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## Environment protection through renewable energy sources

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### Abstract

Due to increase in population, resource consumption and environmental degradation a major problems facing the earth planet is provision of an adequate supply of clean energy. All these three factors converging particularly in the matter of supply of sustainable energy. It is widely agreed throughout the world that our current energy practice will not provide for the entire world's people in an adequate way and still leave our earth with a no livable environment. Hence a major task for the new century will be to develop sustainable and environmentally friendly sources of energy. Projection of future energy needs over this new century show an increase by a factor of at least two and one half perhaps by as much as a factor of five. All of the scenarios from reference three indicate continuing use of fossil sources nuclear and large hydro. However, the greatest increases come from 'new renewable' and all scenarios show extensive use of these sources by 2050. Indeed the projections indicate that the amount of energy derived from new renewable by 2050 will exceed that presently provided by oil and gas combined. This would imply major change in the world's energy infrastructure.

**Keywords:** Renewable energy, bioenergy, fossil sources, atmosphere scenario, environment

### 1. Introduction

Renewable energy sources give us clean energy. Most of the energy generation at present is through non-renewable sources which may become extinct at any time, so our engineers must think about their responsibility to choose an alternative to avoid power crisis before facing critical situation. RES which is also called alternative energy sources can become the ultimate solution for the forthcoming power crises. At present RES contributes about 15% of the total energy generation of the world. RES includes solar, wind geothermal, hydropower, biomass and marine energies. The RES are the primary, domestic and clean or the exhaust able energy resources. The following table 1 shows the renewable energy resources and their usage:

**Table 1:** Main energy renewable sources and their usage form

Energy Source	Energy conversion and usage options
Direct Solar	Photovoltaic, Thermal Power generation, Water heaters
Geothermal	Urban heating, Power generation, Hydrothermal, Hot dry rock
Hydropower	Power generation
Modern biomass	Heat and power generation, Pyrolysis, Gasification, Digestion
Solar	Solar home system, Solar dryers, Solar cookers
Tidal	Barrage, Tidal stream
Wind	Power generation, Wind generators, Windmills, Water pumps
Wave	Numerous design

### 2. Sources of Renewable Energy

Renewable energy sources are those sources which can be used to produce energy again and again, e.g. solar energy wind energy, biomass energy; geothermal energy etc. RES had so many advantages like providing pollution free environment, eliminating green house gases

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effect etc. Different countries are using sources of renewable energy as per according to the availability of sources and distributing them in a suitable proportion. Here we are showing an example of sources distribution of RES in Republic of Serbia in the following manner which are self-explanatory in figure 1. In the previous period the use of RES was based on electricity generation from large river courses and the use of biomass mostly for house hold heating and a lesser part in the industry. Renewable energy system development will make it possible to resolve the presently most crucial tasks like improving energy supply reliability and organic fuel economy; solving problem of local energy and water supply; increasing the standard of living and level of employment of local population; ensuring sustainable development of the remote regions in the desert and mountain zone; implementation of the obligations of the countries with regards to the fulfilling international agreement relating to the environmental protection. Renewable energy sources are the best alternatives for power generation in power station.

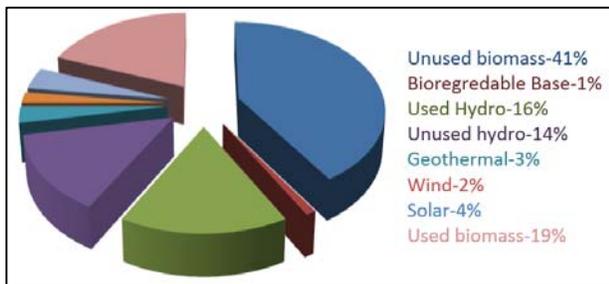


Fig1: Structure of RES in Republic of Siberia

### 3. Atmosphere Scenario

Use of fossil fuel for the generation of electrical energy in power stations produces pollutions which is making nonliving atmosphere in the world, so it is mandatory to go for better alternatives for the energy requirement. Renewable energy resources provides pollution free atmosphere by reducing the effect of global warming and greenhouse gases. Climate change is one of the primary concerns for the humanity in the 21th century. The increasing concentration of greenhouse gases such as methane, carbon dioxide, nitrogen oxide, ozone etc. in the atmosphere is acting to trap heat radiating from earth surfaces and is raising the earth's surface temperature. A schematic representation of this global climate change is illustrated in the figure of the following figure -2 at the next page.

### 4. Solar Energy

The power from the sun intercepted by the earth is approximately  $1.8 \times 10^{11}$  MW, which are many thousands of times larger than the present consumption rate on the earth of all commercial energy sources. Thus if we convert this to other forms of energy, it may be one of the most promising of the non- conventional energy resources.

