Edge

IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities

Low Carbon Property Development

12 May 2022

Low Carbon Pathway

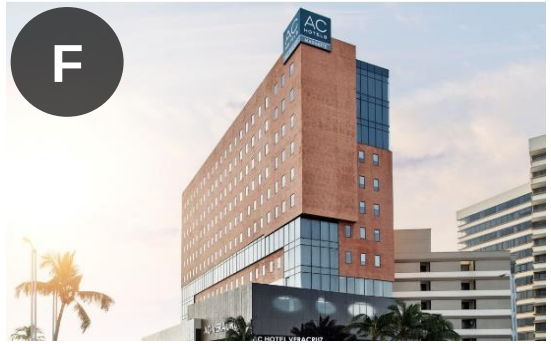
MITIGATION APPROACHES

1. **Decarbonisation:** reducing emissions on an absolute basis.
2. **Removals within the value chain:** balancing remaining emissions by sequestering carbon through activities that happen within the value-chain of the company.
3. **Carbon credits from removal projects:** balancing emissions with carbon credits from carbon removal projects.
4. **Avoided emissions through sold products/services:** balancing emissions with emissions avoided through the use of sold products or services.
5. **Carbon credits from reduction projects:** balancing emissions with carbon credits from carbon reduction or avoidance projects.

Carbon Intelligence

WHICH OF THESE IS A GREEN BUILDING?

QUIZ



A GREEN BUILDING MUST BE AT LEAST 20% MORE EFFICIENT THAN LOCAL BUSINESS AS USUAL BASELINE

Certifiably green* as verified by an independent THIRD PARTY

More efficient performance than the LOCAL BASELINE

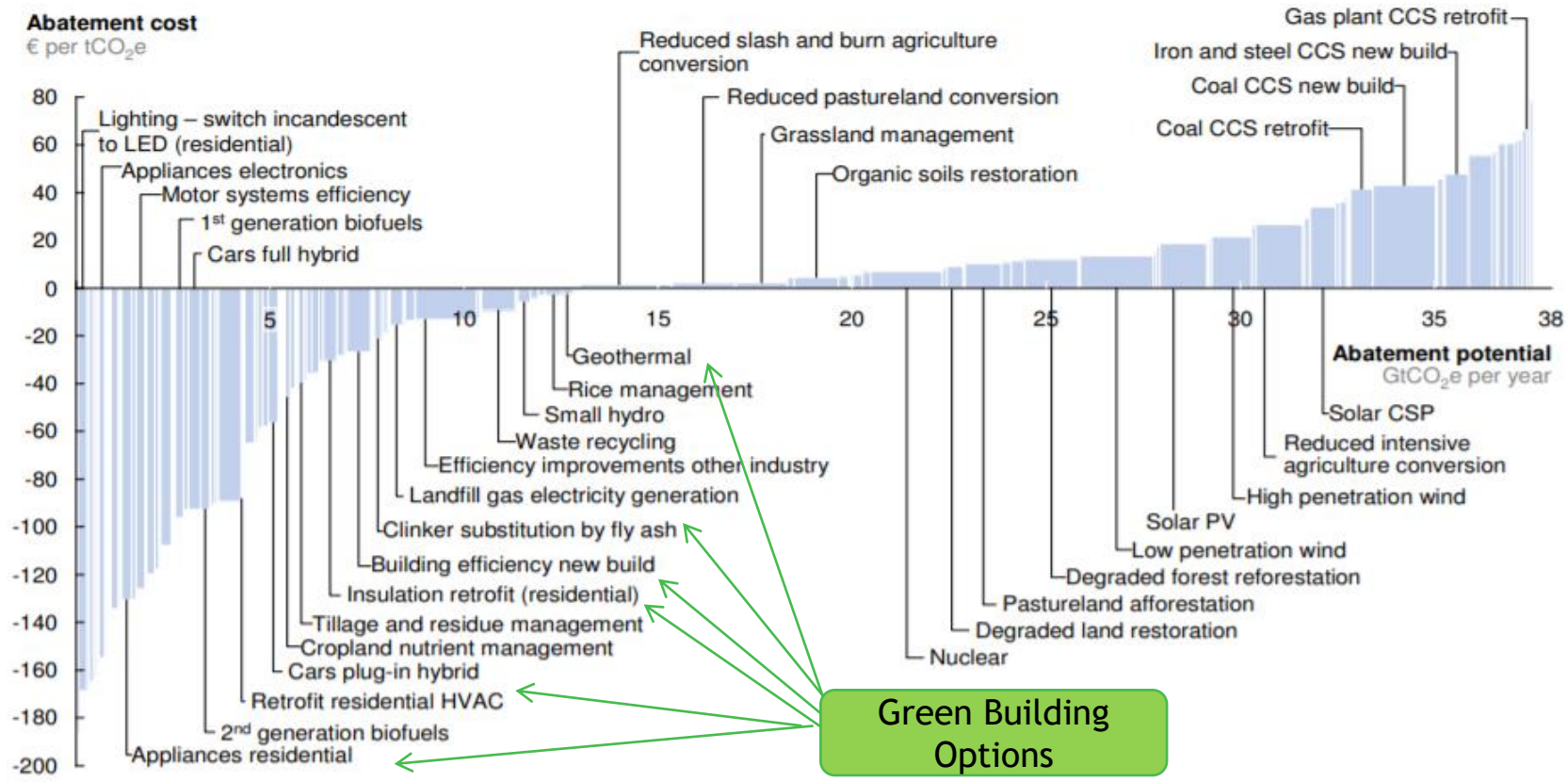
Quantified IMPACT REPORTING

COMMON TO GLOBAL FINANCIAL STANDARDS AND DISCLOSURE PLATFORMS

* IFC's Excellence in Design for Greater Efficiencies (EDGE) certificate, Environmental Assessment Method (BREEAM) certificate as defined by the Building Research Establishment BREEAM, certificate issued by the German Sustainable Building Council (DGNB), GREEN STAR, Leadership in Energy and Environmental Design (LEED) certificate or an equivalent internationally-renowned green building certification system acknowledged by IFC.

WHY CARE ABOUT GREEN BUILDINGS?

