

Concept Paper		
Energy Simulation of Building		
NPA	14 July,2020	SAARC Energy Center

Background:

Buildings use about 40% of global energy and consume approximately 60% of the world's electricity. Buildings also contribute substantially towards greenhouse gas emissions. The construction of both residential and commercial buildings in SAARC Member States is increasing because of population growth, economic development and urbanization. As SAARC Member States are already facing energy shortages, any anticipated increase in the number of buildings and allied installations is likely to further strain the energy supplies of the Member States. This situation merits employment of efficient measures in the buildings.

The energy consumption of a building is a complex function of vast number of interrelated processes such as local weather, occupancy, type of load, operation schedule, expected level of comfort, materials used in building envelop, geometry and facing of buildings and other various scheduled and random variables. For the design and operational decisions of an energy efficient building, correct estimates of these variables and process are needed. For that reason, energy behaviour and performance of variables of the building are modelled and computer simulation is carried out. Based on the results of the simulation, refinements in the processes and variables are determined to have an energy efficient design of the building. Such simulations are increasingly used as a tool for designing, operating and retrofitting of the buildings to meet the energy and environmental requirement

Introduction:

Energy simulation or energy modelling of buildings refers to the use of computational mathematical models to represent the physical characteristics, expected or actual operation, and control strategies of a building and its energy systems. These simulations include calculations of building energy flows, airflows, energy use, thermal comfort and other indoor environmental quality indexes. The result /

outcome of energy simulation of buildings will help to reduced energy use and greenhouse-gas emissions and hence energy and environmental goals in South Asian Regions will be met.

To increase awareness about the buildings simulation tools and their applications, SEC under its thematic area of “Programme to Successfully Implement Technology Transfer (POSIT)” is conducting a webinar on “Energy Simulation of Building”. The proposed webinar will consist of presentations from various experts having key competency in energy simulation of Buildings. Target participants of this webinar are designers and architects of the buildings, municipal authorities, energy manager, academia and energy efficiency practitioners.

Objectives:

The objective of the webinar is to increase awareness about different types of building energy simulation tools and their applications. Experts will share the knowledge about simulation requirements, various available tools, their suitability, viability and application; and use of achieved results in design, operation and retrofit of buildings to make them energy efficient.

Major Aspects /Topics to be covered during the Webinar:

The following aspects of energy simulation of the buildings in SAARC countries shall be covered in the webinar:

1. Range of simulation tools and application
2. Heating, Ventilation and Air Conditioning (HVAC) and lighting systems
3. Understanding, quantifying and modelling of human-building interactions
4. Addressing the building performance gap
5. Modelling building operations, controls, and retrofits
6. Building Performance simulations throughout the building life cycle
7. Energy model calibration and refinement
8. Evaluating the energy-saving potential of building
9. Green buildings and associated aspects

Relevance, Coherence and Sustainability:

SEC, in the past, had conducted number of webinars and studies related to energy efficiency, efficient windows, heating and cooling of buildings, rooftop solar etc. This webinar will focus on the software to be applied while designing operating and retrofitting of building. This webinar is expected to be relevant to address the energy requirement of buildings at optimum cost. This will also provide to access the inherent energy saving potential of buildings. Optimally designed energy efficient buildings will address the sustainability objectives with energy saving, reduction of greenhouse gases, more environmental benefit and expected human comfort.

Potential Professional Resource:

The experts/ presenters from Australia and China having experience in the areas of energy efficient buildings and having good skills in software and simulation shall be engaged in the webinar. The session will be made more interactive addressing the questions raised by the participants. SEC program coordinator will finalize the event program in close coordination with the speakers

Venue of the Webinar:

The Webinar shall be broadcasted from office of SAARC Energy Centre on 14/07/2020