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# Innovative trash solution from TNB Research

*Four waste management related innovations from inaugural Hot House 2017 on the road to commercialisation*

by LINDA ARCHIBALD

THE innovation juices are certainly at work at Tenaga Nasional Bhd (TNB). The inaugural Hot House 2017 event, organised recently by a subsidiary of the national utility corporation, saw waste management solutions being featured prominently.

There were 12 energy-related solutions innovations with the potential for commercialisation showcased at the Kajang-based facility. But what stood out were the four innovative waste management solutions — specifically trash management from TNB Research Sdn Bhd (TNBR). It is notable that some of these innovations are well on the road to commercialisation.

"As we know, research is an expensive affair. TNB has invested heavily in resources to conduct various researches for the company. We discovered that many of our research outputs can be used beyond TNB," said TNBR MD Zainul Asri Mamat during the launch of the inaugural Hot House 2017 in Kajang.

The Hot House is organised by TNBR QATS Sdn Bhd, a subsidiary of TNBR, which in turn is a subsidiary of TNB.

The Hot House 2017 was created to help realise the value and benefit of technology commercialisation, through the promotion of intellectual property (IP).

Also present at the Hot House event were SME Corp Malaysia CEO Datuk Hafisah Hashim, National Innovation Agency of Malaysia (AIM) CEO Datuk Mark Rozario and PlatCOM Ventures Sdn Bhd CEO/ED Dr Viraj Perera. A subsidiary of AIM, PlatCOM Ventures is a national technology commercialisation facilitation platform.

The aim of the event is to pick up TNB's IP and bring it to market for commercialisation.

"We look at it as a win-win situation where TNB is able to provide the IP and the industry with their experience in manufacturing and marketing can commercialise it. It is this type of synergistic relationship that we are hoping to create," he said.

TNBR senior manager for generation Hazha Abdul Hamid said some of these four locally patented technologies were already being employed and utilised by various organisations in the country.

## Trash Buster Craft

One such invention is the trash buster craft. It is a floating cleaning system designed to make work of removing floating litter, trash, natural debris,

trees, logs, aquatic vegetation and other navigational hazards in waterways efficient and easy. The invention is already being used at the Sultan Abu Bakar (SAB) dam in Cameron Highlands.

"It consists of two sub-systems, namely the specially designed collecting boat and trash transfer system. The mechanical floating system has payloads of up to one and half tonne capacity storage, and can reach approximately one metre below the waterline," Hazha said.

The trash buster craft requires minimum maintenance and is designed for continuous operation.

The system was initially designed to collect floating trash in the SAB dam by removing fast-growing plants like water hyacinth that quickly form huge restrictive mats on the surface of the water. But it also offers an immediate, effective

solution to the clearance of waterways, cutting down the need for continuous use of harmful and pollutant chemical herbicides.

It is said to be a durable and robust, trash and debris collection workboat for waterway pollution control and maintenance.

Some of the optional features of this system include global positioning system and underwater sonar. The system can also be equipped with oil recovery and containment system.

## Dual-purpose Trash Separator System

Another innovation featured at the Hot House was a system that not just reduces the size of the trash, but also separates and classifies according to the size of the trash.

"In the separation system, the main machine includes trommel and a trash shredder. The trash shredder separates natural trash, from municipal and agricultural trash," said Hazha.

The innovation is available in a crowded market with China leading the pack with over 12% of global patent filings, followed by the US.

He said because there is already a huge number of similar offerings globally, the locally developed innovation will have to rely heavily on its competitive advantage to penetrate the global and regional markets.

## Diverter Trash

The diverting trash innovation has a strong market potential, particularly in Malaysia due to low competition, though for now it can be used in a limited number of industrial applications and inventors are trying to find



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further opportunities to strengthen their IP and market opportunities.

The system to tackle solid waste issues was created as a solution to a perennial environmental issue in Malaysia — roadside litter, clogged drains and garbage-laden rivers have long been a problem plaguing Malaysian waterways.

With this system, the elongated arm-like structure separates the floating solid waste at hydroelectric station intakes. It also serves to solve issues that arise from pollutants that could result in the malfunction of the water turbine, which would be expensive and time-consuming to repair, and disruptive to the electricity generation process.

### Trash Rake Cleaning

While a similar technology has been developed in the US and Europe, it

may prove to be costly in Malaysia and the region.

"Hence, this innovation has a high potential to be commercialised in Malaysia and its neighbouring countries," Hazha said.

The self-cleaning, self-latching trash rake mechanism removes trash from hydropower plants by reducing the clogging of water intakes.

The system consists of a scrapper, reset assembly, and drainage and supporting infrastructure. Selecting a right trash rake cleaning system, Hazha adds, is important in the development of a hydroelectric facility to deal with unique site conditions, while ensuring a minimal loss of water flow through the intake screen. Hence, the use of trash rake cleaners is both widely acknowledged and has become a standard requirement in any new hydropower

station.

The Hot House 2017 also serves as a platform for TNB innovators to get industry feedback to develop more market-driven products and services, as well as encouraging the creation of IP for commercialisation.

"The difficult part after the invention of new ideas is to bring it to the commercialisation stage," Zainul quipped.

In 1997, TNBR gained status as a certified research and development (R&D) centre from the Malaysian Industrial Development Authority. The status allows companies with R&D engagements with TNBR to be entitled for a double-tax exemption. TNBR QATS was established in 2012 to leverage on the laboratory and technical service business, which has since evolved to include technology commercialisation activities as well.



TNBR QATS SDN. BHD.  
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## TRASH SOLUTIONS: On the way to commercialisation

### Innovation

Floating structure strategically located to separate floating trash from clogging water intakes.



### TRASH DIVERTER

### Benefits

- Very low maintenance cost
- Solve pollutant problems
- Self-adjusting to water level
- Scalable to site requirement
- Robust & modular design

### Innovation

Combines trash separation and classification system to cut down trash management and transport time to landfill



### TRASH SEPARATOR SYSTEM

### Benefits

- High efficiency
- Unique design
- Cost-saving
- Practicality

### COMMERCIAL POTENTIAL

- River Management
- Dam Management
- Harbour Management
- Power Station

### Innovation

This invention is adapted to be compact compared to other systems and with increased efficiency requiring minimal manual intervention.



### TRASH BUSTER CRAFT

### Benefits

- High efficiency
- Cost-saving
- Modular system
- Customizable

### Innovation

Retrofitting and optimisation solution for clogging of water intakes especially in hydroelectric facilities



### ONSITE & ONLINE TRASH RAKE CLEANING

### Benefits

- Self-cleaning and modulated system
- Reduce trash management
- Adaptable and resizeable to different type
- Unlimited lifting height and depth

• All the above inventions are protected under the Malaysian Patents Act 1983

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