UMP
SUSTAINABLE
CAMPUS

BLUEPRINT 2022-2025

UNIVERSITI MALAYSIA PAHANG

20 tahun Mencapai Kegemilangan 2002-2022

UMP sustainable campus blueprint is part of a strategic partnership with

mysun
Malaysia Sustainable University Campus Network

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FOREWORD

UMP SUSTAINABLE CAMPUS BLUEPRINT

Universiti Malaysia Pahang (UMP) Sustainable Campus Blueprint is a guideline for UMP to realise aspirations towards a sustainable Malaysia 2030 based on the Malaysian Green Technology Master Plan 2017 – 2030. It is in line with the 12th Malaysia Plan (12MP) that prioritises national development to continue to be aligned with the Sustainable Development Goals (SDG) under the 2030 Agenda for Sustainable Development (Agenda 2030).

This programme is also highlighted in the 2022 mandate of the Minister of Higher Education, which focuses on achieving 17 targets in the SDGs through a coordination mechanism for monitoring initiatives in the Higher Education Institute.

UMP has established a dedicated committee to develop a model known as UMP Sustainable Campus Blueprint. Based on the UI GreenMetric criteria, the UMP Sustainable Campus Blueprint implements the sustainability element globally and does not only respond to physical development. This intent is reflected in the six components of the UI GreenMetric scale that are mapped to the 17 SDGs as follows:
- Setting & Infrastructure (SDGs 11, 22, and 17)
- Energy & Climate Change (SDGs 7, 11, 13, and 17)
- Waste (SDGs 3, 12, 14, 15, and 17)
- Water (SDGs 6 and 17)
- Transportation (SDGs 11 and 17)
- Education & Research (SDGs 1, 2, 3, 4, 5, 8, 9, 10, 13, 14, 15, 16, and 17)

This blueprint provides measurable guidelines and can be improved from time to time based on the UI GreenMetric World University Ranking criteria to support UMP activities that can conserve resources and improve the quality of the environment. UMP aims for a sustainable campus approach and specific initiatives designed to generate an enabling green ecosystem. Implementing the UMP Sustainable Campus is considered a good long-term and cost-effective investment.
The blueprint is realistic, high value, cost-effective (economical), and focuses on priority-based initiatives. The blueprint is also developed not just for the benefit of the university community, but also for the socio-economic development of the communities surrounding the campus.

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Chairman of the University Board of Director,
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VICE CHANCELLOR'S NOTE

UMP SUSTAINABLE CAMPUS BLUEPRINT

In all environment-related discourses, the role of academic institutions is always highlighted. The education sector can play a pivotal role in undertaking research and make concrete efforts to preserve and restore ecosystems. Way back in 1972, the Conference on the Human Environment held in Stockholm put forward the concept of a green school. Further, in 1994 UNESCO launched an initiative known as the "Education for Environment, Population and Sustainable Development". United Nations designated 2005 – 2014 as the "Decade of Education for Sustainable Development" to integrate sustainable development into the teaching and learning process.

Malaysia has announced a goal for the country to become a carbon neutral country as early as 2050. This agenda needs concentrated efforts and commitment from both the government and private sectors. As part of the government's effort to achieve sustainable development goals, the role of UMP will be institutionalised in various governance mechanisms, especially in the implementation and monitoring of development programmes at the grassroots level to achieve the 2030 Agenda.

UMP has introduced the Universiti Malaysia Pahang (UMP) Sustainable Campus Blueprint as a guideline to materialize the aspirations towards a carbon neutral country. It is responsible for outlining a variety of environmental sustainability issues including infrastructure, energy, waste management, water management, transportation, and education in the university. The blueprint promotes and demonstrates continuous improvement in environmental and energy performance, ensuring best practice, statutory compliance and value for money.

To complement professional and disciplinary education, the blueprint can expose staff and students to the practical problems that must be solved in order to achieve the Sustainable Development Goals (SDGs). They can foster the acquisition of critical, systems-oriented thinking as well as the ability to communicate with various stakeholders within and outside academia.

Achieving a sustainable campus will allow the campus community to learn and gradually develop a culture of sustainability and stewardship of natural resources.
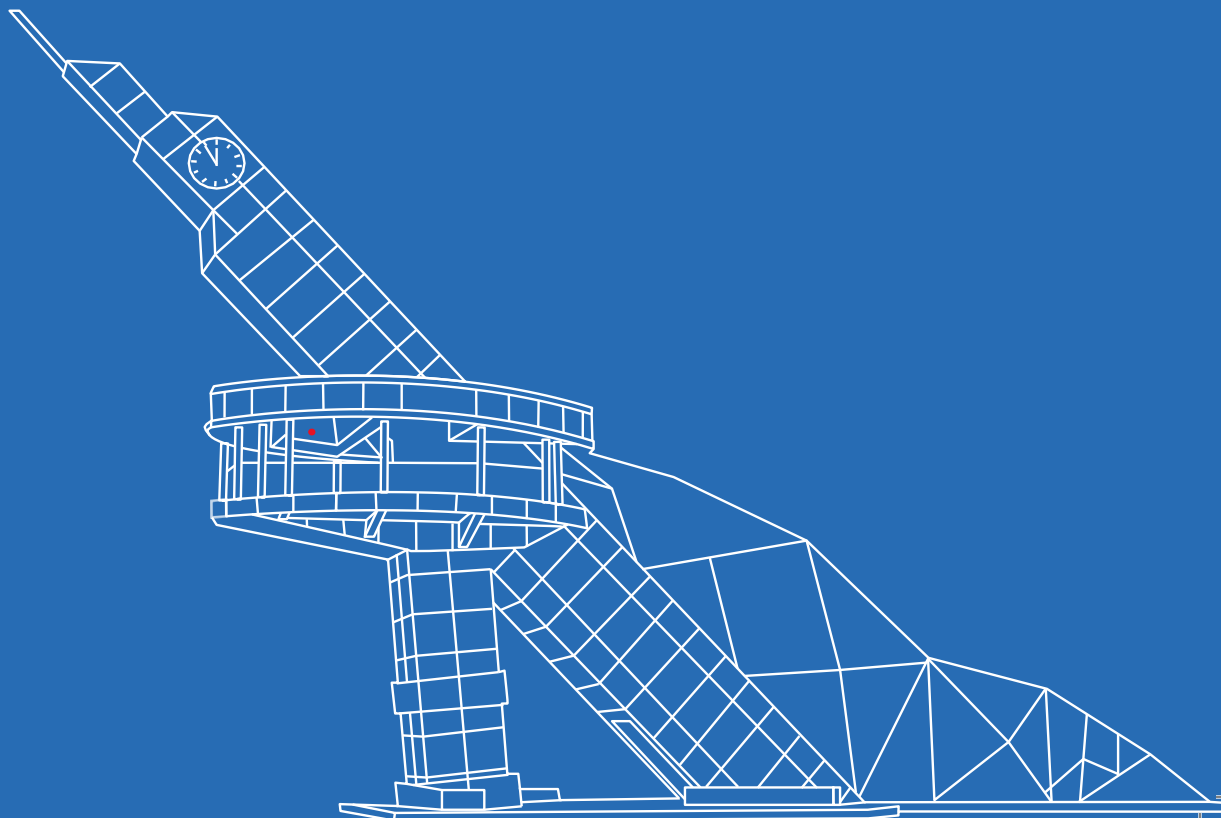
Professor Dato' Ts. Dr. Yuserrie bin Zainuddin
DIMP.
Vice- Chancellor
Universiti Malaysia Pahang

GREEN CAMPUS

Overview

INTRODUCTION

UMP Sustainable Campus serves as a policy for university development and facilities management. UMP campus facilities are planned and implemented considering the requirements of all community segments, minimal development cost, and minimal carbon footprint.

This is a part of UMP's efforts to create an infrastructure that offers residents a campus-style environment and the ideal workplace environment practicable.

