



IMPLEMENTING ENERGY MANAGEMENT IN GOVERNMENT BUILDINGS: JKR Experience

**SEMINAR TEKNIKAL KEJURUTERAAN MEKANIKAL
2017**

IKIM

14 September 2017



**Ir Dr ABDUL MURAD BIN ZAINAL ABIDIN,
Cawangan Kejuruteraan Mekanikal
Ibu Pejabat JKR Malaysia
Kuala Lumpur**

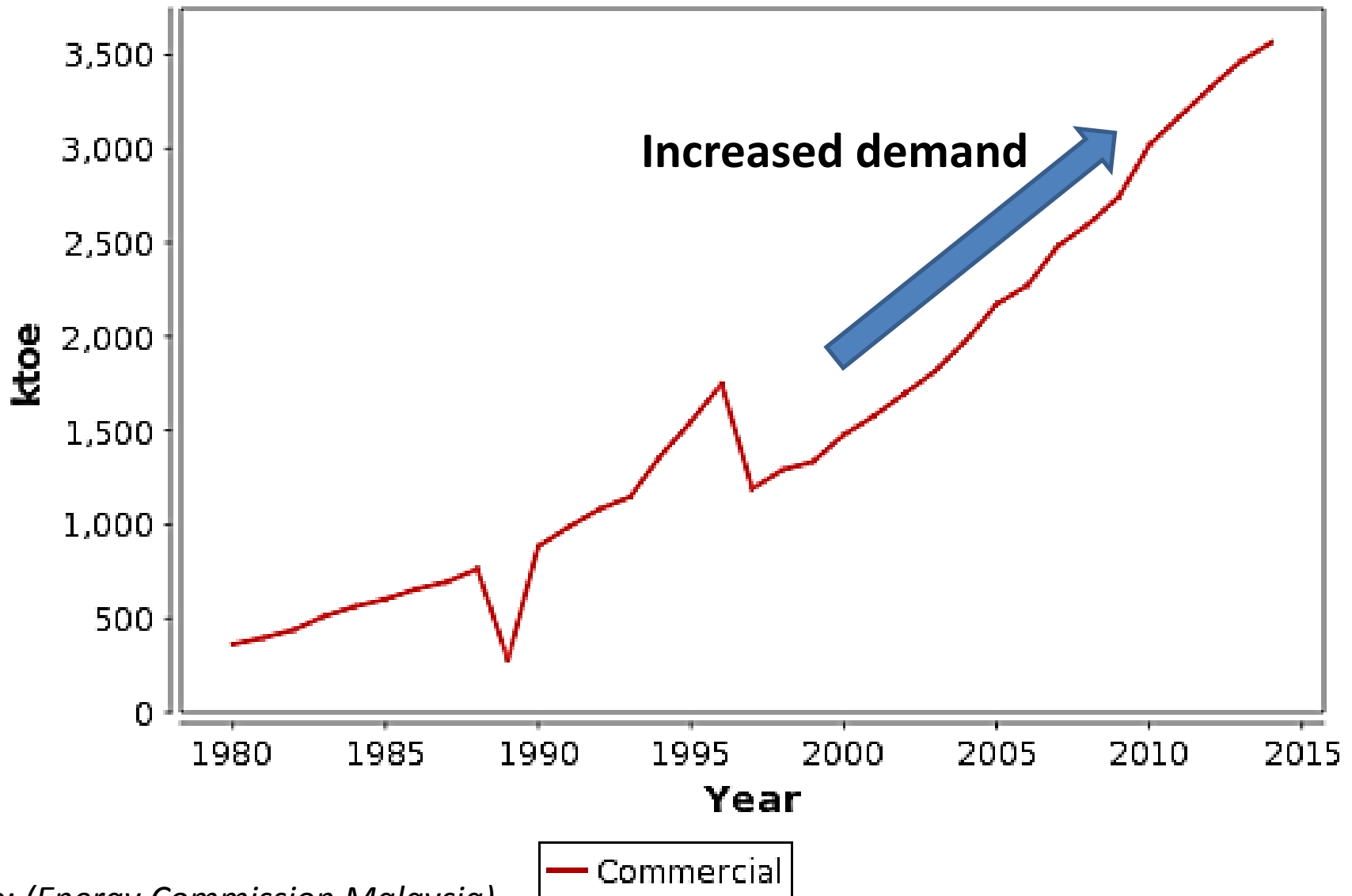
CONTENT

- 1) Malaysia energy use scenario
- 2) Carbon pledge & legal requirements
- 3) JKR efforts
- 4) Case studies
- 5) Web-based energy reporting



MALAYSIAN ENERGY USE SCENARIO

Final Electricity Consumption in equivalent kilotonne of oil (Commercial: 1980 - 2014)



Malaysian pledge....



