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

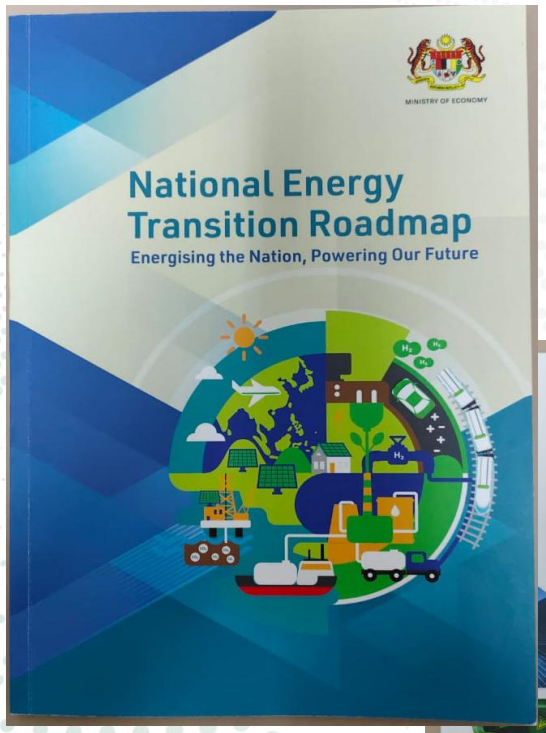
Engaging the National Agenda in Sustainability to the Institution's Key Performance Index (KPI)

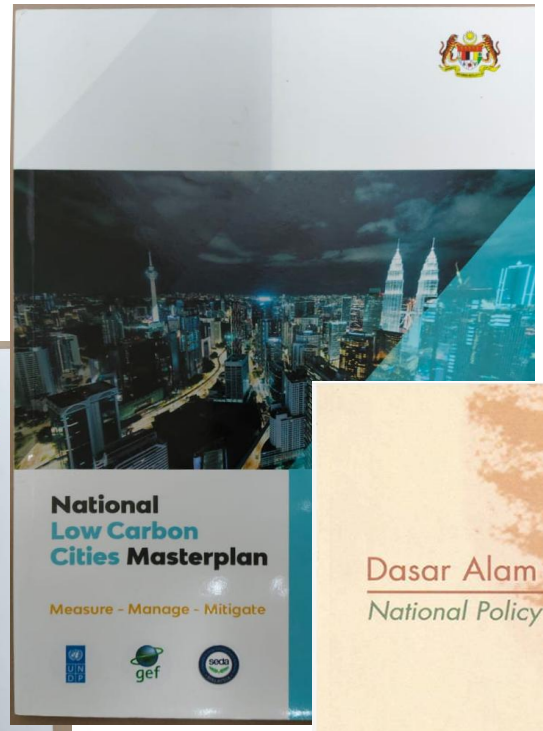
From National Energy Transition Roadmap, National Energy Policy, Sustainable Development Goal etc, the University's **Strategic Planning is developed to respond the National Agenda** to prepare the graduates for SDG aware and ready to tackle global sustainability issues.

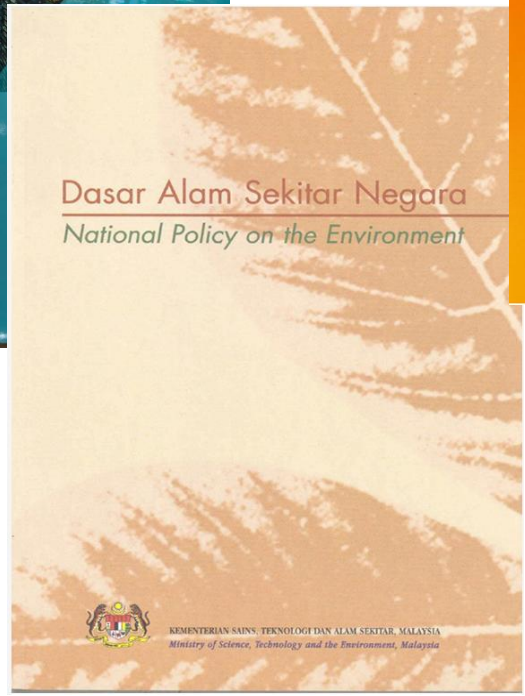
Infrastructure such as Solar PV Electricity Generation, Battery Energy Storage, Rainwater Harvesting system, Building Management System, Real Time Energy Monitoring System etc were built in the campus. Building a **living laboratory in the campus** for students to experience Green Technology themselves. 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

network.

