



Bureau of Energy Efficiency



सत्यमेव जयते  
Government of India  
Ministry of Power



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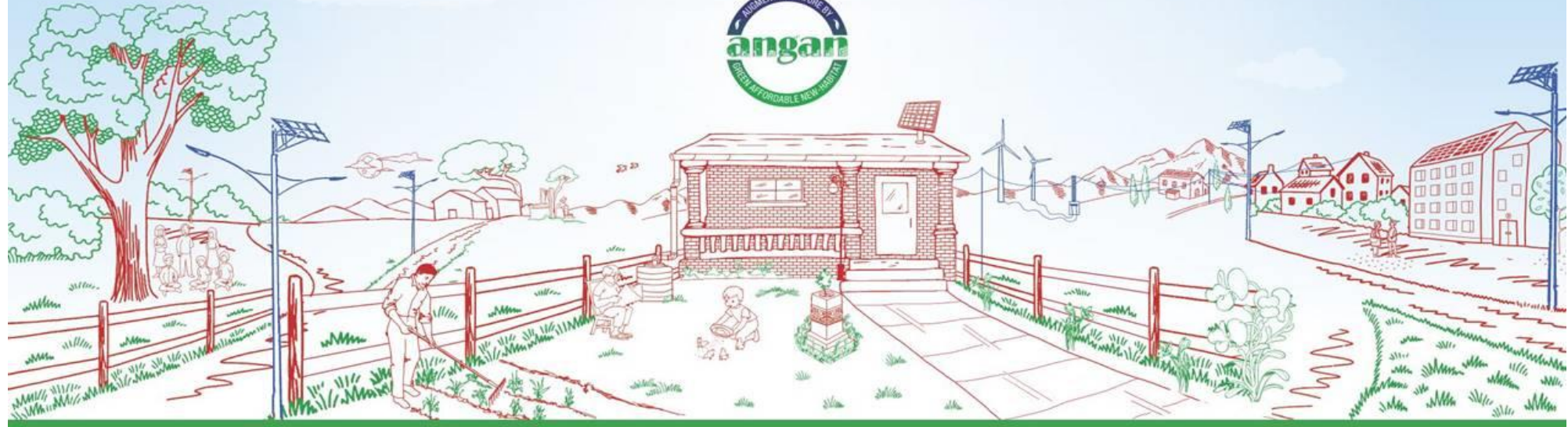
# ANGAN

## Augmenting Nature by Green Affordable New-habitat

A Courtyard for Revolutionary Change in Building Energy Efficiency

An International Conference on Building Energy Efficiency

9<sup>th</sup>-11<sup>th</sup> September, 2019 | Hotel The LaLiT, New Delhi





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THIS PRESENTATION WAS SHARED BY

**Mr. Sriram Kuchimanchi**

Founder & CEO, Smarter Dharma, Bangalore

FOR THE SESSION:

*“Steps towards Net Zero Energy Buildings”*

DURING ANGAN 2019

Knowledge Partner

**teri** | THE ENERGY AND  
RESOURCES INSTITUTE  
Creating Innovative Solutions for a Sustainable Future

Event Partner

**TEC INDIA**™  
EVENT & BRAND MANAGEMENT CO.

# NET ZERO Buildings

## Challenges and Approach in India





**Sriram Kuchimanchi**

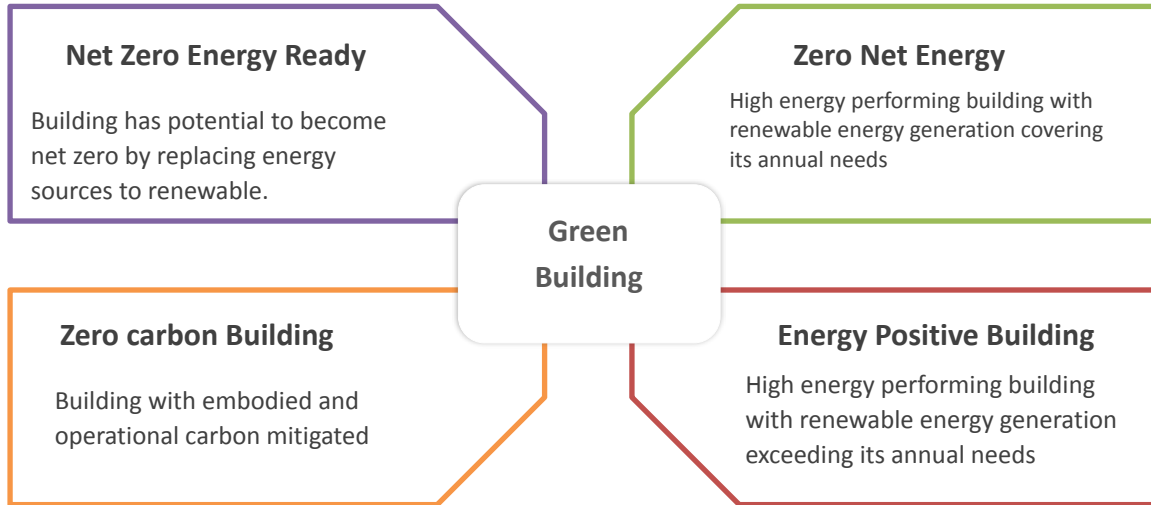
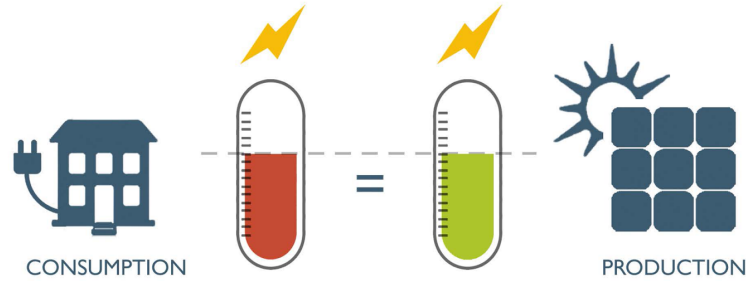
**Founder & CEO**