**Carbon reduction of 45%
(2005 baseline) by 2030**

Domestically...



ELEVENTH MALAYSIA PLAN

2016-2020

ANCHORING GROWTH ON PEOPLE



Strategy

- **Strategy B3: Enhancing demand side management (DSM) by formulating a comprehensive DSM master plan and expanding DSM measures;**

Expanding demand side management measures for buildings, industries and households

During the Eleventh Plan, measures will be taken to identify potential improvements and appropriate approaches to ensure efficient use of energy in buildings, industries and households. These measures include increasing competencies of energy service providers, especially Registered Electrical Energy Managers, and promoting the implementation of Energy Performance Contracting for government buildings. User awareness will be enhanced on energy labelling and the availability of standards such as ISO 50001 for buildings and MEPS for appliances will be promoted. Other specific measures will include introduction of Enhanced Time of Use (EToU) tariff scheme and gradual abolishment of the Special Industrial Tariff for energy intensive industries. Infrastructure related initiatives such as implementation of smart grids and highly efficient co-generation technologies for combined heat and power system will be promoted.

EFFICIENT MANAGEMENT OF ELECTRICAL ENERGY REGULATIONS 2008

REGULATION 3: APPLICATION

Application

3. (1) These Regulations shall apply to -

- (a) any installation which receives electrical energy from a licensee or supply authority with a total electrical energy consumption equal to or exceeding 3,000,000 kWh as measured at one metering point or more over any period not exceeding six consecutive months or
- (b) any installation which is used, worked or operated by a private installation licensee with a total net electrical energy generation equal to or exceeding 3,000,000 kWh over any period not exceeding six consecutive months.