Based on the UI Green Metrics, UMP Sustainable Campus blue print specifies six (6) strategic clusters:
1. Setting & Infrastructure
2. Energy & Climate Change
3. Waste
4. Water
5. Transportation
6. Education & Research

Each cluster has an action plan that must be carried out, either immediately or long-term action.

OVERVIEW

"Malaysia is committed to be a carbon-neutral country at the earliest in 2050." This was the welcome statement by the Prime Minister, YAB Datuk Seri Ismail Sabri Yaakob during the tabling of the 12th Malaysia Plan, 2021- 2025. In the Copenhagen Forum 2009, Malaysia pledged to reduce 40% of carbon emissions by 2020 (taking the 2005 level as baseline) and it is an ongoing vision of global environment sustainability, including Malaysia. Malaysia targets to be a carbon-neutral nation in 2050.

Universiti Malaysia Pahang (UMP) has taken action on the agenda. UI GreenMetric World Ranking of Universities serves as a tool for UMP to address sustainability and is the key driver of achieving the Sustainable Development Goals (SDG). UMP has consolidated its strengths and expertise to a balanced environment, society, and economy. UI GreenMetric has conducted a ranking programme for world universities based on six categories: Setting & Infrastructure, Energy & Climate Change, Waste Management, Water Management, Transportation, and Education & Research. UI GreenMetric has a solid commitment to becoming a global platform for UMP to play an active role in overcoming the world's environmental challenges today.

UMP has a unique and critical role in helping Malaysia to achieve the Sustainable Development Goals (SDG) through research, teaching, operations, and community leadership. Education, research, innovation, and leadership will be essential in helping society transform into pathways of sustainable development. UMP defines the UI GreenMetric criteria and the SDGs as an initiative and a baseline for achieving the goals.

UMP Sustainable Campus (Baseline)

Setting & Infrastructure (SI)	Energy & Climate Change (EC)	Waste (WS)	Water (WR)	Transportation (TR)	Education & Research (ED)
56.5% of the campus is covered with plants* * 3,894,113 m² total area * 2,203,122.38 m² green area 12% → 15% sustainability budget * USD 53 million (university allocation) USD 6.3 million (12%) USD 7.97 million (15%)	1.49 tonne CO_2 1 renewable energy : Solar 20 kW at Pekan Smart building: 7 at Pekan	50%-75% recycled waste Domestic waste: 67 metric ton 50%-75% waste (organic, inorganic, and scheduled) Treated > 25% Paper & plastic saving programmes	Current: 3% RW irrigation system Water consumption 1.7 million m³ 2 water pumps	1411 bicycles 20 electric bicycles	10 sustainability-related start-ups Research projects related to sustainability: USD 8,252,286.00

UMP Sustainable Campus (Target)

Setting & Infrastructure (SI)	Energy & Climate Change (EC)	Waste (WS)	Water (WR)	Transportation (TR)	Education & Research (ED)
56.5% of the campus is covered with plants* * 3,894,113 m² total area * 2,203,122.38 m² green area 12% → 15% sustainability budget * USD 53 million (university allocation) USD 6.3 million (12%) USD 7.97 million (15%)	0.09 tonne CO_2 in year 2025 3 renewable energy: Wind turbine, pico hydro dan biodiesel Smart building: 4 at Gambang, 1 at Pekan Solar 8.31 megawatt: (5.96 MW at Pekan and 2.62 MW at Gambang) Policies and campaigns	Target 75% domestic residue Target: 100% waste management: Waste Management Policy and Review and enforcement of the terms of the Contractor Agreement. The Waste management grant initiative	Aim increment 26% recycled water usage (8 times) Increase the capacity of 4,500 L of rainwater tank to 36,000 L Target 10 water pump units	1431 bicycles and electric bicycles 100 e-scooters EV Shuttle Bus - 13% reduced parking spaces. Car sharing - 14% reduction on parking places. WFH - 6% vehicle/population ratio	Sustainability programme start-up fund RM389,000.00 1. Student associations - 10 Clubs 2. Event/ Programme- 53 programmes 3. Community service: Training kelulut, Livestock technology, Smart technology (Online/Digital) Allocation of research project related to sustainability in 2025: RM1,064,000.00 #1 Ranking by Category (Malaysia), 2023

UMP GREEN CAMPUS FRAMEWORK

06 - IMPROVEMENT

Improvement actions will be taken based on the LPU feedback for each cluster.

05 - LPU MEETING

A progress report is presented at the LPU meeting.

04 - STEERING COMMITTEE MEETING

A progress report is presented at the steering committee meeting.

01 - INITIATIVE

Each cluster identifies initiatives that have the potential to contribute to UIGreenmetric scoring.

02 - ASSESSMENT

The Sustainability Committee will conduct a monitoring audit every 3 months.

03 - CAMPUS SUSTAINABILITY COMMITTEE MEETING

The results of the monitoring audit report will be presented to the Campus Sustainability Committee.

What are we now? | Where do we want to be? | How we will get there?

UI GREENMETRIC MAPPING WITH SDGs

2050 — Carbon-free UMP (long-term goal)

2030 — 45% reduction from 2022 level (medium-term goal)

2025 — 30% reduction from 2022 level (short-term goal 2)

2023 — 15% reduction from 2022 level (short-term goal 1)

2022 — Initial baseline: 14,008 tonne CO_2
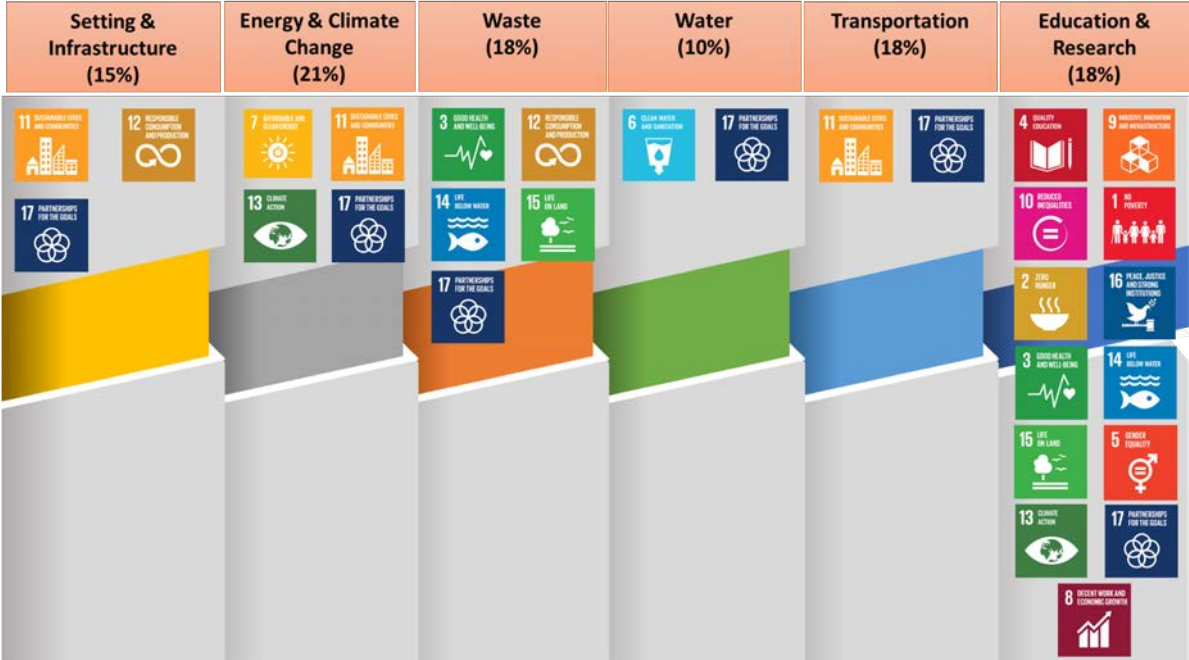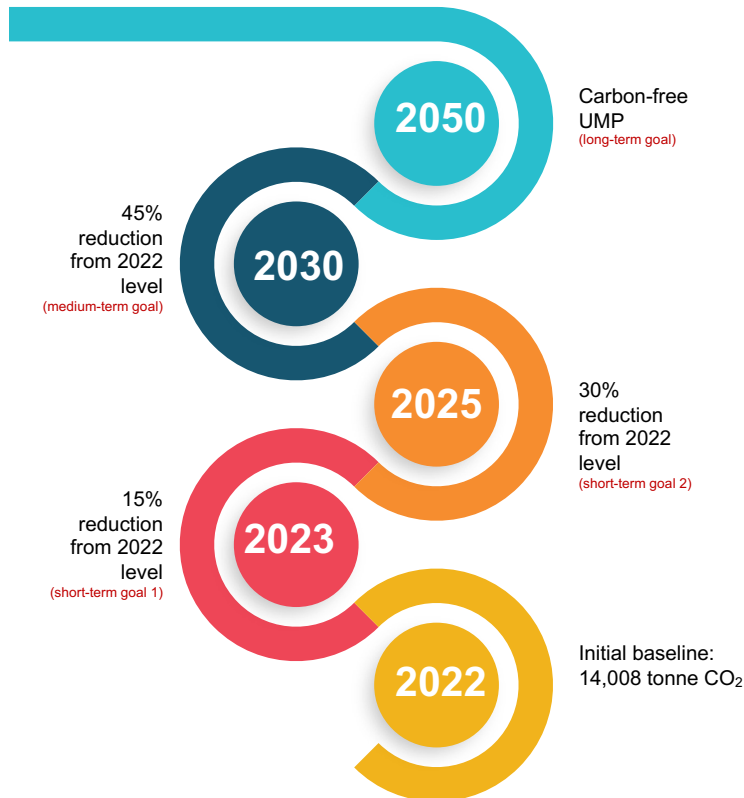
UMP TOWARDS CARBON FREE 2050

