

Advancing Sustainability and Green Skills Towards Greener Future

Integrating Green Infrastructure and Eco-friendly practices
in the campus

Integrating Green Infrastructure and eco-friendly practices

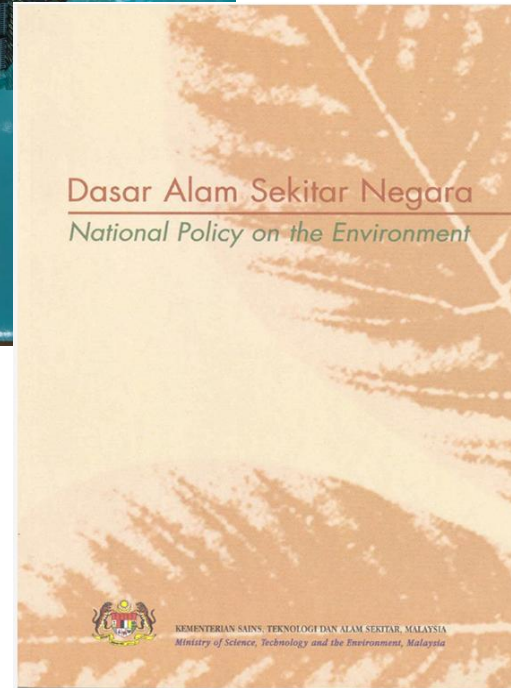
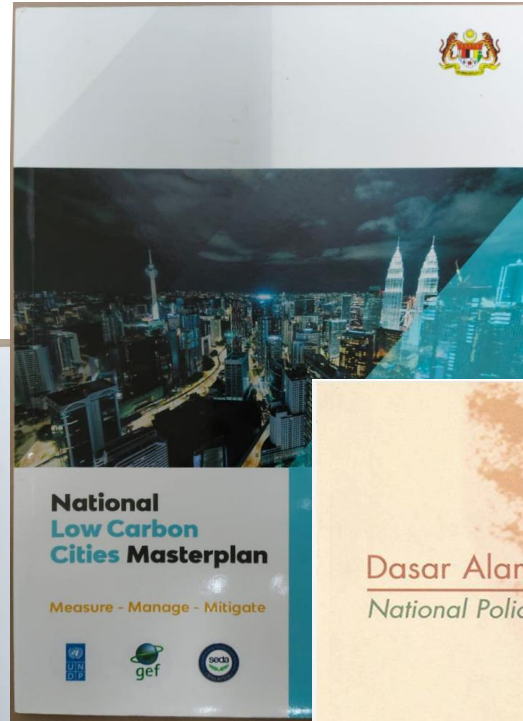
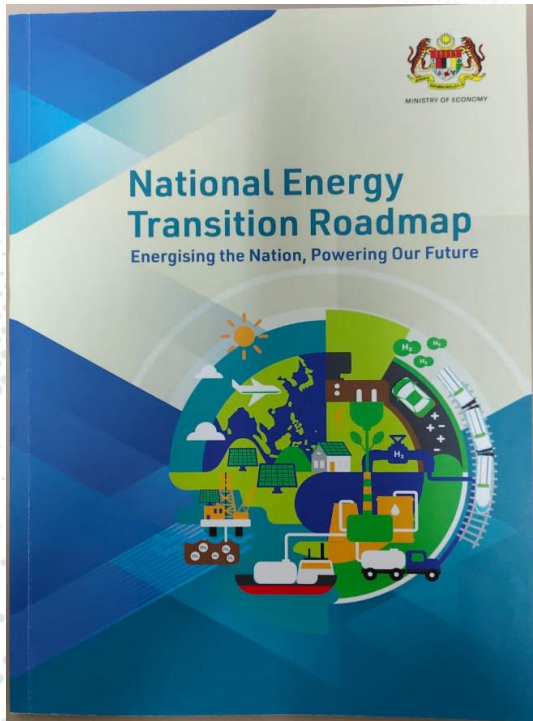
Engaging the National Agenda in Sustainability to the Institution's Key Performance Index (KPI)

From National Energy Transition Roadmap, National Energy Policy, Sustainable Development Goal etc, the University's **Strategic Planning is developed to respond the National Agenda** to prepare the graduates for SDG aware and ready to tackle global sustainability issues.