COMMITMENT TO THE GOVERNMENT



**Being an example in energy management
for the government buildings**

JKR EnMS Guideline for Government Buildings

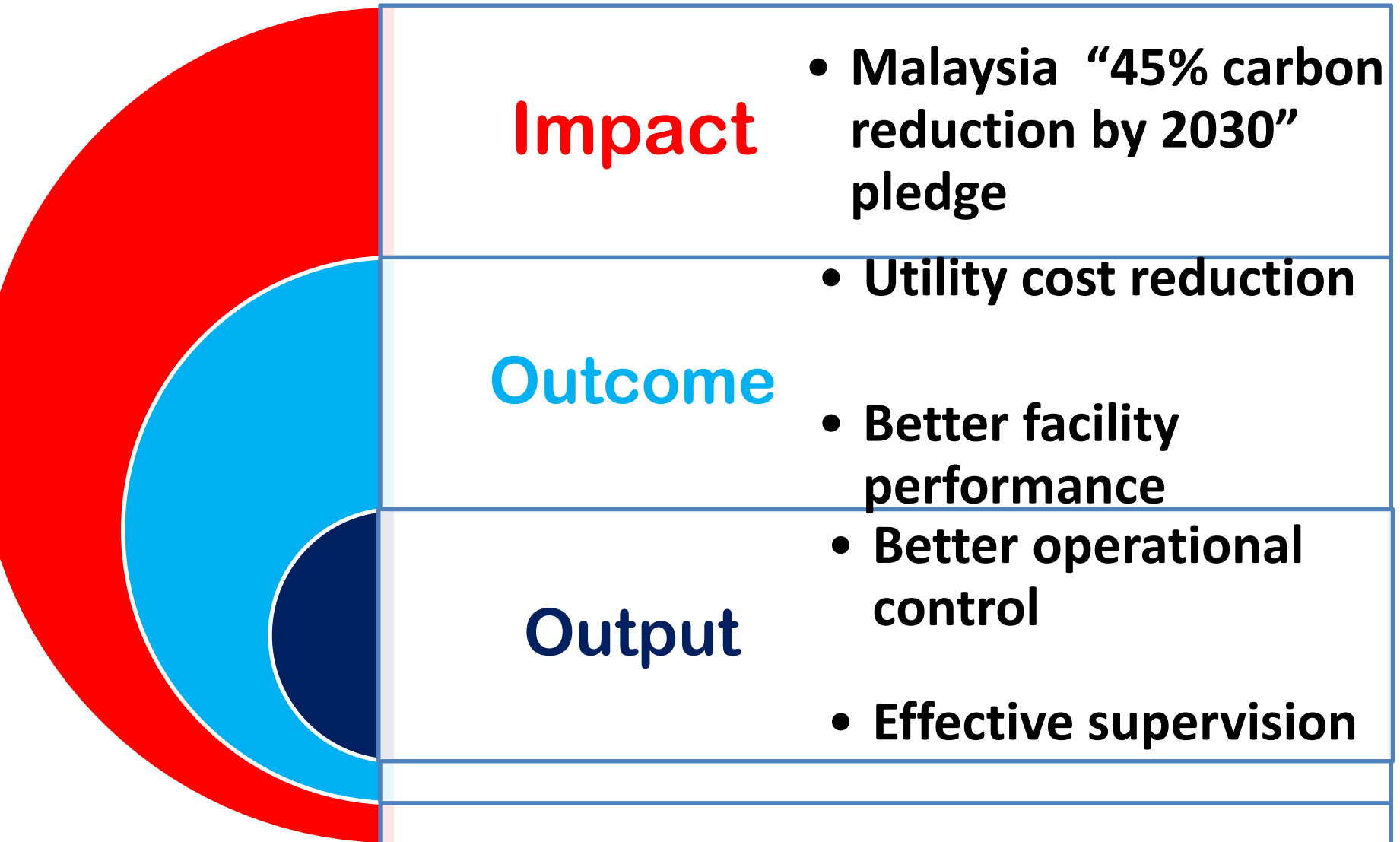


- June 2014 (1st Edition)



- May 2017 (2nd Edition)

BENEFITS



2015: JKR EFFORTS

13-18 April 2015

EnMS WORKSHOPS FOR GOVERNMENT EnMS BRIEFING FOR JKR BRANCHES IN KLR MINISTRIES (PUTRAJAYA)



2017: JKR EFFORTS

NORTHERN ZONE (PRK, PP, KD, J, H, R, S)
SOUTHERN ZONE (MELAKA, N, S, J, H, R, S)
EASTERN ZONE (KTN, T, B, C, B, H, C)



Photo by RushdeenUsa

AKTIVITI-AKTIVITI SPT

(Dibentangkan di Mesyuarat Jawatankuasa Pemandu Pengurusan (JPP) JKR Bil. 5/2017 pada 17 Mei 2017)

Mechanical State PWDs	Reporting Period	Measures	Savings
Selangor	2015-2016	No Cost	9%
Negeri Sembilan	2015-2016	No Cost	16%
Melaka	2015-2016	No Cost	4%
Putrajaya	2015-2016	No Cost	6%
Mechanical Branch (Menara Kerja Raya)	2015-2016	No Cost	7%

CASE STUDY 1: JKR COMPLEX KUALA LUMPUR

BLOCK	Air-Conditioned Areas (m²)
A	1,836
B	1,836
C	1,836
D	1,836
E	1,020
F	22,629
TOTAL	30,993

A Block (4 storeys)

B Block (4 storeys)

C Block (4 storeys)

D Block (4 storeys)

F Block
(17 storeys)



NO-COST ENERGY – SAVING MEASURES FOR JKR COMPLEX KUALA LUMPUR

- a) Switching off 80% of lighting during lunch time;
- b) Air-conditioning system operating hours (7.30 am–4.30 pm), except for Prayer Rooms (12.00 pm–5.00 pm);
- c) Switching off plug loads & individual lighting and individual air-conditioning after working hours;
- d) Conducting awareness campaign for building owners & appointed level officers.

