

# การเปรียบเทียบนโยบายสำหรับการสร้างมหาวิทยาลัยสีเขียวยั่งยืนในประเทศไทย

## Policies comparison for establishing sustainable green university in Thailand

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### บทคัดย่อ

การพัฒนาแบบยั่งยืนเป็นรูปแบบของการพัฒนาที่สนองความต้องการของคนในรุ่นปัจจุบันโดยไม่ทำให้คนรุ่นต่อไปในอนาคต ต้องประนีประนอมยอมลดทอนความสามารถในการที่จะตอบสนองความต้องการของตนเอง เพื่ออนุรักษ์โลกแห่งธรรมชาติ เศรษฐกิจ ปัจจัยสังคมและสิ่งแวดล้อมต้องถูกพิจารณาด้วยความร่วมมือกันและกลมกลืนกัน กฎข้อนี้จะถูกกล่าวถึงในขอบเขตของการศึกษาชั้นสูงเพราะว่านิสิตระดับนี้อยู่ในขั้นกำลังเตรียมตัวเพื่อเข้าไปในตลาดแรงงาน และแสดงทักษะออกมาเพื่อสนับสนุนเศรษฐกิจสีเขียวและเปรียบเสมือนเป็นผู้เชื่อมต่อความคิดทั้งหลาย มหาวิทยาลัยสีเขียวหมายถึงมหาวิทยาลัยที่ปฏิบัติเป็นมิตรต่อสิ่งแวดล้อมและส่งผลประโยชน์ต่อทรัพยากรธรรมชาติ มหาวิทยาลัยเริ่มลงมือดำเนินการโดยจุดโฟกัสอยู่ที่การแข่งขันความยั่งยืนเสมือนว่าเพื่อให้เป็นทิศทางที่ดีในการยกระดับสถานะมหาวิทยาลัย มหาวิทยาลัยไทยและมหาวิทยาลัยในประเทศในภูมิภาคอาเซียนได้เข้าร่วม UI Green Metric Ranking of World Universities เพิ่มมากขึ้น ตั้งแต่ปี ค.ศ ๒๐๑๐ เนื่องจากการจัดอันดับนี้ มหาวิทยาลัยต้องการอย่างมากซึ่งการเอาใจใส่ในด้านข้อผูกมัดและความพยายามของพวกเขา บทความนี้กล่าวถึงความกระตือรือร้นของมหาวิทยาลัยมหาสารคาม มหาวิทยาลัยบูรพา มหาวิทยาลัยเกษตรศาสตร์และ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรีในการเข้าร่วมการเปรียบเทียบการโต้ตอบและการระบุปัญหาด้านสิ่งแวดล้อมนี้ซึ่งเป็นจุดเริ่มต้นทางบวก ระหว่างมหาวิทยาลัยทั้งสี่แห่งนี้ มหาวิทยาลัยเกษตรศาสตร์และมหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรีเป็นมหาวิทยาลัยที่ปฏิบัติด้านมหาวิทยาลัยสีเขียวดีที่สุดในรูปของนโยบายและการประยุกต์ ใช้ในประเทศไทย เพื่อเป็นตัวอย่างในการสร้างสิ่งแวดล้อมสีเขียวสำหรับการศึกษาชั้นสูง

**คำสำคัญ:** มหาวิทยาลัยสีเขียว, ความยั่งยืนของสิ่งแวดล้อม, UI Green Metric Ranking of World Universities, การพัฒนาแบบยั่งยืน

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## Abstract

Sustainable Development is an ability to ensure that development meets the needs of the present without compromising the ability of future generations to meet their own needs. In order to preserve the natural world, economic, social and environmental factors must be cooperatively considered and harmonized. This role is pronounced in the realm of higher education (HE) because in this level students are being prepared to enter the labor market and emerge with skills to support green economies and as messengers of ideas. Green University refers to the universities whose practices are environmentally friendly and benefit our natural resources. Universities have been launched focuses on the competition in sustainability seems to be a good direction to promote the universities' status. Thai universities and ASEAN countries' universities have increasingly joined the UI Green Metric Ranking of World Universities since 2010. Responding to this ranking, universities strongly require devoting their commitments and efforts. This paper discussed the eagerness of Mahasarakham University, Burapha University, Kasetsart University and King Mongkut's University of Technology Thonburi in participating in this comparison debate and identifying environmental issues which is a positive starting point. Among of these 4 universities, KU and KMUTT are the best green university practice in terms of policies and implementations in Thailand, to be the example of building green environment for higher supporting education.

