**Moving Away from Limited Resources**

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**Outline**

Claim: We should stop relying on limited resources and start using renewable energies.

1. Limited resources will run out eventually and we need a replacement.
   1. Increased consumption and low reserves
      1. Global consumption of primary energy has increased every year for the past half century.
      2. Oil and gas reserves are not expected to last for more than a half century from now.
   2. Increased production
      1. Countries that produce oil are increasing their productions which means our resources will run out sooner.
2. The energy sources that we have right now are endangering the environment thus we need to move to a cleaner solution which is renewable energy.
   1. Radiation leakage and carbon emissions
      1. Even with a good design and multiple safety measures, nuclear reactors still present a risk of leaking radiation into the air and water by releasing radioactive materials.
      2. Carbon dioxide emissions caused by the combustion of fossil fuels are affecting climate change by increasing the global surface temperature over the years.
   2. Extermination of Species
      1. The act of extracting these limited resources has consequences such as deforestation or removal of mountaintops for coal mining, which has a negative impact on the environment and causes habitat destruction.
      2. The excessive use of these resources affects global warming meaning it becomes a great threat to mountain and polar restricted species.
3. Electric cars, LED lights, new types of batteries and chips, consume less energy to function allowing renewable sources to provide them with more than enough energy and eliminating the need for limited resources.
   1. Electric cars
      1. Electric vehicles are far more efficient than combustion engine cars as they are better at converting input energy to the wheels with less energy loss.
      2. The energy required to recharge an electric car every day is considerably low that a renewable energy source like solar panels would be able to cover it easily.
   2. LED lights
      1. LED lights are energy efficient, and they don’t dissipate a lot of heat.
      2. Using the same amount of energy as other light bulbs, an LED lamp is brighter and produces less heat.
   3. New electronic chips
      1. Today’s chips can be made of ferroelectric material such as hafnium oxide to become more efficient and reduce the overall energy consumption.
      2. Modern chips can perform all sorts of tasks, eliminating the need for multiple processors inside the same device which also means reducing power consumption.
4. Some readers might point out that moving away from limited resources to renewable ones is not possible at the time.
   1. Transition cost and time.
      1. Transition to renewables is an expensive process.
      2. It takes years to accomplish this transition globally.
   2. The cost in the long run.
      1. In the long run renewables require less maintenance making them a cheaper option.

**Moving Away from Limited Resources**

The use of limited energy resources is coming to an end. Limited energy resources are oil, natural gas, coal, and nuclear energy that humans have been relying on for many centuries to generate electricity, run factories and power up heavy machinery. But they are called “limited” for a reason and that is why we should stop relying on such resources and start using renewable energy sources instead. Fossil fuels are going to run out soon, they are endangering our environment and today’s technologies do not require this much energy anymore to function.

Limited resources will run out eventually and we need a replacement, as the world population increases the consumption of primary energy also increases globally, and the studies show that it has been the case for the past half century. The following statistics are all presented using the same energy unit which is “Terra Watt hour” for the ease of comparability between numbers, where 1 TWh is equal to 1 billion KWh and note that an average house consumes around 200 KWh each month. The consumption of fossil fuel globally has reached 136,018 TWh in 2021, doubling since 1980 when the consumption was around 70,600 TWh (Ritchie et al., 2022). In addition to what was mentioned before, our reserves are running low, and we are expected to run out of oil and natural gas respectively by the end of the next 54 and 49 years according to Ritchie et al. (2020). On top of that, countries are also increasing their production of the previously mentioned resources such as the United States and China as Ritchie et al. (2022) shows that the United States have produced 8,270 TWh worth of oil in 2021 and 9,342 TWh worth of gas and China has produced 23,651 TWh worth of coil in 2021 compared to 8,226 TWh in 2000.

The energy sources that we have right now are endangering the environment thus we need to move to a cleaner solution which is renewable energy. We have been using fossil fuels in our daily life as a power source for cars, homes, factories, etc. and as a result climate change was affected and the main reason behind this is the increasing global surface temperature caused by the emissions of carbon dioxide during the combustion of such fuels (Hansen et al., 2013, p. 2). Some countries also rely on nuclear energy to cover their needs because unlike fossil fuel-powered plants, nuclear plants do not produce carbon dioxide and air pollution while operating but they do produce nuclear waste (U.S. Energy Information Foundation, 2022). Hazra (2018) also mentions that even with good engineering design and multiple safety measures, nuclear reactors still present a risk of leaking radiation into the air and water by releasing radioactive materials. The Chernobyl nuclear power plant disaster in 1986 resulted in the death of many workers and radiation was spread over large areas and on 11 March 2011, a power station that belongs to the Tokyo power company released radioactive material into the environment due to an earthquake and a tsunami that both happened at the time (Hazra, 2018, pp. 53-54). Not to mention the impact of extracting these resources on our nature because this process involves deforestation and removal of mountain tops for coal mining causing habitat destruction for poor mountain-restricted species as Hansen et al. (2013) mentioned.

Electric cars, LED lights, new types of batteries and chips, consume less energy to function allowing renewable sources to provide them with more than enough energy and eliminating the need for limited resources. Because of the new technologies implemented in those devices and machines, engineers were able to reduce their consumption of useful energy and its dissipation as heat, for example electric cars are highly efficient, they can convert roughly 80% of the electrical energy from the grid to the wheels whereas combustion engine cars can only convert around 12%-30% of the energy stored in fuel to power the wheels (Office of Energy Efficiency & Renewable Energy, n.d.) and the energy required to recharge an electric car every day is considerably low that a renewable source like solar panels would be able to cover it easily. Using LED lights is also a great way to reduce energy consumption as they are 90% efficient and an experiment on two lamps from the same manufacturer “Philips” shows that an 11-Watt CFL (Fluorescent lamp) produces 10 Lux compared to a 10-Watt LED lamp that produces 91 Lux (Hudallah et al., 2021, pp. 3-6). Lastly, we have new electronic chips that can perform all sorts of tasks, eliminating the need for multiple processors inside the same device and reducing power consumption because they are built using ferroelectric material such as hafnium oxide (National Science Foundation, 2023).

Some readers might point out that moving away from limited resources to renewable ones is not possible at the time because it is an expensive transition that will take years to accomplish as Toh (2021) said “The reality is that wind and solar are only cheap during the early stages of transition” (para. 3). It can be true that the installation cost of renewables is quite expensive considering the amount of time it takes. However, let’s not forget that in the long run renewables are always cheaper and they require less maintenance, for example solar panels only require cleaning services and annual inspections after being installed unlike electricity generators that need an oil change every 100 hours of use.

After all these years of using our limited energy resources, now is the time for us to move towards renewable ones. Together we can build a path to a cleaner environment for us and for our children to come. Let's make a commitment to renewable energy and inspire others to join the movement towards a more sustainable world.

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