

SINGLE BUYER

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

REMARKS FROM

CEO

SINGLE BUYER



Welcome to the 16th edition of WattsUp. I hope all our readers are in good health and spirit.

At the time of publication of this newsletter, there have been more than 300,000 cases of COVID-19 reported in Malaysia since the start of the pandemic. The impact of the pandemic has been immense and could be seen in the dramatic reduction of the electricity demand especially after the implementation of Movement Control Order (MCO).

After a significant drop in 2020, electricity demand has been on an increasing trend since early this year supported by the lifting of MCO 2.0 in selected states in March 2021 and hot weather conditions, but it is still slightly below the pre-pandemic levels. I hope that vaccine rollout will put the country on the path of economic recovery this year and it will surely contribute to recovery in electricity demand as well.

On the supply side, Suruhanjaya Tenaga (ST) recently announced the result of the LSS@MEnTARI bidding programme that saw a total of 823MW_{AC} LSS capacity being awarded to the shortlisted bidders. I would like to congratulate all of the shortlisted bidders, ten of those are transmission-connected projects with capacity of 50MW_{AC} each while the other twenty are distribution-connected projects with capacity ranging from 10 to 29.99MW_{AC} each. They are all expected to achieve commercial operations in 2022 and 2023.

I hope you enjoy this quarterly publication and find it engaging and informative. I am thankful for the support and feedback that we have received from everyone for our newsletter. We look forward to keeping you updated with relevant developments in the electricity industry in future WattsUp issues.

On a final note, I would like to wish Ramadan Kareem to all our Muslim readers. May this Ramadan be a month of blessings to everyone. 🌟

Charanjit Singh Gill

Chief Executive Officer

Single Buyer

WATT'S INSIDE:

02: NEDA — Large Merchant & Ex PPA

03: NEDA — Engagement Activities

04: Industry Regulatory Framework

05: Knowledge Sharing with EPU

06: Synthetic Inertia role in future power system

08: Watt's Happening

10: GDP Forecasting Workshop

11: Generators Update & LSS@MEnTARI

12: Why do Muslims fast during Ramadan?

13: Biennial Transparency Report (BTR) Workshop

14: Meet the People Behind SB — Aizuddin

15: SB Corner & Market Watch

16: Boiler Tube Leak

NEDA

Let's take a deep dive on how bidding is done for 2 of the categories in NEDA - Large Merchant & Expired PPA generators

Large Merchant & Ex PPA



Bid Submission

Bids are submitted in the form of Price-Quantity (PQ) pairs, whereby:

- Price is in RM
- Quantity represents the energy in kWh



P-Q Pair

Price Quantity can be submitted up to a maximum of 10 blocks for each bidding period



Monotonically Increasing

Bids submitted must be monotonically increasing (each point increasing with increased output and never stays constant)



Minimum Difference

The minimum difference between each block is 10MW



Price Submission

Price submitted must be lower than the monthly Price Cap

TRIVIA

What is monotonically increasing?

The value of slope i.e. dy/dx (gradient) representing the incremental PQ pair must always be increasing.

$y = \text{price (RM/kWh)}$

$x = \text{load (MW)}$

$dy = \text{difference between 2 values of prices}$

$dx = \text{difference between 2 load points}$



NEDA

ENGAGEMENT ACTIVITIES

01 MEETING WITH EXCELLENT BLOSSOM SDN BHD

6 January 2021, Bangsar | A briefing session on NEDA was held for the representatives from Excellent Blossom. The company plans to install rooftop solar to participate in NEDA as a Price Taker.

02 MEETING WITH HANWHA Q-CELLS MALAYSIA SDN BHD

13 January 2021, Bangsar | A meeting was held with several representatives from Hanwha Q-Cells, a supplier of solar panels. The company is interested to participate in NEDA under the Price Taker category, with connection at Distribution level.

03 PROGRESS MEETING WITH SME BANK AND SANDTOWN SOLAR SDN BHD

20 January 2021, Bangsar | A meeting was held between SB, SME Bank and Sandtown Solar to update on the current progress of their solar project under NEDA. This project will be the first solar plant under the Price Taker category.

04 MEETING WITH PERUNDING YULI AND SUNWAY ISKANDAR SDN BHD

20 January 2021, Bangsar | A meeting was held with representatives from Perunding Yuli, a consultancy company together with their client Sunway Iskandar. They plan to install rooftop solar to participate in NEDA as a Price Taker.

05 MEETING WITH TESDEC

21 January 2021, Bangsar | A meeting was held with representatives from TESDEC, a subsidiary of Terengganu state government. They are keen to know about the NEDA mechanism and participate under the Price Taker category.

06 MEETING WITH CLEANTECH SOLAR

22 January 2021, Bangsar | A meeting was held with representatives from Cleantech Solar, a solar company based in Singapore. They are exploring the prospects to participate in NEDA under the Price Taker category.

07 MEETING WITH HELIOS PHOTOVOLTAIC SDN BHD

29 January 2021, Bangsar | A meeting was held with representatives from Helios Photovoltaic, a solar service provider which participated in the LSS4 bidding. They are interested in the NEDA initiative and plan to develop a solar plant in Pahang under NEDA.

08 MEETING WITH DELLOYD-MAQO GROUP

4 February 2021, Bangsar | A meeting was held with a representative from Delloyd-Maqo Group. They have several rooftop installations and are keen to know more about the Price Taker category under NEDA.

09 MEETING WITH INDUSTRIAL LAB

4 February 2021, Bangsar | A meeting was held with representatives from Industrial Lab. The company is developing a financial model to examine the feasibility to participate in NEDA and are keen to understand more about the System Marginal Price.

10 MEETING WITH TERRA VA SDN BHD AND SHER ENGINEERING SDN BHD

5 February 2021, Bangsar | A meeting was held with representatives from Terra Va and Sher Engineering. They are acting on behalf of their client, Jaya Nets Sdn Bhd. Jaya Nets are keen to install rooftop solar to participate under the Price Taker category.

11 MEETING WITH MUDAJAYA GROUP BHD

1 March 2021, Bangsar | A meeting was held with representatives from Mudajaya Group. They currently have several solar FIT, LSS, and mini hydro plants. They are interested in the NEDA initiative and is currently exploring the prospects to join as a Price Taker.

12 MEETING WITH ib vogt MALAYSIA

12 March 2021, Bangsar | A meeting was held with a representative from ib vogt, a solar company based in Germany. They are planning to participate in NEDA under the Large Merchant category. 🇩🇪

INDUSTRY REGULATORY FRAMEWORK




In this edition, we look at the incentive-based regulation (IBR) in one of our neighbouring countries, the Philippines. The Philippines is the pioneer in the South East Asia region that adopted IBR in its electricity power industry regulation. It is commonly known as the performance-based regulation (PBR) in Philippines.

