



JECRC Foundation

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE



JAIPUR ENGINEERING COLL.
AND RESEARCH CENTRE

Year & Sem. – IV Year (VII Sem.)

Subject – Power Generation Sources (7EE6-60.2)

Unit – 1

Topic: World Energy Scenario

VISSION AND MISSION OF INSTITUTE

Vision:

To become a renowned center of outcome based learning, and work towards academic, professional, cultural and social enrichment of the lives of individuals and communities.

Mission:

M1: Focus on evaluation of learning outcomes and motivate students to inculcate research aptitude by project based learning.

M2: Identify, based on informed perception of Indian, regional and global needs, areas of focus and provide platform to gain knowledge and solutions.

M3: Offer opportunities for interaction between academia and industry.

M4: Develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

VISSION AND MISSION OF DEPARTMENT

Vision:

The Mechanical Engineering Department strives to be recognized globally for excellent technical knowledge and to produce quality human resource, which can manage the advance technologies and contribute to society through entrepreneurship and leadership.

Mission:

M1: To impart highest quality technical knowledge to the learners to make them globally competitive mechanical engineers.

M2: To provide the learners ethical guidelines along with excellent academic environment for a long productive career.

M3: To promote industry-institute linkage.

WHY ENERGY?

Energy is one of the major inputs for the economic development of any country. In the case of the developing countries, the energy sector assumes a critical importance in view of the ever increasing energy needs requiring huge investments to meet them.

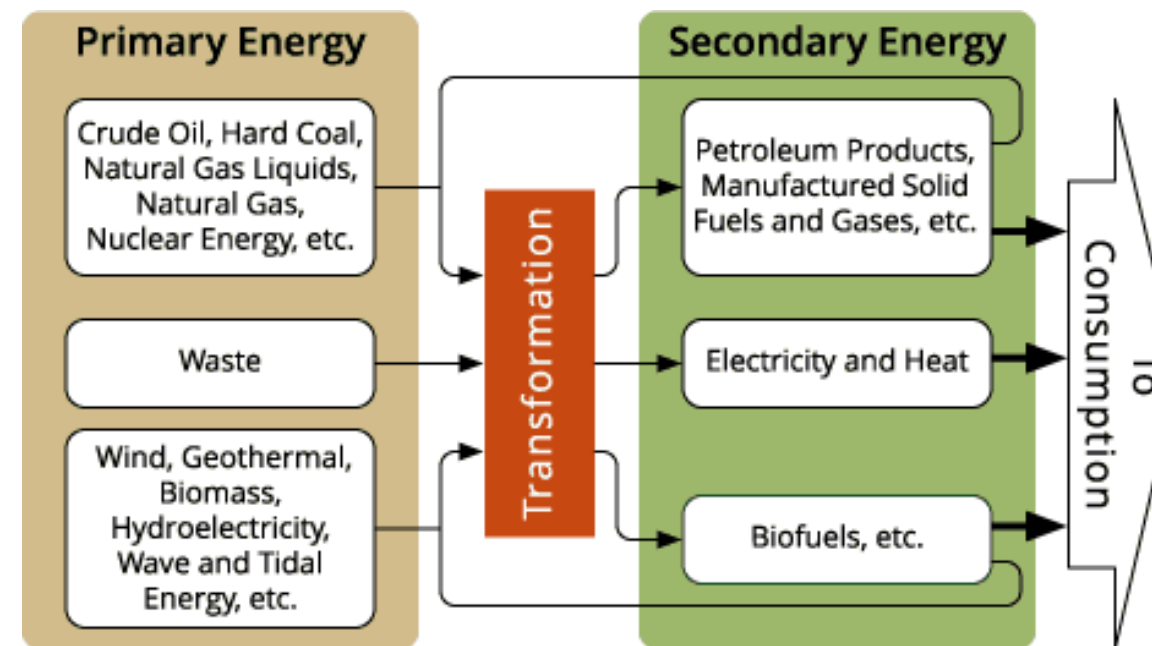
Energy can be classified into several types based on the following criteria:

1. Primary and Secondary energy
2. Commercial and Non commercial energy
3. Renewable and Non-Renewable Energy

Primary and Secondary Energy

Primary Sources: Primary energy sources are either found or stored in nature like coal, oil, natural gas, and biomass (such as wood). This also includes nuclear energy from radioactive substances, thermal energy stored in earth's interior, and potential energy due to earth's gravity.

Secondary Sources: Primary energy sources are mostly converted in industrial utilities into secondary energy sources; for example coal, oil or gas converted into steam and electricity. Primary energy can also be used directly



