GUIDELINES of UI GREENMETRIC

WORLD UNIVERSITY RANKING

2014

ABOUT GREENMETRIC

UI's GreenMetric University Sustainability Ranking (GreenMetric) is a world university ranking for universities to assess and compare campus sustainability efforts. It was launched by Universitas Indonesia in 2010 and is now preparing to launch its fifth year of rankings.

1. Users and stakeholders

It is intended as an entry-level means of assessment for higher education institutions (HEIs) around the globe.

It should also be of interest to governments, international and local environmental agencies, and society.

2. Objectives

The ranking has a number of primary objectives:

- it is open to global participation;

- it is accessible to HEIs in both the developed and developing world;

- it should contribute to academic discourse on sustainability in education and the greening of campuses;

- it should encourage university-led social change with regard to sustainability goals.

3. Benefits of participation

Universities which participate in GreenMetric by submitting their data to be included in the ranking can expect to enjoy a number of benefits:

a. Internationalization and recognition

Participation in GreenMetric can help the university's efforts at internationalization and recognition by getting its sustainability efforts on the map. Participation in GreenMetric is accompanied by increased hits to the university website, more mentions of the institution connected with the issue of sustainability on web pages, and an increase in correspondence with institutions which are interested in your organization.

b. Awareness raising of sustainability issues

Participation can help to raise awareness in the university and beyond about the importance of sustainability issues. The world faces unprecedented civilizational challenges such as population trends, global warming, overexploitation of natural resources, oil-dependent energy, water and food shortages and sustainability. We realize that higher education has a crucial role to play in addressing these challenges. GreenMetric leverages the crucial role that HEIs can play in raising awareness by helping assess and compare efforts at education for sustainable development, sustainability research, campus greening, and social outreach.

c. Social change and action

GreenMetric is primarily about awareness raising, but in future it will be adapted to encourage real change. Understanding needs to shift to action if we are to address emerging global challenges.

4. Influences on the setup of GreenMetric

The decision to establish GreenMetric was influenced by a number of factors:

a. *Idealism*

Future challenges to civilization include population pressure, climate change, energy security, environmental degradation, water and food security and sustainable development. Despite much

scientific research and public discussion, governments around the world have yet to commit to a sustainable agenda. Concerned people at Universitas Indonesia see that universities have a privileged position to help develop a consensus on key areas for action. This includes such concepts as the Triple Bottom Line, the 3 Es: Equity, Economy, Environment, Green Building, and Education for Sustainable Development (ESD).

b. *Existing models*

GreenMetric was not based on any one existing ranking system. It was however developed with awareness of a number of existing sustainability assessment systems and academic university rankings. Sustainability systems that were referred to during the design phase of GreenMetric included: The Holcim Sustainability Awards, GREENSHIP (the rating system recently developed by the Green Building Council of Indonesia which itself was based on the Leadership in Energy and Environmental Design (LEED) system used in the U.S. and elsewhere), The Sustainability, Tracking, Assessment and Rating System (STARS) and The College Sustainability Report Card (also known as the Green Report Card).

Meanwhile, university academic ranking systems that were studied during the design phase of GreenMetric included: the *Times Higher Education World University Rankings*(THE) sponsored by Thompson Reuters, the *QS World University Rankings*, the *Academic Ranking of World Universities* (ARWU) published by Shanghai Jiao Tong University (SJTU), and the *Webometrics Ranking of World Universities* (Webometrics), published by Cybermetrics Lab, CINDOC-CSIC in Spain. UI has been one of the member of International Ranking Expert Group (IREG) Observatory since 2011.

c. *Realities and challenges*

The goal of creating a world university sustainability ranking was done with an understanding that the diversity of types of universities, their missions and their contexts would pose problems for the methodology. In particular, we were aware that universities differ with regard to levels of awareness and commitment to sustainability, to their budgets, the amount of green cover on their campuses and many other dimensions. These issues are complex but GreenMetric is committed to continually improving the ranking so that it will be both useful and fair to all.

d. *Expert advisory*

During the early stages of the design of GreenMetric we sought assistance on the issues from experts in both ranking and in sustainability. These included the holding of a conference on university ranking and video conferences and expert meetings on sustainability and green building. The latest workshop on UI GreenMetric was held on November 21st 2014, in which rectors and representatives from the following universities share their experiences, i.e University of Nottingham, Università Ca' Foscari Venezia, University of Melbourne, Mahidol University, Universitat fur Bodenkultur Wien, Universidad Autónoma de Nuevo Leon, Kasetsart University, King Mongkut's University of Technology Thonburi, Da Yeh University, Universiti Teknologi Malaysia.

