



## REMARKS FROM CHIEF CORPORATE OFFICER **ABU BAKAR AHMAD**

Ramadan Kareem.

The past one year has been eventful for SB. The signing of the Gas Framework Agreement (GFA) for the power sector in 2016 marks a milestone in the energy industry. SB had been instrumental in providing inputs to all the relevant stakeholders during the negotiation and finalization of the agreement.

The GFA governs the obligations of TNB and PETRONAS in nomination and allocation of gas for the power sector based on the grid system requirement. It also provides the previously missing link between TNB and PETRONAS to govern the power producers with PPAs and SLAs with TNB which are subjected to gas nomination by SB and dispatch by GSO.

On the supply side, the grid system will receive more than 1,000MW of generation capacities when Manjung 5 and Pengerang power plants enter commercial operation by the end of 2017. Manjung 5 had successfully synchronized to the grid on 2 May 2017 and is currently undergoing compliance testing. Pengerang is slated to achieve first synchronization to the grid in the second half of this year.

As the global march towards sustainable and clean energy continues on an upward trajectory, Malaysia has also embarked on increasing the share of renewable energy in the national energy mix. Increasing penetration of renewable energy especially solar PV is expected in the near future, stimulated by plummeting global solar PV prices in recent years. Integration of intermittent resources such as solar PV and other disruptive technologies to the grid system will pose a challenge and this remains a widely discussed issue in the industry worldwide.

Also of significance, the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP) which was mooted in December 2013 is expected to materialize soon. SB has been actively involved in the working group on LTMS to look into the technical, commercial and legal aspects of the project.

The project will be implemented in two phases. The first phase of the

LTMS project, which involves power trading of 100MW capacity between Laos and Malaysia via Thailand using the existing networks and interconnections, is scheduled to commence commercial operation in 2018. This multilateral transaction will be followed by the second phase in 2020 or beyond with a possible expansion to include Singapore.

LTMS-PIP will pave the way towards creating the ASEAN Power Grid of interconnected electricity networks which could potentially result in significant savings for the ASEAN member states. It will also further enhance the integration and

**“As the global march towards sustainable and clean energy continues on an upward trajectory, Malaysia has also embarked on increasing the share of renewable energy in the national energy mix.”**

cooperation within ASEAN for the benefit of the people in this region.

We will keep you updated with the latest happenings in the industry in our future issues and on our website. Wishing you all a blessed Ramadhan. □

*Abu Bakar Ahmad*  
**Chief Corporate Officer  
Single Buyer**

### WATT'S INSIDE

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# The Launch of **SINGLE BUYER GOVERNANCE DOCUMENTS**

SB has officially launched the Single Buyer governance documents during the one-day Inaugural Ethics and Compliance Seminar held on 16 May 2017 in KL. The launch was intended to reinforce the ring fencing and to create awareness among staff of SB. It was officiated by the Head of SB, Mr. Charanjit Singh Gill.

During the Seminar, SB launched three governance documents which are the Ring Fencing Guidelines, SB Operations Manual and SB Code of Conduct. The aforesaid launch was done in response to the SB Compliance Audit in 2016 by Ernst & Young and ESB International.

Apart from these three documents, SB is also governed by the Electricity Supply Act 1990 (Amendment 2015) (Act 447) ("ESA"), Energy Commission Act 2001, Malaysian Grid Code, Malaysian Distribution Code, Licenses issued by the Energy Commission under the ESA, Generator Contracts, Code of Ethics, Limits of Authority, SB Rules and NEDA Rules.

In the opening address, SB Top Management urged all employees of SB to comply with all the documents that govern SB operations. In conjunction with the launch, the Seminar also witnessed the signing of Conflict of Interest Declaration by all SB staff. This is in line with the requirements stipulated in the SB Code of Conduct.

The establishment of the Single Buyer governance documents as well as the Conflict of Interest Declaration portray SB's full commitment in achieving its aspiration to be a transparent, trusted and reputable electricity procurement organization and market operator in the region. □



**16 MAY 2017**





# NEDA UPDATES

<https://mpi.singlebuyer.com.my>

Following the NEDA Go-Live for Price Takers category on 1 April 2017, SB is glad to announce the Go-Live for centrally dispatched generators on 1 June 2017. This date also marks the end of the trial run for participants under the category of PPA/SLA, Ex-PPA/SLA and Large Merchant Generators.

Participation during the trial run was positively encouraging, with 639 submissions recorded for the period of 5 months from January 2017. The submissions are in the form of Variable Operating Rate (VOR) and heat rate offers by centrally dispatched generators and planned generation schedules by the Price Takers.

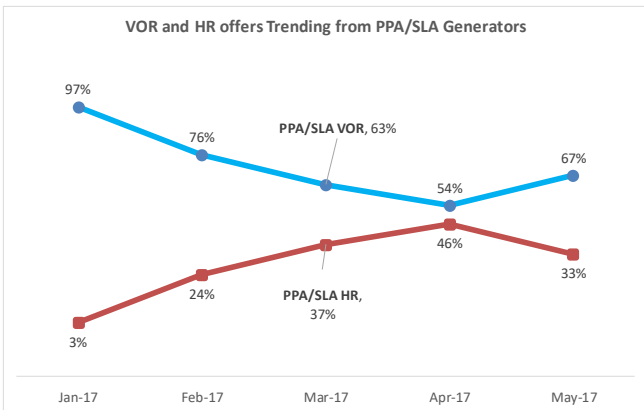
In NEDA, PPA/SLA generators have the option to either submit VOR and/or heat rate offers. An interesting observation during the trial run was that there was a higher number of VOR reduction offers as opposed to heat rate. However, the heat rate offers showed an

increasing trend towards April as the participants became more familiar with the trading platform and NEDA mechanism.

