Sustainability Report

Srinakharinwirot University (Ongkharak Campus)

Academic Year 2019

(August 2019 – October 2020)

Sustainability Report

Srinakharinwirot University (Ongkharak Campus)

Academic Year 2019

(August 2019 – October 2020)

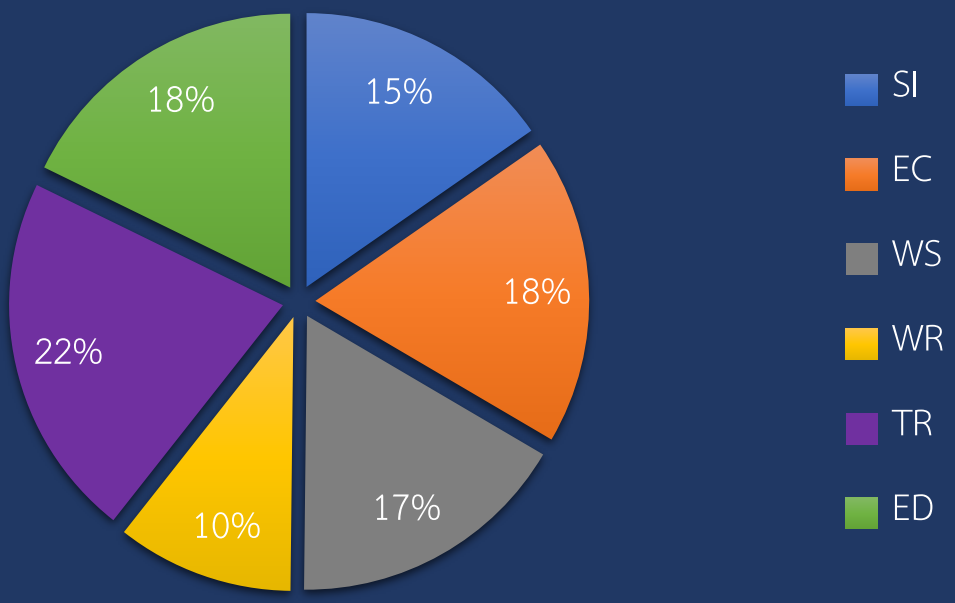
Table of Contents

Executive Summary

Srinakharinwirot University (SWU) has participated in the UI GreenMetric World University Ranking in 2020 (during SWU's academic year 2019; August 2019 – October 2020) and received the total score of 7,175 out of 10,000 or 71.75%. The scores received for each category are as follows:

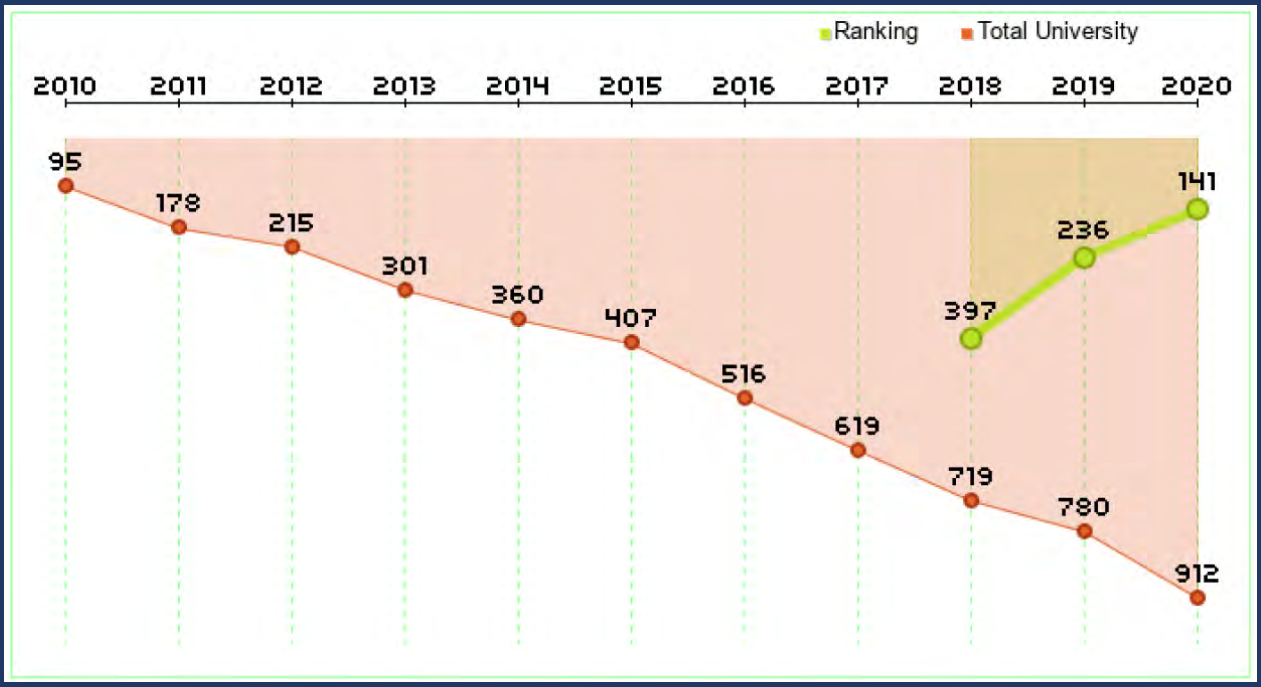
1. Setting and Infrastructure (SI): 1,100 out of 1,500
2. Energy and Climate Change (EC): 1,300 out of 2,100
3. Waste (WS): 1,200 out of 1,800
4. Water (WR): 750 out of 1,000
5. Transportation (TR): 1,550 out of 1,800
6. Education (ED): 1,275 out of 1,800

Chart showing the proportion of the scores received this year for each category in the UI GreenMetric World University Ranking



Result Summary of UI GreenMetric World University Ranking

World Ranking	SI Ranking	EC Ranking	WS Ranking
141	103	226	277
	WR Ranking	**TR Ranking**	**ED Ranking**
	158	36	292



Result Summary of UI GreenMetric Thai University Ranking

Country Ranking	SI Ranking	EC Ranking	WS Ranking
9	7	11	9
	WR Ranking	**TR Ranking**	**ED Ranking**
	9	3	19

1. Introduction

1.1 UI GreenMetric World University Ranking

Universitas Indonesia (UI) initiated a world university ranking in 2010 with the purpose to measure the efforts on sustainability of universities by conducting online surveys in order to demonstrate sustainability programs and policies available in universities around the world. This ranking was later officially known as the "UI GreenMetric World University Ranking."

The UI GreenMetric World University Ranking are broad, covering the aspects of environment, economy, and equity, with all ranking indicators and categories connected to all of these aspects. In addition, indicators and score weighting are free from bias as much as possible so as to make collecting and transmitting information straightforward.

1.2 Scoring Process

A. Ranking Categories and Score Weighting

All categories and score weighting for the UI GreenMetric World University Ranking are as follows:

No.	Category	Percentage of Score to Total Score
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 Score Percentage	**100**

B. Criteria for Each Category

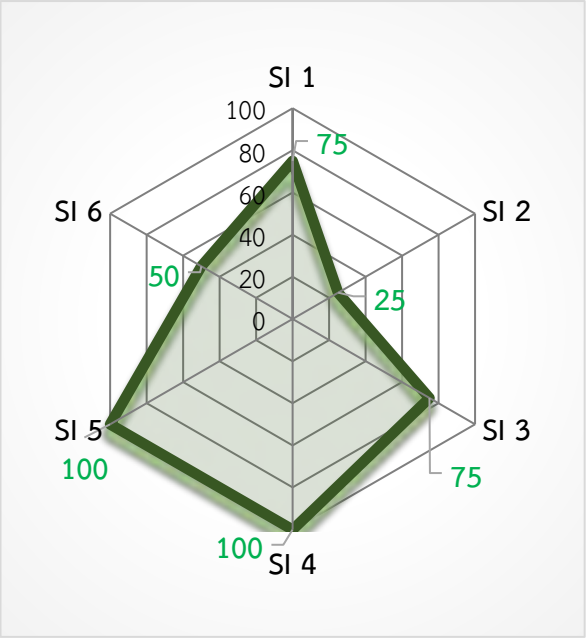
No.	Criteria	Point
1	**Setting and Infrastructure (SI)**	
SI 1	The ratio of open space area to total area	300
SI 2	Total area on campus covered in forest vegetation	200
SI 3	Total area on campus covered in planted	300
SI 4	Total area on campus for water absorption besides the forest and planted	200
SI 5	The total open space area divided by total campus population	300
SI 6	Percentage of university budget for sustainability efforts within a year	200
	Total	**1,500**
2	**Energy and Climate Change (EC)**	
EC 1	Energy efficient appliances usage	200
EC 2	Smart building implementation	300
EC 3	Number of renewable energy sources on campus	300
EC 4	Total electricity usage divided by total campus' population (kWh per person)	300
EC 5	The ratio of renewable energy production divided by total energy usage per year	200
EC 6	Elements of green building implementation as reflected in all construction and renovation policies	300
EC 7	Greenhouse gas emission reduction program	200
EC 8	Total carbon footprint divided by total campus' population (metric tons per person)	300
	Total	**2,100**
3	**Waste (WS)**	
WS 1	Recycling program for university's waste	300
WS 2	Program to reduce the use of paper and plastic on campus	300
WS 3	Organic waste treatment	300
WS 4	Inorganic waste treatment	300
WS 5	Toxic waste treatment	300
WS 6	Sewage disposal	300
	Total	**1,800**

No.	Criteria	Point
4	**Water (WR)**	
WR 1	Water conservation program & implementations	300
WR 2	Water recycling program implementation	300
WR 3	Water efficient appliances usage	200
WR 4	Consumption of treated water	200
	Total	**1,000**
5	**Transportation (TR)**	
TR 1	The total number of vehicles (cars and motorcycles) divided by total campus' population	200
TR 2	Shuttle services	300
TR 3	Zero Emission Vehicles (ZEV) policy on campus	200
TR 4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200
TR 5	Ratio of ground parking area to total campus' area	200
TR 6	Program to limit or decrease the parking area on campus for the last 3 years (from 2017 to 2019)	200
TR 7	Number of initiatives to decrease private vehicles on campus	200
TR 8	Pedestrian path on campus	300
	Total	**1,800**
6	**Education (ED)**	
ED 1	The ratio of sustainability courses to total courses/subjects	300
ED 2	The ratio of sustainability research funding to total research funding	300
ED 3	Number of scholarly publications on sustainability	300
ED 4	Number of events related to sustainability	300
ED 5	Number of student organizations related to sustainability	300
ED 6	University-run sustainability website	200
ED 7	Sustainability report	100
	Total	**1,800**

1.3 Score Summary

Setting and Infrastructure (SI)

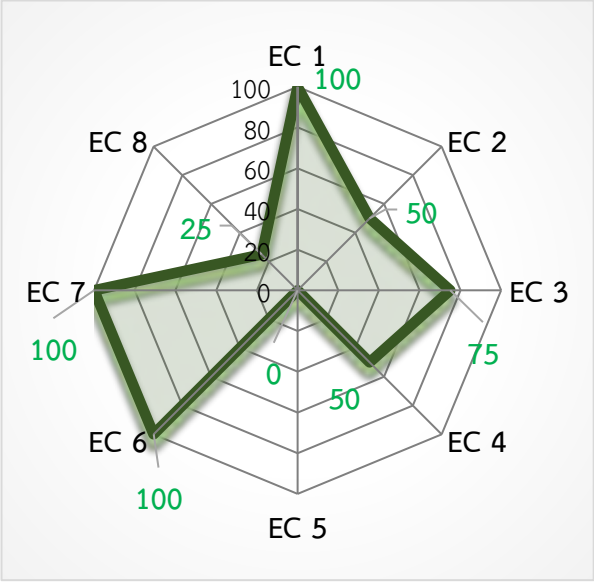
Indicator		Score
SI 1	The ratio of open space area to total area	225
SI 2	Total area on campus covered in forest vegetation	50
SI 3	Total area on campus covered in planted	225
SI 4	Total area on campus for water absorption besides the forest and planted	200
SI 5	The total open space area divided by total campus population	300
SI 6	Percentage of university budget for sustainability efforts within a year	100



Percentage of Score to Maximum Score

Energy and Climate Change (EC)

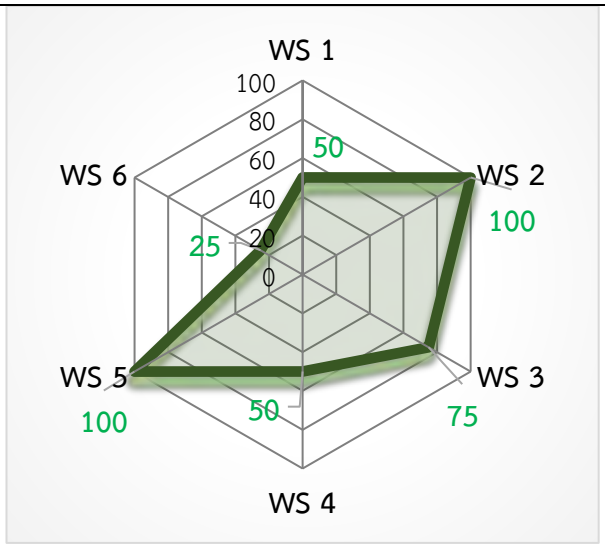
Indicator		Score
EC 1	Energy efficient appliances usage	200
EC 2	Smart building implementation	150
EC 3	Number of renewable energy source in campus	225
EC 4	Total electricity usage divided by total campus population	150
EC 5	The ratio of renewable energy production divided by total energy usage per year	0
EC 6	Elements of green building implementation as reflected in all construction and renovation policies	300
EC 7	Greenhouse gas emission reduction program	200
EC 8	Total carbon footprint divided by total campus population	75



Percentage of Score to Maximum Score

Waste (WS)