Infrastructure such as Solar PV Electricity Generation, Battery Energy Storage, Rainwater Harvesting system, Building Management System, Real Time Energy Monitoring System etc were built in the campus. Building a **living laboratory in the campus** for students to experience Green Technology themselves. From the infrastructure UTeM will make continuous improvement by developing research, student practical experience.

Work closely with MPHTJ (our city office) and **supply the carbon emission data** to participate with Low Carbon City Challenge 2030

Engaging Institution KPI to the National Agenda



Engaging Institution KPI to the National Agenda



developing lands in-campus UTeM accordance to university physical development plan (2021 - 2030) and academic planning.

SI2. Planning lands around UTeM campus with State Government

SI3. Creating livable prosperous campus

Energy Management Gold Standard



SI5. Achieving the Highest Standard in Energy Management Gold Standard (EMGS) by ASEAN Energy Management Scheme (AEMAS)

5 STRATEGIC INITIATIVES (PM CPPF)

45 %

By 2025, 45 % of physical projects in-campus have been planned and executed.

100 %

By 2025, 100% of UTeM - Melaka Strategic Development Plan is completed.

80 %

By 2025, achieve more than 80% in Livable Campus Index (LCI) through dynamic maintenance and operation, safe and secure campus environment, and effective transportation services

50

By 2025, positioning UTeM as TOP 50 in UI GreenMetric World University Ranking

3

By 2025, achieving and maintaining 3 Star in Energy Management Gold Standard (EMGS) by ASEAN Energy Management Scheme (AEMAS)

UTeM KE ARAH KELESTARIAN KECEKAPAN TENAGA

“Mempraktikkan amalan kecekapan tenaga secara berterusan untuk kelestarian alam sekitar.”

Scan untuk info lanjut :



#Utembangkitbersamacekaptenaga

UTeM
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DASAR DAN GARIS PANDUAN
PENGURUSAN TENAGA**
ENERGY MANAGEMENT GUIDELINES AND POLICY

DEKLARASI KOMITMEN
DECLARATION OF COMMITMENT

Universiti Teknikal Malaysia Melaka (UTeM) komited:-
Universiti Teknikal Malaysia Melaka (UTeM) is committed :-

- Untuk menambatkan kecekapan dan pemuliharaan tenaga, air dan bahan api kenderaan secara berterusan di seluruh kawasan kampus dalam menyajikan pengajaran dan pembelajaran, penyelidikan dan operasi perkhidmatan melalui pelaksanaan pengurusan tenaga yang cekap dan berkesan.
To continuously improve efficiency and conservation of energy, water and vehicle fuel throughout the campus in order to carry out teaching and learning, research and service operation by implementing efficient and effective energy management.
- Untuk menangani dan bertindak terhadap pelbagai proses dan aktiviti yang akan memberi kesan kepada prestasi penggunaan tenaga, air dan bahan api kenderaan di semua kawasan kampus Universiti Teknikal Malaysia Melaka.
To address and act towards various processes and activities which might have impact toward usage of energy, water and vehicle fuel at all premises within Universiti Teknikal Malaysia Melaka.
- Untuk memastikan pemuatan terhadap semua akta dan peraturan berkaitan pengurusan tenaga, air dan bahan api kenderaan yang cekap.
To comply with acts and regulations of efficient management of electrical energy.
- Untuk mematuhi Peraturan-peraturan Pengurusan Tenaga Elektrik Dengan Cekap 2008, Akta Bekalan Elektrik 1990 dan perundangan lain yang berkaitan dengan pengurusan tenaga, air dan bahan api kenderaan.
To comply with the Efficient Management of Electrical Energy Regulations 2008, Electricity Supply Act 1990 and other legislation related to the management of energy, water and vehicle fuel.
- Untuk memastikan pemuatan terhadap Garis Panduan Perolehan Hijau Kerajaan.
To comply with the Government Green Procurement (GGP) Guidelines.
- Untuk menyediakan sumber bagi melaksanakan sistem pengurusan tenaga.
To provide resources for the implementation of energy management system.