There were no submissions by the Price Takers since the beginning of the April Go-Live date. This is because some of the trial run participants have yet to complete their registration process. SB is expecting similar trend during the initial few months of the Go-Live for centrally dispatched generator, given that they are also required to complete the registration process as per the NEDA Rules.

SB has also organized a “NEDA Workshop for PPA/SLA, Ex-PPA/SLA & Large Merchant Generators” on 9 May 2017 to enhance awareness as well as to provide a platform for potential participants to gain better understanding on NEDA mechanism. The workshop marked as the final event in the series of engagement sessions before the start of the Go-Live period. It was attended by representatives from ST, GSO, TNB Transmission, TNB Distribution and PETRONAS.

With NEDA in full operation from 1 June 2017, SB’s key role during the initial period is to facilitate the registration process. SB will also monitor and report the performance of NEDA market on regular basis. □



For more information, visit

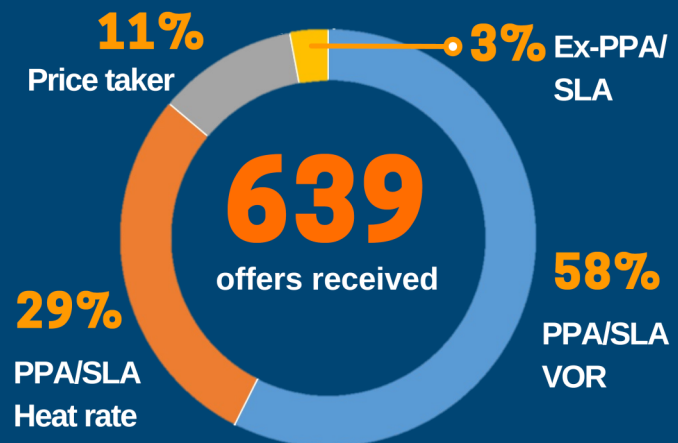
<https://mpi.singlebuyer.com.my>

## NEDA PHASE 2 TRIAL RUN

### S T A T I S T I C S



- 11** PPA/SLA generators
- 1** Ex-PPA generator
- 4** Price takers



# FROM PHOTONS TO ELECTRONS

## THEORY AND EVOLUTION OF SOLAR CELLS



SYNERGY GENERATED SOLAR PLANT  
SETIU TERENGGANU

*In the previous issue, we explored the relevance of solar PV to SB and the MESI. We have also discussed the huge area needed to achieve a significant amount of power from PV plants. Now let's indulge into the theory and evolution of solar cells.*

### What is a solar cell?

A solar or photovoltaic (PV) cell is made of semiconductor material. As the name suggests, a semiconductor material is a kind of material that resides at an intermediate state of conducting and not conducting electricity. Electrons can flow through conductors easily, but can only flow through semiconductors under certain circumstances.

### How can sunlight produce electricity?

The law of conservation of energy states that energy can neither be created nor destroyed. The same principle applies here.

**Energy can neither be created nor destroyed; it can only change from one form to another, in this case, from light energy to electricity!**

So when photons (i.e. light energy) strike a PV cell, three things happen. The photons may be reflected off the cell, passed through the cell, or absorbed by the semiconductor material. Only the absorbed photons provide energy to generate electricity.

When the semiconductor material absorbs enough sunlight (solar energy), electrons are released from the material's atoms so that the electrons move to the surface of the cell. The movement of electrons towards the front surface of the cell leaves "holes" on the back surface.

The electrons accumulating on the front surface carry negative charges, so the "holes" left behind is positively charged. This creates an imbalance of electrical charge between the cell's surfaces.

The imbalance between the surfaces creates a potential energy or voltage potential like the negative and positive terminals of a battery. In this process, solar energy is transformed into potential energy.

### Juicing out the electricity from the solar cells

Metallic strips are placed across the surface of a PV cell to collect the electrons which form the positive (+) connection of the cell. The back of the cell, i.e. the side unexposed to sunlight consists of a layer of aluminium or molybdenum metal which forms the negative (-) connection to the cell.

Hence, a photovoltaic solar cell has two electrical connections, one positive, on the top, and one negative, at the bottom as shown in the following figure<sup>2</sup>. When the conductors are connected in an electrical circuit to an external load, electricity flows in the circuit<sup>1</sup>.

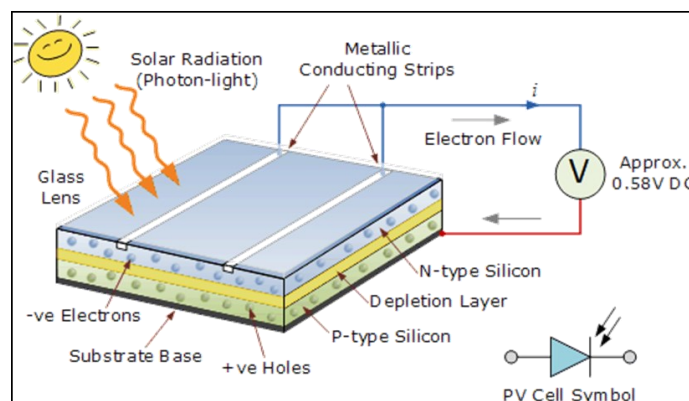


Figure 1: PV Cell Electricity Flow<sup>2</sup>

<sup>1</sup> [https://www.eia.gov/energyexplained/print.cfm?page=solar\\_photovoltaics](https://www.eia.gov/energyexplained/print.cfm?page=solar_photovoltaics)

<sup>2</sup> <http://www.electronics-tutorials.ws/diode/bypass-diodes.html>



When exposed to sunlight (or other intense light source), the voltage produced by a single solar cell is about 0.58 Volts DC, with the current flow being proportional to the light energy (photons). In most PV cells, the voltage is nearly constant, and the current is proportional to the size of the cell and the intensity of the light<sup>3</sup>. As an illustration, you would need a 1.5V battery to operate a wall clock!

electrically, then it is called PV array. PV array makes up a PV system when it is complemented with components such as control systems, meters, batteries, etc. Figure 2 illustrates some of the basic nomenclatures used earlier.