The Energy Regulatory Commission (ERC) of the Philippine has implemented PBR for the following:

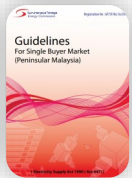
- Transmission utility
- Distribution utilities (DUs)
- Electric cooperatives

Prior to the PBR implementation for the DUs, the return-on-rate-base (RORB) methodology was used. The key differences between these methodologies are shown in the table on the right.

Another unique feature of the PBR in Philippines is that the electricity power industry stakeholders are involved in the entire PBR rate-setting process. The ERC encourages the stakeholders to submit their comments and concerns whereby these inputs would then be considered by the ERC.

RORB		PBR
It uses historical costs as its base	 Key Feature	It uses cost projections to meet projected demand
Price is set backward-looking & does not reflect the actual costs at the time the electricity is provided	 Price	Price is a better representation of the actual costs as at the time the electricity is provided
Lacks incentive for the utilities to be more efficient in planning their expenditure	 Incentive	Incentive & penalty mechanism compels utilities to be efficient while maintaining reasonable rates

Source: <https://www.erc.gov.ph/>



PART 5 Series on GUIDELINES FOR SB MARKET

The fifth part of this series focuses on the Single Buyer Working Groups as specified in the Guidelines for SB Market

Long Term Demand & Supply Working Group



- Members include representatives from KeTSA, ST, SB, nominated fuel supplier, GSO, Grid Owner and other relevant agencies
- Responsible for reviewing issues amongst others related to 10 Year Ahead Load Forecast Report & 10 Year Ahead Generation Capacity Report

Dispatch Scheduling Working Group



- Members include representatives from ST, SB, and GSO
- Responsible, amongst others, for reviewing efficiency and effectiveness of dispatch scheduling procedures, appropriateness of timelines in dispatch scheduling procedures etc.

Single Buyer Website Working Group



- Members include representatives from ST, SB, GSO, and appointed ICT service provider
- Responsible for reviewing information published on the SB Website, format and accessibility of the information published on SB Website etc.

Knowledge Sharing with EPU

SB recently conducted a knowledge sharing session with the Energy Division of Economic Planning Unit (EPU), Prime Minister's Department on electricity demand forecasting and supply planning



PUTRAJAYA, 2 April 2021 | SB conducted a knowledge sharing session with the Energy Division of Economic Planning Unit (EPU), Prime Minister's Department. The weekly sharing session is a new initiative introduced by the new Director of Energy Division, Pn Zaeidah Mohamed Esa. It serves as a platform to provide exposure to the division especially on matters related to the industry.

SB was invited to the session to share about electricity demand projection and power generation planning. SB Chief Operation Officer, En Abd Malik Mohd Jaafar, started the session with a brief introduction about SB's roles and functions. The session then continued with demand projection and generation planning topics.

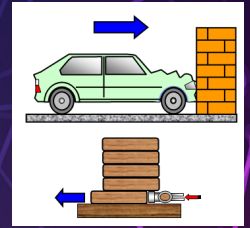
The sharing session was conducted in an interactive manner. It managed to engage and spark interests between the audience. Among the questions asked by the audience were about the Gross Domestic Product (GDP) used in the demand projection, the impact of solar to the system, least cost principle, reserve margin situation and many more.

At the end of the session, Pn Zaeidah thanked SB delegates and wished for more collaboration with SB in the future. 🙏

Synthetic inertia role in future power system

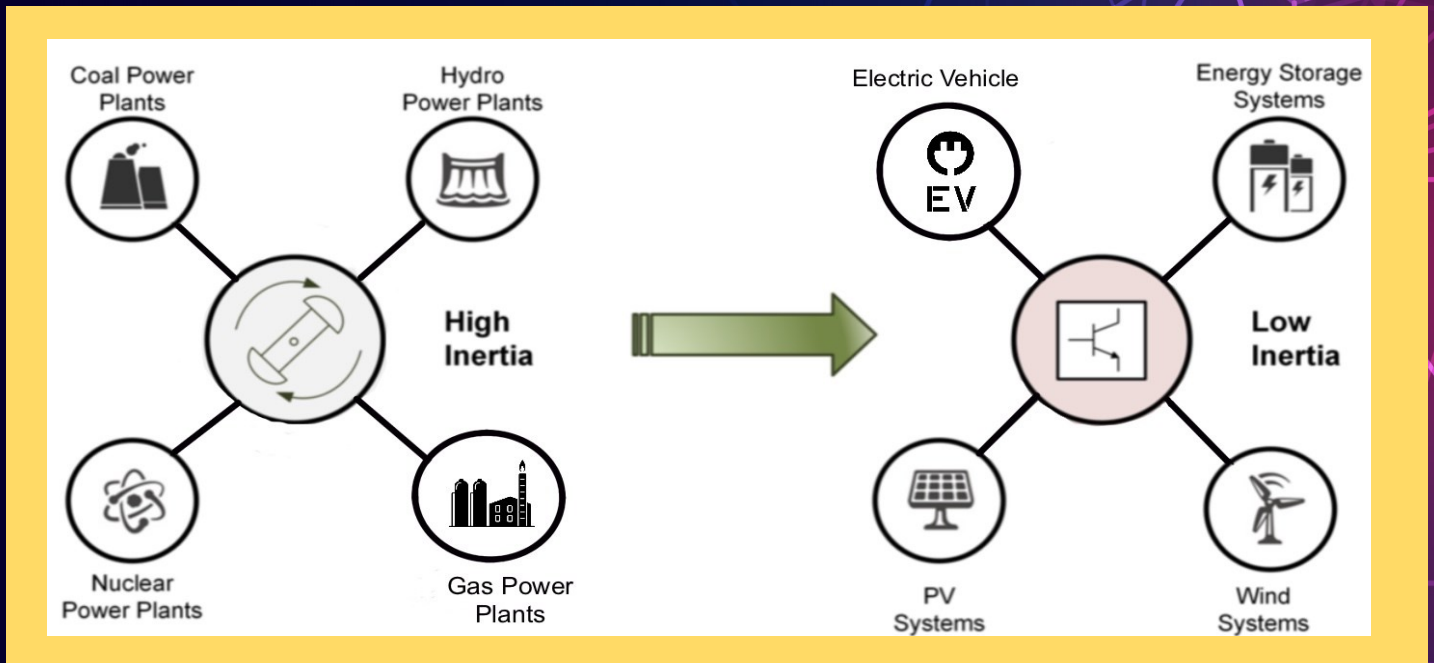
WHAT IS INERTIA?