SI3. Creating livable prosperous campus

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

Energy Management Gold Standard

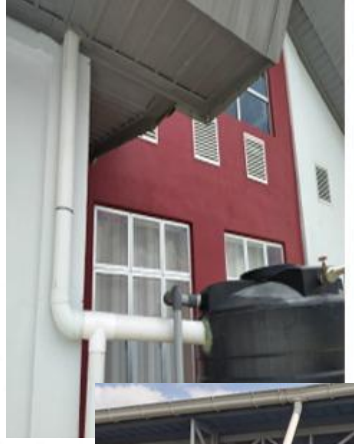
AEMAS

5 STRATEGIC INITIATIVES (PM CPPF)

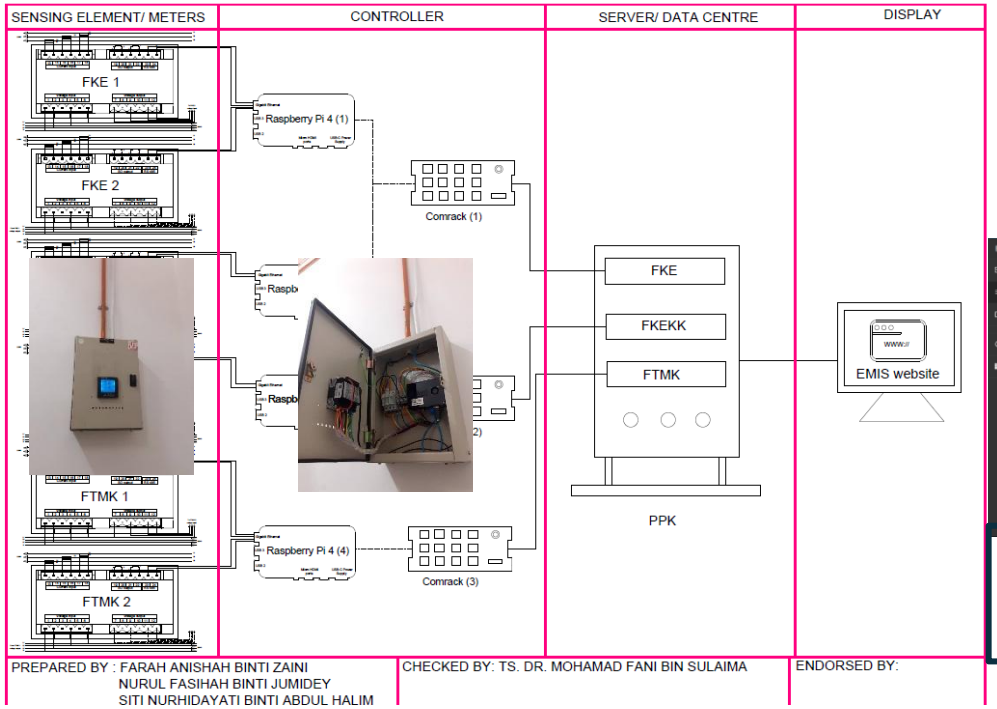
45 %	100 %	80 %	50	3
By 2025, 45 % of physical projects in-campus have been planned and executed.	*By 2025, 100% of UTeM - Melaka Strategic Development Plan is completed.*	*By 2025, achieve more than 80% in Livable Campus Index (LCI) through dynamic maintenance and operation, safe and secure campus environment, and effective transportation services*	*By 2025, positioning UTeM as TOP 50 in UI GreenMetric World University Rankin*	*By 2025, achieving and maintaining 3 Star in Energy Management Gold Standard (EMGS) by ASEAN Energy Management Scheme (AEMAS)*