**Like batteries, the more solar cells are connected in series, the higher is the power output.**

### “Stronger Together”

In order to generate a useful amount of power, cells are connected together in a solar panel. The most typical size used for residential installations is 65 inches by 39 inches, while the common size for commercial applications is 77 inches by 39 inches. The smaller size is a better fit for residential projects to maximize available roof space. Most commercial projects have hundreds of panels and this is why the slightly larger panel is a more ideal choice<sup>4</sup>.

A group of solar PV cell connected in series is called PV module and a group of PV modules connected in series is called PV panel. When the PV panels are arranged together and connected

### “It Gets Better With Time”

Over the years, the efficiency of solar cell of the same physical size has improved as shown in figure 3 below. □

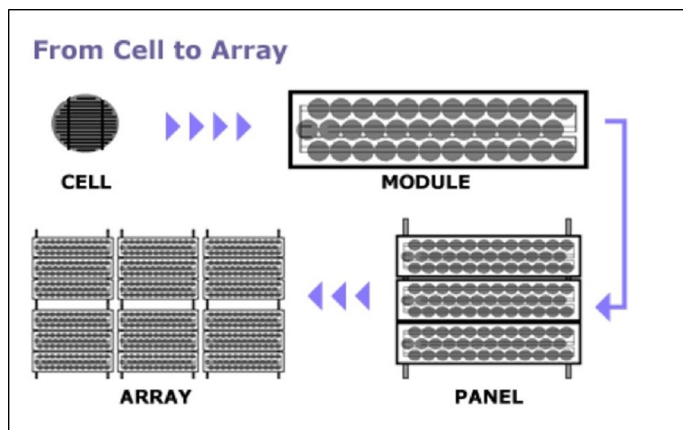


Figure 2: Terminology used to describe solar cell to array<sup>5</sup>

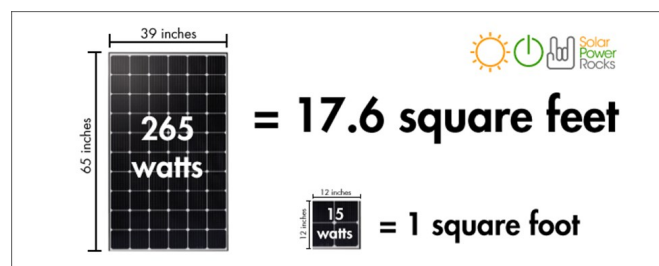
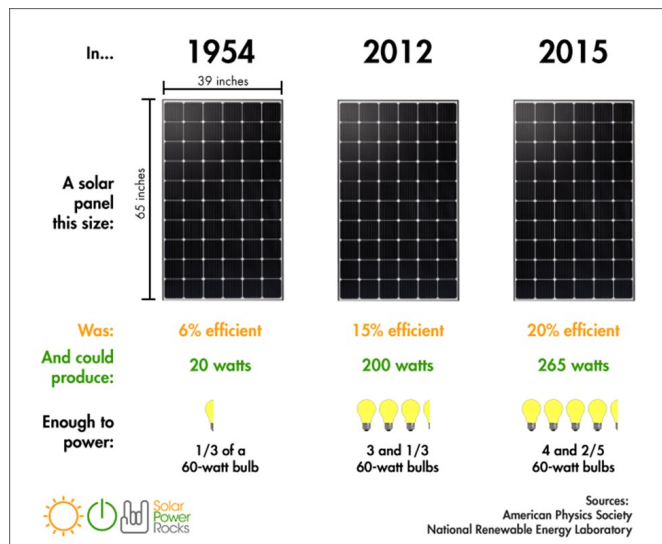


