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Renewable and non-renewable sources of energy. Their pros and cons

Key words: electricity generation, (non) renewable sources of energy.

Introduction. Mankind cannot exist without energy. We totally depend on it. So, it is obvious that there must be sources from which people could get the necessary amount of it. These sources can be divided into renewable and non-renewable ones. The examples of renewable sources of energy are: solar, wind, hydro, geothermal and biomass. Non-renewable are coal, gas, oil, fossil fuels. The renewable energy industry is the part of energy industry focusing on new and appropriate renewable energy technologies. Renewable energy often provides energy in four important areas: electricity generation, air and water heating/cooling, transportation, and rural (off-grid) energy services. Both renewable and non-renewable sources of energy are important for well-being of mankind and we are going to compare their advantages and disadvantages.

The main task is to conduct the research for a renewable and non-renewable sources of energy and to prove the advantages of renewable sources of energy over other types of electricity production, to analyze the strengths and weaknesses of their usage. The priority is given to the efficiency of energy production and safe attitude to the environment.

Renewable energy is generated from natural sources that can be renewed in a relatively short time. Examples of renewable energy include solar, wind, hydro, geothermal and biomass. Non-renewable energy comes from resources that cannot be renewed or are renewed very slowly during some natural processes. The primary sources of non-renewable energy in the world are fossil fuels - coal, gas and oil. Nuclear energy is also considered to be non-renewable because the supplies of uranium in the Earth are limited. When planning the energy profile for

various communities, the advantages and disadvantages of renewable vs. non-renewable energy need to be considered.

Results. What about the advantages of renewable energy? To get energy from the renewable sources we don't need to burn for example, fossil fuels so they do not release pollutants into the atmosphere and provide a cleaner, healthier environment. We have sources of renewable energy everywhere in the world and they can be easily found. Costs for tapping renewable energy are decreasing as the technology advances and, once established, maintenance costs are generally low. Trained technicians are needed to maintain the equipment, some renewable energy plants have the potential to offer more jobs than highly mechanized fossil fuel plants. Moreover, there are little or no greenhouse gas emissions associated with renewable sources of energy which do lot of harm to the state of our planet.

And now some words about disadvantages of renewable energy sources. Initial costs for setting up renewable energy plants are often quite high and require careful planning and implementation. Building dams, for example, for hydroelectric power requires high initial capital and high maintenance expenses. Renewable energies like solar and wind require large tracts of land to produce energy quantities competitive with fossil fuel burning. Renewable sources of energy are also affected by weather, this fact reduces their reliability. For example, wind turbines only rotate it there is enough wind at a given speed and solar panels do not operate at night time and are less efficient on cloudy days.

Despite the disadvantages of renewable sources of energy, they are more useful than non-renewable. Fossil fuels are in a limited supply and one day they can disappear. Processes for extracting and transporting fossil fuels have caused widespread environmental damage from strip mining and accidental oil spills. Most importantly, burning fossil fuels releases harmful greenhouse gases into the atmosphere, primarily CO2. Incorporating CCS technologies into existing fossil fuel plants to prevent CO2 emissions is extremely costly. Nuclear power plants do not release C02, but pose other risks such as potential radiation leaks and waste storage problems.

Based on the ultimate analysis of each fraction of the analyzed fuel types, an estimation of LHV using indirect methods was performed. From an energy point of view, the conducted calculation regarding LHV predictions highlights the fact that the LHV of generated waste in the Italian case is higher than the ones generated in the Romanian cases for all considered fractions (MSW, RMSW, BD, SRF) as presented in Fig. 3. The main reasons are the elemental composition of waste fractions, their percentage in waste and the role of SC. SC in the Italian case overcomes the 65% value, being almost double than in the Romanian cases. Its effect is an indirect concentration of energy in the RMSW. When comparing the LHV of wood/wood residues on a dry basis with the one of wastes, we can state that it is higher than the ones of MSW, RMSW, BD and SRF. This applies for all three regions, only with two exceptions: the LHVs for SRF in the Italian case and in one of the Romanian cases are close to the one of wood/wood residues. This is the positive effect of RMSW pre-treatment. The LHVs of the two types of studied lignite (coal from Romania and Italy) are higher than LHV of MSW, similar to the ones of RMSW and BD, but lower than the ones of SRF and wood, with some exceptions. That depends on the quality of coal, which can vary a lot depending also on the market of reference.

Conclusion. We can make the conclusion that both types of energy sources are important and can be used by people for their different needs. But the main point is to take into consideration the fact that the renewable sources of energy are relatively not limited in comparison with non-renewable. They are almost harmless to the environment and have more economical and technological advantages for usage in future.

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