

SINGLE BUYER

WATT UP ("what's up") ELECTRIFYING THE FUTURE

REMARKS FROM

CEO

SINGLE BUYER

The year is drawing fast to a close and here we are at the last edition of WattsUp for 2021.

2021 has been a challenging year not least to the prolonged COVID-19 outbreak that has continued to adversely affect many aspects of our lives. I am however grateful that the pandemic situation in Malaysia has improved recently after months of movement restrictions. I am optimistic that things will get better and we will be able to put COVID-19 behind us in future.

I am delighted to announce that NEDA has achieved another important milestone on 19 August 2021 as it welcomed two new participants, Utilities Kertih and Utilities Gebeng into the market as Price Takers. The current generation capacity under NEDA has increased to 101.3MW. We hope that more industry players will be keen to participate in NEDA to make generation sector in Peninsular Malaysia more competitive and vibrant.

Recently, Malaysia announced a goal for the country to become carbon neutral as early as 2050 alongside other measures to accelerate green growth. Malaysia's commitment adds to the growing list of countries that have set carbon neutral or net zero targets to tackle the challenge of climate change. SB fully supports this aspiration and we will do our best to support all initiatives related to power sector.

Finally, I would like to take this opportunity to wish all of our Hindu colleagues and friends a Happy Deepavali. May the festival of light bring much blessings and happiness to everyone. 🌟

Charanjit Singh Gill

Chief Executive Officer

Single Buyer

WATT'S INSIDE:

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NEDA SYSTEM MARGINAL PRICE

In this edition, we will take a deep dive on the criteria of a marginal generator and how SMP is derived

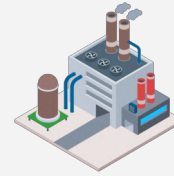
Criteria of a Marginal Generator



Centrally dispatched generator



Not a hydro power plant



Not a must run plant



Not subjected to gas curtailment



Non renewable energy plant



Not a constrained generator



Running on primary fuel



Not a testing generator



Not generating at max or min stable load



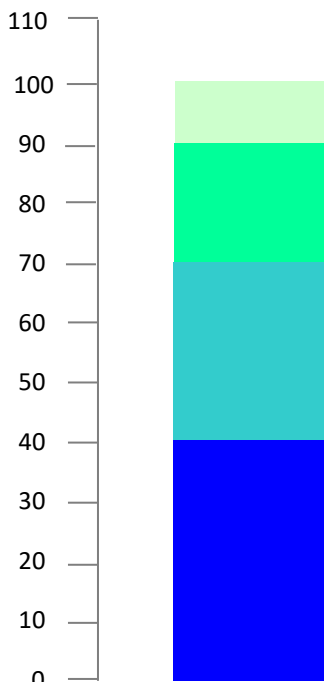
Generator not ramping up or down



Running in normal industry conditions

Derivation of SMP

System Demand (MW)



1430hrs

Generator 4:
20.35 sen/kWh

Generator 3:
18.70 sen/kWh

Generator 2:
15.44 sen/kWh

Generator 1:
12.50 sen/kWh



HOW IS SMP SET?

01

Highest energy cost at 1430hrs is 20.35 sen/kWh from Generator 4

02

However, Generator 4 is a generator on transmission constraint and it is running on alternate fuel (distillate). Therefore, this plant cannot set the SMP.

03

The next highest energy cost is 18.70 sen/kWh from Generator 3

04

Generator 3 meets all the conditions to set the SMP

05

Hence, the SMP at 1430hrs is 18.70 sen/kWh



NEDA

ENGAGEMENT ACTIVITIES

Industry players have continued to show interest in NEDA despite all the challenges due to the COVID-19 pandemic. The engagement sessions with potential participants have slowed down during the third quarter of 2021 due to the unavailability of solar quota under NEDA and the pandemic.

01
12 July 2021

Potential participant: **Kawasaki Gas Turbine**
Plant type: **Co-generation**
Interested NEDA category: **Price Taker**

02
24 Sept 2021

Potential participant: **Pestech Sdn. Bhd.**
Plant type: **Solar plant**
Interested NEDA category: **Price Taker**

HIGHLIGHTS



SB welcomes two new NEDA participants, Utilities Gebeng (UG) and Utilities Kertih (UK) in August 2021.

SB looks forward to more participation and support from the industry players. 🌱

Generator	Category	Registered Capacity (MW)	First Trading Day
Utilities Gebeng	Price Taker	29.9	20 Aug 2021
Utilities Kertih	Price Taker	29.9	20 Aug 2021

INDUSTRY REGULATORY FRAMEWORK

In this edition, we will look into the incentive-based regulation down south, in Australia. Australia's energy networks (electricity and gas) are regulated through an incentive-based system, operated by the Australian Energy Regulator (AER).

Below is the general overview of how the incentive-based regulation works for the network business.

The regulatory period (RP) here is generally a five-year regulatory cycle which was established to help encourage a stable investment environment. For every RP, the AER sets



- the **operating and capital expenditure allowances** for each year within the RP;



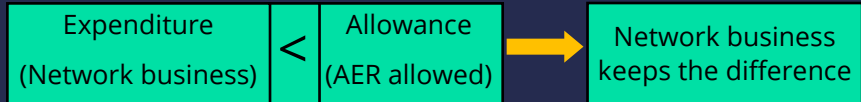
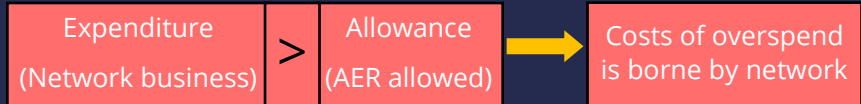
- the **revenue** that can be collected from customers in each year of the RP; and



- for electricity networks, the **service standards** to apply for the RP.

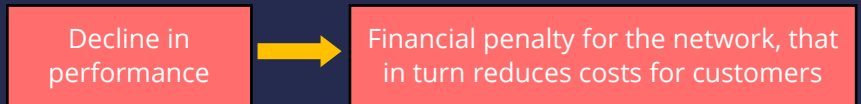
Then as the RP progresses,

- The costs of the business are tracked.