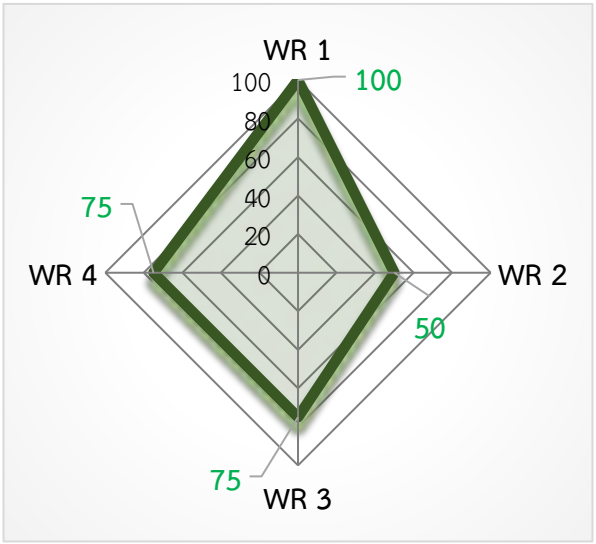
Indicator		Score
WS 1	Recycling program for university's waste	150
WS 2	Program to reduce the use of paper and plastic on campus	300
WS 3	Organic waste treatment	225
WS 4	Inorganic waste treatment	150
WS 5	Toxic waste treatment	300
WS 6	Sewage disposal	75



Percentage of Score to Maximum Score

Water (WR)

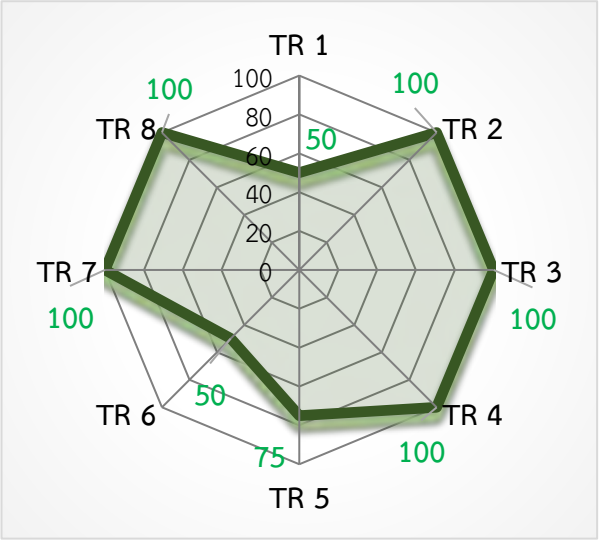
Indicator		Score
WR 1	Water conservation program & implementations	300
WR 2	Water recycling program implementation	150
WR 3	Water efficient appliances usage	150
WR 4	Consumption of treated water	150



Percentage of Score to Maximum Score

Transportation (TR)

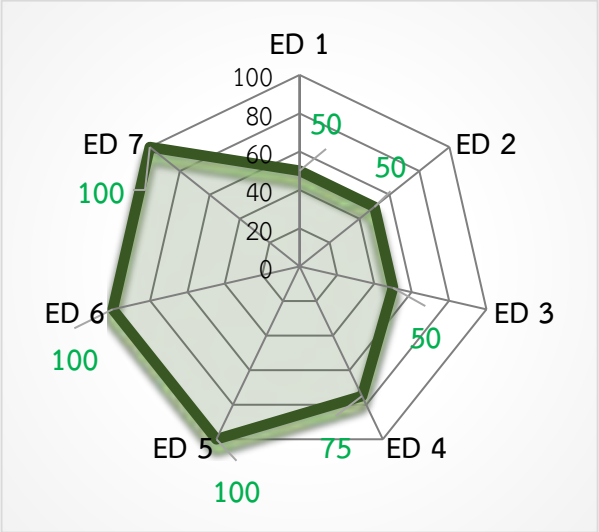
Indicator		Score
TR 1	The total number of vehicles (cars and motorcycles) divided by total campus' population	100
TR 2	Shuttle services	300
TR 3	Zero Emission Vehicles (ZEV) policy on campus	200
TR 4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200
TR 5	The ratio of the ground parking area to total campus area	150
TR 6	Transportation program designed to limit or decrease the parking area on campus for the last 3 years	100
TR 7	Number of transportation initiatives to decrease private vehicles on campus	200
TR 8	Pedestrian path on campus	300



Percentage of Score to Maximum Score

Education (ED)

Indicator		Score
ED 1	The ratio of sustainability courses to total courses/modules	150
ED 2	The ratio of sustainability research funding to total research funding	150
ED 3	Scholarly publications on sustainability	150
ED 4	Events related to sustainability	225
ED 5	Student organizations related to sustainability	300
ED 6	University-run sustainability website	200
ED 7	Sustainability report	100



Percentage of Score to Maximum Score

2. UI GreenMetric Data Submission

2.1 Setting and Infrastructure (SI)

For Setting and Infrastructure (SI), the score received this year is 1,100 points out of 1,500 (or 73.33%). Outstanding features which earned high points in this category are No. 1.11, total area on campus for water absorption besides forest and planted vegetation, and No. 1.15, total open space area divided by total campus population, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 1.9, total area on campus covered in forest vegetation, and No. 1.18, percentage of university's budget for sustainability effort, which have earned only 25% and 50% of the total scores respectively.

No.	Question	Answer	Score	Recommendation
1.1	Type of higher education institution	Comprehensive		
1.2	Climate	Tropical Wet and Dry		
1.3	Number of campus site	2		
		Includes: 1. Ongkharak Campus (main campus for consideration) 2. Prasanmit Campus		
1.4	Campus setting	Rural		
1.5	Total campus area	1,802,847 m^2		
1.6	Total campus ground floor area of buildings	127,865 m^2		
1.7	Total campus buildings area	299,690 m^2		
1.8	The ratio of open space to total area	> 90–95 %	**SI 1** 225 / 300	
		= ((No. 1.5 – No. 1.6) / No. 1.5) x 100% = ((1,802,847 - 127,865 m^2) / 1,802,847 m^2 x 100% = 92.91%		

No.	Question	Answer	Score	Recommendation
1.9	Total area on campus covered in forest vegetation	> 2-9 %	**SI 2** 50 / 200	Grow more plants in the university
		Total area on campus covered in forest vegetation = 124,632 m^2, or 6.91% of the total area of Ongkharak Campus		
1.10	Total area on campus covered in planted vegetation	> 30-40 %	**SI 3** 225 / 300	Increase lawn and park area in the university
		Total area on campus covered in planted vegetation = 637,872 m^2, or 35.38% of the total area of Ongkharak Campus		
1.11	Total area on campus for water absorption besides forest and planted vegetation	> 30 %	**SI 4** 200 / 200	
		= ((No. 1.5 - No. 1.6 - No. 1.9 - No. 1.10) / No. 1.5) x 100% = ((1,802,847 - 127,865 - 124,632 - 637,872 m^2) / 1,802,847 m^2 x 100% = 912,478 / 1,802,847 m^2 x 100% = 50.61 %		
1.12	Total number of regular students	8,401		
1.13	Total number of online students	0		
1.14	Total number of academic and administrative staff	2,371		
1.15	The total open space area divided by total campus population	> 70 m^2 / person	**SI 5** 300 / 300	
		= ((No. 1.5 - No. 1.6) / (No. 1.12 + No. 1.14) = (1,802,847 - 127,865 m^2) / (8,401 + 2,371 persons) = 1,674,982 m^2 / 10,772 persons = 155.49 m^2 / person		

No.	Question	Answer	Score	Recommendation
1.16	Total university's budget	268,856,000 US Dollars		
1.17	University's budget for sustainability effort	8,613,000 US Dollars		
1.18	Percentage of University's budget for sustainability effort	> 1 – 5 %	**SI 6** 100 / 200	
			The UI raters gave more points than anticipated, probably because of adjusted criteria.	

2.2 Energy and Climate Change (EC)

For Energy and Climate Change (EC), the score received this year is 1,300 points out of 2,100 (or 61.90%). Outstanding features which earned high points in this category are No. 2.1, energy efficient appliances usage, No. 2.9, elements of green building implementation as reflected in all construction and renovation policies, and No. 2.10, greenhouse gas emission reduction program, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 2.8, the ratio of renewable energy production divided by total energy usage per year, and No. 2.12, the total carbon footprint divided by total campus population.

No.	Question	Answer	Score	Recommendation
2.1	Energy efficient appliances usage	> 75 %	**EC 1** 200 / 200	
		In 2018, SWU replaced 30,000 out of 34,000 conventional light bulbs with LED ones and 375 out of 5,185 conventional air-conditioners with inverter ones. or = (30,000+375) / (34,000+5,185) x 100% = 77.52%		
2.2	Total campus smart building area	155,849 m^2		
		includes: automatic doors and fingerprint scanning system		
2.3	Smart Building implementation	> 50 – 75 %	**EC 2** 150 / 300	
		= (No. 2.2 / No. 1.7) x 100% = (155,849 / 299,690) x 100% = 52%		
			The UI raters gave fewer points than anticipated, probably because of insufficient evidence	
2.4	Number of renewable energy sources in campus	3 sources	**EC 3** 225 / 300	

No.	Question	Answer	Score	Recommendation
		includes: 1) solar cell system for lights in the parking and pavement areas 2) production of petroleum from plastic with Pyrolysis method, and 3) production of biomass fuel		
2.5	Please specify renewable energy sources in campus and provide capacity produced in kilowatt hour	not applicable		- currently no data record - very little usage of renewable energy - install electricity generation system by using floating solar panels in 2021
2.6	Electricity usage per year	15,876,566 kWh		
2.7	The total electricity usage divided by total campus population	< 1,535 - 633 kWh	**EC 4** 150 / 300	
2.8	The ratio of renewable energy production divided by total energy usage per year	<= 0.5 %	**EC 5** 0 / 200	Record production data and use more renewable energy
2.9	Elements of green building implementation as reflected in all construction and renovation policies	> 3 elements	**EC 6** 300 / 300	
		includes: 1) clear windows 2) clear glasses 3) building manager, and 4 natural air vent		
2.10	Greenhouse gas emission reduction program	Program(s) aims to reduce all three scopes emissions (Scope 1, 2 and 3)	**EC 7** 200 / 200	

No.	Question	Answer	Score	Recommendation
		includes: Scope 1: Direct GHG emission (Project: production of petroleum from plastic with Pyrolysis method) Scope 2: Indirect GHG emission from energy purchase (Project: reduction of electricity usage by using solar cell system) Scope 3: Other indirect GHG emission (Project: reduction of water consumption)		
2.11	Please provide the total carbon footprint (CO2 emission in the last 12 months, in metric tons)	13,638 metric tons		
		GHG emission in metric tons CO_2 (electricity) = (15,876,566/1,000) x 0.84 = 13,336.31 metric tons CO_2 (buses) = ((20 x 108 x 2 x 240)/100) x 0.01 = 103.68 metric tons CO_2 (personal cars) = ((580 x 2 x 2 x 240)/100) x 0.02 = 111.36 metric tons CO_2 (motorcycles) = ((906 x 2 x 2 240)/100) x 0.01 = 86.98 metric tons CO_2 (total) = 13,638.33 metric tons		
2.12	The total carbon footprint divided by total campus population	< 2.05 - 1.11 metric tons	**EC 8** 75 / 300	
		= (No. 2.11) / (No. 1.12 + 1.14) = 13,638 metric tons / (8,401 + 2,371 persons) = 1.27 metric tons / person		

2.3 Waste (WS)

For Waste (WS), the score received this year is 1,200 points out of 1,800 (or 66.67%). Outstanding features which earned high points in this category are No. 3.2, project to reduce the use of paper and plastic on campus, and No. 3.5, toxic waste treatment, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 3.6, sewage disposal, which has earned only 25% of the total scores.

No.	Question	Answer	Score	Recommendation
3.1	Recycling program for university waste	Partial (> 25% - 50% of waste)	**WS 1** 150 / 300	
3.2	Project to reduce the use of paper and plastic on campus	more than 3 programs	**WS 2** 300 / 300	
		includes: 1. Reuse of paper that has been used on only one page 2. Promotion of archiving documents in electronic format 3. Paper printing only when necessary 4. Reducing the use of plastic cups by giving out hard water bottles to students during the freshman welcome event 5. Providing paper cups to reduce the use of plastic cups 6. Providing natural food containers (such as banana-leaf containers) to reduce the use of plastic containers 7. Providing 100%-biodegradable straws 8. Stop handing out plastic bags at all convenient stores on campus 9. Providing cloth bags to students 10. Policies to reduce the use of plastic boxes and prohibit the use of styrofoam boxes on campus		

No.	Question	Answer	Score	Recommendation
3.3	Organic waste treatment	Partial (> 50% - 75% of treated)	**WS 3** 225 / 300	
3.4	Inorganic waste treatment	Partial (> 25% - 50% of treated)	**WS 4** 150 / 300	
3.5	Toxic waste treatment	Extensive (> 75% treated)	**WS 5** 300 / 300	
3.6	Sewage disposal	Treated conventionally	**WS 6** 75 / 300	

2.4 Water (WR)

For Water (WR), the score received this year is 750 points out of 1,000 (or 75%). Outstanding features which earned high points in this category are No. 4.1, water conservation program and implementation, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 4.2, water recycling program implementation, which has earned only 50% of the total scores.

No.	Question	Answer	Score	Recommendation
4.1	Water conservation program and implementation	> 50% water conserved	**WR 1** 300 / 300	
		Natural lakes and rivers interconnecting waterways across the campus for water conservation		
4.2	Water recycling program implementation	> 25 - 50% water recycled	**WR 2** 150 / 300	
			The UI raters gave fewer points than anticipated, probably because of insufficient evidence	
4.3	Water efficient appliance usage	> 25 - 50% of water efficient appliances installed	**WR 3** 150 / 200	
		SWU has replaced 1,590 out of 5,007 conventional taps and flushes with water-efficient ones. or = 1,590 / 5,007 x 100% = 31.76%		
4.4	Treated water consumed	> 50% - 75% treated water consumed	**WR 4** 150/200	


SWU BUS
SRINAKHARINWIROT UNIVERSITY
BUS STOP

2.5 Transportation (TR)

For Transportation (TR), the score received this year is 1,550 points out of 1,800 (or 86.11%). Outstanding features which earned high points in this category are No. 5.5, shuttle service, No. 5.9, Zero Emission Vehicles (ZEV) policy on campus, No. 5.11, the total number of Zero Emission Vehicles (ZEV) divided by total campus population, No. 5.15, number of transportation initiatives to decrease private vehicles on campus, and No. 5.16, pedestrian path on campus, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 5.14, transportation program designed to limit or decrease the parking area on campus, which has earned only 50% of the total scores.