WITH-COST ENERGY – SAVING MEASURES FOR JKR COMPLEX KUALA LUMPUR

1) F Block:

- a) Chiller, cooling tower and pumps retrofit*
- b) LED lighting*
- c) Air-conditioning ducting replacement*

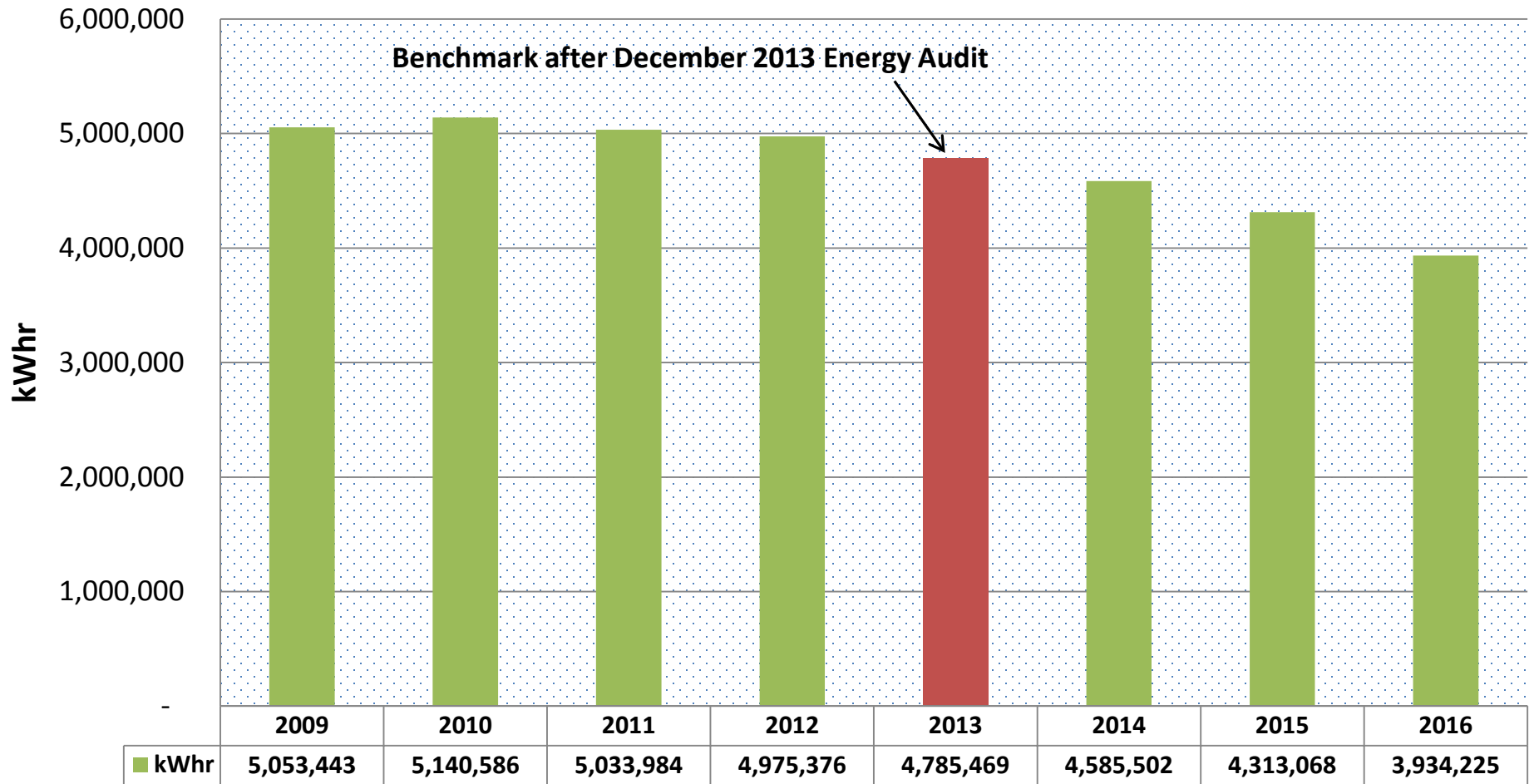
2) D Block:

- a) Air-cooled package retrofit*

3) All blocks:

- a) Digital power meter installation / On-line monitoring*

Energy Use (JKR Complex Kuala Lumpur)



Source: (Jabatan Kerja Raya Malaysia)