Ashoka Fellow

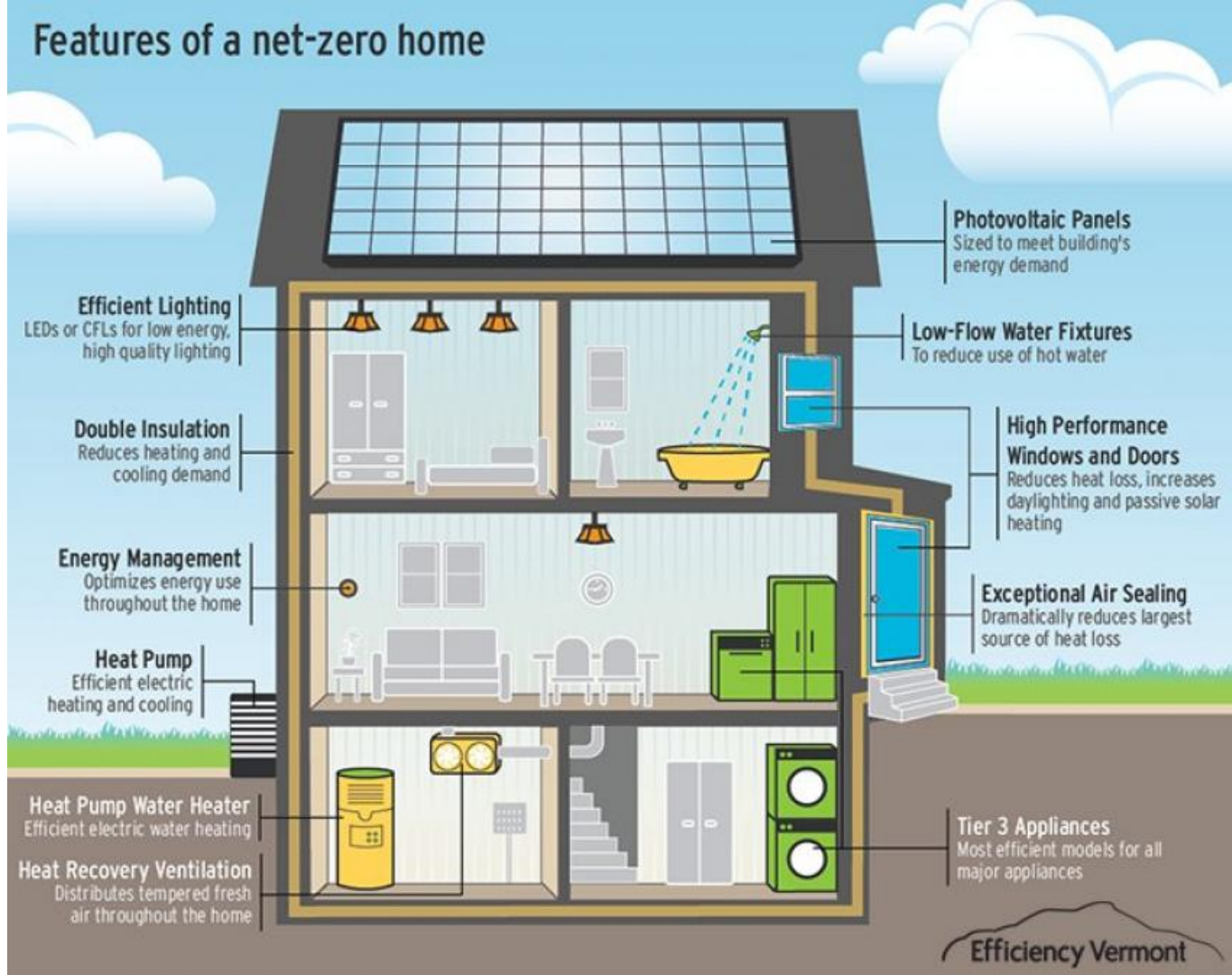
Autodesk Social Fellow



# Net Zero



# Features of a net-zero home



# Net Zero



## Top Challenges to building Net Zero

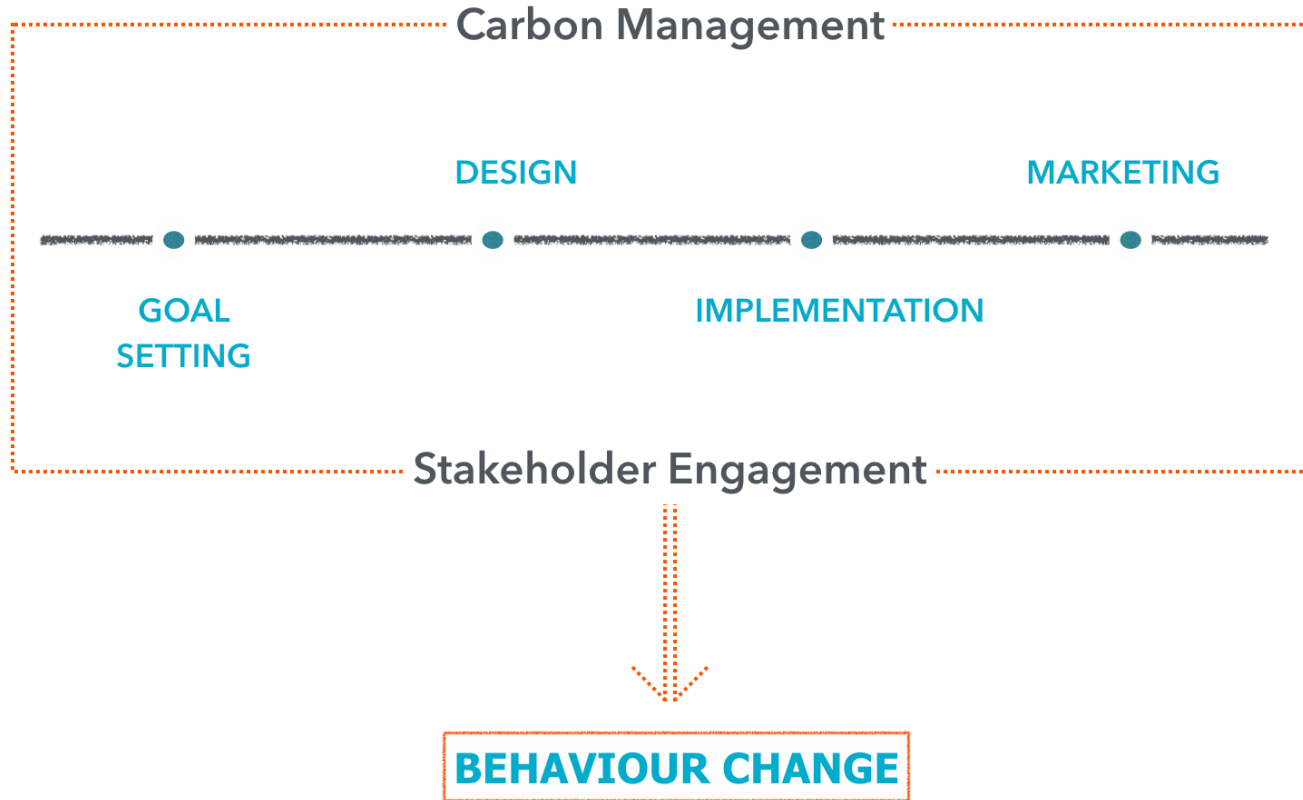
1. Higher (actual or perceived) Initial Investment
2. No proper Goals set
3. It's an After Thought
4. Awareness of Long-term Benefits

energy or low carbon fuels

with renewable energy generation  
exceeding its annual needs



# How



# Stakeholders



# Goals

## Zero External Water Dependency

Project water use & release must work in harmony as a closed loop system without any external inputs

1

## Zero Waste to Landfill

All waste should be reused or composed.  
No trash to be sent to landfills or water-bodies

2

4

Return developed land areas to pre-development environment in terms of green cover & lower temperatures

Integrated Living Enviro.