Things that are moving will keep moving unless a force causes them to stop, and things that are not moving will continue to not move unless a force causes them to move. This resistance is called **inertia**.



WHAT IS SYSTEM INERTIA?

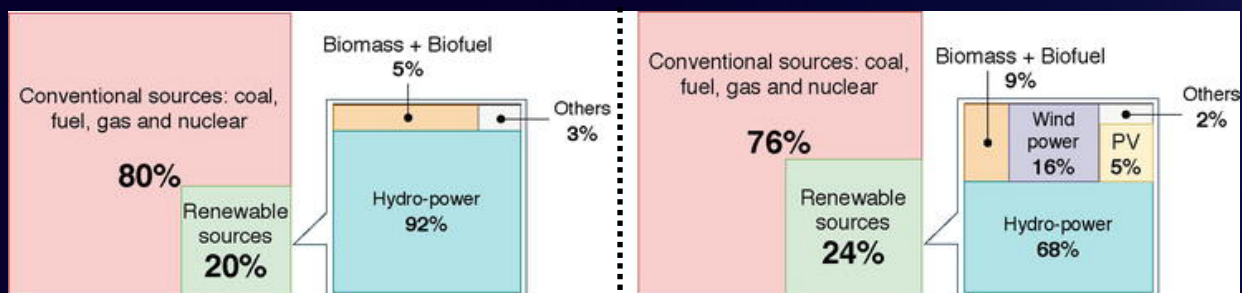
In a traditional grid, the rotating masses of synchronous generators synchronise with the frequency of the system. The rotating masses store inertia as rotating energy, ready to be released when needed to stabilise grid frequency. A rotating machine helps limit frequency fluctuations when a power imbalance occurs.



RENEWABLE ENERGY (RE) AND SYSTEM INERTIA

The demand for clean energy in the modern power system is on the rise, driven by factors such as fuel prices, laws, and regulations. RE sources like photovoltaic (PV) and wind energy are gradually starting to increase in the energy generation mix, displacing traditional generation sources such as coal and gas plants.

The rapid development of RE source is causing the modern power grid to gravitate towards an inverter-dominated system from a rotational generator-dominated system because most RE sources are interfaced through inverters. Although this is advantageous from the point-of-view of harvesting RE sources, the inverter-based generation does not provide any mechanical inertial response, and hence compromises frequency stability.

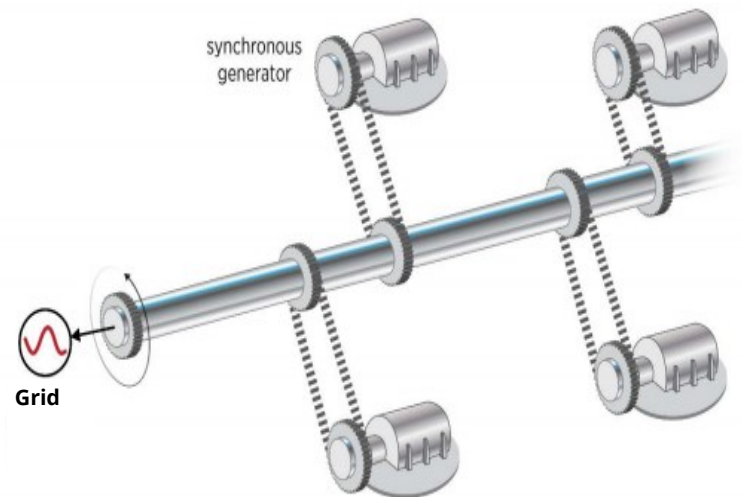
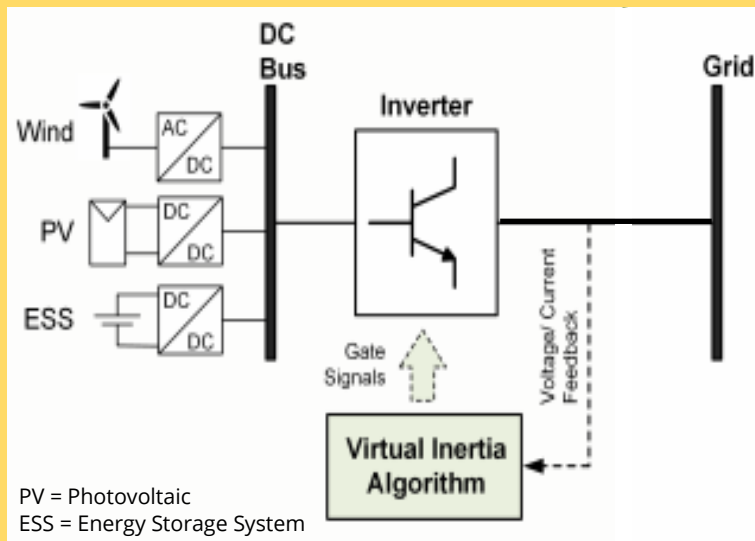


Generation mix in the world change between 1996 (left) and 2016 (right)¹

Synthetic inertia role in future power system

Inverters vs synchronous generators

Most conventional power plants turn the spinning energy of a turbine into electricity via a synchronous generator, which inherently produces alternating current (AC) electricity. Photovoltaic (PV) and batteries produce direct current (DC) electricity, which must be converted into AC for use by the grid. This converter is known as an inverter. Although wind turbines produce electricity via a spinning turbine, it is more efficient to use inverters as well. As a result, these technologies are collectively referred to as inverter-based resources.



Synthetic inertia

- Defined as combination of an energy storage system (battery, super capacitor, synchronous condenser etc.), power electronics converter and a control algorithm that improves the dynamic frequency stability of the grid
- A synthetic inertia supplies or absorbs the active power to and from the energy storage system to improve the dynamic frequency stability
- Provide faster response (operates in milliseconds) than the primary frequency control (operates in seconds) of synchronous generator

'Conventional' Inertia

- Rotational mass from synchronous machines acting as a frequency regulation when subject to large power imbalances while limits the rate of change of frequency
- High short circuit power level that stabilises the voltage fluctuations due to variation of loads and retain power quality
- Overload capacity during faults that supplies short circuit current to the fault locations that retains the reliability of the protection system operations