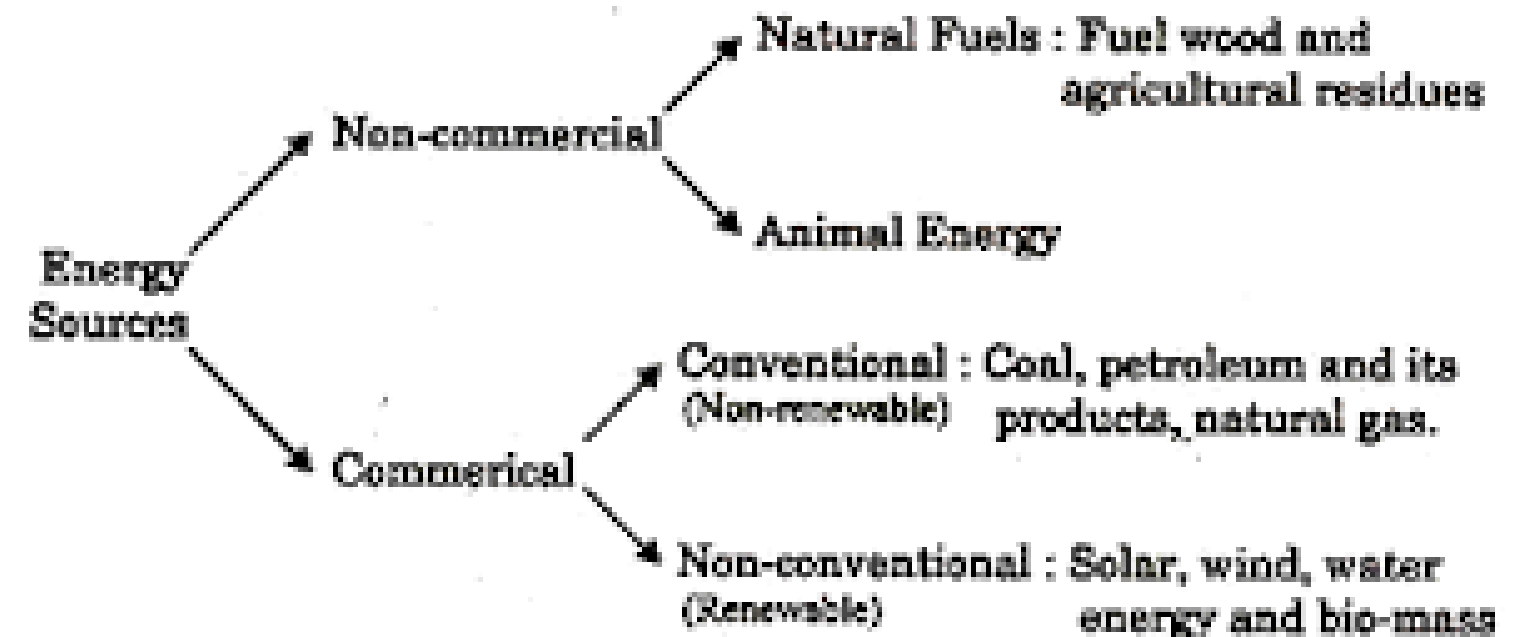
Commercial and Non commercial Energy

Commercial Energy: The energy sources that are available in the market for a definite price are known as commercial energy. Commercial energy forms the basis of industrial, agricultural, transport and commercial development in the modern world.

Examples: Electricity, coal and refined petroleum products.

Non-Commercial Energy: The energy sources that are not available in the commercial market for a price are classified as non-commercial energy. These are also called traditional fuels. Non-commercial energy is often ignored in energy accounting.

Examples: firewood, cattle dung and agricultural wastes- which are traditionally gathered, and not bought at a price used especially in rural households