BUILDINGS PROVIDE THE LOW HANGING FRUIT FOR CO2 ABATEMENT



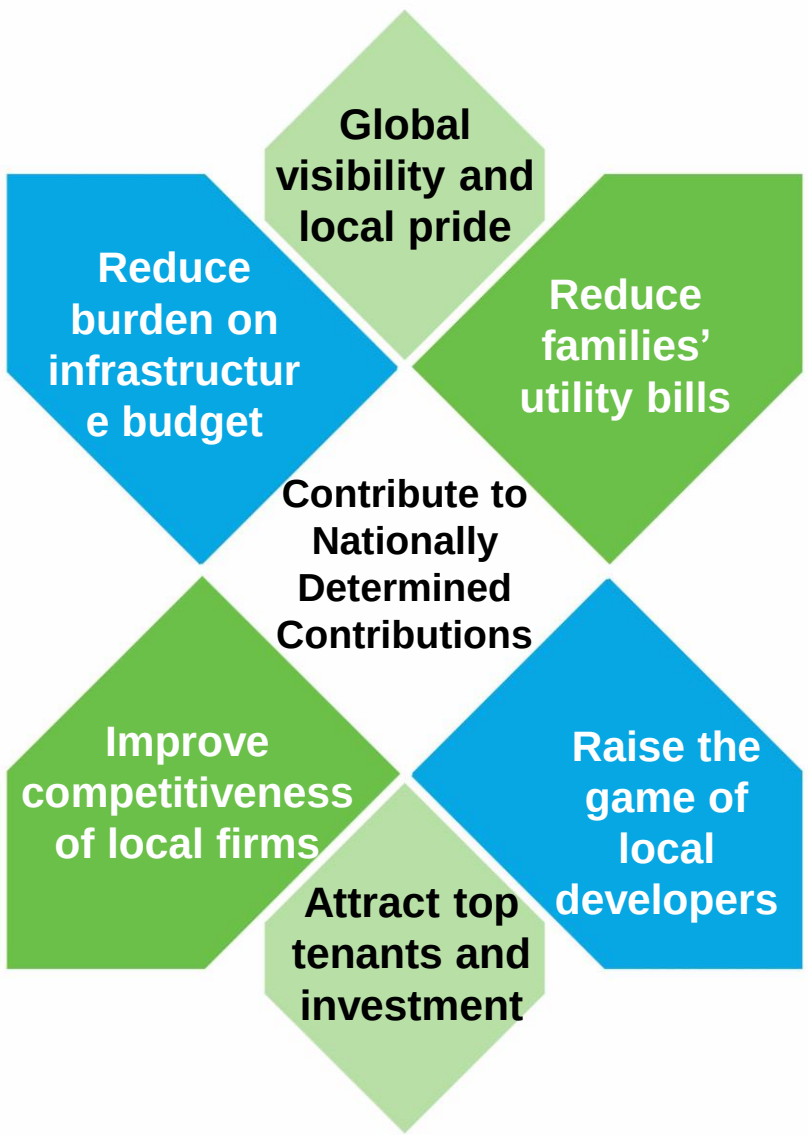
Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €80 per tCO_2e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.
Source: Global GHG Abatement Cost Curve v2.1

Options not currently cost effective: role for concessional finance, advisory, regulation

Options are cost effective with relatively quick paybacks

Carbon "Abatement Curve" by McKinsey, Pathways to a Low Carbon Future, version 2.1, 2010

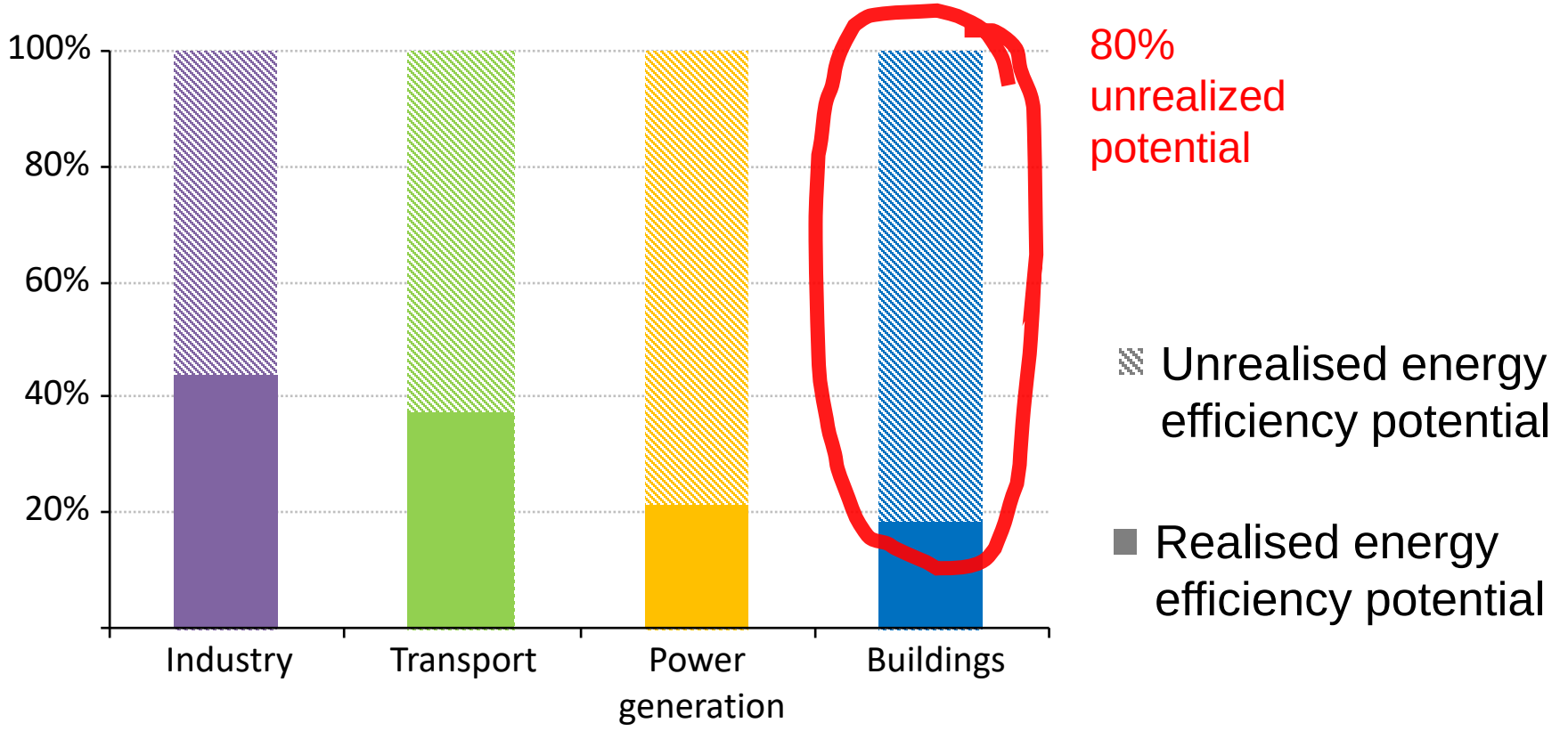
Why Promote Green Buildings?



