7 Dimensions of Higher Education & Associated Indicators of Sustainability

1. Institutional Mission, Structure & Planning
2. Curriculum
3. Research & Scholarship
4. Faculty & Staff Development & Rewards
5. Student Opportunities
6. Community Outreach & Service
7. Facilities & Operations
Institutional Mission, Structure & Planning

- Formal written statements of mission and purpose reflect a commitment to sustainability
- Positions, committees, etc. exist which reinforce sustainability
- Sustainability and environmental issues given broad visibility on campus
BC Board Approved **Strategic Initiatives** includes “Creating a Culture of Sustainability”

- Campus-wide **Sustainability Steering Committee** has been established
- BC **Website** features section dedicated to Sustainability
- Charter Signatory **Presidents Climate Commitment**
- Educational Institution Member **AASHE**
- Signatory **Talloires Declaration**
- Part-time **Sustainability Coordinators** for Student Programs and Curriculum Development
Curriculum

- Courses with sustainability content in all departments
- Sustainability part of traditional disciplinary education
- Institution's relationship to surrounding environment part of formal and informal education
Engaged in early stages of concept development of **Green Building Program, including** Regional Labor Market Analysis

Beginning stages of **Certificate Program in Sustainability Studies and Major in Sustainability Studies**

**Existing Courses:** Physical Science 10 Environmental Science, Agriculture 10 World Food and Hunger Issues, Sociology 5 Our Sustainable Future, Biology 10 Sustaining Life on Earth, Economics 35 Introduction to Environmental Economics, Philosophy 10 Environmental Ethics, IDST 95 Civic Engagement Practicum

**Courses in Planning:** History Environmental History of the U.S. (projected Pilot Fall 08)

**Sustainability Infusion throughout Curriculum** in Anthropology, Business, Geography, Environmental Horticulture, English Composition, Fashion, Interior Design, Natural Resources, Political Science, Psychology, Spanish.
Research & Scholarship

- Research and scholarship on sustainability-related topics/issues
- Interdisciplinary programs/structures for research and policy development
A.S. Sustainability Resource Center

BC Library function is being extended to include supplying and archiving Sustainable informational research, and resources

Submission of National Science Foundation Advanced Technology Education (NSF/ATE) grant - Proposal for green building systems curriculum Development

Submission of EPA People Prosperity & the Planet (P3) grant for Student Engagement - Proposal for Student directed research on tap water vs. bottled water solid waste disposal
Faculty & Staff Development & Rewards

- Hiring, tenure and promotion recognize faculty contributions to sustainability

- Faculty and staff development opportunities enhance environmental awareness and sustainability
Invitational Presentations and Webinars have been made to Faculty, Staff, Admin re: Sustainability in Higher Education

Clear Creek Project - A Butte College Sustainability Curriculum Development Project with summer stipends, provides:
- Travel funds for conferences: UC-CSU-CCC Sustainability, AASHE, and National CC Sustainability
- Reference and Bibliographic Materials
- Sample Curricula
- Class Discussion and Project Ideas
- Sustainability Centered Student Learning Outcomes
- Guided Tours of AASHE website
- Information about Sustainability Related Organizations and Institutions
- Information about Local, State, National and International Sustainability Related Conferences, News and Events
- Community, Collegiality and Common Vision
Student Opportunities

- Orientation and opportunities for student action and involvement in sustainability initiatives
- Exposure to environmental or sustainability-related careers
- **Environmental Affairs Director** on the Associated Students Board

- Sustainability an overarching **goal of Associated Students**

- **A.S. Sustainability Resource Center**

- **Events:** Energy Awareness Fair, Campus Sustainability Day, Focus the Nation, Greendance Film Festival, Earth Days, Bio Tour

- **Student positions** on campus-wide Sustainability Committees: Sustainability Steering, Land-Use, Early Alert, Diversity…

- **Clubs:** Student Alliance for Sustainability, Friends of the Refuge, Phi Theta Kappa, and Students in Free Enterprise

- **Each One, Teach One of Northern California**

- **Student Senate for California’s Community Colleges (SSCCC)**
Community Outreach & Service

- Projects and programs support sustainable local communities

- Partnerships for sustainability with K-12, business, government and other institutions at regional, national and international levels
American Democracy Project

- Culture of Civic Engagement
  - Collaborative Projects with CSUC
    - This Way Sustainability Conferences
    - Focus the Nation
    - CAVE/Service Learning
  - Community Service Learning
    - Study Abroad Projects
  - Global Dimensions of Engagement
    - KIVA Participation
    - Heifer International

Participation in local economic development

- North Valley Renewable Energy
- SBDC/RHORC/CITD/Contract Education
- Local boards (OEDC/Tri-County EDC)
- K-12 Superintendents Councils
- Outreach to Hispanic, migrant, low-income communities (LEAP/Summer Connection/Summer Link & Summer Bridge)

Courses for Credit: IDST 93 & IDST 94
Greenhouse Gas Inventory of Butte Community College

Results and recommendations by Halli Bovia
Results for 2006

12,812,270

Metric Tonnes eCO2
28,246,215 lbs eCO2

(Equivalent to 1,830 homes)
What makes up 12812.27 Metric Tonnes?