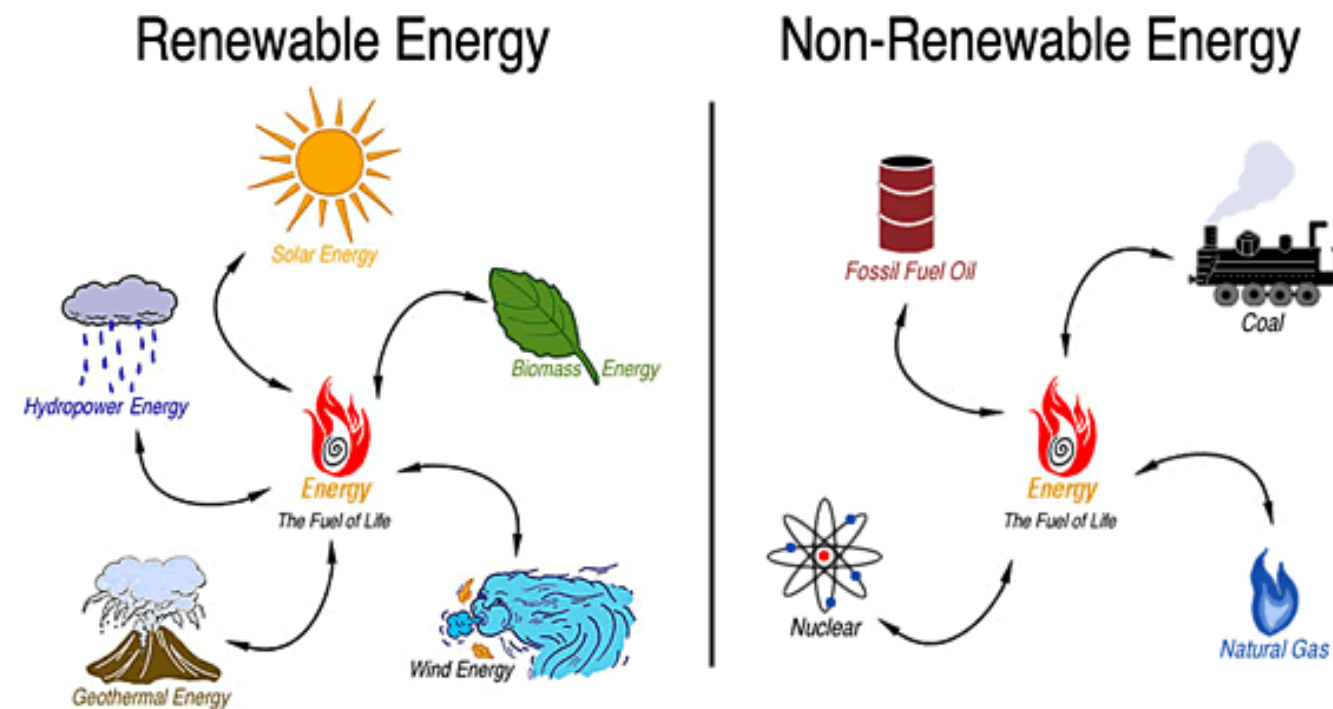
Renewable and Non-Renewable Energy

Renewable Energy : Renewable energy is energy obtained from sources that are essentially inexhaustible. The most important feature of renewable energy is that it can be harnessed without the release of harmful pollutants.

Examples: Wind power, solar power, geothermal energy, tidal power and hydroelectric power.

Non-Renewable Energy : Non-renewable energy is the conventional fossil fuels, which are likely to deplete with time.

Examples: Coal, oil and gas



World Energy Scenario

World energy consumption

Access to energy is a key pillar for human wellbeing, economic development and poverty alleviation

Global gas consumption accelerated in 2018, spurred by the US and China, which accounted for around two thirds of the additional consumption.

[China](#), the world's largest energy consumer since 2009.

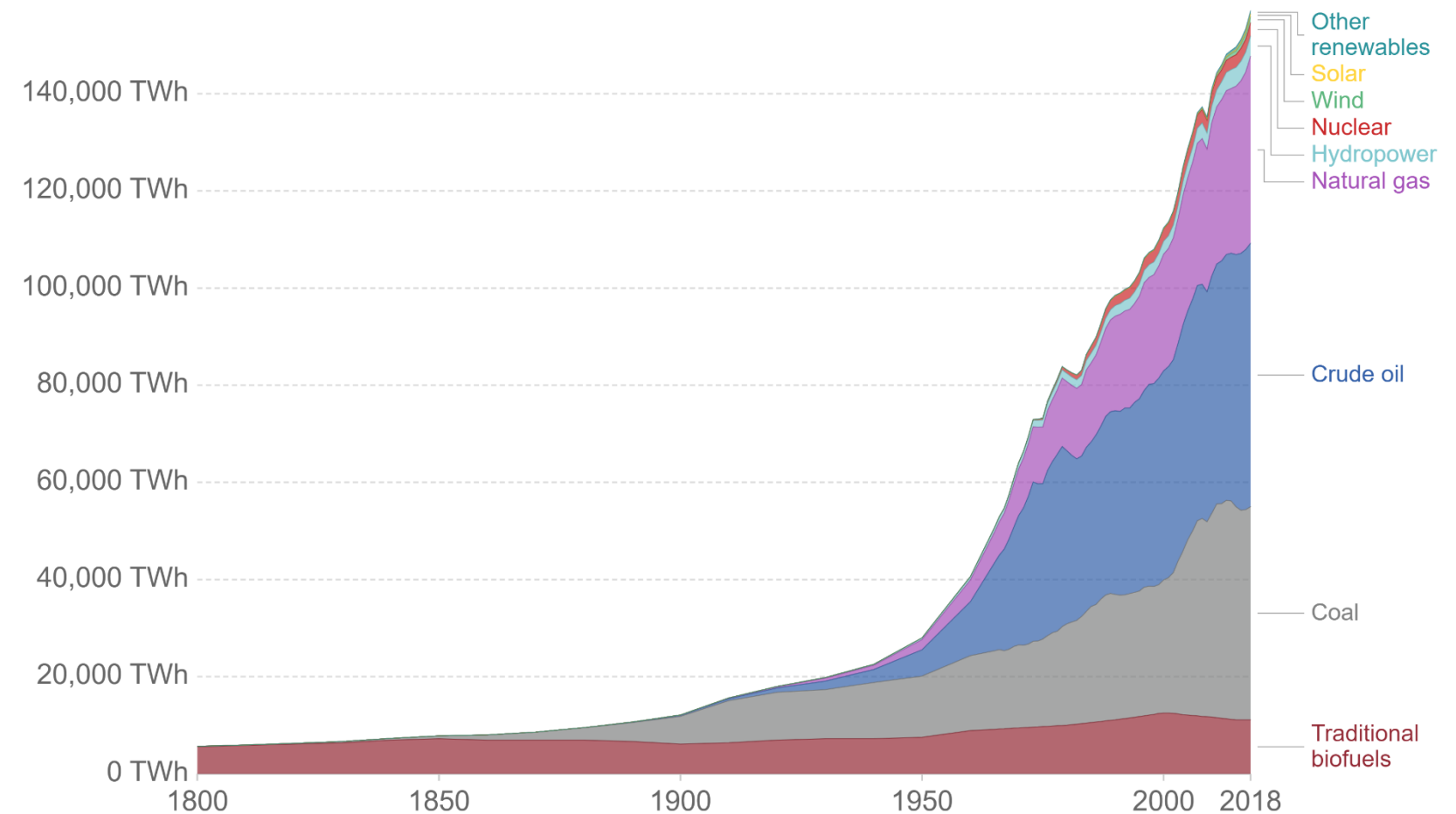
Total energy consumption in the [United States](#) reached a record high of 2.3 Gtoe in 2018, up 3.5% from 2017