- Energy Consumption Reduction
- Water Usage Reduction
- Less Materials Used for Construction
- Less CO_2 Emissions
- Less Pollution
- Green Investment Leading to more Income for Municipality

BUILDINGS EMIT ALMOST 40% OF GHGS FROM ENERGY YET PROFITAL ENERGY EFFICIENCY REMAINS 80% UNTAPPED

Eighty percent of the economic potential to improve energy efficiency remains untapped



Source: World Energy outlook

WHAT IS THE COMMERCIAL VALUE OF GREEN BUILDINGS?

THE BENEFITS OF BUILDING GREEN OUT-WEIGH ADDITIONAL UPFRONT COSTS

The incremental cost of building green is generally **less than 3%** of construction costs.

These benefits more than justify any increase in costs:

1. LOWER OPERATING COSTS
2. SELL OR RENT FASTER AND AT HIGHER PRICES
3. FUTURE-PROOFING AGAINST HIGHER ENERGY COSTS AND CLIMATE CHANGE POLICIES

Benefits for stakeholders in the Green Building cycle

GREEN BUILDINGS COST ~3% MORE UPFRONT, BUT YIELD A ~3 YEAR PAY BACK

this translates to different business cases for different stakeholders.

1 Developers

Differentiation & Profit

Faster sales, potentially higher prices, access to green finance

- Send a positive signal to investors.
- Drive profitability that leads to expansion.
- Ensure cost control & consistency across properties.
- Contribute to a competitive brand of sustainability.

2 Banks

Volume & Less Risk

- Lower the capital allocation needed to cover risk.
- Gain market share through new products such as green bonds and green mortgages.
- Protect from late payments and loan defaults.
- Enhance reputation through CSR leadership.

3 Governments

Safeguarding & Responsibility

- Protection of the under-privileged from utility shocks.
- Establishing a healthier and more socially uplifting environment for all.
- Conservation of precious natural resources.
- Ability to meet NDC commitments as per the Paris Agreement.

4 Owners

Value & Emotion

Lower operating costs, higher occupancy and rentals, stronger asset value appreciation, access to green finance

- Save on utility bills.
- Invest in a property that will increase in value.
- Create a more comfortable lifestyle.
- Inspire pride of ownership.

IF THERE IS SO MUCH VALUE IN GREEN BUILDINGS, WHY ARE WE NOT BUILDING AND FINANCING GREEN?

QUIZ

- MISPERCEPTION
  - Inexperienced developers over-estimate costs
- COMPLEXITY
  - Cost-benefit analysis of green options has been complex
- AFFORDABILITY
  - Certification has been unaffordable

SIMPLE DESIGN CHANGES CAN MAKE A BIG DIFFERENCE

“My Home has good air circulation, so we don’t need to use air conditioning during the day. In my previous home, I used to spend IDR 800,000 ($55) on electricity for a month. Now, we spend only IDR 200,000 ($14) per month. It is a huge difference!”

-Emilia Sutedja, Citra Maja Raya Resident

“In my old place in Jakarta I would spend over IDR 400,000 ($28) on electricity per month. Now I spend IDR 150,000 ($10) per month. For electricity I save a lot because it’s bright, so you don’t need the lights during the day.”

-Piet Haryono, Citra Maja Raya Resident

Further Resource: IFC News on Sustainable Markets

For Video on Youtube: https://www.youtube.com/watch?v=sT0v83qHS-Q

CASE STUDY: **IHS** SAVES RESIDENTS UP TO ONE MONTH OF RENT

IHS Property	Ravenswood	Candlewood	Goedeberg
Actual consumption figures (kWh)	107	219	175
kWh savings compared to a similar non-certified development	54%	68%	41%
Total savings per year ($)	$128	$181	$338

Further Resource: [Housing Finance International Journal Spring 2020]

HOW DOES GREEN BUILDING CERTIFICATION HELP DEMONSTRATE THE COMMERCIAL VALUE?

SEVERAL GREEN BUILDING CERTIFICATION SYSTEMS EXIST

"Tools that examine the performance or expected performance of a 'whole building' and translate that examination into an overall assessment that allows for comparison against other buildings."