No.	Question	Answer	Score	Recommendation
5.1	Number of cars actively used and managed by University	100		
5.2	Number of cars entering the university daily	580		
5.3	Number of motorcycles entering the university daily	906		
5.4	The total number of vehicles (cars and motorcycles) divided by total campus population	< 0.5 - 0.125	**TR 1** 100 / 200	
		= (No. 5.1 + No. 5.2 + No. 5.3) / (No. 1.12 + No. 1.14) = (100 + 580 + 906 vehicles) / (8,401 + 2,371 persons) = 0.1472 vehicle / person		
5.5	Shuttle service	Shuttle service is provided by university, regular, and environment friendly. Or shuttle use is not possible (not applicable)	**TR 2** 300 / 300	
5.6	Number of shuttles operated in your university	20		
5.7	Average number of passengers of each shuttle	24		

No.	Question	Answer	Score	Recommendation
5.8	Total trips of shuttle services each day	108		
5.9	Zero Emission Vehicles (ZEV) policy on campus	Zero Emission Vehicles are available, and provided by university for free	**TR 3** 200 / 200	
		includes: 1) free-of-charge bicycles on campus 2) free-of-charge electric carts and electric car charging stations, and 3) canoes		
5.10	Average number of Zero Emission Vehicles on campus per day	1,618		
5.11	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	> 0.02	**TR 4** 200 / 200	
		= No. 5.10 / (No. 1.12 + No. 1.14) = 1,618 vehicles / (8,401 + 2,371 persons) = 0.1502 vehicle / person		
5.12	Total ground parking area	37,751 m^2		
5.13	Ratio of parking area to total campus area	< 4 - 1 %	**TR 5** 150 / 200	
		= (No. 5.12 / No. 1.5) x 100% = (37,751 m^2 / 1,802,847 m^2) x 100% = 2.09%		
5.14	Transportation program designed to limit or decrease the parking area on campus for the last 3 years (from 2017 to 2019)	Less than 10% decrease	**TR 6** 100 / 200	
		includes: program to switch parking lots to recreational areas		
5.15	Number of transportation initiatives to decrease private vehicles on campus	> 3 initiatives, or initiative no longer required	**TR 7** 200 / 200	
		includes: 1) shuttle service 2) free-of-charge bicycles 3) policy to reduce the number of vehicles in campus, and 4) policy to switch parking lots to recreational areas		

No.	Question	Answer	Score	Recommendation
5.16	Pedestrian path on campus	Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features	**TR 8** 300 / 300	
5.17	Approximate daily travel distance of a vehicle inside campus only	2 kilometers		

2.6 Education (ED)

For Education (ED), the score received this year is 1,275 points out of 1,800 (or 70.83%). Outstanding features which earned high points in this category are No. 6.9, number of student organizations related to sustainability, No. 6.10, university-run sustainability website, and No. 6.12, sustainability report, as shown in the table below. To receive higher points in this category next year, SWU should improve No. 6.3, the ratio of sustainability courses to total courses/subjects, No. 6.6, the ratio of sustainability research funding to total research funding, and No. 6.7, number of scholarly publications on sustainability published, all of which have earned only 50% of the total scores.

No.	Question	Answer	Score	Recommendation
6.1	Number of courses/subjects related to sustainability offered	361		
6.2	Total number of courses/subjects offered	5,631		
6.3	The ratio of sustainability courses to total courses/subjects	> 5 - 10 %	**ED 1** 150 / 300	
		= (No. 6.1 / No. 6.2) x 100% = (361 courses / 5,631 courses) x 100% = 6.41%		
6.4	Total research funds dedicated to sustainability research	848,584 US Dollars		
6.5	Total research funds	8,509,019 US Dollars		
6.6	The ratio of sustainability research funding to total research funding	> 8 - 20 %	**ED 2** 150 / 300	

No.	Question	Answer	Score	Recommendation
		= (No. 6.4 / No. 6.5) x 100% = (848,584 US Dollars / 8,509,019 US Dollars) x 100% = 9.97%		
6.7	Number of scholarly publications on sustainability published	21 - 83	**ED 3** 150 / 300	
6.8	Number of events related to sustainability	18 - 47	**ED 4** 225 / 300	
6.9	Number of student organizations related to sustainability	> 10	**ED 5** 300 / 300	
6.10	University-run sustainability website	Website is available, accessible, and updated regularly	**ED 6** 200 / 200	
6.11	Sustainability website address (URL) if available	green.swu.ac.th		
6.12	Sustainability report	Sustainability report is published annually	**ED 7** 100 / 100	

Appendices

Appendix A: UI GreenMetric World University Ranking Result

UNIVERSITAS INDONESIA
Veritas, Probitas, Iustitia

UI GreenMetric
World University Rankings

Certificate

This certificate is awarded to

Srinakharinwirot University

as The 141st World's Most Sustainable University
in 2020 UI GreenMetric World University Rankings

Jakarta, 7 December 2020

Prof. Ari Kuncoro, S.E., M.A., Ph.D
Rector of Universitas Indonesia

Prof. Riri Fitri Sari, M.M., M.Sc
Chairperson of UI GreenMetric
World University Rankings

FACT FILE 2020

UI GREENMETRIC WORLD UNIVERSITY RANKINGS

SRINAKHARINWIROT UNIVERSITY

Thailand

107 Rangsit - Nakon Nayok Rd, Tambon Ongkharak, Amphoe Ongkharak, Chang Wat Nakhon Nayok 12110

UNIVERSITY PROFILE

Name	:	Srinakharinwirot University
Established	:	1949
Country	:	Thailand

1. VERIFIED DATA

Category	Point	Percentage of Point to Total Score	Maximum Point	Percentage of Point to Maximum Point
Setting and Infrastructure (SI)	1,100	15 %	1,500	73.33 %
Energy and Climate Change (EC)	1,300	18 %	2,100	61.90 %
Waste (WS)	1,200	17 %	1,800	66.67 %
Water (WR)	750	10 %	1,000	75.00 %
Transportation (TR)	1,550	22 %	1,800	86.11 %
Education (ED)	1,275	18 %	1,800	70.83 %
Total Score	7,175	100 %	10,000	71.75 %

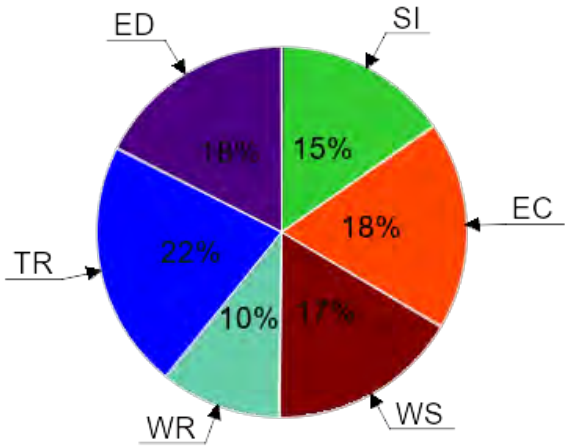


Figure 1.1 Overall Score Diagram

2. RESULTS SUMMARY

World Ranking	SI Ranking	EC Ranking	WS Ranking
141	103	226	277

WR Ranking	TR Ranking	ED Ranking
158	36	292

3. WORLD RANKINGS HISTORY

Figure 3.1 World Rankings History Diagram

4. RANKING IN THAILAND

Country Ranking	SI Ranking	EC Ranking	WS Ranking
9	7	11	9

WR Ranking	TR Ranking	ED Ranking
9	3	19

5. RESULTS DETAIL

Setting and Infrastructure

Indicator		Score
SI.1	The ratio of open space area to total area	225
SI.2	Total area on campus covered in forest vegetation	50
SI.3	Total area on campus covered in planted	225
SI.4	Total area on campus for water absorption besides the forest and planted	200
SI.5	The total open space area divided by total campus population	300
SI.6	Percentage of university budget for sustainability efforts within a year	100

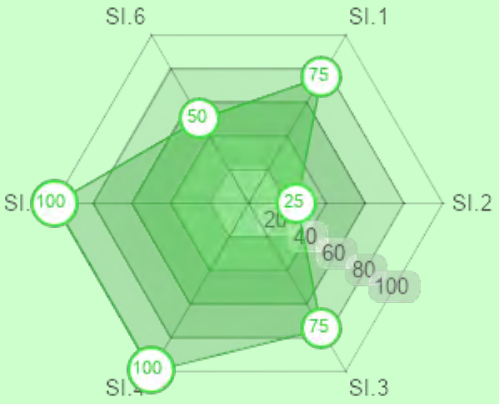


Figure 5.1 Percentage of Score to Maximum Score for Setting and Infrastructure

Energy and Climate Change

Indicator		Score
EC.1	Energy efficient appliances usage	200
EC.2	Smart building implementation	150
EC.3	Number of renewable energy source in campus	225
EC.4	Total electricity usage divided by total campus population	150
EC.5	The ratio of renewable energy production divided by total energy usage per year	0
EC.6	Elements of green building implementation as reflected in all construction and renovation policies	300
EC.7	Greenhouse gas emission reduction program	200
EC.8	Total carbon footprint divided by total campus population	75

Figure 5.2 Percentage of Score to Maximum Score for Energy and Climate Change

Waste

Indicator		Score
WS.1	Recycling program for university's waste	150
WS.2	Program to reduce the use of paper and plastic on campus	300
WS.3	Organic waste treatment	225
WS.4	Inorganic waste treatment	150
WS.5	Toxic waste treatment	300
WS.6	Sewage disposal	75

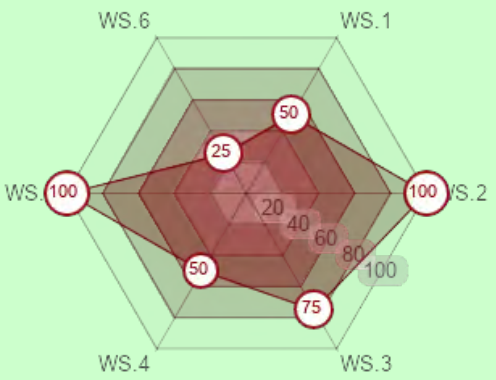


Figure 5.3 Percentage of Score to Maximum Score for Waste

Water

Indicator		Score
WR.1	Water conservation program & implementations	300
WR.2	Water recycling program implementation	150
WR.3	Water efficient appliances usage	150
WR.4	Consumption of treated water	150

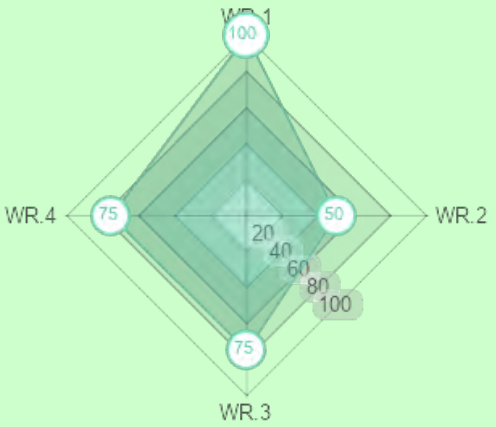


Figure 5.4 Percentage of Score to Maximum Score for Water

Transportation

Indicator		Score
TR.1	The total number of vehicles (cars and motorcycles) divided by total campus' population	100
TR.2	Shuttle services	300
TR.3	Zero Emission Vehicles (ZEV) policy on campus	200
TR.4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200
TR.5	The ratio of the ground parking area to total campus area	150
TR.6	Transportation program designed to limit or decrease the parking area on campus for the last 3 years	100
TR.7	Number of transportation initiatives to decrease private vehicles on campus	200
TR.8	Pedestrian path on campus	300

Figure 5.5 Percentage of Score to Maximum Score for Transportation

Education

Indicator		Score
ED.1	The ratio of sustainability courses to total courses/modules	150
ED.2	The ratio of sustainability research funding to total research funding	150
ED.3	Scholarly publications on sustainability	150
ED.4	Events related to sustainability	225
ED.5	Student organizations related to sustainability	300
ED.6	University-run sustainability website	200
ED.7	Sustainability report	100

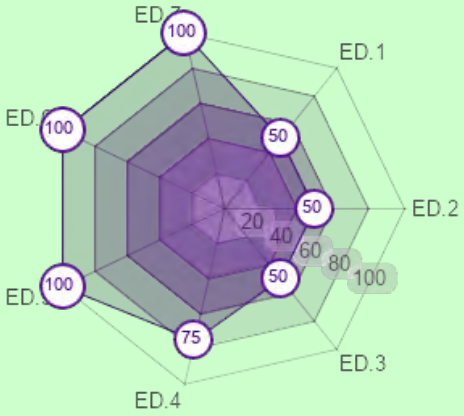


Figure 5.6 Percentage of Score to Maximum Score for Education

UI GREENMETRIC WORLD UNIVERSITY RANKINGS

About UI GreenMetric

UI GreenMetric World University Rankings is an annual publication of university rankings on sustainability. It is an initiative of the University of Indonesia that ranks universities around the world based on their commitment and actions towards sustainability. UI GreenMetric World University Rankings aims to increase university awareness towards sustainability.

History

UI GreenMetric World University Rankings is a non-profit initiative of University of Indonesia developed since 2010.

In 2009 the University of Indonesia hosted an International Conference on World University Rankings. The conference was attended by World University rankers such as Webometrics, HEEACT, and others. In 2010, Prof. Dr. Gumilar Rusliwa Somantri as Rector of the University of Indonesia at that time-initiated UI GreenMetric World University Rankings and appointed Prof. Riri Fitri Sari as the chairperson. Soon a team consisting of Junaidi, Budi Hartono, Allan Lauder, and Prof. Dr. Ir. Gunawan Tjahjono formulated UIGM Questionnaire and introduced UI Ranking to the world. In 2011, 11 new indicators in 5 categories have been added. Subsequently Education was added as a new category in 2012. By the year 2015, a massive improvement was introduced including carbon footprint and a more systematic data collection. In 2016 an online based review and validation system was prepared for the assessors.