On the contrary, energy consumption decreased in the [European Union](#) (-1%) and in particular in Germany (-3.5%) partly due to decreasing consumption in the power sector

Global primary energy consumption

Global primary energy consumption, measured in terawatt-hours (TWh) per year. Here 'other renewables' are renewable technologies not including solar, wind, hydropower and traditional biofuels.

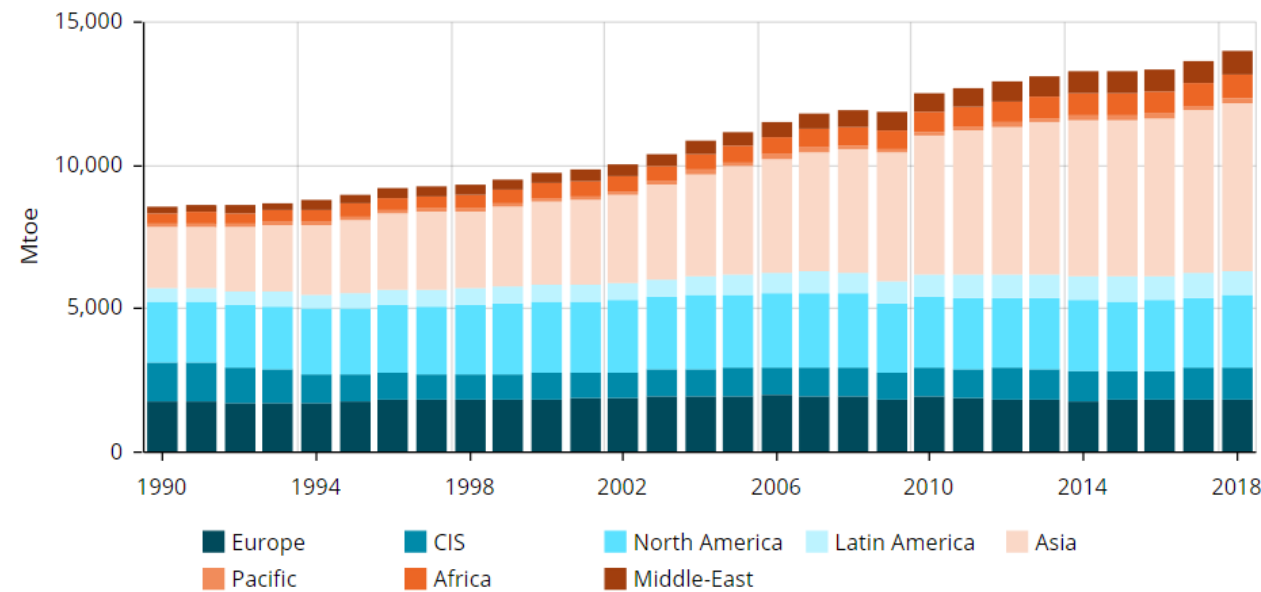
Our World
in Data



CC BY

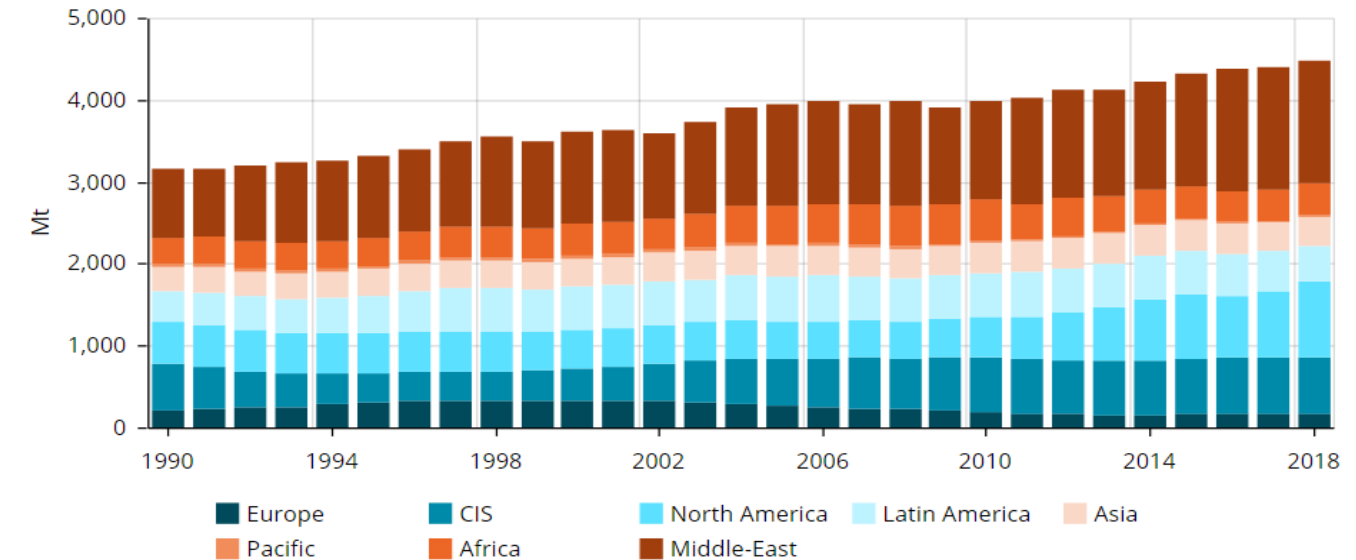
World Energy Consumption

China's energy consumption growth rate.: 3.7%



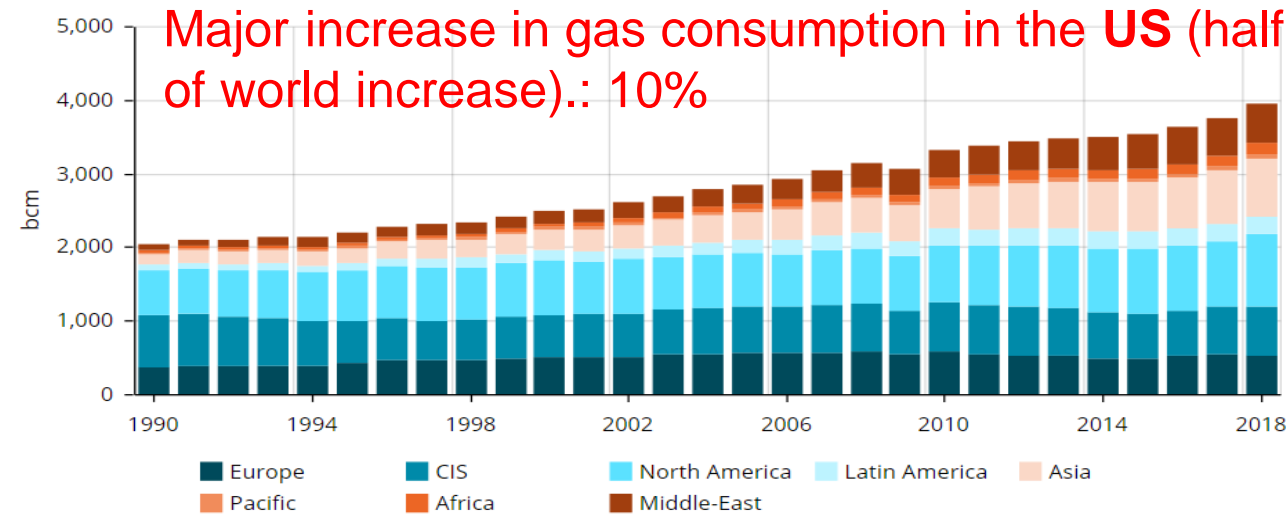
Total Energy

Sharp rise in crude oil production in the US