Figure 3: Solar PV Efficiency Improvements<sup>5</sup>

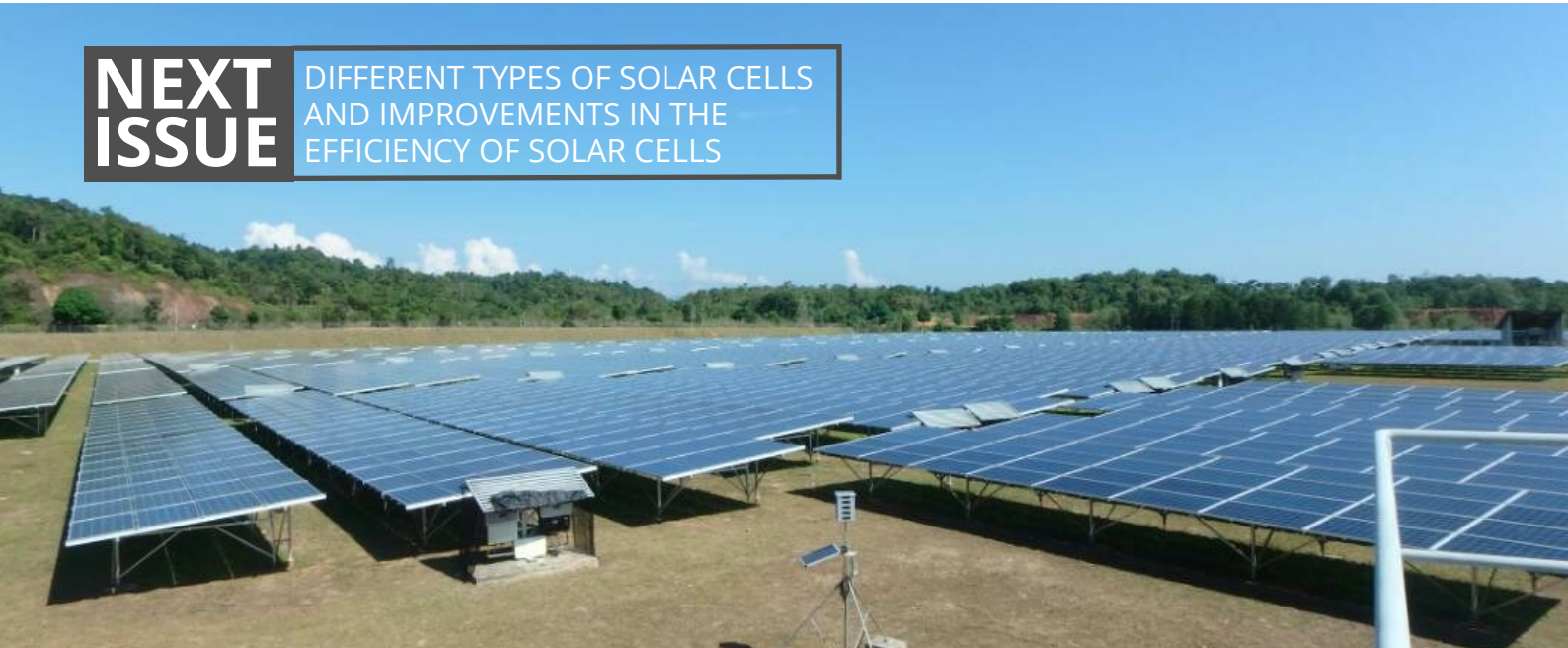
<sup>3</sup> <http://brightstarsolar.net/common-sizes-of-solar-panels/>

<sup>4</sup> <http://www.solar-facts-and-advice.com/what-are-solar-panels.html>

<sup>5</sup> <https://solarpowerrocks.com/solar-basics/how-much-electricity-does-a-solar-panel-produce/>

**NEXT  
ISSUE**

DIFFERENT TYPES OF SOLAR CELLS AND IMPROVEMENTS IN THE EFFICIENCY OF SOLAR CELLS



# WATT'S HAPPENING

# APRIL MAY 2017



## 4-6 APRIL 2017: MARKET SYSTEM OVERVIEW WORKSHOP

A workshop on Market System Overview was conducted by Power System Consultants Asia Pte. Ltd. (Singapore) at Bangsar with attendees from SB, ST and GSO. During the 2-day workshop, the consultant presented overview of electricity markets in Western Australia, Philippines, Singapore and North America from the aspect of market governance, market type, market evolution and settlement.



IMAGE COURTESY OF ST

## 10 APRIL 2017: BRIEFING SESSION ON 'GARIS PANDUAN PELAKSANAAN (GFA) BAGI SEKTOR PENJANAAN ELEKTRIK'

A briefing session on 'Garis Panduan Pelaksanaan Gas Framework Agreement (GFA) bagi Sektor Penjanaan Elektrik' was held at ST. Attendees of the session include the power producers (TNB and IPP), PETRONAS, PETRONAS Gas Berhad, ST, SB, GSO and SESB. The session kicked-off with a presentation from En Rizal of ST on 'The Principles of GFA', followed by a presentation from Pn Akmarhayu of SB entitled 'The Obligation of Power Producers under GFA'. The session ended with a Q&A session with panels from PETRONAS, ST and SB.



## 12-13 APRIL 2017: SINGLE BUYER RISK WORKSHOP

A workshop with the aim to identify risks and mitigations in relation to the operation of Single Buyer as a ring-fenced entity was held amongst the top and middle management of Single Buyer in Bangsar South.



## 25-27 APRIL 2017: THERMOFLOW TRAINING

12 personnel from SB and 2 representatives from ST attended a training session on Thermoflow software in Bangsar. Thermoflow is a leading developer of thermal engineering software for the power and co-generation industries. The training session gave the participants a hands-on opportunity to design and simulate future power plant candidates, which is essential for long term generation development planning.





KENYIR DAM



VIEW FROM THE VANTAGE POINT AT SYNERGY

**3 MAY 2017: TECHNICAL VISIT TO KENYIR HYDRO ELECTRIC POWER STATION AND SYNERGY GENERATED SOLAR PLANT IN TERENGGANU**

A group of 16 personnel from SB visited Kenyir Hydroelectric Power Station and Synergy Generated Solar Plant in Terengganu. The Kenyir power station has 4 units of 100 MW and it is cascaded from Hulu Terengganu Hydroelectric Power Station. The group was fortunate to witness an ongoing major overhaul of Unit 2 during the visit. The visit to Synergy Generated Solar Plant began with a brief presentation by the business manager, followed by a tour of the plant. The solar plant has a capacity of 5 MW spanning over 20 acres of land and has been in operation since November 2014.



**9 MAY 2017: NEDA WORKSHOP FOR PPA/SLA, EX-PPA/SLA & LARGE MERCHANT GENERATORS**

A workshop on NEDA targeted for PPA/SLA, Ex-PPA/SLA and Large Merchant Generators was successfully held in Subang. A total of 58 participants consisted of TNB and IPP Generators, ST, SB, GSO, TNB and PETRONAS attended the workshop. The workshop aimed to enhance the understanding of the NEDA mechanism and also to share the latest rules of NEDA. It also served as a platform for answers and solutions to issues encountered during the Trial Run period. Participants were shown the demonstration on Market Participation Interface (MPI) and One Stop Settlement Centre (OSSC).