Table 1. UI GreenMetric Timeline

UI GreenMetric Timeline	
2010	UI GreenMetric published for 95 Universities
2011	UI GreenMetric added 11 new indicators within 5 categories
2012	Education became one of the categories
2015	Introducing Carbon Footprint and Fact file document
2016	Focusing on university action towards sustainability
2017	UIGWURN established
2018	Focusing on SGDs and enlargement of memberships
2019	Improving questionaire and data collection method
2020	Introducing three new questions on social and economic aspects, such as (1) Startup for the green economy; (2) Public access to open spaces; (3) Community services

UIGM works on different themes every year. They are Policy into Action in 2016, Global Partnership for Sustainable Future in 2017, Universities, Impacts, and Sustainable Development Goals (SDGs) in 2018, Sustainable University in a Changing World: Lessons, Challenges and Opportunities in 2019, and Universities Responsibility for Sustainable Development Goals and World's Complex challenges in 2020. In 2020 912 universities from 84 countries participate in the rankings.

To reach and coordinate more participating universities, UI GreenMetric World University Rankings Network (UI GWURN) was established in 2017 with 1-2 national coordinators in each country. To make it work, Junaidi formulated a strategic framework for the network. Currently, there are 35 national coordinators in 30 countries in Asia, America, Africa and Europe. Each voluntarily organizes national workshop inviting other universities in their country. With the network UI GreenMetric World University Rankings has been increasingly recognized as the first and only universities ranking on sustainability with a global network. Since 2017 participating universities benchmark, do continuous improvement, and develop partnerships in the area of sustainability with other members.

As a member of International Ranking Expert Groups (IREG), more activities and collaboration among participating universities are expected to achieve our common goal: sustainable university for sustainable future. UI GreenMetric itself developed its own ranking system by studying other ranking systems such as: 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.

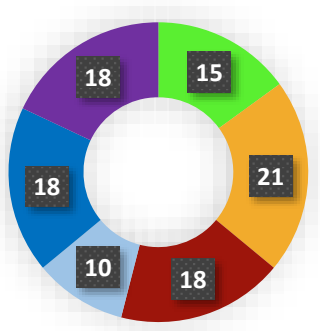
Methodology

UI GreenMetric collects data through online questionnaire. All participants answer questions in the questionnaire and provide evidence. After that, UI GreenMetric expert members and reviewers validate the answers based on the evidence provided. This year's categories and weighting of points are shown as follows. The specific indicators and their points awarded are shown in Table 3. Each indicator has been uniquely identified by a category code and a number (e.g. SI 5).

In our list, universities with the same total score will be ranked according to the highest weighted indicators, i.e firstly based on its Energy and Climate Change (EC) score, then based on the total score for Waste (WS), Transportation (TR), Education (ED). Subsequently, it will be based on its Setting and Infrastructure (SI) score, and lastly on its Water (WR) score.

Table 2. Categories 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 3. Each indicator has been uniquely identified by a category code and a number (e.g. SI 5).

Table 3 Indicators and categories

No	CRITERIA	Point	Weighting
1	**Setting and Infrastructure (SI)**		**15%**
SI1	The ratio of open space area to total area	300	
SI2	Total area on campus covered in forest vegetation	200	
SI3	Total area on campus covered in planted	300	
SI4	Total area on campus for water absorption besides the forest and planted	200	
SI5	The total open space area divided by total campus population	300	
SI6	Percentage of university budget for sustainability efforts within a year	200	
	Total	**1500**	
2	**Energy and Climate Change (EC)**		**21%**
EC1	Energy efficient appliances usage	200	
EC2	Smart building implementation	300	
EC3	Number of renewable energy sources on campus	300	
EC4	Total electricity usage divided by total campus' population (kWh per person)	300	
EC5	The ratio of renewable energy production divided by total energy usage per year	200	
EC6	Elements of green building implementation as reflected in all construction and renovation policies	300	
EC7	Greenhouse gas emission reduction program	200	
EC8	Total carbon footprint divided by total campus' population (metric tons per person)	300	
	Total	**2100**	
3	**Waste (WS)**		**18%**
WS1	Recycling program for university's waste	300	

WS2	Program to reduce the use of paper and plastic on campus	300	
WS3	Organic waste treatment	300	
WS4	Inorganic waste treatment	300	
WS5	Toxic waste treatment	300	
WS6	Sewage disposal	300	
	Total	**1800**	
4	**Water (WR)**		**10%**
WR1	Water conservation program & implementations	300	
WR2	Water recycling program implementation	300	
WR3	Water efficient appliances usage	200	
WR4	Consumption of treated water	200	
	Total	**1000**	
5	**Transportation (TR)**		**18%**
TR1	The total number of vehicles (cars and motorcycles) divided by total campus' population	200	
TR2	Shuttle services	300	
TR3	Zero Emission Vehicles (ZEV) policy on campus	200	
TR4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200	
TR5	Ratio of ground parking area to total campus' area	200	
TR6	Program to limit or decrease the parking area on campus for the last 3 years (from 2017 to 2019)	200	
TR7	Number of initiatives to decrease private vehicles on campus	200	
TR8	Pedestrian path on campus	300	
	Total	**1800**	
6	**Education and Research (ED)**		**18%**
ED1	The ratio of sustainability courses to total courses/subjects	300	
ED2	The ratio of sustainability research funding to total research funding	300	
ED3	Number of scholarly publications on sustainability	300	
ED4	Number of events related to sustainability	300	
ED5	Number of student organizations related to sustainability	300	
ED6	University-run sustainability website	200	
ED7	Sustainability report	100	
	Total	**1800**	

UI GreenMetric Team World University Rankings

Chairperson
Prof. Dr. Ir. Riri Fitri Sari, M.Sc., M.M.,

Vice-Chairs
Junaidi, S.S., MA.
Dr. Nyoman Suwartha, S.T., M.T., M.Agr.

Expert Members
Prof. Dr. Ir. Tommy Ilyas, M.Eng.
Prof. Ir. Gunawan Tjahjono, M.Arch., Ph.D.

IT Specialists
Dr. Ruki Harwahyu, M.T., M.Sc.
Rinoto Cahyo Utomo, S.Tr.
Jauzak Hussaini Windiatmaja, S.Kom.

Sabrina Hikmah Ramadianti, S.Si., Programme Coordinator
Hastin Setiani, S.Si., Administration Coordinator

UI GreenMetric
Integrated Laboratory and Research Center (ILRC) Building 4th Fl.
Universitas Indonesia
Kampus UI Depok 16424
Depok, Jawa Barat
Indonesia
Email: greenmetric@ui.ac.id

Appendix B: Details of Data Submission

UI GreenMetric Answer 2020

swu.ac.th

University Profile

Username : swu.ac.th
University Name : Srinakharinwirot University
University Leader : President : Ass. Prof. Dr. Somchai Santiwatanakul

PIC Profile

PIC Name : Ruktai Prurapark
PIC Position : SWU Green University Representative
Email : ruktai@g.swu.ac.th

No	Question	Choice	Answer
Setting and Infrastructure			
1.1(o)	Type of higher education institution	○ Comprehensive ○ Specialized higher education institution	○ Comprehensive
1.2(o)	Climate	○ Tropical Wet ○ Tropical Wet and Dry ○ Semiarid ○ Arid ○ Mediterranean ○ Humid Subtropical ○ Marine west coast / Oceanic Climate ○ Humid Continental ○ Subartic	○ Tropical Wet and Dry
1.3(o)	Number of campus site		2
1.4(o)	Campus setting	○ Rural ○ Suburban ○ Urban ○ In city center ○ High rise building	○ Rural
1.5(o)	Total campus area (m^2)		1802847
1.6(o)	Total campus ground floor area of buildings (m^2)		127865
1.7(o)	Total campus buildings area (m^2)		299690
1.8(SI.1)	The ratio of open space to total area. Formula: ((1.5-1.6/1.5)*100%)	○ <= 1% ○ > 1 - 80% ○ > 80 - 90% ○ > 90 - 95% ○ > 95%	○ > 90 - 95%
1.9(SI.2)	Total area on campus covered in forest vegetation (please provide total area in square meters)	○ <= 2% ○ > 2 - 9% ○ > 9 - 22% ○ > 22 - 35% ○ > 35%	○ > 2 - 9% | Total area : 124632

No	Question	Choice	Answer
1.10(SI.3)	Total area on campus covered in planted vegetation (please provide total area in square meters)	○ <= 10% ○ > 10 - 20% ○ > 20 - 30% ○ > 30 - 40% ○ > 40%	○ > 30 - 40% | Total area : 637872
1.11(SI.4)	Total area on campus for water absorption besided forest and planted vegetation (please provide total area in square meters)	○ <= 2% ○ > 2 - 10% ○ > 10 - 20% ○ > 20 - 30% ○ > 30%	○ > 30% | Total area : 912478
1.12(o)	Total number of regular students (part time and full time)		8401
1.13(o)	Total number of online students (part time and full time)		0
1.14(o)	Total number of academic and administrative staff		2371
1.15(SI.5)	The total open space area divided by total campus population. Formula: ((1.5-1.6)/(1.12+1.14))	○ <= 10 m^2 / person ○ > 10 – 20 m^2 / person ○ > 20 – 40 m^2 / person ○ > 40 – 70 m^2 / person ○ > 70 m^2 / person	○ > 70 m^2 / person
1.16(o)	Total university's budget (in US Dollars)		268856000
1.17(o)	University's budget for sustainability effort (in US Dollars)		8613000
1.18(SI.6)	Percentage of University's budget for sustainability effort	○ <= 1% ○ > 1 - 5% ○ > 5 - 10% ○ > 10 - 15% ○ > 15%	○ > 1 - 5%
Energy and Climate Change			
2.1(EC.1)	Energy efficient appliances usage	○ < 1% ○ 1 - 25% ○ > 25 - 50% ○ > 50 - 75% ○ > 75%	○ > 75%
2.2(o)	Total campus smart building area (m^2)		155849
2.3(EC.2)	Smart Building implementation (percentage of the total floor area of smart building to the total all floors building area (smart and non-smart buildings area).	○ < 1% ○ 1% - 25% ○ > 25% - 50% ○ > 50% - 75% ○ > 75%	○ > 50% - 75%
2.4(EC.3)	Number of renewable energy sources in campus (solar power, bio diesel, wind power, etc)	○ None ○ 1 source ○ 2 sources ○ 3 sources ○ > 3 sources	○ 3 sources

No	Question	Choice	Answer
2.5(o)	Please specify renewable energy sources in campus and provide capacity produced in kilowatt hour	☐ Not Applicable ☐ Bio Diesel ☐ Clean Biomass ☐ Solar Power ☐ Wind Power ☐ Geothermal ☐ Hydropower ☐ Combine Heat and Power	☐ Not Applicable
2.6(o)	Electricity usage per year (in kilo watt hour)		15876566
2.7(EC.4)	The total electricity usage divided by total campus population (kWh per person). Formula: (2.6) / (1.12+1.14)	○ >= 2424 kWh ○ < 2424 - 1535 kWh ○ < 1535 - 633 kWh ○ < 633 - 279 kWh ○ < 279 kWh	○ < 1535 - 633 kWh
2.8(EC.5)	The ratio of renewable energy production divided by total energy usage per year	○ <= 0.5% ○ > 0.5 - 1% ○ > 1 - 2% ○ > 2 - 25% ○ > 25%	○ <= 0.5%
2.9(EC.6)	Elements of green building implementation as reflected in all construction and renovation policies	○ None ○ 1 element ○ 2 elements ○ 3 elements ○ > 3 elements	○ > 3 elements
2.10(EC.7)	Greenhouse gas emission reduction program	○ None (reduction program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ Program(s) aims to reduce one out of three scopes emissions (Scope 1 or 2 or 3) ○ Program(s) aims to reduce two out of three scopes emissions (Scope 1 and 2 or Scope 1 and 3 or Scope 2 and 3) ○ Program(s) aims to reduce all three scopes emissions (Scope 1, 2 and 3)	○ Program(s) aims to reduce all three scopes emissions (Scope 1, 2 and 3)
2.11(o)	Please provide the total carbon footprint (CO_2 emission in the last 12 months, in metric tons)		13638
2.12(EC.8)	The total carbon footprint divided by total campus population (metric tons per person). Formula: (2.11)/(1.12+1.14)	○ >= 2.05 metric ton ○ < 2.05 - 1.11 metric ton ○ < 1.11 - 0.42 metric ton ○ < 0.42 - 0.10 metric ton ○ < 0.10 metric ton	○ < 2.05 - 1.11 metric ton
Waste			

No	Question	Choice	Answer
3.1(WS.1)	Recycling program for university waste	○ Not Applicable ○ Partial (1% - 25% of waste) ○ Partial (> 25% - 50% of waste) ○ Partial (> 50% - 75% of waste) ○ Extensive (> 75% waste)	○ Partial (> 25% - 50% of waste)
3.2(WS.2)	Program to reduce the use of paper and plastic on campus	○ Not applicable. If there is no program in your university. ○ 1 program ○ 2 programs ○ 3 programs ○ more than 3 programs	○ more than 3 programs
3.3(WS.3)	Organic waste treatment	○ Open dumping ○ Partial (1% - 25% of treated) ○ Partial (> 25% - 50% of treated) ○ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)	○ Partial (> 50% - 75% of treated)
3.4(WS.4)	Inorganic waste treatment	○ Burned in the open ○ Partial (1% - 25% of treated) ○ Partial (> 25% - 50% of treated) ○ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)	○ Partial (> 25% - 50% of treated)
3.5(WS.5)	Toxic waste treatment	○ Not Managed ○ Partial (1% - 25% of treated) ○ Partial (> 25% - 50% of treated) ○ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)	○ Extensive (> 75% treated)
3.6(WS.6)	Sewage disposal	○ Untreated to waterways ○ Treated conventionally ○ Treated technically for reuse ○ Treatment for down cycling ○ Treatment for up cycling	○ Treated conventionally
Water			

No	Question	Choice	Answer
4.1(WR.1)	Water conservation program and implementation	○ None (Conservation program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% implemented at early stage (e.g. measurement of potential surface runoff volume) ○ > 25 - 50% water conserved ○ > 50% water conserved	○ > 50% water conserved
4.2(WR.2)	Water recycling program implementation	○ None (Water recycling program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% Implemented at early stage (e.g. measurement of waste water) ○ > 25 - 50% water recycled ○ > 50% water recycled	○ > 25 - 50% water recycled
4.3(WR.3)	Water efficient appliance usage	○ None (Water efficient appliances is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% of water efficient appliances installed ○ > 25 - 50% of water efficient appliances installed ○ > 50% of water efficient appliances installed	○ > 25 - 50% of water efficient appliances installed
4.4(WR.4)	Treated water consumed	○ None ○ 1% - 25% treated water consumed ○ > 25% - 50% treated water consumed ○ > 50% - 75% treated water consumed ○ > 75% treated water consumed	○ > 50% - 75% treated water consumed
Transportation			
5.1(o)	Number of cars actively used and managed by University		100
5.2(o)	Number of cars entering the university daily		580