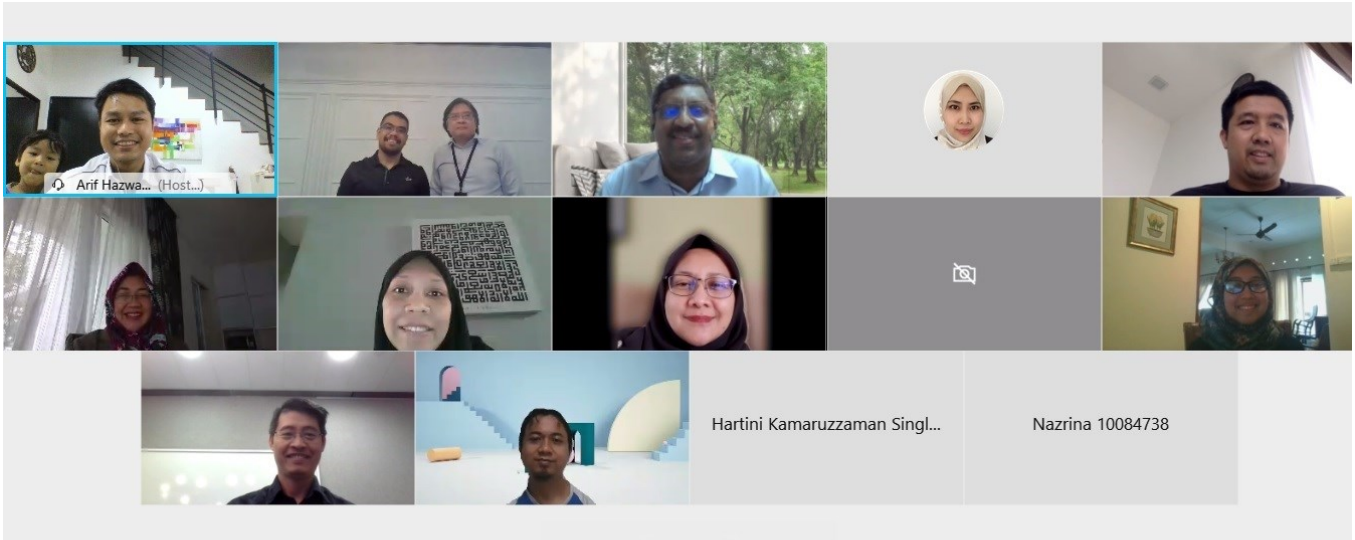
Source:

1. A Review of Virtual Inertia Techniques for Renewable Energy-Based Generators; Ana Fernández-Guillamón, Emilio Gómez-Lázaro, Eduard Muljadi and Ángel Molina-García; 30th May 2020
2. Inertia and the Power Grid: A Guide Without the Spin; National Renewable Energy Laboratory (NREL)



Advanced Training on National Electricity Market of Singapore (NEM)

Online



14-22 Jan 2021 | Technical Advisory and Industry Development (TAID) section of SB organised a virtual training on National Electricity Market of Singapore (NEMS) from 14 to 22 January 2021. Considering the rapid development in Malaysia-Singapore Cross Border Energy Sales (CBES) scheme and Lao-Thai-Malaysia-Singapore Power Integration Project (LTMS-PIP), this advanced training served as a platform for SB employees to gain an in-depth understanding on the market design and framework, economic optimisation and operational practices in the Singapore electricity market. This seven-day training explored in detail about various products in Singapore Wholesale Electricity Market (SWEM), mechanism of the market clearing engine, contract framework, market surveillance and others. The training will enhance SB's ability to facilitate the development of framework, policy and agreement of the upcoming initiatives related to electricity market.



SB Business Plan Workshop

Online



11, 22-23 Feb 2021 | The workshop was attended by SB Management and senior officers to review and realign SB's business plan for the next 5 years (2021–2025). Potential new initiatives were identified and previous ones revisited taking into account recent events and the COVID-19 pandemic.



Value of Lost Load (VoLL) Workshop

Online

VIRTUAL WORKSHOP

Study of Value of Lost Load (VoLL) for Peninsular Malaysia

24 & 25 February 2021
8:30 am - 5:30 pm

Prepared by: **TNB Labs**

24-25 Mar 2021 | The official study kicked off in June 2020 with the first workshop held in August 2020. The final workshop was recently completed in March 2021 and was organised by SB and TNB Labs Sdn Bhd, with participants from KETSA, ST, GSO, TNB Grid, TNB Regulatory and Stakeholder Management and TNB Retail.

SBeeple Activities

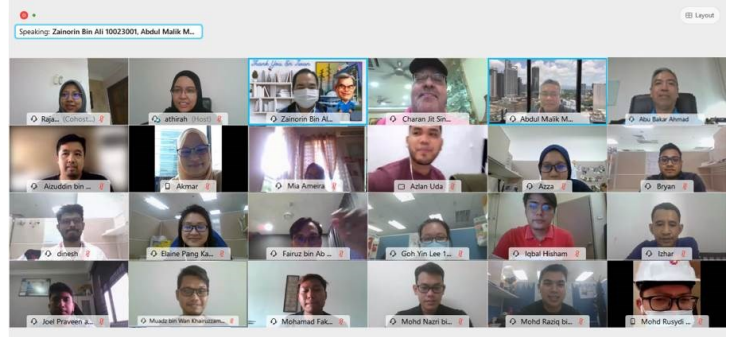
Online



16 Feb & 26 Mar 2021 | SB's own social, wellness and CSR club, SBeeple recently held a series of knowledge sharing talks. Speakers were invited to share their knowledge with SB staff. The speakers and SB staff had fascinating discussions on *Ikigai* (a Japanese concept to having a direction or purpose in life), Healthy Lifestyle, Healthy Travel and Travelling in Spain.

SB Ethics & Compliance Seminar

Online



1 Apr 2021 | The 4th Ethics and Compliance Seminar was recently organised by SB. The objective of the seminar is to increase awareness among SB staff on the codes and regulations governing SB's operations. External speakers were also invited to provide insights into intellectual property laws and regulations.

LTMS-PIP Taskforce & Working Group Meetings

Online



24 Feb, 10 Mar, 19 Apr & 20 Apr 2021 | LTMS-PIP is a multilateral power trade of up to 100MW between Lao PDR and Singapore via Thailand and Malaysia grid. It is an extension of the existing LTM Interconnection. LTMS-PIP is expected to commence in 2022 for two years. Three LTMS taskforces comprising of representatives from the four member states have been set up to facilitate implementation of the project looking into technical, commercial and legal and regulatory aspects. The LTMS taskforces have had a series of discussion to work out the details of the project with the guidance of LTMS Working Group.

