

**UNIVERSITY MALAYSIA PAHANG
LONG-TERM GREEN CAMPUS BLUEPRINT**

I.0 INTRODUCTION

In December 2009, at the United Nations Climate Change Conference 2009, 15th Conference of Parties (COP-15), the Prime Minister of Malaysia, Dato' Seri Najib bin Tun Abdul Razak made a pledge that Malaysia would adopt an indicator of a voluntary reduction of up to 40 percent in terms of carbon dioxide emissions intensity of GDP by the year 2020 compared to the 2005 level. (This indicator is conditional upon receiving the transfer of technology and finance of adequate and effective levels from Annex 1 partners of Kyoto Protocol). Indeed, this is a noble and ambitious pledge made by His Excellency the Prime Minister to the global community – and University Malaysia Pahang stands by his side to support and implement our share of the national goal.

Incidentally too, UMP Five Year Strategy for 2011 – 2015 and 2016 – 2010, also addresses one important area in its Second Key Result Area – Operational Sustainability. This **Long-Term Green Campus Blueprint** was first drafted in 2013 and implemented subsequently depending on the quantum of financial allocations provided in subsequent years.

2.0 UMP's LONG-TERM GREEN CAMPUS BLUEPRINT – VISION, MISSIONS AND STRATEGIES

In the course of achieving excellence in teaching and research, UMP will strive to do the following as its **GREEN CAMPUS VISION**:

Universiti Malaysia Pahang (UMP) is committed to operate in a sustainable manner by being more prudent with its use of energy and other natural resources, as well as care to the environment – with the ultimate aim of contributing to national and global agenda on environment and sustainability.

This Vision shall be achieved through the following **Missions**:

- i) To be more efficient in its energy consumption (including electricity and other energy forms), taking concrete steps to minimize waste;
- ii) To create a positive effect on the local environment and community through efficient use of natural resources and efficient management of wastes;
- iii) To reduce negative impact on the local and global environment at a rate consistent with meeting the national voluntary initiatives voluntary, as well and going further to meet the national target where it is cost-effective to do so.

Based upon the above Vision and Missions, UMP aims to pursue the following:

- i) Reduce its energy consumption through avoidance of wasteful consumption and by being more prudent in its use of energy, particularly electricity and fuel for its transport fleet;
- ii) Reduce the university's environmental impact to the locality through better management of natural resources, greening and "foresteing" of its campus – hence contributing towards carbon sequestration;
- iii) Meet the statutory requirements of all relevant legislations and other requirements and exceed these requirements where they best support the university's other core objectives;
- iv) Adopt best practices to ensure the prevention of pollution;
- v) Support national voluntary initiatives to cut down its greenhouse gas emission as pledged by the Prime Minister in Copenhagen in December 2009;
- vi) Monitor and regularly review its sustainability and environmental performance, and set annual objectives and targets to ensure continuous improvement;
- vii) Conduct and encourage more Energy Efficiency, Biodiversity, Sustainability, Renewable Energy Technologies, and research in the campus under themes that include Sustainable Indigenous Technologies, as well as the importance of Sustainability and Environmental Protection in its teachings;
- vii) Make Energy Efficiency, Environment and Carbon Reduction Initiatives (CRI) as important agenda in the university's management at various levels from the University Management Meeting to meetings at PTJ level;
- viii) Provide Energy Auditing consulting services, particularly to industries and institutions in the East Coast of Peninsular Malaysia to help make their operations more sustainable;
- ix) Communicate both internally and externally about its energy efficiency programme and environmental performance, including awareness and training for staff and students, as well as its local community;
- x) Restructure our Procurement Policy to gradually insist to our regular suppliers and clients to also adopt a sustainability programme in their business operations.

The UMP Long-Term Green Campus Blueprint shall be implemented simultaneously in two inter-related plans, **Energy Efficiency Plan** as well as **Environment and Carbon Reduction Plan**.

3.0 ENERGY EFFICIENCY PLAN (EE-PLAN)

Within the EE-PLAN UMP shall strive to pursue the following initiatives:

3.1 To install internal kWh meters for Responsibility Centres (PTJ, i.e faculties and departments) such that the energy consumption pattern for each PTJ, or a special building in the PTJ, can be studied, and initiatives undertaken to minimize wastes and make their energy consumption be more efficient;

3.2 Following the installation of internal meters as described above, to conduct an Energy Profile Study, which is necessary to establish a true picture of UMP's electricity consumption trend. Increasing monthly bills over the years cannot tell much about UMP's electricity use, as they can be a result of several factors, including; increasing tariff, increase of students and staff population, increase of new buildings and facilities, and special functions and activities happening within the year such as conferences, construction work, hosting of national sports, etc. A more meaningful indicator or index is the electricity consumption per square meter area, AND/OR per capita;

3.3 To save energy in the Lighting and Electrical Systems where significant electricity consumption can be reduced through making the campus lightings be more efficient through removing some bulbs or tubes in areas where the lightings may be in excess, replacing of existing bulbs or tubes with more efficient types (such as T5 tubes or LED), and also possible rewiring of lights to allow alternative switching options;

3.4 To save energy in mechanical systems, where significant electricity savings can be made from the change of existing non-functioning or inaccurate thermostats/sensor to more efficient ones, to installation of stand-alone air-conditioning systems for use during off-office hours (rather than powering on the central cooling systems whereby other unwanted facilities are also cooled down wastefully). A later phase of this initiative may also include installation of High-Efficiency Motors (HEMs) as big HEMS can reduce electricity consumption by as much as 40 percent as compared to cheaper and inefficient motors of the same capacity.