No	Question	Choice	Answer
5.3(o)	Number of motorcycles entering the university daily		906
5.4(TR.1)	The total number of vehicles (cars and motorcycles) divided by total campus population. Formula: (5.1+5.2+5.3)/(1.12+1.14)	○ >=1 ○ < 1 - 0.5 ○ < 0.5 - 0.125 ○ < 0.125 - 0.045 ○ < 0.045	○ < 0.5 - 0.125
5.5(TR.2)	Shuttle service	○ Shuttle service is possible but not provided by university ○ Shuttle service is provided (by university or other parties) and regular but not free ○ Shuttle service is provided (by university or other parties) and the university contributes a part of the cost. ○ Shuttle service is provided by university, regular, and free ○ Shuttle service is provided by university, regular, and environment friendly. Or shuttle use is not possible (not applicable)	○ Shuttle service is provided by university, regular, and environment friendly. Or shuttle use is not possible (not applicable)
5.6(o)	Number of shuttles operated in your university		20
5.7(o)	Average number of passengers of each shuttle		24
5.8(o)	Total trips of shuttle services each day		108
5.9(TR.3)	Zero Emission Vehicles (ZEV) policy on campus	○ Zero Emission Vehicles are not available ○ Zero Emission Vehicles use is not possible or practical ○ Zero Emission Vehicles are available, but not provided by university ○ Zero Emission Vehicles are available, and provided by university and charged ○ Zero Emission Vehicles are available, and provided by university for free	○ Zero Emission Vehicles are available, and provided by university for free
5.10(o)	Average number of Zero Emission Vehicles (e.g. bicycles, cano, snowboard, electric car, etc.) on campus per day		1618
5.11(TR.4)	The total number of Zero Emission Vehicles (ZEV) divided by total campus population. Formula: (5.10)/(1.12+1.14)	○ <= 0.002 ○ > 0.002 - 0.004 ○ > 0.004 - 0.008 ○ > 0.008 - 0.02 ○ > 0.02	○ > 0.02

No	Question	Choice	Answer
5.12(o)	Total ground parking area (m^2)		37751
5.13(TR.5)	Ratio of parking area to total campus area. Formula: ((5.12/1.5) x 100%)	○ > 11% ○ < 11 - 7% ○ < 7 - 4% ○ < 4 - 1% ○ < 1%	○ < 4 - 1%
5.14(TR.6)	Transportation program designed to limit or decrease the parking area on campus for the last 3 years (from 2017 to 2019)	○ None ○ Program in preparation (e.g. feasibility study and promotion) ○ Less than 10% decrease ○ Between 10% - 30% decrease ○ Program resulting in more than 30% decrease in parking area or parking area reduction has reaches its limit.	○ Less than 10% decrease
5.15(TR.7)	Number of transportation initiatives to decrease private vehicles on campus (e.g. car sharing, charging high parking fees, metro / tram / bus services and etc)	○ No initiative ○ 1 initiative ○ 2 initiatives ○ 3 initiatives ○ > 3 initiatives, or initiative no longer required	○ > 3 initiatives, or initiative no longer required
5.16(TR.8)	Pedestrian path on campus	○ None ○ Pedestrian paths are available ○ Pedestrian paths are available, and design for safety ○ Pedestrian paths are available, designed for safety and convenience ○ Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features	○ Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features
5.17(o)	Approximate daily travel distance of a vehicle inside campus only (in Kilometers)		2
Education and Research			
6.1(o)	Number of courses/subjects related to sustainability offered		361
6.2(o)	Total number of courses/subjects offered		5631
6.3(ED.1)	The ratio of sustainability courses to total courses/subjects	○ <= 1% ○ > 1 - 5% ○ > 5 - 10% ○ > 10 - 20% ○ > 20%	○ > 5 - 10%
6.4(o)	Total research funds dedicated to sustainability research (in US Dollars) (average per annum over the last 3 years).		848584

No	Question	Choice	Answer
6.5(o)	Total research funds (in US Dollars) (average per annum over the last 3 years).		8509019
6.6(ED.2)	The ratio of sustainability research funding to total research funding	○ <= 1% ○ > 1 - 8% ○ > 8 - 20% ○ > 20 - 40% ○ > 40%	○ > 8 - 20%
6.7(ED.3)	Number of scholarly publications on sustainability published. (average annualy for the past 3 years)	○ 0 ○ 1 - 20 ○ 21 - 83 ○ 84 - 300 ○ > 300	○ 21 - 83
6.8(ED.4)	Number of events related to sustainability. (average annualy for the past 3 years)	○ 0 ○ 1 - 4 ○ 5 - 17 ○ 18 - 47 ○ > 47	○ 18 - 47
6.9(ED.5)	Number of student organizations related to sustainability	○ 0 ○ 1 - 2 ○ 3 - 4 ○ 5 - 10 ○ > 10	○ > 10
6.10(ED.6)	University-run sustainability website	○ Not available ○ Website in progress or under construction ○ Website is available and accessible ○ Website is available, accessible, and updated occasionally ○ Website is available, accessible, and updated regularly	○ Website is available, accessible, and updated regularly
6.11(o)	Sustainability website address (URL) if available		green.swu.ac.th
6.12(ED.7)	Sustainability report	○ Not available ○ Sustainability report is in preparation ○ Available but not publicly accessible ○ Sustainability report is published ○ Sustainability report is published annually	○ Sustainability report is published annually

Appendix C: Related Evidence for Data Submission

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.3] Number of Campus sites

<table>
<tr>
<td> 



 </td>
<td>Ongkharak Campus (Main)
(Srinakharinwirot University, Thailand)</td>
</tr>
<tr>
<td>  </td>
<td>Prasarnmit Campus
(Srinakharinwirot University, Thailand)</td>
</tr>
</table>

Description:
Srinakharinwirot University (SWU) has nineteen faculties spread across two campuses. The older social science faculties are at the Prasarnmit Campus in downtown Bangkok. The newer health science faculties, plus the Faculty of Engineering, are at the Ongkharak Campus, 70km NE of Bangkok. The Ongkharak Campus is the larger of the two – both in land footprint and number of students – and hence is designated the main SWU campus for this GreenMetric submission.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.4] Main campus setting

Rural setting for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Encompassing more than 1.8 million square metres, Srinakharinwirot University's Ongkharak campus is a beautiful and leafy campus located approximately 70-kilometers away from Bangkok. HRH Princess Maha Chakri Sirindhorn Medical Center is located here alongside the Faculty's new educational and administrative building. Students based at Ongkharak include first year and clinical year students who are provided with onsite dormitories and enjoy numerous facilities including a swimming pool, indoor badminton courts, tennis courts, futsal areas, and other exercise facilities. The main medical library is located at the Faculty's new building at Ongkharak campus.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.5] Total main campus area (meter^2)

Output : Current Area

1802846.97 m² | 1.80 km² | 445.49 acres | 180.28 hectares | 19405683.29 feet² | 0.70 square miles | 0.52 square nautical miles

Main campus area for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Used Daft Logic website (a Google Maps Area Calculator Tool) to obtain the answer of 1,802,847 m^2.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.6] Total campus ground floor area of buildings (meter^2)

Output : Total Area(s)

127864.77 m^2 | 0.13 km^2 | 31.60 acres | 12.79 hectares | 1376324.92 feet^2 | 0.05 square miles | 0.04 square nautical miles

Total campus ground floor area of buildings for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Used Daft Logic website (a Google Maps Area Calculator Tool) to obtain the answer of 127,865 m^2.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.9] Total area on campus covered in forest vegetation (m^2)

Output : Total Area(s)

124631.83 m^2 | 0.12 km^2 | 30.80 acres | 12.46 hectares | 1341525.85 $feet^2$ | 0.05 square miles | 0.04 square nautical miles

Total area on **Ongkharak Campus** covered in forest vegetation (Srinakharinwirot University, Thailand)

Description:
Total area on campus covered in forest vegetation = 124,632 m^2
Total area of campus = 1,802,847 m^2
Ratio of campus covered in forest vegetation = (124,632 / 1,802,847) x 100 = **6.90%**.

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[1] Setting and Infrastructure (SI)

[1.10] Total area on campus covered in planted vegetation (meter^2)

Output : Total Area(s)

637871.89 m² | 0.64 km² | 157.62 acres | 63.79 hectares | 6865995.86 feet² | 0.25 square miles | 0.19 square nautical miles

Total area on campus covered in planted vegetation for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Used Daft Logic website (a Google Maps Area Calculator Tool) to obtain the answer of 637,872 m^2.

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.1] Energy efficient appliances usage are replacing conventional appliances

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td colspan="2">SWU's (Ongkarak Campus) 2018 campaign to become more energy efficient</td></tr>
</table>

Description:
SWU (Ongkharak Campus) recently (in 2018) replaced 30,000 of their 34,000 36-watt halogen lightbulbs with 18-watt LED bulbs.

Additionally, they are, at the time of writing, replacing 375 of their 5,185 aircon units with brand new energy efficient units (some inverters and some VRFs).

So the percentage of energy efficient appliances in use is (30,000+375) / (34,000+5,185) x 100% = **77.5%**

Template for Evidence(s)
UI GreenMetric Questionnaire

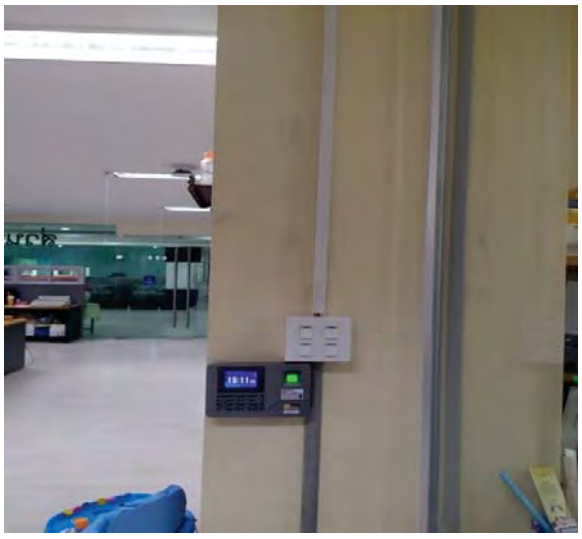
University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.3] Smart Building implementation

Automatic doors (Administrative Building)

Fingerprint scanners (Administrative Building)



Description:

According to the importance of smart building, SWU has already installed plenty of equipment counted as smart building around the campus and monitors them with Building Management System (BMS). Disappointedly, last year SWU didn't have enough time to provide the data for the submission. This year SWU's working team , however, provides sufficient evidence for smart building. That is, the total area of smart buildings on the campus accounts for 155,489 square meter (m^2) out of total area of the buildings of 299,690 square meter(m^2). Thus, the ratio of smart building to total building area is 51.89 %.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.5] Renewable energy produced inside campus

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Examples of renewable energy sources at SWU's Ongkharak Campus</td></tr>
</table>

Description:
Srinakharinwirot University (SWU) have three sources of renewable energy supplying power at their Ongkharak Campus:

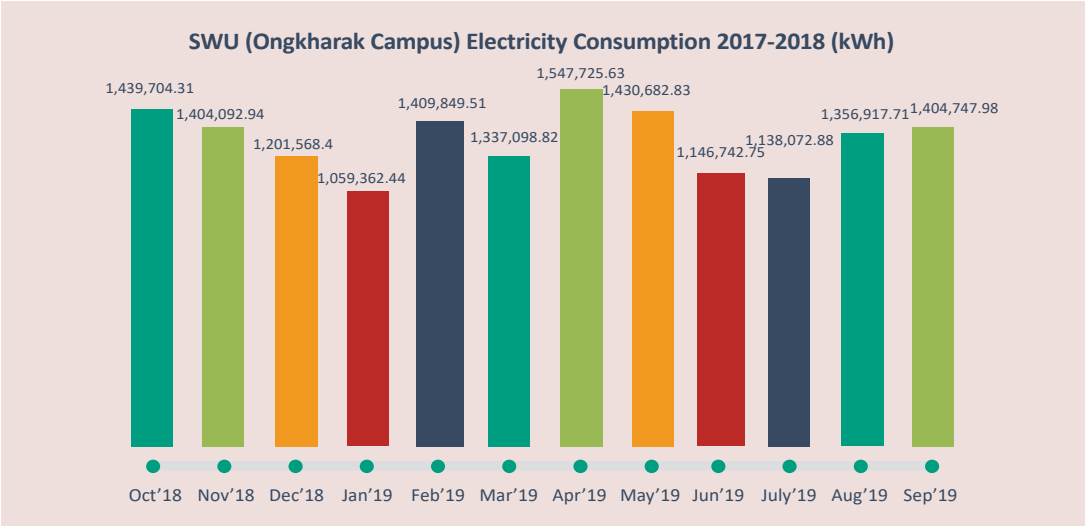
1) Solar powered lighting in several carparks and in newly-installed pedestrian walkways.
2) A bio-methane plant on campus
3) Pyrolysis

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.6] Electricity usage per year (in kilowatt-hour)



Electricity usage per year by **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Total electricity usage per year = **15,876,566 kWh**

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.9] Elements of green building implementation as reflected in all construction and renovation policy


Natural day-lighting – Faculty of Nursing


Natural day-lighting – Faculty of Medicine


Natural day-lighting - New Welcome Building


Tinted windows – one of several new buildings


Tinted windows – renovated Faculty of Engineering

Description:

- Natural day-lighting is found in many of SWU Ongkharak's faculty buildings.
- Tinted windows are used in all new building construction and in renovated buildings.
- Each building has a dedicated Manager to ensure minimum energy usage occurs.
- Natural ventilation is installed in almost every building.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[2] Energy and Climate Change (EC)

[2.11] Total carbon footprint (CO2 emission in the last 12 months, in metric tons)

Greenhouse gas, GHG, emission is derived from variety of the sources categorized into 3 scopes. Here are the examples of related attempts to reduce GHG emission in each scope.

Scope 1: Pyrolysis and biomass programs, initiated by the faculty of Engineering, are intended for the reduction of GHG emitted in terms of stationary combustion.

