UNIVERSITAS INDONESIA

Veritas, Probitas, Iustitia

UI GreenMetric World University Rankings

Guideline

UI GreenMetric World University Rankings 2017

"Global Partnerships for a Sustainable Future"

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1. What is UI GreenMetric World University Rankings?

Universitas Indonesia (UI) initiated a world university rankings in 2010, later known as UI GreenMetric World University Rankings, to measure campus sustainability efforts. It was intended to create an online survey to portray sustainability programs and policies in universities around the world.

We based the rankings broadly on the conceptual framework of Environment, Economy, and Equity. The ranking indicators and categories are intended to be relevant to all. We have designed the indicators and weightings to be as free of bias as possible. The work of collecting and submitting data is relatively straightforward and requires reasonable staff time. Ninety five universities from 35 countries took part in the 2010 version of Green Metric: 18 from the Americas, 35 from Europe, 40 from Asia and 2 from Australasia. In 2016 the ranking ranked 515 universities from 75 countries around the world. This shows that UI GreenMetric has been recognized as the first and only world university rankings on sustainability.

Our theme this year is "Global Partnerships for a Sustainable Future". We would like to focus on universities' effort to work together with their partners in sustainable issues. We look into details of universities' partnerships to improve campus sustainability.

2. What are the objectives?

The rankings aim to:

- Contribute to academic discourses on sustainability in education and the greening of campuses;
- Promote university-led social change with regard to sustainability goals.
- be a tool for self-assessment on campus sustainability for higher education institutions (HEIs) around the globe.
- Inform governments, international and local environmental agencies, and the society about sustainability programs on campus.

3. Who can participate?

All universities in the world with strong commitment to sustainability issues can participate in the annual UI GreenMetric World University Rankings.

4. What are the benefits?

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

a. Internationalization and recognition

Participation in UI GreenMetric can help the university's efforts in internationalization and recognition by getting its sustainability efforts on the global map. Participation in UI GreenMetric can result in an increase of hits to the university website, more mentions of the institution connected with the issue of sustainability on web pages, and more correspondence with institutions interested in your university.

b. Increasing awareness of sustainability issues

Participation can help to raise awareness in the university and beyond about the importance of sustainability issues. The world faces unprecedented global challenges such as population trends, global

warming, over exploitation 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. UI GreenMetric leverages the crucial role that HEIs can play in raising awareness by doing assessment and comparing efforts in education for sustainable development, sustainability research, campus greening, and social outreach.

c. Social change and action

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

d. Networking

All participants of UI GreenMetric are automatically members of UIGWURN (UI GreenMetric World University Rankings Network). In this network, participants can share their best practices in sustainability program(s) as well as networking with other participants worldwide by attending the annual UI GreenMetric International Workshop and regional/national workshops hosted by approved host universities. Participants can also arrange technical workshops on UI GreenMetric at their respective universities.

As a platform to turn sustainability issues into action, the network is managed by UI GreenMetric as the secretariat. Programs and directions are proposed and decided by the steering committee comprising the UI GreenMetric secretariat, regional, and national coordinators.

Currently the network comprises 515 participating universities located in the dynamic and diverse Asia, Europe, Africa, Australia, America and Oceania, 1.537.789 faculty members, 16.500.614 students, with more than US$ 48.892.548.416 total research funds on environment and sustainability.

5. How can universities participate?

To participate in the ranking is simple. The sustainability director or other person in charge can visit www.greenmetric.ui.ac.id to learn about the ranking and if interested can e-mail the UI GreenMetric secretariat (greenmetric@ui.ac.id) to get an invitation letter and access to the system. If you have already participated in the rankings, we will send you an invitation to participate. In case, you decide not to participate due to particular reasons, we would appreciate it if you could inform us. Of course, you can join our survey again in the future. It is always useful, if your university appoints a person in charge as a contact person. You are welcome to contact us for any inquiries regarding the survey.

How was UI GreenMetric World University Ranking developed?
The decision to establish UI GreenMetric was influenced by a number of factors:

a. *Idealism*

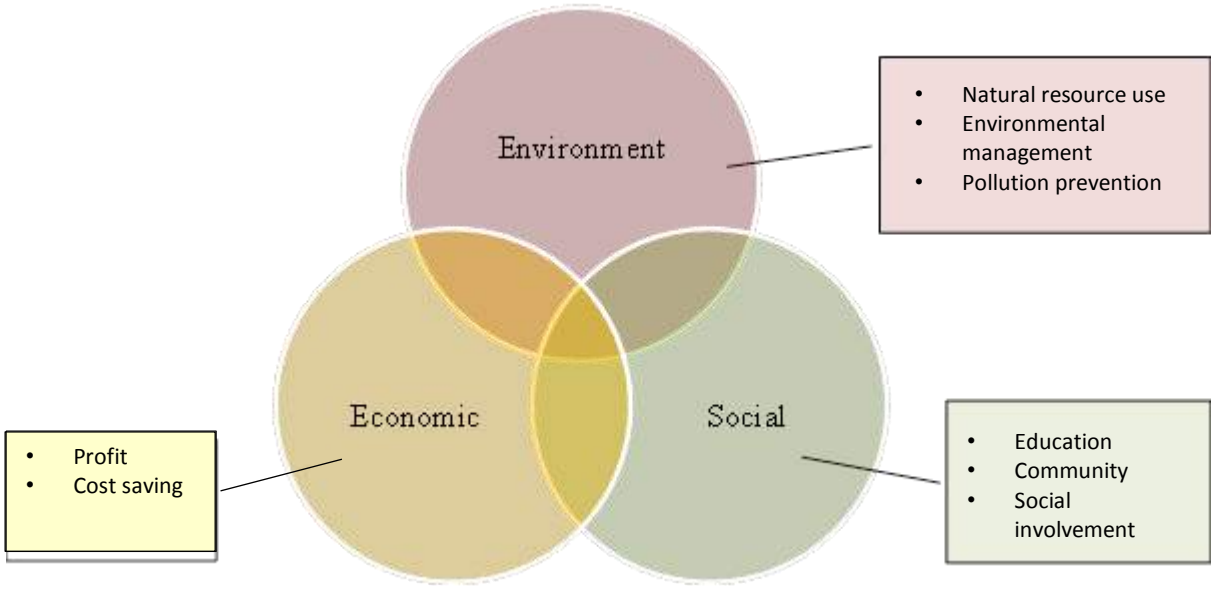
Future challenges to civilization include population pressure, climate change, energy security, environmental degradation, water and food security and sustainable development. Despite many scientific researches and public discussions, governments around the world have yet to commit to a sustainable agenda. Concerned people at Universitas Indonesia perceive that universities have a privilege 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).

