

An aerial, high-angle photograph of a city street. A tram is visible in the lower right, moving along a dedicated track. Several cars are on the road. The street is lined with trees and buildings. The overall image has a grainy, high-contrast appearance.

# GIS-based UrbanSim Modelling for Energy Efficiency and Emission Reduction in Fast Developing Urban Areas.

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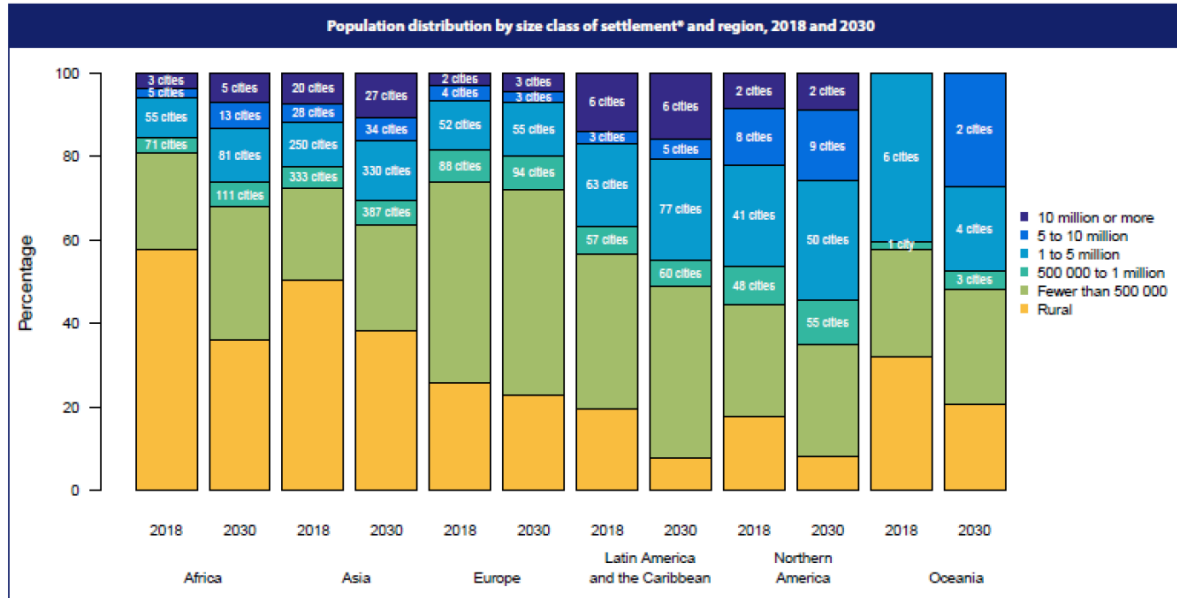
# Problem Background

Urban areas currently consume a large portion of the global primary energy supply. With the rapid growth of urban areas, especially in the developing countries energy consumed by sectors like building and transport in urban areas is likely to increase further. Understanding urban energy consumption patterns may help to address the challenges to urban sustainability and energy security.

A large portion of the energy consumed in urban areas is accounted for by the building and the transport sector. Thus, improvement in the energy performance in the transport and building sector can contribute significantly towards efforts to mitigate climate change.



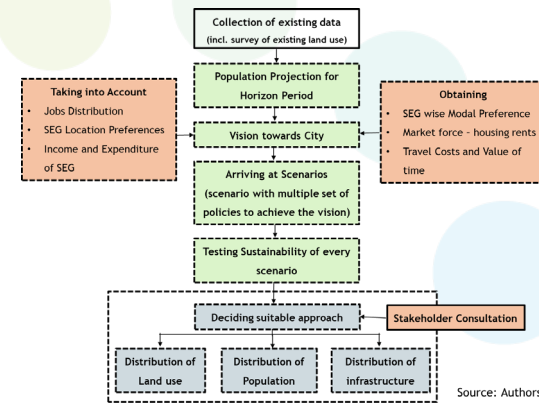
# Problem Background



Increasing incomes coupled with population growth is going to drive convergence and higher urbanisation levels and will result in high demand for housing, vehicles, appliances, etc. resulting in an even higher demand for energy and emissions of greenhouse gases.

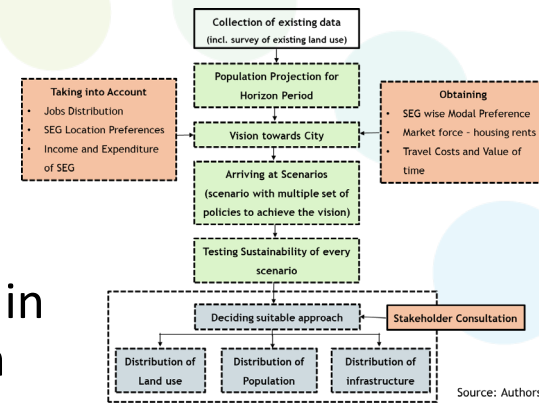
# Problem

- Several methods can be used to model urban development complexities and predict future urban growth and development.
- Model has been developed in Microsoft Excel software for the city of Rajkot which can be extended and developed using a GIS-based platform to predict future transport and housing demand + estimating future energy demand from these two sectors



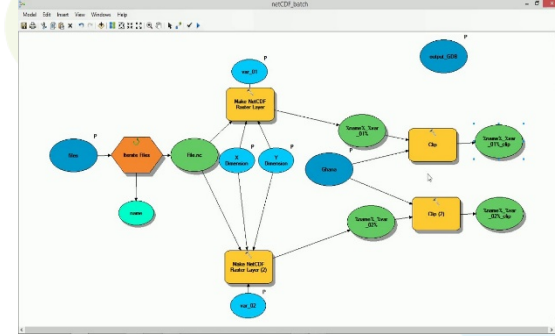
# Problem

- This proposed research will use data and concepts from the land use simulation model developed for Rajkot city in India, and the objective will be to create a generic urban simulation model using GIS software, which will help to model scenarios of urban development and energy efficiency and emission reduction strategies for buildings/transport sector.



# Project assignment

- Review of energy efficiency measure in the transport and building sector?
- How has the city of Rajkot growth in the past? What will be the development in 2050?
- Modelling the energy demand (transport/building) and greenhouse gas emissions for 2050 in the business as usual(BAU) scenario?
- Simulate the energy demand in 2050 for different demand reduction scenarios in Building/Transport sector



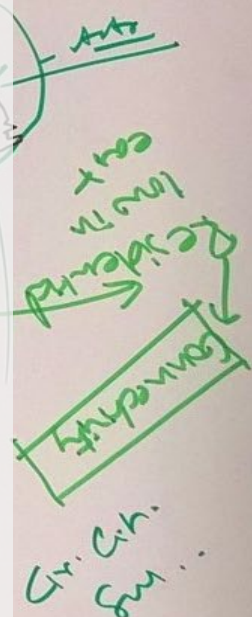
# Prerequisites

Should have attended one more of the following courses

- Quantitative Modelling and Behaviour (42180)
- Sustainable Urban Development Indicators and Sustainable Urban Development (42274)
- Simulation of cities (42188)
- Geographic Information Systems (30530)
- Energy systems analysis and scenarios (42007)

Should be comfortable with quantitative data analysis, software and tools

CONNECTION: METRO 2011, SHAPAR-VERAVALL & KUNAVADY A. N. U



# Contact us for questions



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