Knowledge Sharing Sessions with MyPOWER

SB Office, Bangsar South & Online

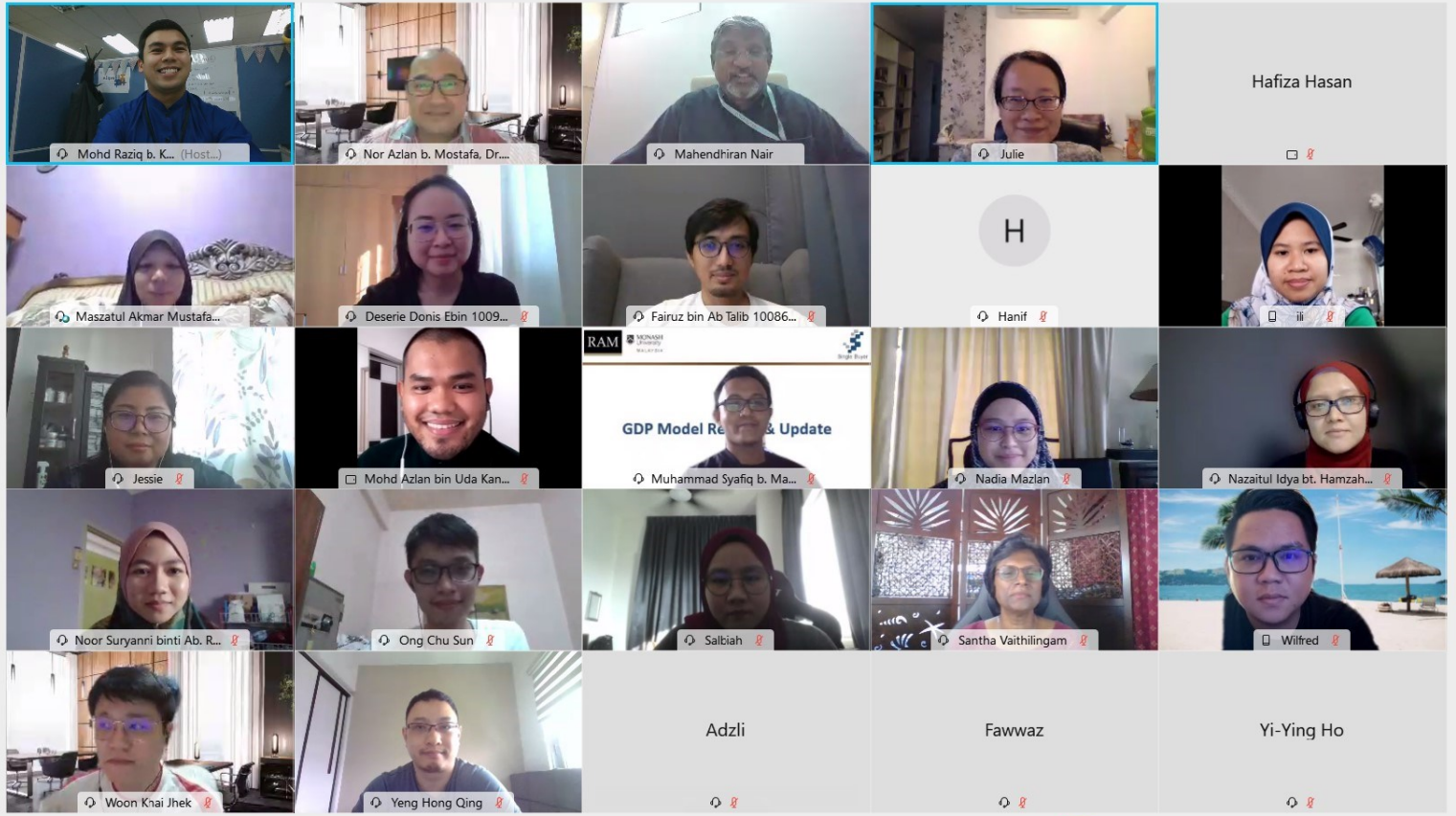


11 Mar, 18 Mar, 22 Mar, 30 Mar, 2 Apr & 22 Apr 2021 | SB recently conducted a series of knowledge sharing sessions with MyPOWER on SB's roles and functions. The sessions covered various topics i.e. RE penetration, load forecasting, generation planning, short-term scheduling, NEDA, fuel planning, and PPA. Representatives from MyPOWER including the head of MyPOWER, Pn Siti Safinah Salleh and SB's management attended the sessions. The participants had lively discussions and exchanged many ideas during the knowledge sharing.

JANUARY APRIL 2021

Gross Domestic Product (GDP) Forecasting Workshop

This 4-day virtual workshop is an update and review exercise to the GDP forecast model used by Load Forecast unit of SB. The highlight of the update is the "Two Step Forecast Process", where impact of Movement Control Order (MCO) is introduced to the forecast model. General overview of COVID-19 impact on the Malaysian economy was also presented during this workshop.



8, 10, 17, and 19 February 2021 | RAM Sustainability Sdn Bhd in collaboration with Monash University conducted this workshop for SB.

The virtual sessions were attended by Load Forecast and Capacity Planning units of SB, Sabah Electricity Sdn Bhd (SESB) and ST.

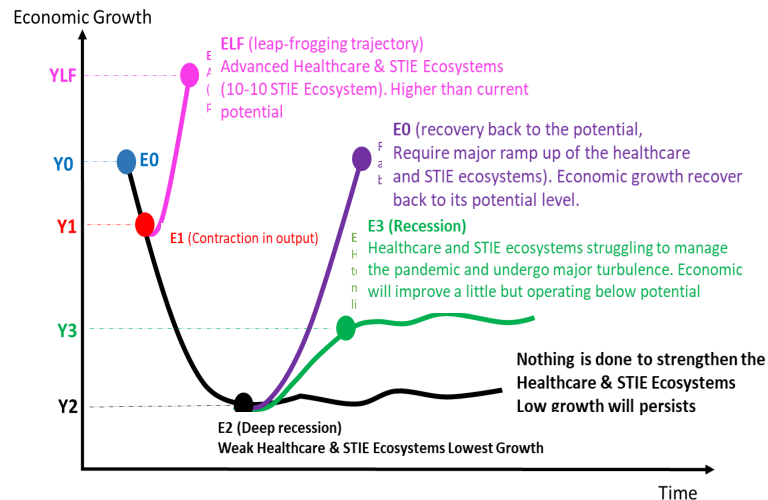
The instructors walked the participants through modelling theories and practical tools used in GDP forecasting. Participants were also trained to equip themselves with the skills to perform quantitative and qualitative forecasting where intuition and expert opinion is considered a critical component of forecasting.

Day 1 began with an introduction on economics and analysis on the impact of COVID-19 to the economy. The instructors spent Day 2 and 3 presenting technical materials with a refresher on time series econometrics, forecasting software, and methods to forecast uncertainties of 2021, 2022 and beyond using the two-step process.

