**Introduction**

- Climate change is an important phenomena of which effects include rising sea levels and extreme weather.
- Global warming crisis is caused by unprecedented levels of CO2 emitted into the atmosphere.
- Transport is the largest emitting sector in the UK of which cars is the main contributor.
- Net Zero Carbon Emissions by 2050 in the UK.

**Methodology**

**Business as Usual**
- Capacity is allocated to a technology based on the agents objective of reducing cost to meet the service demand for that year. What drives this trend is the capital cost of diesel cars is lower than petrol for all years and battery costs decrease over time with plug-in diesel cars also reducing in capital cost.

**Carbon Price**
- Reducing the growth of petrol and diesel cars in 2030 and then reducing growth of non-zero emission cars in 2035 simulates the ban in the UK. Presence of zero emission cars increases after the ban is in place meaning that the use of fossil fuels is reduced drastically by 2050 and carbon emissions reach zero.

**Ban**
- Using low carbon prices means a greater reduction of diesel cars and the introduction of hydrogen based cars. The carbon price will increase costs for a technology that releases emissions such as diesel cars and will mean they are less favoured.

**Low Carbon Price**
- Using low carbon prices means an even greater reduction of diesel to 0 in 2050 and hybrid diesel increasing in 2030 meaning carbon emissions are still present. Ethanol cars are also present by 2050. This carbon price trajectory allows zero emission cars to be used but is not enough to replace all cars using diesel as the costs for diesel are still low.

**High Carbon Price**
- The carbon price drives the results to use ethanol even earlier with this combination overcoming the relatively higher capital cost of ethanol cars in the earlier years.

**Conclusion**

- Carbon pricing allows for a greater zero emission car technology share in 2050 but using that without the ban will not achieve zero carbon emissions from the tail-pipe although it will reduce emissions.
- Applying a real world ban shows a greater uptake of alternative technologies to fossil fuel based cars leading to zero tail pipe emissions by 2050 under all scenarios with carbon pricing. Carbon pricing can effect the share of zero emission technologies, how many types of technologies are present and can allow them to be used earlier on.
- Using an agent based model allows for a consumer driven approach for future research especially if more agents are simulated to reflect different consumer mind sets such as, early adopters.

**References**