A carbon footprint is the total amount of greenhouse gas emissions from the production, use, and end-of-life of a product or service. It includes carbon dioxide, the gas most commonly emitted by humans and others, methane, nitrous oxide, and fluorinated gases, which trap heat in the atmosphere, causing global warming.

The transition to a climate-neutral society is both an urgent challenge and an opportunity for UMP to build a better future for all.

Campus Development Plan
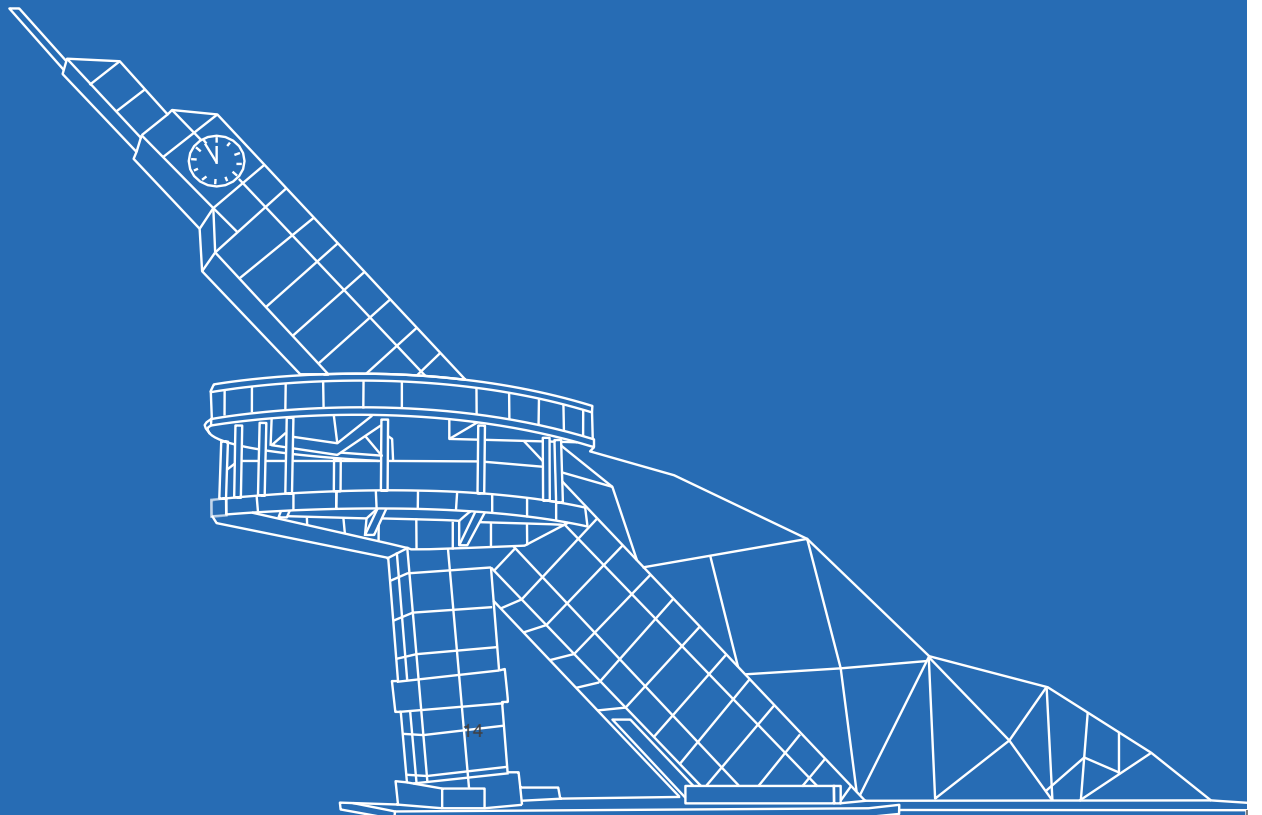
Land use of UMP and its surrounding
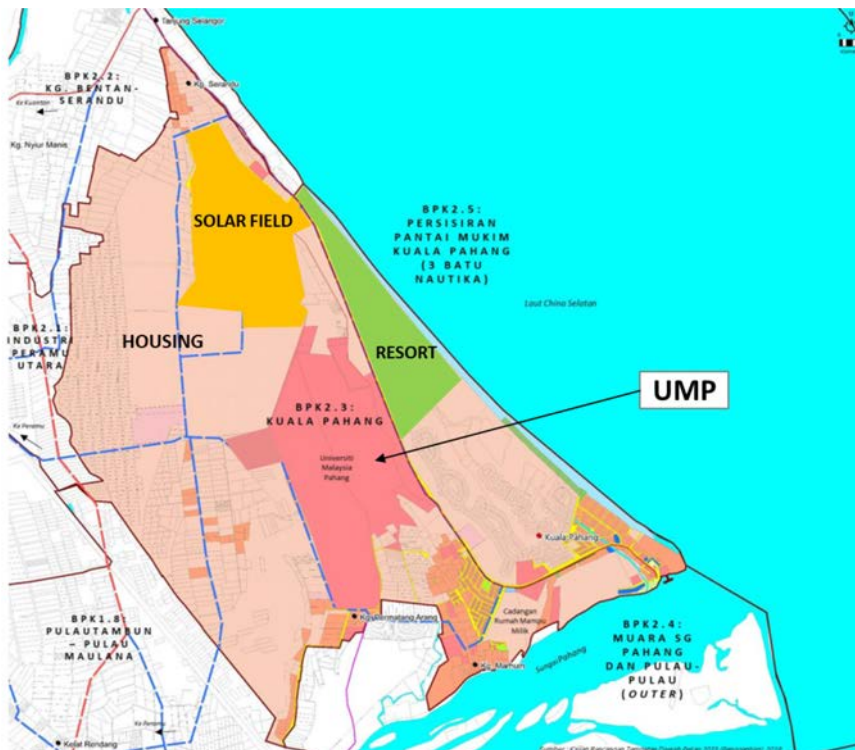
Universiti Malaysia Pahang (UMP), officially under the district of Pekan, is a planned campus that functions to serve the surrounding community with technologies.

The land is a landfill and was a swamp area. It is about 1 km from the seaside and 13 km from Pekan City.

This campus is surrounded by housing projects that are currently developing.

