



**Sustainability at Stanford:
Meeting the Challenges of Growth**

by Therese Brekke, Stanford University
for the Sustainable Campus Conference
Zurich, Switzerland
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Stanford is integrating sustainability throughout the university



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Sustainability goals

- Involve all academic disciplines in finding solutions**
- Grow while conserving resources**
- Cut greenhouse gas emissions**

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Sustainability drivers

Momentum comes from:

- Competitive advantage
- Culture of innovation
- Operational cost savings
- Legal mandates

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Top challenge: growth

Stanford today:

- 8,180 acres (3,310 hectares)
- 7 schools
- 17,000+ students
- 2,400+ faculty
- 8,700+ staff
- 12.5 million square feet (1,161,288 square meters)

Growth trend: up

- Population
- Energy-intensive buildings

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Dimensions of growth

Need to build:

- 2 million academic square feet (185,806 square meters)
- Housing for 2,400 people



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Sustainable building principles

- Don't build unless you have to
- Build well
- Conserve what you have



Jasper Preserve

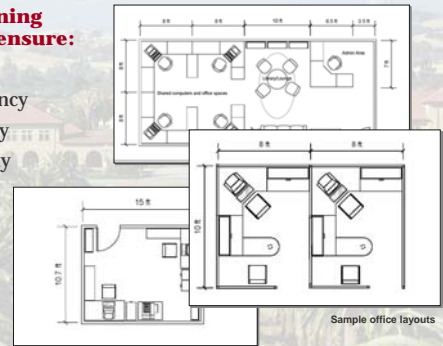
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Rigorous capital planning

Space planning guidelines ensure:

- Equity
- Consistency
- Efficiency
- Flexibility



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High-performance buildings

Stanford's Guidelines for Sustainable Buildings covers:

- Site design and planning
- Energy use
- Water management
- Materials, resources, and waste
- Indoor air quality



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Environment + Energy Building

Features include:

- Natural light and ventilation
- Heat recovery system
- Photovoltaic solar panels



Expected benefit:

- 44% lower total energy costs

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The Green Dorm

Goals include:

- Zero carbon emissions
- Latest technology
- Living laboratory



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Sustainability in Existing Buildings

Target: high-energy-use buildings

- \$15 million investment
- \$4.2 million per year savings (cost recovery in less than 4 years)
- 28 percent reduction in energy use



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Energy Retrofit Program

- **Expense:** \$8 million over 10 years
- **Energy savings:** 158 million kilowatt-hours
- **Payback period:** 5 years or less

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The Keck Building

- Benefits:**
- 48% reduction in chilled water
 - 18% reduction in electricity
 - 33% reduction in steam



Savings: about \$270,000 per year

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A double challenge: Conserve energy + reduce greenhouse gases



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Cardinal Cogen power plant

- Benefits:**
- Highly efficient
 - Relatively clean

- Downsides:**
- Nonrenewable fossil fuel
 - Emits greenhouse gases



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Energy Conservation Incentive Program

Cash for kilowatt hours =

- 3% reduction in budgeted electricity use
- \$718,000 more for program activities

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University GHG emissions

Greenhouse gas inventory is under way

- Preliminary assessment: 239,220 metric tons in 2005
- Final figures due August 2007
- Next steps: develop reduction targets and strategies

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What's next?

Producing renewable energy on campus?

Carbon offset projects?

Solutions still in the lab or classroom?

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Sustainability Working Group

Big ideas

Policy and program recommendations

22 departments, schools, groups, and institutes

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Initiative on the Environment and Sustainability

Seek solutions through research

Educate and train environmental leaders

Move ideas into action by collaborating with decision makers

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