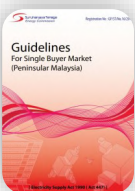
- After a further five years of the particular year of observation, the on-going benefit of any underspend (or costs of any overspend) are passed on to customers.

- For electricity networks, the service performance is monitored.



- The service performance targets are reset at each regulatory determination to promote better service performance.

Source: <https://www.energynetworks.com.au/>



PART 7 Series on GUIDELINES FOR SB MARKET

We have explored the Least Cost Dispatch Scheduling Methodology in the previous issue. The methodology is used by SB in preparing Dispatch Schedules, which consists of Day Ahead Dispatch Schedule, Week Ahead Dispatch Schedule, and Three Month Ahead Dispatch Schedule. Let's find out what they are!

Day Ahead Dispatch Schedule



- To provide GSO with schedule for dispatch of generators to meet day ahead load forecast
- Prepared by SB by 5pm on the day preceding the start of the Day Ahead Dispatch Period

Week Ahead Dispatch Schedule



- To assist SB in optimising weekly scheduling and fuel mix
- Prepared by SB by 5pm on every Thursday

Three Month Ahead Dispatch Schedule



- To provide indicative and non-binding information to generators to assist in their fuel planning and purchase decisions
- Prepared by SB by 5pm on the seventh day of each month before the start of Three Month Ahead Dispatch Period



WHOLESALE ELECTRICITY MARKETS

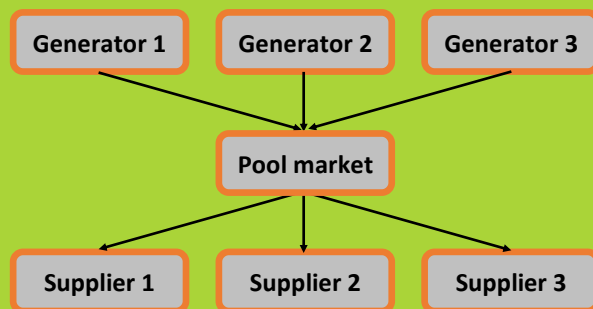
Welcome to the second part of our series on electricity markets! In this article, we introduce the two most common market designs for wholesale electricity markets

01

Centralised pools

Pool markets represent a centralised concept where all energy is sold and purchased through the pool. This is achieved by the centralised scheduling of generators through the pool, where all suppliers must purchase their entire demand from the pool. A pool is thus characterised by the uni-directional exchange of energy from producers to the pool, and from the pool to suppliers.

An example of a pool market is the UK model (the England and Wales Power Pool, 1990-2001). The Pool was later reformed into a bilateral contracts market under the new electricity trading arrangements (NETA) in 2001.



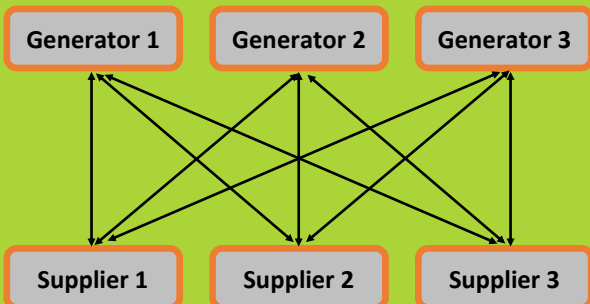
02

Bilateral contracts market

In bilateral contracts markets, market participants are free to engage into any type of contractual obligations for delivery of energy, which then provide the basis for the self-scheduling of producers.

As a consequence, bilateral contracts markets allow for bi-directional exchanges between any two market participants and principally allows all market participants to act as traders. Hence, whilst a producer can only sell to the pool in the first model, it may both buy and sell energy from/to any other party in the bilateral contracts markets.

A number of countries have adopted this market design including European countries, Australia, certain states in the US etc. [↗](#)



AMMONIA

FUEL SOURCE OF THE FUTURE?

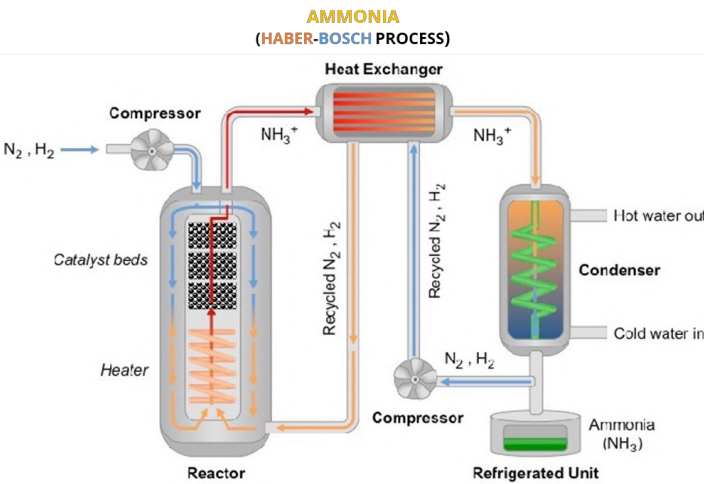
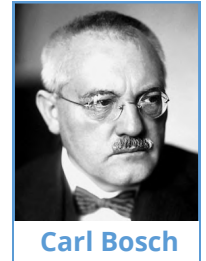
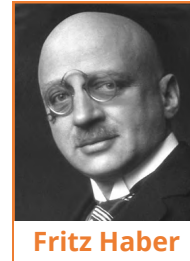
Ammonia (NH_3) - a compound of one part nitrogen and 3 parts hydrogen is a form of energy carrier for hydrogen, as this compound can efficiently transport and store hydrogen at low cost. This is a form of chemical storage of energy for hydrogen, and a potential enabler for a low carbon economy.

1 How Ammonia saved the world once. The Haber-Bosch story.

In the early 1900s,

“humanity was facing global disaster. Mass starvation, long predicted for the fast-growing population, was about to become a reality. A call went out to the world’s scientists to find a solution.”