SOLAR PANEL WITH DUAL AXIS TRACKING SYSTEM

**8 & 18 MAY 2017: TECHNICAL VISIT TO FIRST SOLAR**

The visit to the First Solar plant located in Kulim, Kedah was conducted in two occasions. The objective of the visit was to gain exposure and understanding on how solar panels are manufactured from raw materials to a complete solar panel and how it works to generate electricity. The visit is timely and beneficial as Large Scale Solar (LSS) is about to make its debut in the Peninsula generation mix by the end of this year.



UNDERGROUND ACCESS TO HULU TERENGGANU POWER HOUSE

**18 MAY 2017: TECHNICAL VISIT TO HULU TERENGGANU HYDROELECTRIC POWER STATION**

6 personnel from SB were privileged to visit the Hulu Terengganu Hydroelectric Power Station, which is one of the latest commissioned hydro power stations in Peninsular Malaysia. The Hulu Terengganu Hydroelectric Scheme consists of Puah reservoir (2 x 125 MW) and Tembat reservoir (2 x 7.5 MW). Both Puah units were commissioned in December 2015, while Tembat Unit 1 and Unit 2 were recently commissioned in December 2016 and May 2017 respectively. The visit started with a briefing by the station's production team, followed by site visit to the power house, spillway and main intake.



**23 MAY 2017: THIRD PARTY ACCESS (TPA) BRIEFING SESSION**

In light of the recent amendments to the Gas Supply Act (GSA) and the introduction of Third Party Access (TPA) by the Government, a briefing session was organized by the Regulatory Economics & Planning Division (REAP) of TNB. The session was attended by ST, SB, GSO and TNB. A few presentations were given by ST to enlighten the participants on the new gas market environment.

# MEET THE PEOPLE BEHIND SB



## GOH YIN LEE & THIVANAN

In this edition, we speak to our colleagues Goh Yin Lee and Thivanan Narayanan, engineers of Scheduling Unit, SB. Yin Lee and Thiva jointly won the "Name our Newsletter" contest for design and name category respectively organised before the creation of WattsUp. SB congratulates both of them again.

**WattsUp: Congratulations, Yin Lee and Thiva! How did you come up with the name / design of the newsletter?**

**Yin Lee:** The concept in short was to include the Single Buyer logo into the design of the name of the newsletter. It was a trial and error process since I have no formal training in designing and I mainly used tools in MS Power Point (laughs). I could not believe that my design was chosen!



**Thiva:** I was looking for a name that is trendy and catchy. I was travelling to work one day and saw an advertisement on the bus promoting WhatsApp application. I related it to SB and related it to power, which is the main function of SB. Then I thought of common terms associated with power and Megawatt came to my mind. I introduced "Up" after "Watts" as I believe the objective of the newsletter is to bring up issues and information to readers. Also "Up" is a positive word. I believe that the name is simple, attractive, and meaningful.

**WattsUp: Can you tell us a brief background of yourself?**

**Yin Lee:** I was born in Kampar, Perak and raised in Kuala Lumpur. I graduated with a Bachelor of Electrical Engineering from

Universiti Tenaga Nasional (UNITEN). I joined Scheduling Unit of Energy Procurement Department (currently known as Power and Resources Planning) in 2011. While working, I pursued a Master in Electrical Engineering at the same institution and graduated in 2012.

**Thiva:** I grew up in Puchong and my hometown is in Seremban, Negeri Sembilan. I graduated with a Bachelor of Mechanical Engineering from UNITEN. Upon graduation, I joined the Scheduling Unit of SB in February 2014 in the Scheduling Unit. My work now involves preparing short-term generation planning including weekly and monthly planning, in summary.

**WattsUp: How has it been so far in SB?**

**Yin Lee:** Since I joined SB six years ago, I have gained deep knowledge regarding our energy industry and learned many valuable skills especially in communication and managing people. Knowledge sharing is encouraged within SB, which I really appreciate. I believe I have the privilege to learn about everything under the sun regarding the energy industry and I could apply what I learned in the university. SB also allows me to be acquainted with everyone in the industry namely colleagues from the Regulator, Transmission, Generation and IPPs amongst others.

**Thiva:** It has been a fun and enriching journey working in SB. Every day is a new enjoyable learning process. The two important parts of learning are interacting with others and acquiring knowledge, which I have the luxury to learn the most in SB thus far.

Firstly, to interact effectively with people that I deal with in my daily tasks, I find it important to understand each person's character and working style. Working in SB gives me many opportunities to be acquainted with people from TNB, the regulators, and other industry players.

Secondly, there is abundance of knowledge and information relating to power system

planning, energy procurement and the power industry available in SB. Knowledge sharing within the departments in SB is unique and I find this very useful in improving my competency and expertise. This also makes me appreciate the general outlook of the industry.

**WattsUp: Apart from work, what do you enjoy doing?**

**Yin Lee:** I enjoy travelling with friends especially backpacking. I have a travel buddy who is now married and I cannot help but to always reminisce our travel moments. I am grateful for her support and trust during our adventures together.

**Thiva:** I have many hobbies. I love reading, collecting Lego and watching documentaries - especially medical related ones and Discovery Science documentaries. Recently my newfound interest is in gardening although I do it small scale at home for now (laughs).

**WattsUp: Any last words?**

**Yin Lee:** I would like to take this opportunity to thank from the bottom of my heart all colleagues from SB, REAP, TNB, TNB HR, GSO, ex-TNB and Pelitawanis who helped my family last December during my house fire tragedy. Their help came in all kinds and it truly helped to ease my burden. Thank you also to SBET for interviewing me. I hope to be able to contribute more in the future. Let's march together, SB!

