

## Malaysia has invented world's first 'green tech' palm oil system, says AquaEco's Andrew Liew

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Photo - Palm Oil Tree

Malaysia based Aqua Eco (AquaEco) director Andrew Liew has announced a world first with the invention of a 'green tech' palm oil system to enhance oil extraction yields in line with the government's national industry objectives.

According to Liew, who is also the green technology company's principal shareholder, the system - called AquaEco-SRORS - is a world first because it is the "first proven and commercially viable palm oil raw sludge filtration system."

He said this new invention will increase OER (oil extraction rate) revenue for millers by about RM3.8 million (US\$850,000).

"AquaEco-SRORS enables the extraction of up to 80 percent of the oil in the raw palm oil sludge," Liew said. "This translates to an improvement of 0.4 percent - 0.6 percent in OER [accounting for the RM3.8 million revenue increase]."

"In addition, there is reduction of bio-gas emission by about 70 percent [estimated average depending on the mill's processes], and the output of an oil-free filtrate with no suspended solids - which is discharged into waste water treatment ponds," he said.



*Photo - Andrew Liew, Director, AquaEco*

"This is a really big deal for palm oil millers as this technology drastically reduces the high Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) in waste water- this uplift the entire state of the industry to be much cleaner and environmentally friendly," Liew added.

#### **Average OER in Malaysia**

He said the breakthrough of the 0.4 to 0.6 percent OER extraction is significant. "Annually, an average mill, which processes around 300,000mt of crop will, with AquaEco-SRORS, be able to recover about 1,462mt oil or 0.5 percent OER, translating to an incremental revenue of about RM3.8 million."

The actual figure will depend on prevailing palm oil commodity market rates and a mill's raw palm oil yield amount, he said.

Currently, the average OER of the Malaysia's palm oil stands at 20.65 percent, Liew said. "With AquaEco-SRORS, the entire industry's production would increase to 21.15 percent (with existing palm oil fruit produce). This increase is in line with Malaysia's Performance Management & Delivery Unit's national Entry Point Project 4's [Pemandu's EPP4], which aims to increase the country's palm oil industry OER rate to 23 percent by Year 2020."

The EPP4 objective is to increase OER from palm oil fruits to 23 percent by Year 2020 in order to contribute RM13.7 (US\$3.07) billion in GNI (gross national income) by the same year. EPP4 is also championed by the Malaysian Palm Oil Board (MPOB). Currently, the palm oil sector accounts for more than 5 percent of Malaysia's annual exports.

He said AquaEco has worked closely with MPOB on the technology behind AquaEco-SRORS, which is in line with MPOB's aim of introducing technologies that can enhance the industry, and also attuned to increasingly stringent international regulatory guidelines.

The system has already been installed the system in two Malaysian palm oil mills -in Sandakan, Sabah and in Bota, Perak. The company is now in discussions with a few more mills to install the system, said Liew.

### **Underneath the hood**

He said that in a normal Palm Oil mill, the oil extraction process discharges 65 percent of raw waste sludge, which then requires a large number of wastewater treatment (effluent) ponds to clean. "Being high in Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD), this waste releases high amounts of biogas into the atmosphere. If not properly treated, this wastewater is toxic to aquatic life when it inadvertently enters into the land's many waterways."

The AquaEco-SRORS system solves the issue of wastewater by intercepting the raw sludge and separating it into water, solids and oil, Liew said. "All oil and suspended solids are prevented from entering the treatment ponds. Without the need to break down suspended solids, treatment pond process becomes more efficient, reducing biogas emission by an astonishing 70 percent."

"The system uses an innovative, self-cleaning membrane technology to filter out suspended solids and oil - leaving a filtrate for further processing or recovery. The oil is recovered back as crude palm oil, while the suspended solid is removed as decanter cake in the decanting process," he said.

"Being environmentally friendly, the system provides an immediate solution for millers to better meet increasingly stringent regulatory requirements. It will help the mills to gain extra points for their Round Table Sustainable Palm Oil (RSPO) Millers can take advantage of the compliance to garner the license to export palm oil to Europe," Liew said.

AquaEco started the research and development for the AquaEco-SRORS palm oil raw sludge filtration system in 2011, which has been patented in Malaysia, as well as internationally, said Liew. Aqua Ecotech has now appointed Integrated Green Engineering, MillGreen Technology, Nano Quest and YKL Engineering as distributors for the AquaEco-SRORS system.

## Regulatory challenges

There are currently about 450 palm oil mills operating across the country, which are facing the continual challenge of adhering to international palm oil regulatory requirements, he said.

"From the palm oil community's point of view, we are aware that MPOB is always looking to help millers meet the Malaysian Department of Environment's (DOE's) increasingly stringent legislation to lower sludge output, or at least cleaner discharges by mills. Innovation such as this, will pave the way for a cleaner and increased commercial returns for the Malaysian palm oil industry," said Liew.

The DOE aims to reduce the BOD discharge into water by 50 percent in the near future. At present, the permitted BOD in Peninsular Malaysia is at 50-100ppm, 50ppm in Sarawak while a higher standard of 20ppm has been established in Sabah. The DOE also has strict guidelines in place and those found guilty of violating these guidelines have been fined or jailed, with the convicted mill sometimes being shut down for months

"I am confident of MPOB's support for a 'green tech' such as AquaEco-SRORS for the industry," he said. "After all, it is not every day that such an innovative and commercially-viable green technology is made available to market."