

## Microclimate Impacts on Solar Panel Power Generation in Midlands Area, UK

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**Abstract :** Green House Gas emissions from domestic properties currently account for a substantial part of the total UK's carbon emissions and is a priority area for UK to reach zero carbon emissions. However, GHG emissions of urban complexes depend on building, road, structural developments etc surfaces that form urban microclimate. This in turn may further influence renewable energy system power generation that depend on solar or wind potential. Moreover, urban climatic conditions are also influenced by the installation of those power generation systems that may impact their own power generation efficiency. Increased air temperature is attributed to densely installed roof based solar panels that consequently impact their own production efficiency. Installation of roof based solar panels requires adequate guidance to enable housing businesses, councils and organisations to implement sufficient measures for improved power generation in relation to local urban microclimate. How microclimate is affected and how, in return, it affects solar power productivity. Derby Council & Derby Homes have been collecting solar panel power generation data for a large number of properties. The different building areas and system operation performance will be studied against microclimate conditions through time. It is envisaged that the outcomes of the study will support a working up strategy for Derby city to ensure that owned homes would be able to access information and data of solar photo voltaic PV and solar thermal panels potential on social housing, helping residents on low incomes create their own green energy to power their homes and heat their homeshot water.

**Keywords :** microclimate, solar power, urban climatology, urban morphology

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