5. The Ranking Team

GreenMetric is presently run by a small team reporting directly to the University's Rector. The team members have a variety of backgrounds but are all committed to making GreenMetric fit for purpose. The working team are assisted by a number of experts at the university. These include experts in ecology, sustainability, anthropology, engineering, architecture and urban design, statistics and so on.

6. Methodology

a. The philosophy behind the rankings

We based our instrument on a broad philosophy that encompasses the three E's: Environment, Economics, Equity and Education.

b. The criteria

We selected criteria that are generally thought to be of importance by universities concerned with sustainability. These include the collection of a basic profile of the size of the university and its zoning profile, whether urban, suburban, rural. Beyond this we want to see the degree of green space. The next category of information concerns electricity consumption because of its link to our carbon footprint. Then we want to know about transport, water usage, waste management and so on. Beyond these indicators, we want to get a picture about how the university is responding to or dealing with the issue of sustainability through policies, actions, and communication. In the first version of the methodology, used in 2010, 23 indicators were used within the five categories to calculate the ranking scores. In 2011 34 indicators were used. Then in 2012 we leave the indicator of "smoke free and drug free campus environment" and used 33 indicators to evaluate the green campus. In 2012, we also categorize the indicators into 6 category including education criteria. One change being considered is the formation of a new category for sustainability education and research.

In this year categories are shown in Table 1 along with the number of indicators in each category and the weighting of points for each.

Table 1 Categories used in the ranking and their weighting

	Category	Percentage of Total Points
1	Setting and Infrastructure (SI)	15
2	Energy and Climate Change (EC)	21
3	Waste (WS)	18
4	Water (WR)	10
5	Transportation (TR)	18

6	Education (ED)	18
	TOTAL	**100**

The specific indicators and the points awarded for indicators in each section are shown in Table 2. Each indicator has been uniquely identified by a category code and a number (e.g. SI 5).

Table 2 Indicators and categories suggested for use in the 2014 ranking

N	Categories and Indicators	Points	Weighting
1	**Setting and Infrastructure (SI)**		**15%**
SI 1	Open space area/total area	300	
SI 2	Open space area/total people	300	
SI 3	Area on campus covered in forested vegetation	200	
SI 4	Area on campus covered in planted vegetation	200	
SI 5	Non-retentive surfaces/total area	300	
SI 6	Sustainability budget/total university budget	200	
	Total	1500	
	Energy and Climate Change (EC)		**21%**
EC 1	Energy efficient appliances usage	300	
EC 2	Renewable energy usage policy	300	
EC 3	Total electricity use/total people	300	
EC 4	Energy conservation program	300	
EC 5	Green building	300	
EC 6	Climate change adaptation and mitigation program	300	
EC 7	Greenhouse gas emission reduction policy	300	
	Total	2100	
	Waste (WS)		**18%**
WS 1	Recycling program for university waste	300	
WS 2	Toxic waste recycling	300	
WS 3	Organic waste treatment (garbage)	300	
WS 4	Inorganic waste treatment (rubbish)	300	
WS 5	Sewerage disposal	300	
WS 6	Policy to reduce the use of paper and plastic on campus	300	
	Total	1800	

N	Categories and Indicators	Points	Weighting
	Water (WR)		**10%**
WR 1	Water conservation program		
WR 2	Piped water		
	Total	1000	
	Transportation (TR)		**18%**
TR 1	Total cars entering/total people	200	
TR 2	Total bicycles/total people	200	
TR 3	Transportation policy on limiting vehicles on campus	400	
TR 4	Transportation policy on limiting parking space	400	
TR 5	Campus buses	300	
TR 6	Bicycle and pedestrian policy	300	
	Total	1800	
6	**Education (ED)**		**18%**
ED 1	Sustainability courses/total courses	300	
ED 2	Sustainability research funding/total research funding	300	
ED 3	Sustainability publications	300	
ED 4	Sustainability events	300	
ED 5	Sustainability organizations (student)	300	
ED 6	Sustainability website	300	
	Total	1800	
	TOTAL	**10000**	

c. **Scoring**

Scoring for each item will be numeric so that our data can be processed statistically. Scores will be simple counts of things, or responses on a scale of some sort.

