

MALAYSIA: IMPROVING ENERGY INTENSITY

Towards Energizing a Competitive Energy Industry
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Energy is one of the most important driving forces for a nation to develop. Alternative energy sources and efficiency improvements become essential for energy planning, resource optimization and environmental protection. Malaysian power generation fully depends on fossil fuels that produces huge amount of emission. Solar energy has a good potentiality in Malaysia. However, Malaysia has given emphasis on renewable energy and the renewable energy target is 5.5% of Malaysia's total electricity generation mix by 2015. Energy suppliers in Malaysia are regulated by the state, through The Department of Gas and Electricity Supply Act, which also maintains price regulation. As an upper middle-income country with the second highest GDP per capital in ASEAN, Malaysia's economy is well diversified with a competitive manufacturing base and sound industrial and services sector. The nation's electricity industry had played a vital role in energizing the domestic economy in achieving its target as a high-income nation status by 2020.

SWITZERLAND IN VIEW

According to IMD WCY, the energy intensity is the amount of energy consumed for each US dollar of Gross Domestic Product. Switzerland ranks first in energy intensity for the fifth consecutive year, while Malaysia ranks slightly the same over the same five years from 2010 to 2015. The energy intensity decreases over those period, proving that the nation are consuming energy in a more efficient way. Switzerland has been long known for using hydropower as its source of renewable energy (RE) and constantly looking for new RE such as solar, wood, biomass, wind, geothermal and ambient heat in its energy mix

Under the Tenth Malaysia Plan (10MP), the Government highlighted the New Energy Policy, which focuses mostly on energy efficiency that aims to enhance energy security and reliability of supply through the development of hydro sources, Liquefied Natural Gas (LNG) and coal for power. The Eleventh Malaysia Plan (11MP) outlines the growth of Renewable Energy (RE), additional capacity to import LNG, intensified new generating capacity and related transmission and distribution of infrastructure in Peninsular Malaysia by 2020.

Energy Situation in Malaysia : Present and Its Future

Growing industrialization and increasing standard of living has considerably increased the usage of energy. Malaysian energy consumption has risen dramatically over the past 20 years due to the combined demands of industrialization and urbanization. Due to increasing energy consumption, there has been a growing concern about energy consumption and its adverse impact on the environment. Rational and efficient utilization of energy resources bears special importance as well. The aim of the research is to investigate the energy demand, supply, consumption, environmental impact as well as review the future energy resources. In recent years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies particularly in high efficient technology. Energy is an indispensable factor for the social and economic development of the societies. The usage level of energy is an indication of the economic prosperity of a nation. Known energy sources are exhausted rapidly due to increasing the energy consumption. Therefore, alternative energy sources are very much important for the future energy demand. In the recent years, renewable energy is very popular in many countries. Among the renewable energy sources, solar energy is the most potential energy sources in Malaysia. The earth receives about 1000 pW of energy from the sun every year. This amount is enough to cover the Earth's energy demand for over 1000 times. Capturing sunlight and turning them into electricity for daily usage is a very good idea and the photovoltaic system has been applied in Malaysia in early 1980s. Nowadays, photovoltaic technology grows rapidly in worldwide.

Developed countries (i.e. America, Europe, Australia, China, Japan) have been applied the photovoltaic technology for development of the countries. The developing countries (i.e. Malaysia, Thailand, Vietnam) are starting the use of the PV technology. Photovoltaic technology is growing fast due to the awareness of climate change, thinner ozone layer and carbon emission. The average of solar radiation is 400 to 600 Mj/m² in Malaysia. It has a promising potential to establish large scale solar power installations. The Malaysian government is keen to develop solar energy as one of the significant sources of energy in the country. However, despite rigorous initiatives, the renewable target set out under the Ninth Plan period was not achieved. Under the Tenth Plan (2011–2015), several new initiatives anchored upon the Renewable Energy Policy and Action Plan has been undertaken to achieve renewable energy target in 2015, contributing 5.5% to Malaysia's total electricity generation mix. Major usage of solar field is known as the photovoltaic device. The main aim was encourage of consumers to use of solar energy. The first project started on residential sector for directing of awareness on how to use solar energy in domestic area. Solar irradiation is so large in this area. According to report of government in Malaysia, there will be around 50% to 80% of energy will be generated by solar PV. It can be said that in the north and north east part of Malaysia the value of solar radiation is the highest. It is found that energy consumption is to increase rapidly all over the world as well as in Malaysia. Industrial sector is one of the major energy consumers where the energy consumption increasing rate is very high compared others sectors. Malaysia has good renewable energy resources that can be used for power generation. Solar energy is one of the most potential renewable energy sources.

Energy Situation in the World

Energy is the key input and basic need for the development, economic growth, automation and modernization. As a result, global energy demands are increased rapidly and this concern is addressed internationally to fulfill the demand of energy for the future world.

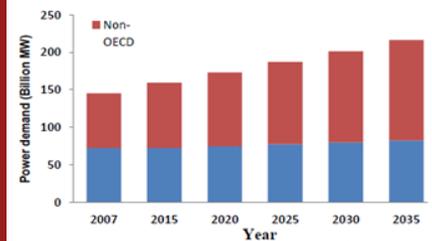


Figure 1 World marketed power demand [4]

World power demand rises from 145 billion MW in 2007 to 218 billion MW in 2035 (i.e. increases by 49 %). Industrial sector consumes more than one third of total world energy consumption. It is also predicted that the share of energy consumption in this sector will be increased in future. Energy demand is increased due to the increasing the economic activities and automation in the industrial sector.

As such it is an important task to analyze and predict energy uses in the industrial sector for the future. Energy used in the industrial sector is more compared to any other sector of the world's total energy used. The demand of energy in the industrial sector depends on the region, country, level of economic activities, industrial product, production processes, technological development.

Energy consumption in the industrial sector increases rapidly in the non-OECD countries due to quick growth of their economy and predicted that the annual average rate will be 1.8 % from 2007 to 2035. Climate change is an important environmental problem which potentially leads to rises in sea levels, loss of coastal land, and ecological shifts.

A major cause of climate change is emissions of greenhouse gases. However, to fulfill the energy demand, energy generation sector contribute to the environmental degradation (i.e. emission, air pollution, acid rain, climate change etc.) To save the earth by curbing global warming has become a common mission of all humanity.