Energy Market

Renewable Energies | Energy Market

Electricity consumption will comprise an increasing share of global energy demand during the next two decades. In the International Energy Outlook 2017 Reference case, total world energy consumption rises from 575 quadrillion British thermal units (Btu) in 2015 to 736 quadrillion Btu in 2040, an increase of 28%. Most of the world's energy growth will occur in countries outside of the Organization for Economic Cooperation and Development (OECD), where strong, long-term economic growth drives increasing demand for energy. Non-OECD Asia (including China and India) alone accounts for more than half of the world's total increase in energy consumption over the 2015 to 2040 projection period. By 2040, energy use in non-OECD Asia exceeds that of the entire OECD by 41 quadrillion Btu in the IEO2017 Reference case (Figure 1)[1]

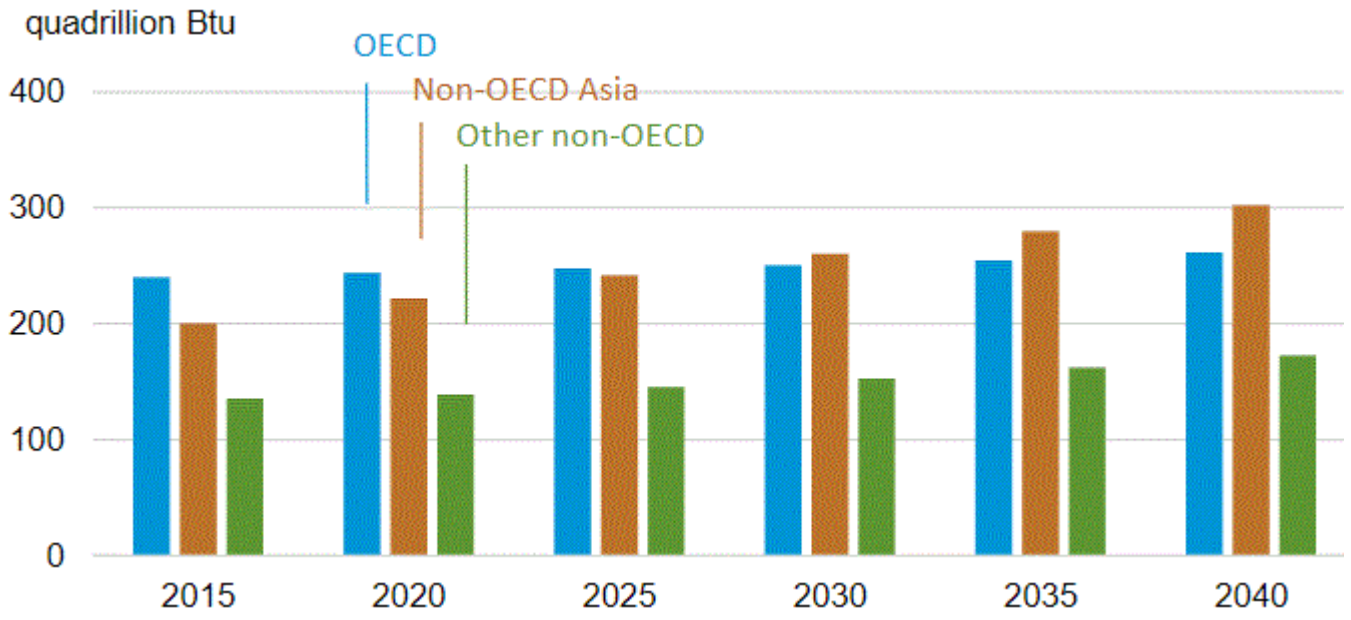

Fig. 1 World Energy consumption by country grouping

Renewable: Why?

Research into alternative sources of energy dated back in the late 90s when the world started receiving shock from oil produces in terms of price hiking.[2] In recent years, the increasing prices of fossil fuels and concerns about the environmental consequences of greenhouse gas emissions have led more nations to seek a technology mix that simultaneously lowers greenhouse gas emissions and enables economic growth. Considering that the major component of greenhouse gases is carbon dioxide, there is a global concern about reducing carbon emissions. In this regard, different policies could be applied to reducing carbon emissions, such as enhancing renewable energy deployment and encouraging technological innovations.