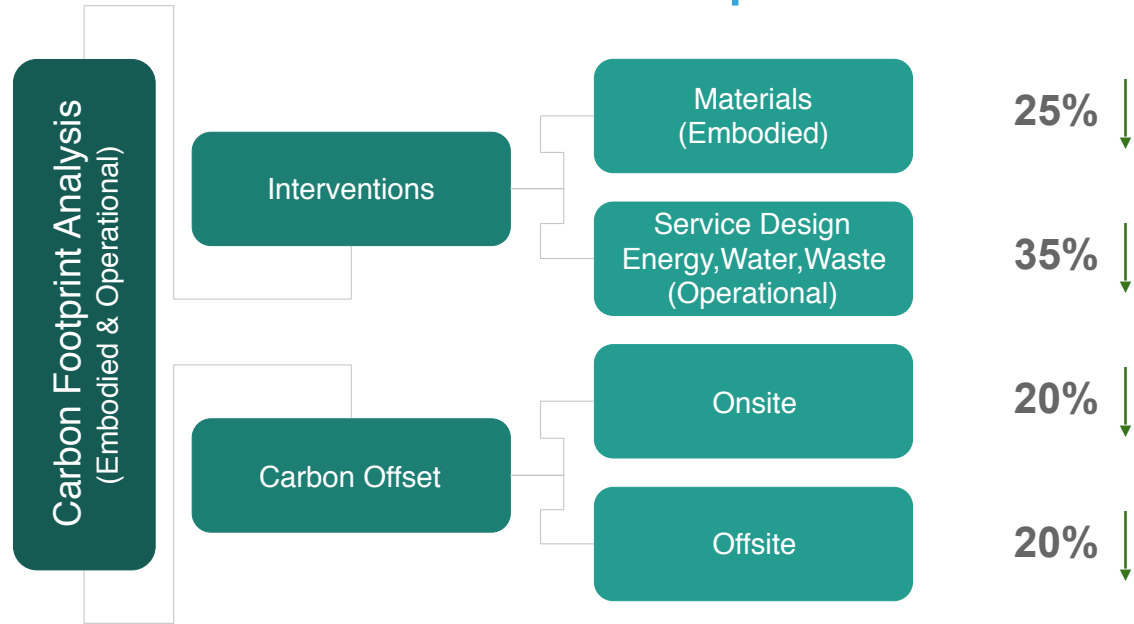
3

To manage all embodied & operational carbon impact by measuring, mitigating and offsetting carbon emissions

