



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL



Creating Markets, Creating Opportunities

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RETAIL IN EAST ASIA



ROI ON MEASURES NEEDED TO REACH EDGE STANDARD

	Incremental Cost	Utility Bills Savings / month	Payback Period in Years
Cambodia	\$125,000	\$13,000	0.8
China	775,000 ¥ \$110,000	71,000 ¥ \$10,000	0.9
Fiji	\$95,000	\$26,000	0.3
Indonesia	815,000 Thsnd. Rp \$54,000	121,000 Thsnd. Rp \$8,000	0.6
Philippines	1,231,450 PhP \$23,000	855,100 PhP \$16,000	0.2
Thailand	\$85,000	\$4,300	1.6
Vietnam	1,600 MVnd \$68,000	126 MVnd \$5,400	1.1



ENERGY

Effective measures include:

- Reduced Window To Wall Ratio
- Demand Control Ventilation for Fresh Air
- Energy Saving Light Bulbs in Sales Area
- Insulating Roof & Natural Ventilation
- Solar Hot Water Collector



WATER

Green strategies include:

- Dual Flush for all Water Closets
- Gray Water Systems and Recycling



MATERIALS

- Floor slabs are biggest cost drivers ranging from 35% - 40% of material costs out of 7 total interventions
- Using other materials in these elements of the building usually saves over 20%



RETAIL IN SOUTH ASIA



ROI ON MEASURES NEEDED TO REACH EDGE STANDARD

	Incremental Cost	Utility Savings / month	Payback Period in Years
Bangladesh	\$26,450	\$5,860	0.4
India (Delhi)	Rs198,460 \$2,700	Rs900,620 \$12,000	0
India (Mumbai)	Rs881,570 \$12,000	Rs768,910 \$10,000	0.1
Sri Lanka	\$117,575	\$13,100	0.8



ENERGY

Potential strategies include:

- Energy Saving Light Bulbs in all areas
- Insulation of Roof & Natural Ventilation
- Reflective paint for the roof
- Variable Refrigerant Flow (VRF) for cooling system

In humid climates, Air Conditioning Systems and De-Humidifiers are potential strategies.



WATER

The EDGE standard can be reached through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



MATERIALS

Strategies may include:

- In-Situ concrete > 30% PFA
- Autoclaved Aerated Concrete Blocks for external and internal walls



RETAIL IN AFRICA



ROI ON MEASURES NEEDED TO REACH THE EDGE STANDARD

	Incremental Cost	Utility Savings / month	Payback Period in Years
Angola	\$43,410	\$29,165	0.2
Cote D'Ivoire	\$17,150	\$6,470	0.2
Ghana	\$140,900	\$27,900	0.4
Kenya	\$137,800	\$16,565	0.7
Nigeria	\$44,740	\$4,900	0.8
South Africa	ZAR 3,948,600 \$274,300	ZAR 138,650 \$9,600	2.3



ENERGY

The most effective energy measures include:

- Energy Saving Light Bulbs
- Reflective Paint/Tiles for Roof
- Skylights Provide Light For top floor



WATER

The best interventions for water consumption reduction include:

- Dual Flush for Water Closets
- Efficient Faucets
- Efficient Urinals



MATERIALS

- Floor slabs are the biggest efficiency drivers, ranging from 35% - 40% of material costs out of 7 total interventions.



RETAIL IN LATIN AMERICA



ROI ON MEASURES NEEDED TO REACH THE EDGE STANDARD

	Incremental Cost	Utility Savings / month	Payback Period in Years
Argentina	\$156,300	\$7,000	1.9
Brazil	\$443,000	\$12,700	2.9
Colombia	\$201,300	\$8,735	1.9
Costa Rica	117,564,000 CRC \$205,000	7,555,700 CRC \$13,200	1.3
Mexico	\$132,700	\$8,230	1.4
Peru	1,468,700 S \$444,000	24,600 S \$7,400	5



ENERGY

The most effective interventions include:

- Energy Saving Light Bulbs
- Insulation of Roof and Walls
- Variable Refrigerant Flow Cooling System
- Air Conditioning with Air Cooled Screw Chiller

In many countries, Solar PV is also an effective choice.



WATER

The best ROI comes from the following measures:

- Dual Flush for all Water Closets
- Aerator and Auto Shut-off Faucet
- Water Efficient Urinals



MATERIALS

- The best areas for efficiency interventions are either Floor Slabs or Roof Construction.





RETAIL IN MENA



ROI ON MEASURES NEEDED TO REACH EDGE STANDARD

	Incremental Cost	Utility Savings / month	Payback Period in Years
Egypt	\$77,400	\$6,100	1
Jordan	\$62,500	\$8,800	0.6
Morocco	\$13,000	\$10,500	0.1
Pakistan	\$35,000	\$4,300	0.6



ENERGY

Effective strategies include:

- Energy-Saving Light Bulbs
- Reflective Paint/Tiles for Roof
- Insulation of Roof: U-Value of 0.442
- Variable Refrigerant Flow (VRF) Cooling System
- Solar Photovoltaics



WATER

The EDGE Standard can typically be reached through:

- Dual Flush for all Water Closets
- Water-Efficient Urinals in all Bathrooms



MATERIALS

- Floor slabs are biggest efficiency drivers ranging from 35% - 40% of material costs out of 7 total interventions
- Using materials other than the base case usually saves over 20%



RETAIL IN EAST EUROPE



ROI ON MEASURES NEEDED TO REACH EDGE STANDARD

	Incremental Cost	Utility Savings / month	Payback Period in Years
Armenia	\$498,420	\$11,150	4
Poland	\$9,530	\$27,980	0.1
Russian Federation	\$61,490	\$8,840	0.6
Serbia	\$3,790	\$120,570	0.2
Ukraine	\$66,220	\$4,730	1.2
Turkey	\$72,160	\$14,020	0.4



ENERGY

Best strategies include:

- Reduced Window To Wall Ratio
- Energy Saving Light Bulbs in Sales Area
- Insulating Roof
- Insulating External Walls
- Sensible Heat Recovery for Exhaust Air



WATER

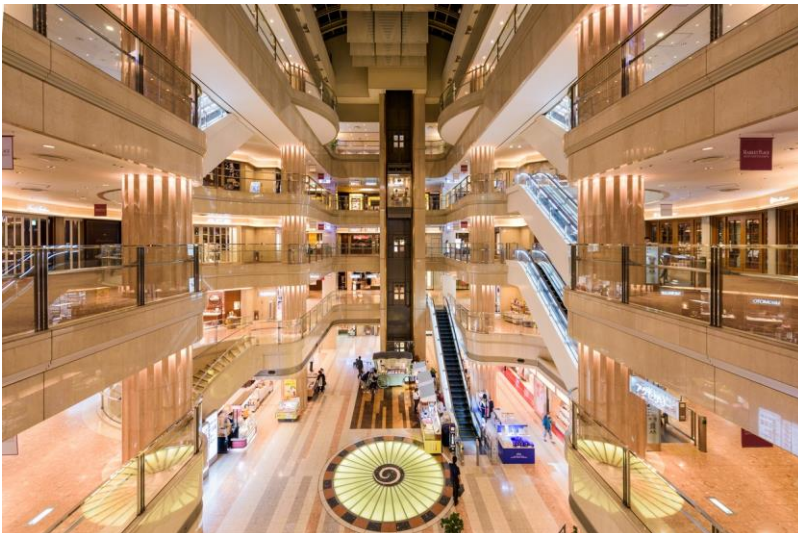
The EDGE standard can usually be reached through:

- Dual flush for water closets
- Water-efficient urinals and auto shut-off faucets



MATERIALS

- Floor Slabs are biggest efficiency drivers ranging from 20%-30% of material costs out of 6 total interventions
- Using other materials in these elements of a shopping center usually saves over 20%





GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN EAST ASIA

RETAIL – CAMBODIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 27% Savings through:

- Insulation of Roof, Natural Ventilation
- Air Conditioning with Air Cooled Screw Chiller
- Energy Saving Light Bulbs, Sales Area



Water – 23% Savings through:

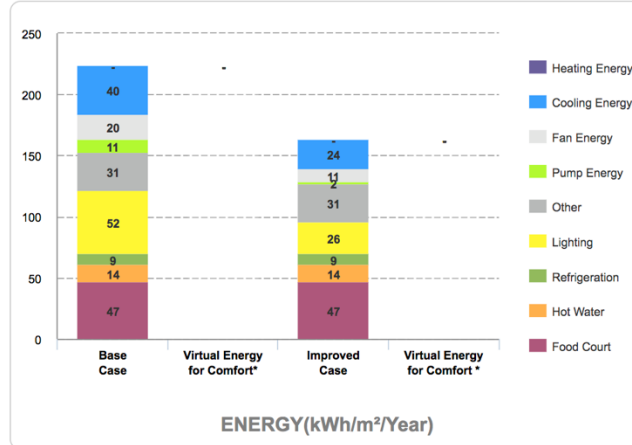
- Dual Flush for Water Closets



Materials – 31% Savings through:

- Timber Floor Construction Floor Slabs

27.16% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$125,000

Utility Bills Savings
\$13,000 / month

Payback in Years
0.80

Operational CO₂
Savings
700 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



SAVEMAX SUPER GROSIR CIBUBUR (INDONESIA)

In-country certified project to replace related example once an EDGE project is certified.