Campus Development Plan

Development of smart campus and sustainability

Referring to the Sustainable Campus Development Plan developed by the Centre for Property Management and Development (PPPH) in collaboration with the Centre for Information and Communication Technology (PTMK), Safety Division (BKES), Occupational Safety and Health Management Office (OSHMO), Student Affairs & Alumni Department (JHEPA), Centre for Corporate and Quality Affairs (PHKK), and other relevant departments

6 CLUSTERS

Setting & Infrastructure

Energy & Climate Change

Waste

Water

Transportation

Education & Research

Land use as of 2022

The total area of UMP's land is 667.9 acres, including four lakes spanning 93.2 acres wide. The balance of the land has been developed with mostly JKR's project. Twenty buildings had been completed, covering 34.8 acres of land. In 2022, there are four projects under construction covering 14.5 acres of land. For RMK-I2 (2020·2025), UMP proposed nine projects to MoHE and this year, under Rolling Plan 3, UMP is granted one project: Convocation Hall.

Infrastructure facilities (road, bicycle lane & pedestrian walkway)
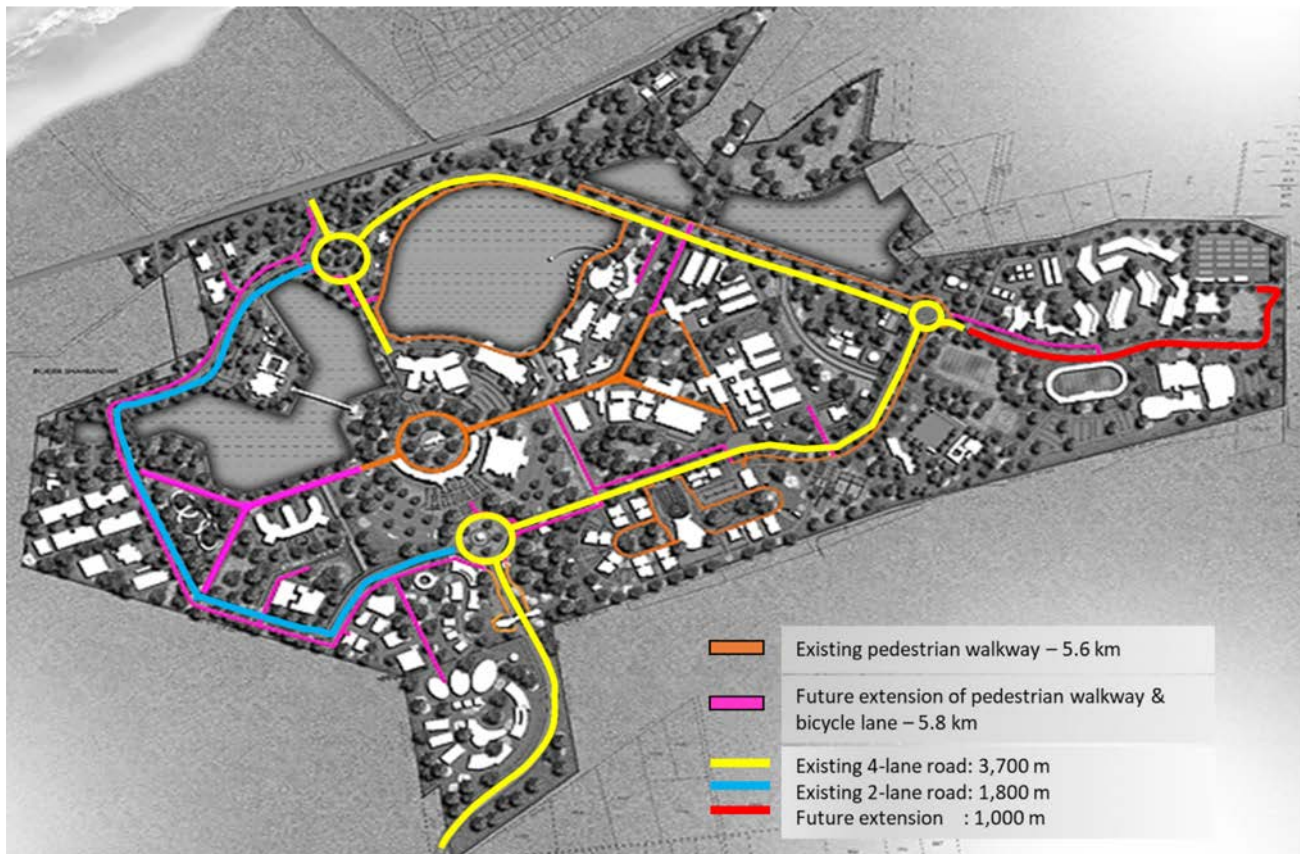
Existing development as of 2022

Campus development planning (2020-2030)
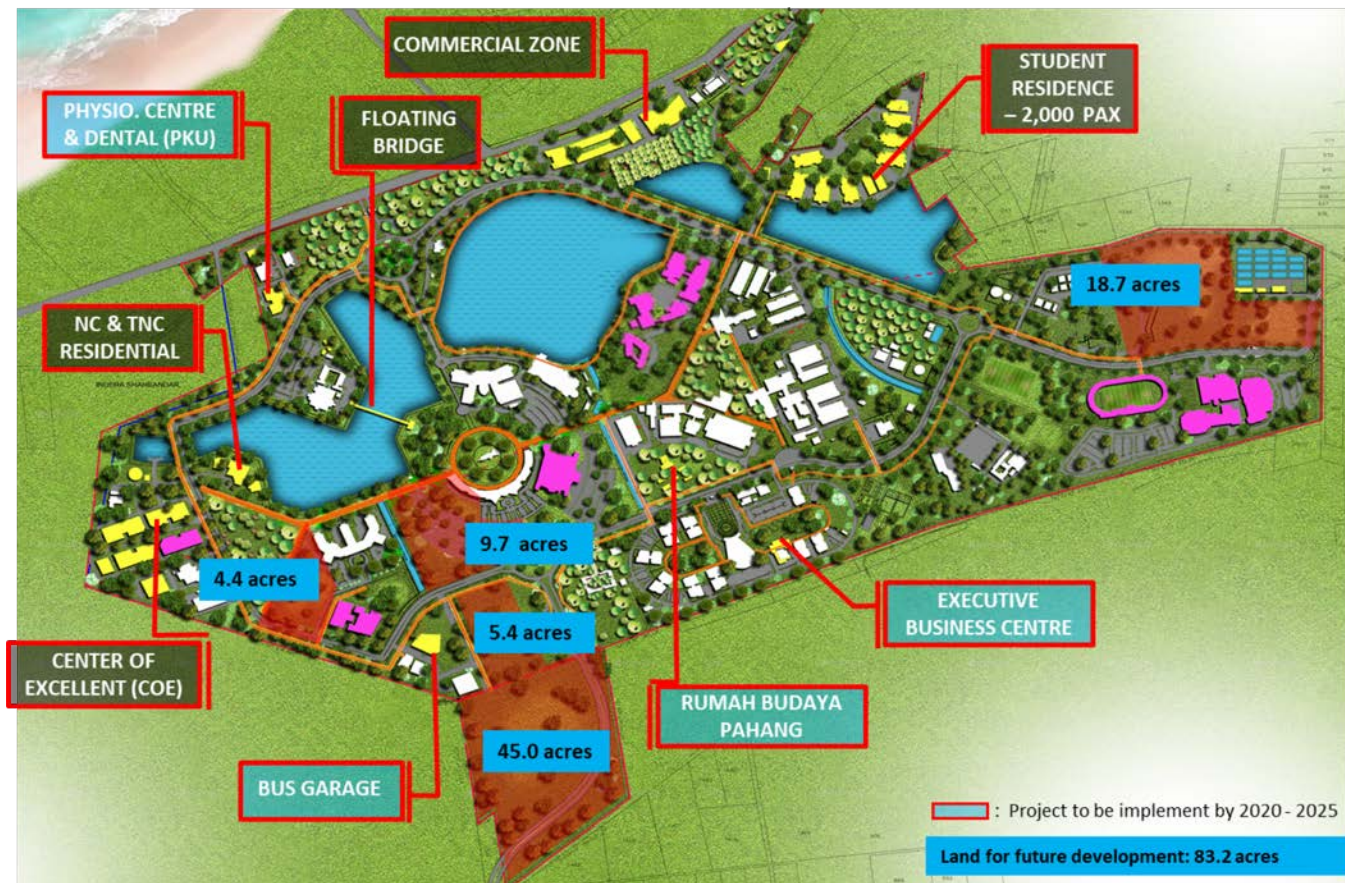
Green Area Development Planning 2020-2025

