

An Institutional Approach to Campus Sustainability Culture

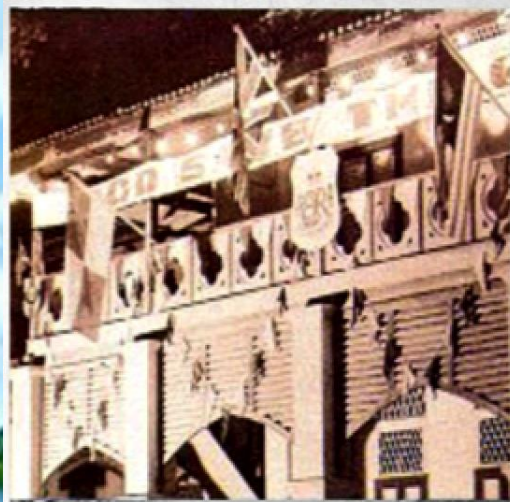
Prof. Dr. Azlan Abdul Rahman
Universiti Teknologi Malaysia (UTM)

LoCARNet 3rd Annual Meeting
23rd-26th November 2104
Bogor, Indonesia

UTM's Brief History



Treacher Technical School, KL (1904)



Technical College, KL (1946)



National Institute of Technology, KL (1972)



Universiti Teknologi Malaysia (1975)

Our history backdates 100 years ago with a humble beginning at Treacher Technical School 1904. But from a full-fledged University status in 1975, UTM is now only 48-years old.

Towards a Sustainable Society

Currently UTM has 23,974 students population (10,382 UG, 13,592 PG). 5,383 PhD students on campus. 4,119 international students. 5,000 staff.

To date, UTM has produced a total graduates of 166,787 and 4,899 of which are international graduates.

1,642
PhDs

19,091
Masters

3,573
Adv Diploma

90,819
Bachelor Deg

51,662
Diplomas

UTM's Modest Ranking (from QS Fact File 2014-2015)

QS WORLD UNIVERSITY RANKINGS@ 2014-2015
OVERALL RANKING

294=

ACADEMIC REPUTATION
322

EMPLOYER REPUTATION
401+

FACULTY STUDENT
174

CITATIONS PER FACULTY
401+

INTERNATIONAL FACULTY
228

INTERNATIONAL STUDENTS
148

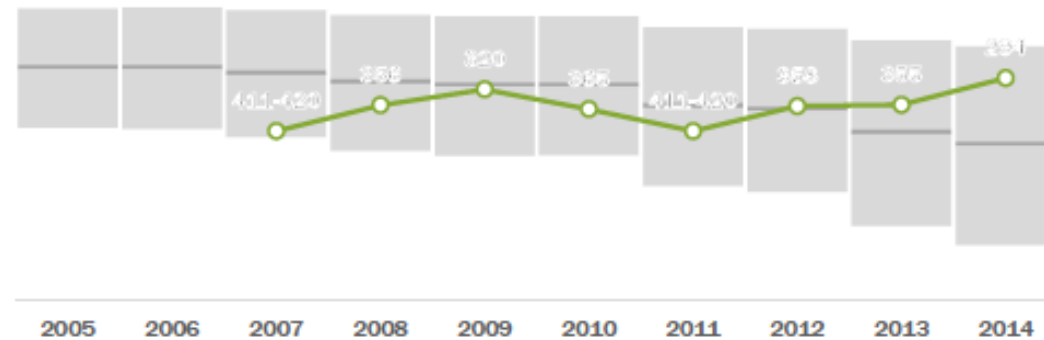
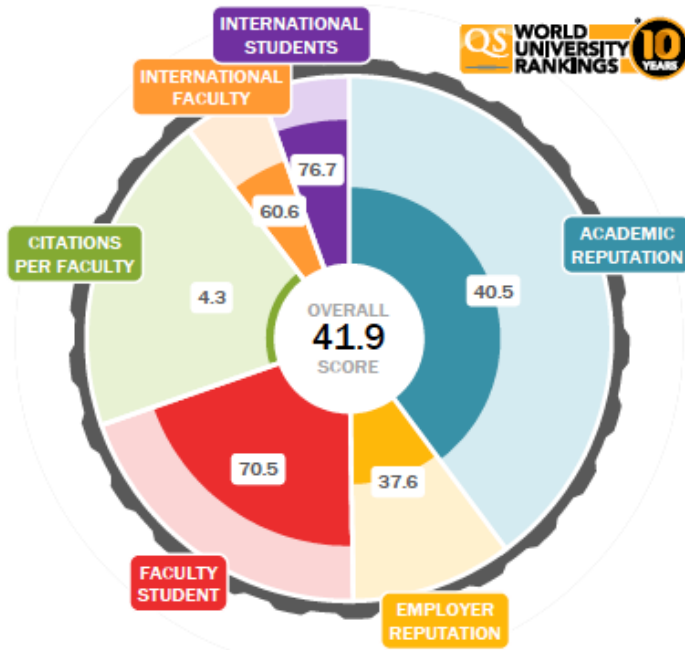
Engineering & Technology



