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## Practicing Sustainable Consumption

By

**Wan Portia Hamzah**

*Senior Fellow, ISIS Malaysia*

**D**o we Malaysians practice sustainable consumption? The answer is 'No' if we just look, for example, at our water consumption. Depending on the sources taken, a Malaysian uses an average of 203 to 280 litres per day. This is reportedly high when compared with Indonesia at 150, Philippines at 175 and Singapore at 155 litres per person per day. Water tariff is relatively low and for households in Selangor 20 cubic-metres of water are made available free every month.

What lessons can we learn from the water rationing exercise in April 2014 in order to save more water for the dams? The water rationing which affected more than one million households in the Klang Valley indicated only a seven per cent reduction in usage. According to a source from the Selangor Water Management Authority, usage had not gone down by much — consumers were probably storing water excessively and they need to change their water usage habits.

Water is vital to all forms of life. It is used for domestic consumption, transportation, agriculture and industry as well as a power source. The main source of water is rain and the availability of water is very much dependent on the amount of precipitation.

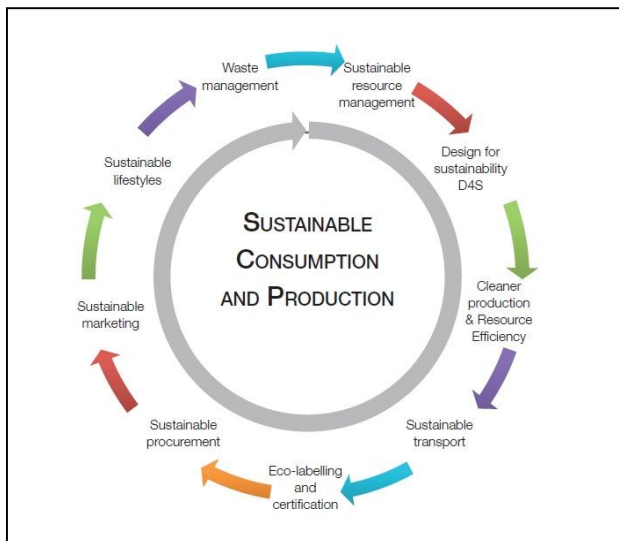
Rainfall in Malaysia is considered high at an average of 2,500mm a year but parts of Malaysia are currently experiencing drought and there is a need to manage the precious resource. The National Water Services Commission (SPAN) has taken the initiative to ensure that water supply services become more efficient and sustainable but the consumers must learn to appreciate the value of water and practice sustainable consumption.

Is the concept of sustainable consumption understood? If we trace back to the Rio Summit in 1992, the issue of sustainable consumption and production (or SCP) was in fact raised and Agenda 21 identified unsustainable patterns of consumption and production as major causes of the continued deterioration of the global environment. Then in the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, there was a call 'to accelerate the shift towards sustainable consumption and production' and to promote social and economic development within the carrying capacity of ecosystems by delinking economic growth from environmental degradation.

The Sustainable Consumption Research Exchange Network (SCORE) was subsequently established to address the issue of SCP in the European Union (EU) and beyond. But according to SCORE,



Figure 1: Sustainable Consumption and Production Cycle.



Source: [www.rona.unep.org](http://www.rona.unep.org)

consumption has to be first understood and then a systemic approach must be taken. This implies that experts who understand business development, solution design, consumer behaviour and the effectiveness of policy instruments must collaborate and cooperate in shaping the concept. This should be further linked with the experiences of industry actors, consumer groups and ecolabelling organisations to understand the whole value chain in the consumption domains identified, be it energy, food, or others (see Figure 1).

The concept of SCP has been studied in promoting sustainable development. Initiatives such as targets for renewable energies as well as energy efficiency and plans for Green Public Procurement have been undertaken by the EU. SCP initiatives have also been undertaken by many other countries although these initiatives may not be labelled as 'SCP' or as addressing the need for SCP. The initiatives include both top-down and bottom-up approaches but the key word here is 'change'. Change, in general, involves rules, financial regulations, services, technologies, consumer practices, values, interests or expectations among others.

What is important therefore is how policy can effectively support the change to enable sustainable consumption and production practices and hence stimulate sustainable markets, sustainable innovation systems or sustainable

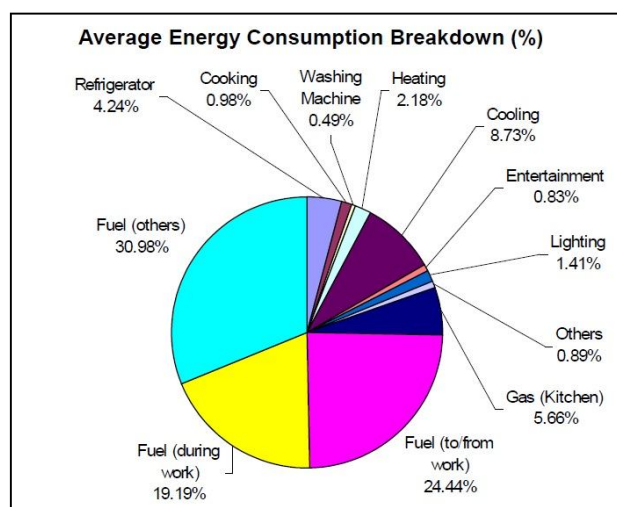
behaviour of businesses and consumers. An equally important key word is 'governance'.

