

Benefits of Renewable Energy Sources to the Environment

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ABSTRACT

All non-renewable energy sources have great impact on Environment. Non-Renewable energy sources (fossil fuel, Petrol, Coal, natural gas, oil, etc.) will become great threat to us in the future. We have to explore another alternative to produce electricity. Renewable energy sources (solar, wind, Geothermal, Biomass, Hydrothermal, Ocean, etc ;) will be that problem. With electricity became a basic requirement from day to day, renewable sources will become a good solution not only for our requirement but also to the environment. This review paper briefly describes, Why should we have to prefer renewable energy sources than non-renewable energy sources?. The effects we will face in the future by using non-renewable sources and how we will be benefited by renewable energy sources.

1. Introduction

Carbon is the main element in fossil fuels. For this reason, the time period that fossil fuels formed (about 360-300 million years ago) is called the Carboniferous Period. Over time, the dead plants were crushed under the seabed. Rocks and other sediment piled on top of them, creating high heat and pressure underground. In this environment, the plant and animal remains eventually turned into fossil fuels i.e. coal, natural gas, petroleum. These are abundant and inexpensive but impossible to reuse. When they are burnt, they produce large amount of carbon dioxide into the atmosphere. This gas is the greatest defaulter in producing global warming. The carbon dioxide keeps the heat in the atmosphere of the earth. This process is called the "greenhouse effect." Life on Earth requires heat to survive, but it is based on a balanced carbon budget. To protect Environment, control pollution and the potential for global warming may encourage wider access to alternative energy sources such as renewable energy source [1]. All these sources are renewable process of energy generation and do not cause environmental pollution.

2. Environmental impact of non-renewable energy source

There are two types of sources for producing electric power energy.

- Conventional Sources (Non renewable sources)- fossil fuel, Petrol, Coal, natural gas, Oil
- Non Conventional Sources (renewable sources)- solar, wind, Hydro, Geothermal, Biomass, Hydrothermal, Ocean, Tidal Energy.

For industrialized nations like the United States, without fossil fuels, we can not imagine modern life. The majority of our

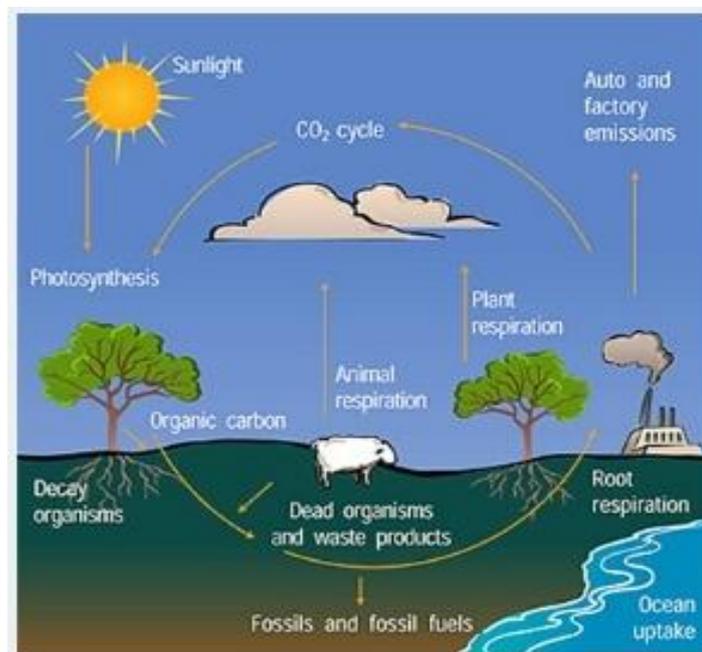
transport and heating, and the power stations we use to generate electricity depend on burning coal, oil or natural gas.. However, fossil fuel production also carries severe economic, environmental and social costs.. Whenever we burn a fossil fuel, we are producing more carbon dioxide, toxic gases into the atmosphere, resulting in potentially devastating long-term contamination of land, air and water resources.

Acid rain refers to precipitation that carries sulfur and nitrogen compounds from the atmosphere to the ground. Negative environmental consequences include damage to vegetation and declining aquatic populations. Decreased agricultural production is also likely, since acid rain depletes the soil of nutrients that crops need to grow.

