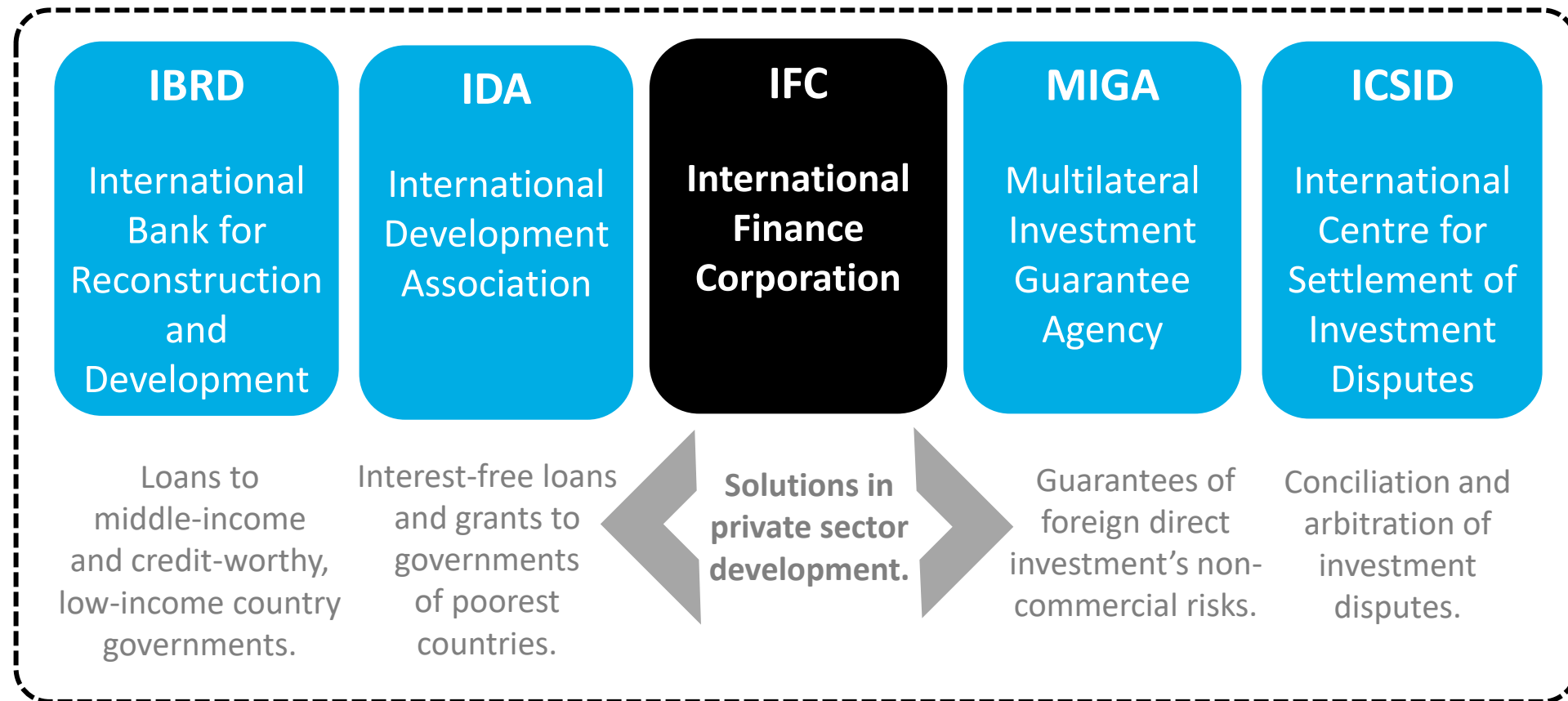




The Value Proposition of Green Affordable Housing in India

Autif Sayyed South Asia Project Lead, Green Buildings

IFC - MEMBER OF THE WORLD BANK GROUP



HOUSING LANDSCAPE IN INDIA

India has a population of 1.3 billion (272 million households)