d. **The weighting of criteria**

Each of the criteria will be categorized in a general class of information and when we process the results, the raw scores will be weighted to give a final calculation.

e. **Refining and improving the research instrument**

While we have put every effort into the design and implementation of the questionnaire, we realize that this third year round is bound to have shortcomings. Therefore, we will be reviewing the criteria and the weightings continuously to reflect input from participants and state of the art developments in the field. We welcome your comments and input.

f. Data collection

Data will be collected through online system between July - October 2014 from the universities we have contacted and who are willing to provide information.

g. Initial results

The preliminary result of the metrics is expected to be collected in November 2014, and final complete result will be released in December 2014.

7. Participation

The number of universities that have provided data in order to take part has shown a growth trend. In the first year in 2010, Green Metric published the ranking for 95 institutions from among all those that submitted data. In the second year, the number published in the ranking was 178. The number of participant in the fourth year is 301 universities. The basic ranking results and the detailed scores can both be found online

http://greenmetric.ui.ac.id/id/page/ranking-2013

We are targeting 1000 participants this year, from every region in the world.

8. Networking and partnerships

This idealism surrounding awareness of sustainability issues is now generating a network of likeminded organizations. UI is a member of the International Ranking Experts Group (IREG) and a signatory to UN Commitments such as that on Sustainable Practices of Higher Education Institutions for the Rio 2012 Conference on Sustainable Development. We have also presented our progress at the International Sustainable Campus Network (ISCN) – GULF-WEF Symposium 2012, together with other Data Monitoring and Evaluation of Sustainability in Higher Education Report such as the College Sustainability Green Report Card and GRI. UI GreenMetric also has been presented at the Quality Education Conference in Universidad Autónoma de Nuevo Leon, Mexico, on October 2013 and the Sustainability, University Ranking Conference at the Università Ca' Foscari Venezia, Italy, November 2013. Various articles, magazines, Journal papers, university and institution webpages cited and referred UI GreenMetric evaluation and result. In 2014, III Asian Universities Forum organized by Al-Farabi Kazakh National University, in Astana & Almaty, endorsed UI GreenMetric to be used as a tool to evaluate university sustainability achievement.

9. Future plans

A new version of GreenMetric should be developed to take into consideration how better to achieve its own goals, how to learn from constructive criticism about rankings and the advancement of ESD, and how to learn from the diverse experience of participants with their different goals and in different settings. Among the ideas under consideration for possible future innovations in the ranking are:

- Better university profiling: universities create a profile based on their unique mission, objectives, typological features and context.

- Category focused results: scores are provided not just as a single aggregate but separately for the main ranking categories and indicators.

10. How to take part

Submitting data for the ranking is relatively easy and is currently done on line. There is no fee for taking part.

If you wish to take part, we will provide you with a password that gives you access to the data submission area on our website : http://greenmetric.ui.ac.id/id/metric .

We would very much like for you to join us. If you have already taken part, please continue.

11. Important Date

| July-October 2014 | November 2014 | December 2014 |

12. Questionare (Criteria and Indicator)

1. Setting and Infrastructure (SI)

The campus setting and infrastructure information will give the basic information of the university consideration towards green environment. This indicator also shows whether the campus deserve to be called Green Campus. The aim is to trigger the participating university to provide more space for greenery and in safeguarding environment, as well as the development of sustainable energy.

1.1.1.   Campus Setting

Please select one of the following options:

[1] Rural

[2] Suburban

[3] Urban

[4] In city center/high rise building

Note: if you have more than one campus site, please select an option that describe your main campus condition.

