Green Buildings

If you build it, build it green

More resources:
www.ifc.org/greenbuildingsreport
www.edgebuildings.com
Conciliation and arbitration of investment disputes.

 Guarantees of foreign direct investment’s non-commercial risks.

 Interest-free loans and grants to governments of poorest countries.

 Loans to middle-income and credit-worthy, low-income country governments.

 Solutions in private sector development.

 Guarantees of foreign direct investment’s non-commercial risks.

 Conciliation and arbitration of investment disputes.

 IFC is a member of the World Bank Group.
IFC HAS A **FOUR-PART STRATEGY** TO SUPPORT GREEN AND RESILIENT BUILDING GROWTH

---

**Investment & Advisory for Banks**
Activate financing through banking partners and support product development such as green mortgages and green bonds

**IFC’s Green Building Market Transformation Program**

**Investment & Advisory for the Building Sector**
Advise and directly invest in the property sector through IFC’s own balance sheet

**EDGE Certification**
Create a scalable voluntary certification system and software to empower the property industry to build green

**Green Building Codes & Incentives**
Incentivize green decision-making by fostering an enabling environment of supportive government policies to raise the bar on building regulations

---

Further Resource: [About EDGE](#)
URBANIZATION PRESSURES:

- 90 million middle class growth p.a.
- 70% world’s population in urban areas in 2050.

CLIMATE PRESSURES:

- Buildings account for 19% of the world’s GHG emissions.
- According to the IPCC’s special report, by 2030 all new buildings must be zero net carbon.¹
- Existing buildings must be zero net carbon by 2050.

ECONOMIC OPPORTUNITY:

- 80% of viable potential is untapped.
- Solutions can benefit multiple stakeholders.

¹IPCC’s Special Report on Global Warming.
BUILDINGS HAVE A SIGNIFICANT CLIMATE CHANGE IMPACT AND THERE ARE MORE NEW BUILDINGS TO COME

Current GHG from USA
6.8 Gt

Current GHG from buildings
9Gt

Additional GHG from buildings by 2030
7Gt

If the right investment choices are not made today, we will be locking into high-carbon urban infrastructure for the next 40 to 70 years.
Green buildings have higher sales prices, quicker sales cycles, lower operational costs, lower loan default rates, and higher resale values.

**Policy-makers launching (non-fiscal) incentives**

Quantifiable results relevant to NDCs, more efficient infrastructure and hence more competitive businesses, lower subsidies for utility bills, and higher disposable income for all residents.
DEFINITION OF A GREEN BUILDING

- CERTIFIABLY GREEN as verified by an independent third party
- BETTER PERFORMANCE than the local baseline
- QUANTIFIED IMPACT REPORTING

100% OF FINANCE OR RE-FINANCE CAN BE COUNTED FOR CLIMATE CO-BENEFITS
THE FREE SOFTWARE SHOWS RETURN ON INVESTMENT FOR RESOURCE EFFICIENCY MEASURES, TAILORED TO LOCAL CLIMATE

EDGEBUILDINGS.COM
EDGE IS AVAILABLE ACROSS **ALL SECTORS**, FOR BUILDINGS OF **ALL VINTAGES**

### NEW BUILDINGS
- HOMES
- HOSPITALITY
  - Hotel
  - Serviced Apt
  - Resort
- RETAIL
  - Department store
  - Shopping mall
  - Supermarket
  - Big box store
  - Food store
  - Airport

### EXISTING BUILDINGS & REFURBISHMENTS
- OFFICES
  - Hospital
  - Clinic
  - Nursing home
- HOSPITALS
  - Hospital
  - Clinic
  - Nursing home
- EDUCATION
  - Pre-school
  - School
  - University
  - Sports facility
  - Religious facility
- INDUSTRIAL
  - Warehouse
  - Light industrial