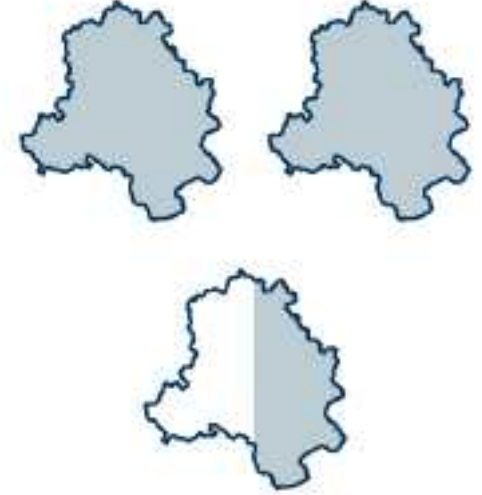
17.7% of the world's population

450 million Indians live in cities



More than the total population of the United States.

PMAY-U aims to construct 10 million new homes by 2020



Equivalent to 2.6 times Delhi's current residential building stock

Source: United Nations DESA, Population Division (February, 2019), Census of India (2011), United Nations DESA, Population Division (February, 2019), GOI Estimate (May, 2018), Housing Conditions In Delhi (November, 2014) - Directorate of Economics and Statistics, IEA Key World Statistics, 2017

ENVIRONMENTAL BENEFITS OF GREEN HOMES

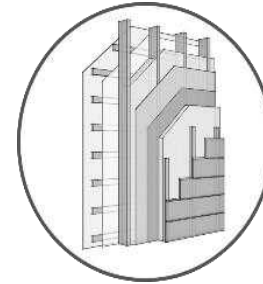
If just 20% of 10 million houses are green



**650 GWh/ year
operational
energy saving**



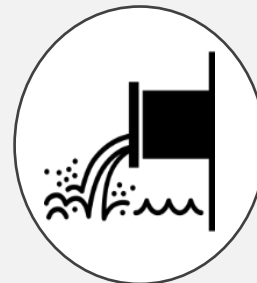
**89 Billion
Liters/ year
water saving**



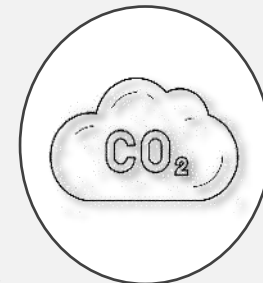
**75 Billion MJ of
embodied
energy saving**



**1200-1800/
home/ year
savings in
electricity bill**



**195 Million
Liters/ day
wastewater
saving**



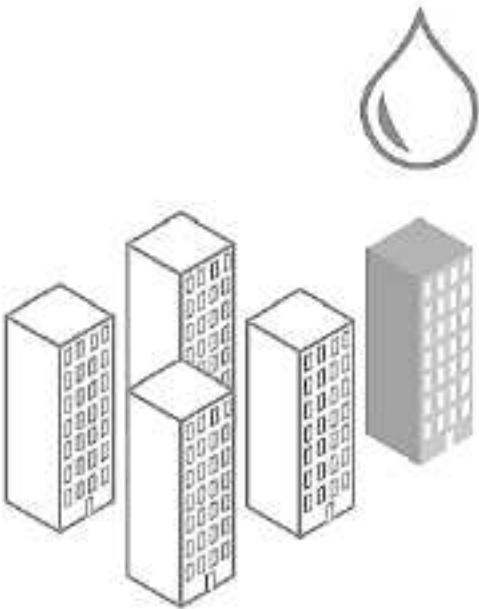
**0.66 million
tons/yr of CO₂
emission
reduction**

Assumptions: Built-up area : 51 sq.m per unit, Average occupancy: 4.5, Water requirement: 135 litres per capita per day (IS 1172), Energy requirements: 32 kWh/sqm/year, 0.82 tons of CO₂ are emitted per MWh of energy consumed (MoP estimate)