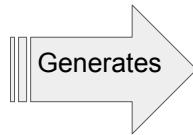
Carbon Neutral



# 7yrs Carbon Neutral Roadmap



55,95,544  
sq ft BUA

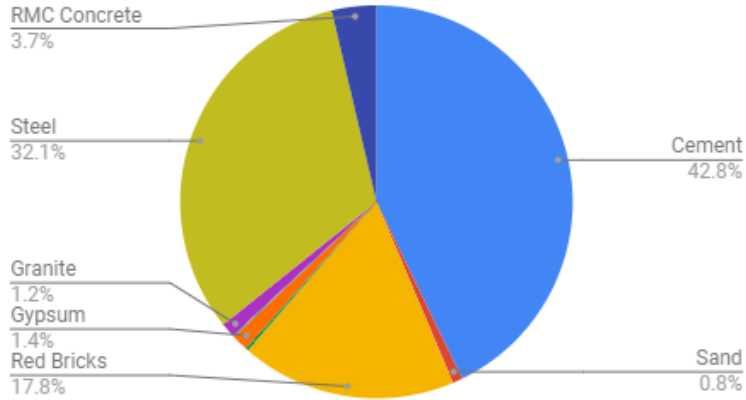


80,000-1,20,000  
tons CO2e

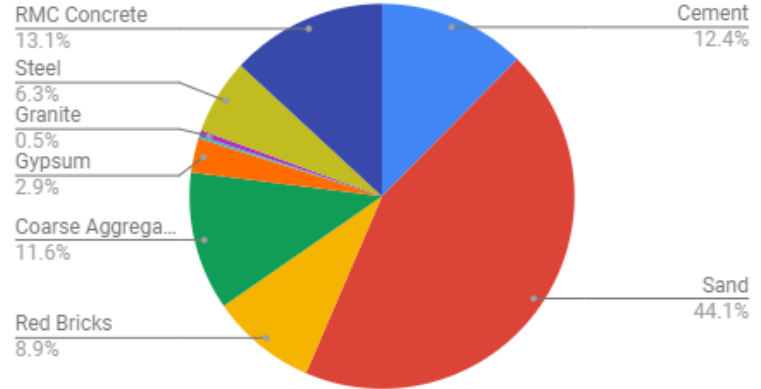


# Carbon Footprint (Embodied)

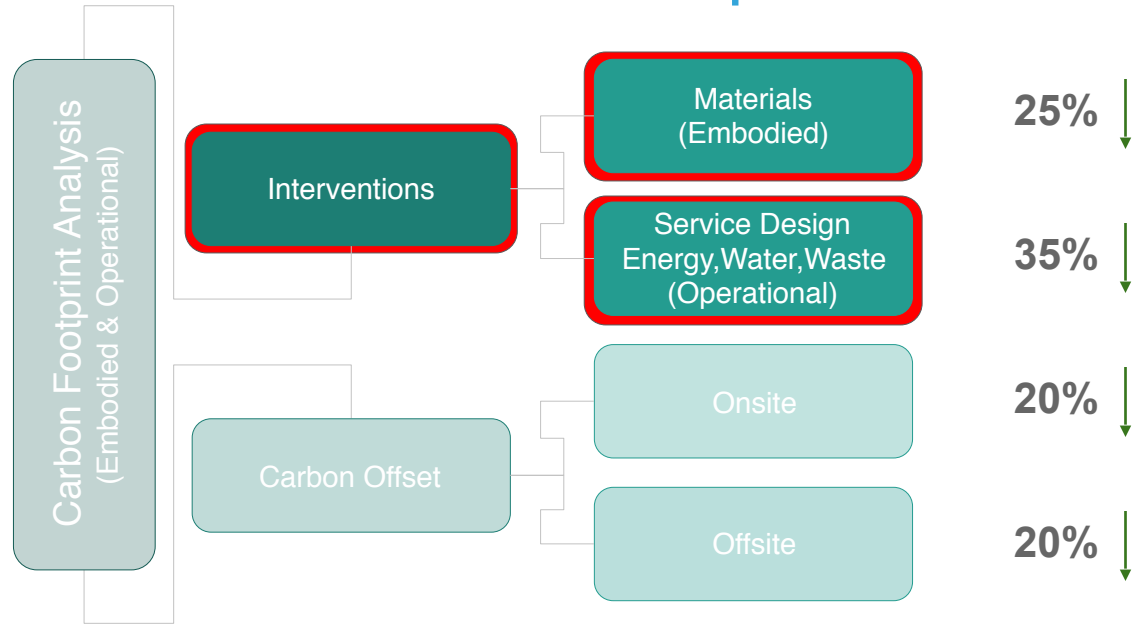
## Embodied Carbon



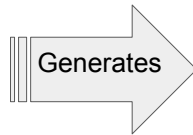
