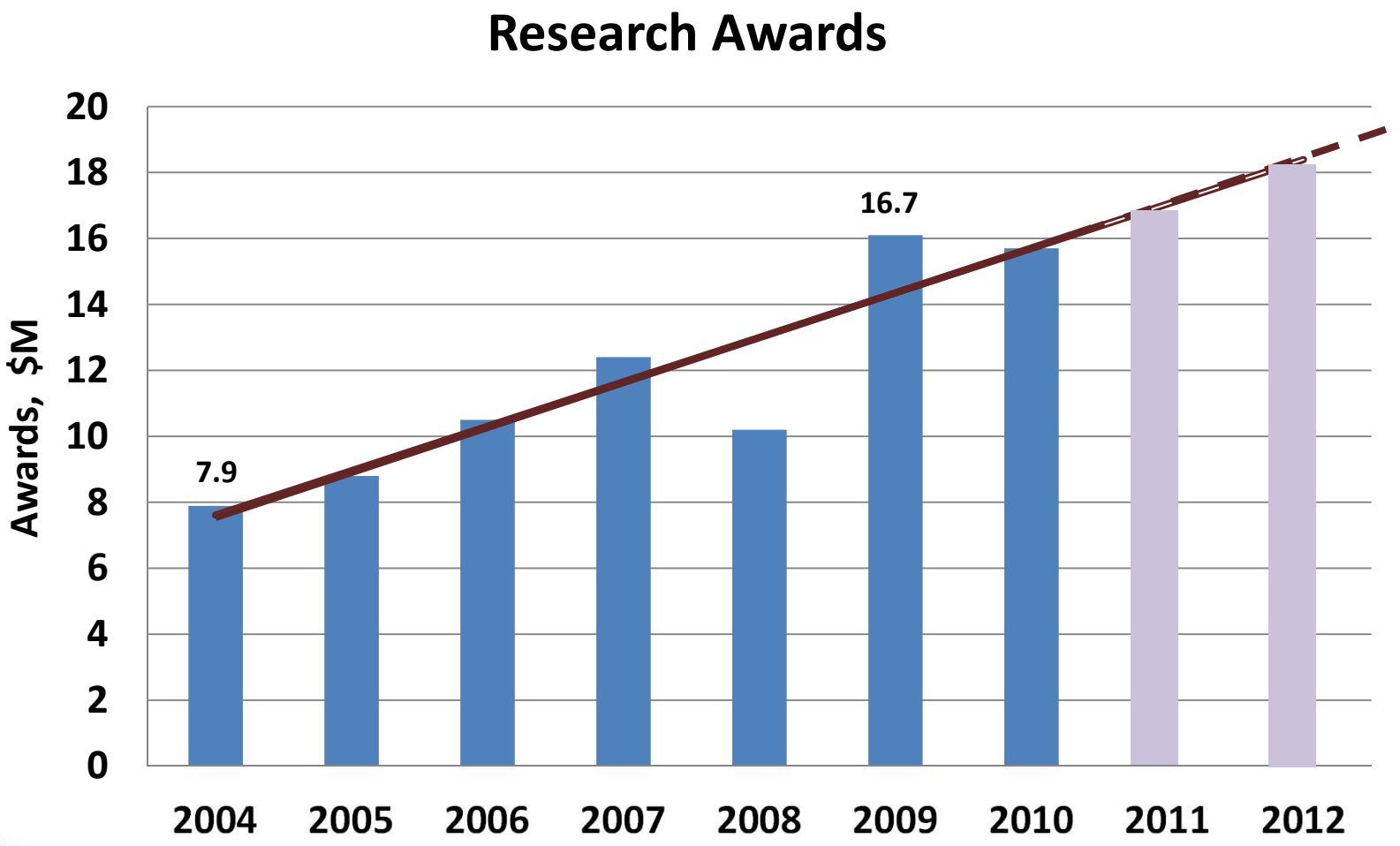
- Enhancing current areas of excellence
- Advancing programs critical to the state and the nation
- Leading the waves of the future in research and teaching