CERTIFICATE



SIRIM QAS International hereby certifies that

**JABATAN KERJA RAYA
JKR MALAYSIA HEADQUARTERS,
JALAN SULTAN SALAHUDDIN,
50582 KUALA LUMPUR
MALAYSIA**

has implemented an Energy Management System complying with

ISO 50001:2011

ENERGY MANAGEMENT SYSTEM – Requirements with Guidance for Use

Scope of Certification:

**OPERATION AND MAINTENANCE OF BUILDINGS (BLOCKS A, B, C, D, E, AND F)
AT JKR'S HEADQUARTERS IN JALAN SULTAN SALAHUDDIN, KUALA LUMPUR.**



Issue date : 12th June 2015
Validity period : 12th June 2015 – 11th June 2018
Certification No. : EnR 0013

Khalidah Mustafa

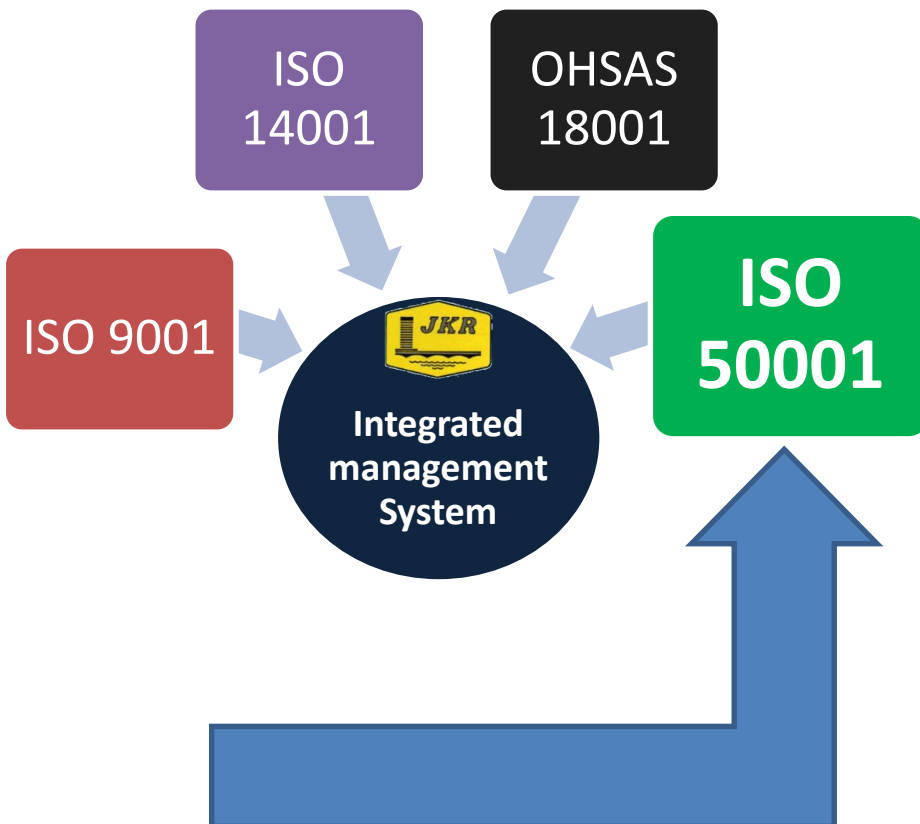
SIRIM QAS International Sdn. Bhd.
(Company No. 410334-X)
1, Persiaran Damai, Mentari
Section 2, P.O. Box 7035
40700 Shah Alam
Selangor Darul Ehsan
MALAYSIA

Tel : 60-3-5544 5434
Fax : 60-3-5544 5787

<http://www.sirim-qas.com.my>
<http://www.malaysiancertified.com.my>

Khalidah Mustafa
Managing Director
SIRIM QAS International Sdn. Bhd.

This certificate is granted subject to the terms and conditions as stated in the Certification Agreement.