Scope 2: The launch of ZEVs helping comfort the students and staff as well as solar panels installed throughout the campus is highly in concern of the university in attempts of reducing GHG emission.

Scope 3: The university has a potential to conserve and produce the water, distributed to all the members on the campus for their sufficient water consumption (not for drinking). This can help reduce the dependence on water purchase from off-campus water producers, leading to the decline in GHG emission. The university, furthermore, often holds online conference to reduce the travel cost.

Here is the sum of CO2 emission in the last 12 months.

Co2 (electricity)	= (15,876,566 / 1000) x 0.84 = 13,336.32 metric ton
Co2(bus)	= (20*108*2*240/100)*0.01 = 103.68 metric ton
Co2(cars)	= (580*2*2*240/100)*0.02= 111.36 metric ton
Co2(motorcycle)	= (906*2*2*240/100)*0.01= 86.98 metric ton
Co2(total)	= 13,336.32 + 103.68 + 111.36 + 86.98 = 13,638.33 metric ton

Calculation of SWU (Ongkharak Campus) carbon footprint calculation using formula provided by UI GreenMetric

Description:

SWU's (Ongkharak Campus) total carbon footprint for the previous 12 months was 13,638 metric tons

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.1] Recycling Program For University Waste

Recycle bins at SWU (Ongkharak Campus)

Description:
Until October 2018, we did not have exact figures for the amount of waste that was recycled. To exactly evaluate the amount of waste recycled, we, from October 1st 2018, kicked off a program for the daily-basis data of recycle waste collection. As of August 2019, we have collected recycle waste of 83,778 kilograms out of expected total amount of waste of 300,000 kilograms (calculated from the total amount of waste which is equal to 1,000 kilograms/day for 10 months). To annually conclude the amount of waste recycled from the data provided above, it is forecasted that the amount of waste recycled per annum is approximately 28% of total waste.

Additionally, students and staff are encouraged to dispose of waste in the provided bins categorized by the types of waste. The bins, including recycle bins, are found all over the campus. As can be seen in these photos, they are well utilised. Plastic, aluminium and glass are spearated at the point of disposal.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.2] Program to Reduce The Use of Paper and Plastic in Campus

<table>
<tr>
<td> 

Re-use of paper encouraged</td>
<td> 

“Be a part of SWU, the Green University, by reducing the use of plastic bags and food containers”</td>
</tr>
<tr>
<td> 
Drinking water fountains seen all over campus</td>
<td> 
All new students given cloth bags</td>
</tr>
<tr>
<td colspan="2">Examples of SWU (Ongkharak Campus) efforts to reduce the use of plastic and paper on campus</td>
</tr>
</table>

Description:
the answer to WS.2 is [5] more than 3 programs **(10 programs in total)**

Reduction of the use of paper

1. reuse of one-side used paper

2. encouragement of more production of E-documents and E-document management system

3. printing when necessary

Reduction of the use of plastic

4. the launch of plastic-use-reduction campaigns

5. providing free water distribution in replacement of the use of plastic water bottles

6. the replacement of plastic food containers and with natural food containers such as banana-leaf containers

7. providing 100%-biodegradable straws and the restriction of plastic straws

8. Stop handing out plastic bags at all of the convenient stores around the campus

Reduction of the use of plastic bags

9. providing ALL fresher students with cloth bags

Plastic and paper use policy

10. policies for dematerialization of administrative procedures

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.3] Organic Waste Treatment






Processing and treatment of the organic leaves / vegetation across the vast vegetation area at **SWU (Ongharak Campus)**

Description:

35% of the 1.8 million sq.m. of Ongkharak Campus is covered in vegetation with a further 7% covered in trees / forest. This results in a lot of organic waste. As these photos show, this organic waste is collected and treated to turn it into fertilizer.

In 2018, we did not have exact figures for the amount of organic waste that was treated. To exactly evaluate the amount of organic waste treated, we, in 2019, kicked off a program for the daily-basis data of waste collection. We have collected general waste as well as recycle/organic/ inorganic/ toxic waste and plastic for recycling and unable-to-recycle plastic for crude oil extraction. The total amount of organic waste collected

from August 1st, 2019 to September 19th ,2019 is 75.24 kilograms per day and about 50% of it is treated. The treated organic waste is mainly used to feed fish, and also to make fertilizers for plants around the campus. To annually conclude the amount of organic waste from the data provided above, it is forecasted that the amount of organic waste treated per annum is 55% of total waste.

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.4] Inorganic Waste Treatment

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Attempts to reduce inorganic waste at SWU (Ongkharak Campus)</td></tr>
</table>

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Description:

Metal is resold for other purposes. 100 percent of single-page printouts are reused by being sent to the company to treat. The rest of papers are treated and sold. Papers for consumable products such as paper cups are separated and resold. Certain types of plastic such as plastic bags and PET bottles are treated with pyrolysis process. Most of inorganic waste is treated both inside and outside campus (by third parties). Thus, the amount of inorganic waste treated is 25-50%

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.5] Toxic waste handled

Toxic waste bin at **SWU (Ongkharak Campus)**

Description:

Toxic waste is separated at the point of disposal. This is facilitated by bins being placed at strategic locations around campus where toxic waste is likely to be produced. SWU has its own medical school and a hospital that produce toxic waste, all of which is 100% treated with appropriate procedures. Also, SWU had an attempt to outsource the companies to treat toxic waste generated by few faculties, such as the faculty of Engineering and the faculty of Pharmacy. For the faculty of Engineering, toxic waste was treated 623.5 kilograms which is 100% of total toxic waste. Thus, the toxic waste generated by those mentioned above is 100% treated.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[3] Waste (WS)

[3.6] Sewerage Disposal

Description:
SWU technically uses membrane bioreactors to help support the sewage disposal system on the campus.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[4] Water (WR)

[4.1] Water Conservation Program Implementation

1. The water reservoirs designed for water conservation program (entirely treated and distributed to the people across the campus for consumption (not for drinking)).

2. Natural lakes and rivers interconnecting waterways across the campus, wholly for water conservation

3. Examples of waterways found all around the campus

Description:
SWU sufficiently produces and distributes water for consumption (not for drinking) to the people across the campus. More than half of the water conserved through surface runoff into the reservoirs, derived from both nature and construction. The volume of water is conserved fully in the containers such as natural lakes, ponds and reservoirs, made for water conservation purpose. However, water coming from rainfalls cannot be entirely conserved due to the capacity constraint of available reservoirs.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[4] Water (WR)

[4.2] Water Recycling Program Implementation

Water Recycling System from various sources such as water from laundry machines and water runoff conserved in lakes.

Tanks for recycled water

water runoff conserved in lakes

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

UI GreenMetric

Examples of the Use of Recycled Water

1. Toilet Flushing

2. Watering Plants
   2.1. Hydroponic Gardening
   2.2. Melon Farm

Hydroponic Gardening

Melon Farm

3. Car/bus washing

Description:

SWU saw the importance of water recycling, and thus implemented water-recycling program. Water used for many purposes such as for laundry can be treated through the water-recycling program to be reused again. Furthermore, throughout the campus, there are several large lakes and interconnecting waterways serving as both repositories for conserving water runoff and also as a source from which the vast swathes of vegetation across campus can be watered. With this attempt, in 2019, SWU can achieve the amount of 25-50% of water recycled, and **the quality of water treated is within the standard for consumption (not for drinking), shown on the table below.**

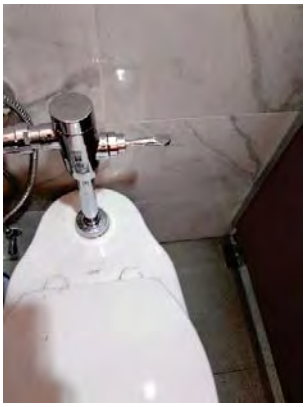
	List to check	Scale	Standard scale
1	Acidity-alkalinity (pH)	7.46	6.50 - 8.50
2	Free Chlorine residue	0.31	0.20 – 0.50
3	Total Dissolved Solids (TDS)	168	< 1,000
4	Appearance Color	5	< 15
5	Turbidity	0.02	5
6	Iron (Fe)	0	< 0.30
7	Nitrate	0	< 50
8	Nitrite	0	< 3
9	Total Hardness	110	< 300

Template for Evidence(s)
UI GreenMetric Questionnaire

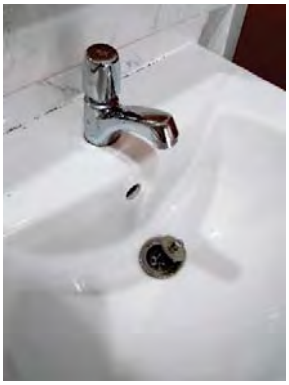
University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[4] Water (WR)

[4.3] The Use of Water Efficient Appliances (Water tap, toilet flush, etc)



Efficient toilet flushes installed in new building


Efficient urinal flush found in most buildings


Efficient tap found in many buildings


Low-cost technique by replacing a water bottle inside the water tank, helping reduce the water use by 25%

Examples of efficient water appliances found across **SWU's Ongkharak Campus**

Description:
1,590 of the 5,007 water appliances (taps and flushes) found across SWU's Ongkharak Campus are classed as efficient. This equates to 1,590 / 5,007 x 100 = **31.76%**

In addition, we also use a low-cost technique by replacing a water bottle inside the water tank, helping reduce the water use by 25%.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

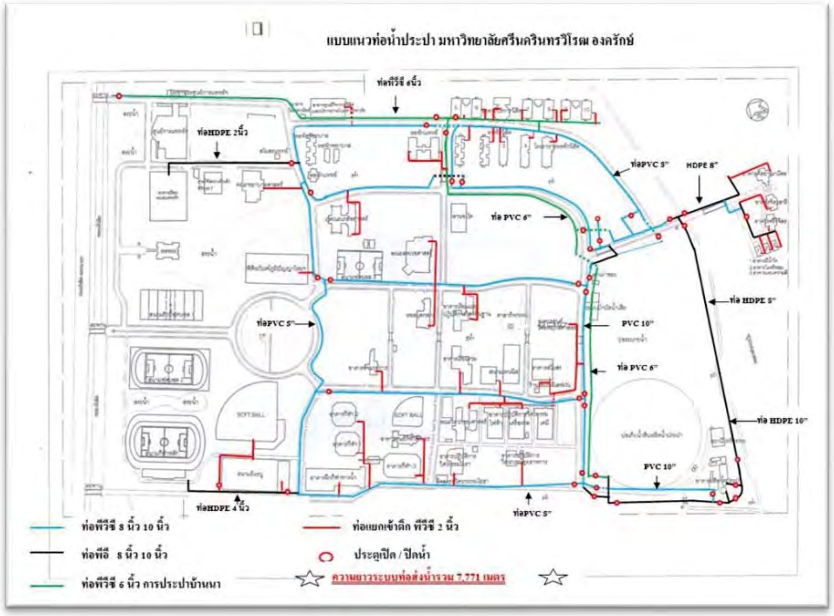
University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[4] Water (WR)

[4.4] Consumption of treated water

1. Water treated for consumption (not for drinking) distributed through water pipelines installed around the campus

The process of water production run by the university



Water pipelines distributing water produced by the university

	List to check	Scale	Standard scale
1	Acidity-alkalinity (pH)	7.46	6.50 – 8.50
2	Free Chlorine residue	0.31	0.20 – 0.50
3	Total Dissolved Solids (TDS)	168	< 1,000
4	Appearance Color	5	< 15
5	Turbidity	0.02	5
6	Iron (Fe)	0	< 0.30
7	Nitrate	0	< 50
8	Nitrite	0	< 3
9	Total Hardness	110	< 300

Weekly water quality check

2. Examples of Water Treated by Membrane Bioreactor (MBR)

Description:
As SWU raises awareness of water treatment and highlights on it, a great amount of 50-75% of water is treated.

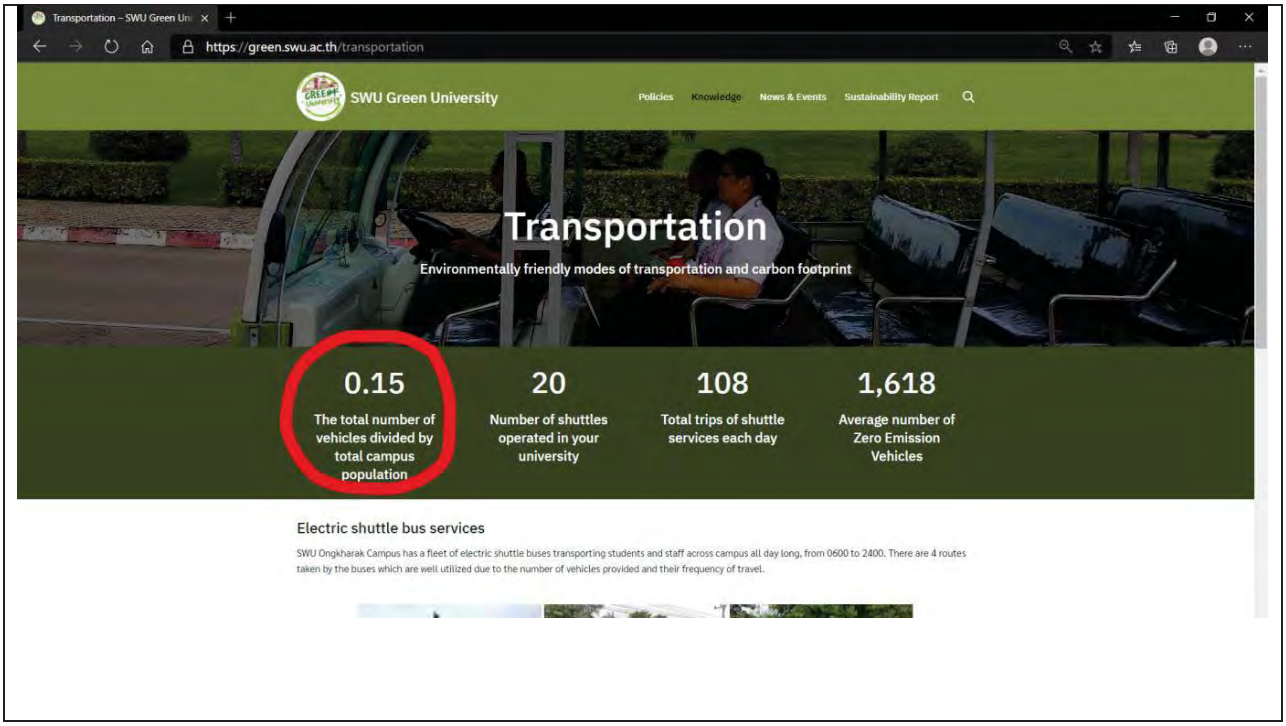
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.4] The total number of vehicles (cars and motorcycles with combustion engine) divided by total campus' population



Description:

Number of cars actively used and managed by university = 100 units
Number of cars entering the university daily = 580 units
Number of motorcycles entering the university daily = 906 units

The total number of vehicles (cars and motorcycles with combustion engine) divided by total campus' population = (100+580+906) / 10,772 = 0.15

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.5] Shuttle services

<table>
<tr>
<td>  </td>
<td>  </td>
</tr>
<tr>
<td>  </td>
<td> 
</td>
</tr>
</table>

Description:

SWU Ongkharak Campus has and organizes a fleet of electric shuttle buses transporting students and staff across campus all day long from 06.00 to 24.00, and provides the service free of charge. The buses runs on 4 routes, covering all the area on the campus, which are well utilized due to the sufficient number of vehicles provided by the university and their frequency of travel.

