

Forum: United Nations Environmental Programme (UNEP)

Issue: The question of renewable energy and future energy demands

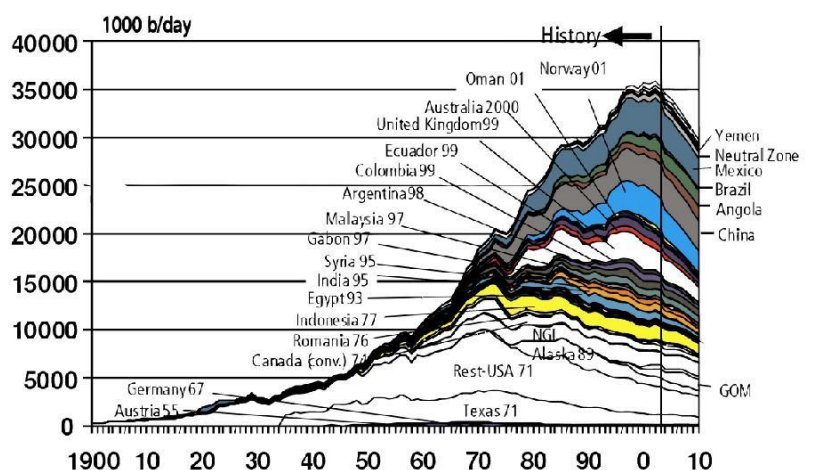
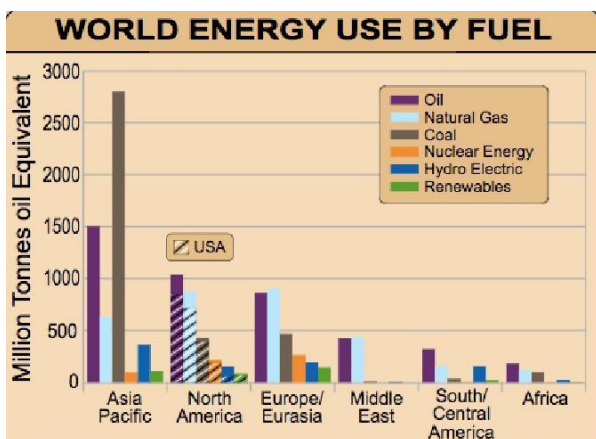
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1. Introduction— Renewable energy is collected from renewable resources, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energies are those generated from sources that do not have a finite end, or those that can be recycled Worldwide investments in renewable technologies amounted to more than US\$286 billion in 2015. Globally, there are an estimated 7.7 million jobs associated with the renewable energy industries, with solar photovoltaics being the largest renewable employer. Renewable energy resources exist over wide geographical areas, in contrast to other energy sources, which are concentrated in a limited number of countries. Renewable energy systems are rapidly becoming more efficient and cheaper. Their share of total energy consumption is increasing. Growth in consumption of coal and oil could end by 2020 due to increased uptake of renewables and natural gas.

2. Key Terms— *Renewable energy*: energy from a source that is not depleted when used, such as wind or solar power. *Fossil fuels*: a natural fuel such as coal or gas, formed in the geological past from the remains of living organisms. *Biofuels*: a fuel (such as wood or ethanol) composed of or produced from biological raw materials. *Levelized cost of electricity (LCOE)*: is used to indicate the average cost per unit of electricity generated, allowing for the recovery of all costs over the lifetime of the plant. It includes capital, financing, operation and maintenance, fuel (if any), and decommissioning. *Energy return on energy invested (EROI)*: Life-cycle analysis, focused on energy, is useful for comparing net energy yields from different methods of electricity generation. (*Energy*) *Peak theory*: The Hubbert peak theory is based on the observation that the amount of depletable resources such as oil, coal, and natural gas in any region is finite. *Load*: An end-use device or customer that receives power from the electric system; electrical demand.

Picture on the right shows a picture explaining the Hubbert peak energy theory by showing oil consumption.