Social Sciences & Mgmt



Faculty Area Ranking



Performance History



UTM Faculties & Schools

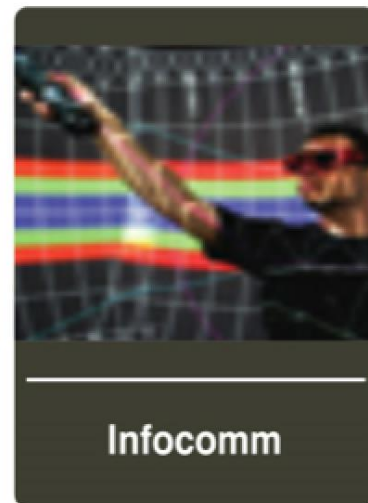
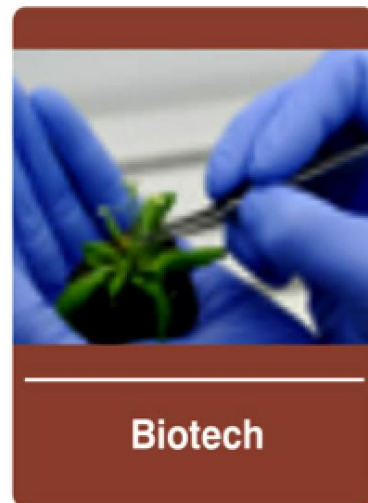
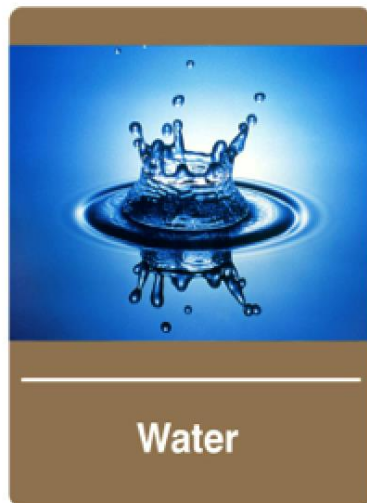
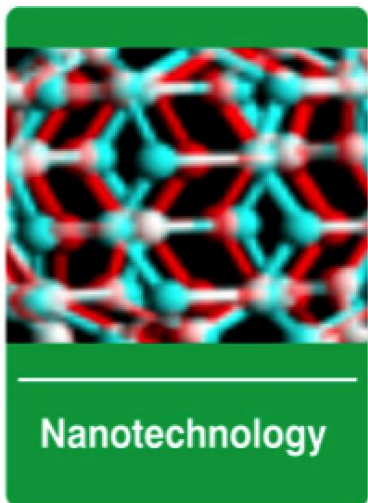
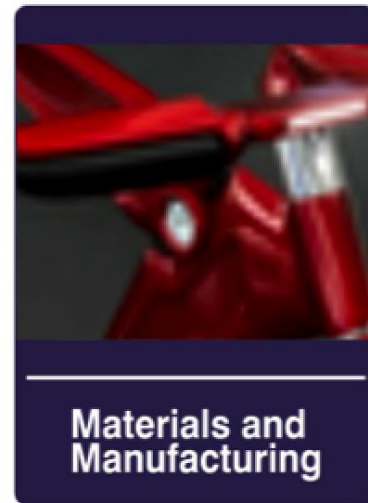
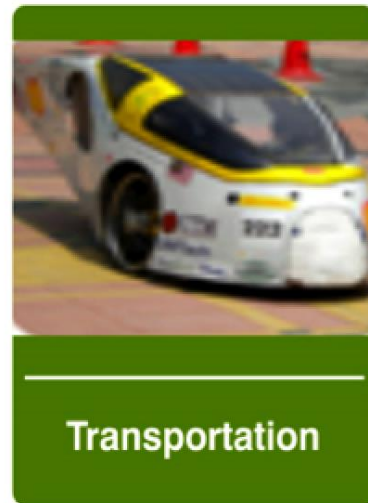
S&T

- ▶ Electrical Engineering
- ▶ Civil Engineering
- ▶ Chemical Engineering
- ▶ Mechanical Engineering
- ▶ Petroleum Engineering & Renewable Energy Engineering
- ▶ Bioscience & Medical Engineering
- ▶ Computing
- ▶ Science
- ▶ Geoinformation & Real Estate
- ▶ Advanced Informatics School
- ▶ Razak School of Engineering and Advanced Technology
- ▶ Malaysia Japan International Institute of Technology