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.9] Zero Emission Vehicles (ZEV) policy on campus

1. Free-of-Charge Bicycles

2. Free-of-Charge Electric Cars and Electric Car Charging Stations

3. Free-of-Charge canoes

Description:

To minimize the volume of green-house gases, SWU (Ongkharak Campus) is highly concerned about this issue by providing a sufficient number of bicycles, electric cars and canoes free of charge to all students and university staff members.

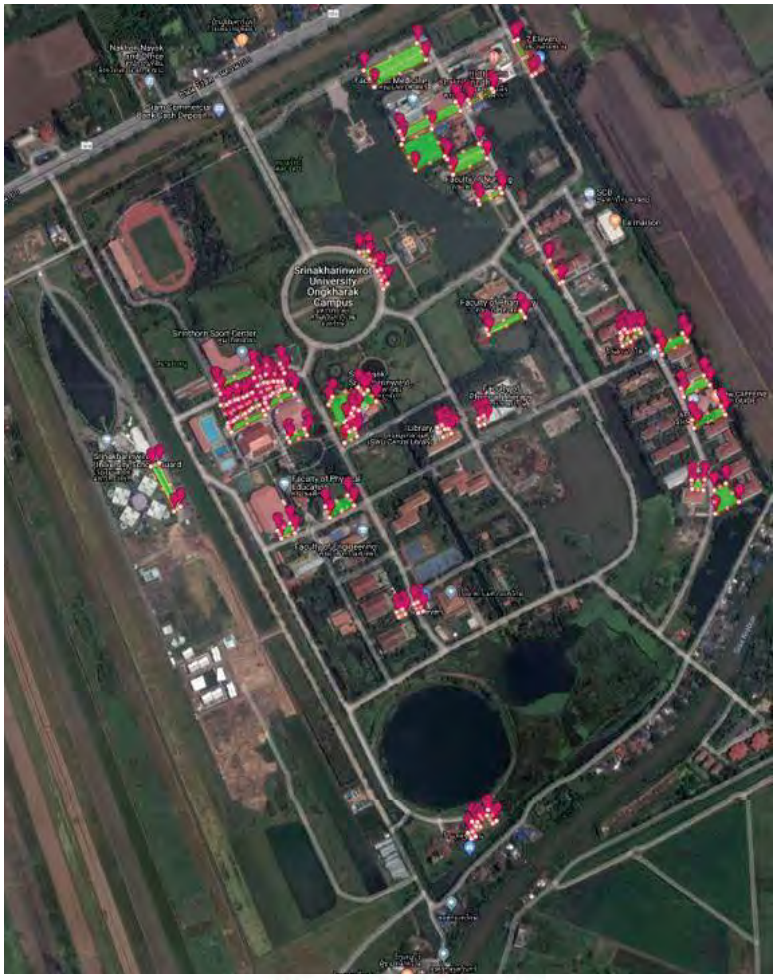
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.13] Ratio of parking area to total campus area



Output : Total Area(s)

37751.00 m² | 0.04 km² | 9.33 acres | 3.78 hectares | 406348.39 feet² | 0.01 square miles | 0.01 square nautical miles

Ratio of parking area to total campus area for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Total campus area = 1,802,847 m^2
Parking area = 37,751 m^2
Ratio of parking area to total campus area = (37,751 / 1,802,847) x 100% = **2.09%**

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.14] Program to limit or decrease the parking area on campus for the last 3 years (from 2017 to 2019)

The program to shrink the parking areas around gyms and gymnasiums
to become the area of recreational purposes

Description:

Moving a lot of parking outside the campus, transforming parking lot into recreation area.

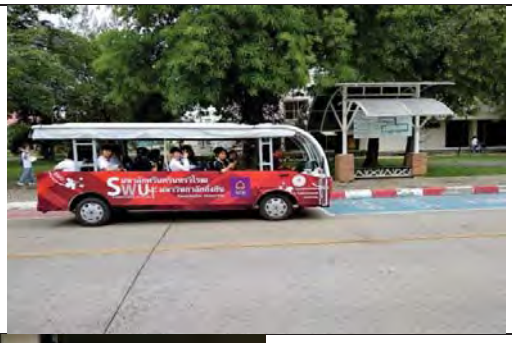
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.15] Number of initiative to decrease private vehicles on campus

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">1. Bus services</td></tr>
</table>

2. Bike sharing

3. Campaign to lessen the number of private motorcycles

4. The program to shrink the parking areas around gyms and gymnasiums to become the area of recreational purposes

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Description:

There are 4 initiatives to decrease private vehicles.
1. Bus services
2. Bike sharing
3. Campaign to lessen the number of private motorcycles
4. The program to shrink the parking areas around gyms and gymnasiums to become the area of recreational purposes

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[5] Transportation (TR)

[5.16] Pedestrian path policy on campus

Description:
1. Safety marking along the entire covered walkway routes.
2. Well-lit for pedestrians to use the walkways at night.
3. Frequently placed ramps for pedestrians with physical disabilities.

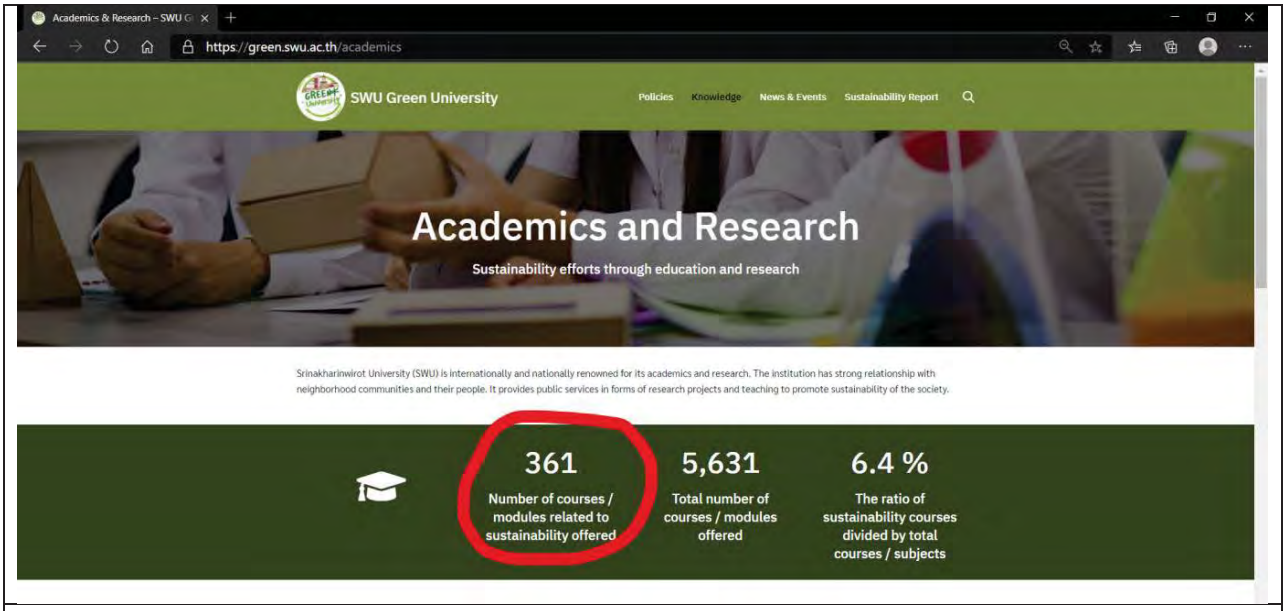
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

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



Courses on sustainability and environment for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
The data has been revised with 361 sustainability courses (Part 1 + Part 2 + Part 3 = 320 + 37 + 4) taught within the university.

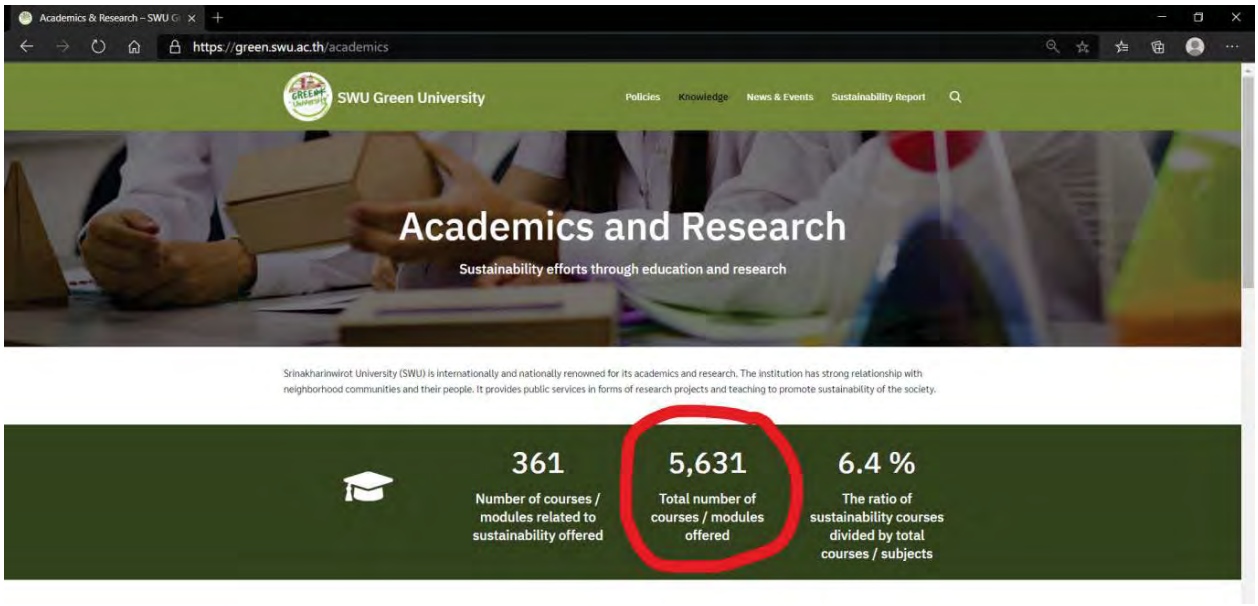
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.2] Total number of courses/modules offered



Total courses offered by **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Total number of courses/modules offered = **5,631 courses**

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.4] Total research funds dedicated to sustainability research (in US Dollars)

SWU have just assigned THB27,800,000 to research the possibility of converting plastic waste into a biofuel (pyrolysis). Data is not available for the years 2016 and 2017.
Ongkharak Campus (Srinakharinwirot University, Thailand)

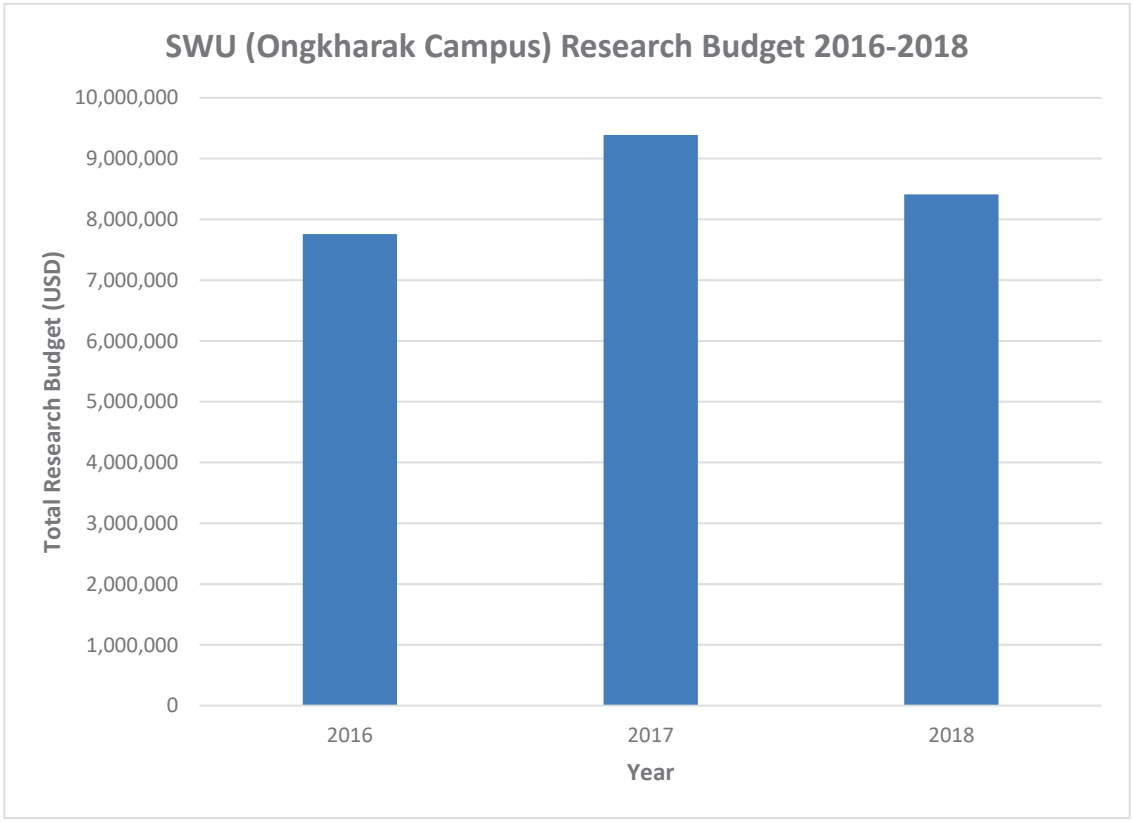
Description:
THB27,800,000 has been assigned to a pyrolysis project. At an fx rate of THB32.7 to USD1 this equates to USD848,584.

