



AFES Bulletin

NewStraitsTimes • THURSDAY, DECEMBER 24, 2020

7

AFES pursues sustainability

PUTRAJAYA

ALAM Flora Environmental Solutions (AFES) Technical Specialist Dr. Muhd Noor Muhd Yunus is a walking encyclopaedia of knowledge and experience, and a stickler when it comes to the application of innovative new technology, precision and the very finest of details.

When it comes to topics such as sustainability and integrated waste management, these are just the right traits to ensure that the company's aims and goals for the country's future are met.

When met at AFES' Fasiliti Inovasi Kitar Semula (FIKS) in Putrajaya recently, a very lively, active and sharp Muhd Noor was keen to share his wealth of experience and knowledge about AFES pursuits and achievements in terms of technology in integrated waste management and facilities, and sustainability.

As AFES pursues the latest in technological advancements and initiatives that are mostly developed in-house and relying on dedicated local expertise and personnel to cater for Malaysia's waste management needs as well as the surrounding environment, one area that he highlighted was incineration, using modern furnaces as a means for not just integrated but improved waste management and disposal.

There were two places that he pointed out as examples of this, namely the island of Pangkor and Cameron Highlands, two places that are well-known tourist attractions in the country.

"An island such as Pangkor and a highland area with resorts such as Cameron Highlands are areas that have very limited space or land for a landfill disposal of Municipal Solid Waste (MSW), and this is where incinerators provide a welcome solution for the huge amounts of waste that



Cameron Highland 40 Ton/Day Incinerator.

are generated.

"In 2010, a turnkey contract was awarded to a local company to build and operate four incinerators to dispose of MSW. Then sometime in 2014/2015, the contract for the O&M (Operations and Maintenance) for the plants were terminated due to premature failures such as low availability and high emissions, just to name a few.

"In 2016, the government budget was under constraint, and the tender for the project was made through PFI (Private Finance Initiative) approach. DRB HICOM Environment Services (DHES), now rebranded as AFES, won the contract to revamp the two plants, namely Pangkor Island (November 2016) and Cameron Highlands (July 2017)," he divulged.

Muhd Noor pointed out that among the targets set for both plants were for higher plant availability and to be more economical to operate by reducing diesel consumption where diesel is mainly used for the incineration plants start-up, and rarely to prop up low furnace temperatures due to sudden wet waste being introduced,

all aimed at better combustion and emission levels, achieve a zero liquid leachate discharge and to improve on Lost of Ignition (LOI) — A measure of Incomplete Ash Combustion Related to Carbon and its compound, while also adhering to the Department of Environment's (DoE) latest regulations.

"There were quite a few issues when we took over that we had to address and rectify, such as overcoming the frequent choking for the gas cooler, overheating of the bag filter which could pose a fire hazard and risk, reducing the diesel consumption and smoothening the combustion process which include maintaining high temperatures all the time while also looking into the poor quality of the ash burn out.

"So we did our homework and research very carefully and meticulously to come up with innovative solutions to address all the problems and issues that were plaguing the plants," he said.

Among the work done was changing the gas cooler to a Hybrid Innovative Heat Exchanger along with a Water Quencher to eliminate gas cooler choking and blockage. They also implemented moisture removal in MSW pre-processing which resulted in a higher LCV (Lower Calorific Value) and also reduced the waste size, introduced new and innovative air inlet systems for the primary and secondary chambers, extending the ash combustion chamber to enhance ash combustion, creating an innovative secondary chamber modification through a combination of computer simulations using both in house modelling and Computational Fluid Dynamic (CFD) Package, and using a ceramic filter that can withstand high temperatures of up to 1000°C.

They also installed intelligent instrumentations and controls to ensure that the secondary chamber temperature is always above 850°C which meets international practice standards, partially treating leachate water that is reused as quenching water resulting in an impressive

zero liquid waste discharge from the plants, and instituting overall process design changes to ensure for low emission that complies with both DoE and international standards for air and land emissions.