— Thomas Hager, *The Alchemy of Air*



In the first decade of the 20th century, German chemists Fritz Haber and Carl Bosch developed the **Haber-Bosch** process. It is a chemical process that turns air into ammonia, the basis of fertiliser.

One of the most important plant fertilisers is nitrogen. Air is mostly nitrogen, but plants can only utilise nitrogen when it is part of chemical compounds. When nitrogen and hydrogen gases pass through an apparatus at a controlled temperature, pressure, and flow rate, and in the presence of a catalyst, ammonia is formed in an energy-efficient process. This process is called nitrogen fixation, a process that converts atmospheric nitrogen into ammonia.

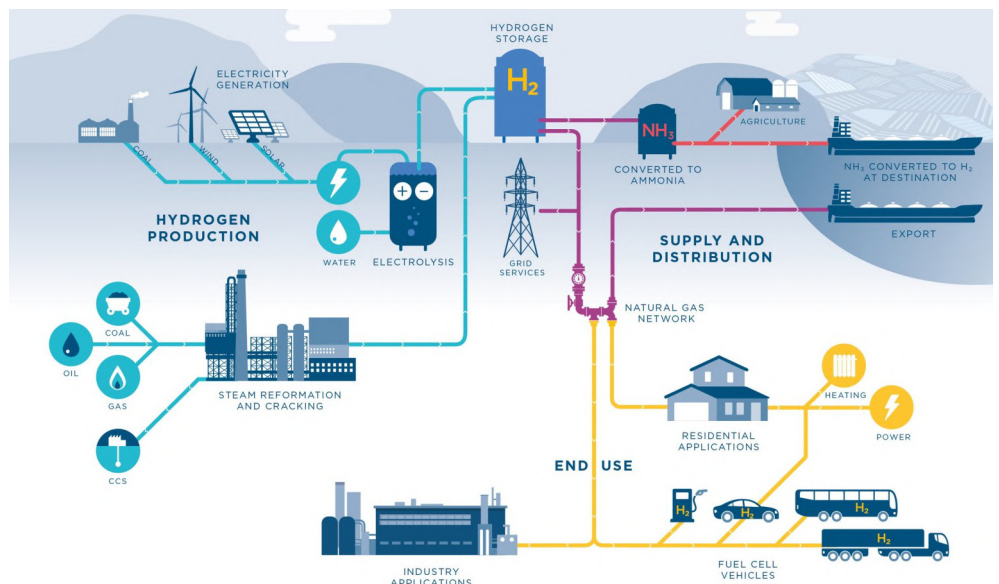
Hager and Bosch’s scientific genius made a solution to prevent mass starvation.

2 In this era, climate change is the crisis. How can ammonia come to the rescue again?

Nature has given ammonia attributes that seem to make it a perfect commodity for a future hydrogen economy.

Ammonia could come to the rescue by capturing, storing, and shipping **hydrogen** from various methods of production (Grey, Blue, Green, Turquoise), for use in emission-free fuel cells and turbines.

Efforts are also underway to combust ammonia directly in power plants and ship engines.

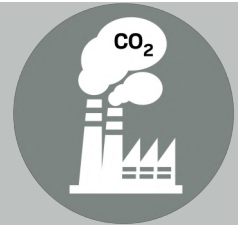


Source: <https://view.ceros.com/hsf/decarbonisation-infographic-4/p/1?heightOverride=750>

3 The Four Ammonias

Grey

Also called brown ammonia, this is conventional ammonia that has been made the same way for 100 years. The Haber-Bosch process, responsible for nearly all of the world's 180 million tonnes of annual ammonia production, reacts hydrogen and atmospheric nitrogen. The hydrogen often comes from the steam reformation of methane, a process that emits CO₂.



Blue

Blue ammonia is conventional ammonia for which by-product CO₂ has been captured and stored, reducing climate impact compared with grey ammonia. Many fertiliser makers have embarked on such projects in recent years. Blue ammonia is controversial and in need of industry standards. Using CO₂ for enhanced oil recovery, for example, is not as environmentally beneficial as injecting it into the ground permanently.



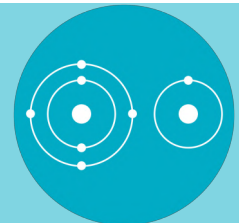
Green

Green ammonia is made with hydrogen that comes from water electrolysis powered by alternative energy. Projects abound, though most are on a modest scale of tens of thousands of tonnes, an order of magnitude smaller than a typical ammonia plant. A massive project in Saudi Arabia, however, aims to make more than 1 million metric tons of ammonia per year.



Turquoise

This process uses pyrolysis to convert methane into pure carbon and hydrogen, which reacts with nitrogen to make ammonia. The industry thinks of turquoise ammonia as somewhere between green and blue. A prominent project is Monolith Materials' carbon black plant in Nebraska, USA.



Source: <https://cen.acs.org/business/petrochemicals/ammonia-fuel-future/99/i8>

4 Pros and Cons of Ammonia-based energy storage technology

Pros

- High volumetric energy density compared to hydrogen
- Energy density of 22.5MJ/kh is comparable to that of fossil fuels
- Green ammonia reactions are easy to control
- Easily liquefiable
- Abundant raw materials for production
- Already existing expertise in ammonia production from fertiliser industry

Cons

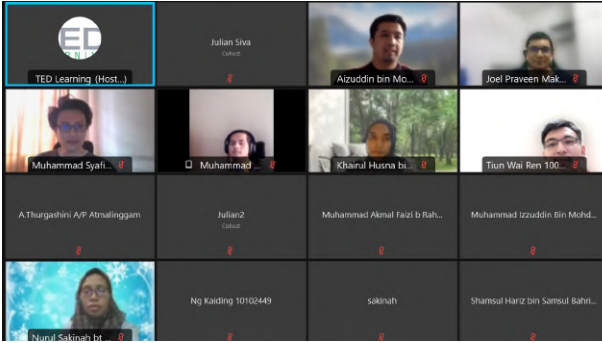
- Lower reactivity compared to hydrocarbons
- Haber-Bosch process adds significant costs to the final costs of green ammonia
- Relatively expensive electrolysis process
- Required corrosive resistant equipment
- Toxic in nature; requires suitable handling
- Trace amounts of ammonia in the hydrogen after decomposition