PROFESOR Tn. DR. MASHILA BINTI KAMALUDDIN
VICE CHANCELLOR/VICE CANCELLOR
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Tandatangan:
6/4/2022

109
(2020)

CONGRATULATIONS
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

114
(2019)

UI Green Metric
World University Rankings

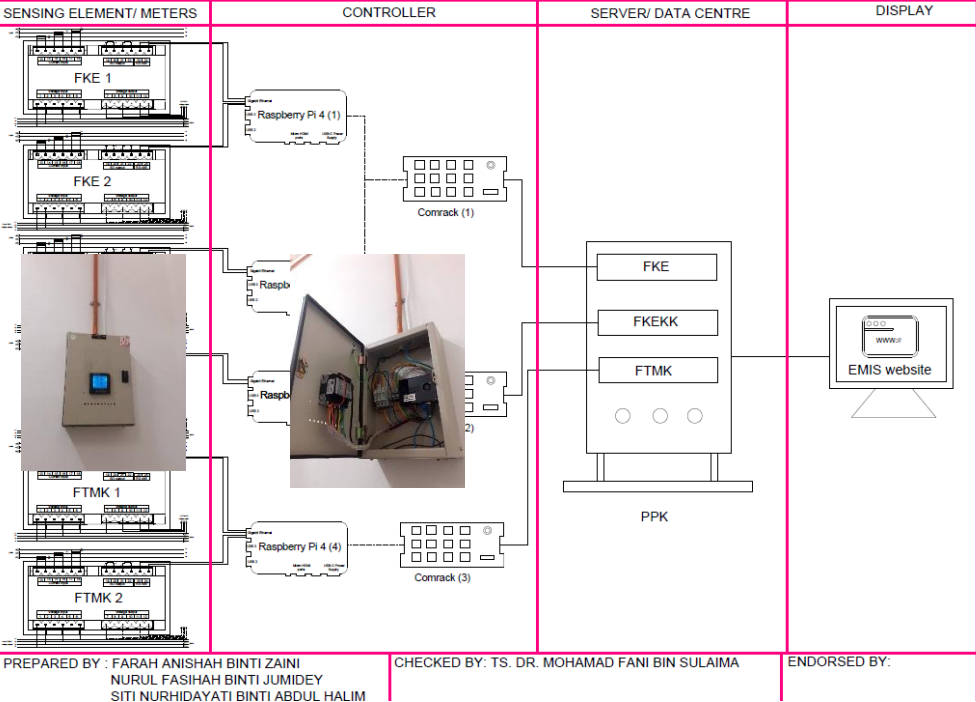
Blueprint
PELAN INDUK
UTeM Pintar Lestari
2035