1.1.2   Climate

Please select one of the following options that clearly describe the climate on you region

[1] Tropical wet

[2] Tropical wet and dry

[3] Semiarid

[4] Arid

[5] Mediterranean

[6] Humid subtropical

[7] Marine west coast

[8] Humid continental

[9] Subartic

1.2. Type of higher education institution

Please select one of the following options:

[1] Comprehensive

[2] Specialized higher education institution

1.3. Number of campus sites

Please state the number of separate locations in which your university has buildings for academic purposes. For example if your university has some campuses in different districts, towns or cities which are separated from the main campus, please state the total number of your university locations.

1.4. Total campus area (meter square)

Please state the total areas of your campuses (in square meter). It is expected that the total area counted are only those in which academic activities are being conducted. Forest and fields and other areas can only be counted if it is being used for academic purposes. If you have separate location for university forest, please do not count this as your campus area.

1.5. Total ground floor area of buildings (meter square)

The green area of your university will be calculated from the percentage of green area of your university. Please provide the information of the area occupied by buildings, by providing the total area of the first floor part of your university buildings.

1.6. Number of students

The total number of students (full time and part time) registered at your university. If your university has calculated the Effective Full Time Students (EFTS) number, you are welcome to submit this number.

1.7. Number of academic and administrative staff

Please state the total number of lecturers and administrative staff working in your university.

1.8. Percentage of area on campus covered in vegetation in the form of forest.

Please provide the percentage of the area on campus covered in vegetation in the form of forest to the total campus area.

1.9. Percentage of area on campus covered in planted vegetation (include lawns, gardens, green roofs, internal planting)

Please provide the percentage of the area on campus covered in planted vegetation (include lawns, gardens, green roofs, internal planting) to the total campus area.

1.10. Retention : non-retentive surfaces on campus as percentage of total area for water absorption

Please provide the percentage of non-retentive surfaces in your campus as **percentage** to the total area. In this case, we define retention as the area that hold water including earth, grass, con-block, etc, and retentive surfaces higher retention (water absorption desirable). The larger water absorption area is desirable.

1.11. Percentage of university budget for sustainability effort

The calculated percentage of the environment and sustainability budget to the total university budget.

2. Energy and Climate Change (EC)

The university's attention to the use of energy and climate change issues be the indicator with the highest weighting in this ranking. In our questionnaire we define several indicators for this particular area of concern, i.e. energy efficient appliances usage, renewable energy usage policy, total electricity use, energy conservation program, green building, climate change adaptation and mitigation program, greenhouse gas emission reductions policy. With this indicator, universities are expected to increase the effort in energy efficiency on their building and to care more about nature and energy resources.

2.2. Energy efficient appliances usage

Please select one of the following options:

[1] **Conventional**, please select tick this option if your university is still using conventional equipments/ways in all energy-based appliances in your university.

[2] **Partly replaced,** please select tick this option if your university has conducted some effort to replace energy appliances with the more efficient appliances, such as lamps, water heaters, etc. Some equipment replacement with better and more efficient appliances have already taken place.

[3] **Fully employed,** please select tick this option if energy efficient appliances have been fully employed in your university.

[4] **Smart Buildings**, please select tick this option if your university has applied the concept of Smart Building in order to accommodate all of energy appliance usage.

Smart Building can be defined as the use of networked technology, embedded within architecture to monitor and control elements of the architecture for exchange of information between users, systems and buildings. If any of your university building applied this concept, you can choose "Smart Building" in the questionnaire. We aware that in LEED standard there is "Energy and Atmosphere" element that accomodate smart building concept, so you can choose "Smart Building" in the questionnaire if you have LEED certificate.

2.3. Renewable energy resources

Please select one or more of the following alternative energy sources used in your campus:

[1] None

[2] Bio Diesel

[3] Clean Biomass

[4] Solar Power

[5] Geothermal

[6] Wind Power

2.4. Electricity usage per year (Total KWH)

Please provide the total energy used last year in your entire university (in Kilo Watt Hour) used for all purposes such as lighting, heating, cooling, running university laboratories, etc.