Source: <https://www.futurebridge.com/industry/perspectives-energy/green-ammonia-for-energy-storage/>

Ammonia can achieve all the benefits of a hydrogen economy with existing infrastructure and may very well be the fuel that makes fuel cell technology commercially viable. Both ammonia and hydrogen are likely to have a place in net zero carbon strategies. With further technology development, the use of ammonia as a fuel rather than a hydrogen carrier should become the more economical choice. In progressing towards achieving the net zero carbon strategies, the available size and maturity of ammonia engines, turbines, or fuel cells as compared to the size and maturity of ammonia crackers, hydrogen engines, and fuel cell will need to be weighed on. 🚀

Fundamentals of Power BI Training

Webex



2-4 August 2021 | SB organised a training on Microsoft Power BI to increase staff competency in the business intelligence tool. Fourteen staff from Short Term Scheduling unit participated in the training. Power BI is a collection of software services, apps, and connectors that works together to turn unrelated sources of data into coherent, visually immersive, and interactive insights.

Energy Sector Round Table Engagement #3

Zoom



3 August 2021 | The third series of the Round Table Series on Energy Sector by CEO Action Network (CAN) was hosted by PETRONAS with the theme "Renewables & Electrification". The context was focused on Malaysia Energy Transition Plan 2021-2040, aiming to achieve 40% RE capacity (18GW) by 2035. For electrification, the focus will be on how Malaysia can increase current rate of 21% to support our national climate ambition. The keynote was addressed by Pn Noor Afifah (KeTSA) and the panelists include representatives from SEDA, Petronas, MPIA and Mr Charan Jit Singh from SB.

SBeeple Talk: "Why We Sleep?" by Joel

Webex



6 August 2021 | SB staff gathered for a talk by a fellow SB staff, Mr. Joel. During this talk, Mr. Joel shared an intriguing topic on "Why We Sleep". SBeeple Talk remains as a great occasional event to unite and let SB staff to socialise during work from home period. During this session, everyone also took the opportunity to welcome and virtually meet new staff who recently joined SB.

Quarterly GDP Briefing

Microsoft Teams

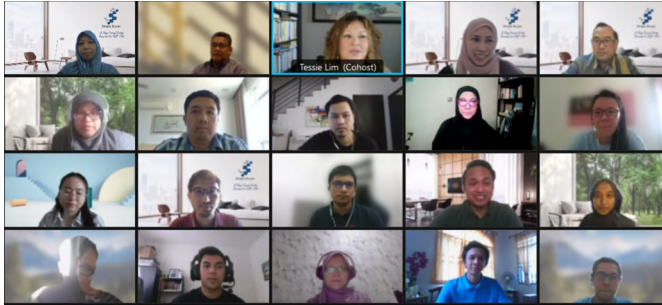


13 August 2021 | Following the release of the 2Q 2021 GDP report by Department of Statistics (DOSM), SB organised a Macro Monitor briefing which was delivered by economists from RAM Sustainability Sdn Bhd. This event is aimed to brief on current events and forecast of Malaysian economy. The presentation includes analysis on demand and supply sectors, inflation, carbon tax and economic outlook for 2021 and 2022.



Training on Figuring Out People

Webex



9 September 2021 | 21 participants from SB joined the training which was designed to bring focus and attention to our default patterns of thinking and operating in our world. The participants were taught how to act and shift to more resourceful states to achieve best performances and highest aspirations.



Fraud & Bribery Risk Training

Webex

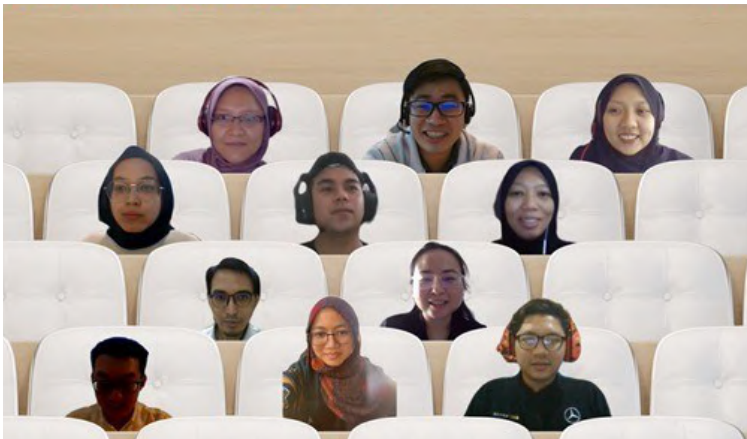


17 September 2021 | SB staff joined a Fraud & Bribery Risk Management Workshop organised by Integrity Department. The workshop aimed to reassess the Fraud and Bribery Risk Register in SB and increase awareness on the risk management amongst SB staff.



Knowledge sharing session on long term load forecasting with Sarawak Energy Berhad

Microsoft Teams



5 October 2021 | Load Forecast unit of SB was invited by counterpart from Sarawak Energy Berhad (SEB) to share knowledge on energy efficiency forecasting. The session began with an introduction by SEB on the electricity supply industry in Sarawak and a general overview on SEB's long term forecasting framework. SB then presented the end use forecasting methodology which is used in SB's long term forecasting of energy efficiency in Peninsular Malaysia. The participants exchanged useful information with one another during the meeting and had already planned for future sessions to share knowledge on other areas of load forecasting and planning.

THE ART OF APPLIED FORECASTING

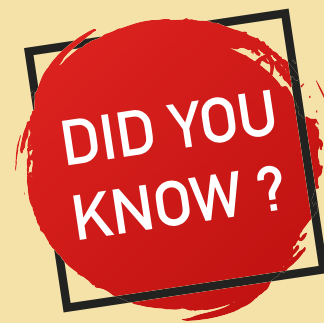
SB recently conducted The Art of Applied Forecasting workshop from 6 to 8 September 2021 in collaboration with RAM Rating Services Bhd and Universiti Malaya to increase competency in the area of forecasting

The objectives of the workshop are to enable participants to:

- learn the theoretical concepts, techniques and methodology for forecasting;
- apply the knowledge learnt to ongoing operational work and applications including to develop, interpret, assess and/or validate forecasting models - whether internal or external - that deploy such techniques and methods; and
- know and understand the different forecasting models/techniques, both quantitative and qualitative and the suitability of different forecasting techniques for the given data set and project objectives.