UI GreenMetric World University Rankings serves as a tool for universities to deal with sustainability challenges our world is facing. Universities can work together to reduce negative environmental impacts. UI GreenMetric is a non-profit institution; therefore, any university can participate for free.

b. *UI GreenMetric World University Ranking model*

Although UI GreenMetric was not based on any existing ranking system, it was developed with an awareness of a number of existing sustainability assessment systems and academic university rankings. Sustainability systems that were referred to during the design phase of UI 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).

In general, the instrument adopts environmental sustainability concept that has three elements, i.e. environmental, economic, and social (Figure 1). The environmental aspect includes natural resource use, environmental management, and pollution prevention, whereas the economic aspect includes profit and cost saving. The social aspect includes education, community, and social involvement. These three aspects are captured in the UI GreenMetric criteria.



Meanwhile, university academic ranking systems that were studied during the design phase of UI 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 members of International Ranking Expert Group (IREG) Observatory since 2011.

During the early stages of the design of UI 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 expert workshop on

UI GreenMetric was held on November 21st 2013, in which rectors and representatives from the following universities shared their experiences, i.e University of Nottingham, UniversitàCa' 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, and Universiti Teknologi Malaysia.

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 removed the indicator of "smoke free and drug free campus environment" and used 33 indicators to evaluate the green campus. In 2012, we also categorized the indicators into 6 categories including the education criteria. One change being considered is the formation of a new category for sustainability education and research. In 2015 the theme was carbon footprint. We add two questions related this issue in the energy and climate change section.We also improved our methodology by adding a few sub-indicators that related to water and transportation in the 2015 ranking. A major change in methodology was done in 2016 by considering new trends in sustainability issues.

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 are fully aware of the fact that universities differ with regard to their levels of awareness and commitment to sustainability, their budgets, the amount of green cover on their campuses and many other dimensions. These issues are complex, but UI GreenMetric is committed to continually improving the ranking so that it will be both useful and fair for all.

6. Who is the team?

UI GreenMetric World University Rankings is managed by a team under the Rector of Universitas Indonesia. The team members come from different academic backgrounds and experiences, such as Environmental Sciences, Engineering, Architecture and Urban Design, Dentistry, Public Health, Statistics, Chemistry, Linguistics and Cultural Studies.

7. What is the methodology?

a. The criteria

This year's categories and weighting of points are shown as follows.

Table 1 Categories used in the ranking and their weighting

No	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 their points awarded 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 2016 ranking

No	Categories and Indicators	Points	Weighting
1	**Setting and Infrastructure (SI)**		**15%**
SI 1	The ratio of open space area towards total area	300	
SI 2	The ratio of open space area towards campus population	300	
SI 3	Area on campus covered in forest	200	
SI 4	Area on campus covered in planted vegetation	200	
SI 5	Area on campus for water absorbance	300	
SI 6	University budget for sustainable effort	200	
	Total	1500	
	Energy and Climate Change (EC)		**21%**
EC 1	Energy efficient appliances usage	200	
EC 2	Smart building implementation	300	
EC 3	Renewable energy produce on campus	300	
EC 4	The ratio of total electricity usage towards campus population	300	
EC 5	The ratio of renewable energy produce towards energy usage	200	
EC 6	Element of green building implementation	300	
EC 7	Greenhouse gas emission reduction program	200	
EC 8	The ratio of total carbon footprint towards campus population	300	
	Total	2100	
	Waste (WS)		**18%**
WS 1	Program to reduce the use of paper and plastic in campus	300	
WS 2	Recycling program for university waste	300	
WS 3	Toxic waste handled	300	
WS 4	Organic waste treatment	300	
WS 5	Inorganic waste treatment	300	
WS 6	Sewerage disposal	300	
	Total	1800	
	Water (WR)		**10%**
WR 1	Water conservation program	300	
WR 2	Water recycling program	300	
WR 3	The use of water efficient appliances	200	
WR 4	Piped water consumed	200	
	Total	1000	
	Transportation (TR)		**18%**
TR 1	The ratio of vehicles (cars and motorcycles) towards campus population	200	
TR 2	The ratio of shuttle services towards campus population	200	
TR 3	The ratio of bicycles towards campus population	200	

No	Categories and Indicators	Points	Weighting
TR 4	Parking area type	200	
TR 5	Transportation initiatives to decrease private vehicles on campus	200	
TR 6	Parking area reduction for private vehicles over the last 3 years (from 2014 to 2015)	200	
TR 7	Shuttle services	300	
TR 8	Bicycle and pedestrian policy on campus	300	
	Total	1800	
6	**Education (ED)**		**18%**
ED 1	The ratio of sustainability courses towards total courses/modules	300	
ED 2	The ratio of sustainability research funding towards total research funding	300	
ED 3	Sustainability publications	300	
ED 4	Sustainability events	300	
ED 5	Sustainability student organizations	300	
ED 6	Sustainability websites	300	
	Total	1800	
	TOTAL	**10000**	

b. 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. Details of the scoring can be found in Appendix 1.