**Thiva:** I wish to work harder, smarter and try my best together with SB to accept the challenge in making us as a reputable organization with God's blessings. I would like to thank SB for the continued opportunity and trust given to me. Lastly, I am still affected by the passing of my comrade, the late Zop. He had helped me a lot although we were from different units. Rest in peace, my friend. ☐



# 4 Tips to achieve a Remarkable Ramadan



## 1 Free your **mind** from...

- ◆ Clutter
- ◆ Negative thoughts
- ◆ Meaningless worry

Negative thoughts breed, one bad thought leads to another. Focus on something else when the mind wanders into negative space and when you do have to worry, **worry only about your relationship with Allah SWT.**



## 2 Free your **body** from...

- ◆ Tensity
- ◆ Laziness
- ◆ Bad speech



Fasting does not give you excuse to be weak; look at the companions during the Battle of Badr!  
As for bad speech, when someone antagonizes you, say, **"Verily, I am fasting, I am fasting, I am Fasting"**

## 3 Free your **heart** from...

- ◆ Vengeance
- ◆ Hatred
- ◆ Unforgiveness



Learn to let go. Allah SWT says in the Qur'an that those who become angry but are **quick to forgive** will have a reward from Allah! And remember that companion who **forgave everyone before he went to bed** is described by the Prophet SAW as a person from Jannah.

## 4 Free your **spirit** from...

- ◆ Hubbud-dunya (Love for the world)
- ◆ People & things



Remember, **everything in this world is temporary.** Your parents, your spouse, your children, your relatives, your friends, your condo, your sports car, your job... everything. Use Ramadan to detach yourself from your love for everything in this world, because in the end... **Only Allah remains.**

(Hadith narrated by Bukhari and Muslim)



Between midnight and 5.30am, demand gradually slows down as the population goes to sleep and commercial activities come to a halt. However in Ramadan, demand is higher during this period due to religious and sahur (pre-dawn) meal activities.



A spike in demand is observed between 6.00am-6.30am. This is when majority of the population wakes up, prepares breakfast and gets ready for work and school. Demand then tapers down at sunrise, when domestic and public lighting are switched off.



Demand ramps up significantly beginning 8.00am, when all business activities start for the day. The weekday morning peak will normally be recorded between 11.00am-11.30am.



Demand tapers down between 12.00pm - 1.30pm as people break for lunch.



Electricity demand is the highest between 2.30pm-4.30pm. This is when the weather is the hottest and the temperature reaches between 33-35 degree Celcius.



After 4.30pm, demand gradually decreases as business activities slow down and people leave the offices to return home.

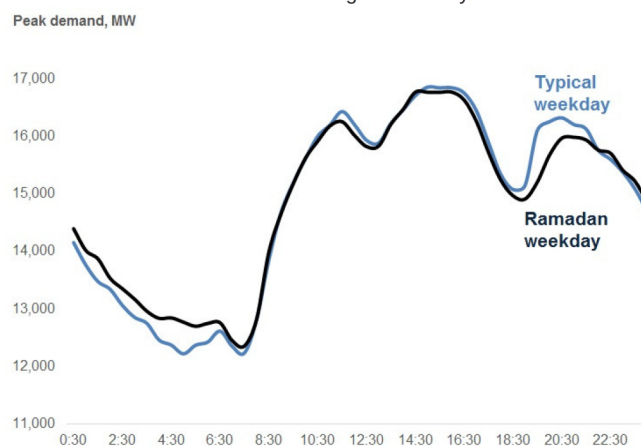


Demand rises again beginning sunset, when people return from work, lights are switched on and dinner preparations are made.

## DID YOU

# KNOW?

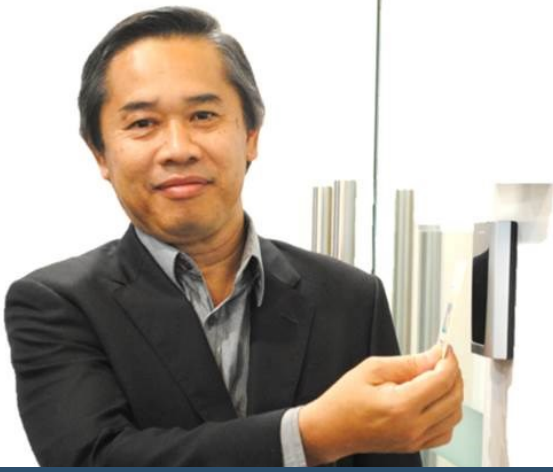
The hourly electricity demand profile tells an interesting story on our behavior throughout the day



After 9.30pm, demand gradually drops as people retire to bed and commercial facilities cease operation.



The night peak will usually occur between 8.00pm-8.30pm. This is when people have their dinner, watch television and perform family and leisure activities. During Ramadan, the night peak happens slightly later. This is due to iftar (breaking fast), tarawih prayers and various religious activities taking place in community mosques.



## GENERAL MANAGER TECHNICAL ADVISORY AND INDUSTRY DEVELOPMENT

### IR. DR. MOHD FUAD JAMALUDDIN

Ir Dr Mohd Fuad Jamaluddin officially retired on 5 June 2017 after almost 39 years of service. He is the first officer to retire officially from SB. Prior to holding the position of the General Manager of Technical Advisory & Industry Development Department (TAID) in SB, Dr Fuad has served in various capacities within TNB, which include Distribution, Transmission, and Regulatory Economics & Planning divisions.

