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M'sia needs efficient technology to develop biofuel

KUALA LUMPUR: Malaysia's research and development into biofuels may have started way back in the 1980s but it has not made much headway in developing viable alternative energy sources.

Biofuel researcher Prof Dr Masjuki Hassan said to date Malaysia has not succeeded in developing a technology that can be widely applied to produce biodiesel as an effective replacement for petroleum-based products.

"We are still looking for an efficient and cost-effective technology that can yield high-quality biodiesel with (improved) oxidative stability," he told Bernama in an interview, here recently.

Biodiesel is a relatively clean-burning, renewable fuel produced from new and used animal and vegetable oil.

Biodiesel is more environmentally-friendly than conventional diesel, which is derived from petroleum, as the former has more oxygen in its molecules. The presence of oxygen enables biodiesel to emit lower levels of environmentally-hazardous greenhouse gases like carbon dioxide, carbon monoxide and hydrocarbons during combustion.

Masjuki, who is a lecturer at Universiti Malaya's Faculty of

Engineering, said Malaysia has to overcome a number of challenges in order to find suitable renewable energy sources and develop an effective technology to harness biodiesel.

One key challenge is reducing its dependence on palm oil as a biofuel ingredient due to the non-availability of a ready supply of cheap feedstock.

"The feedstock, in this case, is procured from palm oil, the availability of which is influenced by its market price. If the price is high, producers prefer to sell the palm oil to get higher returns.

"Only when the price drops (to low levels) do they think of converting the palm oil to biodiesel," said Masjuki, 64, who is among the six recipients of the 2017 Merdeka Award for his research and development of biofuel and other sources of efficient energy and automotive engines.

(The Merdeka Awards was established by Malaysian oil and gas giants Petronas, ExxonMobil and Shell in 2007 to recognise individuals who have made outstanding and lasting contributions to the country and its people.)

Calls made by pressure groups in European countries and the United States to ban the use of

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Prof Dr Masjuki Hassan, biofuel researcher

palm oil in biofuels, citing forest destruction, would also have an impact on palm oil as a biofuel source.

"They (Europe and the US) are actually doing it to protect their own biodiesel market which uses feedstock like soy, corn and sunflower oil," he added.

The low level of environmental awareness among Malaysian individuals and industries is another challenge that the nation has to overcome in its bid to muster wider support for use of biofuel technologies.

Masjuki said Japan, South Korea and some western countries that did not possess fossil fuel sources have succeeded in harnessing alternative energy sources as their citizens were aware of the importance of conserving energy and protecting the environment.

"Since they don't have their own petroleum sources, they are more inclined to depend on alternative energy (sources) like biodiesel," he said, adding that even the farmers in those countries were

given the opportunity to convert some of their agricultural produce to biodiesel.

"The widespread acceptance and use of biofuel (in those countries) has led to the creation of a stable and lucrative biodiesel industry over there."

Masjuki also said that the local automotive industry was reluctant to fit their cars with biodiesel engines as it would entail additional costs and lead to higher car prices.

The engines of existing vehicles would also have to be modified to accommodate biodiesel as the latter's molecules are not compatible with the engine design.

Another downside to using biodiesel is that it can cause certain engine parts to turn rusty.

"Although the rust problem can be overcome by applying a protective coating on the engine parts, car manufacturers are not going for biodiesel engines because of the higher costs involved.

"Their (car manufacturers) principle is this: 'If my fossil fuel-

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powered cars are doing okay, then why the need to disturb its (engine) design because of biodiesel?," pointed out Masjuki.

According to Masjuki, researchers at local universities, including Universiti Malaya, have been doing their part to carry out research into biofuel in an effort to come up with a sustainable energy source for the country.

A team of researchers at Universiti Putra Malaysia has succeeded in converting used cooking oil into biodiesel for use in heavy machinery and vehicles.

Universiti Tenaga Nasional researchers have also carried out research on the use of waste cooking oil as an alternative feedstock for biodiesel production. The university is reported to have established a large-scale plant to convert used cooking oil into biodiesel.

Local university researchers are also currently studying the possibility of harnessing biodiesel from feedstock sourced from coconuts and trees like *Moringa oleifera* (drumstick tree), *Callophyllum inophyllum* (Borneo mahogany) and *Jathropa curcas* (physic nut tree).

Describing their efforts as praiseworthy, Masjuki said there was also a need to set up a special

research centre to coordinate all R&D activities pertaining to biodiesel.

Urging the government to implement policies and campaigns to enhance environmental awareness among the people and step up biodiesel applications, he said a 10 per cent biodiesel use would mean 10 per cent of fossil fuel being 'kept in storage', thus reducing its impact on the environment.

Besides safeguarding the environment, the wider use of biodiesel applications would also ensure the nation's energy security or uninterrupted supply of energy sources.

"We can't tell when wars will break out, which will lead to blocks in oil supplies. If our country has biodiesel, then at least it has an alternative energy source," said Masjuki.

According to 2015 statistics, Malaysia derived 37 per cent of its energy from petroleum sources, followed by natural gas (25 per cent) and coal (21 per cent).

The same year, renewable energy sources like solar, hydroelectric, geothermal, biomass and wind accounted for only eight per cent of the nation's energy consumption while nuclear energy made up the remaining nine per cent.
— Bernama