Non S&T

- ▶ Built Environment
- ▶ Management
- ▶ Education
- ▶ Islamic Civilization
- ▶ Language Academy
- ▶ International Business School
- ▶ Perdana School of Science, Technology & Innovation Policies

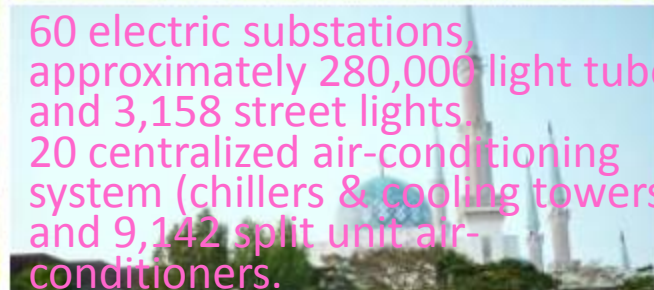
UTM's Research Alliances (RA)



About UTM Campus JB



**23,974 students population (10,382 UG, 13,592 PG).
4,119 international students.
5,383 PhD students on campus.
5,000 staff.**



**60 electric substations, approximately 280,000 light tubes and 3,158 street lights.
20 centralized air-conditioning system (chillers & cooling towers) and 9,142 split unit air-conditioners.**



**RM 19.7m @ 57.2m kWh for year 2013
RM 1.64m/month @ 4.77m kWh/month (in average 2013)**

UTM Campus Sustainability

- Universities have a large environmental footprint, hence making us a key focus for sustainability efforts. We are like 'small cities'.
- We also have the opportunity to create culture of sustainability for today's students and train them to become future sustainability leaders.
- Integrative approach and systemic-based thinking. Connecting the dot!! - Linking the **research, education, campus operations and campus community**.
- The campus as a 'living lab' showcase on how campus community adopt Sustainable Development through engaging and inclusive approach.
- An approach to support the UTM *'Innovative, Entrepreneurial and Global'*.

UTM Campus Sustainability Governance Framework

- UTM Campus Sustainability **Policy** 2010;
- Organization **Governance Structure** : Sustainable Council, Sustainability Technical Expert Group, Green Managers; OCS
- UTM Campus Sustainability **Balanced Scorecard** 2013; **planning**
- Campaigns & **awareness & education**; Carbon Footprint; Recycling Day; Sustainable Café;
- Sustainable **Energy Management Program** – Certified Energy Managers; **operations**
- Sustainability **leadership**; producing future sustainability leaders from among the students; volunteerism
- **Community Engagement** in Sustainability; regional **partnership**
- UTM Campus **Sustainability Report** - Global Report Initiatives (GRI), a standard report for organizational sustainability.

The Policy

- shall ensure that **UTM functions as a sustainable campus community through:**
- responsible and optimized resource management
- innovative environmental and ecosystem management
- efficient energy management
- leadership commitment
- campus-wide participation

Economics

- Adopting green building and infrastructure design
- Optimizing university assets and sustainable business opportunities
- Achieving efficiency in operational management of resources and facilities
- Strategize the provision of adequate financial resources