## Material Quantities



# 7yrs Carbon Neutral Roadmap



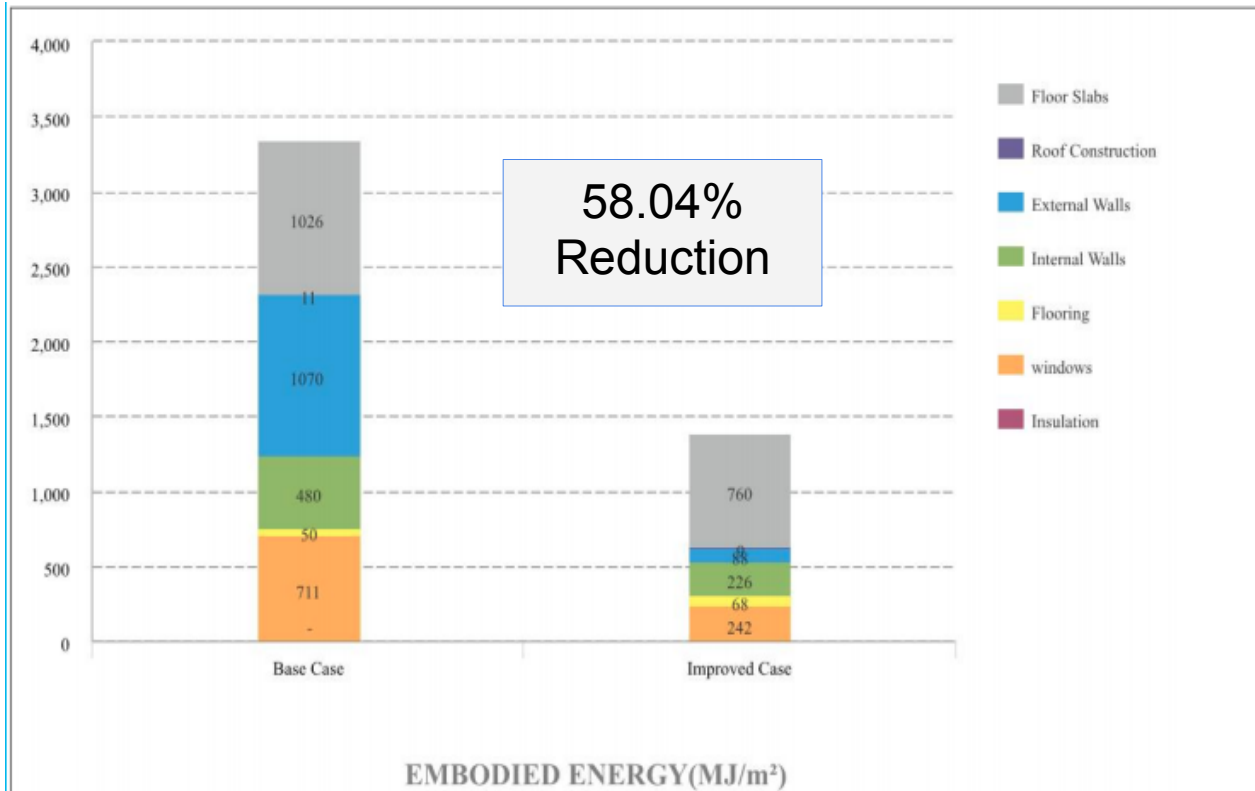
55,95,544  
sq ft BUA



80,000-1,20,000  
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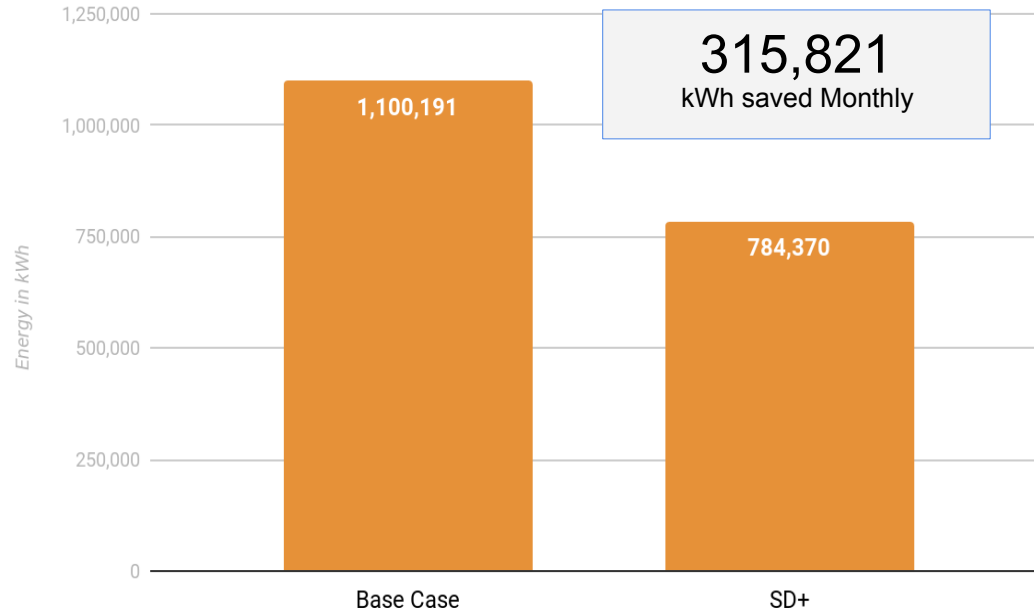


# CF reduction with Material interventions



# Energy

## Monthly Energy Consumption

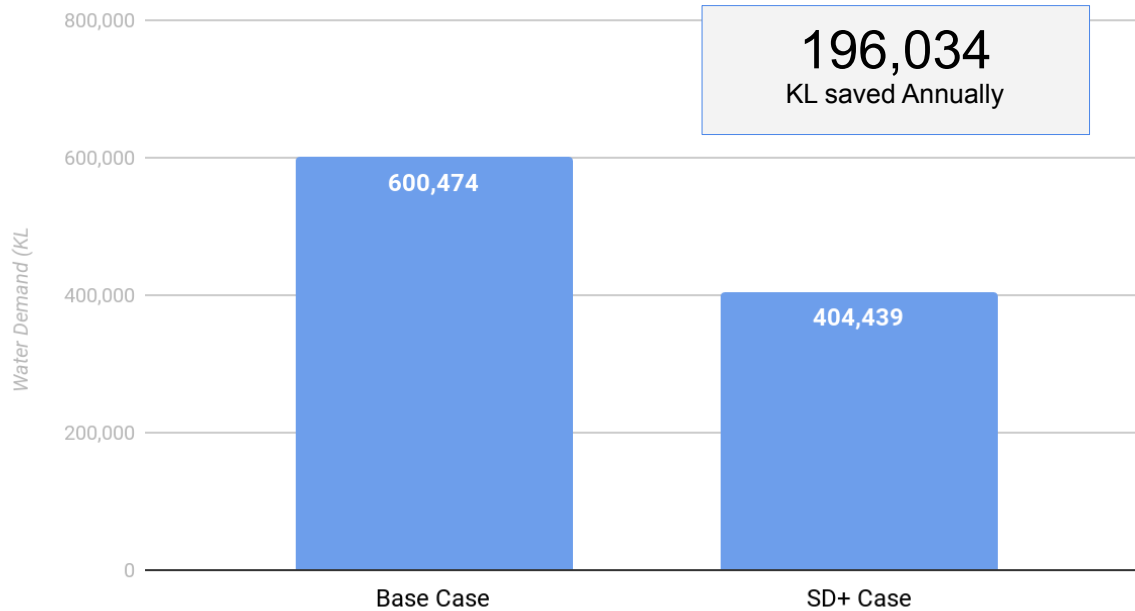


Rs.0.83 per sq ft reduction (Monthly Opex)