Participants were also taught on how to interpret the models' results, outputs and implications for the project objectives and/or other intended use/applications evaluate the adequacy and shortcomings/constraints of various forecasting techniques, methods and/or models, whether internally developed or external by third parties.

The workshop was also attended by representatives from Suruhanjaya Tenaga.

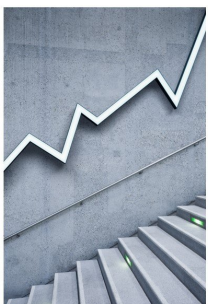


There are two basic methods in forecasting:

- Quantitative: mathematical models that use past data to forecast the future
- Qualitative: subjective methods that rely on judgment and expert opinions.

"Unlike a prediction, a forecast must have a logic to it. That's what lifts forecasting out of the dark realm of superstition"

- Paul Saffo, Six Rules for Effective Forecasting (Harvard Business Review)



SECTION 1A
INTRODUCTION TO FORECASTING
EXPERT JUDGEMENT (QUALITATIVE ANALYSIS)

Dr Lau Wee Yeap



LAOS-THAILAND-MALAYSIA POWER INTEGRATION PROJECT

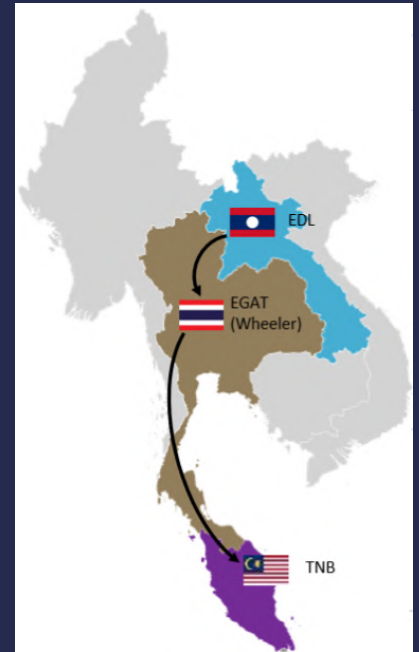
WHAT IS LTM PIP?

Laos-Thailand-Malaysia Power Integration Project (LTM-PIP) is a trilateral power interconnection arrangement between Laos, Thailand and Malaysia.

The initial power trade deal (LTM 1.0) was implemented from January 2018 to December 2019:

- Maximum power of 100MW
- No energy commitment
- Energy transaction available for 9 months per year (June-February) as it is the dry season in Laos during March-May.

A second agreement (LTM 2.0) was signed in December 2019. The maximum capacity was increased to 300MW and also included energy commitment of up to 50GWh/year. The agreement is effective from January 2020 to December 2021.



ENERGY TRANSACTION

Data collected from the monthly energy transaction in 2018 shows that Peninsular Malaysia have imported a total of 16.6GWh of energy from Laos through Thailand.



Some notable reasons as to why we imported energy during these months:



Higher electricity demand



Generators unavailability



Shortfall of fuel supply

The energy transaction in 2018 paled in comparison to our national annual energy consumption (more than 300TWh) but nonetheless, this transaction provides a platform for energy trade deals for the future not just with Laos and Thailand but also other potential neighbours such as Indonesia (through Sumatera and Kalimantan) and the Philippines.

WHAT'S NEXT?

In the future, more ASEAN members will be part of this project i.e. Myanmar, Singapore and Indonesia to form a greater ASEAN Power Grid (APG).

APG is an initiative to build interconnections to connect power grids of different ASEAN member states and facilitate power trade with the ultimate aim of an integrated power grid system in ASEAN.

This interconnection presents multiple advantages which include better energy security, energy affordability, and could potentially reduce ASEAN's green house gas emissions as countries can share RE resources.

FUTURE



A FOND FAREWELL TO RAYMOND MICHAEL

After more than 30 years of memorable stints in TNB, 2 August 2021 marked the last day for Mr. Raymond with SB. He started his career in TNB back in 1984 and possessed substantial experience in the industry. He is retired as the Head of Technical Advisory and Industry Development in SB.



A special online clock-out ceremony was organised in his honour to mark the occasion and with nearly 37 years of service under his belt, there were plenty of goodbyes to be said. Many from top management, colleagues and friends came together to bid him farewell as he takes his well-deserved retirement. We thank you for your service and dedication to help SB reach a position where it is now.



Congratulations to Mr. Raymond and you have truly earned your retirement!

Watt Say You

Return to Office



Klang Valley transitioned from Phase 3 to Phase 4 of the National Recovery Plan on 18 October 2021. More restrictions will be lifted after the transition in line with the decline in COVID-19 cases and rise in number of vaccinated people. In this edition, we interview SB staff to ask their opinion on returning to office.



In my view, many people are excited to return to the office for real-time connections with colleagues, but I prefer to maintain working at home or having a hybrid arrangement. The latter ensures that time in the office is optimised to accommodate changes to work patterns in the COVID-19 endemic era.

Muhamad Rafi Bin Mustapha (Technical Advisory)



The pandemic reminded us that we exist to do more than just work. I now have space to reimagine how a job fits into our lives. The pandemic also accelerated existing trends in remote working. Safety and flexibility are my core concerns for the on-site return. If we can still remain productive, there is no difference between off-site and on-site arrangements. It is also important to balance between expectations and mental health impact of returning on-site, which includes protection from COVID-19.