**Keywords:** Green university, environmental sustainability, UI Green Metric Ranking of World Universities, sustainable development

## Introduction

Sustainable Development is the ability to ensure that development meets the needs of the present without compromising the ability of future generations to meet their own needs<sup>1,2</sup>. In order to preserve the natural world, economic, social and environmental factors must be jointly considered and harmonized. Formal and informal learning have a pivotal function through raising awareness and influencing behavior, if sustainable development is to be achieved. This role is especially pronounced in the realm of higher education (HE) because at this level students are being prepared to enter the labor market and emerge with skills to support green economies and as messengers of ideas<sup>3</sup>. The declarations on sustainability in higher education were merged in the

1990s<sup>4</sup>. On the UN Conference on Sustainable Development in 2012 (Rio+20), the leaders of the international academic community are called upon to commit to the development of sustainable practices for Higher Education Institutions. Green campuses/green university is one of Rio+20's actions which focuses on reducing the environmental footprint through energy, water and material resource efficiencies in the buildings and facilities, adopting sustainable procurement practices in our supply chains and catering services, providing sustainable mobility options for students and faculty, adopting effective programs for waste minimization, recycling and reuse, and encouraging more sustainable lifestyles<sup>5</sup>. Green University refers to the universities whose practices are environmentally friendly and benefit our natural resources. Creating greener

universities requires that measures should be taken for energy efficiency, air-quality, water and resource management, toxic-free materials, waste recycling and many other areas<sup>6,7</sup>. In the United States, a "green university ranking" has been partly introduced in order to raise the visibility of what universities can do to improve their eco-sustainability. This ranking also creates a healthy kind of competition between campuses<sup>6</sup>. UI Green Metric Ranking of World University has been launched since 2010 which focuses on five main indicators: setting and infrastructure, energy and climate change, waste water and transportation. According to UI Green Metric Ranking of World University 2011, six Thai universities were ranked. Kasetsart University was awarded the first green university in Thailand while Mahasarakham University ranked fourth<sup>8</sup>. The competition in sustainability seems to be a good way to promote the universities' status. The eagerness of universities to participate in these debates and to identify environmental issues is a very positive starting point<sup>6</sup>. This study discussed MSU, BUU, KU and KMUTT's commitments on sustainability in order to get the best green university practices in the various functions of the university's institutions.

### Materials and Methods

Four Thai universities; namely, Kasetsart University, King Mongkut's University of Technology Thonburi, Burapha university and Mahasarakham University were selected as the research sites. Research Tools: benchmarking indicators, websites of all universities, field observation and in-depth interview were applied for data collection from each university. In-depth interview were conducted with policy maker and policy implementation in each university. Totally, 16 people

from four universities were interviewed with constructed questionnaires. Four responders were selected from different divisions and parts of each university which including the president / representative of the president of university, head/representative of planning division, head/representative of personnel division, and head/representative of student organization. The collected data as the qualitative information and data including interviews, parts of websites studies and field observation were analyzed by qualitative methods. Benchmarking indicator was designed based on the UI Green Metric World University ranking. This benchmarking assisted in universities' policies comparison.

### Findings

Sustainability is playing a role as an integral part of university life. A global trend among universities showed that universities have revised their mission and restructuring their courses, research programs and operations on campus to include sustainability in university' perspectives. Sustainability added both an overcrowded curriculum and a gateway to a different view of curriculum, of pedagogy, of organizational change, of policy and particularly of ethos. Thai universities and universities of ASEAN's countries have increasingly joined UI Green Metric of World Universities since it was firstly established in 2010. Thai and ASEAN's countries' universities have increasingly joined this ranking respectively, from 2 and 28 universities in 2010 went up to 7 and 38 universities in 2012. MSU, BUU, KU and KMUTT have so far intended to become environmentally friendly university; therefore, their strategic development plan has been changed and adapted. Green University has been applied both direct and

indirect measure into each university's strategic development plan. These four universities established and authorized institution/division to take responsibility for green university mainly.

Table1: Responsible organization for sustaining green university profile.