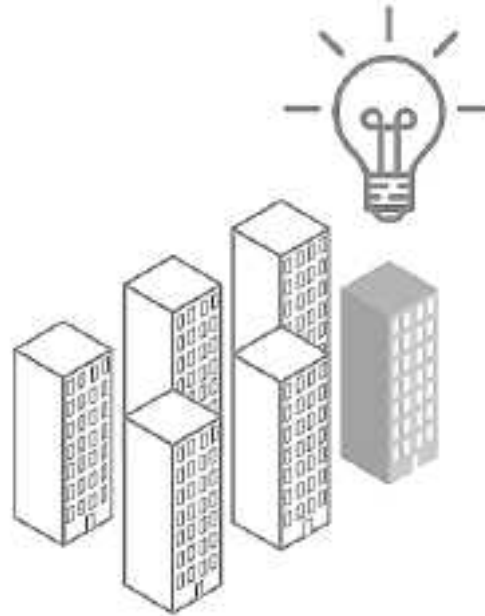
ENVIRONMENTAL BENEFITS OF GREEN HOMES

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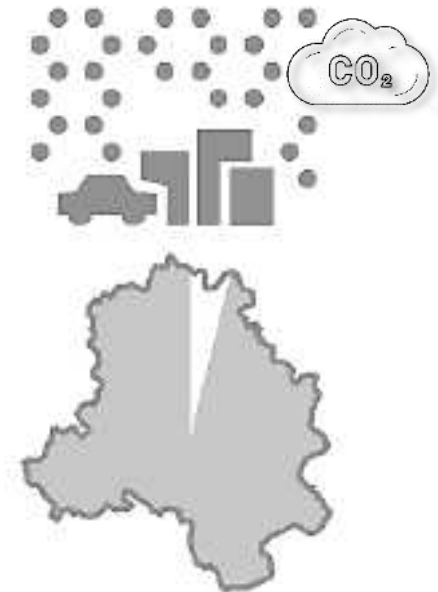
Every 4 green homes will save
enough water to supply
1 additional home



Every 5 green homes will save
enough energy to light up
1 additional home



CO₂ emissions will be reduced by
12% of Delhi's total, **saving INR.
1087 crores** in annual healthcare



CHALLENGES TO BUILDING GREEN

Lack of awareness of end-user benefits

“Green is suitable for the higher income homes only”

Lack of technical know-how

“Green is complex and costly”

Lack of Finance

Local Financial Institutions have limited understanding of green affordable housing