# Water

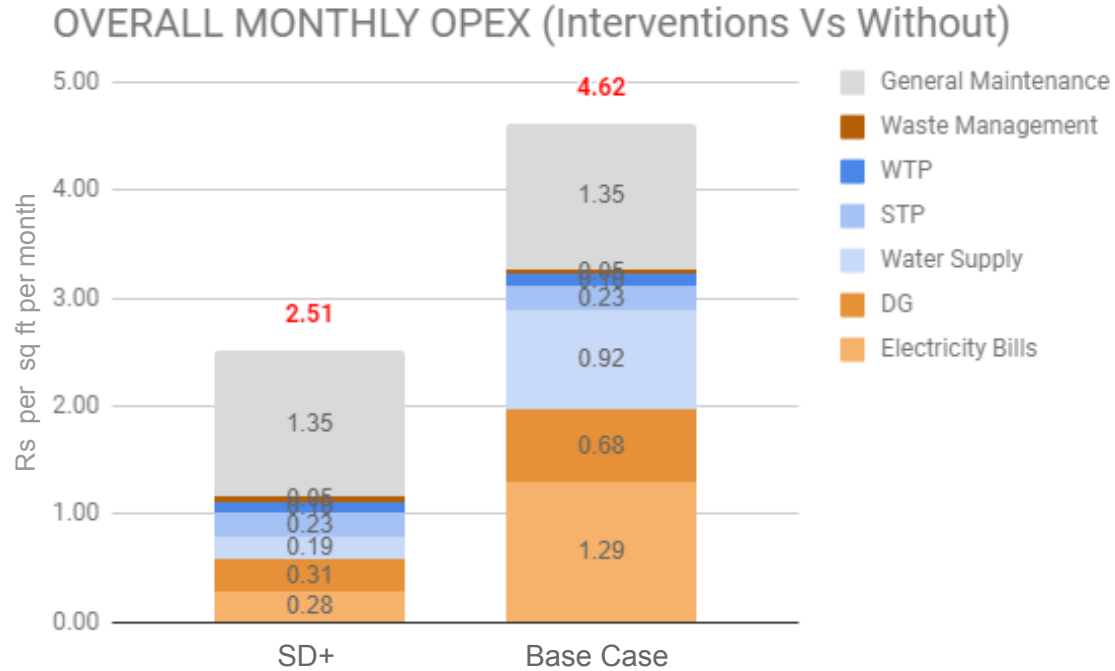
## Annual Water Demand



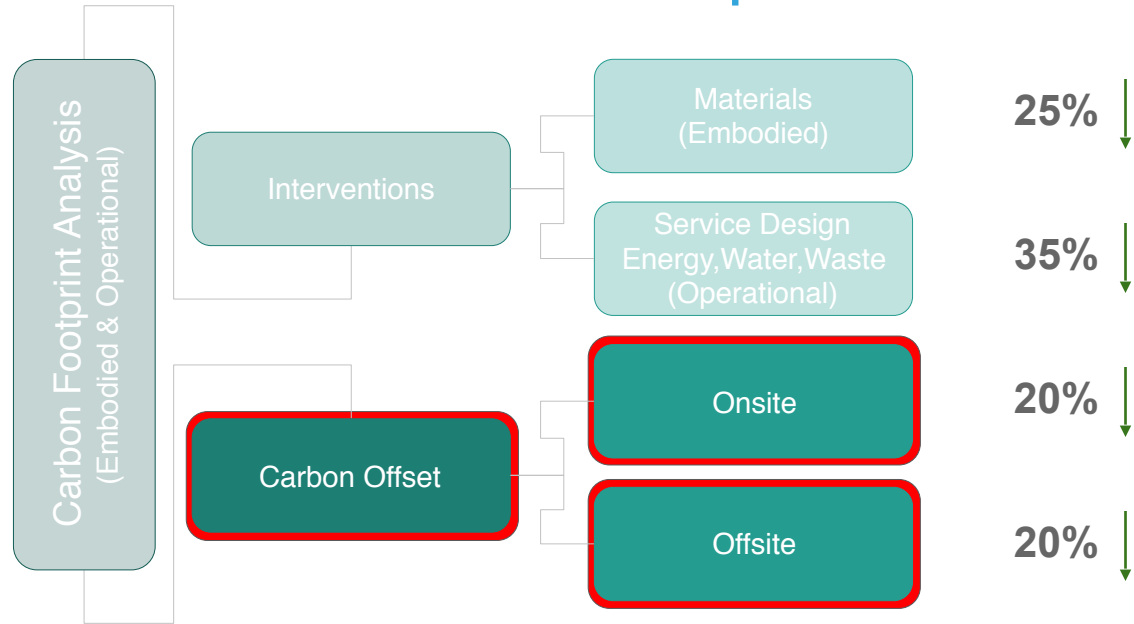
Rs.0.41 per sq ft reduction (Monthly Opex)