+ edutourism
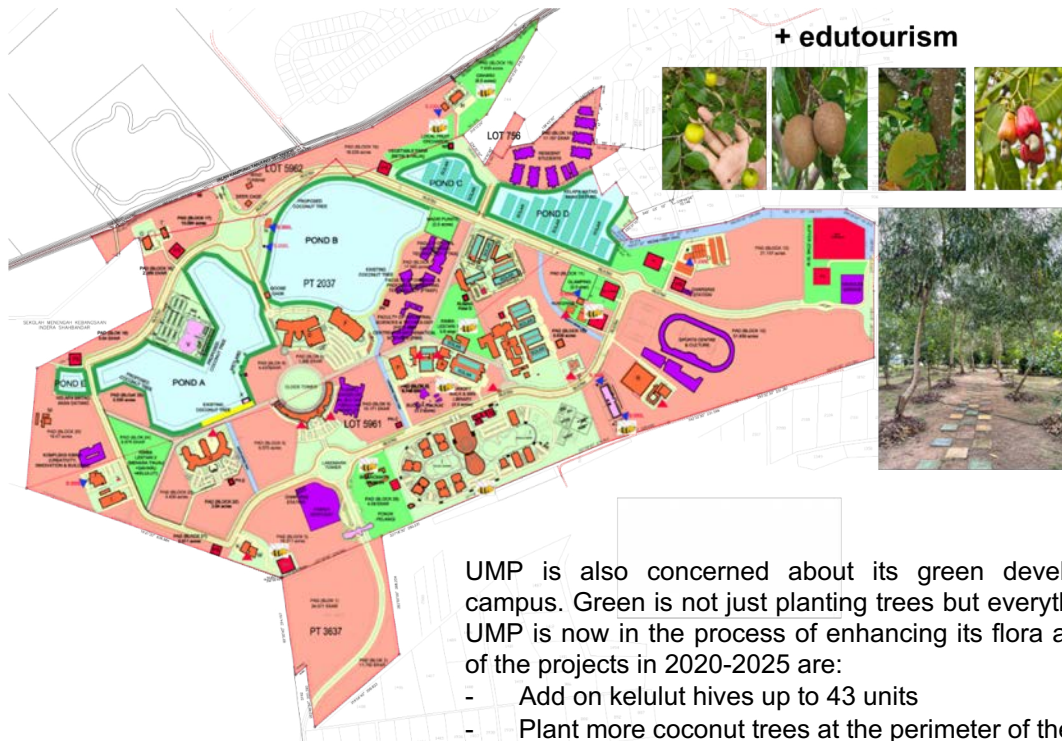
UMP is also concerned about its green development on the campus. Green is not just planting trees but everything related to it. UMP is now in the process of enhancing its flora and fauna. Some of the projects in 2020-2025 are:
- Add on kelulut hives up to 43 units
- Plant more coconut trees at the perimeter of the lakes
- Enhance Rimba Lestari with Menara Tinjau (viewing minaret)
- Prepare area for agarwood, ginger & papaya plantation
- Develop glamping area

Lot & land ownership of UMP Gambang

All these seven lots are owned by UMPH and rented by UMP. All future maintenance and development will be done by UMPH.

TOTAL AREA 458,600msq (115.42 acres)
LOT 74372 :   5.58 acres
LOT 74374 : 21.74 acres
LOT 74376 :   2.11 acres
LOT 74377 : 29.94 acres
LOT 74378 : 19.57 acres
LOT 126914 : 28.98 acres
LOT 126915 :   7.50 acres

LOT 74376
2.11 acres

LOT 74378
19.57 acres

LOT 74377
29.94 acres

LOT 126915
7.5 acres

LOT 126914
28.98 acres

LOT 74372
5.58 acres

LOT 74374
21.74 acres

4 nos. of Student Residence with 5,122 capacity :
RP1 – 1166 students
RP2 – 1272 students
RP3 – 1810 students
RP4 – 864 students

Total Rental Areas : 115.42 acres

Setting & Infrastructures (SI)

The campus setting and infrastructure details provide basic information about the university's commitment to a green environment through sustainability efforts. This metric also indicates whether the institution deserves the title of Green Campus. The goal is to encourage participating colleges to provide greater greenery and environmental protection, as well as the development of renewable energy sources.

The goal of this category is to encourage Universiti Malaysia Pahang (UMP) to provide more vegetation, protect the environment, and produce sustainable energy. The ratio of open space area to the total area, the on-campus area covered in forest, the on-campus area covered in planted vegetation, the on-campus area for water absorbance, the total open space area divided by the total campus population, and the university budget for sustainable effort are all included in this category.

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES
Setting & Infrastructure (SI)	15%	SI1: Ratio of open space area to total area SI2: Area on campus covered in forest vegetation SI3: Total area on campus covered in planted vegetation SI4: Total area on campus for water absorption besides the forest and planted vegetation SI5: Total open space area divided by total campus population SI6: Percentage of university budget for sustainability efforts SI7: Percentage of operation and maintenance activities of building during COVID-19 pandemic SI8: Campus facilities for disabled, special needs, and/or maternity care SI9: Security and safety facilities SI10: Health infrastructure facilities for well-being of students, academics, and administrative staff SI11: Conservation - plant, animal, and wildlife, genetic resources for food and agriculture secured in either medium- or long-term conservation facilities	• Plan for future development in campus to ensure the optimum usage of land (SI1) • Intensify campus greening programme with planted vegetation (SI3, SI11) • Consider the use of water absorption material such as paving block for parking area in future development (SI4) • Monitor the allocation of annual university budget for sustainability efforts to achieve more than 15% of the total university annual budget (SI6)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
SI1	Total campus area - Total building plinth area = A (A / Total campus area) x 100 = answer % 1. ≤1%: 0 point 2. >1%–80%:50 points 3. >80%–90%:100 points 4. >90%–95%:150 points 5. >95%: 200 points	150/200	3,894,113 m² (Total area) 274,644 m² (Total GF building area) 93% (Ratio open space area)	93% (150)	93% (150)	93% (150)	92.5% (150)
						Development of Dewan Konvokesyen 8000 m²	
SI2	,Percentage of area covered in vegetation in the form of forest to the total campus area 1. ≤2%: 0 point 2. >2%–9%: 25 points 3. >9%–22%: 50 points 4. >22%–35%: 75 points 5. >35%: 100 points	75/100	3,894,113 m² (Total area) 1,018,386.3 m² (Total forest area) 26% (Ratio forest area)	15% (50)	15% (50)	15% (50)	15% (50)
SI3	Percentage of area covered in planted vegetation 1. ≤10%: 0 point 2. >10%–20%: 50 points 3. >20%–30%: 100 points 4. >30%–40%: 150 points 5. >40%: 200 points	150/200	3,894,113m² (Total area) 1,184,736.08 m² (Total planted vegetation area) 30.4% (Ratio planted vegetation area)	41% (200)	41% (200)	41% (200)	41% (200)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
SI4	Percentage of campus area for water absorbance besides the forest and planted vegetation (i.e., soil, grass, paving block) to the total campus area 1.≤2%: 0 point 2.>2%–10%: 25 points 3.>10%–20%: 50 points 4.>20%–30 %: 75 points 5.>35%: 100 points	75/100	3,894,113 m² (Total area) 1,091,225.75 m² (Total absorbance area) 28% (Ratio absorbance area)	31% (100)	31% (100)	31% (100)	31% (100)
SI5	Ratio of open space area by total campus population 1. ≤10 m²/person: 0 point 2. >10–20 m²/person: 50 points 3. >20–40 m²/person: 100 points 4. >40–70 m²/person: 150 points 5. >70 m²/person: 200 points	150/200	3,619,469 m² (Total open space area 13,967 (Total campus population) 259 m²/person (Ratio open space / person)	70 m² (200)	90 m² (200)	100 m² (200)	200 m² (200)
SI6	Percentage of university sustainability budget for infrastructure, facilities, personnel cost, research and other related to sustainability efforts per annum to the total university budget	150/200	USD 53,135,137.00 (Total university budget) USD 6,333,680.00 (Sustainability efforts budget) 12% (Percentage of sustainability budget)	16% (200)	18% (200)	18% (200)	18% (200)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
SI7	Percentage of operation and maintenance activities of building conducted during COVID-19 pandemic 1. ≤25%: 0 point 2. >25%–50%: 50 points 3. >50%–75%: 100 points 4. >75%–95%: 150 points 5. >95%: 200 points	75/100	484,627.35 m² (Total building floor area) 443,831.89 m² (Total building floor area operated during COVID-19 pandemic) 92% (Ratio building operated during COVID-19 pandemic)	100% (100)	100% (100)	100% (100)	100% (100)
SI8	Campus facilites for disabled, special needs and maternity care (i.e., toilet, transportation, day care)	100/100	Facilities exist in all buildings and are fully operated	100% (100)	100% (100)	100% (100)	100% (100)
SI9	Campus facilities support security and safety for campus residents	100/100	Security infrastructure available and security responding time for accident, crime, fire, and natural disaster less than 10 minutes	100% (100)	100% (100)	100% (100)	100% (100)
SI10	Health infrastructure facilities for well-being of students, academics, and staff on campus	100/100	Health infrastructure (first aid, emergency room, clinic, and certified personnel) are available and accessible for public	100% (100)	100% (100)	100% (100)	100% (100)
SI11	Campus programme for conservation of plant, animal and wildlife, genetic resources for food and agriculture secured in either medium- or long-term conservation facilities	100/100	Conservation programme fully implemented	100% (100)	100% (100)	100% (100)	100% (100)

