

'expand' the availability of the finite energy resources; secondly, it reduces the detrimental effects of energy production and use; and thirdly increasing the efficiency of energy use is often more attractive than investing additional resources to increase the domestic energy supply. In Malaysia, the growth in energy consumption is around 8 per cent per annum and effective energy conservation is necessary to avert a possible energy crisis brought about by an increase in demand by the various industries. A typical energy conservation implementation programme is outlined. Finally the growing prospects for energy conservation makes it one of the world's major energy resources today and for the future.

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ENERGY OUTLOOK TO 2020: OPPORTUNITIES AND CHALLENGES FOR RESEARCH COMMUNITY IN MALAYSIA

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ABSTRACT

Malaysia is poised for accelerated gas utilization, to displace oil as a primary energy source, when major gas-based power and downstream projects become operational. At issue is whether the country will continue to pursue the four-fuel policy, especially with regard to using coal for electricity generation. Fuel security in the 1990s must somehow be reconciled with the need to protect the nation's huge investment in gas supply. As penetration of gas to displace petroleum products in industrial, transport, commercial and residential sectors is uncertain, domestic refinery input and output mix is simultaneously being modified so that it conforms more closely to the specification of domestic crude and consumption pattern thereby reducing to need to import petroleum products.

If large scale gas use is unchecked, the country may become overly dependent on natural gas with the corresponding risk, but most importantly, our gas reserves will be completely depleted within less than two generations. There is some concern whether the present Malaysia generation should use our gas reserves to sustain economic progress to 2020 or leave the gas in the ground for future generations? On the basis of preliminary results obtained from a study 'Integrated National Energy Plan', this paper argues that a strategy of using oil, natural gas, hydro, coal and nuclear energy for electricity generation will lead to a more balanced primary energy supply mix, while satisfying the goals for industrial development and

leaving adequate national resources as inheritance for future generations. Under the Vision 2020 scenario (7% GDP growth p.a over three decades), final energy demand will grow by more than eight times while electricity will increase at least ten-fold in 2020 compared to 1990, despite significant progressive gains in energy efficiency (20 percent). Our progress to 2020 introduces major constraints and challenges to energy corporation responsible for providing adequate and reliable energy supply. It is very likely that the present practice for farm out specific problems to research bodies and institutions of higher learning (outsourcing) would be continued and expanded, presenting vast opportunities for the research community in the country. The challenge is to provide cost-effective solutions to ensure reasonably priced energy supply to power the nation's progress, as well as the profitability of private sector entities like Tenaga Nasional and subsidiaries and production sharing partners of Petronas.

NGV - ITS MARKET AND TECHNOLOGY

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ABSTRACT

The Natural Gas for Vehicles (NGV) industry is poised to take off significantly transpiring from the Peninsular Gas Utilization (PGU) program and the regional supply of natural gas undertaken by Gas Malaysia. Its setting could also be due to variety of other reasons such as the environmental pressure exerted by the government and community, or simply for economics and security reasons. What ever the causes are, it looks certain that the industry is there to stay. This paper highlights the developmental needs of the market, its potential and technological support required to sustain the credibility of the NGV industry. Various options in NGV technology and the future direction of R & D were also discussed.