ASEAN TVET CONFERENCE

Integrated Green Infrastructure and Eco-friendly practices

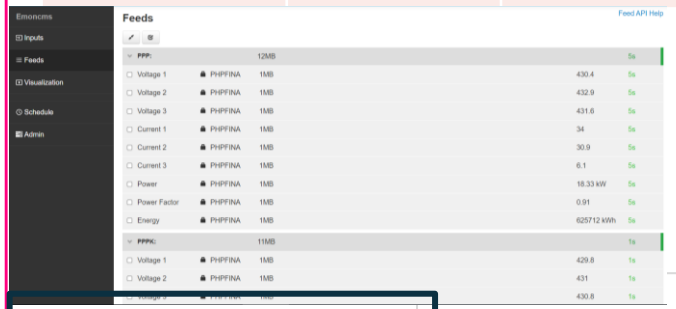


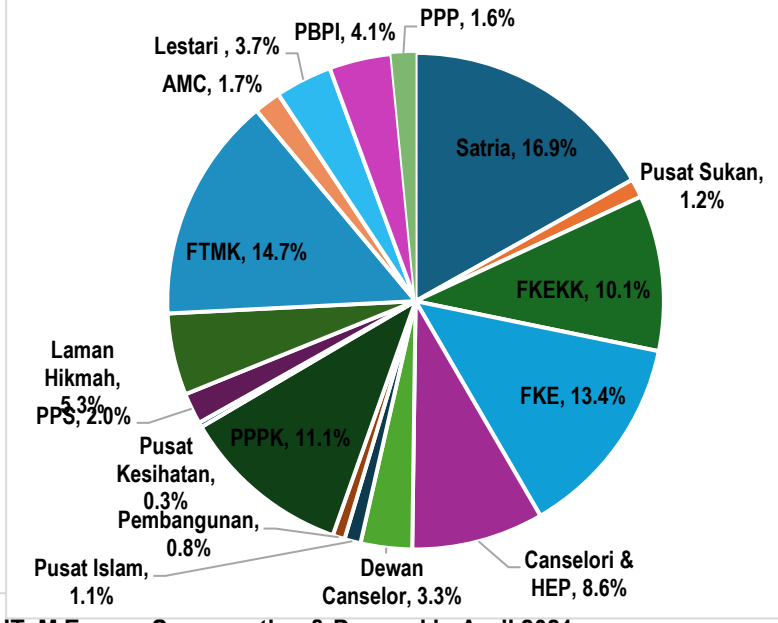
4. IoT Monitoring System



Comparison to TNB Bill

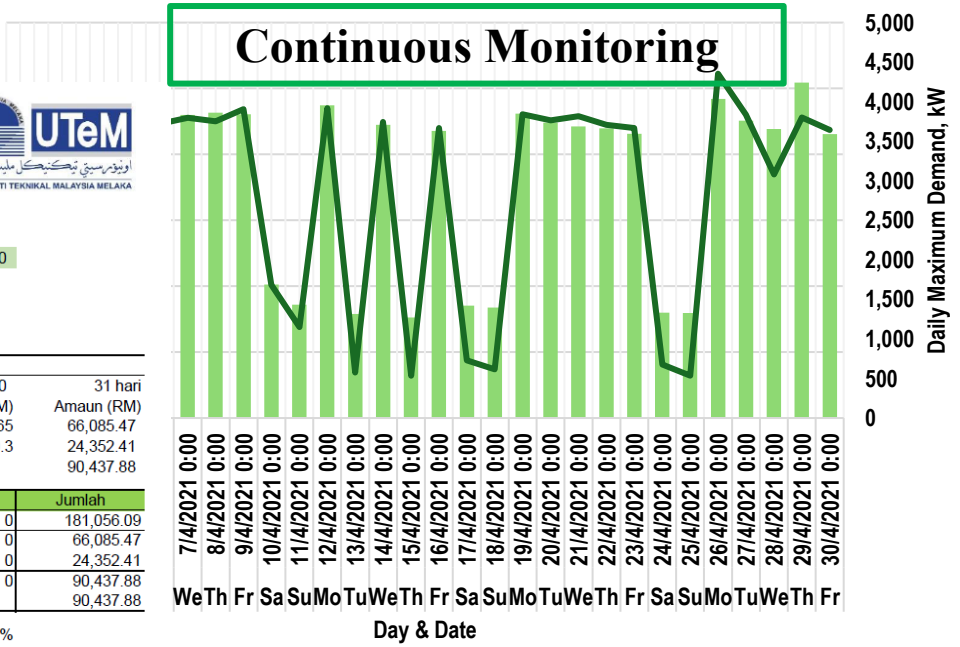
	Energy (kWh)	MD (kW)
DPM IoT	1,098,683.01	4,353.29
TNB	1,166,582.00	4,741.00