University	Responsible organization
MSU	Division of Buildings and Grounds (DBG)
BUU	Division of Buildings and Grounds (DBG)
KU	Vehicle Building and Physical Plant Division (VBPPD)
KMUTT	Energy, Environment, Safety, Healthy division (EESH)

### University's Policies and Commitments on Green University

More attention has been given for combating global climate change, energy and water conservation, waste recycling, and green transportation. Such activities required change of behavior and providing more attention to sustainability of the environment, as well as economic and social problems related to the sustainability. The UI Green Metric ranking which covered on five main indicators which were setting and infrastructure, energy and climate change, waste, water, and transportation offered benefits university leaders put in place eco-friendly policies and manage behavioral change among the academic community at their respective institutions. MSU, BUU, KU and KMUTT committed in terms of policies and programs implementations to meet the competitive criteria and indicators of the ranking.

### Setting and Infrastructure

The campus setting and infrastructure information gives the basic information about the university's

consideration towards green environment. This indicator also showed whether the campus deserved to be called a Green Campus. Green Infrastructure was one of a key element in KMUTT Strategic Sustainability plan that focused on facilities and education and an important role as supporting system and built environment to make campuses keep on going to sustainability. All four Thai universities strongly committed to endure campus setting and green infrastructure. Responding to the eagerness of being green infrastructure, policies/guideline and program have been established and implemented. However, MSU and BUU have not created green website and green statistics which played important role in promoting green infrastructure.

Table 2: Green infrastructure's policy/guideline and program of Thai universities

Green infrastructure's policy/guideline and program	Universities			
	MSU	BUU	KU	KMUTT
Green university Policy	X	X	X	X
Energy & Environment Curriculum/course	X	X	X	X
Energy & Environment Research/Innovation	X	X	X	X
Energy & Environment student club	X	X	X	X
Green website	-	-	X	X
Green Statistics	-	-	X	X
Green Building Policy	X	X	X	X
Green Space set up	X	X	X	X

### Energy and Climate Change

Kasetsart University, King Mongkut's University Technology of Thonburi, Mahasarakham University and Burapha University have taken actions responding to energy and climate change by applying

energy policies/programs and implementation and commitments in the purposes of sustaining green university.

Figure 1: Energy management of Thai Universities



Their setting and implementing of energy policies were not only a good direction to promote the universities' status, but they also pushed universities to meet Thailand and international environmental laws/regulations.

Table 3: Energy policies of Thai universities

Energy policies	MSU	BUU	KU	KMUTT
Energy efficient appliance usage policy	x	x	x	x
Renewable energy usage policy	x	x	x	x
Physically and biologically improve the infrastructure of the university policy	x	x	x	x
Reduce energy consumption and promoting the use of renewable energy within the university policy	x	x	x	x
Green building policy	x	x	x	x

**Climate change**

Climate change is a global challenge with serious consequences for our social and economic

infrastructure as well as the natural environment. Several indicators for this particular concern issue are addressed by MSU, BUU, KU and KMUTT, i.e., green buildings, climate change adaptation and mitigation program, greenhouse gas emission reductions policy.

Figure 2: Climate Change adaptation and mitigation of Thai universities



With these indicators, universities were committed to increase the efforts on climate change indicator.

Table 4: Climate change policies and programs of Thai universities

Climate Policies and programs	MSU	BUU	KU	KMUTT
Greenhouse gas emission reduction policy	x	x	x	x
Green area expansion and forest planting	x	x	x	x
Green building policy	x	x	x	x
Renewable energy usage policy	x	x	x	x
Climate change adaptation and mitigation program	x	x	x	x
Global warming reduction program	-	-	-	x

### Environmental sustainability

Thai universities, MSU, BUU, KU and KMUTT, have committed to environmental sustainability by setting up environmental policies and environmental implementations and daily practices. However, the commitments of university's environmental sustainability were concentrated on different indicators. This caused from location context, socio-economic, natural and environmental resource, size and number of student, budget and research investment, and other conditions involved with.

Table 5: Thai universities' commitments on environmental sustainability

Commitments for environmental sustainability	MSU	BUU	KU	KMUTT
Environmental leadership in all of the activities from operations, teaching, to conducting research	x	x	x	x
To be the leader of environmentally friendly goods and services usage	x	-	-	-
Be a Green University providing a role model on Energy, Environment, Safety Management Systems, promoting the application of all these activities within the university	x	-	x	x
Set up Sustainability Office and adopted Multiyear-Strategic Sustainable plan	x	x	x	x
Set up environmental policies: Green Infrastructure, Energy and Climate change, Waste, Water, Transportation and Learning & Building Constituencies	x	x	x	x