Jawatankuasa Blueprint Kampus Pintar Lestari
06 Februari 2025

Integrated Green Infrastructure and Eco-friendly practices

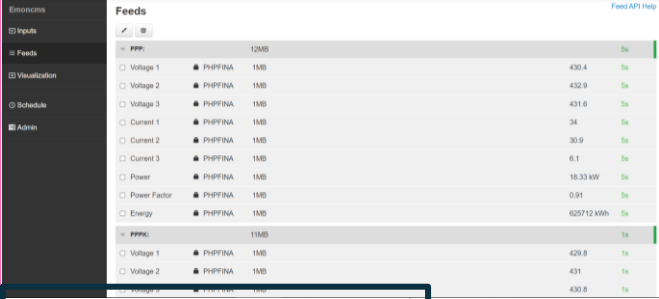


4. IoT Monitoring System



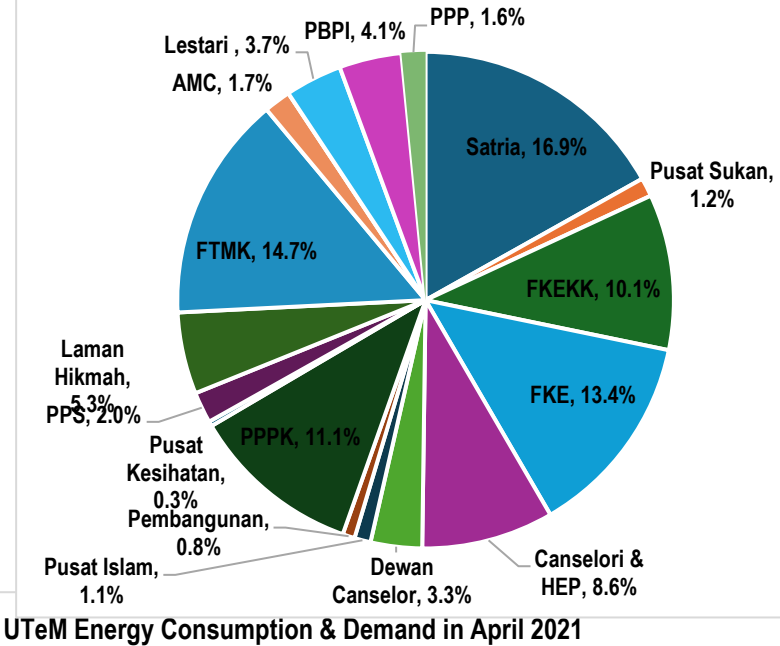
Comparison to TNB Bill

	Energy (kWh)	MD (kW)
DPM IoT	1,098,683.01	4,353.29
TNB	1,166,582.00	4,741.00

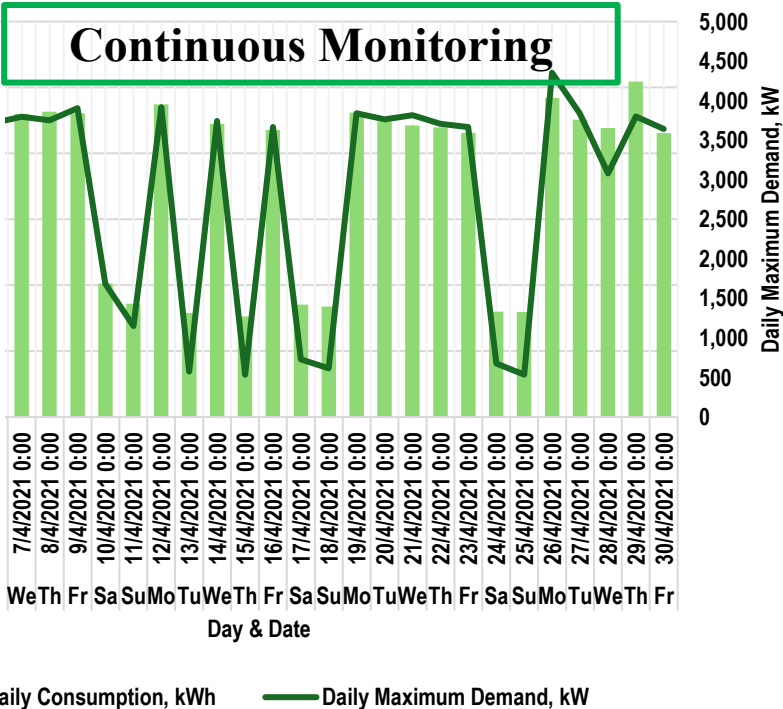


Electricity Bill to All PTjs

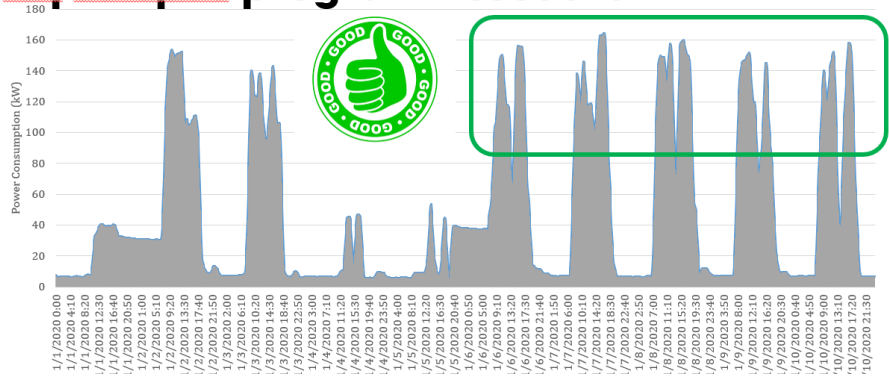
Jumlah Perlu Dibayar (RM) : 90,437.88		Tarikh 1/2/2020 0:00	
Caj Semasa : 90,437.88		Amaun (RM) : 92,665.76	
Caj Terdahulu : 92,665.76			
Jenis Bacaan : Bacaan IoT offline			
Tempoh Bil : 1/1/2020 0:00 sehingga 1/2/2020 0:00		31 hari	
Blok Tariff(kWh/kW) : 181,056.09		Kegunaan (kWh/kW) : 0.365	
Kegunaan : 181,056.09		Kadar (RM) : 24,352.41	
Kehendak Maksima : 803.71		Amaun (RM) : 24,352.41	
Jumlah : 90,437.88		90,437.88	
Keterangan		Tidak Kena ST	Kena ST
Kegunaan kWh		181,056.09	0
Kegunaan RM		66,085.47	0
Kehendak Maksima RM		24,352.41	0
Kegunaan Bulan Semasa		90,437.88	0
