1. Problem introduction

- GHG is threat to human society.
  Produced from the factory and transportation by burning fossil fuel,
  coal burning to produce electricity,
  pesticide and non-organic fertilizer use in agriculture.
- These human activities will lead to earth warming, which has already happened every year.

2. Solution introduction

- To tackle this problem, definitely need solutions. (future carbon neutrality)
- The solution varies, but here we are going to categories into 2, which is carbon production solution and carbon removal solution.
- As we know the production solution is more into reducing further carbon being emit to the atmosphere. Anything can halt the fossil fuel being burnt.
  Renewable & clean energy
  Transport – EV
- Despite this, to achieve future zero carbon it is not enough.
- The existing carbon on the air need to be removed as well.
- Therefore we come to the second solution which is remove the existing carbon. There are 2 strategies, which are biological strategies and technological and chemical strategies.
- Biological strategies - plant trees (carbon sequestration), changing farm practice (increase the agriculture efficiency, increase the natural carbon sink) IT IS NOT ENOUGH. (require lands)
- technological and chemical strategies – Carbon Capture, Utilization and Storage (CCUS) technology. Definition. Nowadays, there are many CCUS technologies, in this report we are going to defined the two popular technologies, which are Direct Air Capture (DAC) and Biomass energy Carbon Capture storage (BECCS).

3. DAC explanation

- Describe the process in simple way.
- Turn out this machine can convert the carbon into solid pellets.
- To reach negative emission, the solid carbon pellets can be buried underground permanently.
- To reach neutral, the carbon pellets can be utilized as well.
  By combining the solid carbon pellets with the hydrogen, might produce substance to power the jet fuel or fossil fuel like.
- This machine benefits
- Case study (prefer China)
- Drawbacks

4. BECCS explanation

- Biomass energy definition.
- Already introduced, but the concept of Biomass Energy (BE) only reaches the carbon neutrality, not helping to remove the existing carbon.
- Yet the new technologies which is CCS added behind, is in order to reach negative emission which means the carbon produced by the biomass energy factory, will be stored underground and no more carbon on the atmosphere.
- Utilize the carbon gas for carbonated soda.
- Since biomass from the crops and trees, so it also reduces the carbon from the natural tree stage (carbon sink).
- Study Case (China)
- Drawbacks

5. Future carbon neutrality (policy and the technologies relationship)

- Policy 2030 & 2060 carbon neutrality
- To reach the target, we cannot only rely the CCUS technologies and neglect the other solutions to reduce carbon.
- The other solution such as use renewable and clean energy also need to be implemented on the same time.
- Cannot underestimate the carbon sink as well, despite it is slower than technologies, because it provides us with many benefits such as cooler ecosystem, biodiversity (wildlife habitat) and most important as carbon sink.
- This will speed up to achieve the future carbon neutrality.

6. Conclusion

The Percentage of World CO2e Produced by Each Sector in 2018