3.5 To save fuel in the university transport vehicles through a more rigorous fleet management and regular maintenance. (Energy Efficiency in the transport sector is a more complicated programme to initiate and implement, and it has never been addressed appropriately in Malaysia, as it is a cross-sectoral issue and its implementations cuts across different sectors and therefore requires coordination among different ministries. (It is therefore a challenge for UMP if the university can implement and manage this particular programme effectively);

3.6 To conduct Energy Audits as a necessary exercise to establish a more accurate picture of the energy consumption characteristics of specific facilities, including a more accurate estimation of the energy wastage, more specific measures to be initiated to further save energy, and a more accurate estimation of the investments required to implement the energy efficiency measures. However, doing these audits for various facilities need time and efforts.

3.7 All initiatives above shall be implemented under three different strategies; namely No-Cost Measures, Low-Cost Measures, and High-Cost Measure. These strategies require different quantum of investments and they each provide different levels of benefits and returns.

- **No-Cost Measures** are basically tightening house-keeping habits and instilling strong awareness among all levels of staff that energy is an expensive commodity both in terms of its availability and price. The building occupants at large should be made to understand that energy should not be wasted and instead be used prudently, just the quantity needed, and without being extravagant.
- **Low-Cost Measures** are improvement initiatives that do require a reasonable amount of investment. Such initiatives may include change of existing tungsten bulbs to compact fluorescent lightings (CFL) or LED bulbs, construction of shades or awnings above windows to cut down solar gain into air-conditioned rooms, and door-closers to automatically close doors in air-conditioned rooms. Such investments provide a Return on Investment (ROI) of up to two years.
- **High-Cost Measures** are improvement initiatives that require significantly high investments, but the energy savings achieved are generally higher. They are usually carried out based on recommendations made after an Energy Audit is being carried out. Such measures may include changes such as installation of stand-alone air-conditioning systems for facilities that operate at odd hours rather than use of central systems, since central system also cool other facilities wastefully

4.0 ENVIRONMENT AND CARBON REDUCTION PLAN (ECR-PLAN)

Within this ECR-PLAN UMP shall strive to pursue the following initiatives:

4.1 To save fuel and reduce emissions by the fleet of vehicles owned and operated by the university, complementing the electricity savings and CO₂ emissions reduction initiatives pursued in buildings and facilities. This shall be made through improvement of the management of the fleet and operation schedules, as well ensuring that the vehicles are efficiently maintained to operate at high efficiency, thus minimising unwanted emissions;

4.2 To promote, where possible and feasible, applications of renewable energy technologies for clean energy generation for use in the university as supplementary sources to the electricity supply from the grid, with efforts to draw in participation and collaboration with the private sector through grants and pilot tests;

4.3 To harvest rainwater, considering that water is a precious commodity and letting rainwater wasted is not sustainable. At the very least, rainwater could be used for gardening, washing, and flushing. With proper filtering, rainwater is safe to be used even for drinking and cooking.

4.4 To further elevate its current e-Comm system towards a “paperless university”. Computer-based systems are widely used by most universities around the world. However, most current systems are still paper-based which involves high dependence on hard-copies. It has to be noted that converting paper-based activities to digital will never reach a system fully without paper. But at least, further minimizing the use of papers will save more trees from being cut, which in turn will help the local environment and the world at large in carbon sequestration;

4.5 To practice the 3R concept (Reduce, Reuse and Recycle), in managing the different types of wastes generated by the university, including students colleges. The university shall ensure that the companies contracted to remove the university’s waste shall also manage the disposal of the waste sustainably and responsibly;

4.6 To actively engage in promoting sustainable wastes disposal and management, particularly agricultural wastes and municipal solid wastes in the East Coast area. UMP shall be actively engaged with local authorities and the community in conducting research for converting wastes to energy, and implementing programmes in the sustainable disposal and management of wastes in the agricultural, residential and industrial sectors;

4.7 To promote cycling as a popular transportation and also a relaxation exercise among staff and students within the campus, while at the same time saving fuel consumption, and more importantly reducing emissions and air pollutions. Cycling is also a healthy transportation mode, encouraging cyclists to keep their muscles and cardiovascular systems active, and allowing them to relax their brains. Future development of the campus will therefore incorporate, where appropriate, a network of cycling lanes to promote inter-faculty and internal campus links;

4.8 To ensure to the extent possible sustainable procurement – meaning that while the government procurement procedures are strictly adhered to, companies producing or supplying items, products and materials, as well as those providing services to the university would also observe sustainable practices in their operations;

4.9 To include sustainable design options for new buildings and facilities In the course of UMP’s expansion and growth. The design of new buildings or facilities by consultants shall

include options for efficient energy consumption and environmentally sound practices, to ensure that the environment, both locally and globally, is not compromised. Such options would also state the extra costs that may incur, complete with the rate of investment (payback period). The final choice and decision, however, shall be left upon the jurisdiction of the university's top management;

4.10 To embark on a programme to plant more trees as an integral part of the campus landscape which would not only help to make the campus look green, beautiful and serene, but as a definite action to sequester carbon dioxide. UMP shall seek external partners in special forestation initiatives as part of their Corporate Social Responsibility programme;

4.11 To undertake the responsibility to quantify and report annually the university CO₂ emission to its stakeholders, as part of the university's self-checking exercise in gauging effectiveness of its energy savings and carbon reduction initiatives,

4.12 To encourage more research in the campus under themes that include energy efficiency, biodiversity, sustainability, renewable energy technologies, and sustainable indigenous technologies, as well as the importance of sustainability and environmental protection in its teachings;

4.13 To further enhance inter and extra-communications within students and staff as well as the local community on awareness related to energy efficiency, efficient use of natural resources, and environmental global warming issues through provision of training and awareness programmes.