### PORTFOLIO CERTIFICATIONS
- PORTFOLIO CERTIFICATIONS
EDGE WEBSITE HAS A LIBRARY OF CASE STUDIES GLOBALLY, WHICH CAN BE USED FOR PROMOTION OR PROOF-OF-CONCEPT

**Ecohome 3 (VNM)**
Homes by Capital House

**Hilton Cucuta (COL)**
Hotel by Hilton

**Johnson Controls HQ Asia (CHN)**
Offices by Johnson Controls

**Sakura Montessori School (VNM)**
School by EMC Education

**Antananarivo Airport (MDG)**
Airport by Bouygues and Colas

**Revolucion 757 (MEX)**
Homes by FICADE

**Villa del Rio (COL)**
Retail by ASHMOREAvenida

**King Hussein Business Park (JOR)**
Offices by the Business Park

**Komfo Anokye Hospital (GHA)**
Hospital by ABP

**Esteban Echeverria (ARG)**
Warehouse by Plaza Logistica

CLICK ON LINKS FOR IN-DEPTH PROJECT STUDIES
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
  - 6 top universities offer EDGE training to students (UI, ITB, UGM, ITS, UNDIP, UNTAR)

**COLOMBIA**
- IFC investment in Bancolombia
  - 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
  - Partnership with Green Building Council South Africa to offer EDGE certification
  - Developers commit to certify >10k homes
  - KFW & EIB also invests in the funds using EDGE
## Indonesia Green Building Program

### Policy Engagement Results

(IFC Advisory Work 2011 - 2019)

<table>
<thead>
<tr>
<th>Location</th>
<th>Buildings</th>
<th>Area (m²)</th>
<th>CO₂ Emission Reduction (Metric tons/Year)</th>
<th>Potential Energy Savings (MWh/Year)</th>
<th>Electricity Cost Saving (Million US$/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jakarta</strong></td>
<td>453</td>
<td>26,000,000</td>
<td>1,240,825</td>
<td>1,591,948</td>
<td>1,591,948</td>
</tr>
<tr>
<td><strong>Bandung</strong></td>
<td>8,003</td>
<td>2,650,000</td>
<td>119,646</td>
<td>142,436</td>
<td>142,436</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>8,456</td>
<td>28,000,000</td>
<td>1,360,472</td>
<td>1,734,384</td>
<td>1,734,384</td>
</tr>
</tbody>
</table>

IFC supported Jakarta, Bandung, Semarang, Ministry of Public Works and Public Housing and private sectors through EDGE on Green Buildings program, in partnership with: **SECO** (Switzerland’s State Secretariat for Economic Affairs)
GREEN BUILDING COURSE IN UNIVERSITY

• Globally, IFC developed Green Building Course Modules for universities.
• In Indonesia, since January 2019, 5 universities (UI, ITB, UGM, ITS, and UNDIP) has been offering the IFC’s GB modules called Design for Greater Efficiency –DfGE as an elective course within their Department of Architecture.
GREEN BUILDINGS
INCREMENTAL COST VS RETURNS
ACHIEVING 20% SAVINGS REQUIRE A FEW PRACTICAL ADJUSTMENTS

ENERGY

• External Shading Devices
• Reflective Paint
• Insulation of Walls
• High Efficiency Boiler for Hot Water
• Energy-Saving Lighting Systems
• Low-E Coated Glass
• Energy-efficient Air Conditioning

WATER

• Low-flow Showerheads
• Low-flow Faucets
• Water-efficient Water Closets
• Rainwater Harvesting System

ENERGY EMBEDDED IN MATERIALS

• Hollow Core Precast Slab for Floor and Roof
• Honeycomb Clay Blocks or Hollow Concrete Blocks for Walls
• UPVC Window Frames
CASE STUDY: **INCREMENTAL COSTS FOR GREEN BUILDINGS ARE MUCH LOWER THAN MARKET PERCEPTION**