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 28% Savings through:

- Variable Frequency Drives in Air Handling Units
- Sensible Heat Recovery from Exhaust Air
- Solar Hot Water Collectors



Water – 24% Savings through:

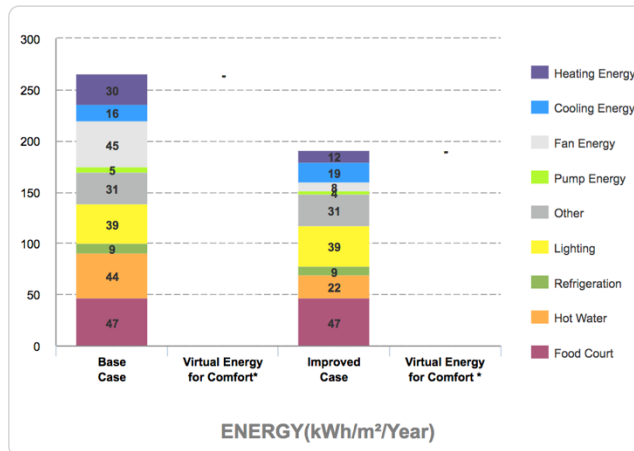
- Dual Flush for Water Closets
- Water Efficient Urinals in all Bathrooms



Materials – 30% Savings through:

- Timber Floor Construction Floor Slabs

28.09% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
775,000 ¥

Utility Bills Savings
71,000 ¥ / month

Payback in Years
0.90

Operational CO₂
Savings
1,300 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 47% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint and Insulation for Roof and Walls, Recovery of Waste Heat from Generator for Heating
- High Efficiency Condensing Boiler for Space Heating
- High Efficiency Refrigerated Cases and Energy Efficient Lighting



Water – 42% Savings through:

- Dual Flush Water Closets, Water Efficient Urinals
- Aerators and Auto Shut-Off Faucets



Materials – 34% Savings through:

- Corrugated Zinc Sheets for Roof, Steel Profile Cladding for External Walls and Solid Dense Concrete Blocs for External Walls



KAUFLAND (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – FIJI CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 29% Savings through:

- Insulation of Roof, Solar Hot Water Collectors
- Air Conditioning with Air Cooled Screw Chiller
- Variable Frequency Drives for Air Handling Units
- Energy Saving Light bulbs, Sales Area



Water – 50% Savings through:

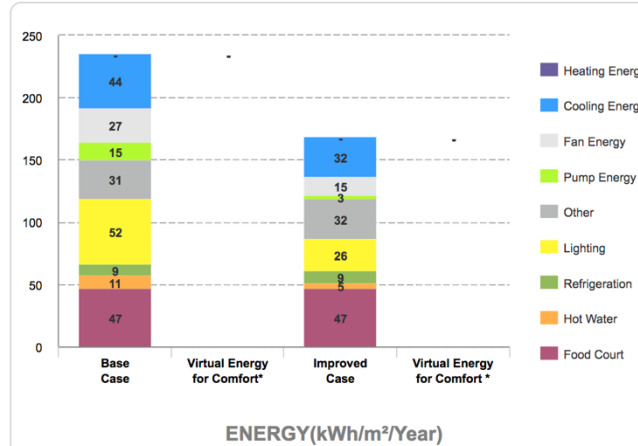
- Dual Flush, Water Efficient Urinals for all Bathrooms
- Gray Water Treatment, Rainwater Harvesting System



Materials – 42% Savings through:

- Re-Use of Existing Floorslab

28.73% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$95,000

Utility Bills Savings
\$26,000 / month

Payback in Years
0.30

Operational CO₂
Savings
550 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Insulated Roofs and External Walls
- Occupancy Sensors in Bathrooms, Energy saving lighting



Water – 24% Savings through:

- Single Flush Water Closets
- Water-Efficient Urinals
- Aerators and Auto Shut-Off Faucet in Bathrooms



Materials – 23% Savings through:

- Steel Sheets on Steel Rafters Roof Construction
- Cement Fibre Boards on Metal Studs for all External Walls and In-Situ Reinforced External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – INDONESIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 22% Savings through:

- Reflective Paint/Tiles for Roof
- Variable Speed Drives on Fans of Cooling Towers
- Energy Saving Light bulbs in Sales Area



Water – 25% Savings through:

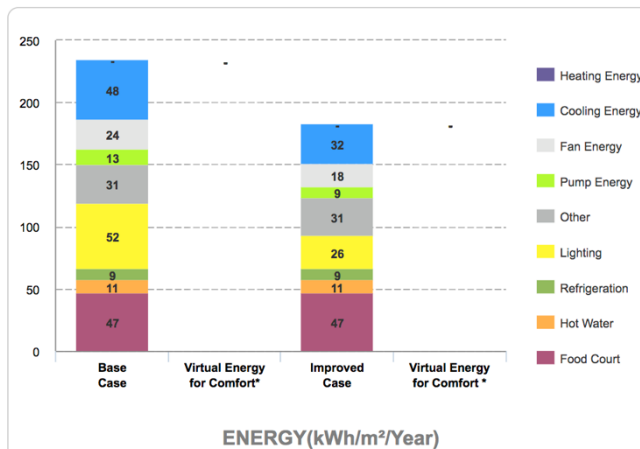
- Dual Flush for Water Closets
- Water-Efficient Urinals



Materials – 31% Savings through:

- Timber Floor Construction Floor Slabs

21.67% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
815,000
Thousand Rp

Utility Bills Savings
121,000
Thousand Rp / month

Payback in Years
0.6

Operational CO₂ Savings
548.93 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



SAVEMAX SUPER GROSIR CIBUBUR (BOGOR)

RETAIL – PHILIPPINES CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 23% Savings through:

- Reflective Paint/Tiles for Roof
- Variable Speed Drives on Fans of Cooling Towers
- Energy Saving Light bulbs in Sales Area



Water – 24% Savings through:

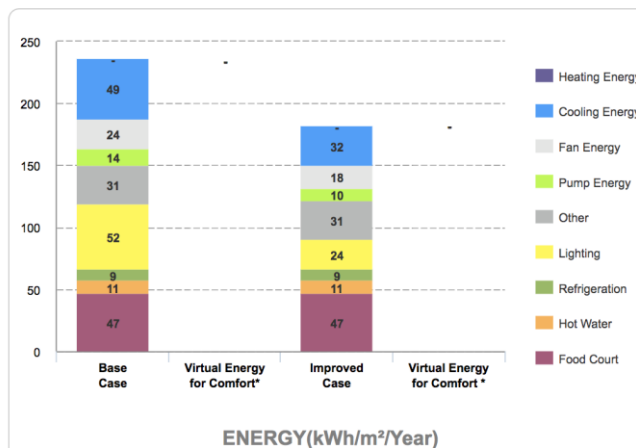
- Dual Flush for Water Closets
- Water-Efficient Urinals



Materials – 31% Savings through:

- Timber Floor Construction Floor Slabs

22.64% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
1,231,450 Php

Utility Bills Savings
855,100 Php / month

Payback in Years
0.2

Operational CO₂
Savings
454.43 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



SAVEMAX SUPER GROSIR CIBUBUR (INDONESIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – THAILAND CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 27% Savings through:

- Insulation of Roof
- Air Conditioning with Air Cooled Screw Chiller
- Energy Saving Light bulbs, Sales Area



Water – 24% Savings through:

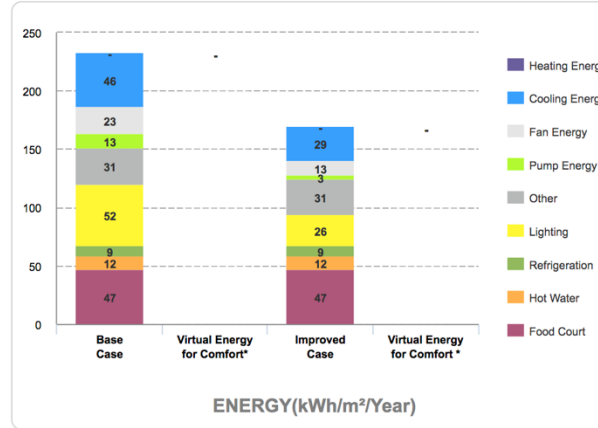
- Dual Flush for Water Closets



Materials – 41% Savings through:

- Re-use of Existing Floorslab

27.49% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$85,000

Utility Bills Savings
\$4,300 / month

Payback in Years
1.6

Operational CO₂
Savings
480 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall ratio, Insulated Roofs and External Walls
- Occupancy Sensors in Bathrooms, Energy saving lighting



Water – 24% Savings through:

- Single Flush Water Closets
- Water-Efficient Urinals
- Aerators and Auto Shut-Off Faucet in Bathrooms



Materials – 23% Savings through:

- Steel Sheets on Steel Rafters Roof Construction
- Cement Fibre Boards on Metal Studs for all External Walls and In-Situ Reinforced External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL –VIETNAM CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 22% Savings through:

- Reflective Paint/Tiles for Roof
- Variable Speed Drives on Fans of Cooling Towers
- Energy Saving Light bulbs in Sales Area



Water – 22.32% Savings through:

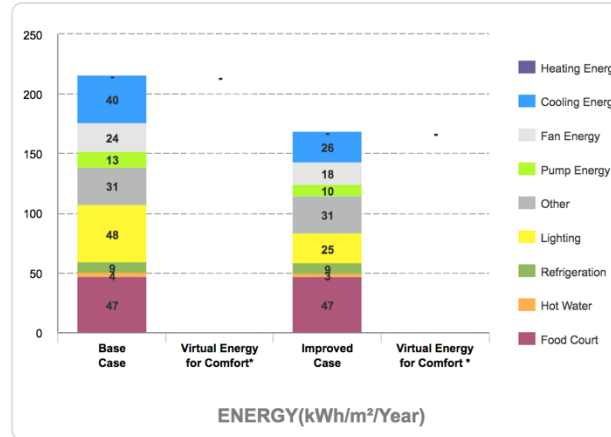
- Dual Flush for Water Closets
- Water Efficient Urinals
- Auto Shut-off Faucets



Materials – 31% Savings through:

- Timber Floor Construction Floor Slabs

21.82% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
1,600 mVND

Utility Bills Savings
126 mVND /month

Payback in Years
1.1

Operational CO₂
Savings
290 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 47% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint and Insulation for Roof and Walls, Recovery of Waste Heat from Generator for Heating
- High Efficiency Condensing Boiler for Space Heating
- High Efficiency Refrigerated Cases and Energy Efficient Lighting



Water – 42% Savings through:

- Dual Flush Water Closets, Water Efficient Urinals
- Aerators and Auto Shut-Off Faucets



Materials – 34% Savings through:

- Corrugated Zinc Sheets for Roof, Steel Profile Cladding for External Walls and Solid Dense Concrete Blocs for External Walls



KAUFLAND (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN SOUTH ASIA



Creating Markets, Creating Opportunities

retail – BANGLADESH CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Shopping Mall



Energy Measures – 22% Savings through:

- Reflective paint for roof
- Variable Refrigerant Flow (VRF) for cooling system
- Energy Saving Light Bulbs in Sales area



Water – 24% Savings through:

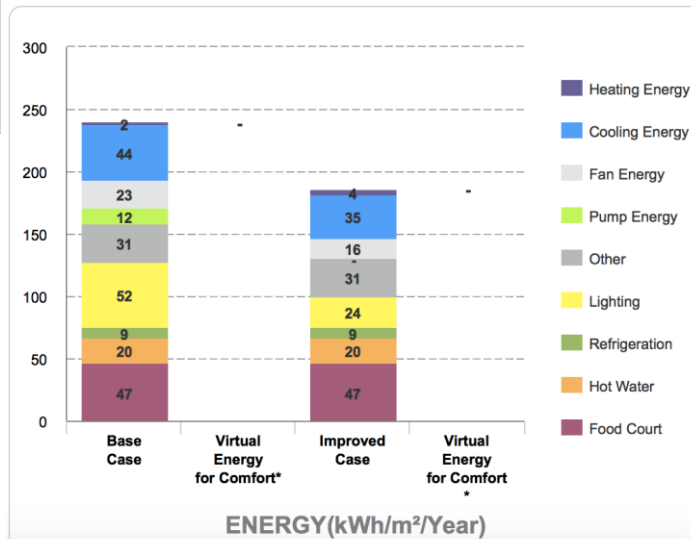
- Dual flush for water closet in all bathrooms