Caj Semasa		90,437.88	0
Peratus Penggunaan daripada Keseluruhan Universiti		%	14%
Indeks Tenaga Bulan Semasa		kWh/(bln.m ²)	8.72



Continuous Monitoring



Profil Penggunaan Tenaga Contoh di sebuah PTi selepas program kesedaran



Integrating Green Infrastructure and Eco-friendly practices

Collaboration with Partners:



TNB RESEARCH
(199301004782)



	LCC 2030 CHALLENGE DATA FILE (LCC PARTNER)	REG. NO.	MGTC/DC/REC/LCC-012
		REVISION	1
		DATE	09/06/2022

USER GUIDE:

This data file will be used to support Local Authorities, Universities and Other Users in calculating the greenhouse gas emissions according to the requirements of the Low Carbon Cities 2030 Challenge (LCC2030C). The output from this file will be used in the Provisional and Diamond Report. This data file will also be used as the main reference document during the Provisional & Diamond Audit.

LCC REGISTRATION NO:

LCC PARTNER / PBT:

ORGANISATION NAME:

BUILDING NAME:

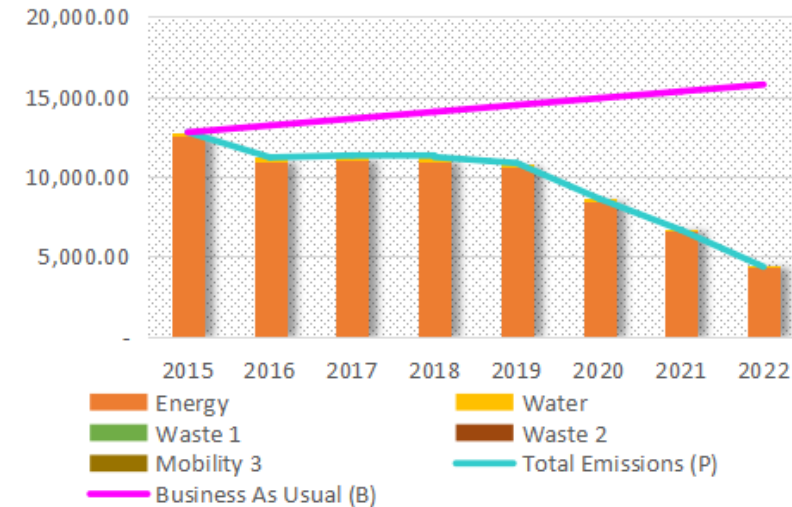
BUILDING TYPE:

UNIVERSITI TEKNIKAL MALAYSIA MELAKA/ MAJLIS PERBANDARAN HAN
MAJLIS PERBANDARAN HANG TUAH JAYA
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
EDUCATION INSTITUTE

First Year (*) 2015 Population/Occupants Base Year 11500
Project Year 2021 Population/Occupants Final Year 13800

Note: * put the earliest year here for each element baseline year AND adjust the source data accordingly

CARBON EMISSION SUMMARY, tCO2e



CARBON EMISSION SUMMARY, tCO2e										
Element	Method	Base year	2015	2016	2017	2018	2019	2020	2021	2022
Energy	Actual	2015	12,503.33	10,947.97	11,077.06	10,966.09	10,608.61	8,481.21	6,560.17	4,300.76
Water	Actual	2015	258.80	246.32	241.19	249.37	231.85	141.22	92.78	60.53
Waste 1	Actual	2015	-	-	-	-	-	-	-	-
Waste 2	Estimate	2015	-	-	-	-	-	-	-	-
Mobility 3	Estimate	2015	-	-	-	-	-	-	-	-
Total Emissions (P)			12,762.12	11,194.29	11,318.25	11,215.46	10,840.47	8,622.43	6,652.96	4,361.29
(Adjusted Baseline) Business As Usual (B)			12,762.12	13,187.53	13,612.93	14,038.34	14,463.74	14,889.15	15,314.55	15,739.95
Reduction Achieved (B-P)			-	1,993.24	2,294.69	2,822.88	3,623.28	6,266.72	8,661.59	11,378.66