IFC's FOUR-PART STRATEGY



Definition of A Green building



BETTER
PERFORMANCE
THAN THE
LOCAL BASELINE

&



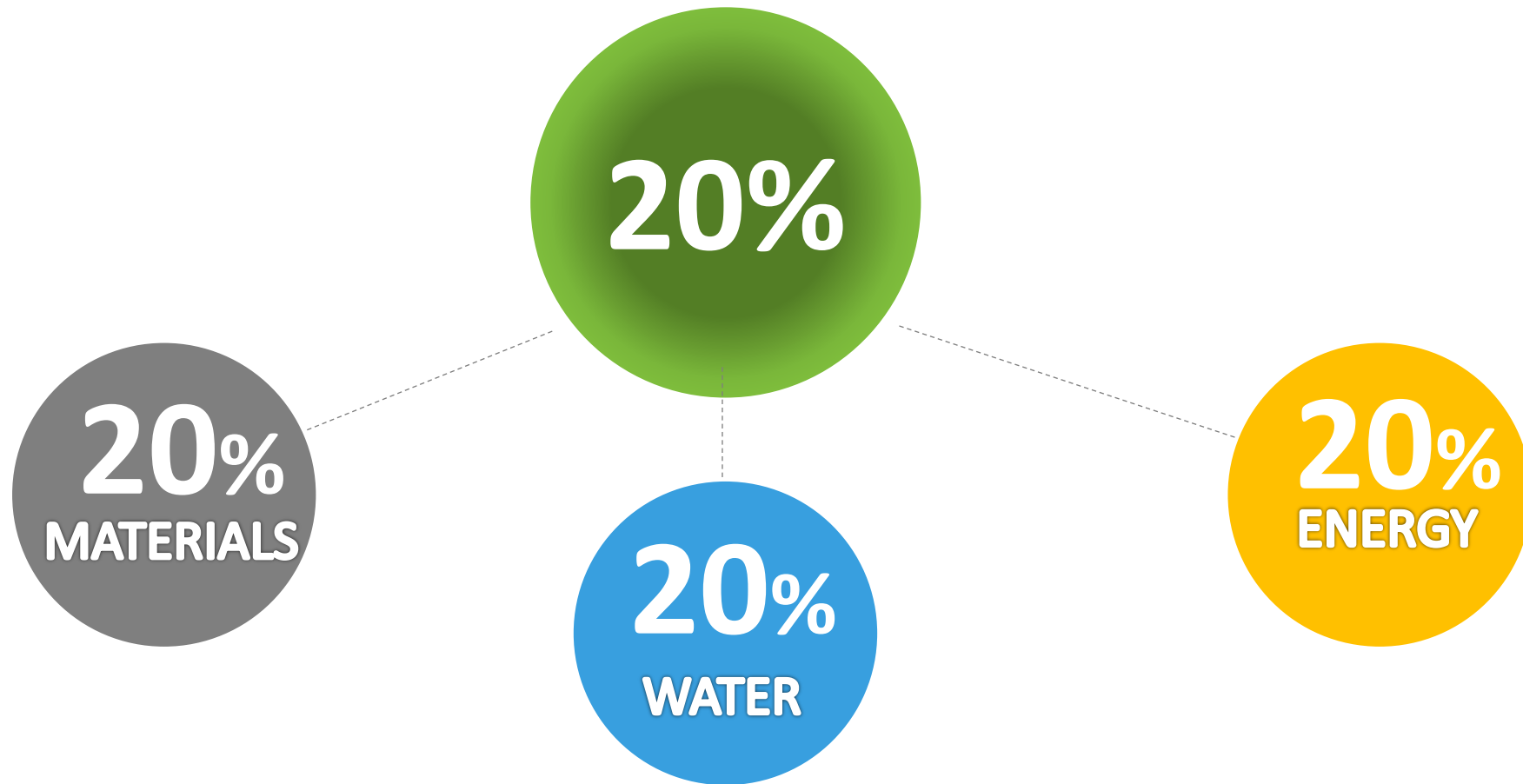
CERTIFIABLY GREEN
AS VERIFIED BY
AN INDEPENDENT
THIRD PARTY

&



QUANTIFIED
IMPACT REPORTING

THE EDGE STANDARD



THE FREE SOFTWARE



Utility Cost Reduction

862.59

Rs/Month/Unit

Incremental Cost

15,877.74

Rs/Unit

Payback in Years

1.53

Yrs.

Energy Efficiency Measures

Choose energy efficiency measures to achieve savings of at least 20%:

- ☒ HME01* Reduced Window to Wall Ratio - WWR of 18%
WWR %
- ☐ HME02 Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo) of 0.7
- ☐ HME03 Reflective Paint for External Walls - Solar Reflectivity (albedo) of 0.7
- ☐ HME04 External Shading Devices - Annual Average Shading Factor (AASF) of 0.49
- ☐ HME05 Insulation of Roof : U-value of 0.45
- ☐ HME06 Insulation of External Walls : U-value of 0.43
- ☐ HME07 Low-E Coated Glass : U-value of 3 W/m².K and SHGC of 0.45
- ☐ HME08 Higher Thermal Performance Glass : U-value of 1.9 W/m².K and SHGC of 0.28
- ☐ HME09 Natural Ventilation

30.43% Meets EDGE Energy Standard



www.edgebuildings.com

EDGE certification verifies the green benefits



EDGE is aligned with international green finance standards for



- ICMA releases the Green Bond Principles as well as guidelines for green buildings.
- EDGE is listed as an accepted certification standard. (See Section E: Certification Standards).