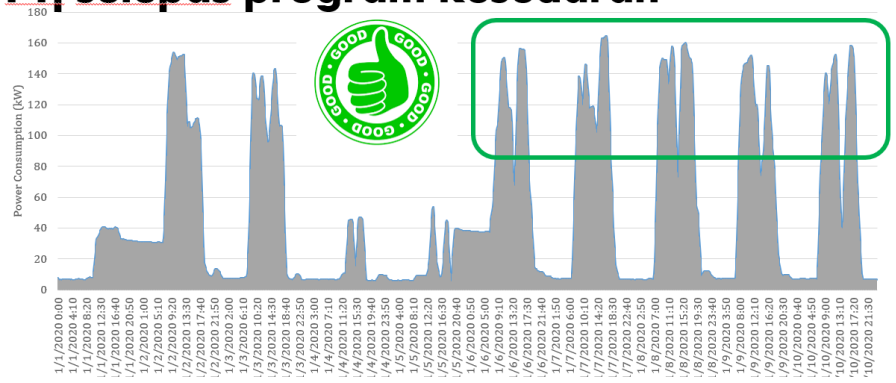


Electricity Bill to All PTjs

UTeM Energy Consumption & Demand in April 2021



Profil Penggunaan Tenaga Contoh di sebuah PTj selepas program kesedaran



PENGGUNAAN TENAGA ELEKTRIK

Tanggungjawab : FKE

Universiti Teknikal Malaysia Melaka,
Hang Tuah Jaya,
76100 Durian Tunggal,
Melaka, Malaysia

Jumlah Perlu Dibayar (RM)	:	90,437.88	Tarikh	1/2/2020 0:00

		Amaun (RM)
Caj Semasa	:	90,437.88
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)		Kegunaan (kWH/kW)	Kadar (RM)		Amaun (RM)
Kegunaan		181,056.09	0.365		66,085.47
Kehendak Maksima		803.71	30.3		24,352.41
Jumlah					90,437.88

Keterangan		Tidak Kena ST	Kena ST	Jumlah
Kegunaan kWh	kWh	181,056.09	0	181,056.09
Kegunaan RM	RM	66,085.47	0	66,085.47
Kehendak Maksima RM	RM	24,352.41	0	24,352.41
Kegunaan Bulan Semasa	RM	90,437.88	0	90,437.88
Caj Semasa	RM			90,437.88

Peratus Penggunaan daripada Keseluruhan Universiti	%	14%
Indeks Tenaga Bulan Semasa	kWh/(bln.m^2)	8.72

Integrating Green Infrastructure and Eco-friendly practices

Collaboration with Partners:

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

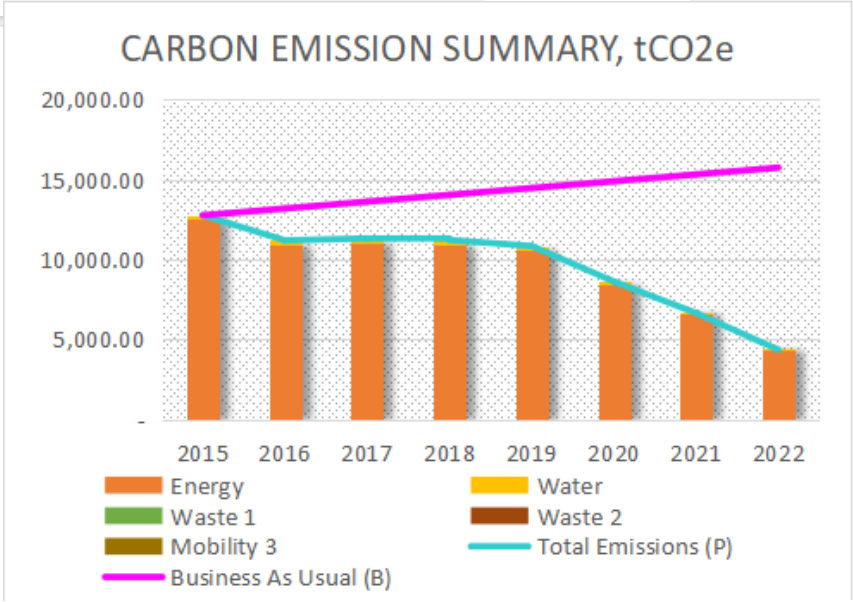
USER GUIDE:

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:	UNIVERSITI TEKNIKAL MALAYSIA MELAKA/ MAJLIS PERBANDARAN HAN
ORGANISATION NAME:	MAJLIS PERBANDARAN HANG TUAH JAYA
BUILDING NAME:	UNIVERSITI TEKNIKAL MALAYSIA MELAKA
BUILDING TYPE:	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

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

Simulation output from OptiDR-Simulator	Actual output from the solution taken

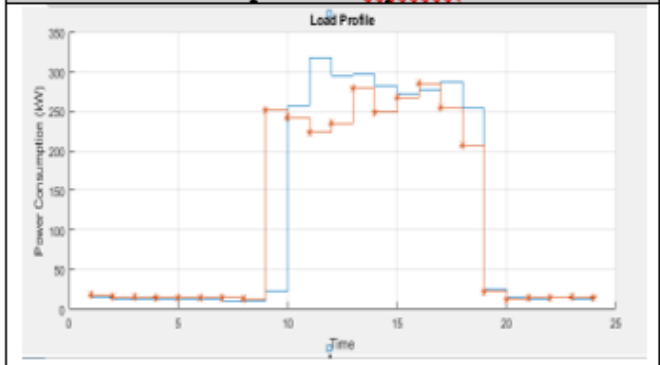
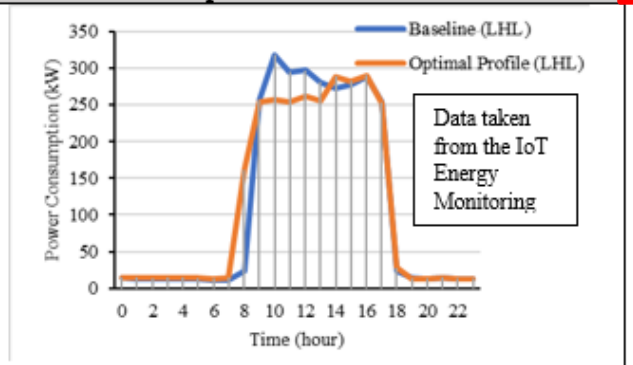

	

Figure 9. Forecast LHL optimal load profile	Figure 10. Actual LHL optimal load profile