c. The weighting of criteria

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

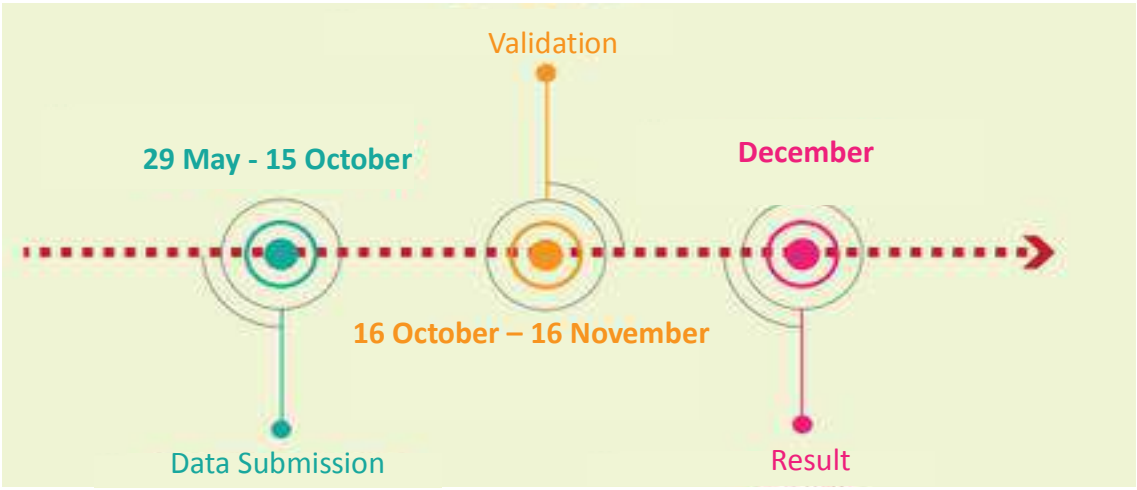
d. Refining and improving the research instrument

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 accommodate input from participants and state of the art developments in the field. We welcome your comments and input.

e. Data submission

Data from the universities should be submitted through an online system between 29 May –15 October 2017.

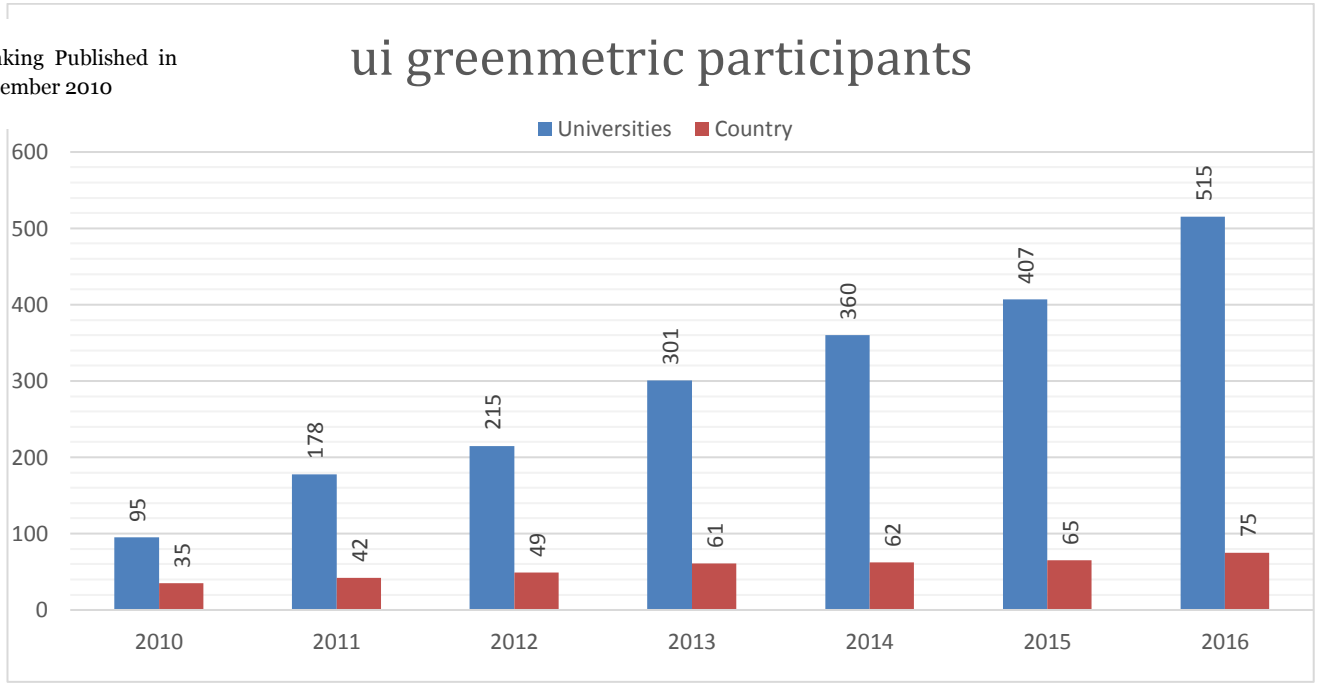
You could also email us some reports such as University Sustainability Tracking, Assessment and Rating System (STARS) report, if you have one. We welcome any e-mail or hardcopy of your university sustainability evaluation and report as well as evidence on sustainability activities in your university.



f. Results

The preliminary results of the metrics are expected to be submitted in October 2017, and the final complete result will be released in early December 2017.