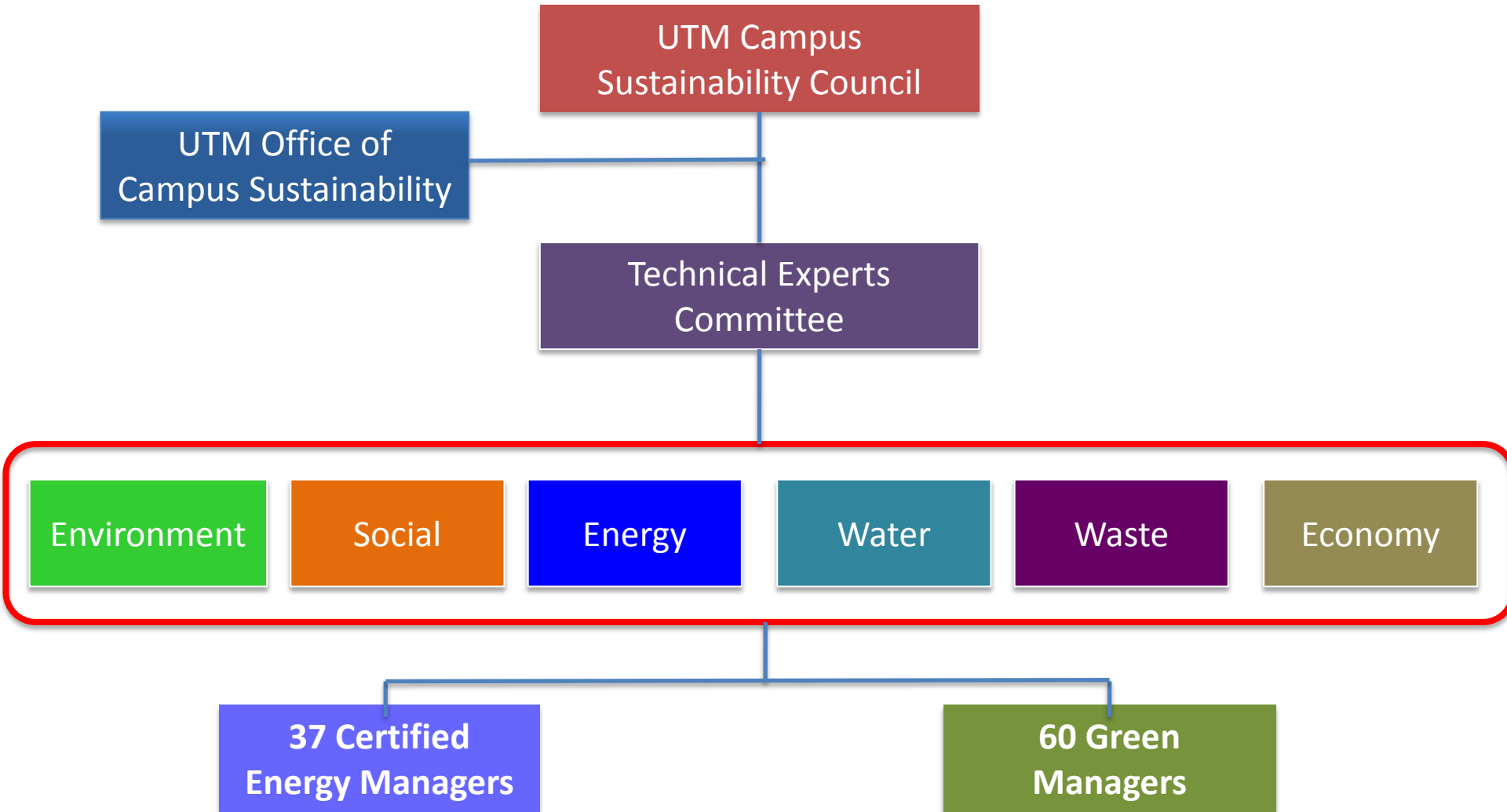
Environment

- Enhancing sustainable consumption of available resources
- Minimizing waste and pollution
- Introducing more local flora and fauna
- Maintaining a healthy balance between developed and green areas
- Augmenting the conservation of wetland features
- Promoting low-carbon practices
- Eliminating non-biodegradable food and beverage packaging

Socio-Cultural

- Promoting community spirit and enhancing quality of life
- Instilling integrity and ethical values
- Encouraging activities that appreciate the existing natural environment
- Promoting a healthy and active lifestyle

Institutionalizing Sustainability



Vision

UTM CS Vision: To realize sustainable lifestyle as personal and communal culture providing positive example to future generation for them to emulate and continuously improve.

Mission

Campus Sustainability Mission:

Sustainable Practices
(environmental, social and economical impacts)

Healthy Living Culture

Iskandar Malaysia Sustainable Icon

Customers / Stakeholders

S1 Sustainability Literate Graduates

S3 Reputable Learning Laboratory Campus

S2 Conducive, Healthy and Happy Life Environment

Resource / Financial

F1 Lower Utility Costs

F2 Lower Procurement Costs

Quality Management & Service Delivery (IP)

Improving our core processes & delivery effectiveness (IP)

P5 Enhance Community Engagement and Outreach

P6 Reduce Greenhouse Gas Emissions

P7 Reduce Waste

P8 Reduce Water Consumption

P9 Reduce Energy Consumption

P4 Strengthen Sustainability Research Direction

P3 Develop sustainable transportation system

P1 Enhance Campus Sustainability Coordination

P2 Provide Sustainable Operating System

Strategic Enablers

Valuing and developing our sustainable workforce (L&G)

Excellent Green Infrastructure

L1 Enhance Sustainability Awareness & Culture

L2 Develop Lean & Productive Workforce

L3 Provide Green & Conducive Campus Facilities

L4 Provide excellent IT infrastructure



UTM Low Carbon Campus: Sustainability Contents in Curriculum

Code	UG Subject
SEBP 3253	Environmental Studies
UKA 2022	Sustainable Development and Community
UK	Community Service Learning
SBEP 2413	Community Planning & Housing
SBEP 2813	Regional & Rural Planning
SBEP 2572	Sustainable Transportation
SBEP 2622	Introduction to Environmental Economics
SBEP 2652	Tourism Planning 1
SBEP 2713	Urban Design
SBEP 2632	Environmental Planning & Management
SBEP 2822	Rural Settlements
SBEP 3262	Planning Legislation
SBEP 3642	Environmental Planning Workshop