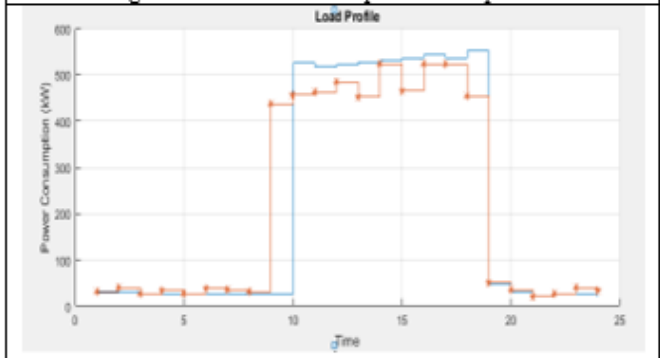
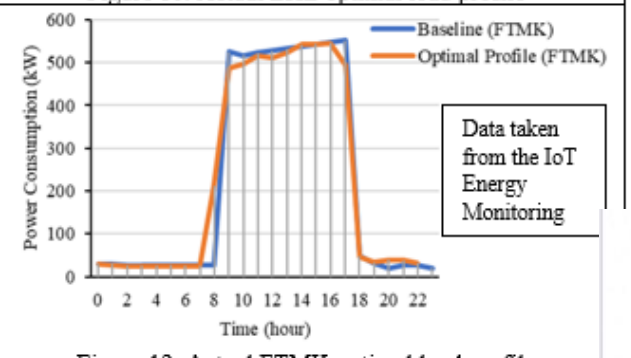
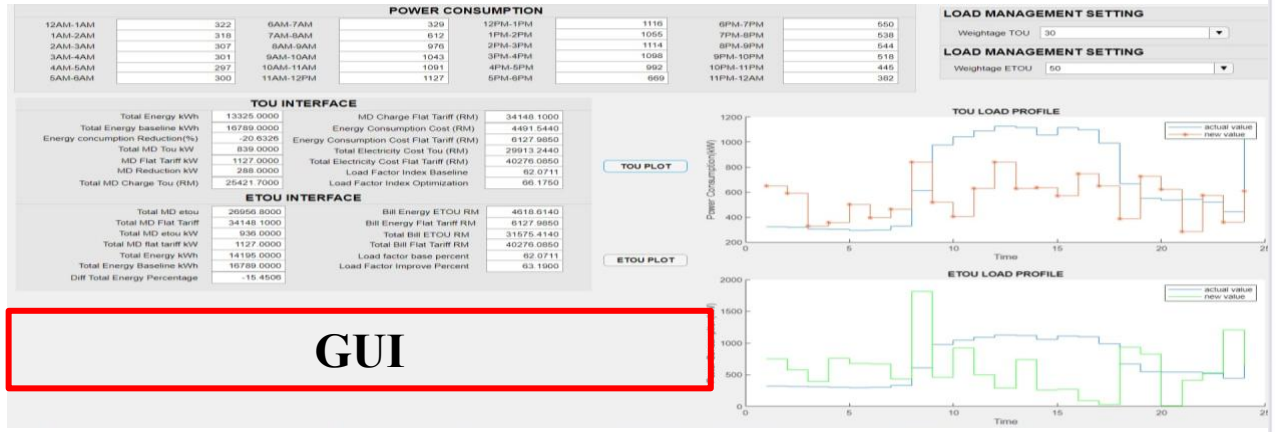
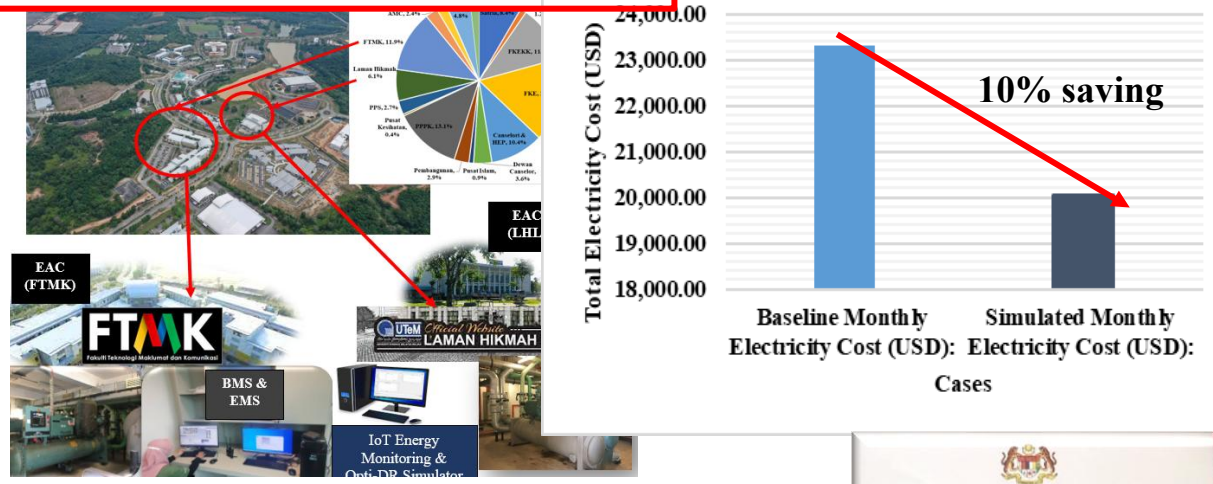