Energy & Climate Change (EC)

The new building is being designed with that in mind energy elements

The most weighted indicator in this ranking is the university's attention to energy use and climate change issues. We define several indicators for this particular area of concern in our questionnaire, including energy-efficient appliance usage, smart building/automation building/intelligent building implementation, renewable energy usage policy, total electricity usage, energy conservation programmes, elements of green buildings, climate change adaptation and mitigation programmes, greenhouse gas emission reductions policy, and carbon footprint. Universities are anticipated to improve their efforts in energy efficiency in their facilities and to care more about nature and energy resources as a result of these indicators.

This cluster investigates the use of renewable and efficient energy in university facilities, as well as the level of knowledge about natural and energy resources. This is regarded as the index's most important indication. As a result, universities should take steps to improve their performance in all aspects of energy and climate change.

UMP carbon footprint

Total UMP area

783.34 acres

Pekan	**667.92 acres**
Paya Besar	**115.42 acres**

Population

Staff	**1,956**
Students	**16,527**

Total carbon footprint

14,008 tonne CO$_2$

From electricity

12,971 tonne CO$_2$

Vehicles

Staff	**762 tonne CO$_2$**
Students	**275 tonne CO$_2$**

ENERGY & CLIMATE

GREEN INITIATIVES IN UMP

Universiti Malaysia Pahang has been spearheading the green and renewable technology effort since 2009. With the vast development of its campuses, UMP has been using efficient and energy-saving electrical devices that enable UMP to become the catalyst in green technology on the East Coast. New technology usage includes applying LED technology, building automation system (BAS), variable reference valve (VRV), and smart building system. The management of UMP also introduces a few initiatives to ensure the government's policy on energy saving can be applied at the university. The policy states that utility usage on every government building needs to be prudent, where the electricity savings needs to be at least 2% of the total usage.

Having two large campuses, UMP's electricity consumption is huge. Initiatives to save energy and be more efficient in the use of electricity directly translate to the prudence in managing the university's operational budget while simultaneously contributing to reducing the university's carbon footprint. In 2017, UMP managed to save an average of 73,672 kWh monthly, amounting to 25.1% savings, with an equivalent CO_2 emission of 51,265 kg monthly.

Malaysia Sustainable Energy and CO_2 Emissions Reduction Policy

Initiatives on promoting energy efficiency and renewable energy in Malaysia started as early as the 1980s. However, efforts then were sketchy, basically prompted and spearheaded by the Ministry of Energy, Telecommunications and Post (the name then) and supported by the Institution of Engineers, Malaysia (IEM) under mainly campaign programmes.

In the decade 2000, Malaysia experienced some drastic progress in developing sustainable energy and the environment with the enactment of laws and implementing mechanisms. The Efficient Management of Electrical Energy Regulation (EMEER) was enacted in 2008, parked under the Electricity Act 2001, making it mandatory for any building, company, and institution consuming a total of 3 million kWh over 6 months to engage an Energy Manager. EMEER 2008 requires these organisations to prepare their annual energy plan to reduce their electricity consumption. The Renewable Energy Act was further enacted in 2009, encouraging the development of small power producers (SPPs) producing electricity from biomass, mini- and micro-hydropower plants, as well as photovoltaic panels fed into the national grid. Both EMEER 2008 and Renewable Energy Act 2009 precipitated the establishment of the Sustainable Energy Development Authority (SEDA), which coordinates and manages the feeding of electricity to the national grid with a special tariff.

Decarbonisation

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES
Energy & Climate Change (EC)	21%	EC1: Energy efficient appliances usage EC2: Smart building programme implementation EC3: Number of renewable energy source in campus EC4: Total electricity usage divided by total campus population EC5: Ratio of renewable energy production towards total energy usage per year EC6: Element of green building implementation EC7: Greenhouse gas emission reduction programme EC8: Total carbon footprint divided by campus population EC9: Number of innovative programme(s) during COVID-19 pandemic EC10: Impactful university programme(s) on climate change	Energy and water saving campaign is, done annually (EC1–10) LED and light sensor installation (EC2) Stages retrofitting programme by changing existing light to energy saving light (EC2) Yearly energy audit – data collection for improvement matters (EC1, 2, 4, and 5) Solar charging station for electric vehicles (EC2, 3, and 4) Solar powered waqf (EC2, 3, and 4) Installation of lighting occupancy sensor lamp (EC2 and 4) Installation of 8.31 MWp solar system on rooftop, parking area & lake (EC1, 4, 5, 7, 8, and 10) Renewable energy source from wind, turbine, pico hydro and biodiesel (EC3)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
EC1	Compare the number of energy efficient appliances and the number of conventional ones used in your campus and provide them in percentage. Examples of energy efficient appliances are A/C with inverter technology, LED light bulbs, and Energy Star-certified computers.	200/200	(80% of UMP buildings applied energy efficient products/technology) Percentage of building applied energy efficient appliances usage	85% (200)	88% (200)	90% (200)	95% (200)
EC2	A building that is classified as a smart building must have the general requirements of smart building features: automation, safety (physical security, presence sensors, video surveillance/CCTV), energy, water (sanitation), indoor environment (thermal comfort and air quality), and lighting (illumination, low power lighting). It is expected that smart buildings are supported by the presence of a Building Management System (BMS)/Building Information Modelling (BIM)/Building Automation System (BAS)/Facility Management System (FMS) and equipped with at least 5 of the remaining identified requirements, where possible, interfaced with the BMS/BIM/BAS/FMS.	150/300	33% smart building in UMP) Pekan: 74% Gambang: 0% *Note: 75% smart buiding in UMP to achieve full mark - 300.*	59% (150) UMP Gambang archeive (46%): Kompleks Baru Light sensor LED light UMP Pekan (76%): Light sensor LED light	69% (225) Kampus Gambang : KK4 Light sensor LED light	85% (300) Kampus Gambang: KK2 Light sensor LED light	90% (300) Masjid UMP Gambang Light sensor LED light