Group presentations on GDP forecast were held on Day 4 where each group presented their GDP forecast results using the theories and methods taught in the workshop. It

was interesting to see that each group came up with different GDP forecast results using the same quantitative method but with different qualitative forecasts.

Different Strategies and Different Growth Trajectories



Generators Update Southern Power Generation

Southern Power Generation Sdn Bhd (SPG), a subsidiary of TNB successfully achieved its commercial operation on 1 January 2021 for the First Generating Block and on 19 February 2021 for the Second Generating Block. Since February, the plant has been online supplying a total of 1,440MW into the Grid System. This marked the start of the world's first operational power plant using the new GE 9HA.02 gas turbines. With combined cycle efficiency exceeding 60%, SPG is crucial in reinforcing the security of electricity supply in southern and central regions specifically and Peninsular Malaysia generally for the next 21 years. SPG's Managing Director, En Rizal Nordin said that SPG's successful completion was achieved due to high commitment and hard work of the project team in completing the project despite the COVID-19 pandemic without compromising on health and safety. Furthermore, the support from stakeholders, regulators and SB were also key to SPG's accomplishment.



Large Scale Solar Bidding (LSS@ME nTARI)

On 12 March 2021, ST announced the selection of 30 shortlisted bidders from the competitive bidding exercise for the development of up to 823.06MW_{AC} of LSS plants in Peninsular Malaysia for commercial operations in 2022 and 2023. A total of 323.06MW_{AC} is offered under the first package for capacity ranging from 10MW_{AC} to less than 30MW_{AC} while 10 bidders with total contribution up to 500MW_{AC} have been selected under the second package for capacity ranging from 30MW_{AC} to 50MW_{AC}.

This is the biggest quota offered since LSS bidding programme was introduced by the government to accelerate the development of the renewable energy industry in Malaysia. Pursuant to the announcement by ST, SB had subsequently organised virtual kick-off meetings with the shortlisted bidders under the second package, to kick start the preparation and finalisation of the power purchase agreements. 🚀



Why do Muslims Fast During Ramadan?



One of the Pillars in Islam

Fasting (*puasa* or *saum*) during the month of Ramadan is the fourth pillar from the 5 Pillars of Islam. Muslims demonstrate the highest degree of obedience to God by willfully fasting from sunrise till sunset.



Spiritual Healing

Muslims perform extra acts of worship such as Tarawih prayers every night and are encouraged to spend their days reading the Quran instead of non-beneficial activities or engaging in activities which may trigger emotional distress. It is through these acts of worship that make the Muslims feel at ease and stress-free during the month of Ramadan.



Gratitude

During this month, Muslims tend to get more appreciative of their lives especially during the breaking of the fast at dusk. Every Muslim family around the world break their fasts differently. There may be families who can afford a great feast while some may not have a proper meal.



Empathy

As Muslims perform their fast during Ramadan, they must spare a thought for those who do not enjoy the same privilege. There are Muslims who are unable to fast due to sickness or old age and for those who are able, they might not be able to afford a decent meal to break their fast. The hunger of the poor cannot be shared by just watching and reading news. But fasting like one might.



Improve Health

Fitness enthusiasts would agree that fasting is beneficial for the digestive system and aid in muscle recovery and body purification, ridding the body of toxins. This is provided we do not overeat during *sahūr* and iftar. Muslims are also advised to keep active and not using fasting as an excuse for being tired and inactive.

Ramadan 2021 Fasting Hours Around



Biennial Transparency Report (BTR) Workshop



7 January 2021 | A workshop on *Malaysia's Preparation for The Biennial Transparency Report (BTR)* was organised by Ministry of Environment and Water (KASA) at Pulse Grand Hotel, Putrajaya. KASA is developing a platform to streamline greenhouse gas emissions (GHG) inventory activities to increase efficiency of coordination among all relevant parties in completing GHG compilation process for reporting of Nationally Determined Contribution (NDC) under the Paris Agreement.

The participants of this workshop include Ministry of Energy and Natural Resources (KeTSA), Ministry of Plantation Industries and Commodities (MPIC), Ministry of Agriculture and Food Industries (MAFI), Ministry of Housing and Local Government (KPKT), Ministry of Transport (MOT), Economic Planning Unit (EPU), ST, Sustainable Energy Development Authority (SEDA), Malaysian Green Technology Corporation (GreenTech Malaysia), SB and other relevant parties. 🌱

Watt Say You?

Ramadan Edition!

In conjunction with the Ramadan month, we have the privilege to request a few of our lovely **working mums** in SB to share their **sahūr** (pre dawn meal) **experience** and a short **Ramadan wish**:

- 🌙 What do you usually have for *sahūr*?
- 💡 Any *sahūr* ideas you would like to suggest to our colleagues?
- 📩 A short Ramadan wish to all who celebrates



Marlia Adilah

🌙 Since I grew up in a family with a firm proponent of a full meal at *sahūr*, I practise the same in my own family. My *sahūr* meals normally consist of leftover *Iftar lauk* (Malay-style dishes) along with rice.

💡 Fresh *ayam goreng*, *telur dadar*, *sambal ikan bilis* with *nasi panas*; *Nasi* with *kicap* and *telur mata* (another quick old classic dish which many of us have eaten when we were children).

📩 While eating *sahūr* is not obligatory (it is, after all, a sunnah), don't ignore its significance as a meal that is rich in blessings. As the Prophet Muhammad (PBUH) said:

"Have *Sahūr*, for there is a blessing in *Sahūr*." [Al-Bukhari and Muslim]



Arafah

🌙 For me personally I like to have dates, yogurt and banana, *bubur lambuk*, a cup of hot Milo and the very must-have: 2 capsules of habbatus sauda for energy!

💡 A half-boiled egg; Omelette (with steamed broccoli and baby carrots); Beef burger with scrambled eggs stuffed in tortilla wrap; Homemade mushroom soup (make it at night and reheat during *sahūr* time) with *roti bakar*; *Bubur lambuk* with *sambal bilis kering*.

📩 **Selamat Menyambut Bulan Ramadan** to everyone. May the blessings of the month of Ramadan be on all of us and may Allah grant our prayers and fasts.



Nur Asyiqin

🌙 Usually for my family, we prefer to eat hot white rice with fried fish or chicken and vegetables soup. Normally we don't take spicy food during our *sahūr*.

💡 *Nasi goreng kampung*; Savoury breakfast oats; Bangers and mash; *Kaya* butter toast with half-boiled eggs.

📩 Ramadan Mubarak to all, I wish you all a happy, safe, and blessed Ramadan. Ramadan Mubarak!



Aifa

🌙 *Nasi putih panas*, *telur kicap*, *timun* and of course with hot lemon tea.

💡 Chicken wrap and hot lemon.