Businesses are in the position to respond to sustainability challenges such as making production and products more resource efficient or adopting a new business model to be competitive. Consumers, on the other hand, can exercise sustainable choices provided there is sensitisation as consumer behaviour can only change if there is the ability, opportunity and motivation.

There are of course challenges since the SCP concept aims to do 'more and better with less' as well as to address the economy, environment and social dimensions in a holistic manner. However, it must be noted that SCP is crosscutting involving, for example, various government entities in terms of agenda-setting and implementation. And while the primary objective is to ensure that basic needs are met, there is a need to build from there and provide a better quality of life. There is an ongoing study that will provide Malaysia with a clearer picture to address the SCP concept and we the consumers must be ready to accommodate the changes for a sustainable future and to be competitive.

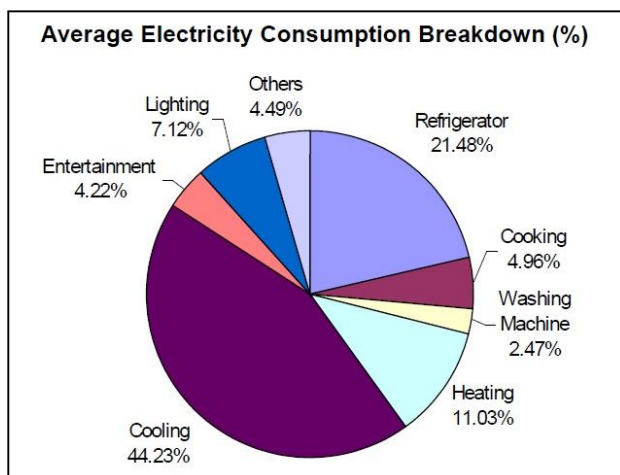
Malaysian consumers can be more proactive. Let us take a look, for example, at the patterns and trends in energy consumption by households (see Figure 2). Malaysians households consume energy in various forms, such as

Figure 2: Average energy consumption breakdown in Petaling Jaya



Source: [www.cetdem.org.my](http://www.cetdem.org.my)

Figure 3: Average Electricity Consumption Breakdown in Petaling Jaya



Source: [www.cetdem.org.my](http://www.cetdem.org.my)

electricity for air conditioning, lighting and appliances. However, cooling devices such as air conditioners, refrigerators and chillers consume more energy compared with all other electrical appliances. A joint research conducted by the Centre for Environment, Technology and Development Malaysia (CETDEM)<sup>i</sup> and the Petaling Jaya City Council in 2006 found that 66 per cent of the average household electricity consumption is for these cooling appliances (see Figure 3). It is therefore important for consumers to understand their electricity consumption trends because of the increasing electricity demand.

According to another research source<sup>ii</sup>, the share of electricity consumption to total energy consumption has increased from 17.4 per cent in 2007 to 21.7 per cent in 2012. The total electricity production was reported at 122.12TWh in 2012 with gas as the major fuel source contributing 52.7 per cent of the total generation fuel mix followed by coal at 38.9 per cent, hydro at 3.7 per cent, with the remaining percentage taken up by oil and others. That there is an increasing dependency on coal in electricity generation — which is expected to grow from 27 per cent in 2005 to 37 per cent in 2030<sup>iii</sup> — must be managed judiciously since coal is largely imported and there are concerns about global warming and the implicit penalties on their use.

Although carbon dioxide (CO<sub>2</sub>) emissions per kWh (for specific fuels) can be determined, the indicator should be used with caution due to data quality problems. What is important is the

