

Global energy crisis

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Man is dependent on energy, which has been the key to his rapid industrial growth and technological development. The pace of development after industrial revolution is unprecedented. Just 200 years ago, the world experienced energy revolution that launched the industrial age. The catalyst to this epochal change was ordinary black coal - an energy rich hydrocarbon. A century later, oil and gas were added to satiate the thirst of industry. Man still relies mainly on these fossil fuels.

Nevertheless many other sources of energy: hydro, solar, nuclear, wind, geothermal, biogas and wave have been tapped. These sources of energy are not only renewable but clean as well. Since the hydrocarbons are exhaustible and their use also threatens human health and environment; this fact has necessitated transformation from non-renewable energy resources to renewable and clean energy resources so that economic growth could be sustained and environmental degradation could be prevented.

Energy is not only vital for the industry but it is also the life blood of our daily life. The consumption of fossil fuels has increased manifolds due to rapid industrialisation of developing countries like China and India. However, the major proportion of hydrocarbon is consumed by already developed countries like the US, Japan and Western European states. The fossil fuels are also the main source of energy for heating of houses and running motor vehicles and generation of electricity. Since the demand has been increased far more than the increase in the production of fossil fuels, a disproportionate imbalance between the demand and supply has been created which has resulted in energy crisis.

If the fossil fuel production remains constant, it is estimated that the reserves will be depleted soon. The oil crisis of 2008, when petrol prices soared to \$150 a barrel, was an early symptom of such scenario. The increasing demand coupled with speculations of depletion of fossil fuels caused sky rocketing rise in the prices, which was the principal catalyst behind economic crises in the world.

The energy crises are caused due to disproportionate dependence on non-renewable energy resources fossil fuels. The hydrocarbons; coal oil and gas together constitute 85 per cent of the world's total energy supply. Their respective share is oil 37 per cent; coal 25 per cent and gas 23 per cent (total 85 per cent).

On the other hand the renewable resources of energy; hydro, solar, wind, nuclear, geothermal, biogas and wave constitute only 15 per cent of global share of energy supply. These are also clean sources of energy. Despite their enormous benefits, the renewable sources of energy have not been exploited sufficiently due to many reasons. The reasons may include technological barriers, initial cost and political compulsions. Both the least developed and developing countries mainly face technological backwardness and barriers, while the developed countries have been too slow and reluctant to transfer their technology due to the higher cost and political reasons.

The world distribution of energy consumption reveals that the most developed countries are the highest consumers of fossil fuels. The US, which is the most advanced country technologically and richest economically, consumes 25 per cent of the total world energy output while its population makes only five per cent of the world. This makes America the highest per capita energy consuming nation. Second comes Japan, which consumes six per cent. The Western European countries which are also technologically advanced consume 15 per cent of the world energy. China, a growing economy, consumes nine per cent of the world energy resources. However, the rest of the world consumes only 45 per cent of energy production.

This consumption is in sharp contrast to the production in respect of regional distribution. As the US has only 2.4 per cent of world oil reserves and 3.5 per cent of gas reserves, Japan imports 75 per cent of its energy needs, China imports more than 50 per cent of its energy needs. The largest fossil fuel reserves are located in Middle East and Russia. The Arab countries possess 61 per cent of oil reserves of the world but they are not big consumers. This uneven distribution of consumption and production is the one cause of energy crisis. Other three causes behind the global energy crisis include surge in demand, tighter supply, political uncertainty in oil producing countries and lack of the diversity of resources. These factors are:

One, the demand of energy resources have surged throughout the world. In 1970, the total consumption of world was 204 Quadrillion BTU which doubled in 2000 to 402 Quadrillion BTU and is now around 500 QBTU higher. It is projected that the energy demand by 2030 will be increased by 50 per cent.

As the economy of world is mainly dependent upon fossil fuel energy, the demand of oil and gas is increasing tremendously. Let's take example of China has more than doubled its oil use over the past decade to 5.55 million barrel a day. The US Energy Information Administration (EIA) has reported that China oil needs could almost double to 11 million barrels a day by 2020. Same is the case with India, the largest growing economy in South Asia. The Central Asian and South American countries have also multiplied their consumption due to rapid industrialisation.

Two, the supply of oil and gas are mainly dependent upon the capacity to pump from the reserves. Though, the Organisation of Oil Exploring Countries (OPEC) boosted the supply during the peak crisis in 2008 but that was not enough to meet the demand of the market. Another factor determining the oil supplies is the volatile price mechanism. As the speculations cause increase in the prices, the oil producing countries get higher profits. This trend has led to new political concept– Resource nationalism. The international firms have found themselves faced with tougher terms and shut out of globe’s most promising oil basins.