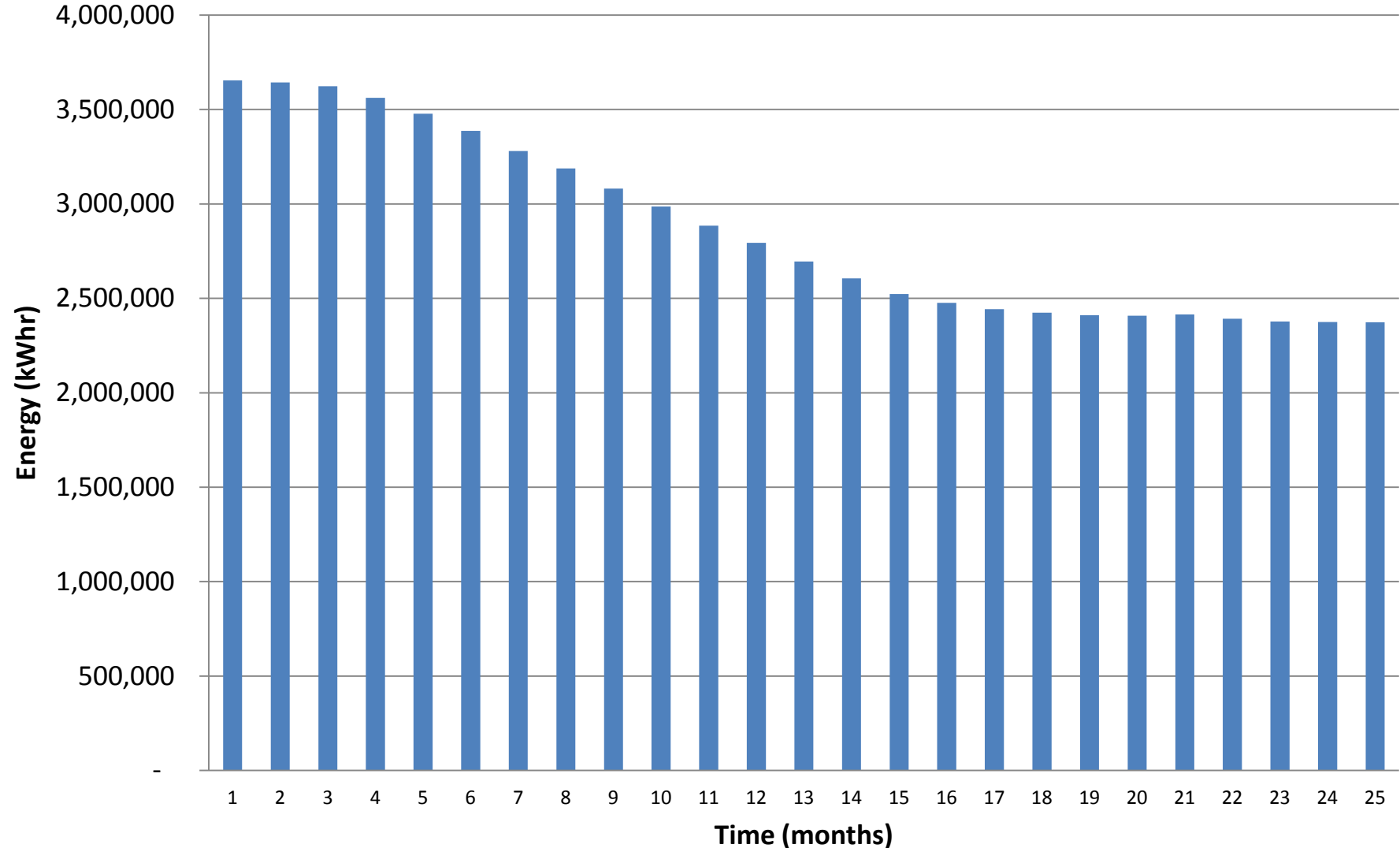


CASE STUDY 2:

C COMPLEX, PUTRAJAYA



Annualised Electricity Consumption for C7 Block Putrajaya (Dec 2014 - Dec 2016)



Source: (Jabatan Kerja Raya Malaysia)



Dashboard



Daftar data



Pengguna

Dashboard

Premis

Cawangan Kejuruteraan Mekanikal Negeri Sembilan

Mula

January

Hingga

December

2015

Paparkan

Click tiles

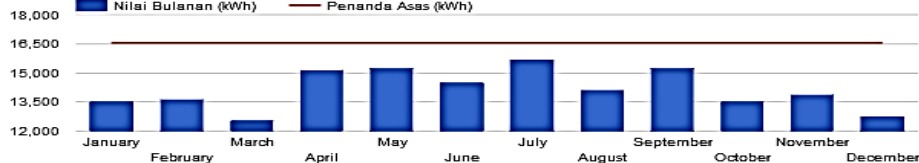
Location & time bar

Cawangan Kejuruteraan Mekanikal Negeri Sembilan
January 2015 - December 2015

Energy use vs Baseline

Penggunaan Tenaga Elektrik Bulanan (kWh)