Commitments for environmental sustainability	MSU	BUU	KU	KMUTT
Increase the life quality for student, staff, society, and the nation by focusing on manage four environmental dimensions (resource, technology, pollution, and human society)	x	x	x	x
Improve and develop of continually environmental management, concordance and to comply with community development surrounding.	x	-	x	x
Reserve green area and open space	x	x	x	x
Improve landscape and environment for encouraging students and staffs live with happiness inside university	x	x	x	x
Support and strengthen education and research in environmental subjects.	-	-	x	-
Support and promote the collaborative development of academic, management, and technology innovation in terms of environment subject for both national and international organizations.	-	-	x	-

### Waste management

Waste treatment and recycling activities are major factors in creating a sustainable environment in higher education. The activities of university's staffs and students in the campus generate a lot of waste. Therefore, programs and

waste treatments have been upraised in MSU, BUU, KU and KMUTT as the concern issue in which universities are facing and need to solve with it. 3Rs (reduce, reuse and recycle) concept and implementation have been applied and dispersed to each university's staffs and students for promoting willingness of people participation to waste management in the university. Proper waste management system within universities in Thailand not only promoted those universities to meet green university policy, but it also offered socio-economic values and university resources. According to this, KMUTT has shaped waste policies such as KMUTT Safety policy, KMUTT Waste management policy and set a goal to reduce 40-50% of waste volume by 2016.

Figure 3: Waste management of Thai Universities



Waste recovery was another important tool in waste management because it could reduce much amount of waste and could be economic outcome. Three universities of selected universities have waste recovery program such as food waste utilization to energy (biogas) and waste utilization to make fertilizer from vegetable and food waste.

Table 6: showed commitments of universities to waste management (waste policies and programs)

Waste management (policies and programs)	MSU	BUU	KU	KMUTT
Recycling program for university waste	x	x	x	x
Food waste utilization to energy (biogas)	x	-	x	x
Waste utilization to make fertilizer from vegetable and food waste	x	-	x	x
Toxic waste recycling	x	x	x	x
Municipal solid waste reuse/recycle	x	x	x	x
Hazardous waste reuse/recycle	x	x	x	x
Waste reductions policy	x	x	x	x
No Foam-food packaging Policy	-	-	-	x
Reducing the use of paper and plastic in campus (Two side- Paper Usage policy)	x	x	x	x
Organic waste treatment (garbage, discarded vegetable and plant matter)	x	-	x	x
Inorganic waste treatment (rubbish, trash, discarded paper, plastic, metal etc)	x	-	x	x
Sewerage treatment before disposal and reuse (primary method of treatment of sewerage)	x	-	x	x

**Water management**

Water use in campus is another important indicator in UI Green Metric Ranking of World Universities. This

indicator is used to measure how universities decrease water usage, increase conservation program, and protect the habitat.

Figure 4: Water management of Thai universities



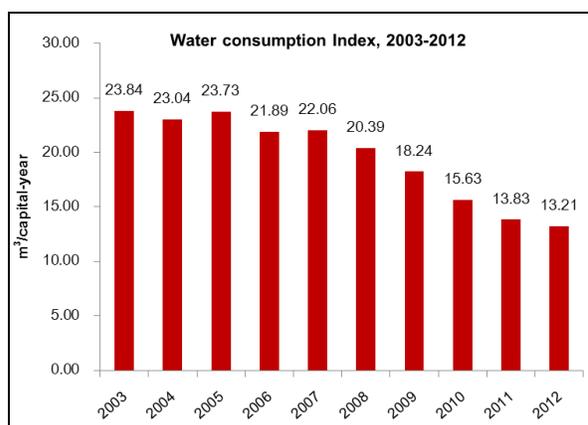
All four universities have set up necessary measures of water management such as water conservation policy, water conservation program and pipe water usage reduction program. Water management was an important step toward sustainability and environmental health in college and university level.

Table 7: Water management tools in Thai universities

Water management	MSU	BUU	KU	KMUTT
Water Conservation Policy	x	x	x	x
Water Conservation program	x	x	x	x
Pipe water usage reduction	x	x	x	x
Rain water / Natural Water Resource usage	x	-	x	x
Implementing water recycling program in new buildings	-	-	-	x
Water reservoir usage program	x	x	x	x
Water recycle and wastewater treatment reuse program	x	-	x	x
Promoting water resources use, water management and support	x	x	x	x

KMUTT has been established Water Conservation policy and Water Conservation program since 2005 with aiming to achieve best practice rain water and natural water resource management and prevention of pollution to waterways within campuses. KMUTT set the goals to reduce 45% of pipe water usage by 2017, to increase 20% of rain water/natural water resources usage in university by 2017 and to implement 50% of water recycling program in new buildings.