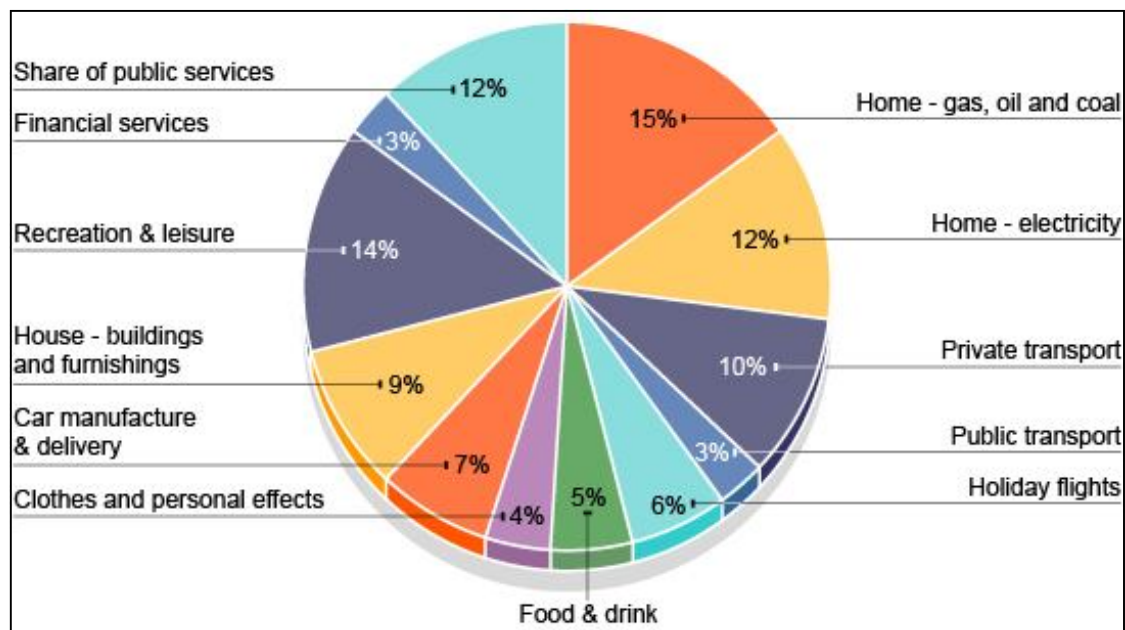
awareness and a need not to be indifferent to prudent energy consumption or production patterns. The call for a change noted earlier could be undertaken fairly quickly (such as for energy-saving lighting) while others will take longer to be effective (such as housing design or electricity generating systems). The policy question will have to focus on how much energy conservation and emission reduction can be achieved that is technologically, economically as well as politically feasible.

Following trends elsewhere, Malaysia promoted energy efficiency (EE) improvements such as SAVE or Sustainability Achieved via Energy Efficiency. In addition, the Entry-Point Project (EPP) 9 under the Economic Transformation Programme introduced rebates for EE equipment. Energy Efficiency labelling was earlier introduced to provide information to consumers on energy consumption but the approximate operating costs of different models should also be made available. This will allow consumers to identify cost savings and compare them with price differentials. Persuasive approaches taken by the government were initially aimed to bring in voluntary behavioural shift among energy users but the government is changing the strategy and a more regulatory approach is soon expected.

In addition, Malaysia may see innovative approaches such as carbon labelling, that is 'carbon footprints' (grams of CO<sub>2</sub> emitted during the production and distribution of products or product lifecycle) in the future. TESCO supermarket in the United Kingdom, for example, started carbon labelling for their food products to encourage food producers and distributors to reduce their carbon emissions and at the same time allow consumers to make informed decisions about their items to be consumed.

Next, public information campaigns have been ongoing to encourage Malaysian consumers to turn off appliances completely when the standby functions are not needed. It must be noted that many electric appliances do consume energy not only when they are in use but also when they are in a standby mode — to operate a clock or remote control system. It has been estimated that in the United States about 5–10 per cent of residential energy consumption is for standby power therefore costing more than USD 3 billion per year or consuming the output of 18

Figure 4: Breakdown of a Typical Person's Carbon Output



Source: [www.bbc.co.uk](http://www.bbc.co.uk)

power stations<sup>iv</sup>. The same source quoted that in Europe, studies have estimated that standby power accounts as much as 7–13 per cent of residential energy consumption. The United States and countries such as Australia have therefore introduced mandatory standards for standby power consumption by various appliances.

Also in the United States, a surcharge is added to electricity bills to fund renewable energy or energy conservation programmes. Similarly, Malaysia has imposed a levy on all electricity consumers using over 300kWh of electricity a month (as of 2014, the levy has been raised to 1.6 per cent) under the Feed-in Tariff mechanism to support renewable energy development. This approach in funding is based on the 'polluters pay' concept and is designed to encourage consumers to be more energy efficient by consuming less electricity.

The National Energy Efficiency Master Plan (NEEMP) under the Ministry of Energy, Green Technology and Water was drafted to stabilise energy consumption against economic growth in three sectors — the industrial, commercial and residential sectors — but the Peer Review by the Asia-Pacific Economic Cooperation recommended that the transport sector be included. This is so because the sector is the second largest energy

user in the economy with a share of 37 per cent in 2012. According to the Review, the large use of energy by the transport sector (the Review used a 2008 figure where the share was 36.9 per cent) was attributed to a high usage of private cars for passenger transport. Fuel consumption for car travel and the resulting CO<sub>2</sub> emissions depends on the type of vehicle and the number of passengers travelling together.

