SUPERMARKET SOLAR POWERED ELECTRIC CARS IN MANCHESTER

HOW MUCH OF MANCHESTER'S PRIVATE ELECTRIC CAR CHARGING DEMAND COULD BE MET BY SUPERMARKET ROOFTOP SOLAR?

We are looking at this specific questions because:

- Solar panels can be installed on roofs relatively quickly (compared to building wind turbines). And for a densely packed city it's the main (if not only) solution for local electricity generation.
- Supermarkets, even in a lockdown, are frequented by the majority of the population, on average on a weekly basis.
- Supermarkets are usually large flat roofed buildings which present an ideal area for the installation of solar panels.

WHO WANTS TO KNOW?

The answer to this question (‘how much of Manchester’s private electric car charging demand could be met by rooftop solar on supermarkets in the area?’) can be used by:

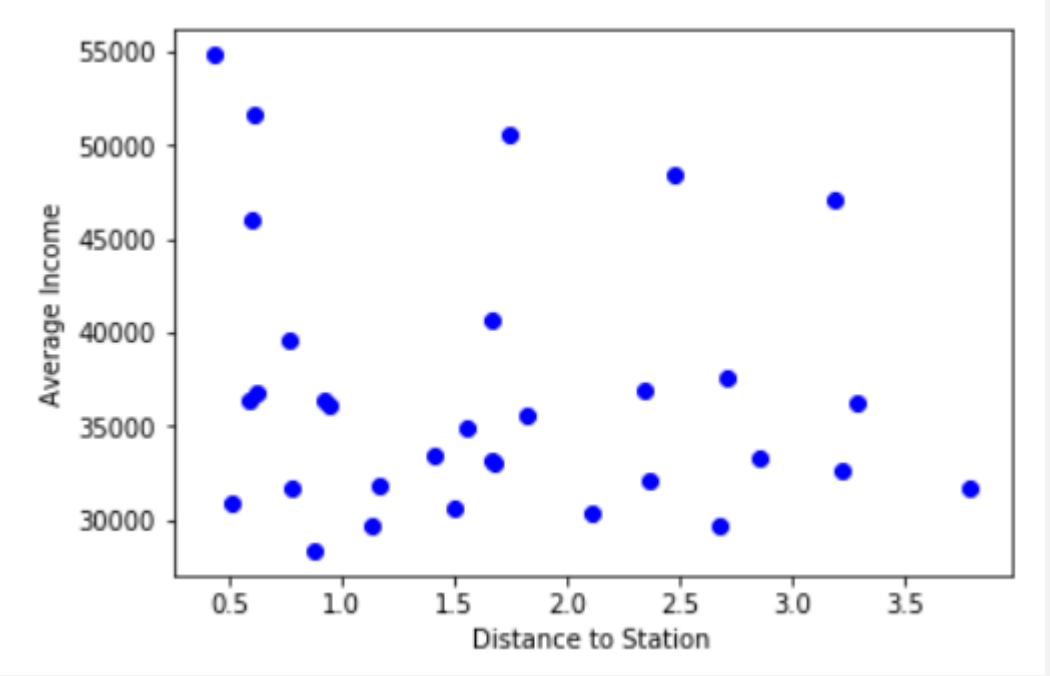
- Policy makers and or Local Authorities - to set targets and incentives for the installation of solar panels on supermarkets and installation of electric vehicle charging points in supermarket car parks,
- Community interest groups - to campaign for the rollout of local charging points and solar panel installations,
- Supermarket owners, solar panel installers, charging network operators and others - to establish the business case and seek investment or funding for the rollout of electric vehicle charging points and solar panels.

DATA ACQUISITION AND CLEANING

- CSV of Manchester districts and wards by latitude and longitude, Source: https://www.doogal.co.uk/UKPostcodes.php?Search=M (June, 2020)
  - Of the 47 fields available in the CSV the 5 fields were selected for use these were all fully populated
- Geojson file of wards of Source: https://martinjc.github.io/UK-GeoJSON/json/eng/wards_by_lad/E08000003.json (June, 2020)
- Foursquare supermarket venue search (June, 2020)
  - Had to clear rows with a mention of Money or Car from the results of the 'supermarket' search
- The solar potential identified for Manchester in Source: Google Environmental Insights Explorer (June, 2020) https://insights.sustainability.google/places/ChIJ2_UmUkxNekgRqmv-BDgUvtk/download

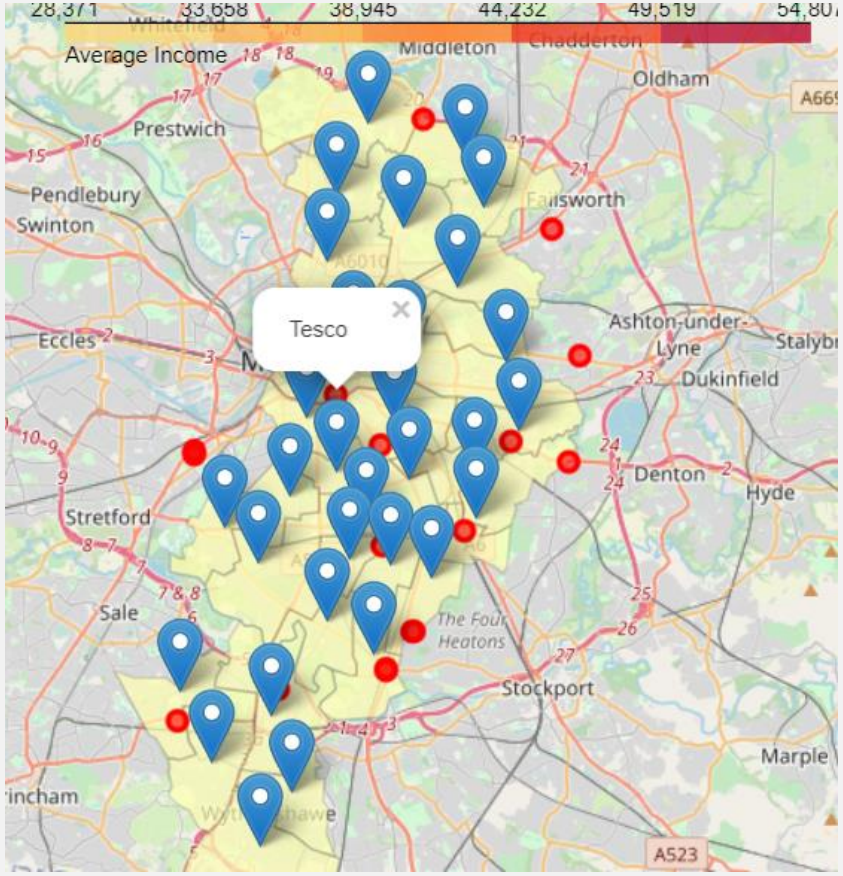
DATA EXPLORATION

- Is there a relationship between Distance to Station and Average Income of a ward?
- Scatter plot of Distance to Station and Average Income shows no correlation
- Wards appearing in the top right hand corner of this graph are hypothesised to be the best candidate locations for chargepoint installations.



DATA VISUALISATION

- Choropleth map to show the distance to the station, markers show the ward name and red circles show locations of the ‘Tesco’ supermarket chain.



CONCLUSIONS AND RECOMMENDATIONS

- Distance to station field includes train stations only, it would be interesting if the distance to bus stop could also be included.
- Type of housing and housing ownership by ward to determine where a home charging will and will not be possible or probable. This would be another factor in the decision on the areas where public charging needed sooner.