Crude Oil

Major increase in gas consumption in the US (half of world increase).: 10%



Natural Gas

Use the following link for updated/other data

<https://yearbook.enerdata.net/total-energy/world-consumption-statistics.html>

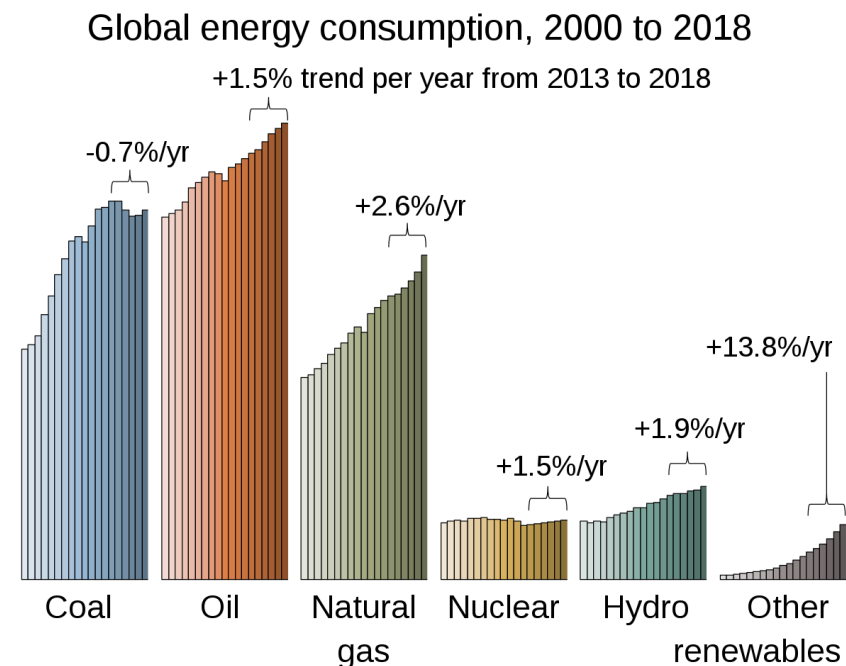
Reasons of Increase of Energy Demand

Population Growth: World population is the total number of humans currently living, and was estimated to have reached 7.8 billion people as of March 2020 and more than 9.7 billion by 2050, driven mainly by population growth in the emerging economies that will represent 85% of global population

Shift in Global Economic Power: 60% of global GDP will be in these emerging countries by 2050.