Ranking Published in December 2010



The basic ranking results and the detailed scores can both be found online http://greenmetric.ui.ac.id/overall-ranking-2016/

8. Who are our networks?

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 has also 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, in November 2013. Various articles, magazines, journal papers, university and institution web pages cited and referred to UI GreenMetric evaluation and results. 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.

In its 2017 3rd International Workshop in Istanbul UI GreenMetric established the UI GreenMetric World University Rankings Network and its first Steering Committee. The network comprises of all participating universities in Ui GreenMetric World University Rankings and focuses on 3 priority areas: shaping higher education and research, creating for future leaders of sustainability, and partnering in solving sustainability challenges. For more information, please visit http://greenmetric.ui.ac.id/.

9. What are the future plans?

A new version of UI GreenMetric should be developed to take into consideration how to better 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 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 missions, objectives, typological features and contexts.
- Category focused results: scores are provided not just as a single aggregate but separately for the main ranking categories and indicators.

10. How to contact us?

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Questionnaire (Criteria and Indicators)

There are six main categories in the questionnaire which consist of setting and infrastructure (SI), energy and climate change (EC), waste (WS), water (WR), transportation (TR) and education (ED). These categories are divided into several sections and the detailed explanations of the questions are as follow:

1. Setting and Infrastructure (SI)

The campus setting and infrastructure information will provide the basic information of the university consideration towards green environment. This indicator also shows whether the campus deserves to be called a Green Campus. The aim is to trigger the participating universities to provide more spaces for greenery and to safeguard the environment, as well as develop of sustainable energy.

1.1. Type of higher education institution

Please select one of the following options:

[1] Comprehensive
[2] Specialized higher education institution

1.2. Climate

Please select one of the following options that clearly describes the climate in your 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] Subarctic

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 university locations.

To answer questions below please note that if you have more than one campus sites, please select an option(s) that best describes those sites.

1.4. Main Campus Setting

Please select one of the following options:

[1] Rural
[2] Suburban
[3] Urban
[4] In city center
[5] High rise building area

1.5. Total main campus area (m^2)

Please state the total areas of your campus(es) (in square meters). It is expected that the total area counted are only those in which academic activities are conducted. Forest and fields and other areas can only be counted if they are used for academic purposes.

1.6. Total main campus ground floor area of buildings (m^2)

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

1.7. Total main campus buildings area (m^2)

Please provide information of the area occupied by buildings, by providing the total area of the ground floor of your university buildings in your main campus.

1.8. Total main campus smart building area (m^2)

Please provide the information of the total area (including ground floor and other floors) of your university smart buildings. A smart building should be equipped with energy efficient tools. Smart building achievement is a measurement of useful building services which make occupants productive (e.g. illumination, thermal comfort, air quality, physical security, sanitation, etc.). Smart buildings should be establishedat the lowest cost and generate beneficial environmental impact over the building lifecycle.

1.9. Total parking area (m^2)

Please provide the information of the total parking area in your university. You can validate this by using google maps.

1.10. Area on campus covered in forest vegetation

Please provide the percentage of the area on campus covered in vegetation in the form of forest (a large area covered mainly with big-trees, a large number or dense mass of vertical, and undergrowth for conservation purposes), owned by campus, to the total campus area.

1.11. Area on campus covered in planted vegetation

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

1.12. Total area on campus for water absorption besides forest and planted vegetation (m^2)

Please provide the percentage of non-retentive surfaces (eg. earth, grass, concrete block, etc.) on your campus for water absorption as a percentage to the total site area. A larger water absorption area is desirable.

1.13. Number of students

a. Total Number of Regular Students

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

b. Total Number of Online Students

The total number of students registered as online students only, at your university.

1.14. Number of academic and administrative staff

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

1.15. University budget for sustainability effort

Please provide the percentage calculation 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 is 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, the implementation of smart buildings/automation buildings/intelligent buildings, renewable energy usage policy, total electricity use, energy conservation programs, elements of green buildings, climate change adaptation and mitigation programs, greenhouse gas emission reductions policy and carbon footprint. Within these indicators, the university is expected to increase their efforts in energy efficiency in their buildings and to care more about nature and energy resources.

2.1. Energy efficient appliances usage are replacing conventional appliances

Energy efficient appliances usages are replacing conventional appliances. This also includes the use of energy efficient appliances/lighting fixtures (e.g. the use of energy star-rating for electronic devices, LED light bulbs).

Please select one of the following options:

[1] None
[2] Less than 20%
[3] 20% - 40%
[4] 40% - 60%
[5] 60% - 80%
[6] 80% - 100%

2.2. Smart Building program implementation

Please provide the stage of smart building implementation in your university. This is defined as the existence of formalized efforts in applying the program in order to accommodate all energy efficient appliances usage. Please select one of the following options:

[1] None
[2] Program in preparation (e.g. Feasibility Study or Detailed Engineering Design phase)
[3] Program in initial implementation (e.g. Builder already appointed)

[4] Implemented in less than 30% of the total building area
[5] Implemented in between 30% - 70% of the total building area
[6] Implemented in more than 70% of the total building area

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.

2.3. Renewable energy produce on campus per year

Please select one or more of the following alternative energy sources used in your campus and please provide the capacity of the energy produced in Kilo Watt:

[1] None
[2] Bio Diesel (provide capacity in Kilo Watt)
[3] Clean Biomass (provide capacity in Kilo Watt)
[4] Solar Power (provide capacity in Kilo Watt)
[5] Geothermal (provide capacity in Kilo Watt)
[6] Wind Power (provide capacity in Kilo Watt)
[7] Hydropower (provide capacity in Kilo Watt)
[8] Combine Heat and Power (provide capacity in Kilo Watt)

2.4. Electricity usage per year

Please provide the total energy used in the last 12 months in your entire university (in Kilo Watt Hour or KWH) for all purposes such as lighting, heating, cooling, running university laboratories, etc.