📩 **Semoga kita semua dikurniakanNya taufiq dan hidayah dalam melaksanakan kebaikan secara berpanjangan. Selamat mencuci hati all!!!**

MEET THE PEOPLE BEHIND SB

SENIOR MANAGER (GENERATION)

TECHNICAL ADVISORY & INDUSTRY DEVELOPMENT

Aizuddin bin Mohd Sopian

In this edition, we are honored to interview Aizuddin about his background, role in SB, goals and interests. Bonus: Find out what his superpower would be if he were a superhero.

01 **WattsUp: Can you tell us your background?**

Aizuddin: I was born in Batu Pahat, Johor but I was raised in Kuala Lumpur, Sabah, Egypt and Sarawak due to the working nature of my father. Then I pursued my degree in Electric Power Engineering at Rensselaer Polytechnic Institute, New York under Yayasan Tenaga Nasional's scholarship. I joined TNB after graduating in 2007.

02 **WattsUp: How and when did you first enter SB? What is your role in SB?**

Aizuddin: I joined SB when SB was established in 2012. Due to my previous experience of working in Generation Planning Unit and later Transmission Planning Unit at the System Planning Department, I was assigned to the Generation Unit of the Technical Advisory & Industry Development. Our main roles are to facilitate the drafting of technical clauses in the PPA/agreements/guidelines, address matters relevant to the commissioning of new generators as well as issues related to power plants in operation and provide advisory services to stakeholders especially on power generation technology/matters.

03 **WattsUp: What is your favourite part about working in SB?**

Aizuddin: The friendly people and cooperative culture in SB. I am blessed with friends and bosses in SB that are always supportive, willing to share their knowledge, experience and insights which are valuable in progressing forward.

04 **WattsUp: What is your vision for SB?**

Aizuddin: SB has always been at the forefront of the Malaysian Electricity Supply Industry. I hope this good reputation of SB will continue and for SB to always remain relevant as the focal point of the industry.

05 **WattsUp: What are your hobbies or interest?**

Aizuddin: I like walking, especially random walks in the morning. Walking along the lush greenery, breathing in the cool breeze and observing life is the best start to my day. It is relaxing, peaceful and brings out the positive vibes. I also appreciate building architecture and marvel at new technologies such as self driving cars.

06 **WattsUp: Apart from your career, do you have a life goal that you would like to achieve?**

Aizuddin: I would like to remain healthy and be able to travel around the world to see the different culture of people from various backgrounds.

07 **WattsUp: What is the first thing you want to do after Covid-19 pandemic ends?**

Aizuddin: To travel further than I can at the moment, perhaps somewhere colder and greener, like New Zealand, or if somewhere closer, to revisit Sabah or Sarawak.

08 **WattsUp: This is a bonus question. If you were a superhero, what would your superpower be?**

Aizuddin: Well, if I were to have a superpower, I would like to go super fast, like the Flash!

There you have it. We hope the readers have enjoyed getting to know another member in SB family. A big thank you to Aizuddin for agreeing to be interviewed. ✨

SB CORNER

Preparation for Raya in 2021

As we are still in the midst of fighting against COVID-19, we need to remain vigilant and adhere strictly to standard operating procedures when celebrating the special occasion

So, to help ease your Hari Raya planning, we've listed down a few things you can do to prepare for this Raya



Raya Checklist

- ◆ Stick to it and don't do last minute shopping to avoid the crowd!



Prepare Virtual

- ◆ Make an early preparation for smooth virtual family gatherings



Practise Social Distancing

- ◆ Celebrate in smaller groups and avoid unnecessarily crowded celebrations



Raya Shopping

- ◆ Follow SOP when shopping at physical stores. Or better yet, do your shopping online!



Prepare e-Duit Raya

- ◆ Avoid crowding at the bank for fresh stacks of Duit Raya or go cashless and contactless



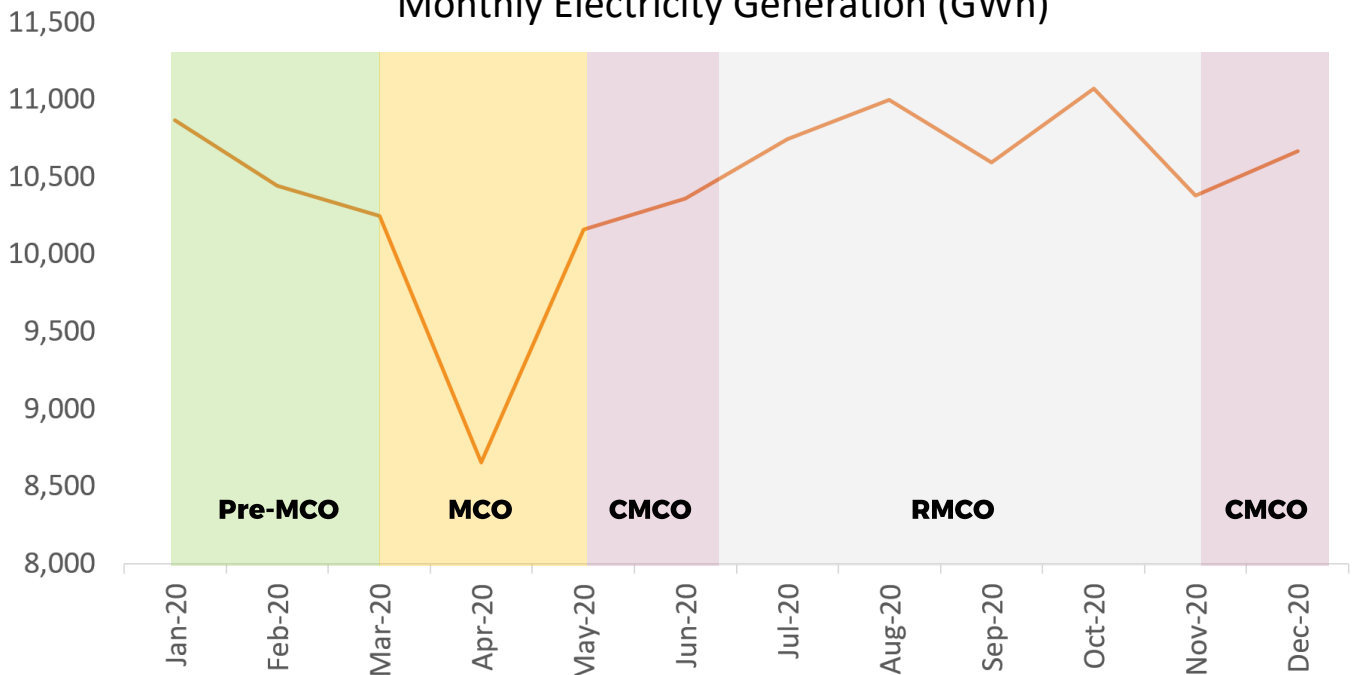
Practise Contactless Raya

- ◆ Don't forget to wear face mask and bring along hand sanitiser!