11

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
EC3	Availability of more sources of renewable energy is considered to indicate that a university has put more efforts in providing alternative energy. Please select the number of renewable energy sources used in your campus:	75/300	There is only 1 initiative in UMP: Solar system 20 kilowatt on the top of FTKM walkway.	300 Introduces/ installation 3 renewable energy sources (wind, turbine small scale, pico hydro, biodiesel)	300	300	300
EC4	The total electricity usage (including one or more alternative energy sources used in campus) divided by the total campus population.	75/300	2029 kW per person per year	1530 kW (150) - Due to COVID-19 previous years, number of UMP populations are less. For the recent year, there will be an increment on the UMP population	665.9 kW (225) Electrical supply from renewable energy – solar system: 3200 kWp (Pekan) 2620 kWp (Gambang)	665.9 kW (225) Electrical supply from renewable energy – solar system: 3200 kWp (Pekan) 2620 kWp (Gambang)	202.6 kW (300) Electrical supply from renewable energy – solar system: 5690 kWp (Pekan) 2620 kWp (Gambang)

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
EC5	The ratio of renewable energy production divided by total energy usage per year	50/200	0.8984	1.5% (100)	63% (200)	63% (200)	89% (200)
EC6	Elements of green building implementation as reflected in all construction and renovation policies	200/200	Rainwater harvesting, natural day lighting, natural ventilation, building energy manager, ventilation bricks, recycled materials	Establish a policy for development and renovation integrated with green building element (200)			
EC7	Greenhouse gas emission reduction programme	100/200	Solar system, wind power, biodiesel, EE appliances, awareness	-	(200) 1. Solar 5.94 MW: 3.85 MW (Pekan) 2.09 MW (Gambang) 2. Electric vehicle: - 2 buses - 2 vans	(200) Tree planting programme	(200) Awareness programme
EC8	Total carbon footprint divided by total campus population (metric ton per person)	0/200	1.78 tonne/CO_2	1.10 tonne/CO_2 (100)	0.46 tonne/CO_2 (150)	0.47 tonne/CO_2 (150)	0.09 tonne/CO_2 (200)

Waste (WS)

Waste treatment and recycling activities are the major factors in creating a sustainable environment. The activities of university staff and students on campus produce lots of waste. Therefore, programmes and waste treatments should be among the concern of the university, i.e., recycling programme, toxic waste recycling, organic waste treatment, inorganic waste treatment, sewerage disposal, and policy to reduce the use of paper and plastic on campus. The indicators are:

 i. Recycling programme for university's waste
 ii. Programme to reduce the use of paper and plastic on campus
 iii. Organic waste treatment
 iv. Inorganic waste treatment
 v. Toxic waste handled
 vi. Sewerage disposal

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES
Waste (WS)	18%	WS1: Recycling programme for university waste WS2: Programme to reduce the use of paper and plastic on campus WS3: Organic waste treatment WS4: Inorganic waste treatment WS5: Toxic waste treatment WS6: Sewerage disposal	Standardise PIC for waste management in Gambang and Pekan campuses (WS1 and 2) Develop policies and enforce proper execution on waste management (WS1 and 2) Create one unit as a centralised function under PPPH for waste management in Pekan (WS3 and 4) Utilise internal grant under PDU special grant on inorganic waste treatment (case study in UMP) (WS4) Scheduled waste disposal (WS5) Update scheduled waste inventory monthly (WS5) Awareness campaign on scheduled waste management (WS5) Add on extra work for waste management contract handled by UMPH (Gambang) to make sure waste management activities will be executed properly and data reported are accurate (WS1, 3, and 4) Develop proper template for waste management at each PTJ and enforce data reporting through the use of available system in e-comm (WS1, 3, and 4)

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WS1	The section refers to the university efforts to encourage staff and students to recycle waste. This will contribute to the understanding of how recycling programmes affect the quantity of waste treated from the total of waste produce.	225/300	225 marks/12.5% (51%)	225 marks/12.5% (51%)	225 marks/12.5% (60%)	300 marks/16.7% (76%)	300 marks/ 16.7% (76%)
WS2	The section indicates the current condition of the university in establishing a formal policy to reduce the use of paper and plastic. The criteria measures how many programmes contribute to recycling programme, such as double-sided printing policy programme, the use of tumblers, the use of reusable bags, print when necessary, spell check before printing campaign, reusable bag campaign, and QR code in teaching & learning activities.	300/300	300 marks/16.7% (4 programmes)	300 marks/16.7% (4 programmes)	300 marks/16.7% (4 programmes)	300 marks/16.7% (4 programmes)	300 marks/16.7% (4 programmes)
WS3	Organic wastes are chemical substances usually of animal or plant origin. The section refers to the method of organic waste treatment in the university considering food waste and green waste. The volume of the organic waste treated (metric ton, MT) against the total organic waste collected indicates the effectiveness of the initiatives.	225/300	225 marks/12.5% (51%)	225 marks/12.5% (51%)	225 marks/12.5% (60%)	300 marks/16.7% (76%)	300 marks/16.7% (76%)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WS4	Inorganic wastes are chemical substances of mineral origin. The section refers to the method of inorganic waste treatment in the university considering paper, discarded paper, bottle, plastic, and metal. The volume of the inorganic waste treated (metric ton, MT) against the total inorganic waste collected indicates the effectiveness of the initiatives.	225/300	225 marks/12.5% (51%)	225 marks/12.5% (51%)	225 marks/12.5% (60%)	300 marks/16.7% (76%)	300 marks/16.7% (76%)
WS5	The section reflects the current practice on the toxic waste handling in the university. The handling process includes whether toxic wastes are dealt with separately, for example, by classifying and handling them over to a third party or certified handling companies. Scheduled waste generation data collection is done through the online platform. This can measure the percentage (%) of the toxic waste collected for disposal.	225/300	225 marks/12.5% (75% treated)	300 marks/16.7% (100% treated)	300 marks/16.7% (100% treated)	300 marks/16.7% (100% treated)	300 marks/16.7% (100% treated)

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WS6	The section describes the primary method of sewage treatment in the university. Sewage generated in campus is a type of wastewater that requires attention since the volume is raising yearly with the increment of student intake. Various techniques have been used to treat campus sewage. Regulations, policies and standard procedure in implementing a proper sewage management should be implemented in university for a better and sustainable campus environment.	225/300	225 marks/12.5% (downcycling)	300 marks/16.7% (upcycling)	300 marks/16.7% (upcycling)	300 marks/16.7% (upcycling)	300 marks/16.7% (upcycling)

Water reservoir area around UMP

Water (WR)

Water use in campus is another important indicator in GreenMetric. Universiti Malaysia Pahang (UMP) aims to reduce water usage, increase conservation programme, and protect the habitat. Water conservation programme and piped water use are among the criteria. The indicators are:

i.   Water conservation programme implementation
ii.   Water recycling programme implementation
ii.   Water-efficient appliances usage
iv.   Consumption of treated water
v.   Percentage of additional handwashing and sanitation facilities during COVID-19 pandemic

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES
Water (WR)	10%	WR1: Water conservation programme implementation WR2: Water recycling programme implementation WR3: Water-efficient appliances usage WR4: Consumption of treated water WR5: Percentage of additional handwashing and sanitation facilities during COVID-19 pandemic	Additional capacity rainwater harvesting from 4,500 to 36,000 L (WR1 and 2) Additional four units of pump system for watering plant from lakes (WR1 and 2) Installation of the water meter at specific place to detect the leakage and monitor usage profile (WR3) Installation of water-efficient appliances, dual flush cistern, and push taps system at toilets (WR3)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WR1	Water conservation programme implementation. Supports water conservation (i.e., for lakes and lake management systems, rain harvesting systems, water tanks, bio pore, and recharge well) 1. None. Please select this option if the conservation programme is needed, but nothing has been done. 2. Programme in preparation (i.e., feasibility study and promotion) 3. 1%–25% implemented at an early stage (i.e., measurement of potential surface runoff volume) 4. >25%–50% water conserved 5. >50% water conserved	200/200	>50% water conserved	100% (200)	100% (200)	100% (200)	100% (200)