In terms of vehicles, Malaysia witnessed a steady growth in numbers and models of fuel-efficient vehicles particularly with the introduction of import duty exemption on all hybrid cars. Sales were reportedly negligible before the exemption with just 322 units recorded in 2010 but surged to 8,403 in 2011 and doubled to 15,355 units in 2012 when more hybrid models were launched<sup>v</sup>. While the tax incentives for completely built units (CBU) of imported hybrid cars have been discontinued, the exemption of excise duties and import taxes for hybrids and electric vehicles will be extended for models that are completely-knocked-down (CKD) and assembled in Malaysia.

Nonetheless Malaysia may witness policies to discourage the use of cars in city centres and promote the use of mass transit when the infrastructure is fully in place. Many cities such as London and Singapore have restricted car

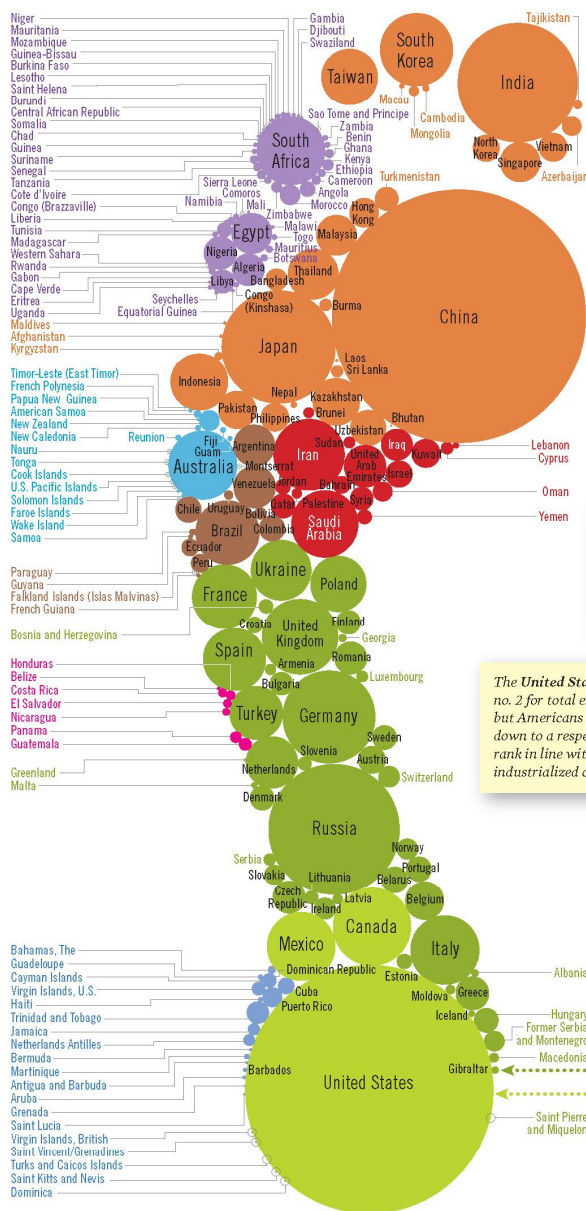


## Tracking Carbon Emissions

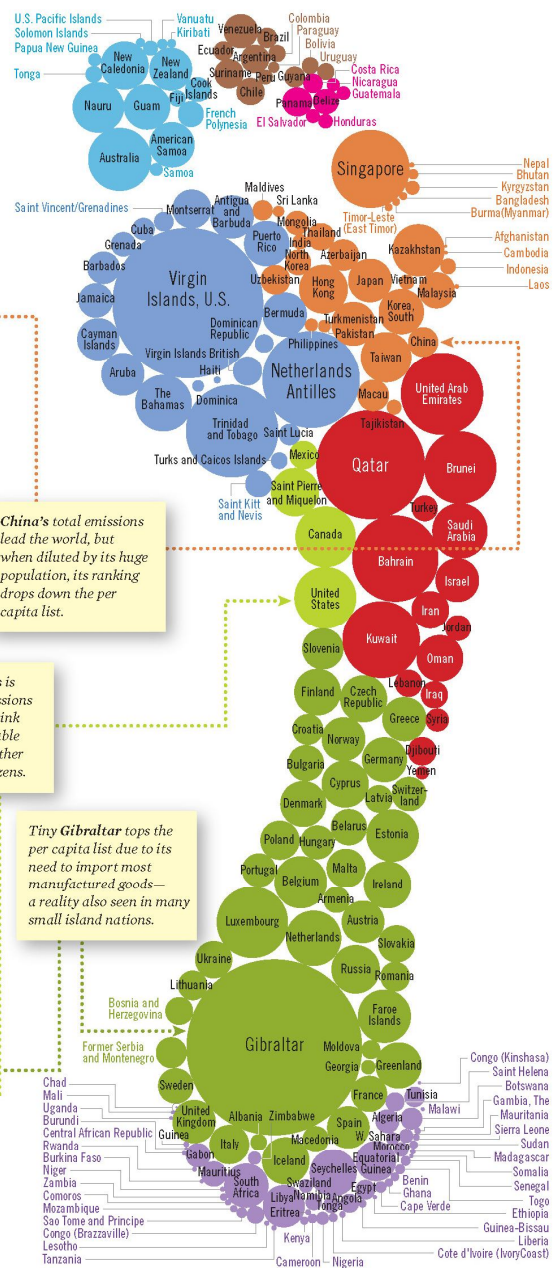
A footprint comparison of total carbon dioxide emissions by nation and per capita shows there's plenty of room for smaller countries to reduce their carbon footprints.