Undergraduate Courses

Code	UG Subject
SBEA 2713	Environment Science & Sustainability (Elective)
SBEQ 2852	Sustainable Construction
SBEQ 4853	Land & Urban Economics
SBEL1592	Environmental Psychology & Socio-Culture
SBEL 2425	Recreation and Park Design
SBEL2552	Ethnobotany Plant Materials
SBEL2435	Urban Landscape Design
SBEL2602	Heritage Landscape & Conservation
SBEL3445	Landscape Resource Planning
SBEL1682	Environmental Physics
SBEL2722	Resource Planning & Management
SKKK 2412	Environmental Engineering &

Postgraduate Courses

Code	PG Subject
MBW 2183	Environmental Resource Planning
MQT 1563	Environmental Bioengineering
MLA	Master of Environmental Engineering

- 70 courses contain sustainability elements in engineering faculties (UG & PG).
- 22 courses contain sustainability elements in non-engineering faculties (UG & PG).
- Strategic thematic areas for students' projects - an interdisciplinary approach.
- Education for Sustainable Development (ESD)

UTM Low Carbon Campus: Campaign – Project – Green Office

Monday is UTM Recycling Day

Sustainable Café Project

Green Office Project Campaign



STOP!
DON'T THROW IT AWAY
RECYCLE

- Aluminium Cans
* Soft Drink Cans
- Steel Tin
* Food Cans (Sardine)
* Beverage Cans (Milo),
Milk Cans
- Plastic
* Mineral Water Bottles
* Soft Drink Bottles, Shampoo
- Car Battery
- Drink Cartons (HL, UHT)
- Newspaper,
Cardboard,
Mixed Papers
- Computer
* CPU
* Monitor
- Stainless Steel (304)
- Brass KK (Steel)

LOCATION :
RECYCLING BOOTH
PARKING AREA INFRONT
OF STUDENT MALL

TIME :
9.00AM-6.00PM

EVERY MONDAY

RECYCLING PROGRAM
UTM SUSTAINABLE CAMPUS

PHS Officer:
En. Dzulkarnain Bin Md. Zubir
Office : 07-553 0292
Mobile : 013-799 7209

SWM Officer:
Muhammad Roddy
Mobile : 012-566 9945
Hotline : 1-800-722-900



ARKED/KAFETERIA
Lestari
UTM

- MENGUMPUL MINYAK MASAK TERPAKAI UNTUK KITAR SEMULA**
- MENGGANTI PEMBUNGKUS MAKANAN POLISTRINA DENGAN BAHAN MESRA ALAM**
- MENGASINGKAN SAMPAH (BAHAN KITAR SEMULA)**
- MENGASINGKAN SISA MAKANAN UNTUK PEMBUATAN KOMPOS**
- MENGGUNAKAN BEG PLASTIK SAMPAH MESRA ALAM**



GREEN OFFICE CAMPAIGN

- SAVE ENERGY**
 - SWITCH OFF THE LIGHT / AIR CONDITIONING WHEN IT IS NOT USED
 - TURN OFF THE COMPUTER WHEN IT IS NOT USED
 - MAXIMIZE NATURAL LIGHT
- GREEN E-WASTE**
 - DISPOSE E-WASTE INTO DESIGNATED BINS
 - ELECTRONIC / ELECTRICAL OFFICE EQUIPMENTS, LIGHT BULBS, BATTERIES, HANDPHONE, ETC.
- SUSTAINABLE MEETING**
 - USE EMAIL FOR MEETING INVITATION
 - USE USB THUMB DRIVE INSTEAD OF PAPER
 - USE SLIDE PROJECTOR INSTEAD OF PRINTING INDIVIDUAL COPIES
 - NO BOTTLED WATER
- PRACTICE RECYCLING**
 - COLLECT YOUR RECYCLE ITEM - CALL MOBILE BUY BACK CENTRE EVERY MONDAY FOR CASH REWARDS (019-7911089 / 012 4669945)
- GREEN PACKAGING**
 - BIODEGRADABLE FOOD & BEVERAGE CONTAINER
 - BIODEGRADABLE PLASTIC BAGS
- SAVE PAPER**
 - REUSE, REDUCE AND RECYCLE PAPER