Materials – 25% Savings through:

- Roof Construction: In-Situ Concrete with >30%PFA
- Autoclaved Aerated Concrete blocks for internal and external walls.
- UPVC Window frames
- Ceramic tiles

22.23% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$26,450

Utility Costs Savings

\$5,860/ month

Payback in Years

0.4

Operational CO₂ Savings

497 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio
- Insulation for Roof & walls
- Occupancy sensors in bathroom
- Energy Saving Lighting in sales area, corridor, common area and external spaces



Water – 24% Savings through:

- Single flush for water closets and water efficient urinals
- Aerators and Auto Shut-off Faucet in All Washrooms



Materials – 23% Savings through:

- Steel sheet on steel rafter roof construction
- Cement fiber board on metal studs for all external wall



RETAIL AT SANTA VERDE

In-country certified project to replace related example once an EDGE project is certified.

retail – INDIA (DELHI) CASE STUDY & CERTIFIED PROJECT



BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Shopping Mall



Energy Measures – 21% Savings through:

- Reflective paint for roof
- Variable Refrigerant Flow (VRF) cooling system
- Energy Saving Light Bulbs in all spaces



Water – 21% Savings through:

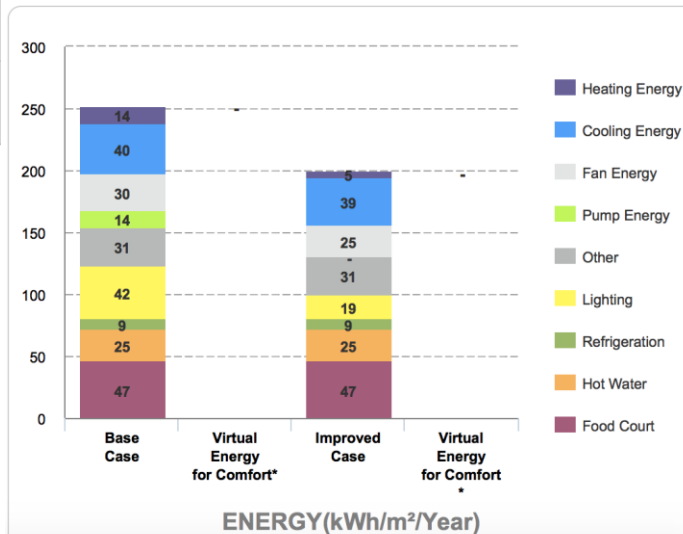
- Dual faucets in all bathrooms
- Water Efficient Urinals



Materials – 25% Savings through:

- Roof Construction: In-Situ concrete > 30% PFA
- Autoclaved Aerated Concrete Blocks for external wall
- UPVC window frames

20.89% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

Rs 198,460

Utility Costs Savings

Rs 900,670/ month

Payback in Years

0

Operational CO₂ Savings

569 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting



Water – 27% Savings through:

- Low-Flow faucets for kitchen and bathroom
- Aerators and Auto Shut-off Faucet in All Washrooms
- Water efficient urinals and dual water closet



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



BMB 001 CAMBUCI - OBRAMAX

In-country certified project to replace related example once an EDGE project is certified.

retail – INDIA (MUMBAI) CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Shopping Mall



Energy Measures – 22% Savings through:

- Reflective paint for roof
- Variable Refrigerant Flow (VRF) for cooling system
- Energy Saving Light Bulbs in Sales area



Water – 23% Savings through:

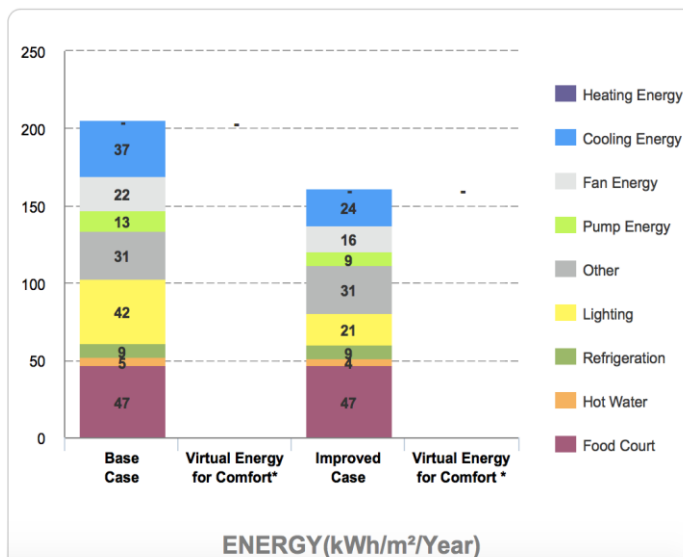
- Dual flush for water closet in all bathrooms
- Water efficient kitchen faucets



Materials – 21% Savings through:

- Roof Construction: In-Situ Concrete with >30%PFA
- UPVC Window frames
- Ceramic tiles
- Common brick wall for internal and external walls

21.73% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

Rs 881,570

Utility Costs Savings

Rs 768,910 / month

Payback in Years

0.1

Operational CO₂ Savings

482 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 37% Savings through:

- Reduced Window to Wall Ratio, recovery of waste heat from generator
- Reflective Paint & insulation for Roof & walls
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting and CO2 sensors controlled ventilation for fresh air
- Variable frequency drives in AHU, Variable speed drive pumps
- High efficiency condensing boilers for space heating



Water – 53% Savings through:

- Water efficient urinals and duals flush water closet
- Aerators and Auto Shut-off Faucet in All Washrooms



Materials – 30% Savings through:

- Steel profile cladding for external wall
- Corrugated zinc sheet for roof construction
- Solid dense concrete blocks for external wall



KAUFLAND – HRISTO SMIMENSKI

In-country certified project to replace related example once an EDGE project is certified.

retail – SRI LANKA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 31% Savings through:

- Insulation Roof
- Insulation of Existing Walls
- Energy Saving Light Bulbs in Sales Area



Water – 37% Savings through:

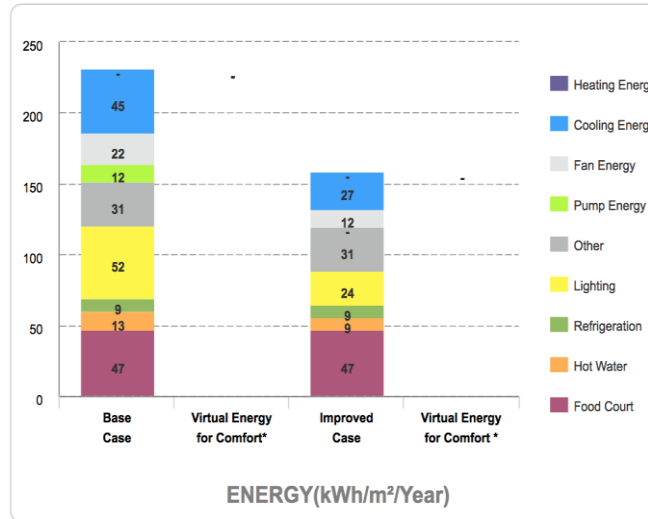
- Single Flush/Flush Valve for Water Closets
- Water Efficient Kitchen Faucets
- Water Efficient Urinals



Materials – 41% Savings through:

- Roof Construction: In-Situ Trough Concrete Slab

31.24% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$117,575

Utility Costs Savings
\$13,100/ month

Payback in Years
0.8

Operational CO₂ Savings
768 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



SAVEMAX SUPER GROSIR CIBUBUR (INDONESIA)

In-country certified project to replace related example once an EDGE project is certified.



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN AFRICA



Creating Markets, Creating Opportunities

RETAIL – ANGOLA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 24% Savings through:

- Reflective Paint/Tiles for Roof, External Walls
- Variable Refrigerant Flow Cooling System
- Energy Saving Light Bulbs



Water – 29% Savings through:

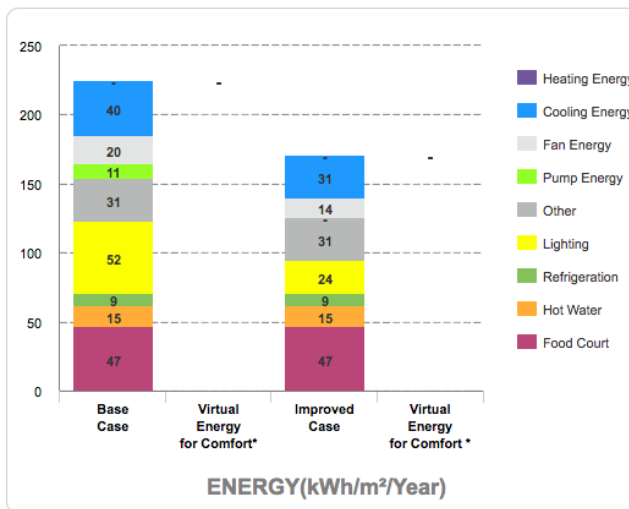
- Dual Flush for Water Closets
- Water-Efficient Urinals in all Bathrooms



Materials – 41% Savings through:

- In-situ trough concrete floor slab

23.78% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$43,410

Utility Costs Savings
\$29,165 / month

Payback in Years
0.2

Operational CO₂
Savings
485 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 37% Savings through:

- Reduced Window to Wall Ratio,
- Reflective paint and insulation for roof, walls
- Recovery of waste heat from generator for space heating
- Variable frequency drives in AHUs
- Variable speed drive pumps
- CO2 sensor/demand-controlled ventilation
- High-efficiency condensing boiler for space heating
- High efficiency refrigerated cases
- Energy-efficient lighting system



Water – 53% Savings through:

- Dual-flush water closets
- Water-efficient urinals
- Aerators and auto shut-off faucets



Materials – 30% Savings through:

- Corrugated zinc sheets for roof construction
- Steel profile cladding for external walls
- Solid dense concrete blocks for internal walls.