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WR2	Water recycling programme implementation Current condition of your university in establishing formal policies for water recycling programmes (i.e., the use of recycled water for toilet flushing, car washing, and watering plants) 1. None. Please select this option if the water recycling programme is needed, but nothing has been done. 2. Programme in preparation (i.e., feasibility study and promotion) 3. 1%–25% implemented at an early stage (i.e., measurement of wastewater) 4. >25%–50% water recycled 5. >50% water recycled	100/200	Category [3], 0.5 × 200 = 100, implemented at early stage, research, and study	50% (100)	75% (150) Additional 2 pump systems for watering plant	100% (200) Additional 2 pump systems for watering plant	150% (200)

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WR3	Water-efficient appliances usage Water-efficient appliance usages are replacing conventional appliances. This also includes the use of water-efficient appliances (i.e., using censored/automated hand washing taps and highly efficient toilet flush) 1. None. Water efficient appliances are needed, but nothing has been done 2. Programme in preparation (i.e., feasibility study and promotion) 3. 1%–25% of water efficient appliances installed 4. >2%5–50% of water efficient appliances installed 5. >50% of water efficient appliances installed	200/200	Category [5], 1.0 × 200 = 200	100% (200)	100% (200)	100% (200)	100% (200)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
WR4	Consumption of treated water The percentage of treated water consumed from water system treatment compared to all water sources (i.e., rainwater tank source, groundwater, and surface water. The water source can be from the treated water installation inside and/or outside your university. 1. None 2. 1%–25% treated water consumed 3. >25%–50% treated water consumed 4. >50%–75% treated water consumed 5. >75% treated water consumed	200/200	Category [5], 1.0 × 200 = 200	100% (200)	100% (200)	100% (200)	100% (200)
WR5	Water pollution control in campus area Water pollution control to prevent polluted water from entering the water system. For example, the mechanism to regularly check water quality (physical, chemical, and biological parameters) on your campus	200/200	Category [5], 1.0 × 200 = 200	100% (200)	100% (200)	100% (200)	100% (200)

Transportation (TR)

Transportation is perhaps one of the main contributors to the carbon emission in the university. Limiting the number of private motor vehicles on campus by using planned public buses judiciously, encouraging the use of bicycles, and introducing a pedestrian walking policy improve pollutant level while simultaneously encouraging a healthy environment. Additionally, the use of environmentally friendly public transportation such as solar or electrically powered public transportation will definitely reduce the carbon footprint on campus.

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES
Transportation (TR)	18%	TR1: Ratio of total vehicles (cars and motorcycles) divided by total campus population TR2: Shuttle services TR3: Zero emission vehicles (ZEV) policy on campus TR4: Ratio of zero emission vehicles (ZEV) divided by total campus population TR5: Ratio of parking area to total campus area TR6: Transportation programme designed to limit or decrease the parking area on campus for the last three years TR7: Number of transportation initiatives to decrease private vehicles on campus TR8: Pedestrian policy on campus	Shuttle transportation with 3 IC engine buses, 2 EV buses (TR1, 6, and 7) EV bus and van (TR2 and 7) EV scooter rental (TR1, 4, and 7) Student resident priority for student with ZEV initiative (TR3 and 4) Staff carpool programme (TR7)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
TR1	Total number of vehicles (cars and motorcycles with combustion engine) divided by total campus population	100/200	Current 0.1154 (during COVID-19 pandemic) 0.187 (Normal conditions) Target ratio is less than 0.04	0.065 (906) 150	0.065 (906) 150	0.044 (616) 200	0.044 (616) 200
TR2	Describe the condition of the availability of shuttles for journeys within campus and whether the ride is free or charge, operated by a university or by other parties. Please select an option from the following options. If shuttle service is not provided due to positive reason(s) such as the campus area is small, another zero-emission transportation service is available, please select "not applicable".	225/300	Lack of zero emission vehicle By first quarter of 2023, UMP is expected to receive 2 units of EV bus to support the initiative	2 EV buses (300)	2 EV buses (300)	2 EV buses (300)	2 EV buses (300)
TR3	Zero emission vehicles (ZEV) policy on campus	200/200	Policy available on electric bicycle	200	200	200	200
TR4	Total number of zero emission vehicles (ZEV) divided by total campus population	200/200	Current 0.186 Target >0.02 ratio	200	200	200	200
TR5	Ratio of ground parking area to total campus area	200/200	34,651 m²/3,901,890 m² = 0.09	200	200	200	200

	CRITERIA	MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
TR6	Programme to limit or decrease the parking area on campus for the last 3 years (from 2018 to 2020)	0/200	Benchmarking programme Currently none target programme result in 30% parking area decrease	9% shuttle (100)	23% (9%+14%) (150)	23% shuttle+ 30% WFH (200)	23% shuttle+ 30% WFH (200)
TR7	Number of initiatives to decrease private vehicles on campus	200/200	More than 3 initiatives	200	200	200	200
TR8	Pedestrian path on campus	300/300	Policy available	300	300	300	300

Education & Research (ED)

The education & research cluster relates the role of the university to educate the campus community and the population at large on the importance of the 17 United Nation Sustainable Development Goals. More precisely, this cluster will acculturate the new generation on sustainable issues related to their every day lives.

CATEGORY	WEIGHTAGE	CRITERIA	INITIATIVES

Education & Research (ED)	18%	ED1: Ratio of sustainability courses to total courses/subjects
		ED2: Ratio of sustainability research funding to total research funding
		ED3: Number of scholarly publications on sustainability
		ED4: Number of events related to sustainability
		ED5: Number of student organisation related to sustainability
		ED6: University-run sustainability website
		ED7: Sustainability report
		ED8: Number of cultural activities on campus
		ED9: Number of university programme(s) to improve teaching and learning
		ED10: Number of sustainability community services project organised and/or involving students
		ED11: Number of sustainability-related start-ups
			1. Seed fund for sustainability programme (ED4, 5, 9, and 10)
			    a. Student organisation
			    b. Event/Programme
			    c. Community service project
			
			2. SDG-themed UMP internal grants (ED2 and 3)

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
ED1	Ratio of sustainability courses to the total number of courses (subjects) in the university	300/300	93%	>93%	>93%	>93%	>93%
ED2	Ratio of sustainability research funding to the total research funding in the university	200/200	62%	>62%	>62%	>62%	>62%
ED3	Average number of indexed publications on Google Scholar related to environment and sustainability published annually over the last three years, using keywords: green, environment, sustainability, renewable energy, and climate change	200/200	838	880	924	970	1019
ED4	Average number of events per annum over the last three years (i.e., conferences, workshops, awareness raising, and practical training) related to the issues of environment and sustainability hosted or organised by the university	200/200	73	77	81	86	91
ED5	Total number of student organisation or association related to sustainability in a faculty or university level	200/200	35	44	53	62	71

CRITERIA		MARKS	BASELINE	KPI (TARGET)			
				2022	2023	2024	2025
ED6	Total number of university-run sustainability website	200/200	1	1	1	1	1
ED7	Total number of sustainability report	100/100	1	1	1	1	1
ED8	Total number of cultural activities on campus (i.e., Cultural Festival) including virtual activities	100/100	8	9	10	11	12
ED9	Total number of university programme(s) to improve teaching and learning (i.e., internet bandwidth improvement, video conferencing facilities, online teaching methods workshop, and Helpdesk group for e-Learning)	100/100	New criterion (2022)	4	4	4	4
ED10	Total number of sustainability community services project organised and/or involving students	100/100	14	15	16	17	18
ED11	Total number of any level sustainability-related start-ups (profit/non-profit, digital/non-digital, managed by university involving student or not) initiated and managed by university	50/100	10	14	15	15	15

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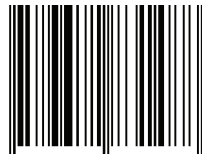019-658 6605
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