2.5. Energy conservation program

Please provide the stage of the energy conservation programs in your university. This is defined as the existence of formalized effort in encouraging members of the campus community to reduce energy use. Please select one of the following options:

[1] No program

[2] Program in preparation

[3] Program in initial implementation

[4] Program implemented with some problem

[5] Program in full implementation

2.6. Green building elements

Please provide information on the element of green building implementation as reflected in the construction and renovation policy in your university. Please select one or more of the following list:

[1] **None.** Please select this option if there is no green building implementation in your university.

[2] **Natural Ventilation,** Please select this option if natural ventilation is used in your university for air circulation purposes.

[3] **Full Day lighting**, Please select this option if natural light is encouraged to be used for daily source of lighting during the day time whenever possible.

[4] **Building Efficiency: Less than 35% for circulation**: Please select this option if your university considers building efficiency according to your particular condition.

2.7. Climate change adaptation and mitigation program

Please select a condition which reflects the current stage of your university program on the following options:

[1] No program

[2] Program in preparation

[3] Program in initial implementation

[4] Program implemented with some problem

[5] Program in full implementation

2.8. Greenhouse gas emission reductions policy

Please select a condition which reflects the current condition of your university in providing formal policy to reduce greenhouse gas emissions on the following options:

[1] No policy

[2] Policy in preparation

[3] Policy in initial implementation

[4] Policy implemented with some problem

[5] Policy in full implementation

3. Waste (WS)

Waste treatment and recycling activities are major factors in creating a sustainable environment. The activities of university staff and students in campus will produce a lot of waste, therefore some programs and waste treatments should be among the concern of the university, i.e. recycling program, toxic waste recycling, organic waste treatment, inorganic waste treatment, sewerage disposal, policy to reduce the use of paper and plastic in campus.

3.2. Recycling program for university waste

Please select a condition which reflects the current condition of your university effort to encourage staff and students to recycle waste from the following options:

[1] None

[2] Partial

[3] Extensive

3.3. Toxic waste handled

Please select a condition which reflects the current condition of your university waste treatment. The treatment includes whether toxic waste is dealt with separately, for example by classifying and handling it over to third party or certified handling companies. Please select one of the following options:

[1] Not managed

[2] Partly contained and inventoried

[3] Completely contained, inventoried and handled

3.4. Organic waste treatment

The method of organic waste (garbage, discarded vegetable and plant matter) treatment in your university. Please select an option that best describe your university overall treatment of the bulk of your organic waste:

[1] Open dumping

[2] Partly composted

[3] Partly composted and the compost are dumped

[4] Fully composted and the compost are used

3.5. Inorganic waste treatment

Please describe the method of inorganic waste (rubbish, trash, discarded paper, plastic, metal etc.) treatment in your university. Please select an option that best describes your university overall treatment of the bulk of your inorganic waste:

[1] Burned in open

[2] Taken off campus to a dump site

[3] Partially recycled

[4] Fully recycled

3.6. Sewerage disposal

Please describe the primary method of sewerage treatment in your university. Please select an option that best describes your university overall treatment of the bulk of your university sewerage disposal:

[1] Disposed untreated to waterways

[2] Treated individually in septic tank

[3] Centralized Treatment before disposal

[4] Treatment for reuse

3.7. Policy to reduce the use of paper and plastic in campus

Please select a condition which reflects the current condition of your university in providing formal policy to reduce the use of paper and plastic from the following options:

[1] No policy

[2] Policy in preparation

[3] Policy in initial implementation

[4] Policy implemented with some problem

[5] Policy in full implementation

4. Water (WR)

Water use in campus is another important indicator in Greenmetric. The aim is that universities can decrease water usage, increase conservation program, and protect the habitat. Water conservation program, piped water use are among the criteria.

4.2. Water conservation program

Systematic and formalized program that support water conservation in your university. Please select an option that describes your program current stage:

[1] No program

[2] Program in preparation

[3] Program in initial implementation

[4] Program implemented with some problem

[5] Program in full implementation

4.3. Piped water

Please provide information about water resources at your university. Please indicate the percentage of water consumed from utility or piped system as a percentage of all sources of water including, e.g. ground or well water.

5. Transportation (TR)

Transportation system plays an important role on the carbon emission and pollutant level in university. Transportation policy to limit the number of motor vehicles in campus, the use of campus bus and bicycle will encourage a healthier environment. The pedestrian policy will encourage students and staff to walk around campus, and avoid using private vehicle. The use of environmentally friendly public transportation will decrease carbon footprint around campus.