By Stanford Kay

### Total Carbon Emissions by Nation



### Per Capita Carbon Emissions by Nation



China's total emissions lead the world, but when diluted by its huge population, its ranking drops down the per capita list.

The United States is no. 2 for total emissions but Americans shrink down to a respectable rank in line with other industrialized citizens.

Tiny Gibraltar tops the per capita list due to its need to import most manufactured goods—a reality also seen in many small island nations.

#### KEY



DESIGN: STANFORD KAY STUDIO.COM

NOTE: BASED ON 2007 DATA. SOURCES: U.S. ENERGY INFORMATION ADMINISTRATION

entry into city centres through the use of road tolls or a congestion charge primarily to limit congestion and air pollution and at the same time to reduce fuel consumption and CO2 emissions.

Energy is still being subsidised in Malaysia but the rationalisation process is an important effort not only to ease the government's burden but also to help increase energy efficiency, reduce energy consumption as well as carbon emissions among other objectives. The ambitious effort, however, is somewhat slow because of the political and social implications.

While corporations do demonstrate environmental concern and social responsibility, market demand can be influenced by consumer behaviour and preferences. The young consumers

***Education for sustainable consumption has an important role in creating responsible attitudes towards a more sustainable lifestyle.***

who are reportedly more concerned with issues relating to sustainable consumption are important actors. Education for sustainable consumption has an important role in creating responsible attitudes towards a more sustainable lifestyle. With the various initiatives taken and more in the pipeline, Malaysia will see a change in the future in terms of sustainable consumption and production.

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**Notes:**

<sup>i</sup>Project Working with the Community on Energy Efficiency at Household Level in Petaling Jaya (WCPJ), <http://cetdem.org.my>

<sup>ii</sup>Tan, C.S., Maragatham, K. and Leong, Y.P. "Electricity energy outlook in Malaysia". Paper presented at the Fourth International Conference on Energy and Environment, 2013.

<sup>iii</sup>Siti Indati Mustapa, Leong, Y.P. and Amir Hisham Hashim. "Issues and challenges of renewable energy development: A Malaysian experience." Paper presented at the International Conference on Energy and Sustainable Development: Issues and Strategies, Thailand, 2–4 June 2010.

<sup>iv</sup>United Nations Department of Economic and Social Affairs, 2007. "Sustainable Consumption and Production: Promoting Climate-Friendly Household Consumption Patterns".

<sup>v</sup>*The Star*, 24 February 2014. "All eyes on announcement today of duty exemption details regarding hybrid electric vehicles".

# Energy Transition Dilemma in Malaysia: Big is Beautiful to Niche Capabilities

By  
**Michelle Kwa**  
*Researcher, ISIS Malaysia*

**T**he revolution of global energy system is seen as one of mankind's greatest achievements. Without energy, be it in the form of light, heat or electrical energy, we lose the ability to do work. In the Medieval period, main energy sources were firewood, charcoal and human muscles. Since the Industrial Revolution in 1760, the energy system from coal combustion developed. In United Kingdom, coal's share of energy generation rose from merely 10 per cent in 1560 to 93 per cent in 1860. This energy demand has sparked a myriad of changes of the ecosphere, revolving a deep transformation of both economic-ecological and sociotechnical equilibria.

Our contemporary industrial metabolism today is driven by a mix of fossil fuel resources and renewable energies. Today, 87 per cent of our total primary energy demand is met by three hydrocarbons — oil, coal and natural gas. In 2011, the global primary energy supply comprised an

estimated 32 per cent of oil, 29 per cent of coal, and 21 per cent of natural gas while biofuels, nuclear, hydro and other energy supply contributed to approximately 10 per cent, 5 per cent, 2 per cent and 1 per cent respectively (see Figure 1).

In the past 250 years, dominant fuel in the energy mix has remarkably transitioned from biomass to coal to oil.

