

Causes why we burn fossil fuels combustion of

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Causes why we burn fossil fuels Combustion of fossil fuels is widely used to create energy as it is very efficient. When burned, huge amounts of energy are generated using a relatively small amount of the fossil fuel. Renewable energy is currently unable to rival the efficiency of fossil fuel combustion.

Fossil fuels are now widely available and cheap to extract contrasting with renewable energy sources which are currently not as cost effective. Effects of burning fossil fuels Burning fossil fuels has a large negative impact on the environment. The carbon dioxide emission from the combustion can cause the 'greenhouse effect'(GHE). The GHE is the process when these by-products are released and get trapped in the earth's atmosphere and unable to escape. The trapped heat remains inside the earth's atmosphere, causing the temperature of the earth to rise. This affects the environment for instance fundamentally altering the distribution of water and ice across the planet causing abnormal weather conditions, higher water levels, and melting ice caps.

This process not only carbon dioxide, but also sulphur dioxide which is dissolved in the water. Sulphur dioxide becomes trapped in the H₂O in the atmosphere and when precipitation takes place can fall to the ground as rain water. This creates 'acid rain'. These substances are toxic to trees and plants as the rainwater falls to the soil. Possible solutions A possible solution is capturing the gas by-products created as they are burned at the power plant. The basic ways of this technology are post-combustion and pre-combustion carbon capture.

Post-combustion carbon capture means carbon dioxide is trapped after the combustion of fossil fuels. When burning natural gases, filtering can be used post-combustion. By filtering the gas using a solvent that absorbs carbon dioxide, carbon dioxide is separated from the flue gases- water vapour, sulphur dioxides and nitrogen oxide. The solvent can be heated later, which will release water vapour and leave concentrated carbon dioxide. The carbon dioxide usually store in underground. After this process, only 10% of carbon dioxide releases to the atmosphere. Figure 1 - It shows diagram of the steps of pre-combustion carbon capture. Pre-combustion carbon capture means that carbon dioxide is captured before combustion.

The fossil fuel is heated in pure oxygen to create carbon monoxide and hydrogen. This mix falls to the bottom of a flask. By passing through a catalytic converter with steam, the gases in the flask will rise, and a chemical called amine will be put into the top. The amine will bind with the carbon dioxide and fall to the bottom of the flask, separating with the hydrogen that rises up out of the flask. After that, through a heating process, the carbon dioxide rises to the top and the amine drops to the bottom of the flask. The Environmental Protection Agency that has instituted recent a standard, ' The Clean Power Plan', can be a solution.

This plan will diminish carbon emissions from fossil fuel-fired power plants. This will include actions such as investing in renewable energy such as wind panel and solar radiation and implementing these facilities to subsidise from coal-fired power systems. The EPA can establish temporary and final carbon dioxide emission performance rates to restrain the massive carbon emission

from combustion of fossil fuels in power plants. Evaluation of possible solutions

Possible Solutions	Strength	Weakness
Post-combustion carbon capture	This process is possible to apply in older power plants. This is because adding a filter is a simple way to trap carbon dioxide as it travels up a smokestack.	Moreover, both pre and post combustion carbon capture can prevent and reduce a significant amount of the carbon burned in a power plant from entering the atmosphere.

Especially with post combustion, for example, ADM Illinois Industrial Project could trap over 1.1 million tons of carbon dioxide per year. It is inefficient due to high cost and is more difficult to implement due to the compressed the gas being transported to filter. For example, as ADOE/NETL analyses said, the cost of electricity for a new crushed coal plant to over 80 percent may be increased and decrease 20 to 30 percent in efficiency of generating energy. This weakness can disturb practical application to power plants.

Pre-combustion carbon capture

This process is lower in cost than post combustion because it is unnecessary to compress the gases which are created after combustion. It can encourage the power plants to implement this technique.

Moreover, it captures a higher concentration of carbon dioxide than post combustion carbon capture. According to Dakota Gasification plant, over 3 million tons of carbon dioxide per year is captured. This will directly show the improvement of global warming and acid rain in short-term. It is complicated and hard to implement, especially in older power plants. A catalytic converter cannot be used without changing the original system. This

increases the cost of this process and discourages the oil industry from investing in this process on a worldwide scale. Also, It may lead people to drink unsafe water and environmental pollution of the water quality.

For instance, Duke University researchers found the groundwater near the carbon-capture plant in Texas showed elements of iron and other pollutant metals increased by over 1, 000 percent. The Clean Power Plan Renewable energy is not associated with pollution, which means no carbon emission occur. Its strength is that renewable energy facilities such as solar panel and wind turbines are able to be utilized both in household and power plants.

Renewable energy is not limited at generating energy as most natural resources cannot be exhausted. It also is planned by an association, so people will follow the plan, if possible. It is expensive and would add a cost to the price of facilities built with integrated Renewable energy. Most coal-fired power plants do not try to apply it to them. Not only this, the efficiency of generating energy from renewable energy is not enough as the efficiency of fossil fuels.

Solution: The government can make adjustment about the legislation to subsidize to the facilities that use renewable energy.