Due to the fluctuations in oil price and its impacts on coal and gas prices, a large amount of investment has been made over recent years in renewable energy. These advancements in

technology have enabled countries to produce renewable energy in larger quantities and more cost effectively. Renewable energy production and supply is continuously increasing on the global level. In the long term, the IEO2017 Reference case projects increased world consumption of marketed energy from all fuel sources—except coal, where demand is essentially flat—through 2040 (Figure 2). (1)

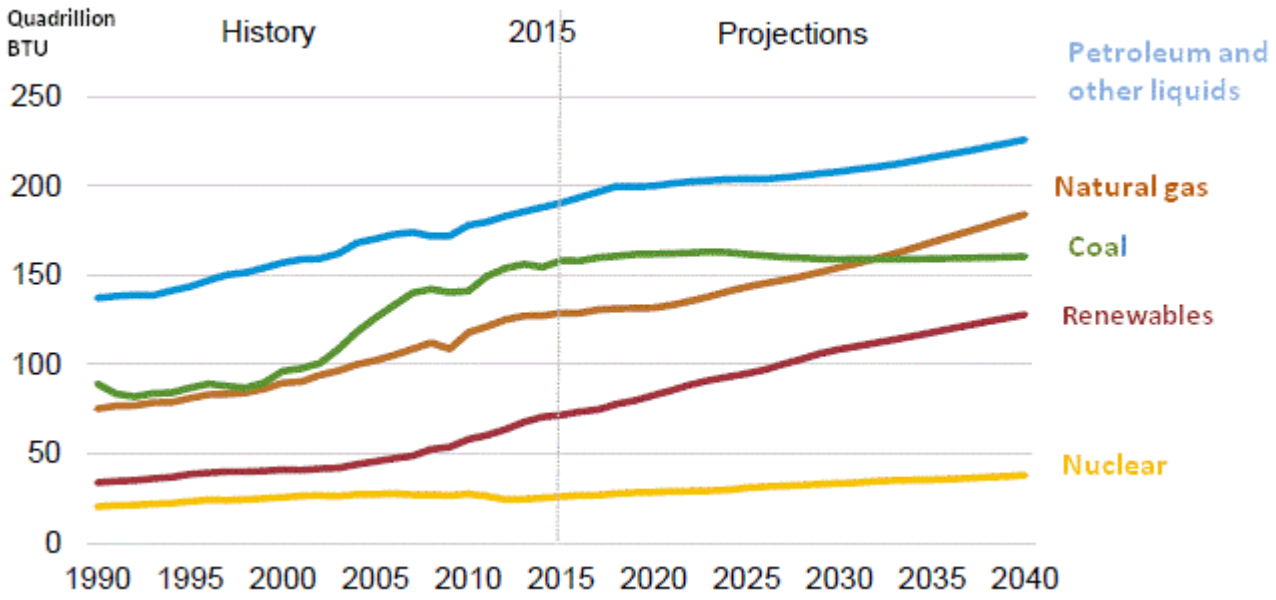

Fig. 2 World energy consumption by energy source, quadrillion Btu

Renewables sources are the world's fastest-growing energy source, with consumption increasing by an average 2.3%/year between 2015 and 2040. Although consumption of non fossil fuels is expected to grow faster than fossil fuels, fossil fuels still account for 77% of energy use in 2040. However, the liquids share of world marketed energy consumption falls from 33% in 2015 to 31% in 2040, leading many energy users to adopt more energy-efficient technologies and to switch away from liquid fuels when feasible [1]

A majority of the communities around the world rely heavily on oil, natural gas and coal for their energy needs. These fuels draw on lots of resources that

will eventually diminish, which in turn makes them too expensive or too environmentally damaging to recover. For that reason, many countries have renewed the interest in the development of alternative energy resources and have started to install facilities that use renewable energy sources for power generation. Meanwhile, new energy investments are expected to continue to provide affordable and reliable energy services and expand them to populations that currently lack access to these services. The search for efficient, low-carbon energy sources involves a realistic assessment of the benefits and constraints of existing and new technologies, as well as their socioeconomic implications. [3]

Renewable: How?

There are two primary concepts talking about clean technologies: energy supply technologies, which refers to alternative sources of renewable energy (e.g., wind and solar power), and energy efficiency technologies, or those technologies which are hired to enhance energy use efficiency, (e.g., combined heat and power (CHP), virtual power plants (VPP) and smart meters. It should be noted that transforming the energy sector and replacing conventional energy with renewable energy is evolutionary associated with technological change and forming markets. 1

IRENA's analysis shows that energy efficiency and renewable energy have the potential to achieve 90% of the emissions reductions needed by 2050 with renewables accounting for two-thirds of primary energy supply in 2050, growing from 16% today. To deliver on the above goals, the growth of the renewable share in total final energy consumption needs to rise seven-fold, from 0.17% per year between 2010 and 2015 to 1.2% per year on average until 2050. The annual improvement rate of energy intensity – total supply of primary energy per unit of gross domestic product measured in power purchasing parity – needs to nearly double

from in the level of the past two decades.[4]

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[1] *International Energy Outlook Executive Summary, 2017; https://www.eia.gov*

[2] *Transforming the energy sector: the evolution of technological systems in renewable energy technology; Jacobsson, S., & Bergek, A. (2004)*

[3] *https://globalchange.mit.edu/research/focus-areas/energy*

[4] *www.irena.org/DocumentDownloads/Publications/IRENA_Energy_Transition_Innovation_2017.pdf*