Summary (Main) Energy Water Greenery & Water Bodies +

OptiDR-Simulator

Forecasting simulator to find the optimal operation energy profile

Testing to real chiller operation

Simulation output from OptiDR-Simulator

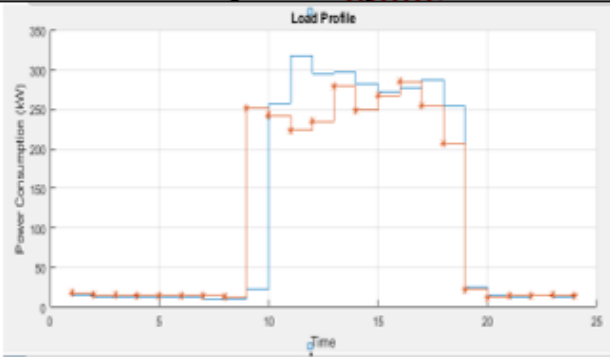


Figure 9. Forecast LHL optimal load profile

Actual output from the solution taken

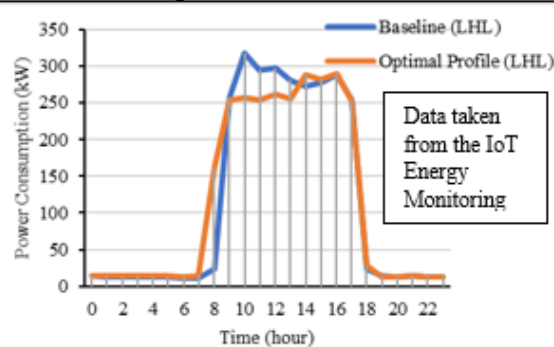


Figure 10. Actual LHL optimal load profile

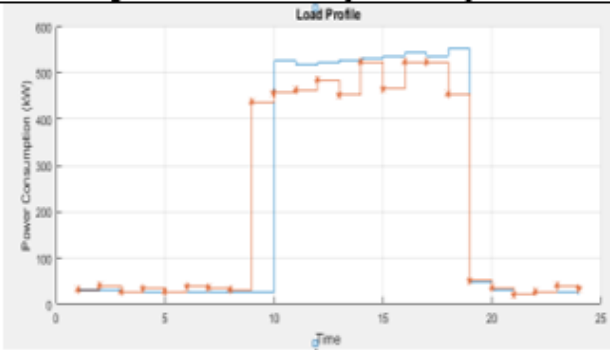


Figure 11. Forecast FTMK optimal load profile

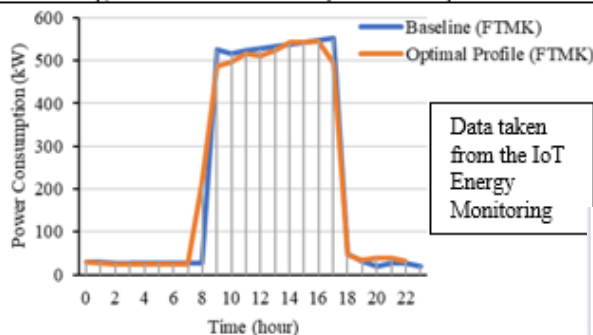
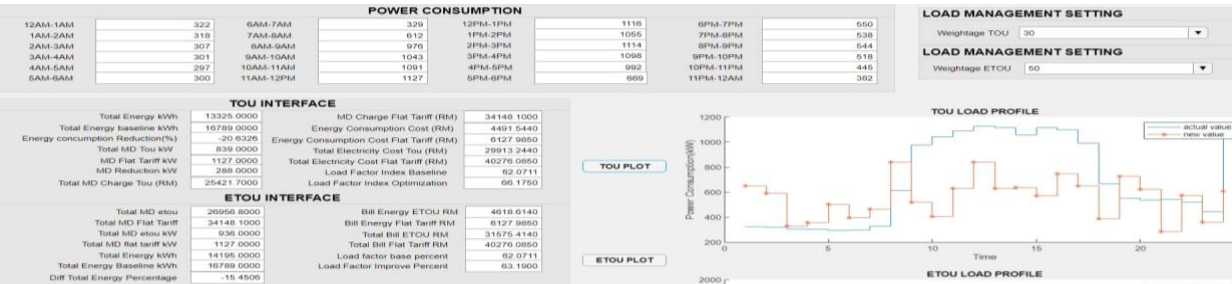
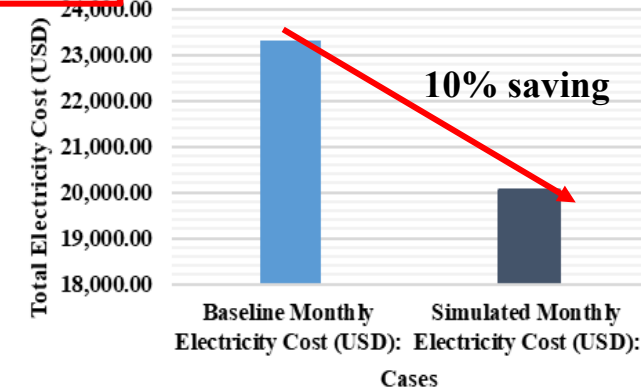
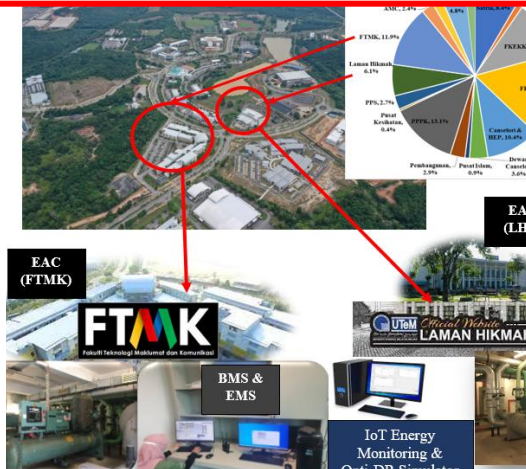