Dr Fuad was born in 1957 in Perak and he is the third son of a successful businessman. He began his education at King Edward VII School, Taiping and obtained a Diploma in Electrical Engineering from University Technology of Malaysia (UTM). In 1980, Fuad was awarded a scholarship from Lembaga Letrik Negara (LLN) to further his studies in the United States where he obtained his Baccalaureate, Master and Doctorate.

In 1978, at the age of 20, he began his career as a Technical Assistant with LLN Kangar and after a year, he was transferred to Batu Pahat, where the scope of work and jurisdiction were greater than his last assignment. Even at the early stage of his career, he was responsible for more than 200 staff. After completing his study in the United States, he continued to serve LLN as an Assistant Engineer in Teluk Intan for two years. His vast experience and knowledge were highly sought after when he was assigned to Integrated Learning Solution (ILSAS) to teach Distribution courses. At the same time, he developed new courses for Transmission and Generation divisions on topics such as System Analysis and Machine Language for automation.

Dr Fuad was later assigned to Planning Division in year 1991 and was involved in different units related to technical planning particularly load forecasting, area network planning, and special grid planning projects. While in Operation Planning, he developed methodology and process for short-term load forecast to be used for generation scheduling and simulation of transmission constraints. He has been the reference point on load forecasting by universities such as Universiti Teknologi Malaysia, Universiti Malaya, Universiti Tenaga Nasional and Universiti Islam Antarabangsa Malaysia. He also acts as co-supervisor for many postgraduate students mostly in engineering faculties on load forecasting. When SB was established in 2012, he was appointed as the General Manager (GM) of Power Resources and Planning and later GM of TAID until his retirement. The main function of TAID amongst others are to provide top-tier technical expertise, guidance, and advice on generation, transmission and electric industry matters to SB and other related agencies, as required.

Dr Fuad is optimistic for the future of the staff in SB. With the recent developments and challenges in the power industry, staff of SB should realize that their roles and responsibilities are unique and pertinent in the running of the industry. As such, he continuously encourages all SB staff to strive in building up self-competencies and always have the ultimate road map for their own retirement plans. SB staff should also aim to further their studies at postgraduate level and obtain professional accreditation in their line of work such as Professional Engineer and Chartered Accountants.

As a father of five children and himself having seven siblings, Dr Fuad stresses on always maintaining good relationship with others, especially family members. His advice for the young executives is to always live within their means and remain humble while accumulating wealth for future undertakings. He also advises on the importance of high morality; *"Indeed, whatever we do in our work, do it earnestly with sincerity and integrity, as this would continuously generate prosperity and blessings from Allah SWT"*.

Dr Fuad looks forward to finally doing all the things he always hoped to do but never had the time to accomplish. He plans to spend more time on his leisure pursuits such as gardening, charitable works and to be more involved in a voluntary group he has been supporting called "Rumah Ngaji" for children which teaches the reciting of the Quran. He is also open to the idea of providing advisory works concerning technical matters, investment strategies and finance.

Dr Fuad would like to take this opportunity to express his heartfelt gratitude to the staff and the bosses especially in SB for the experience and their endless support. He would also like to dedicate this memorable achievement to his wife, children, and family members for the unconditional love and patience for many years.

Dr Fuad's last words to his fellow colleagues are *"Dream big, always plan and be prepared for your future. Gain as much experience as possible from others, contribute to the humanities and always be ready to give and take"*. □





# MARKET WATCH



## LARGE SCALE SOLAR PHOTOVOLTAIC PLANT

Second Competitive Bidding Program for the Development of Large Scale Solar Photovoltaic Plant (LSS) In Peninsular Malaysia and Sabah / Labuan

Bid closing date: 1 August 2017

Evaluation of bids: 7 August 2017 to 30 October 2017

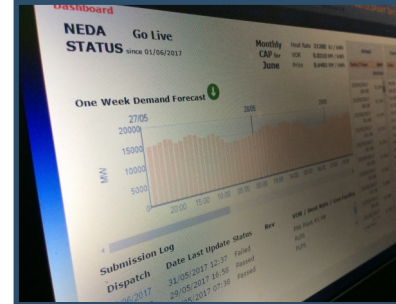
Approval processes: November 2017

Issuance of letter of acceptance of offer to the shortlisted bidders: December 2017



**2 MAY 2017**

Manjung 5 synchronized to the grid



**1 JUNE 2017**

NEDA Go-Live for PPA/SLA and Merchant Generators

## SB-ANS CREATIVE CORNER



### A COOKED FROG by Poe

The pond was large and it smelled of fish. It had tadpoles, lilies and lotus leaves. A 2-year-old frog lived in the pond with its old mother. The frog believed that it was too comfortable to go out into the world alone. The next day was dark and rain fell into the pond. The water level in the pond rose and the frog jumped out of the pond after the storm destroyed its home. Hours passed and the frog then found itself in a pot of water. The frog felt really fine and unafraid. The frog had never seen a pot before and it thought the pot was a comfortable place for it to be. Without much thinking, the frog decided that the pot would be his next home. But what the frog did not know was that the pot was sitting on a stove. The fire underneath the pot was burning very slowly. The poor frog did not realise that the pot was getting warmer and warmer, then hotter and hotter, and it was then too late. On that same fateful day, sadly, the frog did not jump and the frog was cooked.

## WORDS OF WISDOM

Knowledge is not what is memorised. Knowledge is what benefits.