KAUFLAND (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – COTE D'IVOIRE CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 24% Savings through:

- Reflective Paint/Tiles for Roof
- Natural Ventilation w/Operable Windows
- Energy Saving Light Bulbs



Water – 25% Savings through:

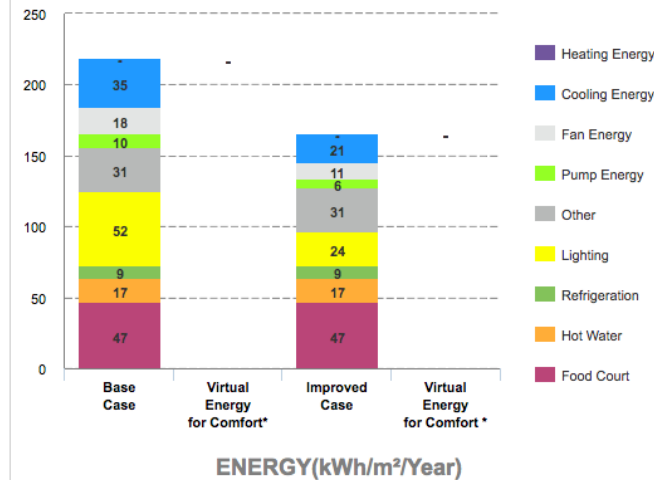
- Dual Flush for Water Closets
- Water-Efficient Urinals



Materials – 21% Savings through:

- Light Gauge Steel Floor Cassette

23.78% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$17,150

Utility Costs Savings

\$6,470 / month

Payback in Years

0.2

Operational CO₂ Savings

360 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio,
- Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls
- Autoclaved Aerated Concrete for Internal and External Walls



SAVEMAX SUPER GROSIR CIBUBUR (INDONESIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – GHANA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 34% Savings through:

- Reflective Paint/Tiles for Roof
- Skylights to top floor
- Solar Photovoltaics



Water – 28% Savings through:

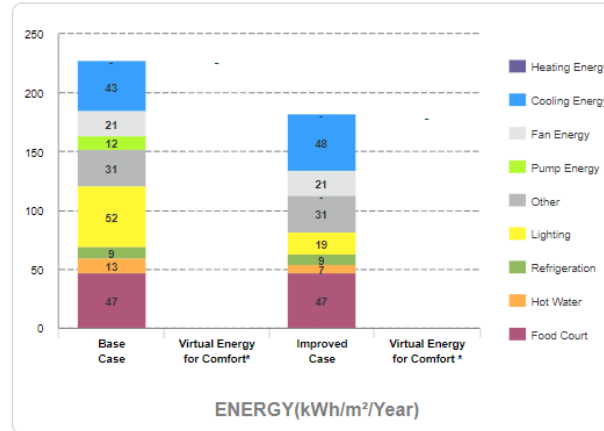
- Dual Flush for Water Closets
- Water-Efficient Kitchen Faucets



Materials – 23% Savings through:

- Composite Slim Floor Slabs with Steel I-Beams

20.65% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$140,900

Utility Costs Savings
\$27,900 / month

Payback in Years
0.4

Operational CO₂
Savings
268 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio,
- Insulated roofs and external walls
- Occupancy sensors in bathrooms
- Energy saving lighting in sales, corridors, common and external areas



Water – 24% Savings through:

- Single flush for water closets
- Water-efficient urinals
- Aerators and auto-shut-off faucets in all bathrooms



Materials – 23% Savings through:

- Steel sheets on steel rafters roof construction
- Cement fibre boards on metal studs for all external walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – KENYA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 34% Savings through:

- Insulation of Roof
- Variable Refrigerant Flow Cooling System
- Variable Frequency Drives in AHUs
- Energy Saving Light Bulbs



Water – 22% Savings through:

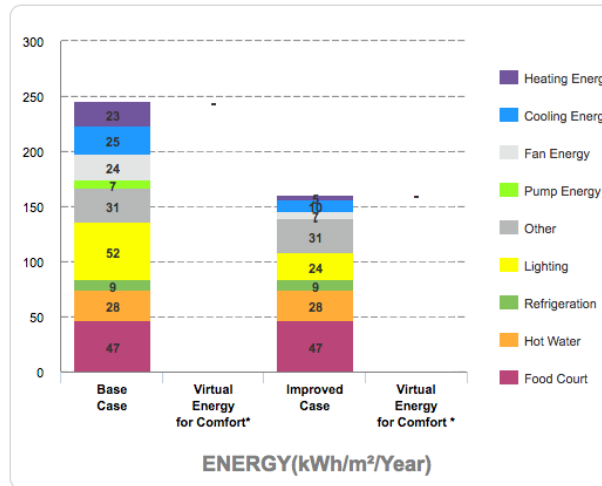
- Dual Flush for Water Closets in all Bathrooms



Materials – 27% Savings through:

- Composite in-situ concrete and steel deck

34.05% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$137,800

Utility Costs Savings
\$16,565 / month

Payback in Years
0.69

Operational CO₂
Savings
546 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio,
- Insulated roofs and external walls
- Occupancy sensors in bathrooms
- Energy saving lighting in sales, corridors, common and external areas



Water – 24% Savings through:

- Single flush for water closets
- Water-efficient urinals
- Aerators and auto-shut-off faucets in all bathrooms



Materials – 23% Savings through:

- Steel sheets on steel rafters roof construction
- Cement fibre boards on metal studs for all external walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – NIGERIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 22% Savings through:

- Variable Refrigerant Flow Cooling System
- Energy Saving Light Bulbs, Sales Area



Water – 29% Savings through:

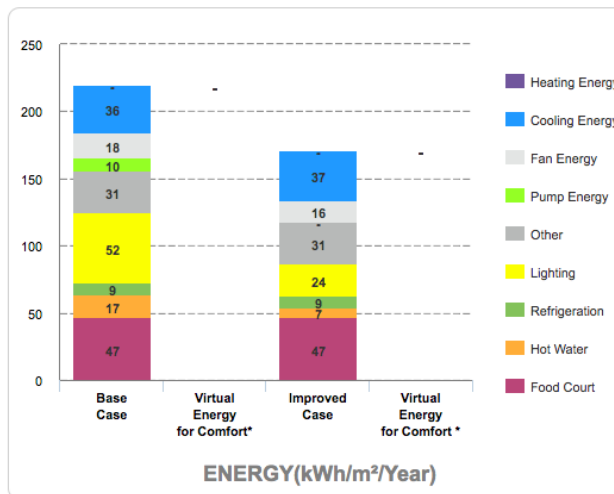
- Aerators & Auto Shut-off Faucets in Bathrooms
- Water-Efficient Kitchen Faucets
- Rainwater Harvesting System



Materials – 41% Savings through:

- Composite in-situ concrete and steel deck

21.96% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$44,740

Utility Costs Savings
\$4,900 / month

Payback in Years
0.76

Operational CO₂
Savings
282 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio,
- Reflective paint and tiles for roof
- Insulation of roof, external walls
- Variable Refrigerant Volume (VRV) cooling system
- Energy saving lighting system in external, corridors, sales & common areas
- Skylights



Water – 27% Savings through:

- Low-Flow faucets in kitchens, bathrooms
- Dual-flush water closets and water-efficient urinals
- Aerators and auto shut-off faucets in all bathrooms



Materials – 36% Savings through:

- Steel sheets on steel rafters for roof construction
- Medium weight hollow concrete blocks, steel profile cladding for external walls
- Medium weight hollow concrete blocks for internal walls
- Finished concrete floor



BMB 001 CAMBUCI - OBRAMAX (BRAZIL)

In-country certified project to replace related example once an EDGE project is certified.



BUILDING DETAILS

Site Area	Floor to floor height	Landscaped Area	Amenities
15,000 m ²	4m	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 22% Savings through:

- Reflective Paint/Tiles for Roof
- Insulation of Roof and External Walls
- Air Economizers During Favorable Outdoor Conditions
- Variable Frequency Drives in AHUs
- Energy-Saving Light Bulbs



Water – 25% Savings through:

- Dual Flush for Water Closets
- Water-Efficient Urinals in all Bathrooms



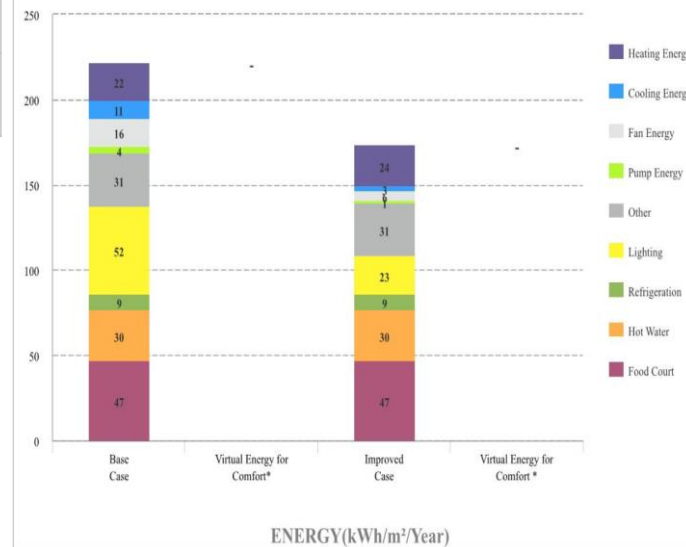
Materials – 27% Savings through:

- Composite In-Situ Concrete and Steel Deck

Energy Efficiency measures 21.64%

Energy Savings

Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
ZAR 3,948,600

Utility Costs Savings
ZAR 138,650 / month

Payback in Years
2.3

Operational CO₂
Savings
664 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 27% Savings through:

- Low-flow faucets in kitchens and bathrooms
- Dual-flush water closets
- Water-efficient urinals
- Aerators and auto shut-off faucets in all bathrooms



Materials – 36% Savings through:

- Steel sheets on steel rafters for roof construction
- Medium-weight hollow concrete blocks and steel profile cladding for external walls



BMB001 CAMBUCI OBRAMAX (BRAZIL)

In-country certified project to replace related example once an EDGE project is certified.