2.5. Ratio of renewable energy production towards total energy usage per year

Please provide the ratio of renewable energy production towards total energy usage per year Please select one of the following options:

[1] None
[2] Less than 20%
[3] 20% - 40%
[4] 40% - 60%
[5] 60% - 80%
[6] 80% - 100%

2.6. Elements of green building implementation as reflected in all construction and renovation policies

Please provide information on the elements of green building implementation as reflected in the construction and renovation policies in your university. Please select one or more that apply from 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 Natural Lighting. Please select this option if natural light is encouraged for daily source of lighting during the day time whenever possible.

[4] Existence of a building energy management system. Please select this option if your university has a building energy management system.
[5] Existence of Green Building. Please select this option if your university has implemented green building practices.

2.7. Greenhouse gas emission reduction programs

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

[1] None
[2] Program in preparation
[3] Program in initial implementation
[4] Program implemented in HVAC System / Refrigerator / Laboratory Gases (Heat, Ventilation, Air Conditioning and Refrigeration)

2.8. Please provide total carbon footprint (CO_2 emission in the last 12 months, in metric tons)

Please provide the total carbon footprint of your university. Please exclude carbon footprint from flights and secondary carbon sources such as dishes and clothes. You can use the carbon footprint calculator from www.carbonfootprint.com as the standard for carbon footprint calculation, please visit the website to see elements of carbon footprint that you can count.
For an example of how to calculate your university carbon footprint please refer to the appendix 2.

3. Waste (WS)

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

3.1. Policy to reduce the use of paper and plastic on campus

Please select one or more which best reflects the current condition of your university in establishing formal policy to reduce the use of paper and plastic from the following options:

[1] None
[2] Double sided-printing policy program
[3] Use of tumblers
[4] Use of reusable bags
[5] Print only when necessary

3.2. Recycling program for university waste

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

[1] None
[2] Partial (less than 25% of waste)
[3] Partial (25% - 50% of waste)
[4] Extensive (more than 50% of waste)

3.3. Toxic waste handled

Please select a condition which reflects the current condition of how your university handles toxic wastes. The handling process includes whether toxic wastes are dealt separately, for example, by classifying and handling them over to a 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 (e.g. garbage, discarded vegetable and plant matter) treatment in your university. Please select an option that best describes your university's overall treatment of the bulk of organic waste:

[1] Open dumping
[2] Partly composted
[3] Partly composted and compost used
[4] Fully composted, compost used
[5] Fully composted, compost used internally and externally

3.5. Inorganic waste treatment

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

[1] Burned in open area
[2] Taken off campus to a dump site
[3] Partially recycled (less than 50%)
[4] Fully recycled (more than 50%)

3.6. Sewerage disposal

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

[1] Disposed untreated into waterways
[2] Treated individually in septic tanks
[3] Centralized treatment before disposal
[4] Treatment for recycling

4. Water (WR)

Water use in campus is another important indicator in the UI GreenMetric. The aim is to encourage universities to decrease water usage, increase conservation programs, and protect the habitants. Water conservation programs, water recycling programs, water efficient appliances usage, and treated water usage are among the criteria.

4.1. Water conservation program implementation

Please select a condition describing your current stage in the program, which has a systematic and formalized program that supports a water conservation program (e.g. for lakes and lake management systems, rain harvesting systems, water tanks) in your university, from the following options:

[1] None
[2] Program in preparation (e.g. Feasibility Study and promotion)
[3] Program in initial implementation (e.g. initial measurement of potential water conserved)
[4] Implemented in Rain Harvesting Systems
[5] Implemented in Ground Water Tanks
[6] Implemented in Lakes or Ponds

4.2. Water recycling program implementation

Please select a condition which reflects the current condition of your university in establishing formal policies for water recycling programs (e.g. the use of recycled water for toilet flushing, car washing, watering plants, etc). Please select an option that describes the current stage of your program :

[1] None
[2] Program in preparation (e.g. water efficient appliances selection priority are identified)
[3] Program in initial implementation (e.g. initial measurement of potential water recycle)
[4] Recycled water is used for garden sprinkler systems
[5] Recycled water is used for toilet flushing
[6] Recycled water is used for the cooling system and/or car wash

4.3. Water efficient appliance usage

Water efficient appliance usages are replacing conventional appliances. This also includes the use of water efficient appliances (e.g. using censored/automated hand washing taps, high efficient toilet flush, etc). Please select one of the following options:

[1] None
[2] Program in preparation (e.g. water efficient appliances selection priority have been identified)
[3] Less than 25% water efficient appliances installed
[4] 25%-50% water efficient appliances installed
[5] 50%-75% water efficient appliances installed
[6] More than 75% water efficient appliances installed

4.4. Piped water consumed

Please indicate the percentage of **Piped** water consumed (e.g. rain water tank source) from the utility or piped water system compared to all water sources in your university.

5. Transportation (TR)

Transportation systems play an important role in the carbon emission and pollutant levels in universities. Transportation policies to limit the number of motor vehicles on campus, the use of campus buses, and bicycles will encourage a healthier environment. The pedestrian policy will encourage students and staff to walk around campus, and avoid using private vehicles. The use of environmentally friendly public transportation will decrease the carbon footprint around campus.

5.1. Number of cars owned by your university

Please indicate the number of cars owned by your university.

5.2. Number of cars entering the university daily

Please indicate the average number of cars that enter your university daily based on a balanced sample, taking term and holiday periods in consideration.

5.3. Number of motorcycles entering the university daily

Please indicate the average number of motorcycles that enter your university daily based on a balanced sample, taking term and holiday periods in consideration.