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.5] Total research funds (in US Dollars)



Ongkharak Campus (Srinakharinwirot University, Thailand)

Description:
Total research fund in 2016 = USD7,757,006
Total research fund in 2017 = USD9,387,281
Total research fund in 2018 = USD8,409,209

The averaged annum last 3 years of research fund = USD8,509,019

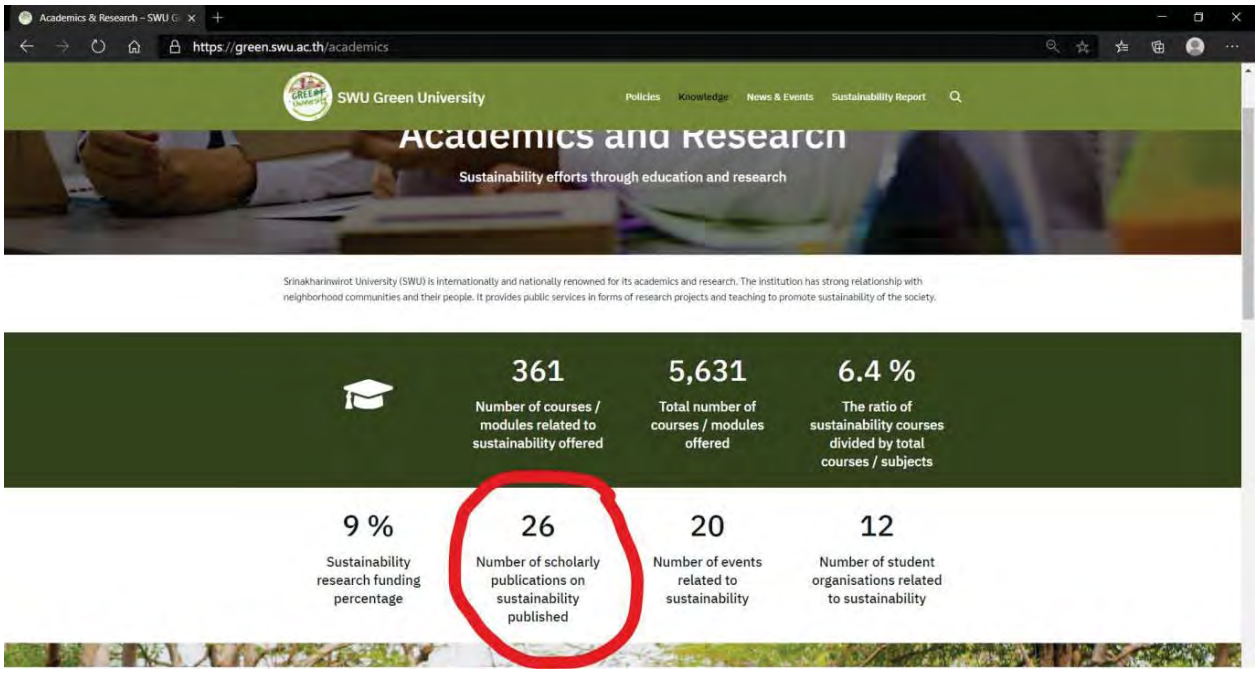
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.7] Number of scholarly publications on sustainability



Total scholarly publications on sustainability by **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Number of scholarly publications on sustainability published = **26**

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.8] Number of events related to environment and sustainability

Sustainable Community Forest Project

SWU Love and Care for Sanseab Project

Science to Sustainable Community Development in Sakaew Province Project

มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

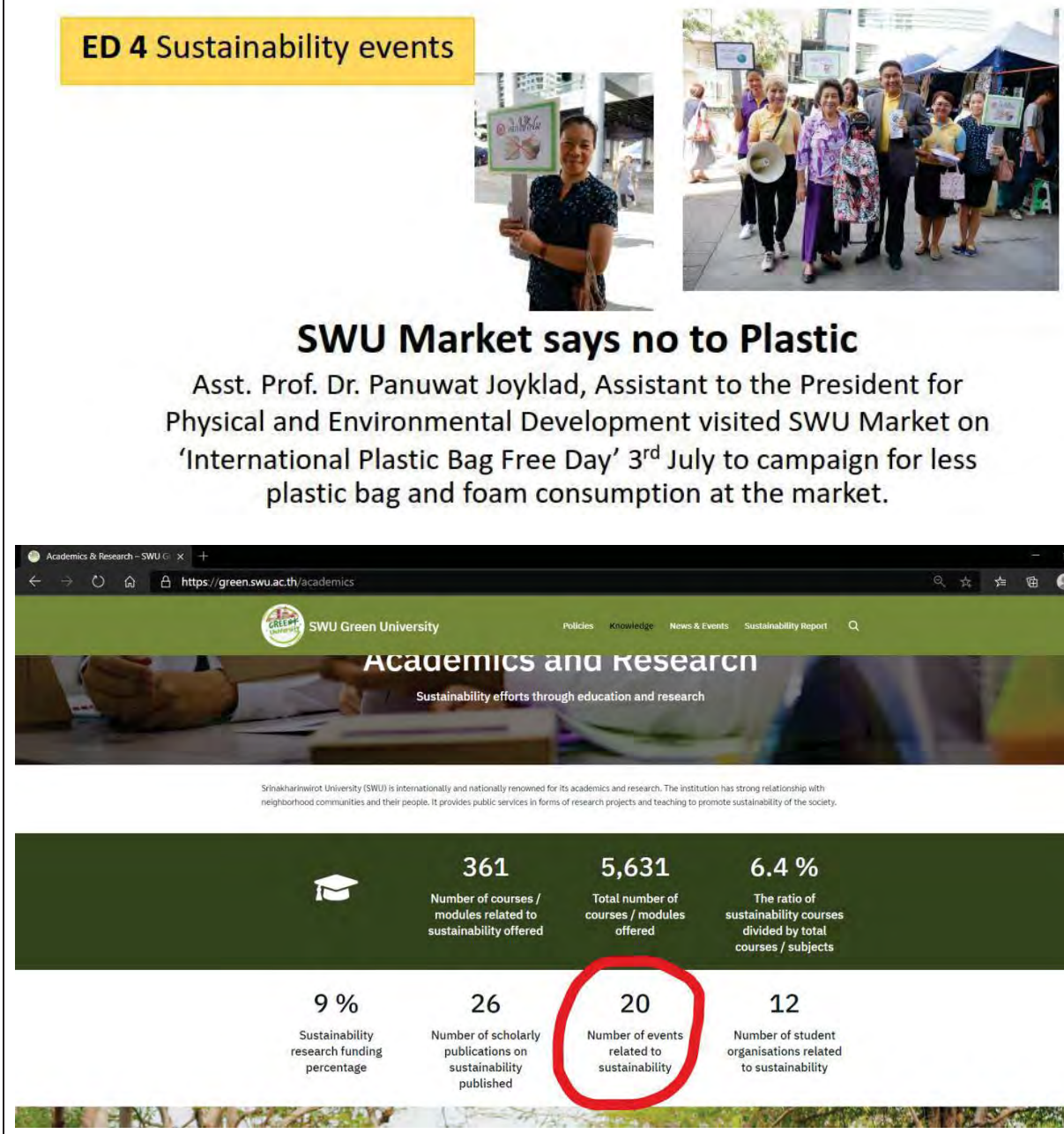
UI GreenMetric

Dam Project for Na Haew Community as Social University Concept

ED 4 Sustainability events

Green University Ambassador 2018

A small contest during an orientation period on the 9th August 2018 of seeking for an ambassador from faculties and colleges to represent the university on SWU Green University campaign.



Events related to environment and sustainability for **Ongkharak Campus** (Srinakharinwirot University, Thailand)

Description:
Number of events related to environment and sustainability = **20 events**

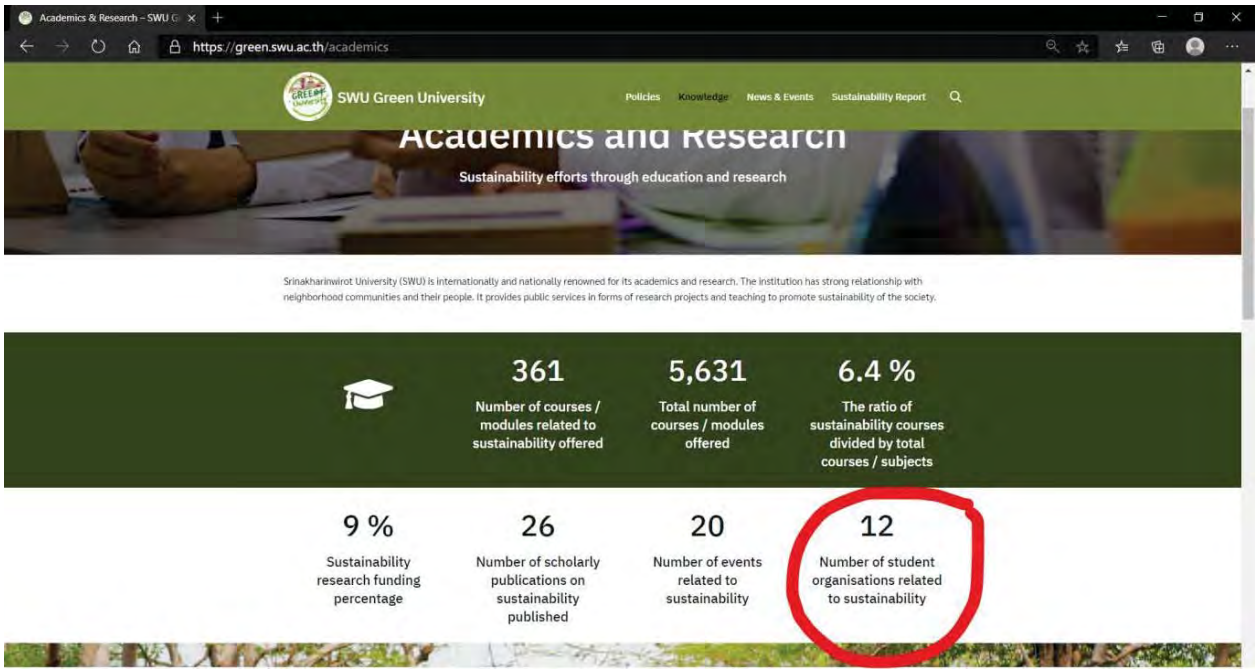
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.9] Number of student organizations related to sustainability



Description:
Number of student organizations related to sustainability = **12**

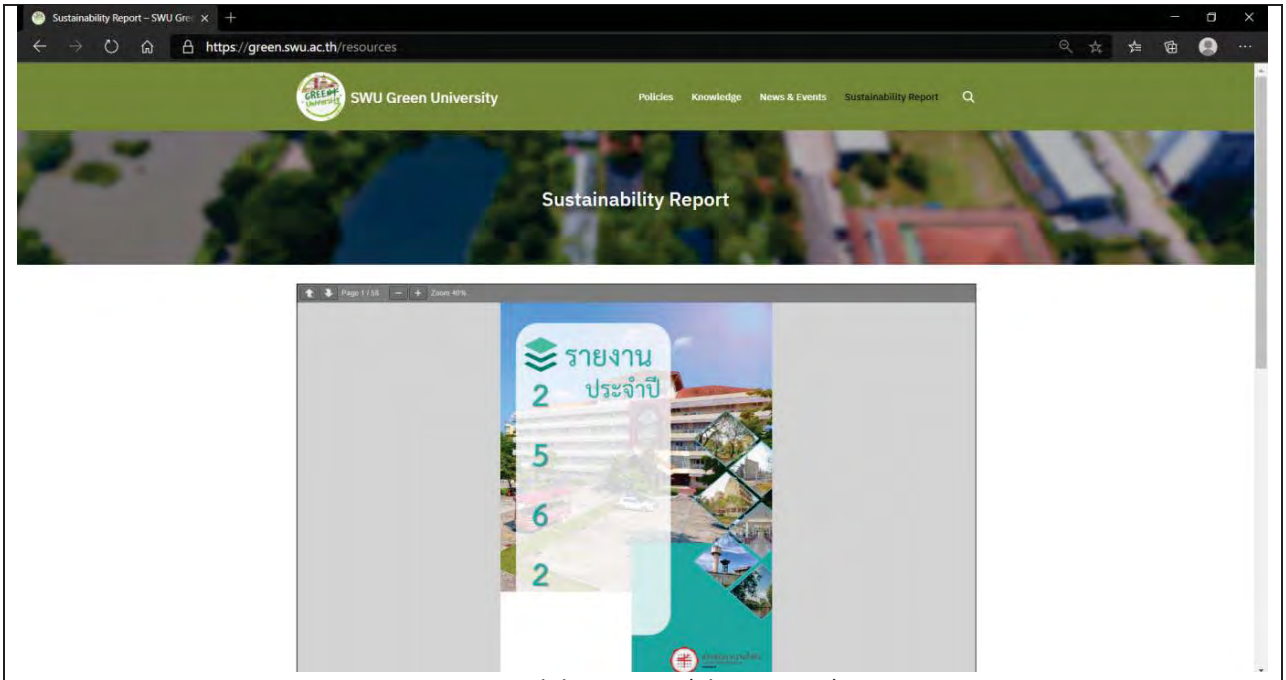
มหาวิทยาลัยศรีนครินทรวิโรฒ
SRINAKHARINWIROT UNIVERSITY

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Srinakharinwirot University (Ongkharak Campus)
Country : Thailand
Web Address : https://www.swu.ac.th/en/gen_info.asp

[6] Education and Research (ED)

[6.12] Sustainability report



Sustainability Report (Thai version)

Sustainability Report for submission to the UI GreenMetric Ranking (Thai and English versions)

For further information, please contact:

Sustainable Development Office

Srinakharinwirot University (Ongkharak Campus)

Rangsit – Nakhon Nayok Road, Ongkharak, Nakhon Nayok 26120

green.swu.ac.th

ส่วนพัฒนาความยั่งยืน
มหาวิทยาลัยศรีนครินทรวิโรฒ