CONSTRUCTION INFRASTRUCTURE ARCHITECT WORLD • VOLUME 8 | ISSUE 6 | MUMBAI | JAN - FEB 2020 | PAGES 100 | PRICE ₹ 350

CONSTRUCTION INFRASTRUCTURE ARCHITECT WORLD

CRAFTING THE CONSTRUCTION INDUSTRY IN WORDS

SMART *Cities* and Sustainable *Solutions*

Sustainable solution related to a city is a process or system of strategies or governance which enforces sustainability & thus focusses on meeting the needs of the present times without compromising the ability of future generations to meet their needs.

CONTENTS

CONSTRUCTION INFRASTRUCTURE ARCHITECT WORLD
JAN - FEB 2020 VOLUME 8 ISSUE 06 PAGES 100 PRICE RS. 350

22 SMART CITIES AND SUSTAINABLE SOLUTIONS

Sustainable solution related to a city is a process or system of strategies or governance which enforces sustainability & thus focusses on meeting the needs of the present times without compromising the ability of future generations to meet their needs.

68 EXCON 2019

CII organised and hosted the 10th Edition of EXCON – An International Exhibition & Conference on Construction Equipment & Construction Technology was held between 10 to14 December 2019 at Bangalore International Exhibition Centre (BIEC), Bengaluru, Karnataka.

OTHER PAGES

MUNICIPALIKASPECIAL

EXCON SPECIAL

VOL 8 | ISSUE 6 | MUMBAI PAGES: 100 | `

CONSTRUCTION INFRASTRUCTURE ARCHITECT WORLD

CRAFTING THE CONSTRUCTION INDUSTRY IN WORDS

Editor & Publisher: Vijaykummar G Nair
vijay.ciaworld@gmail.com

Deputy Editor: Sunitha V N
sunita.ciaworld@gmail.com

Green Building & Sustainability Advisor: Mala Singh

Consulting Editor: ***Dr Gorakh Bobde***

Business Development: ***Laxmi Venkatachalam***

Art Director: *J. C. Narkar (Artalks Advertisement LLP)*

Sales & Marketing: ***Umesh Makwana***

Sales & Marketing: ***G. Krishnan (South), M. Dev (North) , S Sainath (East)***

Web Incharge: ***Mukund Pilankar, Digambar***

Subscription Incharge: ***Lalit Kumar***

YEARLY SUBSCRIPTION:

Inland: ***Rs1800/-*** *Single Copy:* ***Rs350/-***
Foreign; ***$80*** *Single Copy:* ***$17***

Printed, Published & Owned by Vijaykummar G Nair and printed at Creative The Printing Press, F/313, First Floor, Dream Mall, Gate No.:2, LBS Marg, Bhandup (W), Mumbai 400078.

Corporate Office: EPIC Media Private Limited, Vrindawan, Office # 15, Yeshwant Nagar, Opp Shiv Sena Shakha, Vakola, Santacruz (East), Mumbai -400055. Contact: 9820899959 / 9833399819

EDITOR: VIJAYKUMMAR G NAIR

Building low Carbon Cities

The world is fast urbanizing – more than 55% of world population now lives in cities - from 751 million in 1950 to 4.2 billion in 2018. The 2018 Revision of World Urbanization Prospects produced by the Population Division of the UN Department of Economic and Social Affairs (UN DESA) estimates another 2.5 billion people will be added to urban areas by 2050, with close to 90% of this addition happening in Asia and Africa.

By Dr. Roshni Udyavar Yehuda

A recent release on the carbon footprint of 13,000 cities around the world led by Daniel Moran of the Norwegian University of Science and Technology, indicates that the 100 highest-emitting urban areas accounted for 18% of the global carbon footprint. In most countries, the report summarizes, the top three urban areas drive more than one-quarter of national emissions. In India, this cluster comprises New Delhi, Kolkatta and Mumbai ranked 30, 49 and 70 respectively in global ranking. While the ranking has much to do with population, it also has to do with affluence and the corresponding consumption and lifestyle.

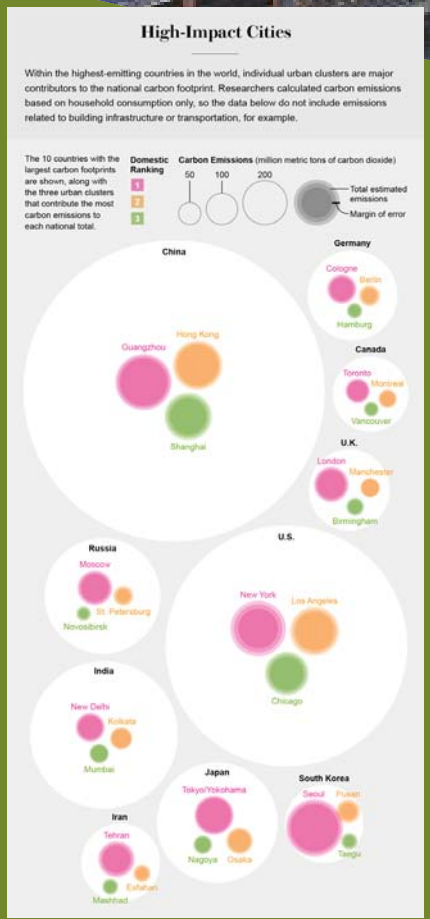
According to the United Nations DESA report 2018, India has 52 cities with population between 1 to 5 million, and 49 cities with population between 500,000 to 1 million. In the context of this trend, below are five strategies for planning low carbon cities:

Sustainable mobility is a people-centric and low-energy planning of transportation which provides for easy access to basic amenities such as school, office, super market, banking, place of worship, shopping and recreation–walkable to the extent possible – or by using modes of transportation which require low energy input per unit of population transported, such as cycling, mass transit including trains, buses (bus rapid transit system – providing priority to bus lanes), trams/ light rails, waterways and the like. It is imperative for these systems to be of low intensive construction.

Urban farming spaces can to be allocated within city limits – on peripheral buffer zones or rooftops - to provide fresh greens to the city while minimizing carbon emissions from transportation. These agri-zones built using efficient green-houses and hydroponics will have the potential to use recycled organic waste from city as fertilizer, thereby reducing the use of fossil-fuel based chemical fertilizers and promoting healthy lifestyles in addition to increased bio-diversity within city limits.

Circular economy principles to recycle and reuse, utilize waste as resource and follow best practices in utilization of natural resources. This includes use of building construction materials from agriculture and industrial waste such as fly ash, rice husk, and aggregates from building construction debris, use of bamboo and other natural materials in structural and non-structural uses. It will also be applied to all consumer and electronic goods, creating a cycle and culture of segregation, recycle, reuse and reduce.

Energy efficient buildings have low cooling and lighting loads, reduced energy consumption and low carbon footprint. This can be achieved by designing energy efficient building envelope, with U-value or rate of thermal transmission below the maximum value stated in the Energy Conservation Building Code (ECBC). Currently used external walls made of 230mm clay bricks (average density 1500kg/ cu.m) have U value



of 1.5 W/m2 0K, 200 mm Fly Ash block is 1.3 W/m2 0K, and for a 200 mm AAC (Autoclaved Aerated Concrete) block wall is 0.8 W/m2 0K. The most efficient of these, ie. AAC, is only 50% as efficient as that required by the ECBC - of 0.4 W/m2 0K. It is projected that buildings which follow the code will be 30 – 40% efficient as compared to conventional buildings.

In the context of urban high rise buildings, roof U-value is not significant as comparitive area with respect to wall and glazing is much smaller. However, it will be of great significance in buildings of up to 3 to 4 storeys height. Glazing orientation, area, SHGC and u-value are improtant in all dwelling types. Their appropriate design and shading will ensure a more efficient envelope and natural light within dwellings.

The star labelling scheme of the Bureau of Energy Efficiency (BEE) provides a guide for energy efficient equipment. Five star rated ACs, geysers and refrigerators, although higher in cost by 10 – 15%, payback capital in less than 5 to 6 months. Similarly, use of LED lamps in habitable spaces and sensor based dimmable LEDS in common areas such as staircases, can have significant savings in electricity bills. Brushless DC fans consume 50% of energy as compared to a regular fan. Efficient building envelope and equipment together can reduce the Energy Performance Index (EPI) of a building by up to 50%.

Net Zero Energy buildings and cities powered by alternate fuel sources – solar, wind, biomass, biogas and bio-diesel – will complete the cycle of energy. Grid-connected solar photovoltaic panels on building rooftops, public spaces including railway stations, bus stops and public buildings complimented by wind and biomass based energy, can drastically reduce carbon emission of cities.

Low carbon cities have been conceived as in the master planning of Masdar city in Abu Dhabi by Sir Norman Foster. One of the best examples of low carbon city is the city of Freiburg – a quaint little town in South-West Germany that was almost razed during World War II. In June 1992, the Freiburg city council adopted a resolution that it would permit construction only of "low-energy buildings" on municipal land, and all new buildings must comply with certain "low energy" specifications. Low-energy housing uses solar power passively as well as actively. In addition to solar panels and collectors on the roof, providing electricity and hot water, many passive features use the sun's energy to regulate the temperature of the rooms. A typical Passive House here consumes only 15kWh/m2per year.

By systematic planning of green spaces based on ecosystem approach will increase bio-diversity and act as carbon sink even as it will improve the quality of life in these cities. CIA

Regn No.: MAHENG/2011/41183

Wherever a hydraulic, lubrication or process fluid is operating, **FILTREC** filters and filter elements ensure the correct fluid cleanliness to maintain the system's efficiency and reliability.

FILTREC BHARATMANUFACTURING Pvt. Ltd.

Phone:+91 80 2648 1675
Mail: info@filtrec.in
Web: www.filtrec.in