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN LATIN AMERICA



Creating Markets, Creating Opportunities

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 24% Savings through:

- Insulation of Roof and External Wall
- Variable Refrigeration Flow Cooling System
- Air Conditioning with Air Cooled Screw Chiller



Water – 31% Savings through:

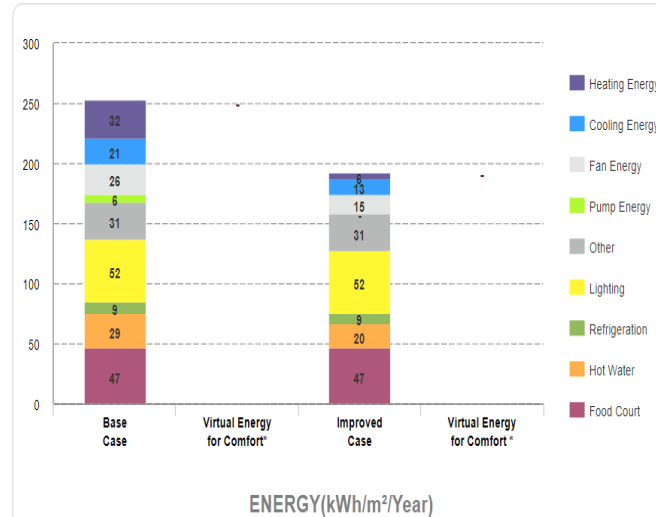
- Dual Flush for Water Closets
- Aerator and Auto Shut-off Faucet



Materials – 24% Savings through:

- Concrete Hollow Filler Slab

23.39% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$156,300

Utility Cost Savings

\$7,000/month

Payback in Years

1.9

Operational CO₂ Savings

1370 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – BRAZIL CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 37% Savings through:

- Insulation of Roof
- Air Conditioning with Air Cooled Screw Chiller
- Solar Photovoltaics Replacing 25% of energy



Water – 42% Savings through:

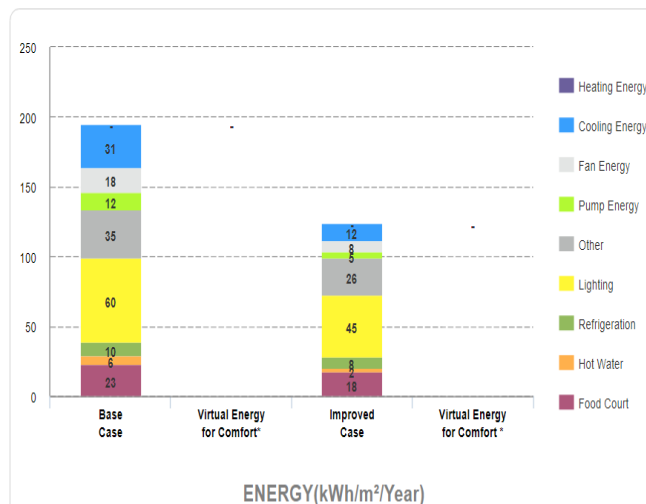
- Dual Flush for Water Closets
- Water Efficient Urinals
- Aerator and Auto Shut-off Faucet



Materials – 39% Savings through:

- In-Situ Concrete with >25% GGBS for Floor and Roof

36.94% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$443,000

Utility Cost Savings

\$12,700/month

Payback in Years

2.9

Operational CO₂ Savings

785 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- insulation of roof and external walls
- variable refrigerant volume cooling system
- energy-saving lighting system for external spaces, sales, corridors, common areas skylights.



Water – 27% Savings through:

- Low-flow faucets in kitchens and bathrooms
- dual-flush water closets, water-efficient urinals
- aerators and auto shut-off faucets in all bathrooms.



Materials – 36% Savings through:

- Steel sheets on steel rafters for roof construction
- medium weight hollow concrete blocks and steel profile cladding for external walls
- medium weight hollow concrete blocks for internal walls
- finished concrete floor.



BMB 001 CAMBUCI – OBRAMAX (BRAZIL)

RETAIL – COLOMBIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 29% Savings through:

- Insulation of Roof and External Wall
- Air Conditioning with Air Cooled Screw Chiller
- Variable Refrigerant Flow Cooling System



Water – 35% Savings through:

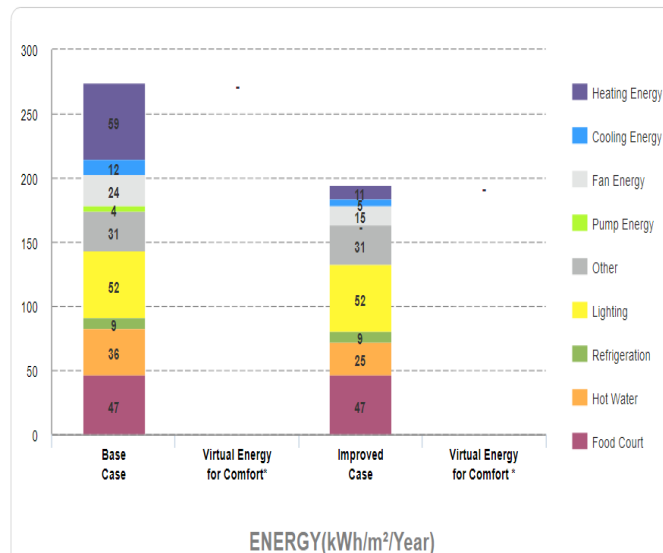
- Dual Flush for Water Closets
- Water Efficient Urinal
- Aerator and Auto Shut-off Faucet



Materials – 24% Savings through:

- Concrete Filler Roof Slab

28.89% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$201,300

Utility Cost Savings

\$8,735/month

Payback in Years

1.9

Operational CO₂ Savings

655 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 58% Savings through:

- Reduced Window To Wall Ratio and Insulation of Roof and Walls
- Energy-efficient VRV Cooling System
- Variable Frequency Drives In Air Handling Units
- Sensible Heat Recovery From Exhaust Air
- CO2 Sensor/Demand Controlled Ventilation For Fresh Air Intake
- Energy-saving Lighting and Occupancy Sensors In Bathrooms.



Water – 41% Savings through:

- Dual flush for water closets
- water-efficient urinals and kitchen faucets.
- aerators and auto-shut-off faucets in all bathrooms



Materials – 44% Savings through:

- Hollow core precast slab for floors
- steel-clad sandwich panel for roof construction, autoclaved aerated concrete blocks for external walls
- autoclaved aerated concrete blocks and plasterboards on metal studs with insulation for internal walls, and finished concrete flooring.



VILNIUS FABIJONISKES BY LIDL (LITHUANIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – COSTA RICA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 23% Savings through:

- Insulation of Roof and External Wall
- Air Conditioning with Air Cooled Chiller
- Energy Saving Light Bulbs, Sales Area



Water – 25% Savings through:

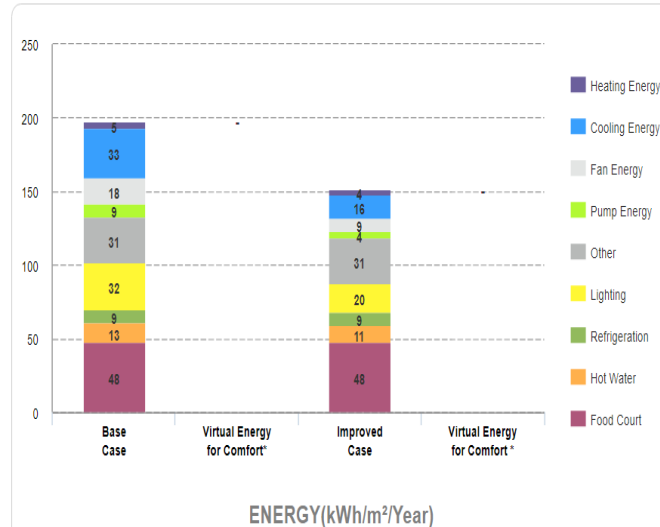
- Dual Flush for Water Closets
- Water Efficient Urinals
- Aerator and Auto Shut-off Faucet



Materials – 25% Savings through:

- In-situ Trough Concrete Floor Slab

23.30% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

117,564,000 CRC

Utility Cost Savings

7,555,700 CRC/month

Payback in Years

1.3

Operational CO₂ Savings

400 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

RETAIL – MEXICO CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 24% Savings through:

- Insulation of Roof and External Wall
- Air Conditioning with Air Cooled Screw Chiller
- Variable Refrigerant Flow Cooling System



Water – 37% Savings through:

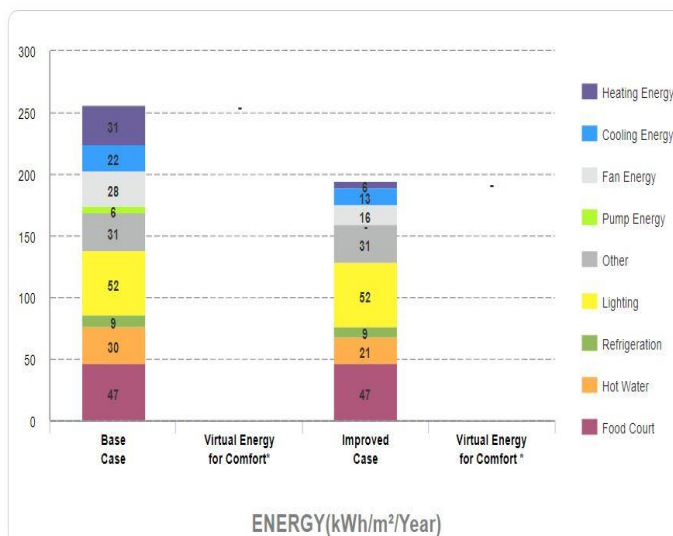
- Dual Flush for Water Closets
- Water Efficient Urinals
- Aerators and Auto Shut-off Faucet



Materials – 24% Savings through:

- Concrete Filler Floor Slabs

24.18% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$132,700

Utility Cost Savings

\$8,230/month

Payback in Years

1.4

Operational CO₂

Savings

1275 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs, Steel Sheets on Steel Rafters Roof
- Steel Profile Cladding for External Walls; Autoclaved Aerated Concrete for Internal and External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – PERU CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors Above Ground	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 21% Savings through:

- Insulation of Roof and External Wall
- Variable Refrigerant Flow Cooling System
- Air Conditioning with Air Cooled Screw Chiller
- Energy Saving Light Bulbs, Sales Area



Water – 24% Savings through:

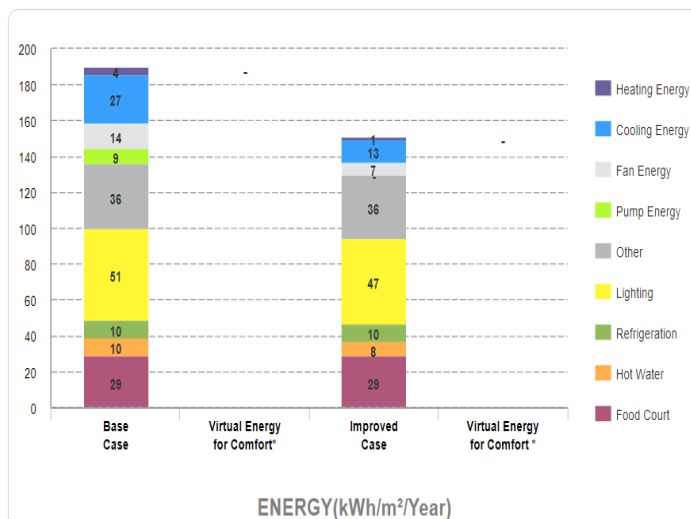
- Dual Flush for Water Closets
- Water Efficient Urinals
- Aerator and Auto Shut-off Faucet



Materials – 23% Savings through:

- Concrete Filler Floor Slabs

20.75% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

1,468,700 S

Utility Cost Savings

24,600 S/month

Payback in Years

5

Operational CO₂ Savings

1050 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 37% Savings through:

- Reduced Window To Wall Ratio
- Reflective Paint And Insulation For Roof And Walls
- Recovery Of Waste Heat From The Generator For Space Heating
- Variable Frequency Drives In Ahus, Variable Speed Drives Pumps
- CO2 Sensor/Demand-controlled Ventilation For Fresh Air Intake
- High Efficiency Condensing Boiler For Space Heating
- High Efficiency Refrigerated Cases And Energy-efficient Lighting System



Water – 53% Savings through:

- Dual Flush Water Closets, Water-efficient Urinals
- Aerators And Auto Shut-off Faucet In All Washrooms



Materials – 30% Savings through:

- Corrugated Zinc Sheets For Roof Construction
- Steel Profile Cladding For External Walls And Solid Dense Concrete Blocks For Internal Walls



KAUFLAND – HRISTO SMIMENSKI (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN MENA



Creating Markets, Creating Opportunities

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 20% Savings through:

- Reflective Paint/Tiles for Roof -Solar Reflectivity
- Insulation of Roof: U-Value of 0.442
- Variable Refrigerant Flow (VRF) Cooling System



Water – 22% Savings through:

- Dual Flush for Water Closets in all Bathrooms
- Single Flush/Flush Valve



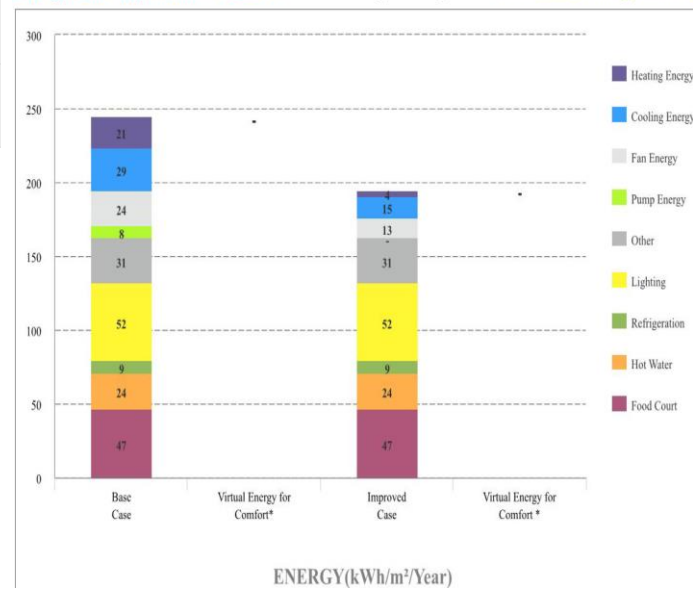
Materials – 22% Savings through:

- Composite In-Situ Concrete and Steel Deck

Energy Efficiency measures 20.27%

Energy Savings

Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$ 77,400

Utility Costs Savings
\$ 6,100 / month

Payback in Years
1

Operational CO₂
Savings
\$ 300 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Variable Refrigerant Volume (VRV) Cooling System
- Energy Saving Lighting, Solar Photovoltaics



Water – 49% Savings through:

- Low-Flow Plumbing Fixtures
- Aerators and Auto Shut-off Faucet in All Washrooms
- Rainwater Harvesting System



Materials – 36% Savings through:

- In-Situ Reinforced Concrete Floor Slabs
- Steel (zinc or galvanized iron) sheets on steel rafters for roof
- Steel profile cladding for external walls



SAVEMAX SUPER GROSIR CIBUBUR (INDONESIA)

In-country certified project to replace related example once an EDGE project is certified.

RETAIL – JORDAN CASE STUDY & CERTIFIED PROJECT



BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 25% Savings through:

- Solar Photovoltaics - 25% of Total Energy Demand



Water – 24% Savings through:

- Dual Flush for Water Closets
- Single Flush/Flush Valve
- Water-Efficient Urinals in all Bathrooms



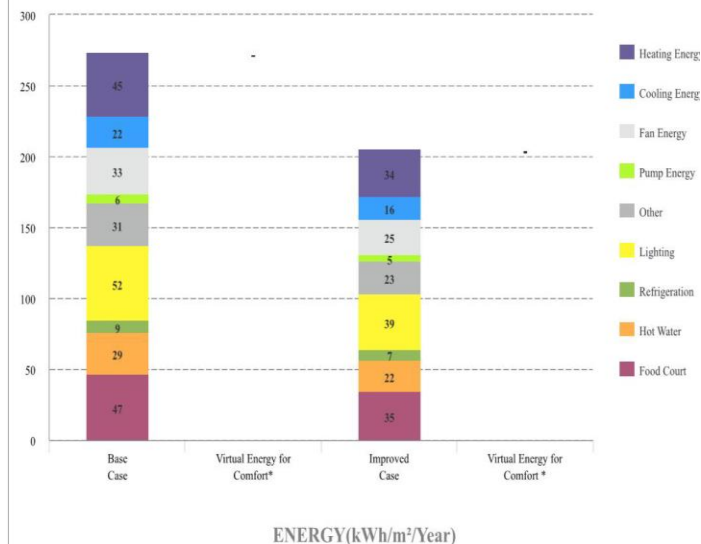
Materials – 22% Savings through:

- Composite Slim Slabs with Steel I-Beams

Energy Efficiency measures 25.04%

Energy Savings

Meets EDGE energy standards



PROJECT METRICS

Incremental Cost
\$62,480

Utility Costs Savings
\$ 8,800 / month

Payback in Years
0.6

Operational CO₂ Savings
\$ 600 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 58% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- Insulation of roof and walls
- Energy-efficient VRF cooling system
- Variable frequency drives in air handling units
- Sensible heat recovery from exhaust air



Water – 41% Savings through:

- Dual flush for water closets
- Water-efficient urinals
- Aerators and auto-shut-off faucets in all bathrooms
- Water-efficient kitchen faucets.



Materials – 44% Savings through:

- Hollow core precast slab for floors.
- Steel-clad sandwich panel for roof construction
- Steel-clad sandwich panel



Vilnius Fabijoniskes by Lidl (Lithuania)

In-country certified project to replace related example once an EDGE project is certified.

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 23% Savings through:

- Variable Refrigerant Flow (VRF) Cooling System
- Energy-Saving Light Bulbs - Sales Area



Water – 21% Savings through:

- Dual Flush for Water Closets
- Single Flush/Flush Valve



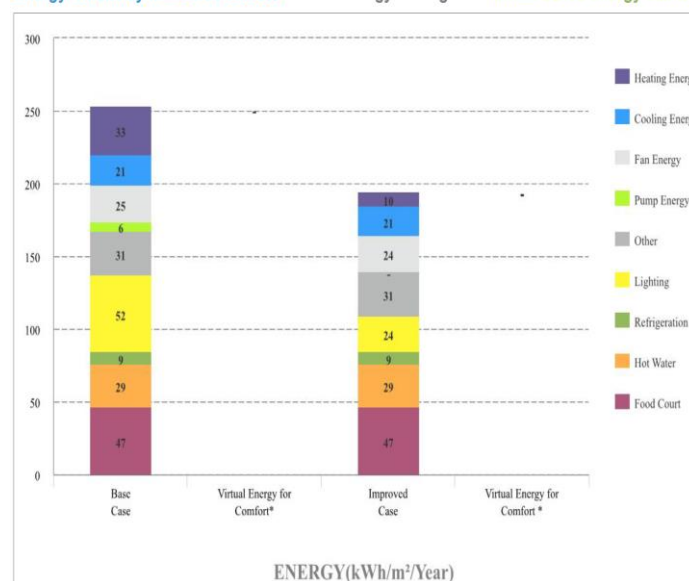
Materials – 27% Savings through:

- Composite In-Situ Concrete and Steel Deck

Energy Efficiency measures 22.63%

Energy Savings

Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$ 13,000

Utility Costs Savings
\$10,500 / month

Payback in Years
0.1

Operational CO₂ Savings
\$ 480 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof
- insulated roofs and external walls
- Occupancy sensors in bathrooms
- Energy-saving lighting in sales areas corridors and common areas, and external spaces.



Water – 24% Savings through:

- Single flush for water closets
- Water-efficient urinals
- Aerators and auto-shut-off faucets in all bathrooms



Materials – 23% Savings through:

- Steel sheets on steel rafters roof construction
- Cement fibre boards on metal studs for all external walls
- In-situ reinforced external walls



Retail at Santa Verde (Costa Rica)

In-country certified project to replace related example once an EDGE project is certified.

BUILDING DETAILS

Site Area	Car Parking	Landscaped Area	Amenities
15,000 m ²	Indoor Car Parking	1,000,000 m ²	Supermarket, Food Court



Energy Measures – 21% Savings through:

- Insulation of Roof, Natural Ventilation
- Reflective Paint/Tiles for Roof -Solar Reflectivity
- Variable Refrigerant Flow (VRF) Cooling System



Water – 23% Savings through:

- Dual Flush for Water Closets
- Single Flush/Flush Valve



Materials – 27% Savings through:

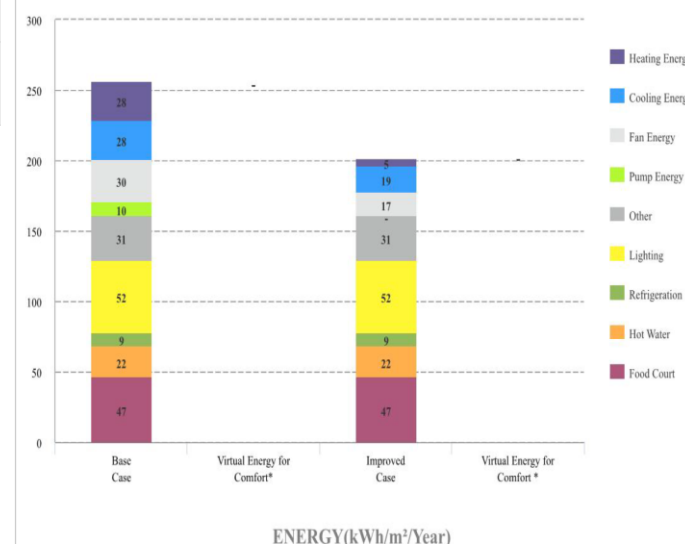
- Composite In-Situ Concrete and Steel Deck

Energy Efficiency measures 20.82%

Energy Savings

Meets EDGE energy standard

PROJECT METRICS



Incremental Cost
\$ 35,000

Utility Costs Savings
\$ 4,300 / month

Payback in Years
1

Operational CO₂
Savings
\$ 400 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 37% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint for Roof.
- Reflective paint and tiles for roof.
- Insulation of roof and external walls.
- Variable frequency drives in AHUs
- CO2 sensor/demand-controlled ventilation for fresh air



Water – 53% Savings through:

- Dual flush water closets.
- Water-efficient urinals.
- Aerators and auto shut-off faucets.