	

Figure 11. Forecast FTMK optimal load profile	Figure 12. Actual FTMK optimal load profile



GUI

Testing to real chiller operation



Recognition:

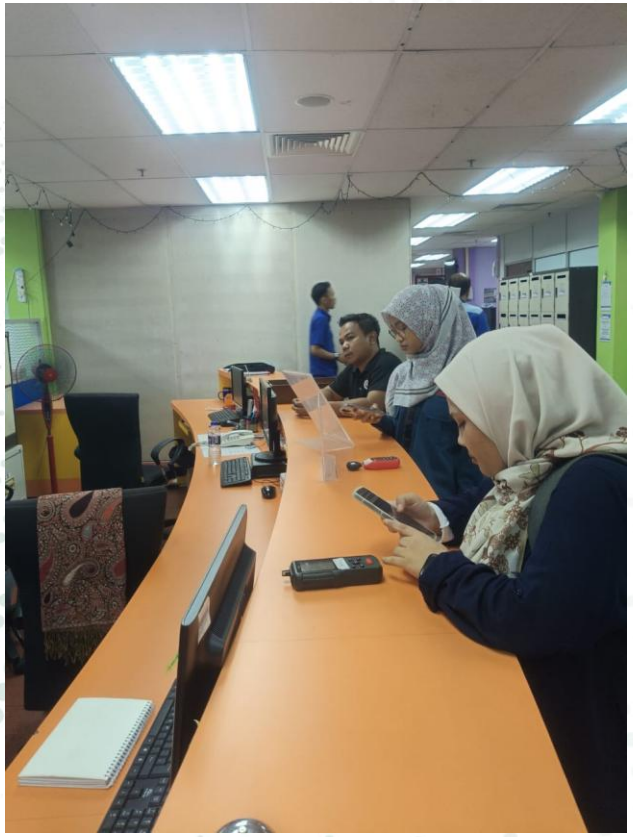
Embedding environmental sustainability into curriculum and teaching practices

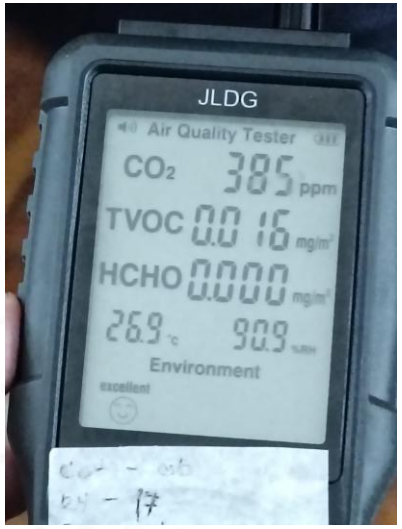
Embedding Environmental Sustainability into UTeM/our Curriculum and Teaching Practices

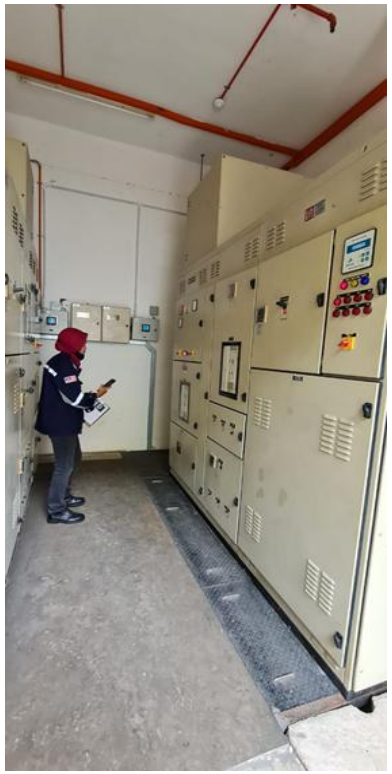
Emphasize on Energy Management in most of our Engineering and Technical curriculum, by giving additional **certificate of competency** to our students. For example, Certified Energy Manager, Certified Professional Monitoring & Verification, Solar installation practical certification, etc.

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

From Campus to schools