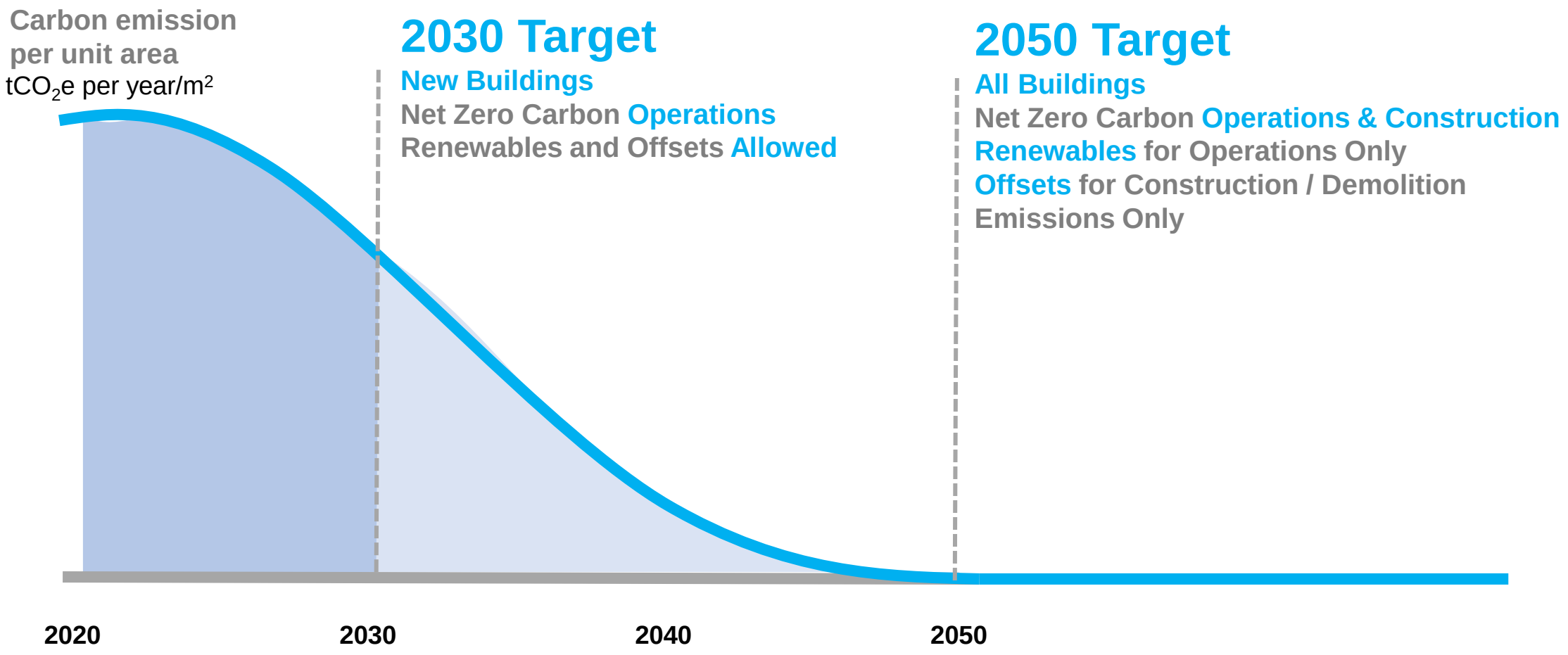
- There are tens of green building rating systems worldwide.
- Some focus on a particular building type (residential or commercial)
- They all provide Green Targets or credits to rate level of sustainability

THE MINIMUM REQUIREMENTS FOR ENERGY AND WATER REDUCTION IN THE MOST APPROPRIATE RATING SYSTEMS.

	Energy Efficiency	Water Efficiency	Materials Efficiency
LEED [USA]	10%	20%	0%
Energy Star [USA]	15%	0%	0%
Green Mark Singapore	20%	23%	0%
India: GRIHA	14%	23%	0%
Indonesia: Greenship	10%	20%	0%
Malaysia: GBI Malaysia	10%	10%	0%
UAE: Estidama	17%	23%	0%
BREEAM [UK]	0%	0%	0%
Philippines: BERDE	0%	0%	0%
Average	15%	17%	0%
Median	15%	20%	0%

LOW CARBON PATHWAY AND ROLES OF PUBLIC AND PRIVATE SECTORS

Mapping a Zero Carbon Pathway for Buildings



Mapping a Zero Carbon Pathway for a Building Portfolio with EDGE

1

Map existing building portfolio and retrofit capex

1. *Inventory carbon footprint (tCO_2e per year/m^2) with EDGE*
2. *Assess refurbishment costs versus GHG savings with EDGE*
3. *Prioritize least cost ($/$tCO_2e$) refurbishments*

2

Raise quality-on-entry criteria to for new build progressively

1. *100% EDGE Certified by 2022*
2. *100% EDGE Advanced by 2024 (ready for EDGE Zero Carbon including carbon credits)*
3. *100% EDGE Zero Carbon by 2030 without carbon credits*
4. *100% embodied carbon in materials, construction and demolition offset by 2050*

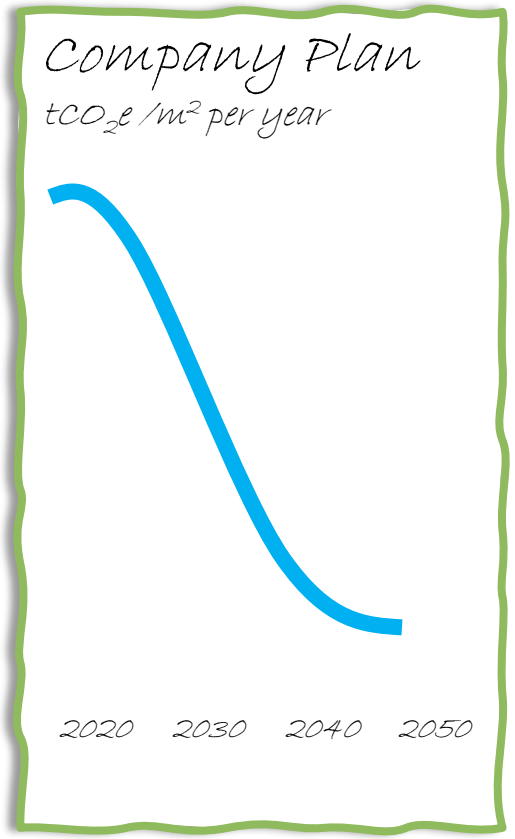
✓ ***Establish RE procurement / generation plan for all portfolio***

3

Communicate credible annual goals and report against them

1. *Set annual portfolio goals for tCO_2e per year/m^2 using EDGE*
2. *Publicize annual quality-on-entry criteria to attract and prepare leading developers*
3. *Report on progress with EDGE GHG reporting*

✓ ***Report progress for Sustainability Linked Bonds etc***



Getting to Zero Carbon with EDGE

Reduce Energy Use

Achieve at least **EDGE Advanced** level

Purchase Carbon Offsets

Purchase the equivalent **carbon offsets** to your GHG emissions

Use Renewable Energy

Source the energy used to renewable sources such as hydro, wind and solar

Invest in Renewables

Invest in renewable technologies onsite such as solar, geothermal, biomass and more

Level 3

Zero Carbon

Ecoloft is a pioneer in the development of zero carbon project in Indonesia

Excellence In Design For Greater Efficiencies

Edge

This certifies that

Ecoloft Jababeka Golf Residences Cikarang

has been awarded a

ZERO CARBON CERTIFICATE

The project has achieved the EDGE Advanced standard with energy savings on site of 40% or more relative to the local baseline. The remaining energy consumption is provided by renewable energy or carbon credits have been purchased to offset emissions from non-renewable energy consumption.