■ Nilai Bulanan (kWh) — Penanda Asas (kWh)

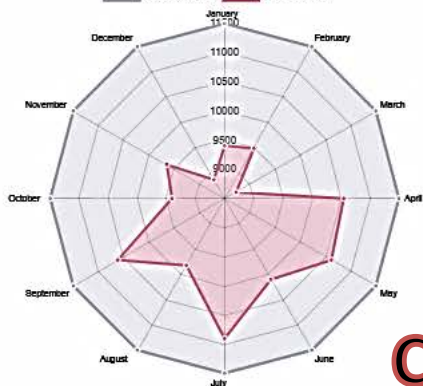


Utility & BEI info

Penjimatan kWh Bulan December	Penjimatan kWh Kumulatif
22.86 %	14.36 %
Penjimatan Utiliti Bulan December	Penjimatan Utiliti Kumulatif
RM 1,381.16	RM 10,410.17
BEI (kWh / year / m ²)	
0	

Nilai Pengurangan Karbon (kgCO₂)

□ Penanda Asas □ Nilai Bulanan



Cumulative savings

Nilai Penjimatan kWh Kumulatif

■ Nilai Kumulatif (kWh)



Carbon reduction info

Data Register



Daftar data

Daftar data

Premis : Cawangan Kejuruteraan Mekanikal Negeri Sembilan

Tahun : 2015

Bulan : January

Nilai Bulanan (kWh) : Masukkan nilai penggunaan

Penanda Asas (kWh) : Masukkan nilai penanda asas

GFA (m²) : 1000

Kadar Tarif TNB (RM/kWh) : 0.38

Jumlah (RM) : 0

Simpan

Tahun : 2015

Bangunan : Cawangan Kejuruteraan Mekanikal Negeri Sembilan

Tukar Paparan

Tahun 2015

Bulan	Nilai	Kadar	Penanda Asas
January	13553	0.38	16555
February	13677	0.38	16555
March	12566	0.38	16555
April	15184	0.38	16555
May	15286	0.38	16555
June	14551	0.38	16555
July	15683	0.38	16555
August	14147	0.38	16555
September	15277	0.38	16555
October	13542	0.38	16555
November	13902	0.38	16555
December	12771	0.38	16555

User put utility data input
bill value, baseline,
GFA & Tariff

User



Pengguna

List of Assigned Personnel

Add Personnel

Delete Personnel

Tambah pegawai

Show 10 entries

Nama pengguna	No IC	Lokasi	Peranan	Hapus
Abdul Murad B Zainal Abidin	711227105917	Cawangan Kejuruteraan Mekanikal	Pegawai P	
Ahmad Raizal Bin Md Rozali @ Zakaria	870319065287	Cawangan Kejuruteraan Mekanikal Negeri Kelantan	Penyelaras	
Ahmad Ridzaudinn B Ibrahim	730515015055	Cawangan Kejuruteraan Mekanikal Negeri Melaka	Admin	
Faiz Bin Fadzil	770905075703	Cawangan Kejuruteraan Mekanikal	Pegawai Pusat	
Hasbullah B Osman	730705085695	Cawangan Kejuruteraan Mekanikal	Pegawai Pusat	
Hasrul Nizam Bin Hashim	820512035877	Cawangan Kejuruteraan Mekanikal Negeri Pahang	Penyelaras	
Hazrim Bin Abdullah	831217035085	Cawangan Kejuruteraan Mekanikal Negeri Johor	Penyelaras	
Lukman Bin Mohd Nor	640101037511	Cawangan Kejuruteraan Mekanikal Negeri Kelantan	Admin	
Malek B Hisham	670303015553	Cawangan Kejuruteraan Mekanikal Negeri Johor	Admin	
Mohd Firdaus Ab Gapar	830617145975	Cawangan Kejuruteraan Mekanikal Negeri Pahang	Pegawai Pusat	
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Showing 1 to 10 of 21 entries

IMPACT TO THE NATION

Reduced government utility cost

Better performance of government assets



2030 Mission





THANK YOU