Emissions by Source

- Electricity: 23%
- Natural Gas: 5%
- Solid Waste: 5%
- Fleet Total: 7%
- Student Commute by personal vehicle: 32%
- Staff & Faculty Commute: 22%
- Travel: 6%
- Agriculture: 0.23%
3622 Metric Tonnes eCO2 for 2006
28% of total Emissions for 2006
eCO2 Emissions from Electrical Use By Year

Metric Tonnes eCO2 from Purchased Electricity by Year

Year

1999 2000 2001 2002 2003 2004 2005 2006

2141 2144 1977 2673 3133 4080 3616 2943
Commute By Personal Vehicle

- 6,977 Metric Tonnes eCO2 annually
- 54.83% of Total Emissions

Emissions by Source

- Student Commute by personal vehicle: 32%
- Staff & Faculty Commute: 22%
- Fleet Total: 7%
- Natural Gas: 5%
- Electricity: 23%
- Travel: 6%
- Solid Waste: 5%
- Agriculture: 0.23%
Roughly 15.25% of the students surveyed use the Bus system exclusively.

The Bus system saved you: 905 Metric Tonnes eCO2
Metric Tonnes eCO2 Produced by Air Travel

Year

2003 2004 2005 2006

Year

Air Travel
Private Vehicle and Car Rental

Metric Tonnes eCO2 Produced by Private Vehicle and Car Rental Travel Per Year

Year

2003 2004 2005 2006

53 70 88 96

0 20 40 60 80 100 120
Summary

- **602.7** Metric Tonnes eCO2 from waste
- **3,622** Metric Tonnes eCO2 from power
- **8,558.3** Metric Tonnes eCO2 from travel

Emissions by Source

- **Travel** 6%
- **Electricity** 23%
- **Natural Gas** 5%
- **Fleet Total**: 7%
- **Student Commute by personal vehicle** 32%
- **Staff & Faculty Commute** 22%
- **Solid Waste** 5%
- **Agriculture** 0.23%
Strategies to Investigate for Emission Reduction

How can we get to our 2015 Goal?
Energy Reduction

Phase II and III Solar Projects
Reduction of Commute

- Faculty and Staff participation
  - Estimated to reduce 461 Metric Tonnes eCO2
- Run 35% Biodiesel on Diesel Bus Fleet
  - Estimated Reduction of 98.63 Metric Tonnes eCO2 annually at current use
Facilities Planning and Management’s Efforts on Sustainability
Trends in US Energy/Power Sectors – Net Primary Resource Consumption ~97 Quads

Source: US Dept of Energy and Lawrence Livermore National Laboratory
| Main Campus Usage: |  |  |  |  |  |  |  |  | Notes |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2002-03          | 6,074,270 | $782,718.45 | 156,015 | $134,752.41 |
| 2003-04          | 5,736,989 | $819,565.70 | 127,829 | $139,757.93 |
| 2004-05          | 4,948,607 | $724,896.59 | 150,913 | $122,177.26 |
| 2005-06          | 3,539,714 | $588,258.01 | 126,008 | $143,180.30 |
| 2006-07          | 4,496,913 | $666,871.95 | 126,558 | $122,919.63 |

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<tr>
<th>Electric Cost %</th>
<th>KWH %</th>
<th>Therms</th>
<th>Gas Cost %</th>
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<tr>
<td>&gt; 20%</td>
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<td>&gt; 66%</td>
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<tr>
<td>1.78</td>
<td>Allied Health Public Service Center Building On-line</td>
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<tr>
<td>1.91</td>
<td>Physical Science Renovation</td>
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<td>1.68</td>
<td>Fire Rescue Training Tower &amp; BE Renovation</td>
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<td>1.29</td>
<td>PE Renovation &amp; Technology Renovation &amp; LRC On-line</td>
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<tr>
<td>1.22</td>
<td>Library Renovation Expansion On-line</td>
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| Chico Center Usage: |  |  |  |  |  |  |  |  | Notes |
|-------------------|--------|--------|--------|--------|--------|--------|--------|
| 2002-03           | 139,088 | $18,692.88 | 3,060 | $2,785.46 |
| 2003-04           | 197,329 | $30,802.72 | 2,559 | $2,553.29 |
| 2004-05           | 685,713 | $96,004.10 | 8,541 | $9,724.38 |
| 2005-06           | 630,400 | $96,860.79 | 7,809 | $11,281.44 |
| 2006-07           | 719,040 | $113,166.43 | 8,112 | $9,688.44 |