- CBI releases standards for green bonds funding residential or commercial buildings
- EDGE is included as a qualifying certification system.



- EU Taxonomy was launched by the European Commission to guide sustainable finance.
- EDGE definition of 20% quantified resource efficiency is aligned with EU Taxonomy Principles.

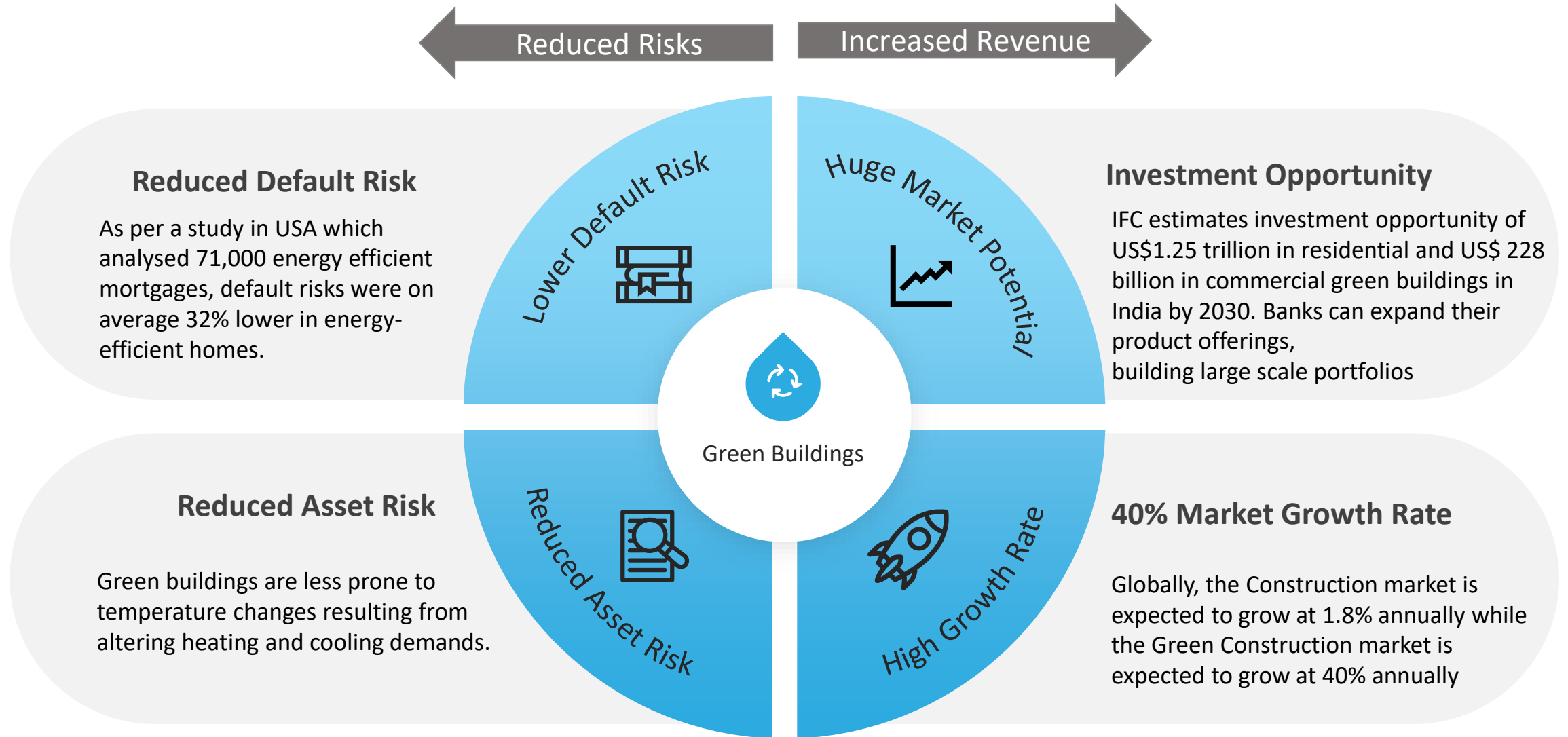


- Used by property developers and investors to obtain data on the performance of their investments.
- EDGE can be used completing the Real Estate Assessment or the Developer Assessment.



- Global disclosure system for investors, companies, cities, states and regions to manage environmental impacts.
- Protocol for reporting to CDP using EDGE is forthcoming, following joint webinar.

Green Housing Business Case for Commercial Banks



Source: Green Buildings A Finance and Policy Blueprint for Emerging Markets (2019); Home Energy Efficiency and Mortgage Risks (2013)

IFC's financial and advisory tools for promoting green housing

IFC's Green Building Offering for Financial Institutions

INVESTMENT:

Debt, equity, structured finance

- Investment in developers who adopt green standards
- IFC provides construction bridge loans, warehousing facilities, long-term loans, guarantees, and risk-sharing facilities
- Capital markets: Green bonds, covered bonds, securitization of green mortgages, etc.



ADVISORY:

Strategy and business development, credit and risk management, marketing

- Technical in-house expertise
- Green Mortgage Toolkit
- Certification tool and support to measure cost/benefit and demonstrate value
- IFC's support in identifying or developing investment pipeline, market intelligence
- Training for loan officers and developer clients



MARKET CREATION:

World Bank coordination, building codes, EDGE certifications, awareness

- Global awareness campaign for green buildings
- Stakeholder education through Green Building Councils
- Country-specific marketing campaigns