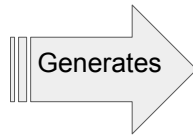
# Reduction in Monthly OPEX



# 7yrs Carbon Neutral Roadmap



55,95,544  
sq ft BUA

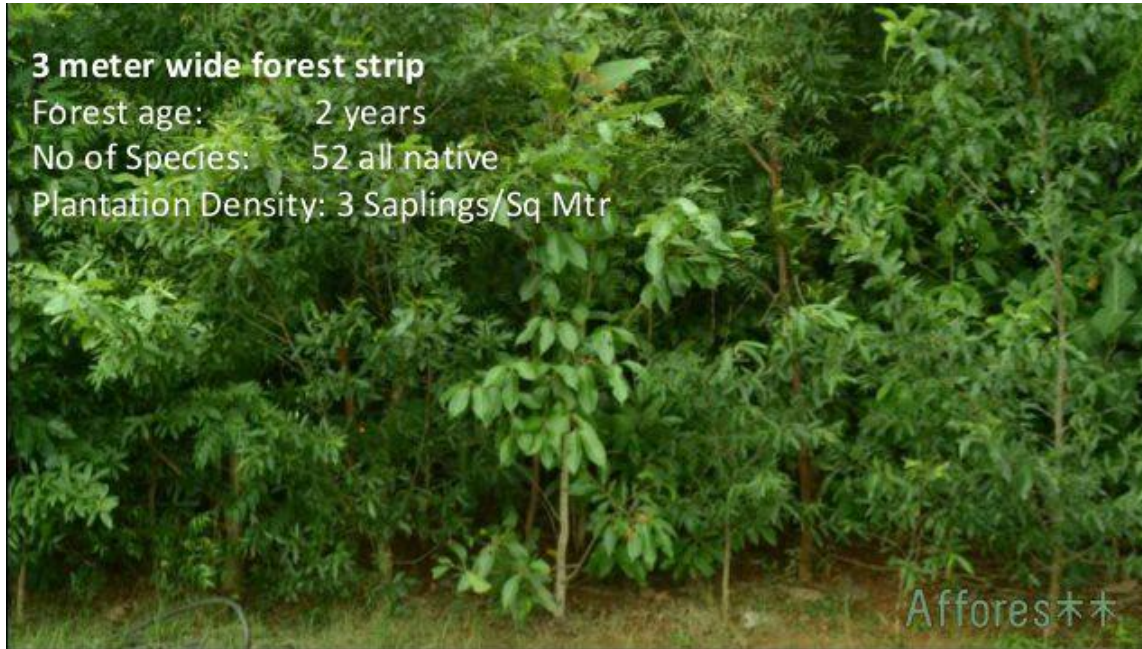


80,000-1,20,000  
tons CO2e

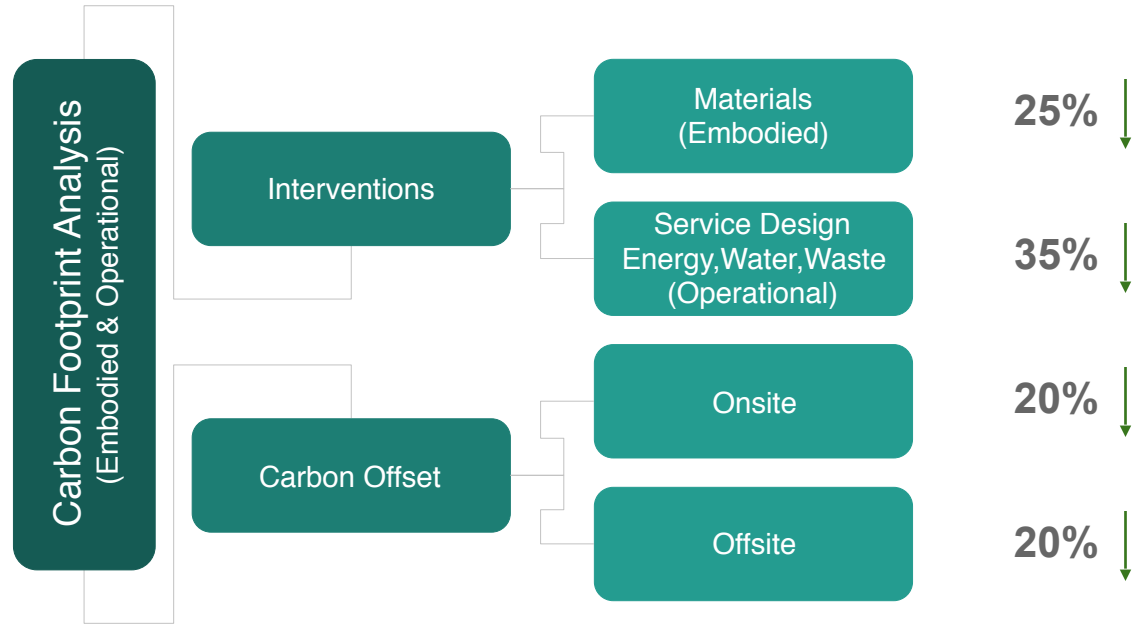


# Onsite & Offsite Carbon Offset

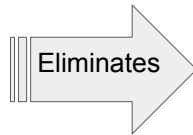
## Urban Forest - Miyawaki Model



# 7yrs Carbon Neutral Achieved



55,95,544  
sq ft BUA



80,000-1,20,000  
tons CO2e



# Case Study - SMR Project, CBD Area

## Sustainability Impact

Annual Savings

**ENERGY**

10,50,907 kWh

**WATER**

38,221 kL

**WASTE**

369 tons

## Financial Impact

Capex

Opex

↑ 3.3 Cr    ↑ 0.84 Cr

↓ 0.07 Cr    ↑ 0.19 Cr

↓ 0.11 Cr    0.03 Cr

Type : Office + Retail + F&B  
Area : 6,37,032 sq ft



15 yr  
mitigation  
**19,023**

CO<sub>2</sub>e tons



**95,115**

15 yr  
savings  
**19 Cr**

Rs



# Impact



**2,580**

**MWh ENERGY SAVED**



**79,600**

**KL WATER SAVED**



**14,120**

**TONS WASTE AVOIDED**

**Building  
footprint**

**5**

Million sq ft

**Building Types**

Residential, Commercial,  
Retail, Hotels, Hospitals



**25,200**

Tons CO2e mitigated

**Carbon Neutral  
Projects**

**2**



# Reverse Energy

**FOOD FOR  
THOUGHT**



Let us make a better today!



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