Chong Sook Fei Primalia (Medium Term Scheduling)



After almost two years of working from home due to the COVID-19 outbreak, I have become adapted to it and hope to continue working remotely. Commuting, which in my case took at least a minimum of two hours daily (switching trains, train delays to name a few), has been eliminated. However, I missed spending time with my colleagues at the office. The physical workplace enables me to stay aligned, feel connected and improve my job satisfaction. Returning to office and staying safe are possible if we adhere to strict SOPs. Perhaps, a hybrid work schedule can be considered for SB.

Nik Siti Aishah (Contract Performance)



Announcement made by our Prime Minister shows that our country is moving positively in handling this pandemic issue. However, it is very crucial to ensure effective planning and execution of return to work policy in order to protect the employees and mitigate the spread of COVID-19. To have a hybrid working arrangement can also be considered to minimise the threat of the virus. If an employee is needed in the office, then that person has to be in the office. These two years can be regarded as a trial phase for future implementation if it is feasible. 🌟

Khairunnisa (Settlement & Clearance)

MEET THE PEOPLE BEHIND SB

HEAD
TECHNICAL ADVISOR & INDUSTRY DEVELOPMENT
MUHAMAD ZULKIFLI BIN MEAH

In this issue, we had a chat with one of SB's latest members, Muhamad Zulkifli bin Meah to talk about his background, vast work experience and his favourite sports.

01

WattsUp: Thank you for giving us an opportunity to get to know you better. Firstly, can you tell us a bit about yourself?

Zulkifli: I was born in Butterworth, Pulau Pinang. I obtained a scholarship from LLN and pursued my degree in electric power engineering at Rutgers University, New Jersey, USA. I joined TNB after graduating in 1991.

I was first assigned as a wayleave engineer at Transmission Maintenance (Kuala Lumpur), directly responsible for maintenance of transmission lines and rentices. In 1993, I was transferred to National Load Dispatch Centre (NLDC) as an operation and planning engineer. At NLDC, I was responsible for conducting short-term system study and then was assigned to do production planning. In 1998, I was promoted as manager in Power Market Development at Business Management Unit under Transmission Division and this unit was then transferred to a new division known as Grid System Management Division.

In 1999, I was assigned to Economic Planning Unit, Prime Minister's Department as a member of Independent Grid System Operator (IGSO) task force. In 2000, I returned to Transmission Division and was assigned to do Strategic and Business Planning at Business Planning and Development Department. I was also briefly assigned to Unit Kerjasama Awam Swasta (UKAS), Prime Minister's Department as a technical expert on electricity supply industry.

In 2013, I was promoted as General Manager (Sustainable & Industry Study) at Corporate Planning & Sustainable Department, Planning Division. Before coming to Single Buyer, I was the Head of Industry & Electricity Market Department, Regulatory & Stakeholder Management Division.

04

WattsUp: What is your vision for SB?

Zulkifli: I envision SB to be recognised locally and internationally as a well-respected organisation. SB at its current position in the industry and with the capability, expertise and technical know-how it possesses, can become the think tank for the industry and as a reputable reference point.

02

WattsUp: How and when did you first join SB? What is your role in SB?

Zulkifli: I was assigned to SB on 1st June 2021 as Head of Market Operation and Assessment (MOA). Under MOA. On 3 August 2021, I was then assigned as Head of Technical Advisory and Industry Development (TAID). Here at TAID, our role is to provide technical expertise and advice on generation, transmission, and Malaysia Electricity Supply Industry (MESI) related matters to SB and Suruhanjaya Tenaga.

03

WattsUp: Tell us about the proudest moment in your career?

Zulkifli: I was honoured to lead the negotiation of Gas Framework Agreement (GFA) with PETRONAS. GFA is an agreement between PETRONAS and TNB relating to the gas delivery by PETRONAS and offtake by the power sector in Peninsular Malaysia. I was also tasked to lead on behalf of TNB, the negotiation on Energy Purchase and Wheeling Agreement (EPWA) with Electricite du Laos (EDL) and Electricity Generating Authority of Thailand (EGAT). The agreement enables Malaysia to purchase electricity produced by hydropower stations in the Mekong Delta in Laos, via Thailand's transmission lines. The agreement is an important step, as it is the first multilateral energy trade agreement for ASEAN members. The deal will be a stepping stone for expansion of the Laos-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP).

05

WattsUp: Lastly, what sports do you play?

Zulkifli: I was a sportsman during my time at high school and college. I represented my high school in rugby, field hockey, *sepak takraw* and tennis. I also enjoy playing football, volleyball, table tennis and bowling. Currently, at my age of over 50, I just enjoy morning or evening walks and occasionally playing bowling with my family. Since now is the National Football League (NFL) season in the USA, I enjoy watching American football matches. Currently, I support Tampa Bay Buccaneers because of their quarterback - Tom Brady (laugh). Anyway, my all time favourite NFL team is the New York Giants.