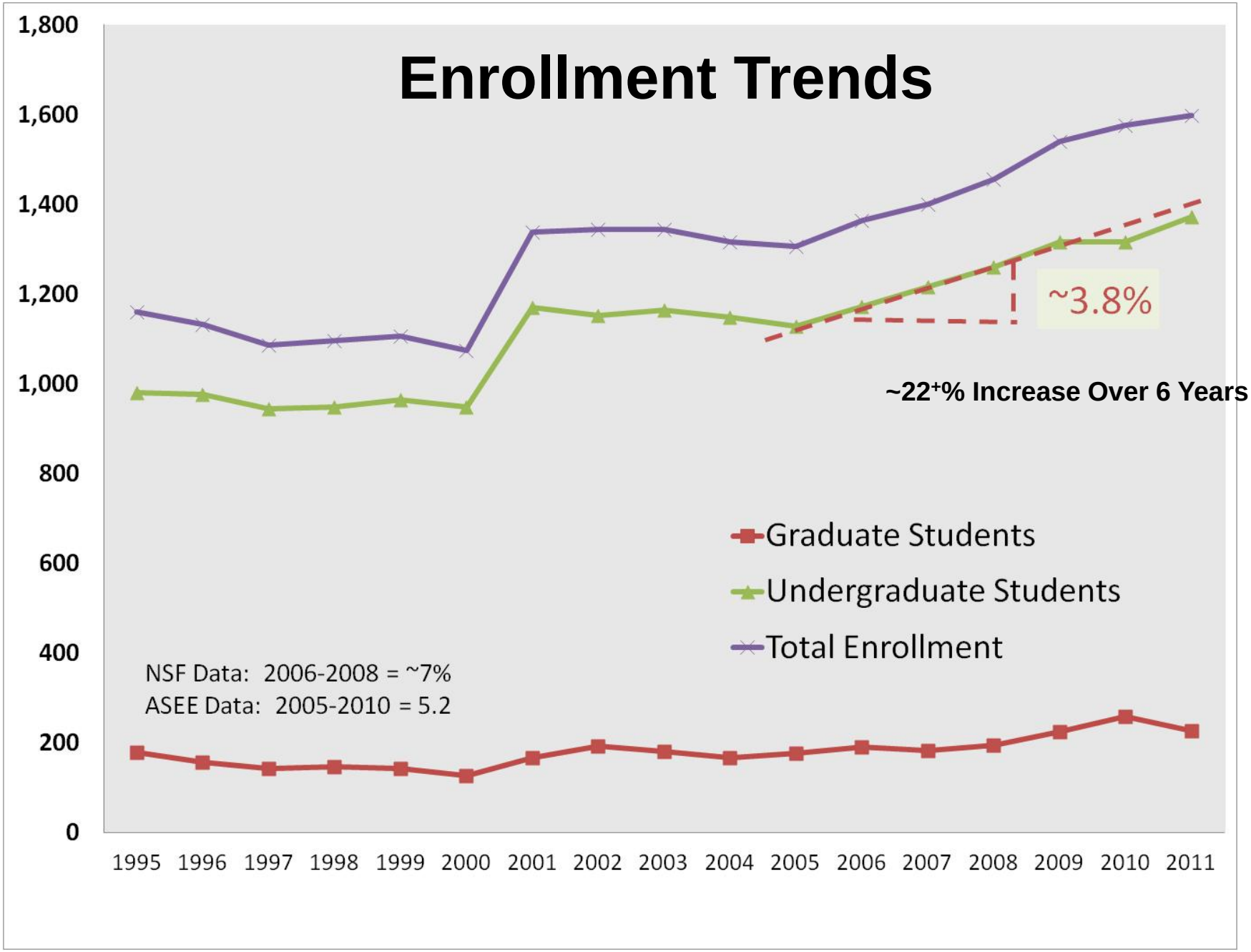
UW shall "assist in the development of the parameters for the renovation and reconstruction plan for the college of engineering at the University of Wyoming, which plan shall be designed in cost and approach to *lead the university toward a tier one academic and research institution in areas of excellence appropriate for Wyoming.* (*HB 25: 2012 Wyoming Legislature*)

Areas of excellence & critical needs of the state

- Energy
- Material science (composites, high temperature, biological)
- Computational fluid-, solid-, and geo-mechanics
- Cloud and aerosol physics
- Power transmission
- Biomedical science, biochemical engineering
- Transportation and infrastructure
- Water (hydrologic cycles, water quality)
- Robotics and mechatronics

Research Trends

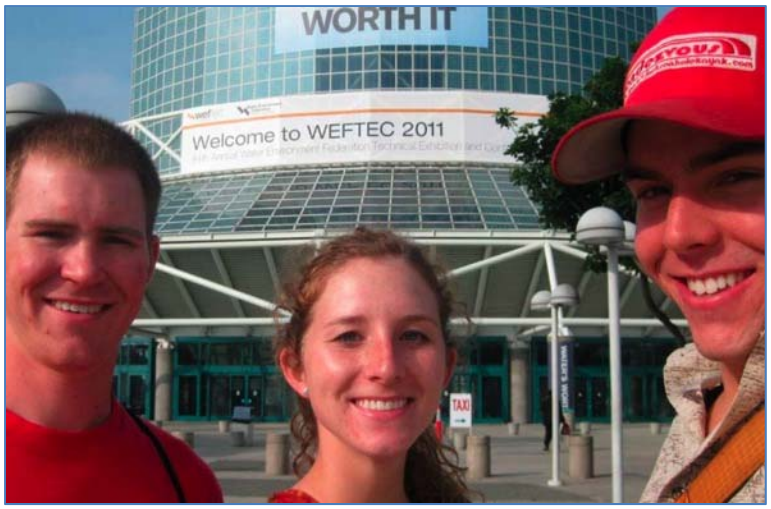



Enrollment Trends
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
~3.8%
~22+% Increase Over 6 Years
Graduate Students
Undergraduate Students
Total Enrollment
NSF Data: 2006-2008 = ~7%
ASEE Data: 2005-2010 = 5.2