UTM Low Carbon Campus : Awareness Campaign; Cycling Club



Cycling Day

VC With Top Management Campus Tour Every Wednesday



Students Cycling Around Campus



Cycling Activities In Programme



Cycling Club

UTM's Cycling Club



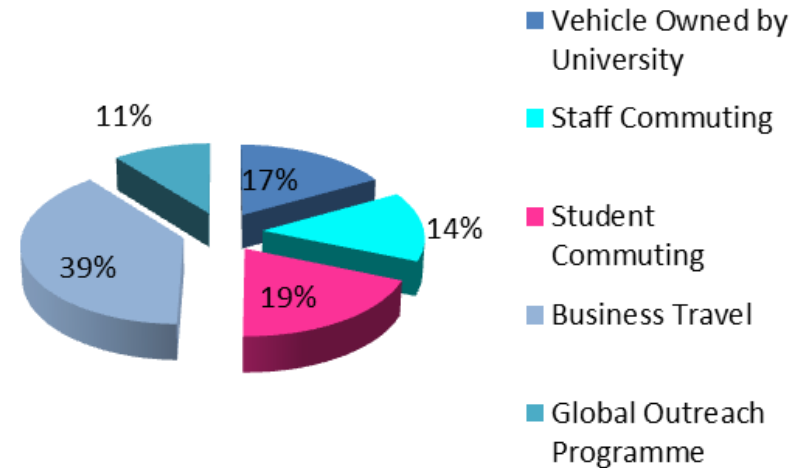
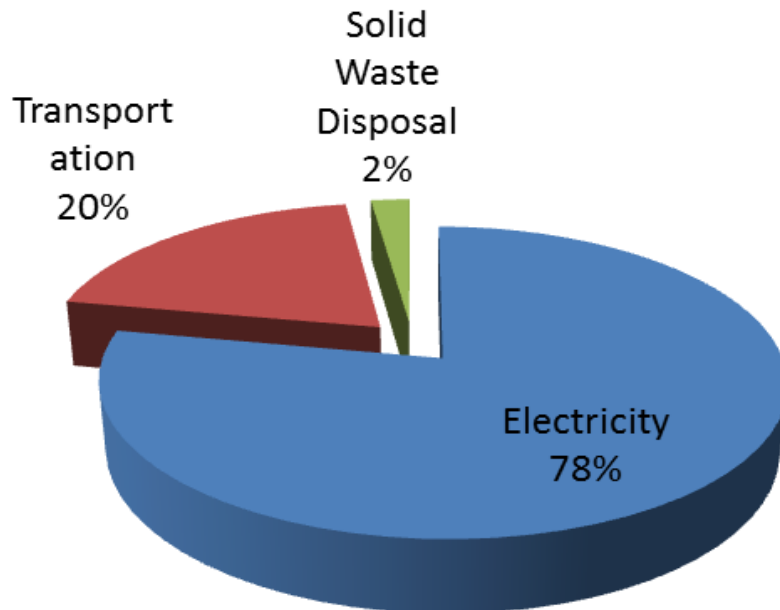
UTM Low Carbon Campus: Research and Operations

Source of Emission	Carbon Emission (MTCO ₂)
Electricity	64,393
Transportation	16,396
Solid Waste Disposal	1,789
Total	82,578

The First Campus Carbon Footprint in Malaysia.

Three main sources of carbon emissions in UTM :

1. Electricity
2. Transportation
3. Solid Waste Generation



UTM LCCF: Some Updates on Low Carbon Tracking (Best Practice Level 3)

LCCF CARBON TRACKING :: RESULTS



Calculator Criteria	Element	TOTAL CARBON EMISSIONS			Percentage	Remarks
		2012 Baseline (B)	2014 Project (P)	Reduction (B-P)	Reduction Achieved (B-P)/B	
		tCO ₂ /yr	tCO ₂ /yr	tCO ₂ /yr	%	
		2012	2014			
LANDUSE	LANDUSE - C Storage in Soil (Losses)	50.29	50.29	0.00	0.00	Verify Project Data
	LANDUSE - C Sequestration by Vegetation (losses)	0.00	0.00	0.00	0.00	Verify Project Data
LANDSCAPE	LANDSCAPE - C Storage in Soil (losses)	-396.55	-396.55	0.00	0.00	Verify Project Data
	LANDSCAPE - C Sequestration by Vegetation	0.00	0.00	0.00	0.00	Verify Project Data
	LANDSCAPE - C Seq. by Trees (not within Open Space)	0.00	0.00	0.00	0.00	Verify Project Data
EMBODIED CARBON IN CONSTRUCTION	Building Construction	11,635.21	11,635.21	0.00	0.00	Verify Project Data
	Infrastructure Construction	1,656.85	1,656.85	0.00	0.00	Verify Project Data
OPERATIONAL CARBON	Energy	39,025.17	37,263.75	1,761.42	4.51	2013 Data is used for projected
	Water	1,599.78	1,515.84	83.95	5.25	2013 Data is used for projected
	Waste	9,764,300.00	6,612,000.00	3,152,300.00	32.28	2013 Data is used for projected
	TOTAL EMISSIONS	9,817,870.75	6,663,725.38	3,154,145.37	42.04	Best Practise 3 (BP3)