"Such a project was well worth the time, funds and effort as it addressed environmental concerns and issues such as proper waste management, the management of air, water and land pollution levels as well as the emission of greenhouse gas emissions thanks to the revamping of the incinerator.

"Our extensive work has also brought about welcome positive impacts such as a more stable operation, less pollution to the surrounding environment, a higher availability with reduced diesel consumption, and a much better ash combustion with the LOI at about one to three per cent compared to the 25 per cent baseline," he revealed.

He shared that apart from the plants being able to operate more efficiently and able to comply with the 2014 Malaysian Clean Air Regulation, it has also resulted in welcome savings for the company such as reduced diesel consumption and reduced plant downtime (maintenance) that allows for longer operations with 85 per cent availability.

"Pangkor Island's economy is very much dependent on fishing and tourism. Therefore the plant will contribute towards sustaining the island's resources which is critically vital, as good solid waste management is a prerequisite for a sustainable society.

"The rationale of targeting these areas of work for the plant was for a better, proper management of the island's limited resources, which are very critical in order to maintain and preserve its existing limited and fragile resources.

"The Pangkor Island incinerator has been operating since February 2020 after going through an extensive continuous Testing and Commissioning for more than two months. The Cameron Highland incinerator on the other hand, has been operating since March after passing the rigorous con-



View from Control Room.

tinuous Testing and Commissioning of nearly two months. Both are operating well, thus, it deserves praise".

"Therefore, such activities on the island bring about welcome benefits for the communities such as the creation of job opportunities, while minimising the impact on the island's resources and surrounding environment," he added.

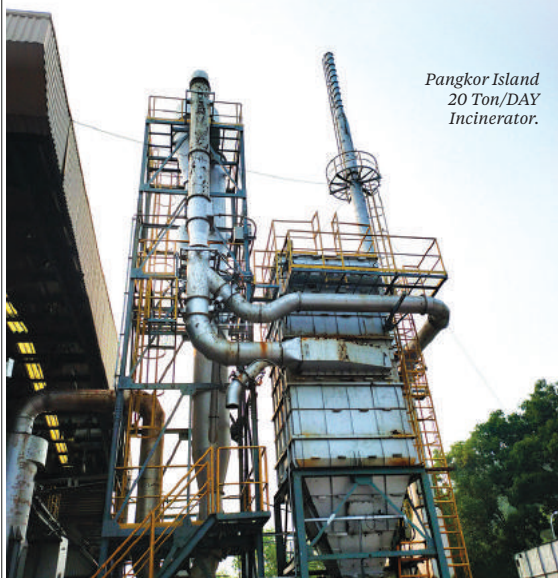
Muhd Noor stressed that cleanliness and good solid waste management are essential for vital economic activities for the island and Cameron Highlands, such as tourism and therefore this is why these two projects were given a high priority and concentrated focus.

"With the growth of its fishing and tourism industries thanks in part to the new tax incentives, these places will definitely produce more solid waste that would need to be professionally managed and executed and this is where we, AFES, will play a very important role in supporting the communities, businesses and industries in these areas," he pointed out.

In addition, AFES also won the Best Environmental Impact Award for 2019 for its incinerator project. The award was presented at the Europa Awards for Sustainability, organised by EUMCCI – EU and Malaysian Chamber of Commerce and Industry.

"Fast forward to present day, what AFES can conclude is that the Pangkor Incinerator has been successfully upgraded with an exemplary high plant operational availability while also adhering to the latest Department of Environment's (DoE) emission standards.

"The Pangkor Island Solid Waste Management is now fully equipped with good and functioning solid waste management infrastructure right from the collection activity right up to the disposal process, and the project has also contributed to sustainable development goals be it directly or indirectly in a rather short period of time," he said.



Pangkor Island 20 Ton/DAY Incinerator.