DEVELOPED BY
Asia Green Real Estate

CERTIFIED BY
Green Building Council Indonesia

ENERGY SAVINGS OVER BASELINE (FROM EDGE CERTIFICATE)
82%
ELECTRICITY CONSUMED ON SITE
110,434 kWh/year
SUPPLIED BY
ON-SITE RENEWABLE GENERATION
671 kWh/year (1%)
OFF-SITE RENEWABLE GENERATION
0 kWh/year (0%)
NON-RENEWABLE ELECTRICITY
109,763 kWh/year (99%)
TOTAL ENERGY USAGE
45 kWh/m²/year

SITE EMISSIONS
95 tCO_2 /year
OFFSETS FOR SITE EMISSIONS
RENEWABLE GENERATION EXPORTED
1%
OFFSETS PURCHASED
99%
CATEGORY
Zero Carbon
REVIEWED BY
Muhammad Rizky Waskito Aribowo
CERTIFICATION NUMBER
LP2-IDN-1010000041-19- Z1

PERIOD VERIFIED
April 2022 - March 2023

DATE OF ISSUE
December 23, 2022

DATE OF EXPIRY
December 22, 2024

GREEN BUILDING COUNCIL INDONESIA

WORLD BANK GROUP
IFC International Finance Corporation

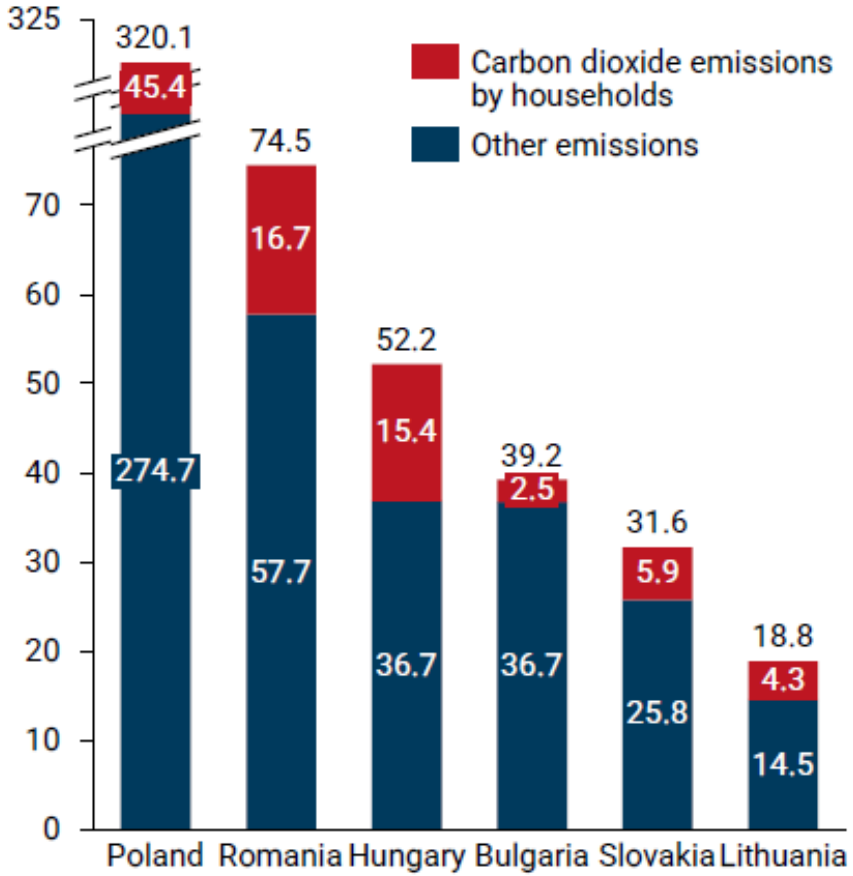
Ecoloft Jababeka Golf Residences Cikarang

- The investor of the project, Asia Green Real Estate, has worked with IFC since 2017 to help its clients identify the most cost-effective solutions to build green.
- The company has already invested in more than two million square meters of sustainable floor space and has achieved EDGE certification for number of projects, including Samara Suites, Verde Two Terraverde Tower, Verde Two Monteverde Tower and Guizhou Tower.
- Green solutions include reduced window to wall ratio, external shading devices, insulation of roof and external walls, air conditioning system with high COP, energy-saving lighting system for internal spaces, common areas and external spaces, solar hot water collectors, and solar photovoltaics.

Edge

GREEN BUILDINGS ARE A TARGET FOR REGULATORY CHANGE DUE TO THEIR LARGE GHG FOOTPRINT

CARBON DIOXIDE EMISSIONS AMONG SELECTED EUROPEAN COUNTRIES, 2021, MILLION TONS



Source:: Eurostat; Odyssee-Mure

Almost 40% of energy related GHGs come from building construction and operation worldwide

Over 23% of carbon dioxide emissions in Europe come from homes

Worldwide, governments are beginning to penalize inefficient buildings and banks are factoring this into risk profiles

- Energy Performance Certificate ratings in Europe linking to **restrictions on renting** - Netherlands
- **GHG taxes** for buildings - New York City
- EU and other **green taxonomies** for the financial sector worldwide. The SBFN reports green frameworks are under development in Ukraine, Georgia, Kazakhstan, Serbia, Kyrgyz Republic, South Africa, Indonesia, Peru, Colombia

GOVERNMENTS ARE PROVIDING INCENTIVES FOR GREEN BUILDINGS

1 TAX INCENTIVES

Offer a tax credit to developers to offset extra costs.

Colombia
Brazil

2 BONUS DENSITY

Allow developers to increase the height of their buildings.

Peru, India

3 EXPEDITED PERMITTING

Prioritize permitting for green construction and/or waive permit fees.

Argentina

4 GRANTS & LOANS

Provide grants to cities to incentivize solar power or to developers to subsidize certification costs.

Bangladesh

5 TECHNICAL ASSISTANCE

Train planners, building inspectors on how to audit green buildings.

South Africa

6 NET METERING

Work with utilities to enable owners to export renewable energy to the grid.

7 PUBLIC CAMPAIGNS

Generate public support through advocacy efforts.

South Africa
Vietnam

8 LEGISLATION

Bundle a certification standard directly into a new set of codes.

Ghana, Nigeria, China

Source: EDGE Website for Governments

INVESTORS AND REGULATORS ARE SETTING NEW STANDARDS

Standards responding to government and private investor demand for green definitions all include green buildings

- 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).