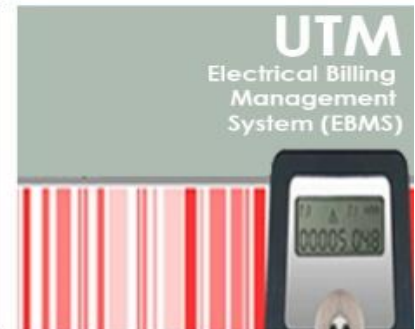
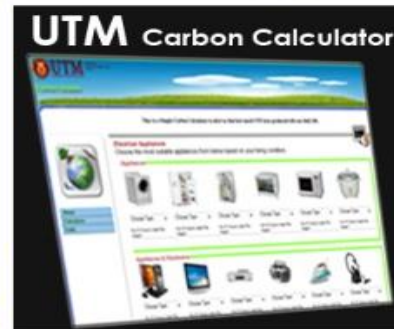
Notes: Baseline Data has been established. Energy, water, waste projected 2014 data is using 2013 data and subject to actual action/performance later. Transport sector is not included.

UTM Low Carbon Campus : Operations/Energy Management

UTM
Sustainable
Energy
Management
Programme.



3-Star Energy
Management
Gold Standard.



UTM Low Carbon Campus: Waste – Food Composting – Saving Paper

- Mission of Office of Asset & Development: *Provide Sustainable & Excellent Services & Facilities.*
- **Zero Waste Campus** : Increase recycling - reduce the cost of waste collection (RM 800,000/year).
- **Food Waste Composting** : Arked Lestari

Saving Paper (Green Office)



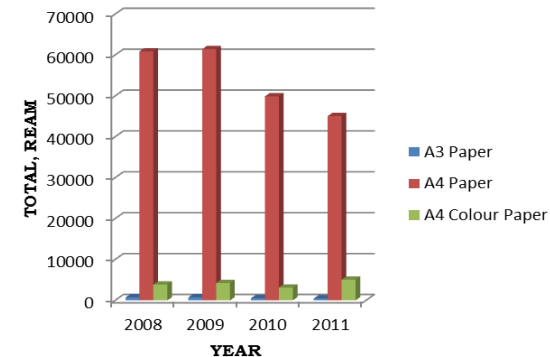
Outdoor Recycling Bins



Indoor Recycling Bins



**UTM SAVE PAPER
2008-2011**



UTM Low Carbon Campus: Young Sustainability Leadership

Developing Young Sustainability Leadership



UTM GREEN OFFICE CAMPAIGN

Lestari
UNIVERSITI TEKNOLOGI MALAYSIA

GREEN OFFICE

Green Office Environment

SAVE ENERGY
THIS MEANS YOU!

GREEN WASTE

SAVE PAPER

GREEN PACKAGING

PRACTICE RECYCLING

SAVE PAPER

Objective :

1. To create a sustainable office environment;
2. To educate a pro-environmental behavioral staff;
3. To contribute to the Campus Sustainability;
4. To develop a Sustainable Campus Culture.

Organized By:
Sustainability Unit
Office of Asset & Development (OAD)

Konvensyen Kampus Lestari 2012

BAYAR KEPADA: JOHAN PERTANDINGAN POSTER

RINGGIT MALAYSIA: RM 700.00 TUJUH RATUS SAHAJA

KONVENSYEN KAMPUS LESTARI 2012

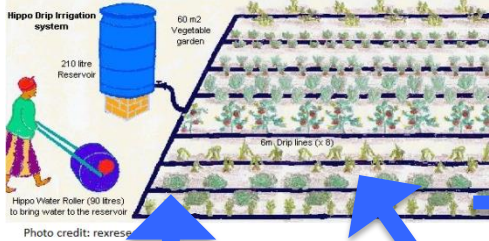
UTM Low Carbon Campus: Students & Sustainability Culture



Students Volunteerism : Eko-Lestari Club for Sustainable Students' Café Project Campaign



UTM Low Carbon Campus: Community Engagement in Sustainability



RWH system with low-cost small reservoir tank and drip irrigation system



Underground rainwater collection tank to reduce footprint and aesthetic impact.



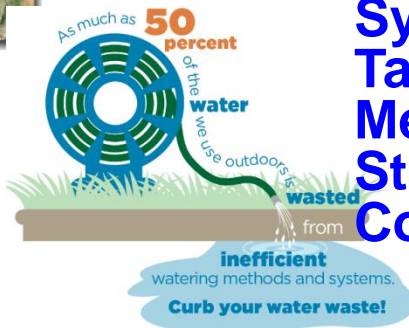
Idea ?