**South Africa** – IHS: $270 per residential unit = <1% of capital costs

**Vietnam** – Capital House: 1% more

**Mexico** – Vinte: $300 per unit

**Indonesia** – Ciputra: 4.7% more with payback period of 1.8 years

Further resource: [Green Building Return on Investment](#)
<table>
<thead>
<tr>
<th></th>
<th>Incremental Cost</th>
<th>Utility Savings/ Month</th>
<th>Payback Period in Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homes</td>
<td>$270/Unit</td>
<td>$15/Unit</td>
<td>1.5</td>
</tr>
<tr>
<td>Hotel</td>
<td>$153,000</td>
<td>$8,500</td>
<td>1.5</td>
</tr>
<tr>
<td>Shopping Center</td>
<td>$132,700</td>
<td>$8,230</td>
<td>1.4</td>
</tr>
<tr>
<td>Light Industry</td>
<td>$117,490</td>
<td>$6,170</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Source: IFC’s EDGE [Green Buildings ROI]; costs are reflected in US dollars.

IFC EDGE estimates show payback periods of less than two (2) years in homes, hotels, shopping centers and in light industry buildings.

HIGH RETURNS ARE POSSIBLE IN ALL MAJOR BUILDING SECTORS
## CASE STUDY: IHS SAVES RESIDENTS UP TO ONE MONTH OF RENT

<table>
<thead>
<tr>
<th>IHS Property</th>
<th>Ravenswood</th>
<th>Candlewood</th>
<th>Goedeberg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual consumption figures (kWh)</td>
<td>107</td>
<td>219</td>
<td>175</td>
</tr>
<tr>
<td>kWh savings compared to a similar non-certified development</td>
<td>54%</td>
<td>68%</td>
<td>41%</td>
</tr>
<tr>
<td>Total savings per year ($)</td>
<td>$128</td>
<td>$181</td>
<td>$338</td>
</tr>
</tbody>
</table>

Further Resource: [Housing Finance International Journal Spring 2020](#)
CASE STUDY: CAPITAL HOUSE OF VIETNAM INCREASED SALES 3X AND WON THE FINANCIAL TIMES AWARD FOR LOW COST HOUSING

- Green construction costs only 1% more in capital costs.
- Design utilizes sensible features.
- Capital House held a model apartment showcase with EDGE branding, which increased their sales 3x.
- Capital House won the Financial Times Transformational Business Award in 2018.

Further Resource: Capital House Story
HOW CAN I CAPTURE THE ECONOMICS OF GOING GREEN?

Citra Maja Raya

Citra Maja Raya is a 2,000-hectare development of commercial and residential property in Banten that includes 373 affordable green townhouses. Developed by Ciputra Group. [https://edgebuildings.com/project-studies/citra-maja-raya/](https://edgebuildings.com/project-studies/citra-maja-raya/)

<table>
<thead>
<tr>
<th>Savings Impact of Green Measures:</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="30% Lower Energy Bill" /></td>
</tr>
</tbody>
</table>

Green Technical Solutions:

- Reduced window to wall ratio
- External shading device
- Energy-saving lighting
- Natural ventilation
- Low-flow faucets for washbasins, kitchen
- Micro concrete tiles on steel rafters for roof construction
- Autoclaved aerated concrete blocks
GOVERNMENT INCENTIVES FOR GREEN BUILDINGS
<table>
<thead>
<tr>
<th>1</th>
<th>Tax Incentives</th>
<th>2</th>
<th>Bonus Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offer a tax credit to developers to offset extra costs.</td>
<td>Allow developers to increase the height of their buildings.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Expedited Permitting</th>
<th>4</th>
<th>Grants &amp; Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritize permitting for green construction and/or waive permit fees.</td>
<td>Provide grants to cities to incentivize solar power or to developers to subsidize certification costs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5</th>
<th>Technical Assistance</th>
<th>6</th>
<th>Net Metering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train planners, building inspectors, and other government staff on how to audit green buildings.</td>
<td>Work with utilities to enable owners to generate renewable energy to the grid.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7</th>
<th>Public Campaigns</th>
<th>8</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generate public support through advocacy efforts.</td>
<td>Bundle a certification standard directly into a new set of codes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further Resource: [EDGE Government Pages](#)
GOVERNMENT INCENTIVES FOR GREEN BUILDINGS