5.4. Number of shuttles operated in your university

Please indicate the number of campus shuttles operating in your university. The campus shuttle can be in the form of buses, MPV cars or mini vans which are operated inside the campus.

5.5. Average number of passengers of each shuttle

Please indicate the average number of passengers of each shuttle on one trip.

5.6. Total trips of shuttle services each day

Please indicate the total number of shuttle service trips each day.

5.7. Average number of bicycles on campus every day

Please indicate the average number of bicycles on campus daily which include both those owned by the university and privately owned bikes.

5.8. Parking area types

Please select a condition which reflects the current condition of your university in terms of parking area type.

[1] Open space or horizontal type
[2] Combination of open space and building
[3] Building or vertical space
[4] Parking is restricted

5.9. Transportation program designed to limit or decrease parking area on campus over the last 3 years (from 2014 to 2016)

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

[1] None
[2] Program in preparation
[3] Program resulting in less than 10% decrease
[4] Program resulting in between 10% - 30% decrease in parking
[5] Program resulting in more than 30% decrease in parking or parking is restricted

5.10. Transportation initiatives to limit or decrease private vehicles on campus

Please select a condition which reflects your university's current initiatives on the availability of transportation to limit or decrease the number of private vehicles on campus. Please select an option(s) that best describes your university from the following:

[1] None
[2] Charging high parking fees
[3] Car sharing
[4] Metro/tram/bus station on campus
[5] Metro/tram/bus services inside campus

5.11. Shuttle services

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

[1] Shuttle service is not possible or practical
[2] Shuttle service is available, but not free
[3] Shuttle service is available and free, or shuttle use is not possible

5.12. Bicycle and pedestrian policy on campus

Please describe the extent to which the use of bicycles or walking are supported. Please select an option from the following list that applies to your campus:

[1] Bicycle and pedestrian paths are not available
[2] Bicycle use is not possible or practical, but pedestrian paths are available
[3] Bicycle and pedestrian paths are available
[4] Bicycle and pedestrian paths are available, and bicycles are provided freely by the university

5.13. Approximate daily travel distance of a vehicle inside campus only (in kilometers)

Please provide the approximate daily travel distance of a vehicle (e.g. bus, car, motorcycle) inside campus only in kilometers.

6. Education (ED)

6.1. Number of courses/modules related to environment and sustainability offered

The number of courses related to environment and sustainability offered at your university. Some universities have already tracked on how many courses/modules 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 defined according to your university's situation. If a course/module contributes in more than a minor or passing way to increasing awareness, knowledge, or action related to Environment and Sustainability, then it counts.

6.2. Total number of courses/modules offered

The total number of all courses/modules 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.

6.3. Total research funds dedicated to environmental and sustainability research (in US Dollars)

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

6.4. Total research funds (in 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.

6.5. Number of scholarly publications on environment and sustainability published

Please provide the average number of indexed publications (Google scholar) on environment and sustainability published annually over the last 3 years.

6.6. Number of events related to environment and sustainability

Please provide the number of events (e.g. conferences, workshops, awareness raising, practical training, etc.) related to environment and sustainability **hosted or organized** by your university (average per annum over the last 3 years).

6.7. Number of student organizations related to environment and sustainability

Please provide the total number of student organizations at faculty and university level. For example, a student association on green campus in the Faculty of Humanities can be considered as an organization.

6.8. Existence of a university-run sustainability website

If your university has a 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 useful.

Related Papers and Publications about UI GreenMetric

[1] 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, Journal of Cleaner Production, Volume 61, Pages 46–53 (2013)

[2] Critical review of a global campus sustainability ranking: GreenMetric by Allan Lauder, Riri Fitri Sari, Nyoman Suwartha, and Gunawan Tjahjono, Journal of Cleaner Production, Volume 108, Part A, Pages 852–863 (2015)

[3] University contributions to environmental sustainability: challenges and opportunities from the Lithuanian case by Renata Dagiliut and Genovaite Liobikien, Journal of Cleaner Production, Volume 108, Part A, Pages 891–899 (2014)

[4] Opening up the Pandora's box of sustainability league tables of universities: a Kafkaesque perspective by David R. Jones, Studies in Higher Education, Volume 40, Pages 480-503 (2015)

[5] Sustainable Universities – From Declarations on Sustainability in Higher Education to National Law by Thomas Skou Grindsted, Journal of Environmental Economics and Management, Volume 2 (2011)

[6] Moving Toward Socially and Environmentally Responsible Management Education—A Case Study of Mumbai by Ela Goyal and Mahendra Gupta, Journal Applied Environmental Education & Communication, volume 13, Pages 146-161 (2014)

[7] The comprehensiveness of competing higher education sustainability assessments by Graham Bullock and Nicholas Wilder, International Journal of Sustainability in Higher Education, Volume 17, Pages 282-304 (2016)

[8] Green Campus initiative and its impacts on quality of life of stakeholders in Green and Non-Green Campus universities by Ronnachai Tiyarattanachai and Nicholas M. Hollmann, SpringerPlus, Volume 5, no info pages (2016)

[9] Environmental management and sustainability in higher education: The case of Spanish Universities by Yolanda León-Fernández and Eugenio Domínguez-Vilches, International Journal of Sustainability in Higher Education, Volume 16, Pages 440-455 (2015)

[10] Getting an empirical hold of the sustainable university: a comparative analysis of evaluation frameworks across 12 contemporary sustainability assessment tools by Daniel Fischer, Silke Jenssen and Valentin Tappeser, Journal Assessment & Evaluation in Higher Education, Volume 40, Pages 785-800 (2015)

Appendix 1

Details of the scoring are described as follows:

No	Categories and Indicators	Points	Score	Weighting
1	**Setting and Infrastructure (SI)[§]**			**15%**
SI 1	The ratio of open space area towards total area	**300**		
SI 2	The ratio of open space area towards campus population	**300**		
SI 3	Area on campus covered in forest	**200**		
SI 4	Area on campus covered in planted vegetation	**200**		
SI 5	Area on campus for water absorbance	**300**		
SI 6	University budget for sustainable effort	**200**		
	Total	**1500**		
	Energy and Climate Change (EC)			**21%**
EC 1	Energy efficient appliances usage	**200**		
	None		0	
	Less than 20%		0.15×200	
	20% - 40%		0.25×200	
	40% - 60%		0.50×200	
	60% - 80%		0.75×200	
	80% - 100%		200	
EC 2	Smart building implementation	**300**		
	None		0	
	Program in preparation (e.g. feasibility study or detailed engineering designed phase)		0.15×300	
	Program in initial implementation (e.g. builder already appointed)		0.25×300	
	Implemented in less than 30% of the total building area		0.50×300	
	Implemented in between 30% - 70% of the total building area		0.75×300	
	Implemented in more than 70% of the total building area		1.00x300	
EC 3[†]	Renewable energy produce on campus	**300**		
	None		0	
	Bio diesel		1/7×300	
	Clean biomass		1/7×300	
	Solar power		1/7×300	
	Geothermal		1/7×300	
	Wind power		1/7×300	
	Hydropower		1/7×300	
	Combine heat and power		1/7×300	
EC 4	The ratio of total electricity usage towards campus population[§]	**300**		
EC 5	The ratio of renewable energy produce towards energy usage	**200**		

No	Categories and Indicators	Points	Score	Weighting
	None		0	
	Less than 20%		0.15×200	
	20% - 40%		0.25×200	
	40% - 60%		0.50×200	
	60% - 80%		0.75×200	
	80% - 100%		1.00x200	
EC 6	Element of green building implementation‡	**300**		
	None		0	
	Natural ventilation		0.25×300	
	Full natural day-lighting		0.25×300	
	Existence of building energy manager		0.25×300	
	Existence of Green Building		0.25×300	
EC 7	Greenhouse gas emission reduction program	**200**		
	None		0	
	Program in preparation (e.g. feasibility study and promotion)		0.33×200	
	Program in initial implementation (e.g. initial measurement of gas emission reduction)		0.66×200	
	Implemented in HVAC System/Refrigerator/Laboratory Gases		1.00x200	
EC 8	The ratio of total carbon footprint towards campus population§	**300**		
	Total	**2100**		
	Waste (WS)			**18%**
WS 1‡	Program to reduce the use of paper and plastic in campus	**300**		
	None		0	
	Double sided-printed policy program		0.25×300	
	The use of tumbler		0.25×300	
	The use of reusable bag		0.25×300	
	Print when necessary		0.25×300	
WS 2	Recycling program for university waste	**300**		
	None		0	
	Partial (less than 25% of waste)		0.33×300	
	Partial (25%-50% of waste)		0.66×300	
	Extensive (more than 50% of waste)		1.00x300	
WS 3	Toxic waste handled	**300**		
	Not managed		0	
	Partly contained and inventoried		0.5×300	
	Completely contained, inventoried and handled		1.00x300	
WS 4	Organic waste treatment	**300**		
	Open dumping		0	
	Partly composted and compost dumped		0.25×300	
	Partly composted and compost used		0.5×300	
	Fully composted, compost used		0.75×300	

No	Categories and Indicators	Points	Score	Weighting
	Fully composted, compost used internally and externally		1.00x300	
WS 5	Inorganic waste treatment	**300**		
	Burned in open area		0	
	Taken off campus to a dump site		0.33×300	
	Partially recycled (less than 50%)		0.66×300	
	Fully recycled (more than 50%)		1.00x300	
WS 6	Sewerage disposal	**300**		
	Disposed untreated to waterways		0	
	Treated individually in septic tank		0.33×300	
	Centralized treatment before disposal		0.66×300	
	Treatment for recycling		1.00x300	
	Total	**1800**		
	Water (WR)			**10%**
WR 1[∞]	Water conservation program	**300**		
	None		0	
	Program in preparation (e.g. Feasibility Study and promotion)		0.15×300	
	Program in initial implementation (e.g. initial measurement of potential water conserved)		0.25×300	
	Implemented in Rain Harvesting System		0.25×300	
	Implemented in Ground Water Tank		0.25×300	
	Implemented in Lake or Pond		0.25×300	
WR 2[∞]	Water recycling program	**300**		
	None		0	
	Program in preparation (e.g. Feasibility Study and promotion)		0.15×300	
	Program in initial implementation (e.g. initial measurement of potential water conserved)		0.25×300	
	Recycled water is used for garden sprinkler system		0.25×300	
	Recycled water is used for toilet flush		0.25×300	
	Recycled water is used for cooling system		0.25×300	
WR 3	The use of water efficient appliances	**200**		
	None		0	
	Program in preparation (e.g. water efficient appliances selection priority are identified)		0.15×200	
	Water efficient appliances installed (less than 25%)		0.25×200	
	Water efficient appliances installed (25%-50%)		0.50×200	
	Water efficient appliances installed 50%-75%)		0.75×200	
	Water efficient appliances installed		1.00x200	