Figure 5: KMUTT water consumption usage from 2003-2012



Source: <http://sustainable.kmutt.ac.th/sustainability-at-kmutt/water/>

### Transportation

Transportation is another important indicator of UI Green Metric Ranking of World Universities since the transportation system plays an important role on the carbon emission and pollutant levels in university. Green transportation management has been applied in the universities. Bicycle and pedestrian policy, walk and bike society policy and clean energy usage policy have already been implied and partly implemented in each university.

Figure 6: Transportation management of Thai universities



On the other hand, BUU and KMUTT have not consumed transportation policy designed to limit/decrease the parking area on campus yet while MSU and KU have implemented with some problems existing such as rapid motor vehicles increasing, student number and residential areas and people participation etc.

Table 8: Transportation policies in Thai universities

Transportation policies	MSU	BUU	KU	KMUTT
Transportation policy designed to limit the number of motor vehicles used on campus	x	-	x	x
Transportation policy designed to limit or decrease the parking area on campus	x	-	x	-
Campus buses	x	x	x	x
Bicycle and pedestrian policy on campus	x	x	x	x
Clean Energy usage policy	x	x	x	x
Walk & Bike society policy	x	x	x	x

## Discussion and Conclusion

Maharakham University, Burapha University, Kasetsart University and King Mongkut's University of Technology Thonburi have strongly devoted their commitments and efforts for sustaining green university status. The eagerness of the universities in participating in green university was a positive starting point since it provided pattern route and be example of building green environment in higher education realm for other Thai universities and ASEAN's countries' universities following to be green university. University's policies/guidelines and program implementation and their commitments were integral of sustaining green university profile in Thailand because they were university's tools used to promote green university development.

The university's policies/guidelines and program implementations pushed all university's stakeholders knowing their responsibilities and roles and implementing them. They were not only used as command and control measure to ensure that activities programs were appropriately with university's commitments, but also used as incentive measure to promote willingness of participation from staffs and students, who are policy users and provide feedback to university's policy/guideline maker level. Well cooperation of all organization involved such as university's policy/guide decision makers and policy/guideline users (students and staffs) was clearly vital factor effecting on building green university development in Thai universities. Establishing

committees and particular organization for green university development to review and improve goal and plan of university were needed. They played important role in collecting, correcting, storing and analyzing data and activities related to green university.

In middle of five main criteria of UI Green Metric Ranking of World University, energy and climate change criteria was strongly paid attention by these universities. Energy and climate change indicator was the highest weight in UI Green Metric, climate change is global issue which all higher educational institutions have to take involvement to deal with, and energy usage reduction and renewable energy usage could reduce the impacts of climate change and global warming on human being were examples of why these four universities strongly committed on energy and climate change than other indicators of UI Green Metric Ranking of World Universities.

Between of these four universities, KU and KMUTT were the best green university practice in terms of policies and implementations in Thailand. These two Thai universities have set the clearly policies and action plans on each indicator of UI Green Metric. The universities have also implemented projects, programs and activities in order to promote and improve their conditions to comply with green university criteria. KU and KMUTT have fully supported researches and other innovations related to green university.

The four universities have already done so far for sustaining well green university profile in terms policies/guideline and program implementations;

however, these policies/guidelines and other programs have been activated with some problems such as inefficiency and deceitfulness in the process of budget/fund allocation, disagreement and lack of technician/experts in the area of each criteria of green university ranking, lack of data/ information for policy decision making of green university criteria, the complexity of policy implementation process, physical structure of buildings and lack of common sense/willingness to participation and inefficiency of communication measure in which universities should consider and intervene to diminish these green universities barriers.

Being and sustaining green university ranked by UI Green Metric Ranking of World Universities, guidelines and indicators and route patten are considered such as setting commitment to green university; adapting green university in strategic development plan; setting up responsible organization and committee group of green university; supporting from university in term of fund/budget allocation, knowledge transferring and trainings, materials, technology and skill, research innovation and other supports on green university; doing campaign, activities and project programs to build awareness and knowledge in attention to have good cooperation and full participation in green university sustaining; and establishing and implementing policies/guidelines and programs to comply with UI Green Metric Ranking of World Universities' criteria and indicators by mainly focusing on campus setting and infrastructure, energy and climate change, environmental sustainability, waste management, water management and transportation management.

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