Further Resource: EDGE Government Pages
Green Buildings

POLICY PATHWAYS FOR EMERGING MARKETS

Download the Policy Pathways Report
CASE STUDIES ARE COMPiled in IFC’S GREEN BUILDINGS REPORT

Green Buildings
A Finance and Policy Blueprint for Emerging Markets

Download the report from www.ifc.org/greenbuildingsreport
THE FUTURE OF GREEN BUILDINGS:
THE IMPORTANCE OF PARTNERSHIP
INNOVATION AND TECHNOLOGY
PATHWAY TO ZERO CARBON & RESILIENT BUILDINGS
CASE STUDY: CATALYZING THE GREEN BUILDINGS MARKET IN COLOMBIA

PARTNERSHIPS
- Training, education, and marketing through CAMACOL, Chamber of Construction
- Demonstration investments with banks, universities, retail, and hotels
- First green bond in Colombia was for green buildings

INCENTIVES BY BANKS AND GOVERNMENT
- Bancolombia: incentivized interest rate, assistance
- Davivienda: reduced rate and certification costs
- SURA: 10% insurance refund
- Government: VAT exclusion and income tax deduction

Further Resource: EDGE Banking and Government Pages

RESULTS
- 2.4 million m2 space certified or registered
- Green mortgages launched
- $400 million program by Bancolombia, expanding into neighboring countries
- 80 technical experts accredited by IFC

Further Resource: Colombia EDGE Page
PATH TO ZERO CARBON AND RESILIENT BUILDINGS

Efficient new buildings + Retrofits for existing buildings + Clean energy + Resilience and Adaptation

TECHNICAL PATHWAYS

MINIMUM STANDARD

INCENTIVES

ENABLING ENVIRONMENT

ROLE IN FINANCING

GOVERNMENT ACTION
EDGE HAS A PATH TOWARD ZERO CARBON

1. EDGE Certified
Achieve the minimum standard of 20% in energy, water and embodied energy in materials.

2. EDGE Advanced
Earn 40% or more energy savings for a higher level of recognition, with at least 20% savings in water and materials.

3. Zero Carbon
Go all the way to carbon neutral with 40% or more energy savings on-site, achieving 100% through renewables or topping off with carbon offsets.

Further Resource: EDGE Certification and Zero Carbon Webinar
CASE STUDY: **ArthaLand Tower** is the first Zero Carbon EDGE Certification with a sustainability strategy funded by a green bond.

- First in the world to achieve EDGE Zero Carbon certification.
- $59 million green bond issuance; first non-bank issuer of green bonds in the Philippines.
- Short-listed for the Financial Times Transformational Business Awards.

Further resource: [EDGE Case study](#); [ArthaLand Green Bond Prospectus](#)
TOOLS FOR ACTION

TECHNICAL TOOLS

FINANCE CASE STUDIES

GOVERNMENT CASE STUDIES

IFC PARTNERSHIP

DISCLOSURE
EDGE IS ALIGNED WITH INTERNATIONAL GREEN FINANCE STANDARDS FOR 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).
- 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.
- 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.
- Used by property developers and investors to obtain data on the performance of their investments.
- Real Estate Assessment or the Developer Assessment.

