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DECARBONIZING HABITAT PROGRAMME

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From urbanization to the ascent of the working classes worldwide, an increasing population to hi-tech advancements, all these progressions lead to significant ramifications for cities. These ramifications are largely in terms of loss of natural resources, such as vegetation, pollution, and global climate change. Increasing urbanization brings with it an increase in incomes of the citizens that subsequently provides an impetus to the rise in demand for a comfortable lifestyle and better standard of living. This puts stress on the environment and creates an ever-widening gap between the demand and supply of portable water, electricity, and other valuable resources (Nagrath and Gilbert 2014). To meet these burgeoning needs more infrastructure has to be created. The building and construction industry, which becomes an integral part of this infrastructure, is one of the significant contributors to increasing GHG emissions. Hence, it becomes important that the environmental impact of the construction industry is taken into consideration and effective and efficient methods are discovered for moving onto the path of sustainable development (Horvath 2004; Liudmila and Balkiz 2019). Therefore, creating sustainability goals for this industry and achieving them through the construction of green buildings and infrastructure shall contribute immensely towards mitigating climate change.

The building sector uses a substantial amount of non-renewable energy and contributes significantly to global CO₂ emissions. About 39% of annual global CO₂ emissions come from buildings. Also, according to reports, the building sector consumes more than one-third of all energy worldwide, in both developed and developing nations. Therefore, it becomes pertinent to employ CO₂ reduction efforts. To encourage CO₂ emission reduction, energy conservation planning and the execution of methods to decrease potential emissions should be highlighted. The primary step while aiming at reducing emission is quantifying the GHG emissions caused due to anthropogenic activities. Carbon Footprint (CF) can be understood as a methodology that is used to quantify the amount of GHG emissions attributed to organization/company/industry over the life cycle of products. The Greenhouse Gas Protocol created the scope 1, 2, and 3 systems in response to the primary goal of limiting global temperature increases well below 2°C, set in the Paris Agreement. Three “scopes” (scope 1, scope 2, and scope 3) are defined for GHG accounting and reporting purposes to aid in the differentiation between direct and indirect emission sources, increase the transparency, and provide utility for various types of climate policies and types of business target areas.

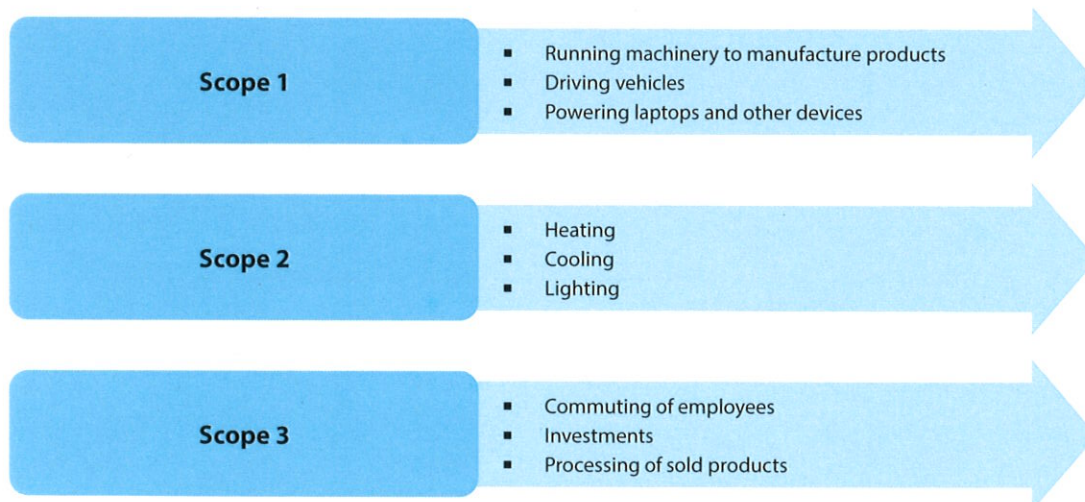


Figure 1: Categorization of GHG emissions – Scope 1, Scope 2, and Scope 3

Mainstreaming climate action at the local level with appropriate mitigation and adaptation approaches is crucial to meet our country's carbon neutral target as well as international commitments. GRIHA (Green Rating for Integrated Habitat Assessment) is an indigenously developed national green building rating system established in the year 2007 with the combined efforts of the Ministry of New and Renewable Energy (MNRE), Government of India and TERI—to develop a rating system that suits Indian climate and construction practices. GRIHA assesses the environmental performance of a building from cradle-to-grave, i.e., it holistically evaluates buildings over its entire life cycle. The rating aligns itself with the national regulatory framework and policies, such as, *National Building Code, Energy Conservation Building Code, Ministry of Environment and Forests clearance, Central Pollution Control Board guidelines, etc.* India, in its intended nationally determined contributions (INDC) document, submitted at COP 21 in Paris, has highlighted GRIHA as an indigenous green building rating system developed in India. The United Nations Framework Convention on Climate Change (UNFCCC) in their third biennial update report on India has acknowledged the work done by GRIHA in the field of carbon mitigation in the building sector. GRIHA Council has received accolades in the spheres such as energy efficiency, site planning, and conservation and efficient utilization of resources.

GRIHA rating is developed on the principle of 'what gets measured, gets managed'. GRIHA uses its tool to analyse and foresee the possible effective and efficient solutions to modern problems coming up due to technological advancements and anthropogenic activities. GRIHA Council currently has over 3280 registered projects across the country, with a combined footprint spanning 722 million square feet. Of these, more than 700 buildings that have already been rated have helped preventing 83,93,046 tons of carbon dioxide from being released into the atmosphere every year. A total of 533 MWp of renewable energy systems has been installed and are responsible for saving 2,97,38,818 MWh of energy. GRIHA rated projects have contributed to water savings of 10,36,11,250 kL/annum; 2,66,770 newly planted trees, and 28,000 preserved trees.