The temperature in the atmosphere increases due to the greenhouse effect. The result is an increase in global temperatures, the U.S. Environmental Protection Agency states. This phenomenon of climate change is associated with floods and heavy rain falls in many regions, as well as more frequent droughts and severe heat waves.

Fossil fuels are a major contributor to health-harming air pollution. The combustion process also creates nitrogen oxides that lead to the creation of smog, These materials can cause bronchitis and pneumonia, decrease resistance to respiratory infections and irritate the lungs. Power plant and transportation-related activities are about equally responsible for nitrogen oxide emissions

Coal-fired power plants also release pollutants that contaminate nearby soils. The transportation of oil raises the risk of spills that leave oceans and waterways uninhabitable for years to come [2].



Fossil fuel combustion is the part of carbon cycle

To protect the environment from these dangerous pollutants, we need cheap, natural and friendly environment production of Electricity resources are required. For this reason, the importance of renewable resources has increased. Renewable energy sources are sources that constantly renew throughout the human lifespan.

They are also referred to as Green Energy or Clean Energy as they do not emit carbon-di-oxide or other greenhouse gases. The major sources of renewable energy source are Solar, Wind, and Biomass Hydropower, Geothermal, and Tidal energy

All India the total installed capacity due to renewable energy sources is 62846.90MWh on 30-12-2018 [3].

While there are no global warming emissions associated with generating electricity from solar energy, there are emissions associated with other stages of the solar life-cycle, including manufacturing, materials transportation, installation, maintenance, and decommissioning and dismantlement.

The wind is one of the cleanest and most sustainable ways to generate electricity as it produces no toxic pollution or global warming emissions. Wind is also abundant, inexhaustible, and affordable, which makes it a viable and large-scale alternative to fossil fuels.

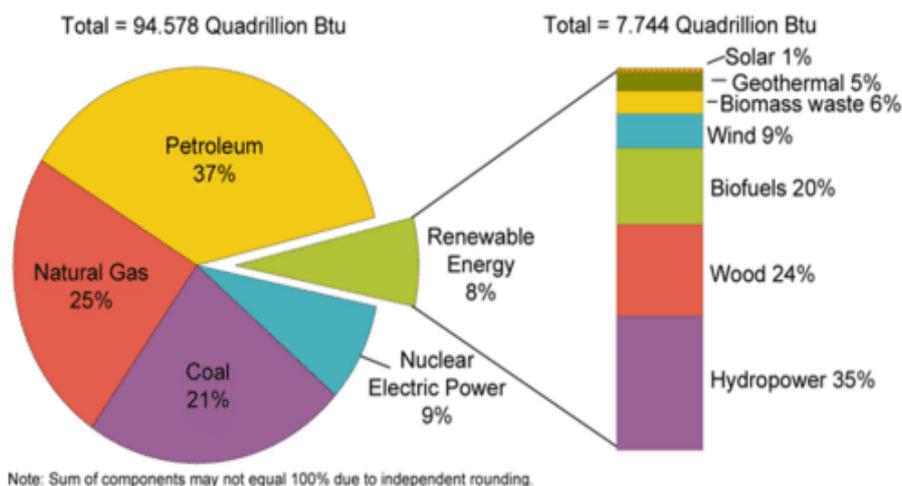
3. Nuclear Power

Nuclear power is energy released from the radioactive decay of elements, such as uranium, which releases large amounts of energy. Nuclear power plants produce no carbon dioxide and, therefore, are often considered an alternative fuel (fuels other than fossil fuels). Currently, world production

of electricity from nuclear power is about 19.1 trillion KWh, with the United States producing and consuming about 22% of that. Nuclear power provides about 9% of the electricity in the United States (Figure 7).

There are environmental challenges with nuclear power. Mining and refining uranium ore and making reactor fuel demands a lot of energy. Also, nuclear power plants are very expensive and require large amounts of metal, concrete, and energy to build. The main environmental challenge for nuclear power is the wastes including uranium mill tailings, spent (used) reactor fuel, and other radioactive wastes. These materials have long radioactive half-lives and thus remain a threat to human health for thousands of years. The half life of a radioactive element is the time it takes for 50% of the material to radioactively decay. The U.S. Nuclear Regulatory Commission regulates the operation of nuclear power plants and the handling, transportation, storage, and disposal of radioactive materials to protect human health and the environment.