5.2. Number of vehicles owned by your institution

The number of motor vehicle (car and bus) owned by your university.

5.3. Number of cars entering the university daily

The average number of cars that enter your university daily based on balanced sample, e.g. considering term and holiday periods.

5.4. Number of bicycles that are found on campus on an average day

The average number of bicycles used around the campus daily which include both those owned by the university and privately owned bikes.

5.5. Transportation policy designed to limit the number of motor vehicles used on campus

Please select a condition which reflects the current condition of your university on the availability of transportation policy designed to limit the number of motor vehicles used on campus. Please select an option that best describe your university from the following options:

[1] No policy

[2] Policy in preparation

[3] Policy in initial implementation

[4] Policy implemented with some problem

[5] Policy in full implementation

5.6. Transportation policy designed to limit or decrease the parking area on campus

Please select a condition which reflects the current condition of your university on the availability of transportation policy designed to limit or decrease the parking area on campus. Please select an option that best describe your university from the following options:

[1] No policy

[2] Policy in preparation

[3] Policy in initial implementation

[4] Policy implemented with some problem

[5] Policy in full implementation

5.7. Campus buses

Please describe the condition of the availability of buses for journeys within the campus and whether the ride is free or charged. Please select an option from the following options:

[1] Not available

[2] Available (paying service)

[3] Available (free service)

5.8. Bicycle and pedestrian policy on campus

Reflects the extent to which use of bicycle or walking is supported. Please select one or more options from the following list that apply to your campus:

[1] Bicycle use not possible or practical

[2] No policy but bicycle use not discourage

[3] Bicycle provide by university

[4] University provides bicycle track

[5] University provides pedestrian way

6. Education (ED)

6.2. Number of courses related to environment and sustainability offered

The number of courses related to environment and sustainability offered at your university. Some university already have tracked on how many courses available for this. The definition of the extent to which a course can be stated to be related to environment, sustainability, or both, can be define according to your university situation. If a course contributes in more than a minor or passing way to increasing awareness, knowledge, or action related to Environment and Sustainability, then it counts.

6.3. Total number of courses offered

The total number of all courses provided at your university yearly. This information will be used to calculate to what extend environment and sustainability education has been defined in your university teaching and learning.

6.4. Total research funds dedicated to environmental and sustainability research (US Dollar)

The average funding for research on environment and sustainability per annum over the last 3 years.

6.5. Total research funds (US Dollars)

The average total research funds per annum over the last 3 years. This information will be used to calculate the percentage of environment and sustainability research funding to the overall research funding.

6.6. Number of scholarly publications on environment and sustainability published

The average number of publication on environment and sustainability published annually over the last 3 years.

6.7. Number of scholarly events related to environment and sustainability

The number of scholarly events that was **hosted or organized** by your university related to environment and sustainability (average per annum over the last 3 years).

6.8. Number of student organizations related to environment and sustainability

The total number of student organizations at faculty and university level. For example a student movement on green campus in the faculty of humanities can be considered as one organization.

6.9. Existence of a university-run sustainability website

If your university has sustainability website, please provide the address of the web. Some detailed information of a university website to educate students and staff as well as providing information of their latest involvement on green campus, environment and sustainability programs will be very beneficial. You could also email us some report such as University Sustainability Tracking, Assessment and Rating System (STARS) report, if you have one. We welcome any e-mail or hardcopy of your university sustainability evaluation and report as well as evidence on sustainability activities in your university.

13. Related Papers and Publications about UI GreenMetric

1. UI GreenMetric Ranking of World Universities: Methodology and Evaluation by Prof. Riri Fitri Sari, Prof. Gunawan Tjahyono Published at Journal of Higher Education Evaluation and Development Volume 6, No.2 (December 2012)

2. Evaluating UI GreenMetric as a tool to Support Green Universities Development: Assessment of the Year 2011 Ranking by Dr. Nyoman Suwartha and Prof. Riri Fitri Sari. Published at Journal of Cleaner Production Volume 61, (15 December 2013)

3. Proceeding of International Workshop of UI Greenmetric 2013

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