Increased Urbanization: We expect to go from 3 to 6 billion people living in cities in 2050. The new infrastructure will be built in Asia and Africa .

Aging Population: We are not only becoming more people, we are becoming older. Today we are some 500 million people over 65. By 2050 this will have increased more than 3 times to above 1.6 billion.



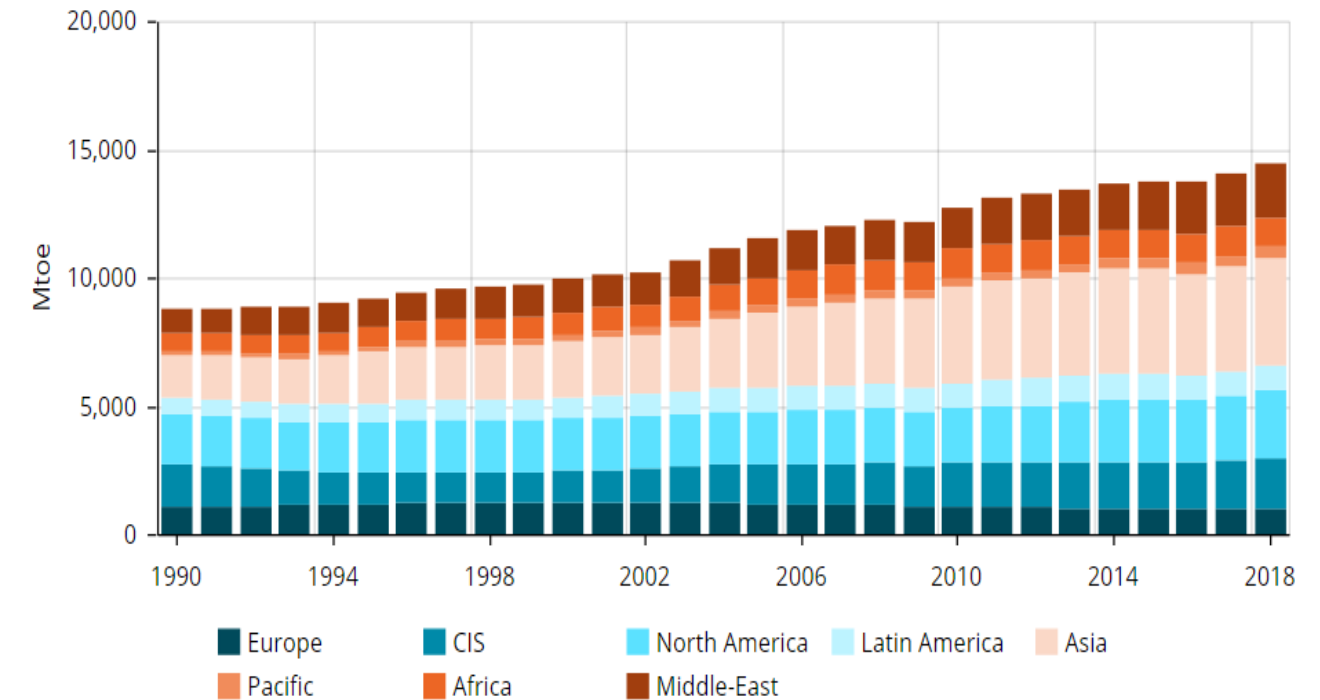
World Energy Production

Key data for 2018 energy production by fuel are as follows

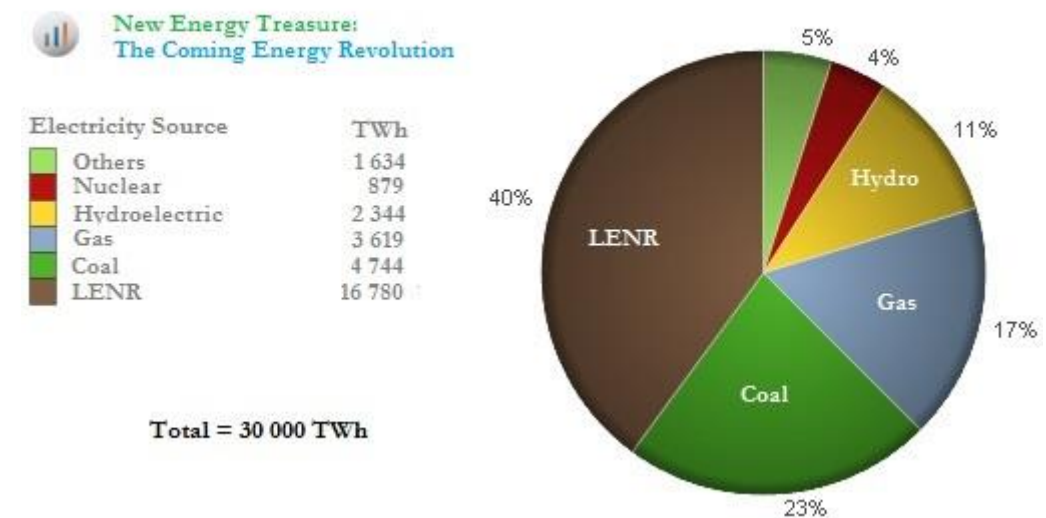
The United States and China were the main contributors to the increase in global energy production, together contributing 54% of growth in 2018.