By volume, the waste produced from mining uranium, called uranium mill tailings, is the largest waste and contains the radioactive element radium, which decays to produce radon, a radioactive gas. High-level radioactive waste consists of used nuclear reactor fuel. This fuel is in a solid form consisting of small fuel pellets in long metal tubes and must be stored and handled with multiple containment, first cooled by water and later in special outdoor concrete or steel containers that are cooled by air. There is no long-term storage facility for this fuel in the United States.



Note: Sum of components may not equal 100% due to independent rounding.

Figure 7. U.S. Energy Consumption by Energy Source, 2009

Renewable energy makes up 8% of U.S. energy consumption. Source: U.S. Energy Information Administration

There are many other regulatory precautions governing permitting, construction, operation, and decommissioning of nuclear power plants due to risks from an uncontrolled nuclear reaction. The potential for contamination of air, water and food is high should an uncontrolled reaction occur. Even when planning for worst-case scenarios, there are always risks of unexpected events. For example, the March 2011 earthquake and subsequent tsunami that hit Japan resulted in reactor meltdowns at the Fukushima Daiichi Nuclear Power Station, causing massive damage to the surrounding area.

The report outlined three broad strategies to shift to a circular economy. The use of products should be maximized, such as through car-sharing or keeping vehicles for longer, it said. Recycling and reducing waste are also key, as is using natural, low-carbon materials in construction, like bamboo and wood instead of cement, it said.

4. Green ambitions — on renewable energy targets

In a surprising statement this month, Union Power Minister R.K. Singh said India would overshoot its target of installing 175 gigawatts of capacity from renewable energy sources by 2022. India was on track, he said, to hit 225 GW of renewable capacity by then. This is a tall claim, considering India has missed several interim milestones since it announced its 175 GW target in 2015. The misses happened despite renewable capacity being augmented at a blistering pace, highlighting how ambitious the initial target was. Technological and financial challenges remain: both wind and solar generation could be erratic, and India's creaky electricity grid must be modernised to distribute such power efficiently. Meanwhile, wind and solar tariffs have hit such low levels that suppliers are working with wafer-thin margins. This means small shocks can knock these sectors off their growth trajectories. The obstacles have capped capacity addition to 69 GW till date, with India missing its 2016 and 2017 milestones. To hit its 2022 target of 175 GW, 106 GW will have to be added in four years, more than twice the capacity added in the last four.

In the solar sector alone, which the government is prioritising, policy uncertainties loom large. Manufacturers of photovoltaic (PV) cells have demanded a 70% safeguard duty on Chinese PV imports, and the Directorate General of Trade

Remedies will soon take a call on this. But any such duty will deal a body blow to solar-power suppliers, who rely heavily on Chinese hardware, threatening the growth of the sector. There is also the problem of the rooftop-solar segment. Of the current goal of 100 GW from solar energy by 2022, 40 GW is to come from rooftop installations, and 60 GW from large solar parks. Despite being the fastest-growing renewable-energy segment so far — rooftop solar clocked a compound annual growth rate of 117% between 2013 and 2017 — India only hit 3% of its goal by the end of 2017, according to a Bloomberg New Energy Finance report. The reason? Homeowners aren't warming up to the idea of installing photovoltaic panels on their terraces because the economics does not work out for them. Compared to industries and commercial establishments, a home typically needs less power and will not use everything it generates. So, homeowners need to be able to sell electricity back to the grid, which in turn needs a nationwide "net-metering" policy. As of today, only a few States have such policies, discouraging users elsewhere. Such challenges can be overcome with the right incentives, but they will take time to kick in. The good news is that even if India hits the 175 GW target, it stands to meet its greenhouse-gas emission goal under the Paris climate agreement. This in itself will be a worthy achievement. Overshooting this target will be a plus, but until the government tackles the policy challenges, it must hold off on implausible claims.

5. Conclusion

Burning fossil fuels gives out toxic gases like carbon dioxide. Trees, eco life, infrastructure and monuments get damaged due to pollution caused by this toxic gases. Burning fossil fuels also increases the greenhouse effect because of increased carbon dioxide emissions. Scientists are increasingly worried about global warming and the melting of polar ice-caps, rising sea levels, and changing weather patterns around the world. 7 million people die every year due to pollution. We argued that clean and low carbon energy is the only logical choice for our future. Renewable energy sources play a major role to modify these deficiencies. Due to this, There is no pollution or ecological balance problem. Several renewable energy sources are financially and economically competitive for certain applications.

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