Build retention pond for harvesting rainwater



Build large rainwater tank with low-cost but high durability material. eg. – ferrocement



Simple Rainwater Harvesting System.
Target: Farmers in Air Papan, Mersing.
Students participating in a Community Project



ChemEngOutreach@BiodieselinSchool2014

Mini Biodiesel Reactor: Chemical Engineering Target: School Kids across PINTAR schools in Malaysia



Oliah Sahri Ahmad
bhvrs10@sh.com.my
Postian

UTM turun padang promosi biodiesel B5

Sekumpulan mahasiswa Universiti Teknologi Malaysia (UTM) menggerakkan pendekatan turun padang bagi mengkomunikasikan kebolehan penggunaan biodiesel kepada pelajar sekolah dan penduduk, dekat sini.

Program yang diperkenalkan mahasiswa jurusan Kejuruteraan Petroleum dan Tenaga Diperbaharu bertujuan memperkenalkan kaedah menghasilkan bahan bakar mesra alam menggunakan minyak masak terpakai.

Pengarah Pustaka, Siti Shahrani Sahari, berkata aktiviti diadakan bersempena dengan Program Komuniti

Bank Islam bersama Persatuan Nelayan Kawasan Perak menawarkan sambutan menggalakkan.

“Program bertujuan mempromosikan bahan bakar alternatif biodiesel yang dibenarkan sebagai B5 menggunakan minyak masak baharu dan terpakai untuk kegunaan komersial bagi mengurangkan pencemaran alam sekitar.

Selain itu, katanya, penginapan diberi penerangan mengenai kepentingan keberterusan kimia serta aplikasinya yang banyak membantu

“ KAMI TURUT MENGADAKAN DEMONSTRASI MENGENAL PASTI KANDUNGAN VITAMIN DALAM BUAH-BUAHAN DAN PROSES MENCUCI MINYAK DIESEL YANG MENARIK MINAT PENGUNJUNG ”

Siti Shahrani Sahari,
Pengarah Pustaka

dalam memantapkan ketahanan sains.

“Pendedahan yang diberikan dijangka dapat menarik minat khususnya dalam kalangan pelajar sekolah

dengan memilih botol-botang pengalihan pilihan di universiti.

“Kami turut mengadakan demonstrasi mengenai pasti kandungan vitamin dalam buah-buahan dan proses mencuci minyak diesel yang menarik minat ramai pengunjung untuk mengetahui dengan lebih mendalam,” katanya.



CSR Partner in Sustainability: Bank Islam Malaysia

Regional Partnership for Low Carbon Cities Framework (LCCF)



Low-Carbon City 2025 Sustainable Iskandar Malaysia



Universiti Teknologi Malaysia
Kyoto University
Okayama University
Ritsumeikan University



Some Modest Results

ENERGY SAVINGS IN kWh



ENERGY SAVINGS IN RM



ENERGY MANAGEMENT AWARDS



Some Modest Achievement 2012-2014

01

UTM is the first Institution to be awarded 3-Star ASEAN Energy Management Gold Standard Certification (AEMAS) -2014

02

Installation of 60,203 units of T5 Energy-Saving Fluorescent Lamps had saved electricity bills of RM1.1 mil.

03

60% Development of Tropical Sustainable Campus with 25% maintained as Green Area.

04

UTM is ranked 98th (among 305 universities) in the World Green University Ranking in 2013

Some Modest Achievement 2012-2014

05

UTM is a leading university in Malaysia having Campus Sustainability Governance structure at all departments with 60 Green Managers, 35 Certified Energy Managers.

06

UTM is the first Low Carbon Campus in Malaysia which has achieved level of Best Practice 3 based on Low Carbon Cities Framework (LCCF) by Ministry of Energy, Green Technology & Water (KeTTHA) - 2014

07

UTM was the first university in Malaysia to have developed calculation of Campus Low Carbon Footprint in 2011/2012

08

UTM is the first university in Malaysia to join Global University Partnership In Environmental Sustainability (GUPES) under the United Nation Environmental Program (UNEP) - 2014

tenki takk спасибо kam sah hamnida
дзякуй hvála ขอขอบคุณคุณ dhanyavadagalu tack
gracias mési xièxie tanemirt dank je
arigatô danko kop khun krap iaafetai lava
dziękuje bedankt shukriya ありがとう kia ora dankon dėkuji
ačiū grazzi ありがとう mamnun gràcie kaitos spas
dhanyavad barka ありがとう mamnun gràcie kaitos spas
gracias ago tau dankie ありがとう mamnun gràcie kaitos spas
teşekkür ederim bayarlalaa obrigada chnorakaloutioun
sagolun murakoze taiku mahalo didi madloba chokrane rahmat
sukriya obrigado dakujem
terima kasih misaotra welalin mercé najis tuke
asante grazie nandri 謝謝 mercé kőszönöm اراكش
mauruuru nandri 謝謝 mersi sobodi nanni vinaka
matondo cam on ban go raibh maith agat merci nanni vinaka
paldies ngiyabonga