Sustainability Issues in Higher Education: Whole institution approach

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Two examples

• Specialized higher education program

• Campus wise sustainability activities
"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.

Global Survivability Studies Program (GSS) 5-year Program

- 5-year Doctoral Program
  - Academic research (graduate school)
  - Course work
  - General seminar
    - Students selected from participating graduate schools
    - GSS classes
    - Field training
    - Internship
    - Interdisciplinary seminar
    - International school
    - Industry/university cooperation project (0,1)
    - International collaboration project

- L1
- L2
- L3

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

Office for Planning
- Office for Coordination
- Assets Management Center

From April 2013

Facilities Department
- Facilities Coordination Division
- Environment, Safety and Health Division
- Construction Division
- Management Division
- Property Management Division

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

<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>
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</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>Subtotal</td>
<td></td>
<td></td>
<td>1,225,500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subsidy from administrative bureau</td>
<td>1,200,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>2,425,500</td>
<td></td>
<td></td>
<td></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

(1 US dollar = 100 yen)
Flowchart of Tax System for Campus Sustainability

- 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

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

From bureau
- Dept. 1 H × a
- Dept. 2 H × b
- Dept. 3 H × c

Different fund
- Dept. 1 α
- Dept. 2 β
- Dept. 3 γ

Energy saving constructions

Results Inspection, Publication

Facilities
Experimental devices
Environmental friendly action

Project choice, Investigation support

Investigation, commissioning

Consultants

Different funds

Energy saving constructions

Flowchart details:

- Facilities Department of administrative bureau
- Experimental devices
- Environmental friendly action
- Results Inspection, Publication
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