GENERATORS UPDATE LSS@MEnTARI

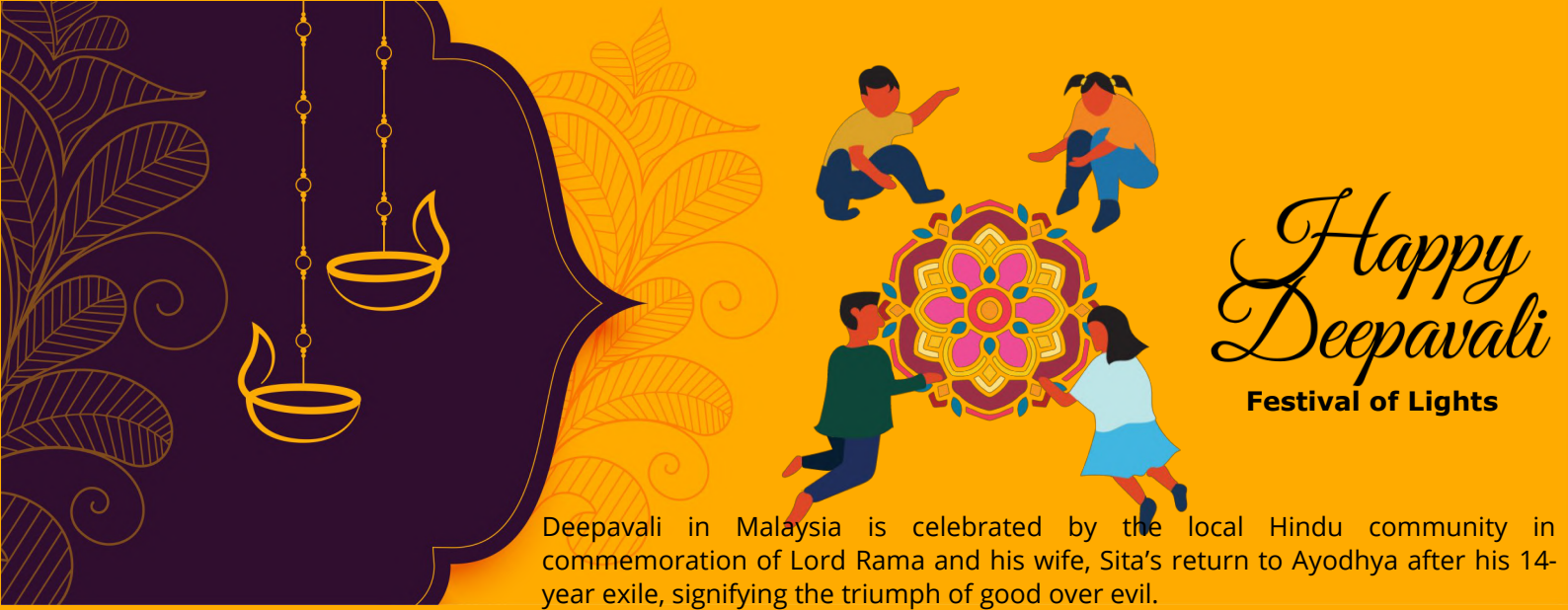
Ten successful bidders signed PPAs

On 19 and 23 August 2021, ten companies successfully executed power purchase agreements (PPAs) with TNB. This is in relation to the LSS@MEnTARI bidding cycle organised by Suruhanjaya Tenaga in the second half of 2020. Each project is 50MWac in size and will contribute 500MWac of new LSS capacity in the grid system by 2023.

Since the introduction of the LSS program in 2016, a total of 1,750 MW was awarded for transmission connected package with current total operational capacity of 609MW. The execution of the PPAs in relation with the LSS@MEnTARI bidding cycle is in line with supporting the Malaysia Government's effort to increase the share of renewable energy (RE) capacity to 31% in 2025.

Locations of transmission-connected LSS@MEnTARI





Deepavali in Malaysia is celebrated by the local Hindu community in commemoration of Lord Rama and his wife, Sita's return to Ayodhya after his 14-year exile, signifying the triumph of good over evil.

Other legends talk of how Deepavali is a time to honour and celebrate the Hindu goddess Lakshmi, the goddess of light and prosperity. Symbolically, it is a day that recalls when good triumphed over evil. From darkness into light. It is a tradition for Hindus to rise early in the morning and prepare for the day ahead. At the dawn of Deepavali, Hindus perform a ritual oil bath which signifies the cleansing of the body and soul. The day continues with families hosting prayer services in their homes. Alternatively, some may choose to visit the local temple for any other acts of worship or to take part in rituals.

Homes will be decorated in beautiful coloured paper lanterns. A Deepavali staple at most major shopping centres, temples and homes is the *kolam*, a temporary but very intricate floor design made entirely out of colourful powders and dyed rice. It may look easy, but it takes considerable effort to perfect the art of *kolam*. A must-try Malaysian snack is the *murukku*, another staple you will find everywhere particularly on this day.

Sources:

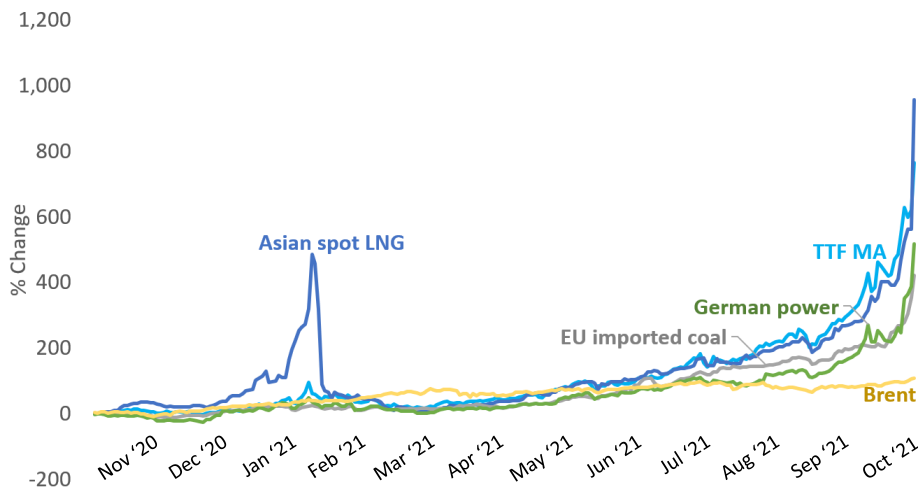
1. <https://www.3ecpa.com.my/resources/malaysia-public-holidays/deepavali/>
2. <https://www.wonderfulmalaysia.com/faq/deepavali.htm>
3. <http://www.kuala-lumpur.ws/magazine/deepavali-in-malaysia.htm>

MARKET WATCH

Looming energy crisis threatening global recovery

Evolution of energy prices, 2020-2021

Gas and coal prices have jumped to all-time highs, taking electricity prices with them



Global energy markets are facing the perfect storm. Demand for energy shot up after China and other major economies began to recover from the pandemic. In Europe, a cold winter depleted gas reserves, while a long spell of still days reduced wind power supply to the grid. Meanwhile, CO₂ prices have hit record levels. Russia, one of Europe's biggest suppliers, had declined to increase supplies on the short-term spot market, although the Kremlin recently said it was starting to help out. 🚧

Sources:

1. IEA (2021), What is behind soaring energy prices and what happens next?, IEA, Paris <https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>
2. The Guardian (2021). Global energy crisis: how key countries are responding, <https://www.theguardian.com/business/2021/oct/12/global-energy-crisis-how-key-countries-are-responding>

WORDS OF WISDOM

"You should take the approach that you're wrong. Your goal is to be less wrong"

- Elon Musk -

CONTACT US

We welcome any comments or content that you would like us to include in the upcoming editions of WattsUp.

