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Moving the nation towards sustainable energy sources

Balancing of various sources of fuel also impacts the nation's plans to reduce the country's CO2

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THE nation has to shift its focus from being dependent on fossil fuel to more sustainable sources of energy, including renewable energy (RE), in an orderly manner.

"Otherwise, it will cause a lot of problems from the aspect of reliability and the quality of our electricity supply," Ministry of Energy, Green Technology and Water secretary general Datuk Seri Dr Zaini Ujang said in a recent interview with a local television station.

The issue is connected to electricity tariffs, which in Malaysia, is largely determined by gas prices and foreign-exchange (forex) rates when buying coal.

"The two sources account for more than 78%, because 22.5% of our energy is sustainable energy while 78% is energy generated from gas and fuel which we need to buy. Some gas supply we obtain from Petroliam Nasional Bhd (Petronas), some from locally produced gas and we also buy from abroad.

"And, we also rely heavily on coal, which is fully imported. It is almost fully imported because there is very little coal mined in Sarawak. When the forex is not in ringgit's favour or the price rises at the international level, it has great impact on us. That's why the government is looking at how best to cushion the tariff hike and for this, we have formulated several mechanisms that we deliberate on from time to time," he said in the recent interview with *Astro Awani*.

Elaborating on the topic, Zaini said the average electricity price in Peninsular Malaysia is 38.53 sen per kilowatt hour (sen/kWh).

"The cheapest that we can supply electricity is by generating it through the use of coal which costs 25 sen. So, if at this price, we can sell at 38 sen and make a profit.

"Gas is about 34 sen, 33 sen, 35 sen, 36 sen and lately 37 sen. At 37 sen to 38 sen, the difference is just sen. But, if we go for other fuel or sources, it will be more expensive. For example, if we now go for solar energy on a large scale, the cheapest pricing is 40 sen. So, even then, we have to ensure that the tariff level stays at 38.53 sen. This is specific, as at more than 38.53 sen, it will cause a steep rise or surge in our price," he said in the interview whose transcript was released by *Bernama*.

It is understood that TNB can generate up to 2mW using the stream of a big river for small hydro stations

Balancing Act

The balancing of the various sources of fuel also has an impact on the nation's plans to reduce the country's carbon dioxide (CO2) emissions by 25% in the next 13 years, as part of the national effort to address the threat of the carbon discharge on human health and the environment.

Under the Green Technology Master Plan 2017-2030, the government aims to slash CO2 emissions from the present eight metric tonnes (MT) per capita to six MT per capita in 2030.

The 13-year plan also targets 25% RE in the country's power generation mix, boost energy efficiency from less than 2% to 15%, treated wastewater recycling to 35% from less than 1%, 15% freshwater extraction rates from the present 2%, and 50% green manufacturing small and medium enterprises (SMEs) from just 10% now. Other definite and behavioural initiatives include cost-balancing management for green application, tariff rates amendments and continuous engagement between various stakeholders.

Power generation and transportation are the main contributors to CO2 emissions. Old technologies utilisation, inefficient power usage and business reluctance to adopt green technology had driven CO2 up, increasing the greenhouse effect and the rise in sea water and flood.

In an earlier interview with *The Malaysian Reserve (TMR)*, Zaini said it was "a tough balancing act" to meet the country's pledge to reduce its carbon footprint made at the Paris climate conference in 2015. He said for example, the country has pledged to increase RE to the country's installed power capacity and targeting about 30% in 2030 and 50% by 2050.

Zaini said while green technologies are favoured for RE, there are cost concerns and whether the public will bear the additional costs.

"In Malaysia's case, with the present technology, the more green components come into the power grid, the more coal needs to be fired to level the tariff at 38 sen," he said at *TMR's* Third Green Growth Roundtable on "Powering Malaysia: Transitioning Towards Clean Energy" in Bangi in June.

Transitioning to Sustainable Energy

Elaborating on the issue of transition to sustainable energy, Zaini told the local broadcasting station that if Malaysia depends on gas, it will have to pay at a rate that is profitable to the national oil company, Petronas.

"Yes, it is our homegrown company. The royalty from Petronas will be paid to the government for various purposes. Secondly, we have to find other methods on how to address the issue of cheaper energy and find a replacement to coal. Coal is cheapest currently, at 24 sen.

"In the current situation, our tariff is fixed at 38 sen, coal 24 (sen). Whatever is above 24 (sen) should be balanced so that we get the 38 sen. The more expensive the energy, the more coal we are forced to use to generate electricity. And, this is what we use everyday, the balancing happens daily," he said.

He noted that there are several sustainable energy tools that cost less and do not hinge on entry of foreign products or attract forex. One of them is small hydro stations. It is understood that Tenaga Nasional Bhd (TNB) can generate up to two megawatts (mW) using the stream of a big river.

"They divert the water and generate power. If we can generate, let's says, 100mW or 200mW which does not require a dam or forex, continuously, it means, we buy the machine only once, say from Japan or Germany, not for now as it is not sustainable as we still depend on feed from fuel that we import...that will be cheaper," he said.

Financial Woes

On the financing front, Zaini said the ministry has embarked on several initiatives to ensure that companies pursuing sustainable energy projects are supported. Among others, the ministry is joining hands with Bank Negara Malaysia to conduct a workshop for financial institutions to explain to them the relevant requirements.

"Many financial institutions are not clear about the investment risk element involved in such projects. They are very cautious. For example, tariffs were supposed to have been revised but this was not the case. According to their calculation, the review was supposed to have been done but the government did not do so. They are wary as to what will happen to their investments. Many financial institutions are cautious in investing in sustainable energy," he said.

Moving forward, Zaini is also urging consumers to look at net energy metering (NEM) to tap on the solar energy. NEM and the feed-in-tariff (FiT) are some of the methods designed to accelerate investments in RE technologies.

"The FIT quotas for industries, commercial and individuals have been taken up. We obtain about 338 megawatts. The quota has been fully exhausted. What is available now is net energy metering. With FIT, we generate electricity and sell to utilities, for example at 74 sen. Then we buy back for our own consumption at 38.53 sen.

"We make our profits here. But, remember, electricity generation is for between four and five hours only each day. The electricity supply generated is not much. Second, the NEM is undertaken by us for our own consumption and the excess is sold to utilities. We sell for 31 sen only," he said.

He added that less than two megavolt (MV) of the 500MV available quota for NEM has been taken up.