No	Categories and Indicators	Points	Score	Weighting
	(more than 75%)			
WR 4§	Treated water consumed	**200**		
	Total	**1000**		
	Transportation (TR)			**18%**
TR 1§	The ratio of vehicles (cars and motorcycles) towards campus population	**200**		
TR 2§	The ratio of shuttle services towards campus population	**200**		
TR 3§	The ratio of bicycles found towards campus population	**200**		
TR 4	Parking area type	**200**		
	Open space or horizontal type		0.25×200	
	Combination of open space and building		0.50×200	
	Building or vertical space		0.75×200	
	Parking is restricted		1.00x200	
TR 5‡	Transportation initiatives to decrease private vehicles on campus‡	**200**		
	None		0	
	High charging parking fee		0.25×200	
	Car sharing		0.25×200	
	Metro/tram/bus station on campus		0.25×200	
	Metro/tram/bus services inside campus		0.25×200	
TR 6	Transportation program designed to limit or decrease the parking area on campus over the last 3 years (from 2014 to 2016)	**200**		
	None		0	
	Program in preparation (e.g. feasibility study and promotion)		0.25×200	
	Program resulting in less than 10% decrease		0.50×200	
	Program resulting in between 10% - 30% decrease		0.75×200	
	Program resulting in more than 30% decrease /or parking is restricted		1.00x200	
TR 7	Shuttle services	**300**		
	Shuttles use is possible but not provided		0	
	Shuttles service is available, but paying service		0.5×300	
	Shuttles service is available and free service. Or bus use is not possible		1.00x300	
TR 8	Bicycle and pedestrian policy on campus	**300**		
	Bicycle and pedestrian way is not available		0	
	Bicycle use not possible or practical, but pedestrian way is available		0.33×300	
	Bicycle , and pedestrian way is available		0.66×300	

No	Categories and Indicators	Points	Score	Weighting
	Bicycle and pedestrian way are available, and bicycles provided freely by university		1.00x300	
	Total	**1800**		
6	**Education (ED) §**			**18%**
ED 1	The ratio of sustainability courses towards total courses/modules	**300**		
ED 2	The ratio of sustainability research funding towards total research funding	**300**		
ED 3	Sustainability publications	**300**		
ED 4	Sustainability events	**300**		
ED 5	Sustainability student organizations	**300**		
ED 6	Sustainability website	**300**		
	Total	**1800**		
	TOTAL	**10000**		

Notes:

§ : The score of these categories and/or indicators is based on the minimum and maximum numbers from participants. Hence, the score of these categories and/or indicators can only be calculated after all participants have submitted their data.

† : Each response (except 'None') scores 1/7×300. For example, if you choose 'Bio diesel' only, your score is 1/7×300; if you choose 'Bio diesel', 'Solar power', and 'Geothermal', your score is [(1/7)+(1/7)+(1/7)]×300

‡ : Each response (except 'None') scores 0.25×300 (for EC6 and WS1) or 0.25×200 (for TR5). For example, if you choose 'Natural ventilation' only, your score is 0.25×300; if you choose 'Full natural day-lighting' and 'Existence of building energy management', your score is (0.25+0.25)×300

∞ : For WR1 and WR2, the score for 'None' is 0, the score for 'Program in preparation' is 0.15×300, the score for 'Initial implementation' is 0.25×300. You may select more than one option for [4], [5], and [6], and get 0.25×300 (with additional 0.25×300) for each score. For example, if you choose option [4], your score is [o.25+(0.25)]×300. If you choose options [4], [5], and [6], your score is [o.25+0.25+0.25+(0.25)]×300.

Appendix 2

Calculation of Carbon Footprint

The Carbon footprint calculation can be conducted based on the stage of calculation as stated in http://carbonfootprint.org, which is the sum of electricity usage per year and transportation per year.

- **Carbon Footprint Per Year**

Total emissions divided by open space area per total people

Notes:

Total emissions come from:

- Electricity usage per year
- Transportation per year: Bus, Car, Motorcycle

Example of calculation:

- Open space area = total campus area – total ground floor area of building
- Total people = number of students including part- and full- time students + number of academic and administrative staff

- **Electricity Usage Per Year**

  CO2 emission from electricity

  = (electricity usage per year in KwH / 1000) x 0.84

  = (1633286 KwH/1000) x 0.84

  = 1371.96 metric ton

  Notes:

  Electricity usage per year in UI = 1633286 KwH

  0.84 is the coefficient to convert KwH to Metric ton (source: www.carbonfootprint.com)

- **Transportation Per Year (Bus)**

  = (Number of shuttle bus in your University * total trips for shuttle bus service each day * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100) * 0.01

  = ((15 x 150 x 5 x 240)/100)) x 0.01

  = 270 metric ton

  Notes :

  240 is number of working days per year

  0.01 is the coefficient (source: www.carbonfootprint.com) to calculate the emission in metric ton per 100 km for bus

- **Transportation Per Year (Car)**

  = (Number of cars entering your University * 2 * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100) * 0.02

  = ((2000 x 2 x 5 x 240)/100)) x 0.02

  = 960 metric ton

  Notes :

  240 is number of working days per year

  0.02 is the coefficient (source : www.carbonfootprint.com) to calculate the emission in metric ton per 100 km car

- **Transportation Per Year (Motorcycle**)

  = (Number of motorcycle entering your University * 2 * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100)* 0.01

= ((4000 x 2 x 5 x 240)/100)) x 0.01

= 960 metric ton

Notes :

240 is number of working days per year

0.01 is the coefficient (source: www.carbonfootprint.com) to calculate the emission in metric ton per 100 km for motorcycle

- **Total Emission Per Year**

  = total emission from electricity usage + transportation (bus, car, motorcycle)

  = 1371.96 + (270 + 960 + 960)

  = 3561.96 Metric ton

- **Open Space Area Per Total People**

  Open space area

  = total campus area – total ground floor area of building

  = 350000 – 75000

  = 275000

  Total people

  = number of students including part- and full- time students + number of academic and administrative staff

  = 45000 + 5000

  = 50000

  Open space area per total people = 275000/50000 = 5.5

- **Carbon Footprint Per Year**

  = Total emissions divided by open space area per total people

  = 3561.96 / 5.5

  = 648 metric ton

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