MARKET WATCH

IMPACT OF COVID-19 TO ELECTRICITY GENERATION IN 2020

Monthly Electricity Generation (GWh)



Electricity generation was affected the most during the first three months of Movement Control Order (MCO) with a severe drop in April 2020 during which MCO lasted throughout the whole month.

The implementation of Conditional Movement Control Order (CMCO), which began on 4 May 2020, saw electricity generation increased by 17% in May 2020 after the government allowed companies to operate with full capacity and other restrictions were eased. The country transitioned to Restricted Movement Control Order (RMCO) from 10 June 2020 until 9 November 2020 when CMCO was reinstated due to resurgence of COVID-19 cases. Overall, the electricity generation system generated 3.7% less output in 2020 compared to 2019. 📈

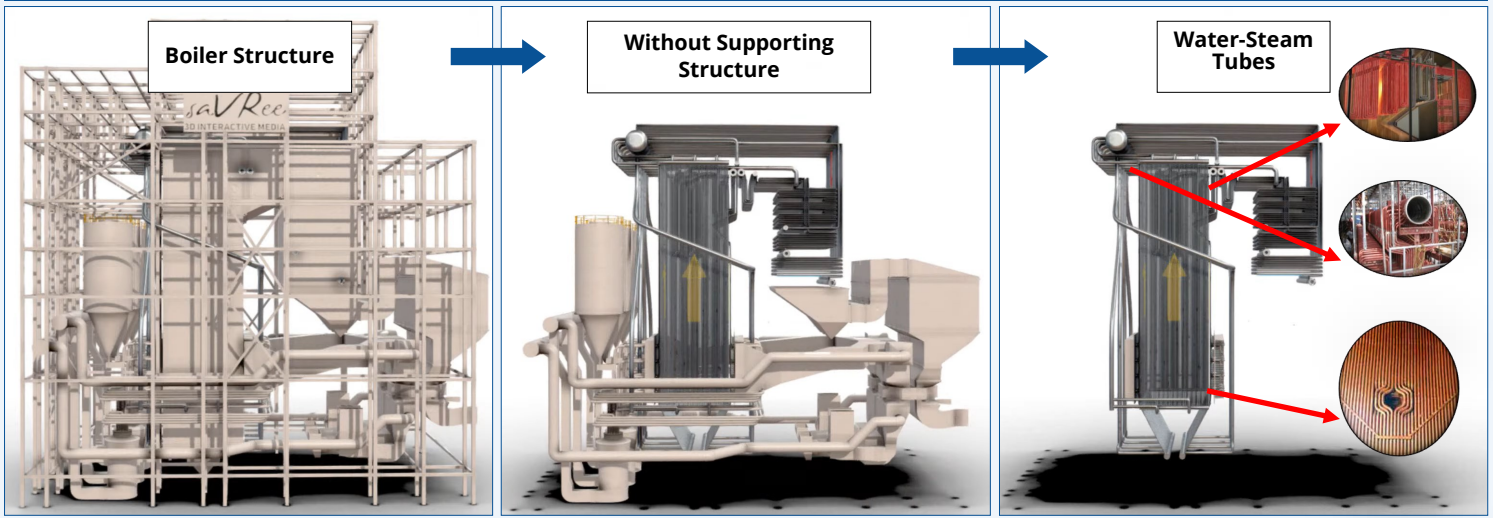
BOILER TUBE LEAK



What is a Boiler Tube Leak?

A Boiler Tube Leak is a leak in the water-steam carrying tubes in a boiler due to various reasons, which leads to the major cause of coal-fired power plants outage and generation loss. Boiler tube leaks have been known to lead to bending damage and deformation of the entire boiler.

Where does this occur? In the Water-Steam Tubes of the Boiler



What causes a Boiler Tube Leak?

Damages caused by particulate matter entrained in high-velocity flue gas striking boiler tube metal surfaces

Fly Ash Erosion



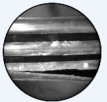
Fire Side Corrosion

Damages caused by coal combustion at high temperature releasing volatile compounds, exposing the tubes to corrosion



Stress Corrosion Cracking

Damages due to cracks that are induced by brittle materials on the tubes



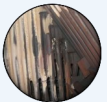
Mechanical Damage

Damages caused by clinker falling or mechanical work during repair process



Thermal Fatigue

Damages caused by failure with cracks resulting from cyclic thermal stresses and strains due to temperature changes



Soot Blower Erosion

Damage caused by the operation of the soot blower to clean the boiler of slugging and fouling



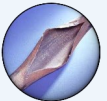
Long Term Overheating

Damages that are typically related to long term operation at high temperature leading to creep and oxidation damages



Short Term Overheating

Damages caused due to the sudden changes of the operating condition such as an increase of metal temperature due to tube blockage



Welding Quality - Construction/Factory

Damages caused by poor welding of the metal tubes; a large utility boiler may contain few tens of thousands of welds



Repair Quality - Site Work

Damages caused by poor site work during repairs to the boiler tubes that leads to further tube leaks



Boiler Tube Leak Detection Techniques and Monitoring

Techniques to detect boiler tube leaks	Non-Destructive (NDT) techniques	<ul style="list-style-type: none"> ⇒ Diameter-metering (conventional) ⇒ Extensive dye penetrate test ⇒ Oxide scale measurement
	Modern techniques for flaw detection	<ul style="list-style-type: none"> ⇒ Remote Field Electromagnetic techniques (RFET) ⇒ Low Frequency Electromagnetic technique (LFET) ⇒ Time of Flight Diffraction (TOFD) ⇒ Cold Air Velocity Testing (CAVT) ⇒ Thermography of water wall tubes
	Advanced inspection techniques	<ul style="list-style-type: none"> ⇒ Robotic inspection using magnetic flux ⇒ Boroscopic inspection

Monitoring techniques
<ul style="list-style-type: none"> • Temperature excursion monitoring • Dissolved oxygen in condenser/ deaerator • Acoustic steam leak detection installation • Five core chemical parameters monitoring (pH, Na, DO, NH₃ & PO₄)



Source:
 1. ST's Boiler Tube Leak Task Force 2020
 2. Boiler Tube Leak Detection Techniques and Monitoring; http://www.eecpowerindia.com/codelibrary/ckeditor/ckfinder/userfiles/files/1_Boiler%20Tube%20failures.pdf