- 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.

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

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

- EU Taxonomy became law Dec 6 2021, enforced from Jan 2022.
- EDGE definition of 20% reduction in kWh / m2 / year is aligned with EU Taxonomy Principles.
- **Dozens of emerging economies are now developing similar taxonomies**

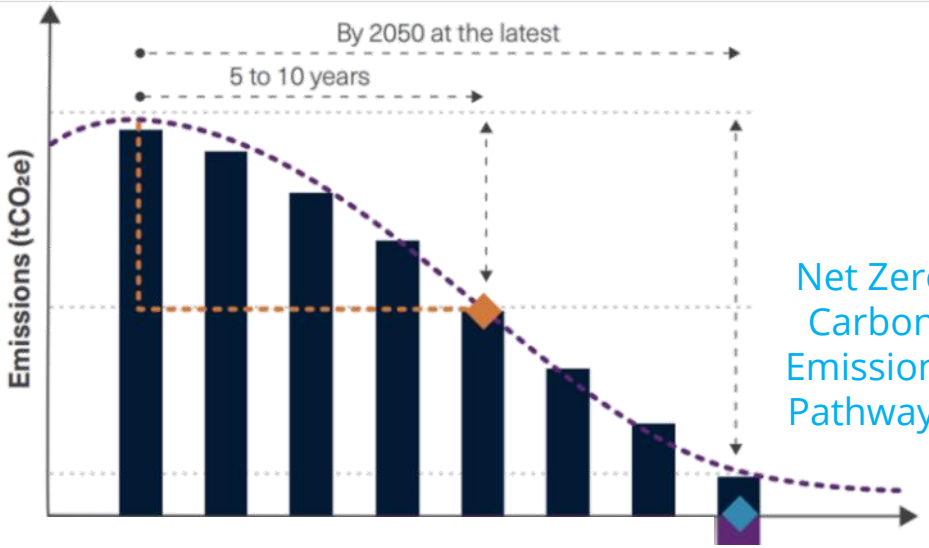
GFANZ - Over 450 members from over 45 countries representing over $130 trillion commit to science based targets for Paris-alignment, including 50% emission reductions by 2030 and reporting progress annually.

BANKS ARE OFFERING INCENTIVES FOR GREEN BUILDINGS

Incentives can include lower interest rates or free technical assistance.

Role of voluntary action: An increasing number of companies are committing to formal climate targets

Corporates will play an important role in driving global decarbonization. Many real estate investment companies have made net zero commitments and have promised to take action on them.



Net Zero Carbon Emissions Pathway*

INVESTORS

Net-zero asset owner alliance
42 institutional investors, representing $ 6.6 tn AUM have committed to transition their investment portfolios to net-zero GHG emissions by 2050

Net-zero carbon by 2040 or sooner for own operations, managed properties and indirect supply chain emissions

Carbon neutral by 2050 with an initial milestone of reducing the carbon footprint of Allianz Real Estate's global portfolio by 25% by 2025

From 2021, cut carbon dioxide emissions at its new investments by **15% within the first three years** of buying the asset or company

Commitment to reach net zero emissions by 2050 and an absolute science-based emissions reduction target of 46% by 2030

Committed to setting a science-based target to reach net-zero GHG emissions by 2040 **without buying carbon offsets**

Sources: Science Based Targets initiative

QUIZ

IFC'S INITIATIVES ON BUILT ENVIRONMENT DECARBONIZATION

IFC's Approach to Creating a Green Building Market

EDGE is now available worldwide and has certified 55 million m2 in over 81 countries with 8 IFC-licensed certifiers and over 1,400 IFC-accredited EDGE Experts. Estimated EDGE share of annual new build now ranges from 2% to 20% in South Africa, Peru and Colombia.

~ $42 billion
Worth of floor space certified

>261,000 homes
certified as green with lower utility bills

>792,000 tCO2e
GHG reduced every year from the EDGE buildings

EDGE is approved as a green finance standard by

ICMA International Capital Market Association
GRESB
CDP
EU TECHNICAL EXPERT GROUP ON SUSTAINABLE FINANCE
Climate Bonds Initiative

DFI Leadership: ADB, CDC, DFC, EBRD, IADB, Proparco, FMO, KfW have adopted EDGE

IFC's Green Building Market Transformation Program

- Advice for policymakers: incentives and codes
- Technical assistance for developers
- **Direct IFC Investments in green buildings**

CREATES GREEN STOCK

- EDGE certification system
- Local partnerships with Green Building Councils and industry associations

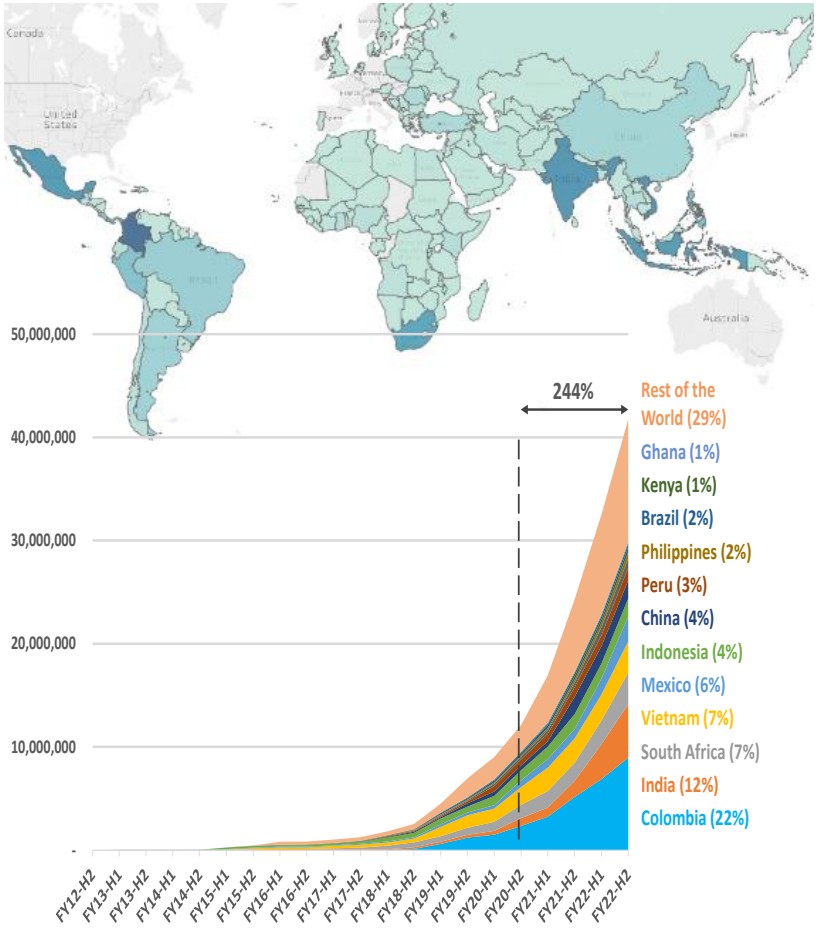
CERTIFIES GREEN STOCK

- Help FIs increase green building portfolios, launch new products and raise green finance
- **IFC Investment in FIs**

