Sustainability Issues in Higher Education: Whole institution approach

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Two examples

• Specialized higher education program

• Campus wise sustainability activities
Graduate schools and Research Institutes involved in the Inter-Graduate School Unit for Sustainable Development and Survivable Societies

<table>
<thead>
<tr>
<th>Graduate School of Education</th>
<th>All departments (Department of Education, Department of Clinical Education)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate School of Economics</td>
<td>Department of Economics</td>
</tr>
<tr>
<td>Graduate School of Science</td>
<td>Division of Earth and Planetary Sciences</td>
</tr>
<tr>
<td>Graduate School of Medicine</td>
<td>Department of Medicine and Medical Science, School of Public Health</td>
</tr>
<tr>
<td>Graduate School of Engineering</td>
<td>Department of Civil and Earth Resources Engineering, Department of Urban Management, Department of Environmental Engineering, Department of Architecture and Architectural Engineering, Department of Mechanical Engineering and Science</td>
</tr>
<tr>
<td>Graduate School of Agriculture</td>
<td>All departments (Division of Agronomy and Agricultural Science, Division of Forest and Biomaterials Science, Division of Applied Biosciences, Division of Environmental Science and Technology, Division of Natural Resource Economics, Division of Food Science and Biotechnology)</td>
</tr>
<tr>
<td>Graduate School of Asian and African Area Studies</td>
<td>All departments (Division of Southeast Asian Area Studies, Division of African Area Studies, Division of Global Area Studies)</td>
</tr>
<tr>
<td>Graduate School of Informatics</td>
<td>Department of Social Informatics, Department of Communications and Computer Engineering</td>
</tr>
<tr>
<td>Graduate School of Global Environmental Studies</td>
<td>All departments (Doctorate Program in Global Environmental Studies, Doctorate Program in Environmental Management)</td>
</tr>
<tr>
<td>Disaster Prevention Research Institute</td>
<td></td>
</tr>
<tr>
<td>Research Institute for Sustainable Humanosphere</td>
<td></td>
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<tr>
<td>Center for Southeast Asian Studies</td>
<td></td>
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</tbody>
</table>

About the Program for Leading Graduate Schools

The Program for Leading Graduate Schools aims to prepare students for leadership roles in society, with a focus on sustainability. It offers a comprehensive curriculum that includes courses in environmental science, economics, engineering, and other related fields. The program is designed to foster interdisciplinary collaboration and equip students with the skills needed to address complex environmental challenges.

Contact

Kyoto University
Center for the Promotion of Interdisciplinary Education and Research
Inter-Graduate School Unit for Sustainable Development and Survivable Societies

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Tel.: 075-785-7100  http://www.gss.sals.kyoto-u.ac.jp/

2012 edition
"Leading Graduate School (Super Doctor) "
Educational Program in Global Survivability Studies

Program characteristics

In recent years, our global society has been experiencing a surge of large-scale natural disasters, sudden man-made disasters and accidents, growing regional environmental changes such as environmental degradation and infectious diseases, food security issues. To address these challenges, Kyoto University has launched a new multidisciplinary field called Global Survivability Studies (GSS), and develops global experts who can contribute to social safety and security.

Global Survivability Studies Program (GSS) 5-year Program

5-year Doctoral Program

- Academic research (graduate school)
- Course work
- Master thesis or Preliminary doctoral thesis: research & writing

Leading Graduate School

Global Survivability Studies Program (GSS)

Students are expected to understand the theoretical and methodological aspects of Global Survivability Studies, and to develop advanced research capabilities.

How to enroll in the Global Survivability Studies Program (GSS)?

Students who have graduated from a Japanese university (4-year undergraduate program), or who have an equivalent qualification, and who are enrolled in any of the graduate schools and departments involved in the Program can apply. Nationality, gender and age are not considered.

Understanding of... prevention and mitigation

Human adaptability (medical and mental)

Social adaptability (economy, public policy, etc.)
Key learning

• Needs regulatory reforms in the university [since different graduate school has its own criteria for degrees]

• Needs a strong incentives to the students and faculty members [to provide scholarship, research grant etc.]
Establishment of the Office for a Sustainable Campus

Until March 2013

Facilities Coordination Division
Environment, Safety and Health Division
Construction Division
Management Division
Maintenance Division of Yoshida Campus

From April 2013

Facilities Coordination Division
Environment, Safety and Health Division
Construction Division
Management Division
Property Management Division
Office for utilizing real estate
Assets Management Center
Maintenance Center of Yoshida Campus

Office for Planning
Office for Coordination
Assets Management Center
Office for a Sustainable Campus
**Background of this system**

- Energy consumption and CO₂ emission **increased by 93%** in 2006 in comparison with the level in 1990 because of the increase of graduate students and the upgrade of facilities and experimental devices.
- Carbon dioxide emission of Kyoto University is **the fourth largest place** in Kyoto-city.
- Cost of energy consumption of Kyoto university is **about 35 million US dollars per year**.
- Energy saving measures have been performed in just faculty departments only, therefore **an university-wide action plan and its implementation are needed**.

