Building Envelope Optimization

Urban Planning, Residential and Commercial penetration of energy efficient envelope

Level 1

Level 1 assumes that Energy Conservation Building Code (ECBC) compliance may remains voluntary and penetration of energy efficient building design & materials remain low. This could be because of technological, knowledge and financial barriers. Smart building penetration is limited to state capital and periphery areas. By 2050, 25% buildings comply to ECBC Code. Penetration of smart buildings interventions in residential buildings reaches 11%, 5% and 0% respectively for High rise, Horizontal Development, and Affordable Housing.

Level 2

Level 2 assumes slightly higher penetration of energy efficient building designs and materials in urban areas. This could be supported by policy measures like a reduced property tax, registration fees, etc., for the energy efficient buildings. By 2050, 50% buildings comply to ECBC Code. Penetration of smart buildings interventions in residential buildings reaches 54%, 43%, and 0% respectively for High rise, Horizontal Development, and Affordable Housing.

Assam had 14% urbanization in 2011.From Year 2001 to Year 2011 the urban population increased by 28% from 3.4 million to 4.4 million while rural population increased by 15% during the same period from 23.2 million to 26.8 million. Further it is expected that urbanization in the state will reach 25% in next thirty to thirty five years. This increase in urbanization will increase demand for residential and commercial space in urban centers and periphery. The state government has also planned for development of Guwahati as a smart city which will increase demand efficiently. This lever analyses impact of user's choice on building sector energy demand. As a first step, three scenarios on how the urban planning is expected to pan out in the future are offered. In the second step, users can choose four different scenarios on reducing the cooling load of buildings through greater penetration of energy efficient building materials and appliances. The savings achieved depend on the chosen Urban Planning Scenario and the GDP growth.

Level 3

Level 3 assumes mandatory compliance of energy efficiency standards for new buildings. Smart buildings penetration also increases, which could be due to government schemes and incentives. By 2050, 75% buildings comply to ECBC Code. Penetration of smart buildings interventions in residential buildings reaches 81%, 60%, and 0% respectively for High rise, Horizontal Development, and Affordable Housing.

Level 4

Level 4 is the most aggressive scenario which assumes more aggressive Energy Performance Index (EPI) standards for buildings and mandatory adoption of new codes by new buildings. Penetration of smart buildings also increases significantly in urban centers and periphery areas. By 2050, all buildings comply to ECBC Code. Penetration of smart buildings interventions in residential buildings reaches 98%, 87%, and 0% respectively for High rise, Horizontal Development, and Affordable Housing.