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<td>0.98</td>
<td>Old Chico Center Off-line</td>
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<td>1.51</td>
<td>New Chico Center Building On-line</td>
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<td>1.94</td>
<td>Campus Ctr &amp; AHPSA Building - Solar Power On-line</td>
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| Solar Usage: |  |  |  |  |  |  |  |  | Notes |
|--------------|--------|--------|--------|--------|--------|--------|--------|
| 2002-03      | 2,295,212 | $335,057.63 |  |  | > 50% |
| 2003-04      | 2,158,046 | $316,695.02 |  |  | < 6%  |
| 2004-05      | 1,581,019 | $165,299.75 |  |  | < 26% |
| 2005-06      | 522,400  | $70,165.81  |  |  | < 67% |
| 2006-07      | 548,100  | $58,105.23  |  |  | > 4%  |

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<th>Gas Cost %</th>
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<td>&gt; 68%</td>
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<td>&lt; 26%</td>
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<td>2.25</td>
<td>Campus Ctr &amp; AHPSA Building - Solar Power On-line</td>
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Note: The electricity usage is based off of PGE numbers. AES and PGE uses/reads the meters at the same time. The gas usage (therms) are based off of Gym Main Campus Meter PGE numbers ONLY. Sempra only has $ amounts (therms unknown). DGS pays PGE directly for any therms used for Gym Main Campus Meter for starting in 2002.
Institution Structures

• Sustainability Committee and Co-chairs

• Greenhouse Gas Inventory
  – 12,812 MT CO2e/yr – Butte College
  – 36,625 MT CO2e/yr – CSU, Chico

• Target date for greenhouse gas neutrality is year 2015

• Comprehensive Plan
  – California Energy Commission lighting audit
  – Chevron Energy Solutions, Comprehensive Energy Audit (CEA)
  – Continuing retrofits – small HVAC & lighting next
  – UC System Public Interest Energy Research (PIER) project
  – California Community Colleges/IOU Energy Efficiency Partnership
  – Pacific Gas & Electric
• Solar Phase II & III
  • 3 to 3.5 megawatts needed

• Conservation trends
  • $1.91 sq foot/yr – 2003-2004
  • $1.22 sq foot/yr – present

• Cost utilities increases by 3 to 6% yearly
  • Square footage increase
  • Usage decrease

• Three degrees in temperature change equals 10% savings in gas and electric cost

• Monitoring Based Commissioning (MBCx) - Planning campus wide installations, 100% funded by CCC/IOU

• MBCx – Business Education
  • 25% HVAC, 25% lighting, 50% plug loads/computers
• Recycling is greater than 50% since 1995
  – 2006 diversion rate 64.4%
  – 2000 to 2005 average diversion rate is 80.63%

• Diversions:

• Recycling at Butte College:
  – CFLs, papers & cardboards, beverage containers: plastic, glass, aluminum, oil, tires, concrete, metal, landscape waste, composting, E-waste (all), Freon, antifreeze, printer cartridges, batteries.

Goal for fall 2008: a recycling container in every classroom
Building
• LEED – New Construction
  – Instructional Arts (silver level)
  – Student and General Services (certified level)

• LEED – Existing Building
  – Allied Health Public Service Center, Chico, Learning Resource Center, Library

• LEED Existing Building = MBCx = Decreased utility and operations cost

Green Purchasing
• Policy and procedure in place
• Recycled content on building materials, carpeting, furniture, VCT, etc.

Printing
• NEW for 2007-2008 30% post consumer recycle (all paper)
• Standard double side printing
Green Clean
• All custodial products are green, exception restrooms.

Water
• All waste water treated and used for wildlife habitat.
• All storm water receives biofiltration before leaving campus.

Grounds
• No insecticides, fungicide, etc.
• Only use three materials for herbicides

Transportation
• Three natural gas buses
• Seven biodiesel compatible buses
• 1,000 students each day
• 250K miles per year
• **NEW** All five Chico bus routes pick-up and go to the Chico Center then main campus.
Butte College
Sustainability Conference
2007 - August 3rd and 4th (1st conference)
2008 - June 4th, 5th and 6th (2nd conference)

Building “On Time On Budget, Green”
“Classrooms of the Future”
Exhibit 3
Butte College Instructional Arts Site Logistics Plan

Notes:
1. All materials to be offloaded from trailers at the designated truck off-loading area and brought into the construction site by forklift or small truck via the "Small Material Delivery Route".
2. Tractor trailers may be brought into the construction site via the "Large Material Delivery Route" and only if specifically noted in the bid package descriptions.
3. Emergency vehicle routes must be maintained at all times throughout the project.