

# Project Summary

Project Id/No	
Project Name	Complex Network Analysis: Indian Railways with Special Emphasis on using Solar Energy
Project Members	Aayush Jain, Arvind Singh, Namrata Arora
Abstract	<p>A country's transportation system is one of its most substantial economic growth measures. The empirical analysis of the Indian Railway Network (IRN)'s statistical characteristics comprising 926 nodes, i.e. train stations. The IRN consists of more than 8000 stations, whose study as one whole network is a Herculean task. We have studied the network on a small scale which could give us the complete properties of the railway network and preserve its properties and make our study consistent, more than 8000 stations were reduced to 926 major stations and the total of 16 zones were reduced to 4 zones selected on the basis of average degree. The possible beneficial usage of solar energy on IRN system is looked into.</p> <p>Detailed complex network analysis of IRN network includes studies involving like shortest-path length, accompanied by degree of clustering and the scale-free distributions weighted degrees, namely strengths and distributions of clustering coefficients. For the whole network average path length came out to be 2.162, clustering coefficient came out to be 0.679 and average degree came out to be 134.269. The Indian Railway Network shows similar properties to that of a small world network as the average degree is high (134.269) and average path length is small (0.679).</p> <p>A sustainable transport system is one that is based on energy efficiency and prevents damaging environmental and human influences. Achieving this objective involves optimizing transport networks to conserve energy. The use of solar energy as an auxiliary power will save an estimated 1.2 lakh kilo liters of diesel every year, the railways will be able to pocket Rs 146.4 crores in one year.</p>

Project Photos