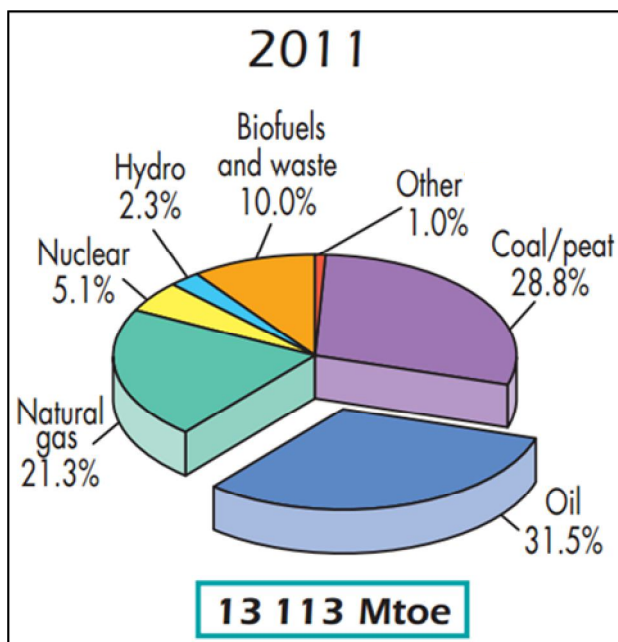
At such a unique fashion, why and how did the energy transition occur?

Along with looming shortages of energy reserves, geopolitical conflicts, large-scale environment degradation and climate change, the conventional energy systems are at a crossroads. Countries are grappling to secure energy supply and mitigate current and future vulnerabilities and risks to alleviate energy crises as seen in the 1970s, 1990s and 2000. Energy price shocks followed by sustained higher energy prices have a negative impact on the economy. Many resource-poor countries seek to minimise their vulnerability to external dependency by pursuing alternative solutions. The challenges remain to ensure sustainable and reliable sustainable energy supply to cope with the soaring energy demand.

Globally, its repercussions are spelling out the urgency of transitioning to sustainable energy systems within the next 10–20 years. In Denmark, change in energy system is seen from the rise in the overall annual share of wind power in the electricity mix from under 1 per cent in 1980 to 33 per cent in 2013. Following the Fukushima accident in 2011, energy transition policy package in Germany rigorously calls for all nuclear phase-outs by 2022. The Indian Government has pledged a transition to a low carbon economy of which solar power may provide 35–40 per cent of the future energy demand.

The key goal of economic growth in politics renders an energy transition puzzle and

Figure 1: World\* total primary energy supply in 2011 by fuel (Mtoe\*\*)



Note: \*World includes international aviation and international marine bunkers.

\*\*Mtoe—Million tones of oil equivalent

Source: IEA, 2013

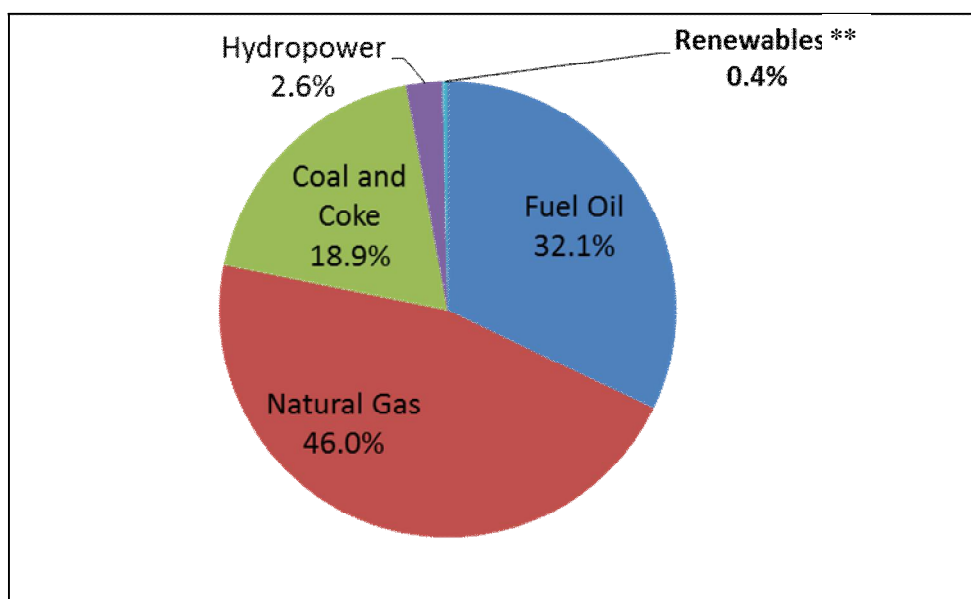
dilemma not only in Malaysia but in many developing countries. This is due to the imperative nexus of energy consumption and economic growth. In Malaysia, the industrial sectors contributed about 30 per cent of the total energy consumption in 2012. The upward trend of energy consumption is mainly attributed to the progress of infrastructure projects causing positive spillover effects to activities in the domestic manufacturing and services sectors. Rise of energy consumption is inevitably linked to the increase of economic growth rates supported by robust domestic consumption and energy intensive industries. Given such high priority in economic development and addressing social equity, attributed to population growth, processes of urbanisation and industrialisation, low growth arguably is unacceptable. Without the tapping of fossil resources to fuel and drive economic activities, economy will eventually stall.