SCALES GREEN STOCK

Multiple interventions across value chains to move the Green Buildings agenda

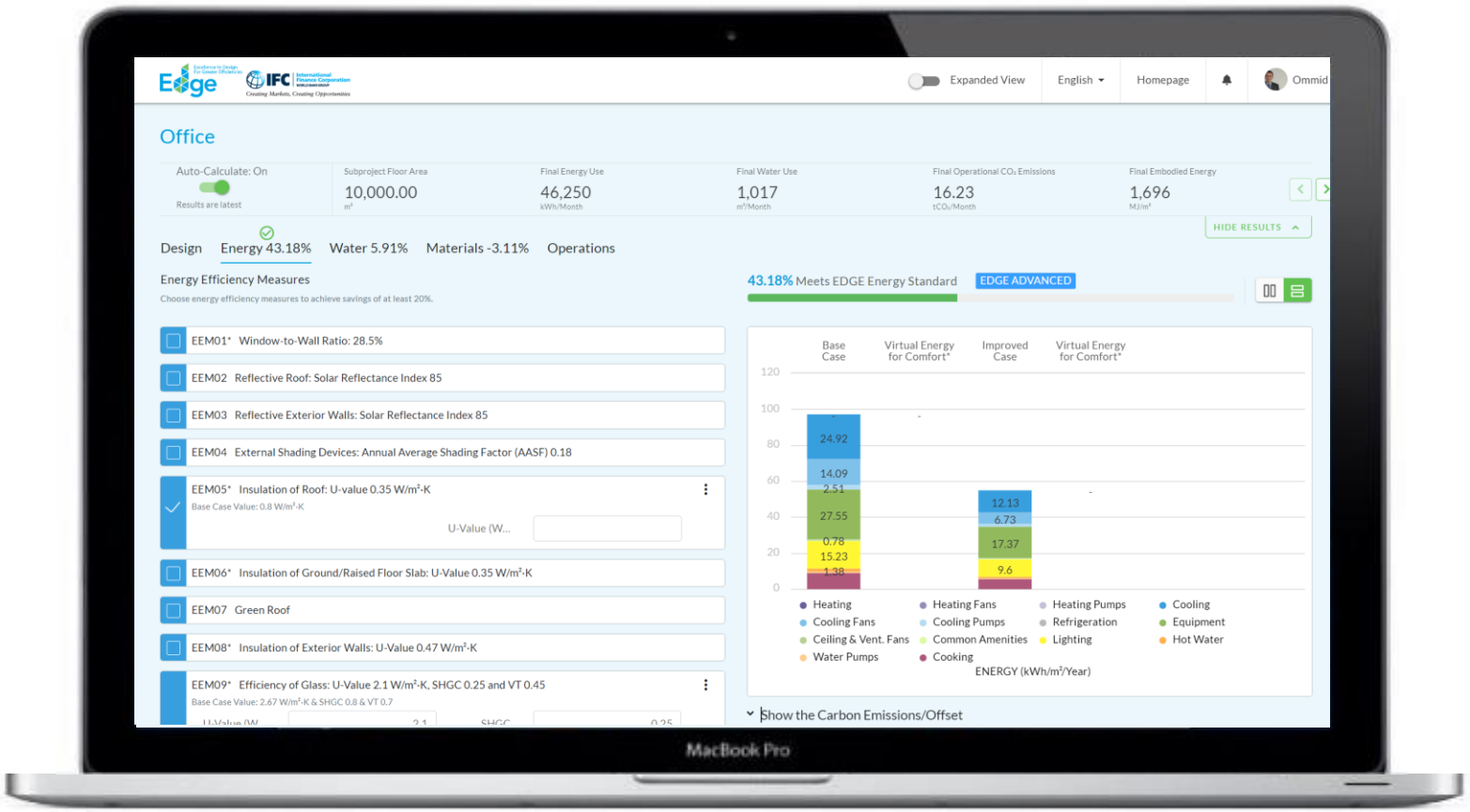
IFC is a Global Leader in Green Buildings



EDGE has certified 55 million m^2
(10 times the area of Vatican City)

EDGE makes it easy to design and certify resource-efficient and Zero Carbon buildings.

IFC created EDGE to respond to the need for an affordable, measurable and credible solution to prove the business case for building green and to help channel investment.



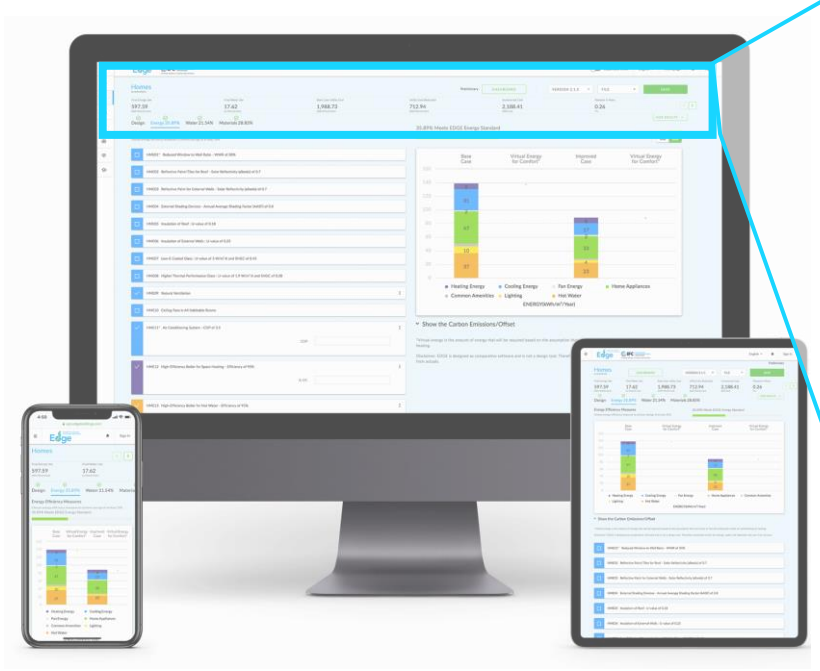
Build for retrofit. The EDGE design software calculates the cost of measures for retrofit and provides option for users to update it. Under operations tab building actual use data can be reported for carbon footprint calculations and reduction.