- Successes in government relations (national and city) for green building codes and incentives



IFC case study #1 - Grupo Bancolombia



Starting 2017, IFC Advisory services worked with Bancolombia to catalyze green buildings financing by creating a strong portfolio of EDGE projects for the bank

IFC Value-add to client

- Building client capacity: through the EDGE certification
- Awareness raising in the market (construction developers, regulators, end-clients)
- Internal capacity building of staff through awareness workshops and trainings to the sales force

Impact (January 2019)

- Bancolombia issued a green bond of **\$115 million** in 2016, with IFC as the sole investor in the bond.
- **12,770 homes** in the EDGE certification pipeline.
- **567,000 square meters** has been registered for EDGE certification.
- More than **1.2 million square meters** has been EDGE certified.

#2 – Beneficiary Led Affordable Homes: Aavas Financiers



IFC's Green Housing Project with Aavas aims to create a product offering for beneficiary-led construction of affordable green homes

Phase I	Market research and feasibility analysis to establish a business case, followed by a pilot
Phase II	Support roll out and scaling of the green housing product through internal capacity building and integration of EDGE within Aavas' operations.
Impact (Expected)	<ul style="list-style-type: none">• 32,000 green housing loans (incl. 8,000 women beneficiaries)• USD 358.4 million green housing loans disbursed (incl. USD 90 million for women beneficiaries)
Sectoral Impact	'First of its kind' structured advisory project to create a value proposition in the affordable housing segment of beneficiary-led construction of green homes

IFC's Housing Footprint in India

IFC has promoted housing finance down the income ladder and is now advancing green housing finance

First investments

2004



Establishing
Aadhar with Equity
Investment



Thought leadership

Study on affordable
housing (by Monitor
Group, now FSG)