Analysis of total primary energy supply by type of fuel in Malaysia showed that natural gas contributed a significant portion at 46 per cent, followed by oil at 32 per cent, 19 per cent for coal and 3 per cent for hydropower in 2012 (see Figure 2). Our present mode of generating, distributing and consuming energy has made the oil and gas sector the largest business in Malaysia — contributing to 20 per cent of the gross domestic product (GDP). It is a key sector identified to fuel national growth under Malaysia's Economic

Transformation Programme of which is expected to generate RM 131.4 billion of Gross National Income (GNI) by 2020. Owing to this, it is no surprise that the view of transitioning to sustainable energy is invariably contested by interested parties. The persistent role of existing established industry coalition and countervailing energy regime create resistance in transition. As such, deep lock-in situation fails to mobilise the necessary willpower and resources to form any breakthroughs in industrial niche development.

Additionally, breaking the fossil fuel dependence is environmentally rational but simply lacks economic logic to many. In fact, more than 10 per cent of the government's operating expenditure was spent on fuel subsidies, accounted for about 2.3 per cent of the GDP, around RM 33 billion on allocation in 2011. This subsidy not only has an unintended effect of promoting unsustainable consumption behaviour and practices among consumers, it is also disincentivising the investment of public and private sectors in innovative energy solutions. Sustainable energy system has fundamentally lower energy return on energy investment than fossil fuels and thereby is unattractive to all consumers, financial and industrial investors. This lack of competitiveness impedes its diffusion. Without sufficient active entrepreneurial activities and development of local absorptive capacity to breach the established habits of business-as-usual,

Figure 2: Malaysia Energy Mix of Primary Energy Supply in 2012 (of 83,937 ktoe\*)



Note: \*ktoe—1000 tonnes of oil equivalent

\*\* Renewables encompasses biodiesel, biomass and biogas

Source: Energy Commission Database



the sustainable energy market remains sluggish. A competent environment for a rapid transition entails an ecosystem which enables the growth of niche market along with effective strategic policy integration. As such, this sets a clear fundamental signal for developers to form the market.

The emergence of sociotechnical change will be the key driver to foster and spur energy transition. Evolutionary discoveries and inventions such as steam engines, internal combustion engines, gas turbines and nuclear fission have catalysed and transformed large-scale energy conversion in the past and will continue to play an important role in the future. Technological innovations can establish the transitional arena for the energy system transformation. Frontrunners in the niche create sustainability interests, experiments and ambitions in shaping solutions for the transition. The advancement of science and technology innovation under national support networks are an indication of a flourishing environment and capability accumulation for energy transition.

By 2020, Malaysia targets to become a high-income country, in which knowledge, technology, entrepreneurship and innovation will be key elements to economic growth. Our unprecedented growth will come with societal, environmental and political externalities that are not monetised. An estimated prediction (based on Hubbert Peak Theory) of our country's fossil fuel resources indicates that petroleum will be

***An estimated prediction ..... indicates that petroleum will be depleted in 2021, followed by natural gas in 2058 and coal around the year 2066.***

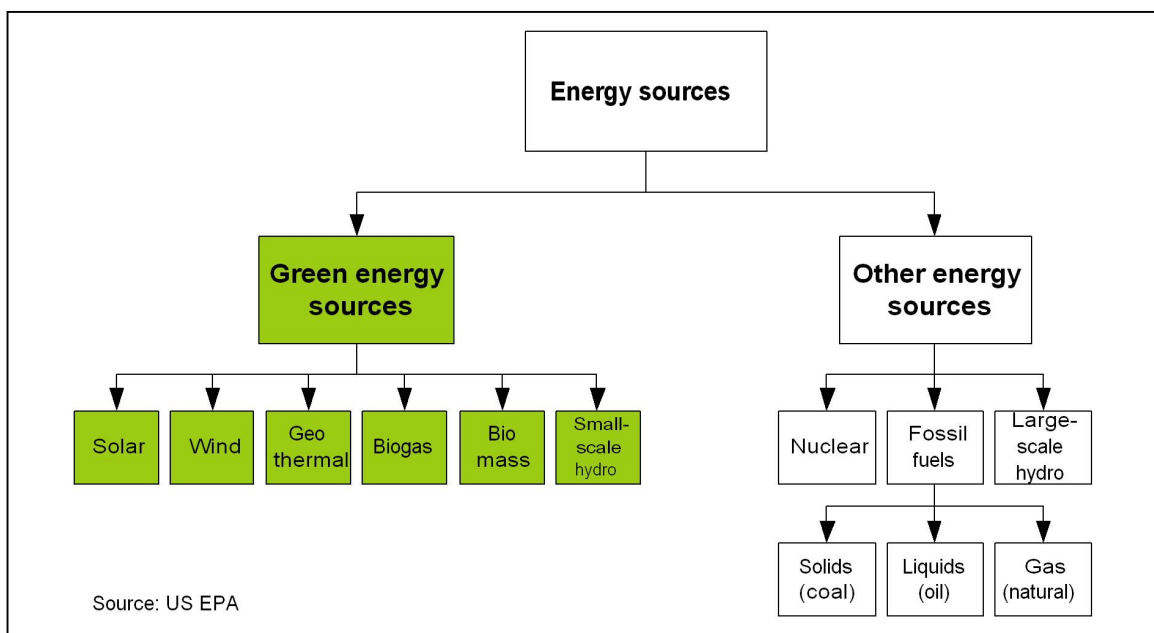
depleted in 2021, followed by natural gas in 2058 and coal around the year 2066.