Please email us at sbet@singlebuyer.com.my

DISCLAIMER

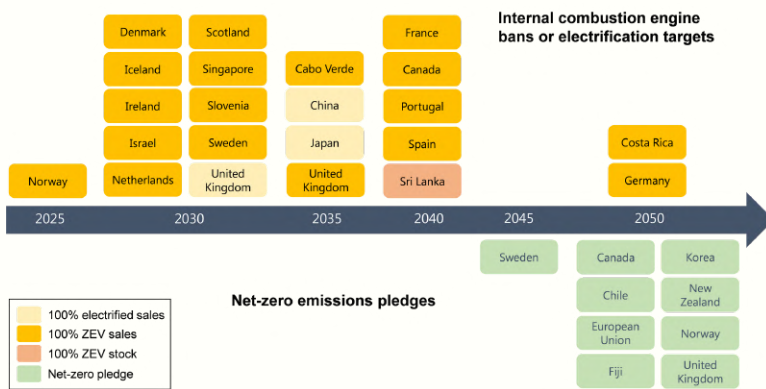
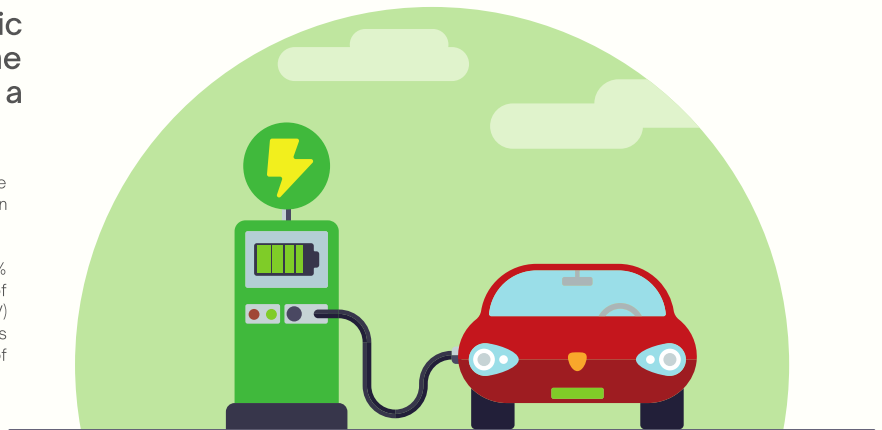
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Electric Vehicles Future of Mobility

There were 10 million electric cars on the world's roads at the end of 2020, following a decade of rapid growth.

Electric car registrations increased by 41% in 2020, despite the pandemic-related worldwide downturn in car sales in which global car sales dropped 16%.

Around 3 million electric cars were sold globally (a 4.6% sales share), and Europe overtook the People's Republic of China ("China") as the world's largest electric vehicle (EV) market for the first time. Electric bus and truck registrations also expanded in major markets, reaching global stocks of 600,000 and 31,000 respectively.



More than 20 countries have electrification targets or ICE bans for cars, and 8 countries plus the European Union have announced net-zero pledges

In the long term, realising the full potential for EVs to contribute to cut vehicle emissions requires integration of EVs in power systems, decarbonisation of electricity generation, deployment of recharging infrastructure and manufacturing of sustainable batteries.

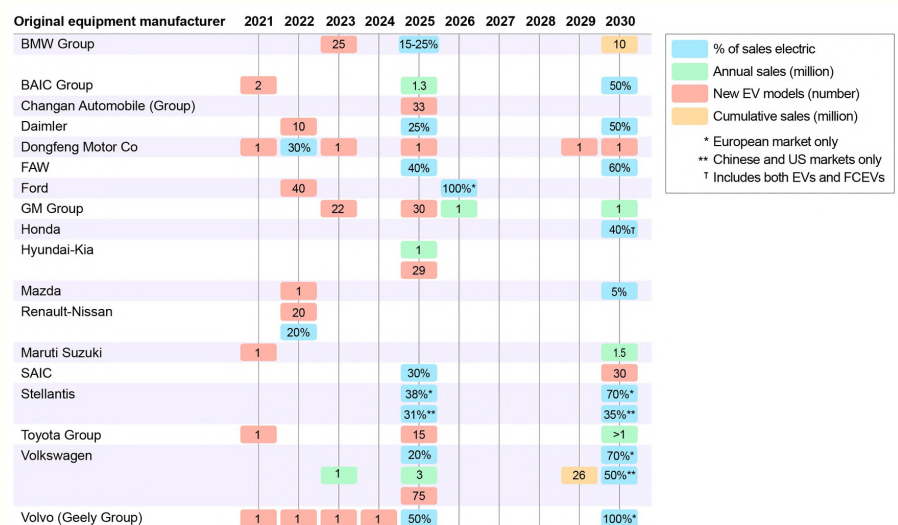
18 of the 20 largest OEMs have committed to increase the offer and sales of EVs

OEMs are expected to embrace electric mobility more widely in the 2020s. Notably 18 of the 20 largest OEMs (in terms of vehicles sold in 2020), which combined accounted for almost 90% of all worldwide new car registrations in 2020, have announced intentions to increase the number of available models and boost production of electric light-duty vehicles (LDVs).

A number of manufacturers have raised the bar to go beyond previous announcements related to EVs with an outlook beyond 2025. More than ten of the largest OEMs worldwide have declared electrification targets for 2030 and beyond.

Significantly, some OEMs plan to reconfigure their product lines to produce only electric vehicles.

Original equipment manufacturer (OEM) announcements related to electric light-duty vehicles



Source: IEA (2021) Global EV Outlook, <https://www.iea.org/reports/global-ev-outlook-2021>. All rights reserved.