**April 2, 2007**  
We created **"Energy Saving Policy of Kyoto University"**

- Each faculty department should reduce energy and greenhouse gas per unit area by 1% a year.
- Each faculty department should submit a report regarding the result of the reduction, and the department has to explain the reasons officially if it wasn’t able to achieve 1% reduction.

**January 21, 2008**  
We created **"Tax System for Campus Sustainability of Kyoto University"**

**Tax System for Campus Sustainability**

**Tax in 2006**

<table>
<thead>
<tr>
<th>Faculty Department</th>
<th>Target for charging</th>
<th>Unit</th>
<th>Unit price (US Dollar)</th>
<th>Tax for unit price ($)</th>
<th>Annual usage (in 2006)</th>
<th>Total amount of Tax (US Dollar)</th>
<th>Tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>kwh</td>
<td>0.105</td>
<td>0.005</td>
<td>178,000,000</td>
<td>890,000</td>
<td>4.76%</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>m³</td>
<td>0.400</td>
<td>0.015</td>
<td>12,500,000</td>
<td>187,500</td>
<td>3.75%</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>m³</td>
<td>2.301</td>
<td>0.100</td>
<td>1,480,000</td>
<td>148,000</td>
<td>4.35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Subtotal</strong></td>
<td>1,225,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Subsidy from administrative bureau</strong></td>
<td>1,200,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td>2,425,500</td>
</tr>
</tbody>
</table>
Examples for energy-saving (at Yoshida Campus)

Renovation from Fire-tube packaged boiler to Once-through packaged boiler

- Reduction of primary energy: 15,951 GJ/year
- Reduction of CO₂: 801.2 t-CO₂/year
- Reduction of energy cost: 270,170 USD/year
- Rate of reduction: 20% down

Introduction of Photovoltaic power generation

- Reduction of primary energy: 65 GJ/year
- Reduction of CO₂: 1.8 t-CO₂/year
- Reduction of energy cost: 970 USD/year

Introduction of Inverter of pump

- Reduction of primary energy: 466 GJ/year
- Reduction of CO₂: 134 t-CO₂/year
- Reduction of energy cost: 6,970 USD/year
- Rate of reduction: 54% down
Flowchart of Tax System for Campus Sustainability

- **Flow of Money**
  - Administrative bureau ¥H
  - Dept. 1 ¥A
  - Dept. 2 ¥B
  - Dept. 3 ¥C
  - Taxing a charge: 4-5% of energy consumption
  - Flow of Money

- **Flow of Service**
  - Facilities Department of administrative bureau
  - Consultants
  - Investigation, commissioning

- **Distribution to department**
  - From Tax
    - Dept. 1 A
    - Dept. 2 B
    - Dept. 3 C
  - From bureau
    - Dept. 1 H × α
    - Dept. 2 H × β
    - Dept. 3 H × γ

- **Different funds**
  - Dept. 1 Energy saving construction
  - Dept. 2 Energy saving construction
  - Dept. 3 Energy saving construction

- **Results**
  - Inspection, Publication

- **Energy saving constructions**
  - Facilities
  - Experimental devices
  - Environmental friendly action

**Different funds**

- Dept. 1 α
- Dept. 2 β
- Dept. 3 γ

**Facilities Department of administrative bureau**

**Flowchart of Tax System for Campus Sustainability**

**Kyoto University**

Environmental Education Laboratory
Graduate School of Global Environmental Studies
Key activities

• **Governance** issues
  – Eco-code Sustainable Handbook
    • Messages from President and City Mayor
    • List of active student organizations focused on sustainability
  – Promote eco-appliances and tax return system
  – Campus sustainability guidebook [by AY 2014]

• **Education** issues
  – Sustainability literacy test
  – Environmental education course for any undergraduate students

• **Awareness** issues
  – Sustainability week [June 24 - 30 2013], Sustainability month [June 2014]
  – Student project competition and fund innovative ideas
Although each organization makes characteristic efforts on campus sustainability, cross-cutting view-exchanges including assessment method are not active.

It is imperative to establish an organization such as AASHE and EAUC in Japan!!
CAS-Net JAPAN
( Campus Sustainability Network in Japan)

Themes
• Administration and planning
• Facilities and operation
• Change management
• Engaging students
• Collaboration and partnership

• Assessment
• Awarding system
• International network
• SLT

Linking Governance Education and Technology