In COP 26, India has pledged to be a 'Net Zero Emission' nation by the year 2070. In commitment to this vision of our Hon'ble Prime Minister of India, GRIHA Council has initiated a drive towards a

zero-carbon mission with the launch of its 'Decarbonizing Habitat Programme' at this year's World Urban Forum in Poland. The 'Decarbonizing Habitat Programme' will aid an organization/company/industry to estimate its current carbon footprint and adopt cost effective strategies that will help in reducing the footprint in the future. This would also aid in improving the stakeholders' ability to comprehend the effects produced by their actions and help decision-makers create efficient policies, objectives, and implementation strategies.

There is currently a dearth of knowledge regarding GHG emissions calculation at various levels. Cities require tools and evaluations to track their carbon emissions, and efforts ought to begin at the micro level with customers and their lifestyles; before moving on to buildings, neighbourhoods, and so forth. Our built environment is an intricate system that includes energy, water, and waste systems. Users and communities affect the effectiveness and efficiency of these systems through their way of life and individual behaviours. In that regard, the Decarbonizing Habitat Programme by GRIHA Council encapsulates the key to mainstreaming climate action at the local level—calculating the net GHG emissions by breaking the system into smaller systems. In addition, the programme also brings our focus on carbon sequestration, a very relevant and state-of-the-art solution to reduce atmospheric carbon. This programme would enable an organization or industry to estimate its current carbon footprint considering both the emitted and offset carbon. The tool has the potential to push industries to adopt cost effective strategies that will help in reducing the footprint in the future.

GRIHA Council carries out carbon calculation in a standard way of measuring and reporting the environmental impact that a person, building, land, or a structure, has on the environment. GRIHA Council carries out the assessment of total emission of energy, water, waste, transport, social, and lifestyle and intends for the quantification to encourage an organization/company/industry to curtail their operational carbon emissions. The carbon assessment would be conducted for the parameters as mentioned in figure 2.

The registered projects under this certification are evaluated using a carbon rainbow certification. VIBGYOR defines the level of carbon mitigation implemented by various projects/companies/

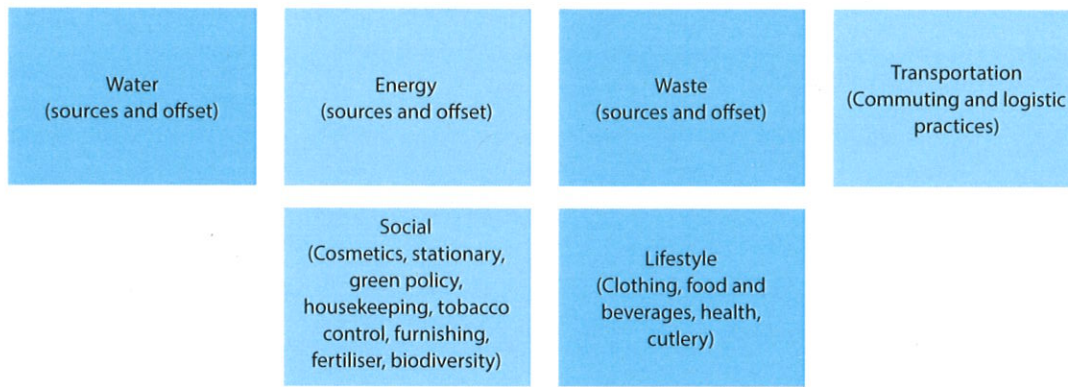


Figure 2: Parameters for carbon assessment under DHP

organizations. Red, as denoted by the colour, implies the worst case and denotes 20% reduction in carbon emissions. The name of the certification presents itself as an opportunity, a ray of hope towards a greener future in the current overstressed natural environment. The range for certification in the initial levels is higher in comparison to the final levels.

Certification Level		Scale
Red	High carbon emission	0.2
Orange	Moderate carbon emission	0.4
Yellow	Low carbon emission	0.6
Green	Towards carbon reduction	0.8
Blue	Near net zero	0.95
Indigo	Net zero	1
Violet	Net positive	1+

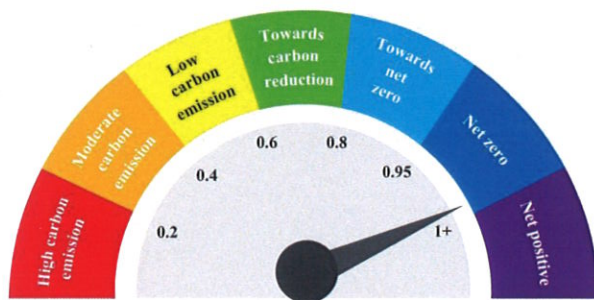


Figure 3: Certification Scale

As the world is moving towards carving a low carbon future, GRIHA Council has been recognized as a frontrunner in ensuring sustainable development. The ratings and certification are aligned towards achieving SDGs in an effective and efficient numbers. Using its tool, GRIHA Council extracts relevant data

that is subsequently used to understand and analyse the present condition of achievement of SDGs. Every parameter that is being assessed in the GRIHA rating caters to a specific component that is vital for moving towards sustainable green habitat and green growth. GRIHA being an indigenous-national green rating system in India, aims at handholding users in moving towards sustainable habitat in an effective and efficient manner.

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