- Imam Shafi'i -

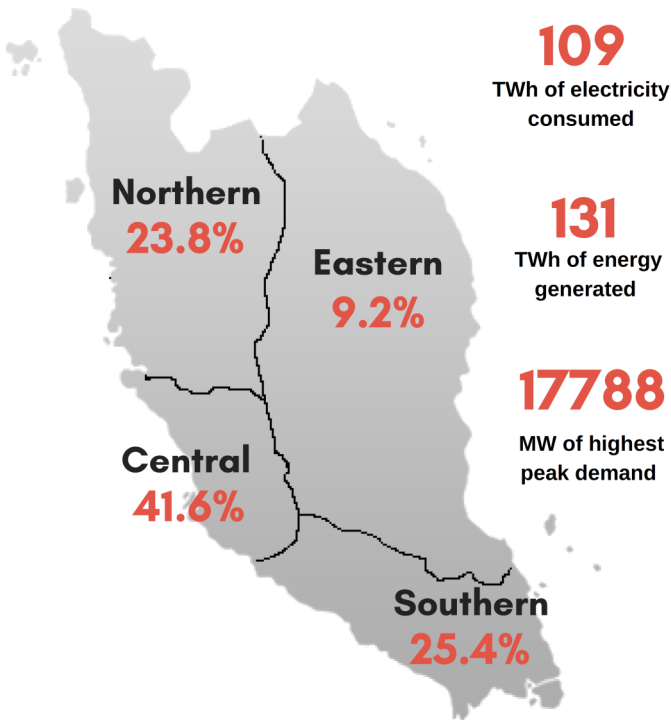
## YOUR FEEDBACK MATTERS

We welcome any comments or suggestions to improve our newsletter. If you have any feedback or content that you would like us to include in the upcoming editions of WattsUp, please email us at [sbet@singlebuyer.com.my](mailto:sbet@singlebuyer.com.my)

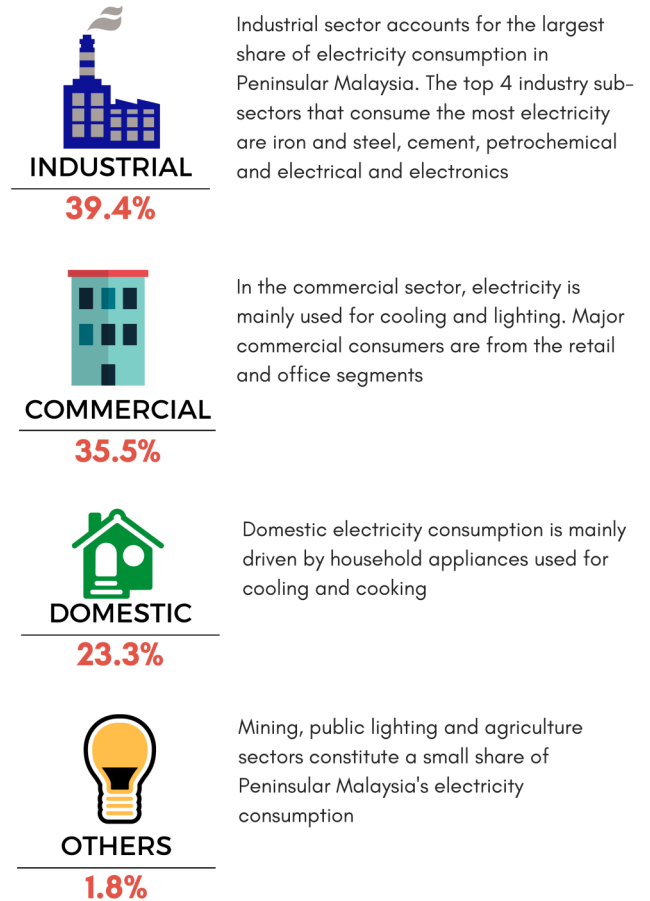
# ELECTRICITY CONSUMPTION TRENDS

## ELECTRICITY CONSUMPTION BY REGION

In 2016, more than 40% of Peninsular Malaysia's demand comes from Kuala Lumpur and Selangor

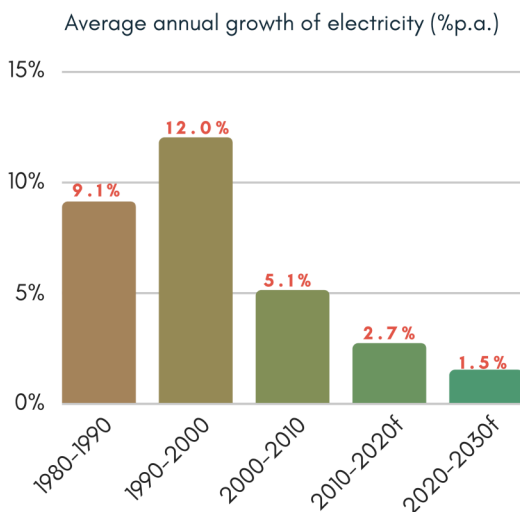


## ELECTRICITY CONSUMPTION BY SECTOR



## FACTORS INFLUENCING ELECTRICITY CONSUMPTION

The evolution of Malaysia's economy, technology advancements and changing consumer behaviour is changing Peninsular Malaysia's electricity demand trends



### ECONOMY

Malaysia is becoming less electricity intensive as the country shifts towards a service-oriented economy



### ELECTRICITY PRICE

Increasing electricity prices drives consumers to change consumption behaviour and explore energy efficiency, distributed generation and other energy options



### RENEWABLE ENERGY

The increasing penetration of solar, biomass, biogas and hydro will replace the amount of conventional energy required to meet demand



### POPULATION

Peninsular Malaysia population is expected to grow by 1.0%pa within the next 20 years



### ELECTRIC VEHICLES

Market growth in electric vehicles will result in an increasing demand for electricity



### WEATHER

The impact of weather becomes increasingly prominent when there is an increase in air-condition load from commercial and domestic sectors



### ENERGY EFFICIENCY

The increasing amount of savings achieved from energy efficiency will reduce electricity demand further