2010

Advisory to MFIs and HFCs



2011/12



2013/14



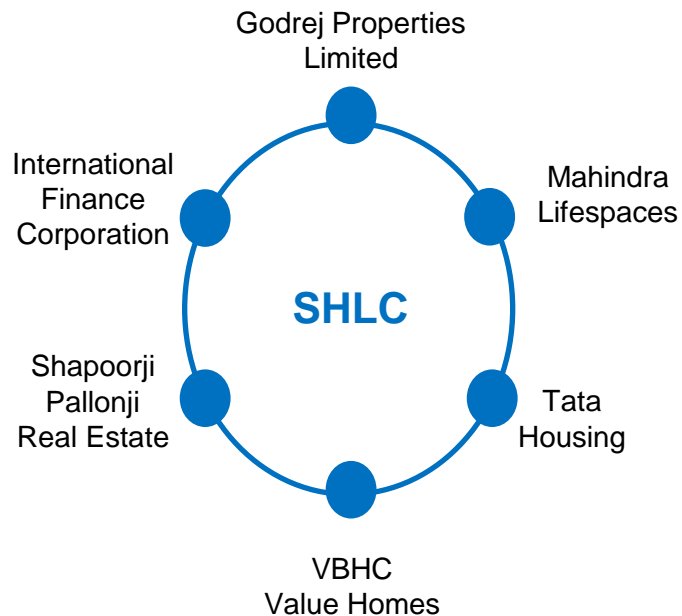
From 2015 to date

1. USD 800 million investment portfolio
2. 300,000 homes built
3. 4.55 million people reached
4. Knowledge Management - Affordable Housing Benchmarking toolkit developed

Sustainable Housing Leadership Consortium (SHLC)

Sustainable Housing Leadership Consortium (SHLC) was convened by IFC to mainstream sustainable housing in India, and to create an enabling environment for the same.

Founding Members



A charter outlining the objectives and targets of SHLC was signed by the five founding members on January 6, 2016




Objectives

- ▶ **20%** of India's new multi-family housing construction to be sustainable by 2022
- ▶ **20%** reduction in incremental variable cost for sustainable housing construction
- ▶ **100%** of consortium's new housing projects to be green by 2020

EDGE certified Green Affordable Homes

KESAR CITY,
AHMEDABAD, GUJRAT






	Savings	Measures
 ENERGY	23%	<ul style="list-style-type: none">- Low Window-Wall-Ratio- Energy efficient Lighting & Fans
 WATER	24%	<ul style="list-style-type: none">- Low flow water fixtures- Recycled black water used for flushing
 MATERIALS	71%	<ul style="list-style-type: none">- FaIG blocks- In-situ concrete with more than 30% flyash

<https://www.youtube.com/watch?v=jM7DEddGliw&t=3s>

EDGE certified Green Affordable Homes

VBHC VAIBHAVA,
BENGALURU, KARNATAKA






	Savings	Measures
 ENERGY	33%	<ul style="list-style-type: none">- Low Window-Wall-Ratio- Energy efficient Lighting & Fans- Reflective paint
 WATER	29%	<ul style="list-style-type: none">- Low flow water fixtures- Recycled black water used for flushing
 MATERIALS	23%	<ul style="list-style-type: none">- Optimized RCC structure

<https://www.youtube.com/watch?v=jM7DEddGliw&t=3s>

EDGE certified Green Affordable Homes

TCP ALTURA,
CHENNAI, TAMIL NADU



	Savings	Measures
 ENERGY	27%	<ul style="list-style-type: none">- Reduced WWR- External shading devices- Energy-saving lighting in outdoor areas- Solar photovoltaics.
 WATER	41%	<ul style="list-style-type: none">- Low-flow showerheads- Water-efficient kitchen and bathroom faucets- Dual flush water closets- Recycled grey water for flushing
 MATERIALS	69%	<ul style="list-style-type: none">- Honeycomb clay blocks with internal and external plaster- UPVC window frames

EDGE acknowledgments

The following major donors have demonstrated their generous support of the EDGE program:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO



UK Government



European Union

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Thank You



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