Planning Metrics

Metric	2004	2010	2020
Undergraduate Student Enrollment	1,148	1,300	2,000
Graduate Student Enrollment	164	259	500
Research Awards	$7.9M	$15.7M	$25M

Quality Programs Excite Students



Darrin Harris, Emily Hart, Collin Reinert –

Won national student contest at Water Environment Federation Congress in Los Angeles, Fall 2011

***Gretchen Heberling* – ASCE, 2012 "one of top ten emerging young civil engineers in US"**

Quality Programs Attract Great Faculty

Faculty colleagues have a 2011 “most read” paper in Inst. Electrical & Electronics Engr. (IEEE)
(Cam Wright and Steve Barrett)

Regional Comparators

Eng College	Newest Building*	Oldest Building*
CSU	2013	1982
UC-Boulder	2011	1981
Utah	2008	1980
MT State	2008	1980
ND State	2006	1975
UW	1980	1925

(*Newest & Oldest Building based on new construction or total renovation)

UW is 25-50 years behind our peer engineering facilities.

New CSU Engineering II Building

http://www.youtube.com/watch?v=1WU6vU3vdLc&feature=player_embedded

Construction in 2011 - 2013

$69 M

New CU BioTech Eng Building

- New 257,000 ft^2 Building
- Completion - Fall 2011
- Chemical and Biological Engineering Department

http://www.colorado.edu/news/r/9909881d509d177762e652142045ea60.html

New Construction of Engineering Buildings at Colorado School of Mines

Brown Hall addition: $33 million, 78,000 square feet addition

Marquez Hall: $25 million, 75,000-square-foot new building to house the Department of Petroleum Engineering

Total cost: $58 M

University of Utah
New Warnock Engineering Bldg

UW: One Plan -- Two Projects

1. **Engineering Building** … to upgrade and expand the college's capacity to deliver ***high quality programs of education and research***

2. **Energy Engineering Research Facility (EERF)** … to create needed research labs ***increasing research in strategic energy areas, and more***

Projects	Buildings	Approximate Cost	Benefits
1 **Upgrade and Expand the College of Engineering & Applied Science**	**Sawtooth Replaced** **New academic building**	**Level I:** (Internal) **Level II:** ($1.15M) **Level III:** (state appropriation, gifts)	 • High quality career paths • Increased enrollment capacity • Educate the technical work force for Wyoming and the nation • Expertise to research, innovate, and help commercialize
2 **Energy Engineering Research Facility**	**Large-scale research lab facility** **High-bay lab** **Assignable floor area sought: 60,000 sq ft**	**Level I:** (Internal) **Level II: (**$400K) **Level III:** (AML, gifts)	 • Increased research capacity, especially for large-scale experiments • Critical infrastructure of energy-related research

Student Concepts
Engineering Building

Renderings by
Arch. Eng. students

Engineering Building Location?

EERF Project Objectives

- Enhanced research capacity in strategic energy areas
- Space and infrastructure for large-scale testing

Planning Process

- UW Level I Plan: Spring 2012 – available for distribution, feedback, and discussion
  (primarily a needs assessment & data collection)

- Begin UW Level II Planning: Summer 2012

- Leadership from Joint Minerals, Business, and Economic Development Interim Committee: 2012

Planning Process (cont'd)

- Solicit broad input from, for example:
  - Governor's Blue Ribbon Taskforce: 2012-2013
  - College of Engineering Advisory Board: 2012-2013
  - Community Outreach: 2012-2013
  - Legislative Outreach: 2012-2013
  - Campus (Faculty/Student/Staff) Outreach: 2012-2013
  - Donor Outreach: 2012-2014

Timelines for the Year Ahead

- Summer/Fall 2012
  - Obtain Trustee approval for Level II contract
  - Joint Minerals, Business and Economic Development Interim Committee
  - Private fundraising
  - Pre-meetings with Governor and legislators

- Early 2013
  - Respond to legislative questions re the Engineering Complex: January
  - Legislative Session: February-March
  - Complete Level II Study: March

Summary

- Strengthen Wyoming's ability to develop its resources
- Promote technological innovation
- Educate the professionals critical to the state's economic development

Discussion

The new facility marks the beginning….