Affordable. The EDGE design software is free to use and instantaneously calculates the most cost-effective investments to make.
The certification process costs a fraction of the time and fees of traditional options.

Measurable. A simple green building standard based on quantified energy, water and materials savings; EDGE provides streamlined impact reporting.

Internationally recognized for green finance
EDGE makes it fast and easy to verify the resource efficiency of a project.

The Free EDGE Software Shows the Payback for Each Efficiency Measure - Reducing Costs and Speeding up Design and Decision-making



Instantaneous Feedback on Green Options

✓ Energy 36.52%	✓ Water 32.77%	✓ Materials 47.67%	Progress Toward Certification
Utility Cost Reduction 9,788.45 PAB/Month	Incremental Cost 49,753.26 PAB	Payback in Years 0.42 Yrs.	Incremental Cost and Payback
Embodied Energy Savings 1,056.04 MJ/m²	Energy Savings 506.90 MWh/Year	Water Savings 4,520.42 m³/Year	Energy, Water, & Materials Savings
Operational CO_2 Savings 155.89 tCO_2/Year	Carbon Emissions 265.92 tCO_2/Year		Carbon Tracking

IFC GREEN BUILDING PROGRAM – ASIA, LATIN AMERICA, AFRICA

INDONESIA

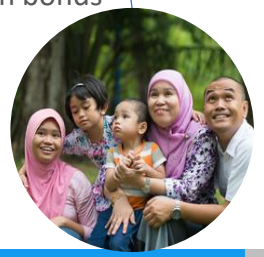
IFC investment for Developer & Bank

IFC loans for green affordable housing and green properties

Partnership with GBC Indonesia to offer EDGE

Jakarta, Bandung & Semarang adopts green buildings code

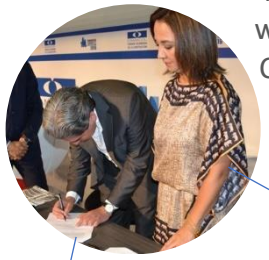
IFC invests in green bonds



20 top universities offer EDGE training to students

COLOMBIA

IFC investment in Bancolombia



IFC Partnership with Chamber of Construction on EDGE

Universities offer GB courses

Bancolombia issues offers green construction loans with 0.5% -2% interest

Homes owners save up to $20/month in utility bills

SOUTH AFRICA

IFC investment in IHS property fund

Investment with blended financing to green 2000 affordable homes

Partnership with Green Building Council South Africa to offer EDGE certification

KFW & EIB also invests in the funds using EDGE

EIB

KFW

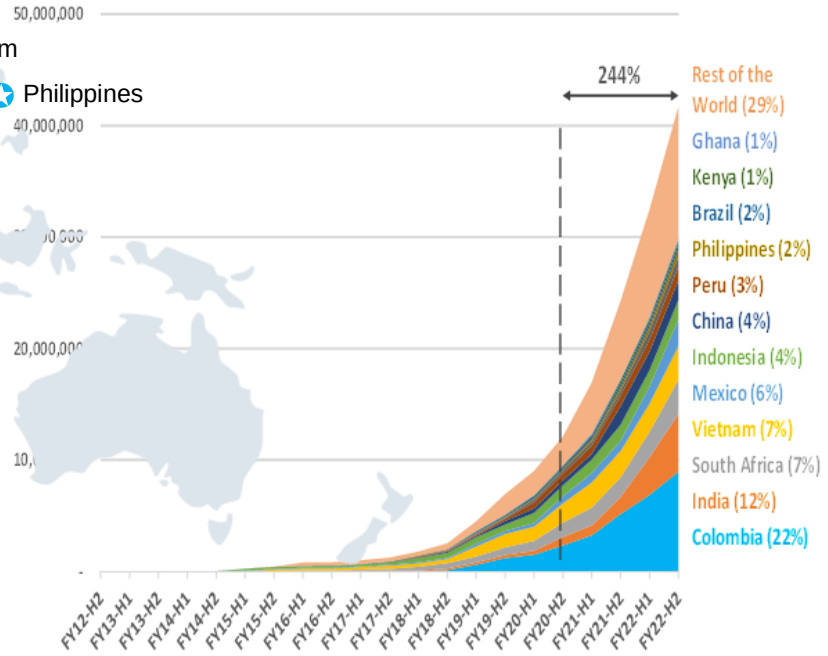
Developers commit to certify >10k homes

GREEN BUILDING IS GROWING FAST AND ACROSS THE WORLD

EDGE Green Building Certification has been growing exponentially

81
Countries have projects certified

Denmark
Lithuania
Poland
Republic of North Macedonia
Romania
Croatia
Bulgaria
Portugal
Cyprus
Greece
Lebanon
Turkey
Jordan
China
Afghanistan
India
Myanmar
Vietnam
Philippines
Thailand
Cambodia
Indonesia
Mexico
Haiti
Guatemala
El Salvador
Costa Rica
Panama
Colombia
Ecuador
Peru
Brazil
Paraguay
Argentina
Ghana
Côte d'Ivoire
Nigeria
Djibouti
Cameroon
Kenya
Angola
Zambia
Madagascar
Namibia
South Africa



55 million
M2 floor area
EDGE certified

Data: 1 April 2023

EDGE is currently funded by the UK Government with original funding by Switzerland's State Secretariat of Economic Affairs (SECO)

UKaid
from the British people

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

Additional support has been provided by Austria, Canada, Denmark, ESMAP, EU, Finland, GEF, Hungary, and Japan.

Edge Excellence In Design For Greater Efficiencies

GBAC Green Banking Academy

AN INNOVATION OF IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities

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