How do we navigate the new direction to ensure sustainability and quality of growth?

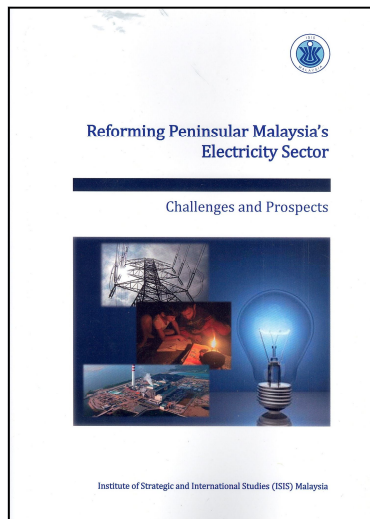
Questions raised here are how to bridge the 'unfamiliarity gap' of the transitional pathway and how to understand and address tradeoffs across sectors. The need to open doors for constructive discussion on pragmatic steps on how to balance the mutuality of interests across the society and economy is pressing. More importantly, are both short-term objectives and the long-term perspective thoughtfully weighed?

Which sustainable energy alternative should the nation transition to? Their capability to compete with conventional systems will highly depend on the readiness of all players to absorb the policy risks and bear the long-term cost. Our utmost dilemma is to balance between long-term benefits and transition needs on one side and transition costs and risks to different industries on the other.

Figure 3: Energy Sources



## Latest ISIS Publications

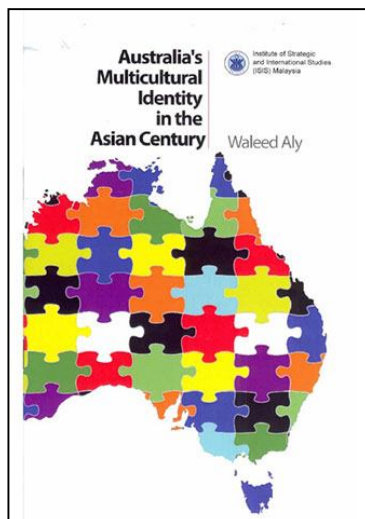


### **Reforming Peninsular Malaysia's Electricity Sector: Challenges and Prospects (E-book)**

Kuala Lumpur: ISIS Malaysia, 2014

The e-book discusses the prospects and challenges associated with the objective of reforming the power sector in Peninsular Malaysia. It revolves around four themes, namely energy market outlook and regional experience with electricity market reform; electricity tariff review in Malaysia and its expected impact; reforms to increase competitiveness in Malaysia's electricity sector; and transition and adaptation to a new sectorial structure. These themes were drawn from the discussions that took place during the *Public Forum on Reforms in Peninsular Malaysia's Electricity Sector*, which ISIS Malaysia and MyPower Corporation co-organised on 7 November 2013.

Available at: [http://www.isis.org.my/attachments/e-books/Electricity\\_Reforming\\_Final-book.pdf](http://www.isis.org.my/attachments/e-books/Electricity_Reforming_Final-book.pdf)



### **Australia's Multicultural Identity in the Asian Century**

Author: Waleed Aly

Kuala Lumpur: ISIS Malaysia, 2014

This monograph is based on a talk titled, 'Australia's Multicultural Identity in the Asian Century', given by the author at an ISIS International Affairs Forum on 30 April 2013 in Kuala Lumpur.

Available at: [http://www.isis.org.my/attachments/e-books/Waleed\\_Aly.pdf](http://www.isis.org.my/attachments/e-books/Waleed_Aly.pdf)





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**P.O. Box 12424, 50778 Kuala Lumpur, Malaysia**  
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