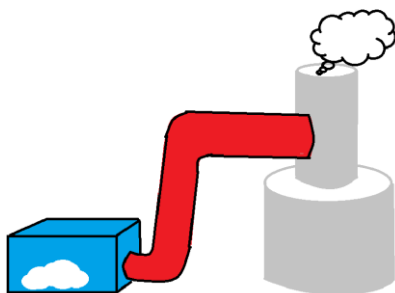


Singapore's greenhouse gas emission is expected to reach 77.2 million tonnes in 2020 of which 60.3% is contributed by the industrial sector (National Climate Change Secretariat [NCCS], n.d.). This means that if the industries do not make adjustments to their industrial processes, the carbon footprint in Singapore can only set to increase further.

In order to decrease the carbon footprint in Singapore, we need to think of solutions which primarily focus on reducing industrial carbon dioxide emission. The making of industrial products typically produces a lot of waste gases which are released into the atmosphere. These waste gases are typically treated to remove air pollutants such as sulfur dioxide. However, carbon dioxide usually makes up a significant amount of the waste gases. To prevent carbon dioxide from being eventually released to the surroundings in the form of waste gases, a tube can be connected to the side of the chimney where the waste gas escapes. Through the use of suction force, carbon dioxide can be collected and stored as dry ice to save space. When carbon dioxide exists in the gaseous state, its huge volume takes up a lot of space. By converting carbon dioxide into dry ice through the sublimation process, its volume is drastically reduced and it can be stored underground in a deep-freezing chamber to drastically reduce the use of space in land scarce Singapore. When necessary, the dry ice can be converted back into carbon dioxide in its gaseous state. Carbon dioxide can be used to manufacture chemical and pharmaceutical materials such as urea for fertilisers and methanol. However, one disadvantage is that it is energy consuming to store dry ice as the temperature of the deep freezing chamber needs to be maintained at below -78 degree Celsius since dry ice has a sublimation point of -78 degree Celsius.

A simple illustration of how the carbon dioxide produced could be stored as dry ice in underground deep freezing chambers is included below.



Another main cause of an increasing amount of greenhouse gases in the atmosphere is due to the use of transport vehicles. Motor cars use fuels such as petrol to move from one place to another in a timely and convenient manner. However, this modern convenience brings about the production of air pollutants such as carbon monoxide and oxides of nitrogen. Although catalytic convertors are installed in most transport vehicles to convert harmful gases to harmless gases, it also converts carbon monoxide into carbon dioxide which remains as one of the biggest source of carbon dioxide. The release of carbon dioxide into the atmosphere brings about detrimental impacts on the environment.

One solution would be to develop rechargeable battery-powered motor vehicles. Studies have shown that use of batteries can eventually decrease the number of carbon emissions into the air (Media, 2018). Hence, the use of rechargeable batteries is a feasible alternative to using natural gas to power motor vehicles. This could drastically reduce the use of petrol to power motor vehicles as well as decrease the amount of carbon emissions into the air. The battery could be recharged by using futuristic tires to generate electricity when driving on the road. This could be achieved by converting mechanical energy, caused the rubbing of the tires and the gravel on the road, into chemical potential energy which could be stored in the battery. In the future when our technology is more advanced, scientists can also invent tires that makes use of the mechanical energy produced from the spinning tire which has rotational kinetic energy, to convert it to heat energy. Heat energy can then be converted into chemical potential energy to be stored in the battery. The battery does not produce any sort of carbon-containing compounds which could be released into the air and cause harm to our environment. Should the rechargeable battery in a motor vehicle run low when it is in use, a signal will be in place to alert both the driver and nearby cars in the form of a bright blue light to warn the driver that the battery is about to run out as well as to warn other drivers to slow down in case the motor vehicle suddenly comes to a stop. An extra compartment could be included at the back of the car as to store and provide the driver with an additional battery if the battery in use runs out of power. When the battery runs out of power, drivers can recharge it from the power outlet in their homes.

In conclusion, climate change is a global phenomenon that has led to significant detrimental effects on the environment. The increasing rate of production of carbon dioxide must be

curbed in order to reduce the effects of climate change. We must constantly innovate and make use of technological advances to implement creative and effective solutions that reduce the effects of climate change on our environment.

References:

(n.d.). Retrieved June 15, 2018, from <https://www.nccs.gov.sg/climate-change-and-singapore/national-circumstances/singapores-emissions-profile>

Media, J. A. (2018, January 23). How Batteries Reduce Carbon Footprint. Retrieved June 15, 2018, from <https://storentech.blog/2018/01/22/how-batteries-reduce-carbon-footprint/>