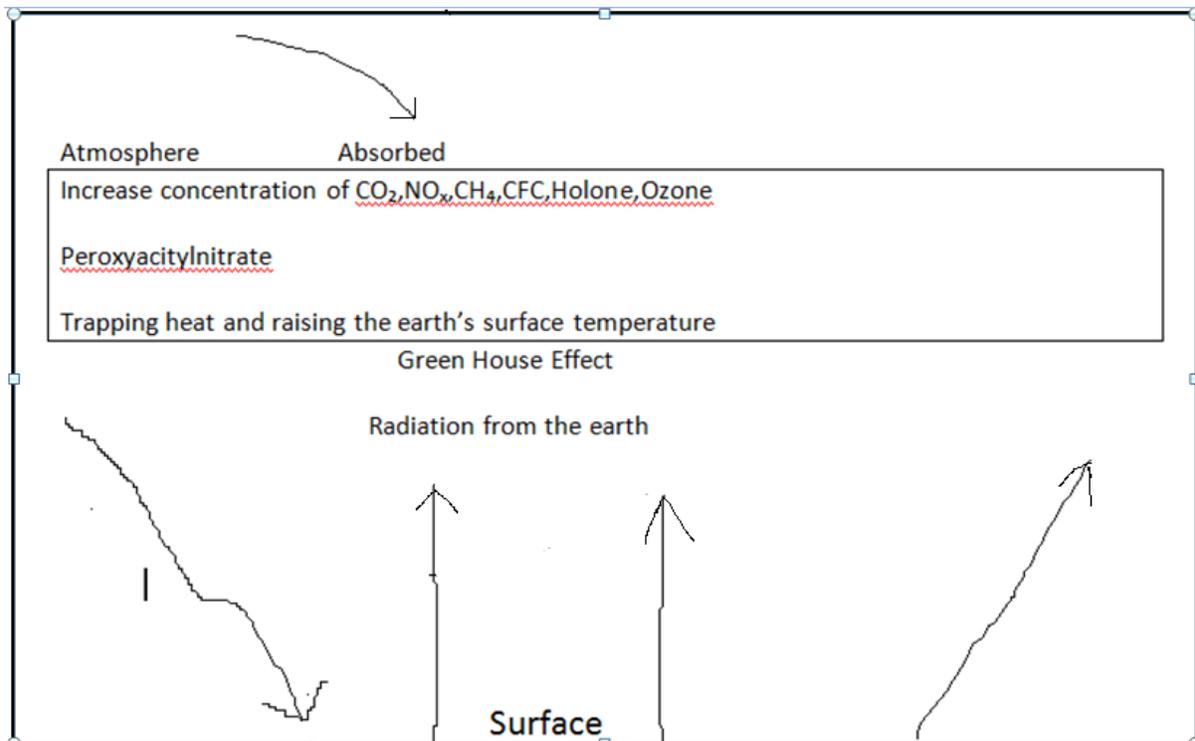


Fig2

## 5. Wind Energy

Wind energy for electricity production today is a mature, competitive and virtually pollution free technology is widely used in many areas of the world. India is one of the most promising countries in the world for the development of wind power energy

- The earth receives  $1.74 \times 10^{17}$  watts of power (per hour) from the sun. About one or 2 percent of this energy is converted to wind energy (which is about 50-100 times more than the energy converted to biomass by all plants on earth)

## 6. Bioenergy

There are various methods for producing bioenergy such as Biogas, Biodiesel, gasifier etc. The biogas has evaluated as one of the most energy- efficient and environmentally beneficial technology for bioenergy production. Biodiesel has the potential to reduce emissions from the transport industry, which is the largest producer of greenhouse gases. The use of biodiesel also reduces the particulate matter released into the atmosphere as a result of burning fuels, providing potential benefits to human health.

Gasifier is a device which converts solid fuel into gaseous fuel through thermo chemical conversion route. In the gasifier low grade fuel, i.e. biomass gets converted in high grade fuel known as charcoal and further into low calorific gas called producer gas.

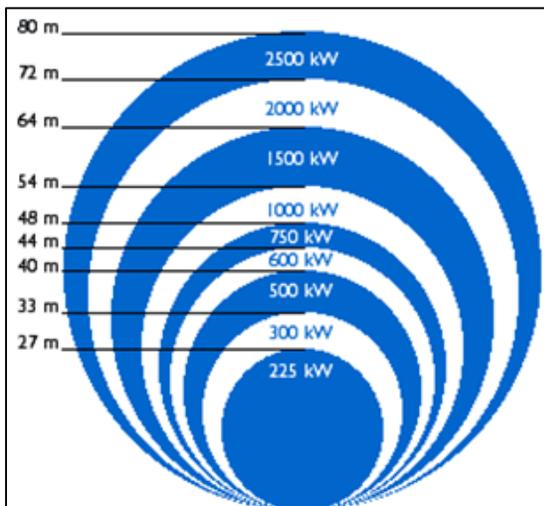


Fig3

## 7. Conclusion

It can be concluded on the basis of above discussion that In order to eliminate the effect of global warming and the greenhouse gases RES is the only solution for the forth coming future of energy generation for the whole world. The paper explicitly points out the greenhouse gas emission mitigation potential depending on the use and availability of renewable energy Sources and fuel replaced by it.

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