3. History— With rapid development of technology during the industrial revolution, all attention was swung away from renewable energy sources as the industrial revolution progressed on the basis of the concentrated energy locked up in fossil fuels. Theories and investment in solar technology lasted until the outbreak of WWI. The importance of solar energy was recognized in a 1911 Scientific American article: "in the far distant future, natural fuels having been exhausted, solar power will remain as the only means of existence of the human race". The concept of peak oil in the 1950s began a new drive towards renewables. In the 1970s environmentalists promoted the development of renewable energy both as a replacement for the eventual depletion of oil, as well as for an escape from dependence on oil, and the first electricity generating wind turbines appeared. Solar panels were too costly to build solar farms until 1980. The IEA 2014 World Energy. Fossil fuels received about \$550 billion in subsidies in 2013, compared to \$120 billion for all renewable energies. As of 2015 worldwide, more than half of all new electricity capacity installed was renewable. On 22 April 2016 the Paris Agreement was signed, strongly encouraging the use of renewable energy.

4. Key Issues—

1. commercialization barriers faced by new technologies competing with mature technologies
2. price distortions from existing subsidies and unequal tax burdens between renewables and other energy sources
3. failure of the market to value the public benefits of renewables
4. wind and solar generation increase variability and uncertainty.
5. Approximately 40% of the world's population, mostly in low- and middle-income countries, don't have access to modern sources of energy, instead relying on old-fashioned biomass burning, such as the use of firewood, charcoal, or animal waste, which leads to environmental issues.

5. Major Parties Involved— China- the biggest wind energy producer & second biggest solar energy producer; USA-second biggest wind energy producer & fifth biggest solar energy producer; Germany- third biggest wind energy producer & the biggest solar energy producer; Sweden- although not the biggest producer of solar energy on world scale, Sweden leads the way with approximately 50% of its energy coming from renewables in its gross final consumption; The International Renewable Energy Agency- is an intergovernmental organization to promote adoption and sustainable use of renewable energy. It was founded in 2009 and its statute entered into force on 8 July 2010.

6. Timeline— Nov. 17, 2007 The Intergovernmental Panel on Climate Change (IPCC) Report

Concludes Climate Change Is Happening and Is Mostly Human Caused

Feb. 17, 2009 - American Recovery and Reinvestment Act of 2009 Contains Billions of Dollars for Renewable Energy and Energy Efficiency Developments

June 25, 2013 - President Obama Releases His Climate Action Plan Including Increased Use of Renewable Energy and Carbon Pollution Restrictions for Power Plants

22 April 2016 - The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gas emissions mitigation, adaptation and finance starting in the year 2020. Mar. 28, 2017 - President Trump Signs Executive Order to Begin Reversal of President Obama' Clean Power Plan

7. Evaluation of Previous Attempts— *US-China Clean Energy Research Centre* (CERC), announced in 2009, is a research and development (R&D) partnership between the United States and China. CERC is a great example of how today's developed nations are aiding the deployment of renewables in currently developing countries. The transfer of resources, funds, and technological knowledge from developed countries to less developed countries (LEDCs), with collaboration involving research, business, venture capital, and government organization in both groups of countries. CERC has already had numerous notable accomplishments such as: “accelerating market uptake of critical air barrier technologies”, “Developing more energy efficient and lower cost ground source heat pumps” and many more.

8. Possible Solutions— An important issue to tackle is the increasing the infrastructure of LEDC-s and the use of renewable energy.

9. Bibliography—1. Global Education Project, “ World Energy Supply”, *theglobaleducationproject.org*;

2. *Unknown*, “Renewable Energy: All You Need To Know”, *EnironmentalScience.org*;

3. Wikipedia, “Photovoltaics”, published by Wikimedia Foundation, Electronically published on September 28, 2017;

4. Wikipedia, “Renewable energy”, published by Wikimedia Foundation, Electronically published on September 13, 2017.

Appendices— <http://www.resilience.org/stories/2010-08-12/nine-challenges-alternative-energy/>

<http://www.renewableenergyworld.com/index/top-news.html>

<https://www.theguardian.com/environment/renewableenergy>