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By
PROF
GRAHAM
KENDALL



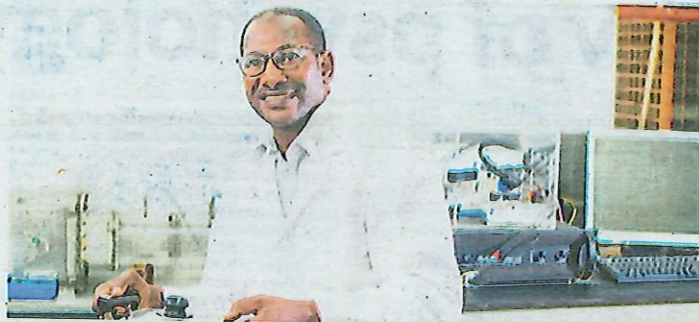
From waste to wealth

MALAYSIA generates about 42 million metric tonnes of municipal solid waste a year, compared with about 30 million produced in the United Kingdom. Sixty per cent of this waste is food and plastic. *The Star* (Oct 15, 2018) reported that during Ramadan in 2018 Malaysia produced 215,000 metric tonnes of food waste. It was also reported that research undertaken by the Malaysian Agricultural Research and Development Institute found that 20% to 50% of fruits and vegetables are discarded.

According to the Malaysian Housing and Local Government Ministry, 76% of waste goes to landfill, costing the Malaysian government about RM2.4bil per annum to manage, which also causes severe impacts on health as well as environmental degradation. In addition to the waste management challenges, there is limited recycling in Malaysia, which also needs to be addressed.

It is against this background that a recent Newton Ungku Omar Grand Challenge announced an initiative called Waste to Wealth, which is a joint research funding initiative between the UK and Malaysia. It encourages collaboration between the two countries in coming up with innovative solutions to some of the world's most challenging problems.

The University of Nottingham Malaysia has been awarded two grants funded under this initiative. Both grants are supported by UK and Malaysian companies and it is pleasing to see that researchers at Nottingham are working closely with industrial partners to address such challenging problems. The research that is



Prof Yousif Abdalla Abakr.

undertaken has direct applicability to the commercial sector, which ensures more rapid deployment to those that are able to benefit from it. More importantly, it enables UK expertise and knowledge to be transferred to Malaysia.

The first project involves Ricardo UK PLC from the UK and Tex Cycle (P2) Sdn Bhd from Malaysia as collaborators, with Prof Yousif Abdalla Abakr as principal investigator from the University of Nottingham Malaysia.

The research will investigate how waste can be used to generate fuel in a way that can be done on a small scale, enabling it to be used in both rural and urban populations. These communities will benefit from the use or sale of the resulting fuel. It also removes the need to transport waste or send it to landfill. Individuals will be incentivised to ensure that personal waste is correctly separated, so that the benefits of the system are maximised.

The second project also has UK and Malaysian companies as collaborators – CPL Industries and Eureka Synergy Sdn Bhd – with Dr Ajit Singh as the Nottingham principal investigator.

The research will utilise hydrothermal carbonisation (HTC), which has only recently reached a point where it is able to process thousands of tonnes of waste a year. HTC is ideal for wet waste, as the carbonisation is carried out in the liquid phase, which is important as no pre-drying, energy-intensive stage is required.

The UK commercial partner already operates a commercial-size HTC plant, which was funded by Innovate UK and University of Nottingham, UK.

The University of Nottingham Malaysia, along with its industrial collaborators, is very grateful for the opportunity to be involved in this research, which has the potential to transform the lives of many people living and working in Malaysia.



Dr Ajit Singh.

We owe a debt of thanks to many stakeholders, including our industrial partners and the funding agencies in the UK and Malaysia. Malaysian Industry-Government Group for High Technology (MIGHT) deserves a special mention – it does a great job in managing the Newton Ungku Omar fund in Malaysia, as does the Newton fund in the UK, which works with several partners in delivering this world-changing research.

Most importantly, though, we are excited about being able to work on these two projects with the potential to make a real impact on Malaysia, which will not only bring about financial benefits, but also have significant environmental and sustainability impacts.

■ Prof Graham Kendall is chief executive officer, provost and pro-vice-chancellor of the University of Nottingham Malaysia. Twitter: @Graham_Kendall