- **Crude oil:** +2% driven by explosive growth of shale in the United States (+16.5%)
- **Gas:** +5.2% propelled by the United States and Russia, the two main producers
- **Coal:** +1.9%, led by China, the world's largest producer
- **Electricity:** +3.5% with China and the United States accounting for three quarters of the rise in 2018

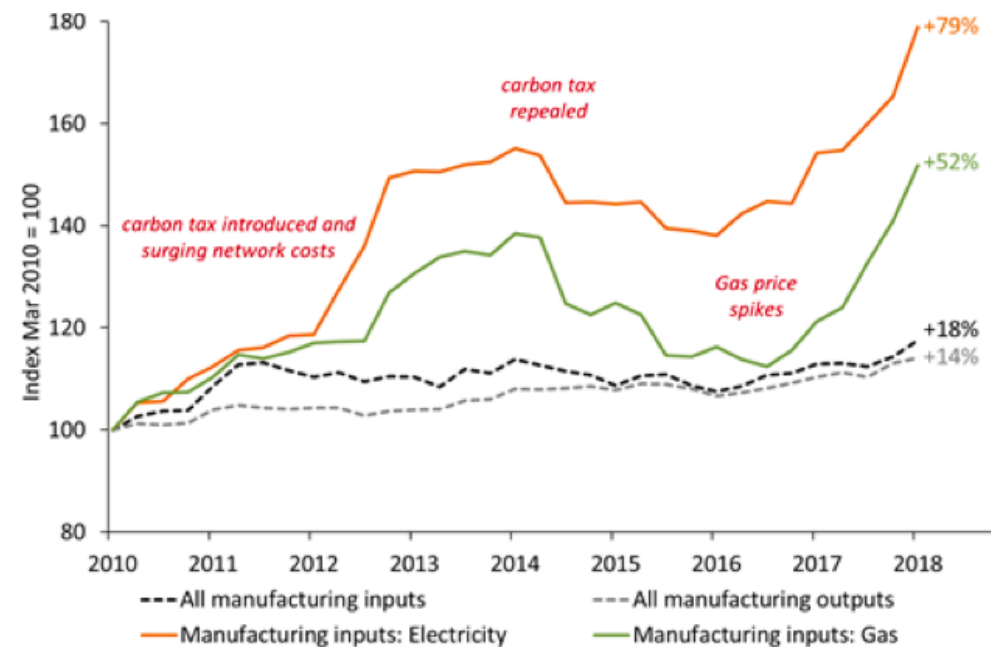
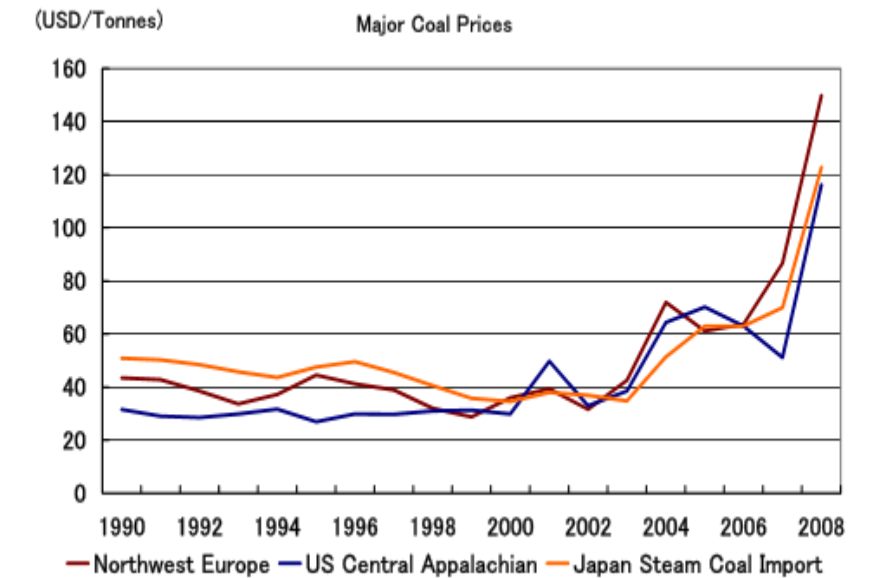
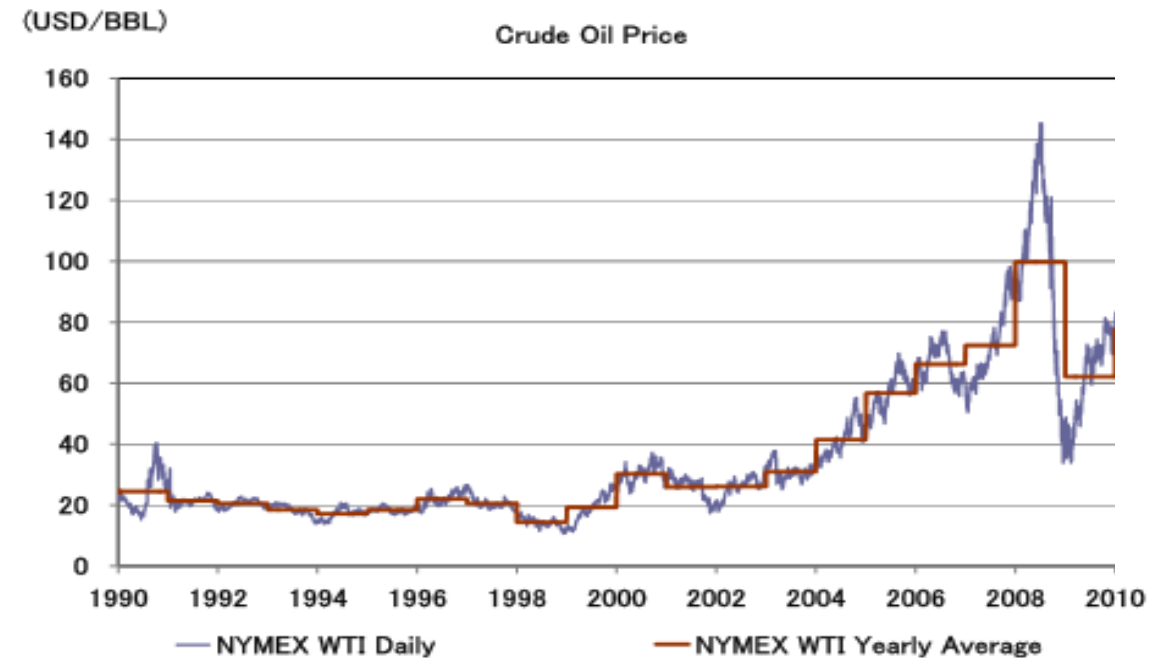
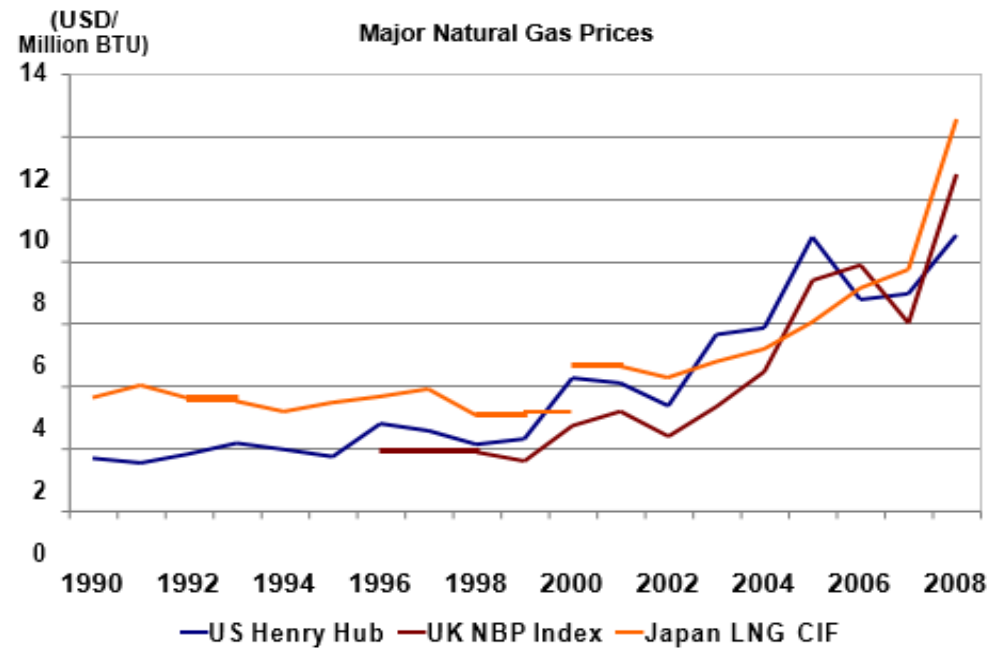
14% Growth in US oil and gas production in 2018.



World Electricity Production from All Energy Sources in 2020 (TWh)



Trend of International Energy Prices



The price hike this time involved various factors:

- (1) An increase in consumption by the newly wealthy in developing countries,
- (2) Geopolitical risk and a decrease in stockpiles due to “resource nationalism” in supply countries,
- (3) The influences of speculative investors,
- (4) Inflation and influences of dollar depreciation and quotation in dollars, and so forth.

Assignment-1

Q.1 Classify the types of the energy available on the earth?

Q.2 Mention some of the long-term energy strategies available for the better energy. Also discuss the demand and supply aspect of energy in the world.

Q.3 Briefly describe the economic reforms in Coal, oil and natural gas and electricity sectors ?

Q.4 Differentiate between Energy Conservation and Energy Efficiency.
?

Q.5 Differentiate between Commercial and non-Commercial Energy Sources?



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*Thank
you!*

STAY HOME, STAY SAFE