Third, the supply of hydrocarbons is also affected by the political condition in the resource countries. Unfortunately, the political conditions in all the oil producing regions are volatile. It was painfully felt by the western world when Arab leaders clamped an oil embargo on the US in retaliation to Washington’s support of Israel in the 1973 Middle East war. Even today the conditions in this region are not stable. The US forces are occupying Iraq in order to secure oil supplies. Iran is facing sanctions due to nuclear imbroglio with the West. Russia is also at odds with Europe on the gas supplies. Hugo Chavez is busy in consolidating power in Venezuela where he is facing the US-backed political opposition. The Central Asian States have their own internal political turmoil.

Fourth, nature has bestowed man with infinite resources of energy but man has made himself dependent on the finite resources. The lack of diversity of resources is the chief cause of energy crises. Instead of harnessing new technology, the industrial growth in developing countries is increasingly dependent on fossil fuels.

Such importance of energy has made it important element in the foreign policies of the independent states. The 20th century and dawn of the 21st century have seen wars fought for oil. In 1977, CIA prepared a plan “Go to war to get oil” and subsequently, the US went to war with Iraq in 1991 Gulf war. America is again there for the same purpose.

Similarly China’s foreign policy towards many regions of the world particularly Africa, the Middle East and Caspian Sea region, oil holds a critical status. China’s vibrant policies in these regions are being watchfully monitored by Washington. This is also true for South Asian region. Pakistan is engaged with Iran for gas pipeline project and is equally interested in the Caspian Sea region – Central Asian States.

Besides these conflicts, the fossil fuels cause havoc to our environment. The hydrocarbons are the chief source of green house gases-carbon dioxide, Methane, fluorine, which cause global warming. Burning coal accounts for 43 per cent of carbon emissions. Oil and gas account for another 40 per cent of emissions of CO₂.

Fears of global warning aside, burning fossil fuel releases chemicals and particulates that cause cancer, brain and nerve damage, birth defects, lung injury, and breathing problems. The toxics released by combusting hydrocarbons pollute the air and water and causes acid rain and smog. These negative implications of burning fossil fuels on human environment and life make it incumbent upon man to diversify the energy resources.

Man also needs to realise that the fossil fuel energy is limited and would be depleted. Henry Kissinger had said, “The amount of energy is finite And competition for access to energy can become the life and death for many societies”.

First; the solar energy, the basic source of energy, can be converged and converted into different ways, such as simple water heating for domestic use or by the direct conversion of

sunlight to electrical energy using mirrors, boilers or photovoltaic cells. Currently only 0.5 per cent of the world energy supply is obtained from this source.

Second; humans have been harnessing the wind for thousands of years and have succeeded in producing electricity from it. Air flowing through turbines or spinning blades generates power that can be used to pump water or generate electricity. At present, the wind energy constitutes 0.3 per cent of world energy supply but it has a great potential. Germany is producing 23000 MW from wind, which is more than Pakistan's total installed electricity generation capacity. Like solar energy it is also a clean source of energy. According to the US Department of Energy the world's winds could supply more than 15 times its current energy demand.

Third; hydroelectric power is another source of renewable energy in the natural water cycle. The flow of streams can be manipulated by construction of dams at higher altitudes and the kinetic energy of waterfall is used to rotate the turbines to make electricity. This is the very cheaper source and clean form of energy.

Fourth; atomic energy is hailed as panacea to pollution problems generated by fossil fuels, and is destined to be the cheapest source of energy. However, it is also limited and has hazardous effects on human health. But given the potential of energy and the capacity of technology to safeguard the nuclear plants, it is the quickest option to solve the energy crises in the world as one nuclear pellet (finger) produces energy equivalent to 17000 cubic feet of natural gas.

Fifth; biomass is also a potential source of energy. Humans have been burning biomass materials since the dawn of time. It has been recently discovered to produce clean combustible gas from waste products such as sewerage and crop residue. Many countries have also invested in bio-fuels. However, this is counter-productive as it induced rise in food prices, therefore only bio waste should be used for energy production.

Sixth; another alternate source of oil is methanol – a clear colourless liquid made from natural gas, coal industrial garbage. This is a reliable source of fuel for automobiles as it is cheaper and far easier to be produced in bulk.

Seventh; geothermal energy can be used with heat pumps to warm a buildings or swimming pools in winter. This can lessen the need for other power to maintain comfortable temperatures in buildings, particularly in countries having very cold winters.

Eighth; hydrogen has been touted as the fuel of the future. It is most abundant element known in the universe and can be burnt as a fuel for vehicles and industry. If this form of energy is taped at a larger scale, it will eventually become society's primary energy carrier in the 21st century.

The media and industry claim that renewable energies are not yet economically competitive fossil fuels. Perhaps not; but given the health and environmental costs, and limit of fossil fuels, the price of renewable energy is only viable option. However, no renewable energy form will single handedly replace oil, but together they will become a very important part of the energy mix of the future.

As the demand of energy is set to grow rapidly during next 20 years the supply of energy is going to decline, which could give rise to competition and conflict coupled with economic instability. Meanwhile, human environmental and health hazards could become irrecoverable. Therefore, man should strive for energy independence that can be achieved

only through fuel choice and competition. And the first choice of sustainable energy is the clean and renewable energy.
