Sustainability Issues in Higher Education: Whole institution approach

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Two examples

• Specialized higher education program

• Campus wise sustainability activities
9 graduate schools, 3 research institutions

Graduate schools and Research Institutes involved in the Inter-Graduate School Unit for Sustainable Development and Survivable Societies

| Graduate School of Education | All departments (Department of Education, Department of Clinical Education) |
| Graduate School of Economics | Department of Economics |
| Graduate School of Science | Division of Earth and Planetary Sciences |
| Graduate School of Medicine | Department of Medicine and Medical Science, School of Public Health |
| Graduate School of Engineering | 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 |
| Graduate School of Agriculture | All departments (Division of Agronomy and Horticultural Science, Division of Forest and Biomaterials Science, Division of Applied Life Sciences, Division of Applied Biosciences, Division of Environmental Science and Technology, Division of Natural Resource Economics, Division of Food Science and Biotechnology) |
| Graduate School of Asian and African Area Studies | All departments (Division of Southeast Asian Area Studies, Division of African Area Studies, Division of Global Area Studies) |
| Graduate School of Informatics | Department of Social Informatics, Department of Communications and Computer Engineering |
| Graduate School of Global Environmental Studies | All departments (Doctorate Program in Global Environmental Studies, Doctorate Program in Environmental Management) |
| Disaster Prevention Research Institute | |
| Research Institute for Sustainable Humanosphere | |
| Center for Southeast Asian Studies | |

About the Program for Leading Graduate Schools

The Program for Leading Graduate Schools aims at mentoring talented students into future leaders, armed with a broad view and creative thinking, active globally in industry, academia and government. In order to do so, the Program for Leading Graduate Schools mobilizes high-level educators and students and the participation of industry, academia and government, supports a radical reform of graduate education that develops interdisciplinary world-class 5-year graduate programs, and promotes the development of graduate schools fulfilling their status of highest educational institution.

(From the application guidelines for the Program for Leading Graduate Schools, 2011)

Contact

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"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. In this program, 9 graduate schools and 3 research institutes from Kyoto University join forces to develop a new multidisciplinary field called Global Survivability Studies (GSS), and develop global experts who can contribute to social safety and security.

Scope of Global Survivability Studies in the field of

Understanding of

Prevention and

Human adaptability

Social adaptability (medical and mental)

Self-sufficiency, population issues, agriculture policy, etc.

Global Survivability Studies Program (GSS) 5-year

5-year Doctoral Program

Course work

Master thesis or Preliminary doctoral thesis: research & writing

General seminar

Leading Graduate School

Global Survivability Studies Program (GSS)

Students are expected to understand the objectives and content of Global Survivability Studies, and their abilities and fit to the Program are evaluated.

Students selected from participating graduate schools

Qualification (Selection)

Qualifying Examination

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...
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

**Facilities Department**

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

**Office for Planning**

- Construction Division
- Management Division
- Property Management Division

**Office for Coordination**

- Environment, Safety and Health Division

**Office for a Sustainable Campus**

- Office for utilizing real estate
- Assets Management Center
- Maintenance Center of Yoshida Campus

Until March 2013

From April 2013
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”

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.

<table>
<thead>
<tr>
<th>Tax System for Campus Sustainability</th>
<th>Tax in 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faculty Department</strong></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
</tr>
<tr>
<td>kwh</td>
<td>0.105</td>
</tr>
<tr>
<td>Gas</td>
<td>0.400</td>
</tr>
<tr>
<td>m³</td>
<td>2.301</td>
</tr>
<tr>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>m³</td>
<td></td>
</tr>
<tr>
<td><strong>Unit price (US Dollar)</strong></td>
<td>0.005</td>
</tr>
<tr>
<td><strong>Tax for unit price ($)</strong></td>
<td>0.015</td>
</tr>
<tr>
<td><strong>Annual usage (in 2006)</strong></td>
<td>178,000,000</td>
</tr>
<tr>
<td><strong>Total amount of Tax (US Dollar)</strong></td>
<td>890,000</td>
</tr>
<tr>
<td><strong>Tax rate</strong></td>
<td>4.76%</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>1,225,500</td>
</tr>
<tr>
<td><strong>Subsidy from administrative bureau</strong></td>
<td>1,200,000</td>
</tr>
<tr>
<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

- **Taxing a charge**: 4-5% of energy consumption

- **Flow of Money**
  - Administrative bureau ¥ H
  - Dept. 1 ¥ A
  - Dept. 2 ¥ B
  - Dept. 3 ¥ C

- **Flow of Service**

- **From Tax**
  - Dept. 1 A
  - Dept. 2 B
  - Dept. 3 C

- **From bureau**
  - Dept. 1 H \( \times \alpha \)
  - Dept. 2 H \( \times \beta \)
  - Dept. 3 H \( \times \gamma \)

- **Different fund**
  - Dept. 1
  - Dept. 2
  - Dept. 3

- **Energy saving constructions**
  - Dept. 1 Energy saving construction
  - Dept. 2 Energy saving construction
  - Dept. 3 Energy saving construction

- **Results Inspection, Publication**

- **Facilities Department of administrative bureau**

- **Flowchart**

- **Facilities**
  - Experimental devices

- **Experimental devices**

- **Environmental friendly action**

- **Consultants**

- **Investigation, commissioning**

- **Implementation of energy saving constructions**

- **Financial funds**

- **Distribution to department**

- **Project choice, Investigation support**

- **Different funds**
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