Materials – 30% Savings through:

- Corrugated zinc sheets for roof construction.
- Steel profile cladding for external walls.
- Solid dense concrete blocks for internal walls.



Kaufland (Bulgaria)

In-country certified project to replace related example once an EDGE project is certified.



GREEN BUILDINGS RETURN ON INVESTMENT: RETAIL IN EAST EUROPE



Creating Markets, Creating Opportunities

retail – ARMENIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 36% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Energy Saving Light Bulbs



Water – 37% Savings through:

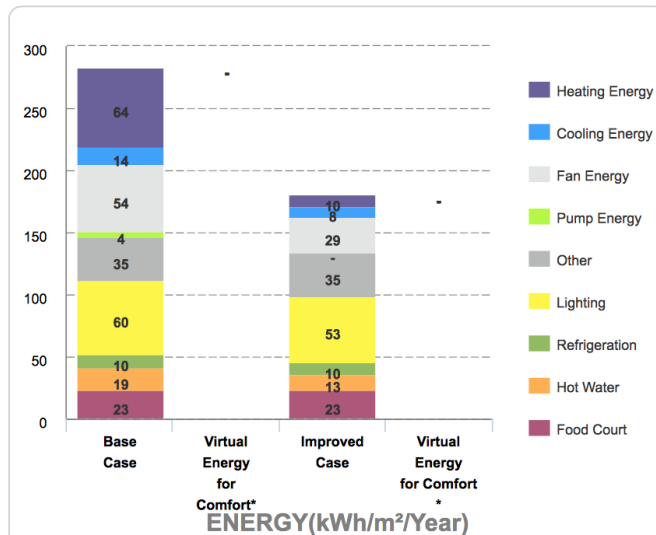
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

36.23% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$498,421

Utility Costs Savings

\$11,152/ month

Payback in Years

4

Operational CO₂ Savings

631 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced Window to Wall ratio, Insulated Roofs and External Walls
- Occupancy Sensors in Bathrooms, Energy saving lighting



Water – 24% Savings through:

- Single Flush Water Closets
- Water-Efficient Urinals
- Aerators and Auto Shut-Off Faucet in Bathrooms



Materials – 23% Savings through:

- Steel Sheets on Steel Rafters Roof Construction
- Cement Fibre Boards on Metal Studs for all External Walls and In-Situ Reinforced External Walls



RETAIL AT SANTA VERDE (COSTA RICA)

In-country certified project to replace related example once an EDGE project is certified.

retail – POLAND CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 38% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Ground Source Heat Pump



Water – 44% Savings through:

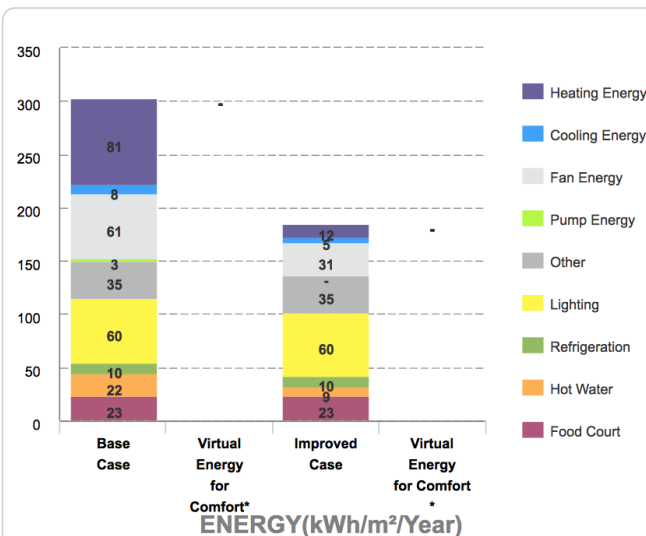
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

38.84% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$9,530

Utility Costs Savings

\$27,987/ month

Payback in Years

0.03

Operational CO₂ Savings

1,333 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 58% Savings through:

- Reduced Window to Wall Ratio
- Insulation of roofs and walls
- Energy efficient VRV cooling system
- Energy-saving lighting and occupancy sensors in bathrooms



Water – 41% Savings through:

- Dual-flush waster closets in all bathrooms
- Water-efficient urinals and kitchen faucets
- Aerators and auto-shut-off faucets in all bathrooms



Materials – 44% Savings through:

- Hollow core precast slab floors
- Steel-clad sandwich panel for roofs
- Finished concrete flooring



VILNIUS FABIJONISKES BY LIDL (LITHUANIA)

In-country certified project to replace related example once an EDGE project is certified.

retail – RUSSIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures – 21% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Ground Source Heat Pump



Water – 43% Savings through:

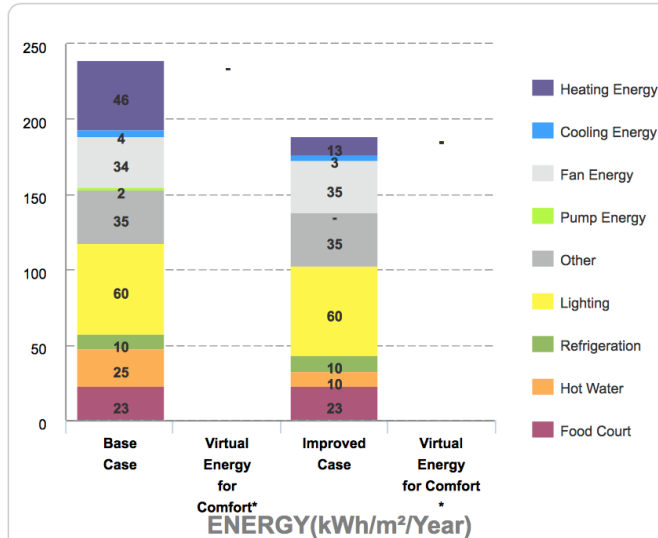
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

20.62% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$61,490

Utility Costs Savings

\$8,841/ month

Payback in Years

0.58

Operational CO₂ Savings

311 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 58% Savings through:

- Reduced Window to Wall Ratio
- Insulation of roofs and walls
- Energy efficient VRV cooling system
- Energy-saving lighting and occupancy sensors in bathrooms



Water – 41% Savings through:

- Dual-flush waster closets in all bathrooms
- Water-efficient urinals and kitchen faucets
- Aerators and auto-shut-off faucets in all bathrooms



Materials – 44% Savings through:

- Hollow core precast slab floors
- Steel-clad sandwich panel for roofs
- Finished concrete flooring



VILNIUS FABIJONISKES BY LIDL (LITHUANIA)

In-country certified project to replace related example once an EDGE project is certified.

retail – SERBIA CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures –35% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Ground Source Heat Pump



Water – 44% Savings through:

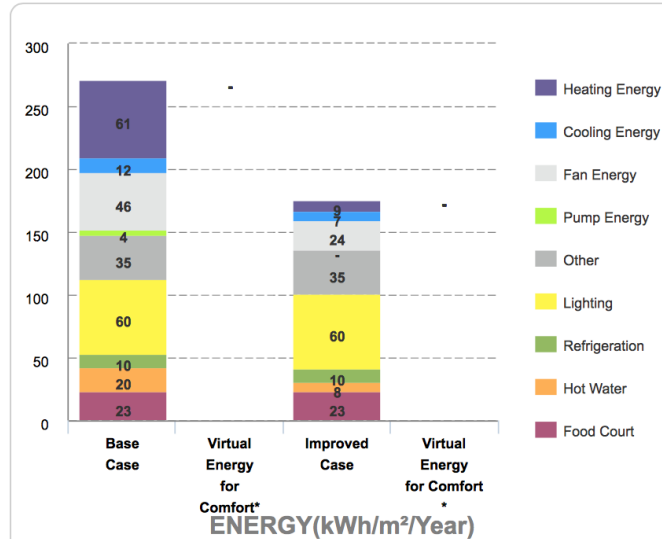
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

34.71% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$3,795

Utility Costs Savings
\$120,578/ month

Payback in Years
0.2

Operational CO₂
Savings
1,127 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 47% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint and Insulation for Roof and Walls, Recovery of Waste Heat from Generator for Heating
- High Efficiency Condensing Boiler for Space Heating
- High Efficiency Refrigerated Cases and Energy Efficient Lighting



Water – 42% Savings through:

- Dual Flush Water Closets, Water Efficient Urinals
- Aerators and Auto Shut-Off Faucets



Materials – 34% Savings through:

- Corrugated Zinc Sheets for Roof
- Steel Profile Cladding for External Walls
- Solid Dense Concrete Blocs for External Walls



KAUFLAND (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.

retail – UKRAINE CASE STUDY & CERTIFIED PROJECT

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures –26% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Ground Source Heat Pump



Water – 45% Savings through:

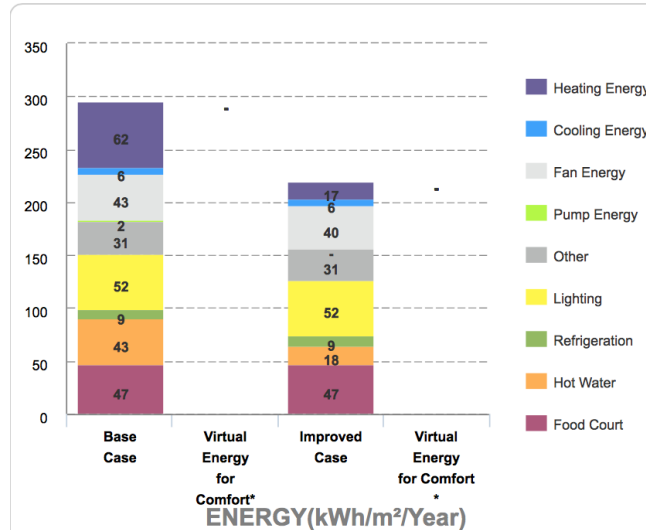
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

25.54% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost
\$66,222

Utility Costs Savings
\$4,734/ month

Payback in Years
1.17

Operational CO₂ Savings
647 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 47% Savings through:

- Reduced Window to Wall Ratio, Reflective Paint and Insulation for Roof and Walls, Recovery of Waste Heat from Generator for Heating
- High Efficiency Condensing Boiler for Space Heating
- High Efficiency Refrigerated Cases and Energy Efficient Lighting



Water – 42% Savings through:

- Dual Flush Water Closets, Water Efficient Urinals
- Aerators and Auto Shut-Off Faucets



Materials – 34% Savings through:

- Corrugated Zinc Sheets for Roof, Steel Profile Cladding for External Walls and Solid Dense Concrete Blocs for External Walls



KAUFLAND (BULGARIA)

In-country certified project to replace related example once an EDGE project is certified.