Figure 12. Actual FTMK optimal load profile



GUI



Recognition:



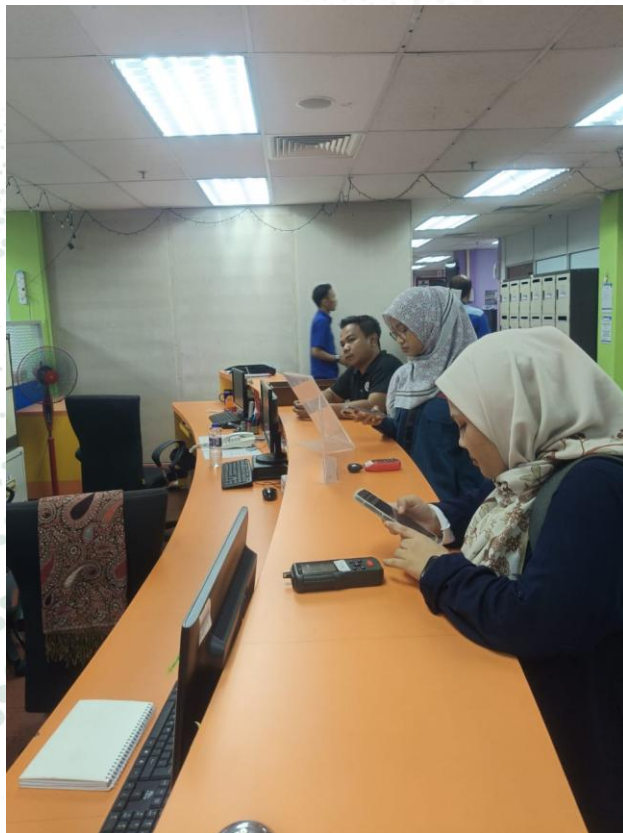
Embedding environmental sustainability into curriculum and teaching practices

Embedding Environmental Sustainability into UTeM/our Curriculum and Teaching Practices

Emphasize on Energy Management in most of our Engineering and Technical curriculum, by giving additional **certificate of competency** to our students. For example, Certified Energy Manager, Certified Professional Monitoring & Verification, Solar installation practical certification, etc.

UTeM giving more experiences to our student in **Co-curriculum subject** to practice about Energy Management and Audit, Green Practices and show their project to **primary school** students to spread their knowledge and products. For examples Decoration from Recycle materials, small Solar system installation, etc.

Embedding environmental sustainability into curriculum and teaching practices



Eco-friendly practices: Recycle Program in Campus



اوتيمرسيتي تېكنيكل مليسيا ملاك
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Kitar Semula SISA FABRIK
@Masjid Sayyidina Abu Bakar



THANK YOU
TERIMA KASIH

CLOTHES, SHOES,
HANDBAGS, BELTS,
LINEN, SOFT TOYS

PAKAJAN, KASUT,
BEG TANGAN, TALI
PINGGANG, CADAR,
MAINAN LEMBUT

JOM HANTARI!
SEMUA JUALAN
PENGUMPULAN AKAN
DISUMBANG KE
TABUNG MASJID

JADUAL KUTIPAN
TONG KITAR SEMULA
SISA FABRIK:
ISNIN & JUMAAT
SETIAP MINGGU



شماکن تمکیم
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CFWSEI
PUSAT ALAM SEKITAR PINTAR
Centre for Smart Environment





اوتيمرسيتي تېكنيكل مليسيا ملاك
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Sangkar Kitar Semula
@Masjid Sayyidina Abu Bakar





JOM HANTARI!
SEMUA JUALAN
PENGUMPULAN AKAN
DISUMBANG KE
MASJID



شماکن تمکیم
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CFWSEI
PUSAT ALAM SEKITAR PINTAR
Centre for Smart Environment

From Campus to schools