ICMA
Climate Bonds
EU Technical Expert Group on Sustainable Finance
GRESB
CDP

ICF
International Finance Corporation
Creating Markets, Creating Opportunities
## IFC’S MARKETING SUPPORT

<table>
<thead>
<tr>
<th>+ Issue a Press Release</th>
<th>+ Use EDGE in Your Sales Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Submit a Project Study</td>
<td>+ Construct an On-site Billboard</td>
</tr>
<tr>
<td>+ Launch a Social Media Campaign</td>
<td>+ Add EDGE to Your Showroom</td>
</tr>
<tr>
<td>+ Publish Your Story</td>
<td>+ Win an Award</td>
</tr>
<tr>
<td>+ Send an Email</td>
<td>+ Speak at a Conference</td>
</tr>
<tr>
<td>+ Include EDGE in Your Mission</td>
<td>+ Hold a Certification Ceremony</td>
</tr>
<tr>
<td>+ Shoot a Video</td>
<td></td>
</tr>
</tbody>
</table>

Further resource: [EDGE Marketing Toolkit](#)
Training and Promotional Video on Innovate4Climate Platform

https://www.resilienceindex.org/
DONOR ACKNOWLEDGMENTS

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

IFC also wishes to express its appreciation to the following donors:

The European Union; the Ministry of Finance of Japan; the Hungarian Export Import Bank; the Canada Climate Change Program and the Department of Foreign Affairs, Trade and Development Canada; the Royal Ministry of Foreign Affairs of Denmark and the Danish Green Growth Fund; the Federal Ministry of Finance of Austria; and the Ministry of Foreign Affairs of Finland. In addition, the support of the GEF-IFC Earth Fund Platform and the Energy Sector Management Assistance Program (ESMAP) of the World Bank helped seed EDGE.

The following donors have demonstrated their generous support of the Green Bond Technical Assistance Program:
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Vietnam Business Development
Diep Ngoc Do
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Philippines Business Development
Angelo Tan
atan1@ifc.org
CASE STUDY: SALVADOR, BRAZIL – DISCOUNTED PROPERTY TAX

City: Salvador

Building Typology: Residential

Government Entity: City of Salvador

Incentive: Point-based system for a 5%, 7% or 10% discount on property taxes with re-application each year; certification guarantees a 7% discount.

Available Certification Systems: ACQUA, CASA AZUL, EDGE, GBC BRASIL, LEED

Source: IFC EDGE Government Pages
CASE STUDY: SEKONDI-TAKORADI, GHANA – LOWER PERMIT FEES

City: Twin City of Sekondi Takoradi

Building Typology: Residential & Commercial

Government Entity: Mayor’s Office

Incentive: 30% reduction in permit fees.

Source: IFC EDGE YouTube Video
CASE STUDY: LIMA, PERU – HEIGHT BONUS INCENTIVE

City: Lima (Miraflores)

Building Typology:
Residential & Commercial

Government Entity:
District Municipality of Miraflores

Incentive:
15% extra floor ratio (FAR)

Available Certification Systems:
EDGE, LEED, BREEAM

Source: IFC EDGE Government Pages
EDGE DELIVERS VALUE

- FINANCIAL CALCULATOR
- COST EFFECTIVE
- SIMPLIFIED COMPLIANCE
- EASY IMPACT REPORTING
- REDUCED PROCESSING
- WORLD BANK GROUP BRAND

Further resource: www.edgebuildings.com
CERTIFICATION WORKFLOW FOR DEVELOPERS

REGISTER

- Use the EDGE App for self-assessment & project registration

DESIGN

- Submit design documents into the EDGE App

CONSTRUCTION

- Site visit & as-built documents submitted in EDGE App

OPERATION

- Operational data submitted in EDGE App carbon calculator

PRELIMINARY EDGE CERTIFICATE OR EDGE ADVANCED CERTIFICATE

- EDGE co-marketing and project study for sales promotion
- EDGE Advanced certificate automatically granted to projects with 40% energy savings

FINAL EDGE CERTIFICATE OR EDGE ADVANCED CERTIFICATE

- Asset certification does not need to be renewed

ZERO CARBON CERTIFICATE

- Project must have one year of operation & 75% occupancy
- Must renew operational certificate every 2-4 years