BUILDING DETAILS

Site Area	Car Parking	Floors	Amenities
15,000 m ²	Indoor Car Parking	1	Supermarket, Food Court



Energy Measures –23% Savings through:

- Insulation of Roof and External Walls
- Air Conditioning with Air Cooled Screw Chiller
- Ground Source Heat Pump



Water – 45% Savings through:

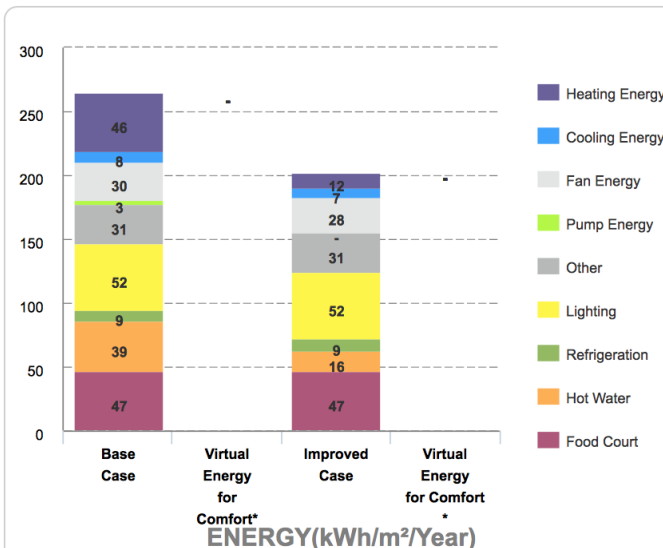
- Dual Flush for Water Closets
- Water-Efficient Urinals and Auto Shut-off Faucets



Materials – 24% Savings through:

- Floor Slabs: In-Situ Concrete with >25% GGBS

23.31% Meets EDGE energy standard



PROJECT METRICS

Incremental Cost

\$72,166

Utility Costs Savings

\$14,021/ month

Payback in Years

0.43

Operational CO₂ Savings

341 tCO₂/Year

RELEVANT CERTIFIED PROJECT



Energy Measures – 29% Savings through:

- Reduced window to wall ratio
- VRV cooling system
- Reflective Paint and Insulation For External Walls
- Energy-Saving Lighting Systems



Water – 27% Savings through:

- Low-Flow Faucets in Kitchens and Bathrooms
- Dual Flush Water Closets
- Water-Efficient Urinals
- Aerators and Auto Shut-off Faucet in Bathrooms



Materials – 36% Savings through:

- Steel sheets on steel rafters for roof construction
- Medium weight hollow concrete blocks for internal walls, and a finished concrete floor



BMB 001 CAMBUCI – OBRAMAX (BRAZIL)

In-country certified project to replace related example once an EDGE project is certified.



METHODOLOGY, NOTES, ACKNOWLEDGMENTS



Creating Markets, Creating Opportunities

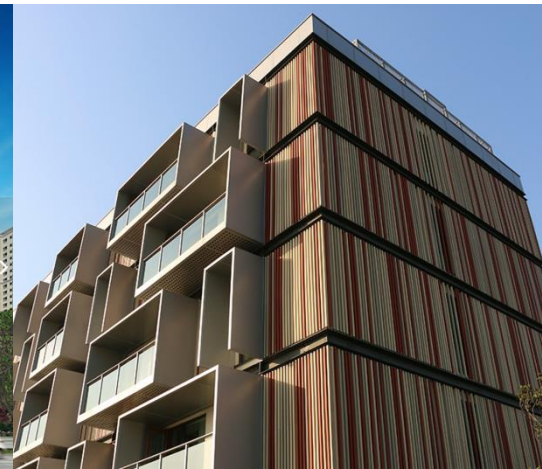
RESEARCH OBJECTIVE: MOST EFFECTIVE INTERVENTIONS TO REACH THE EDGE STANDARD

Reach 20% savings across the Energy, Water, and Materials categories in the most cost effective manner.

Analyzed focus countries in order to understand the environment and geographic impact on interventions.

Analyzed six sectors in each country – Homes, Hospitals, Hotels, Schools, Offices, and Retail – for best interventions unique to the sector and country in question in order to obtain EDGE certification.

By utilizing EDGE, we sought the most effective interventions in the passive building design phase that would in turn lead to the lowest possible payback and lowest cost for investors and builders.



OVERVIEW OF EDGE: A SOFTWARE, STANDARD, AND GREEN BUILDING CERTIFICATION SYSTEM



20%



The EDGE application helps to determine the most cost-effective options for designing green within a local climate context. Free on-line application is available from www.edgebuildings.com.

A building has reached the EDGE standard when it achieves 20% reduction in each of the 3 categories: energy, water, and embedded energy in materials.

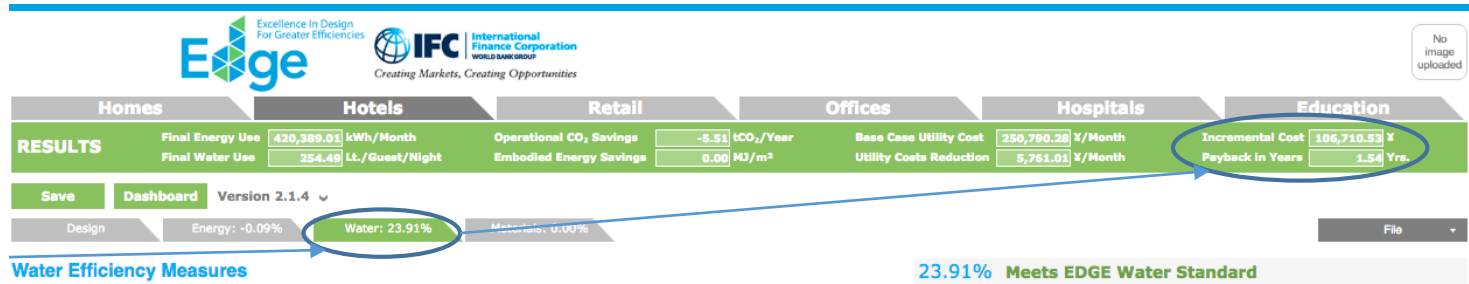
Third party certification verifies the resource efficiency savings so they can be credibly communicated between investors, developers, and buyers.

RESEARCH METHODOLOGY

The most cost effective interventions were determined through an iterative process using the EDGE application.

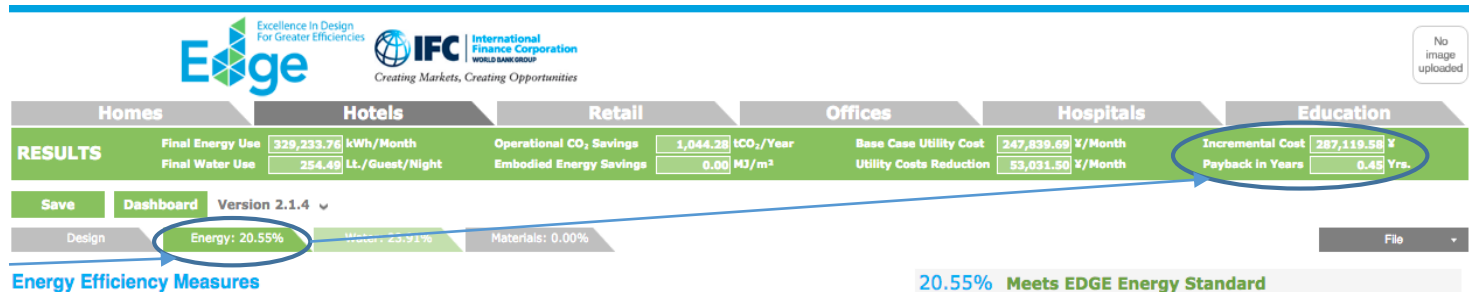
1

Determine top water measures that allow to pass the 20% minimum at the lowest Cost & Payback. Water was chosen first because it is tied to energy savings.



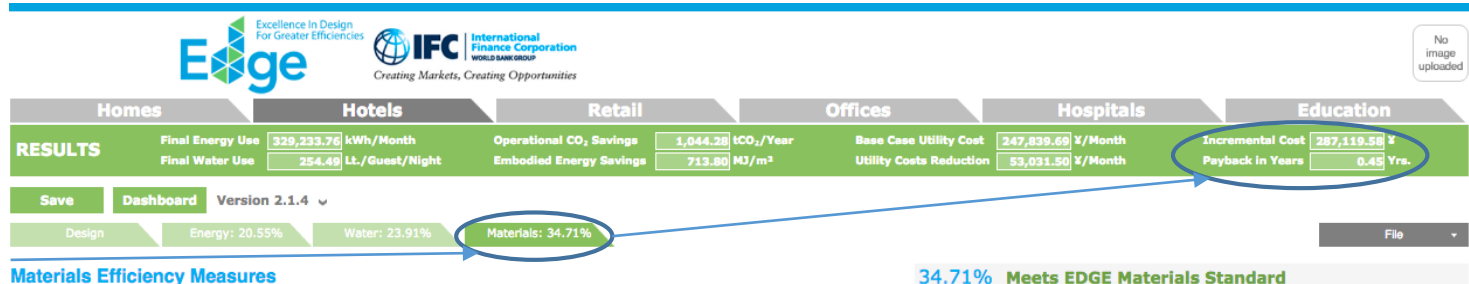
2

Once determined, proceed with next measure (energy) and repeat the process. Note: Water and energy measures may directly impact multiple categories.



3

Proceed to test materials measures and review the final Incremental Cost & Payback in Years.



4

Repeat.

NOTES

- Case studies and certified projects are given for **illustrative purposes** only.
- Case studies included several assumptions in the building design, as per EDGE default values.
- Since case studies were chosen for the capital city only, the key takeaways for a country may be different in countries with varying climactic conditions across geographic regions.
- Education and Light Industrial are **new sectors** added to the EDGE application, have few certified buildings.
- Investors and developers of buildings should **use the dynamic EDGE software** with inputs specific to their respective building and climactic conditions, and then choose green interventions that **best address their specific needs**.
- IFC is **collecting additional data**, including operational savings of certified buildings – the operational data will be forthcoming, as will the ROI analysis for other regions.
- This research is part of ongoing series provided by IFC – in-depth country studies are available from: <https://www.edgebuildings.com/marketing/research/>



ACKNOWLEDGEMENTS

DONOR ACKNOWLEDGEMENT

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COLLABORATION ACKNOWLEDGEMENT

IFC thanks the Georgetown University McDonough School of Business for collaborating on developing the market intelligence reports.

Visit www.edgebuildings.com for more information