

BUILDING GREEN

APPROACH AND INSIGHTS FOR MARKET TRANSFORMATION

SEPTEMBER 17th, 2020

MAITREE

MARKET INTEGRATION AND TRANSFORMATION FOR
ENERGY EFFICIENCY

MAITREE supports uptake of cutting-edge technologies, innovative business models, and end-user engagement, to accelerate adoption of energy efficiency strategies and technologies at scale.



1. ENERGY EFFICIENCY IN BUILDINGS

Support Energy **Conservation Building Code** implementation

Expanding markets for green and energy efficient buildings

Moving towards **super efficient and Net Zero** Energy target for new buildings

Large scale energy efficiency upgrades of existing buildings



2. SUSTAINABLE COOLING

Program design and implementation **for low-energy cooling technologies**

Support **large scale deployment** of super-efficient air-conditioning technologies



3. TRAINING & CONSUMER ENGAGEMENT

Skill development for building sector professionals

Capacity building for energy efficient design, construction and operation

Consumer outreach for energy efficiency behaviour modification

MARKET TRANSFORMATION APPROACH



**PRIVATE SECTOR
ENGAGEMENT**

Creating Business Opportunities for Private Sector:

- Appliance Disposal
- Smart Energy Monitoring
- Energy Audits
- Technologies: ACs and Trigenation



SCALE UP

- Business Strategy and Model Design and Roll Out
- Business Process Optimization
- Demand Aggregation
- Efficacy through Digitization



ENABLING POLICY

- Green Building Guidelines for Residential and Commercial Buildings
- Sustainable Procurement Systems



**CONSUMER
ENGAGEMENT**

- Research for Consumer Behaviour and Green Building Market Transformation
- Training for NZEBs

EESL



- RAISE – Initiative Healthy and EE Bldgs
- Super-efficient Air Conditioning Program
- Bldg EE Program
- Chiller EE Program
- Institutional Capacity Building

BEE



- ECBC implementation scale up through IT tools
- Net zero energy buildings

LDA



- Green and Energy Efficient Buildings Roadmap for Lucknow Dev. Authority
- 12,000 Affordable housing pilot

Indian Railways



- Net Zero Energy Station strategy
- Green station development approach

EEREM – Delhi



- Energy efficiency upgrades through ESCO model
- Net zero strategy

ADB



- Supporting Phase II Superefficient AC program with EESL

UNEP



- Tech Assistance to MoF, GeM
- Sustainable Procurement Policy
- SPP Specifications for Air conditioners

GGGI



- Tech Assistance to MoRD
- Vision and roadmap for Green Rural Housing
- Scale up strategy for 1 mn houses

USGBC



- Green Building Market Transformation Strategy
- Scale up to South Asia

ISHRAE Institute



- Professional Certification Program for cooling design
- Training and Capacity building

IGBC



- NZEB Certification Framework

World Bank



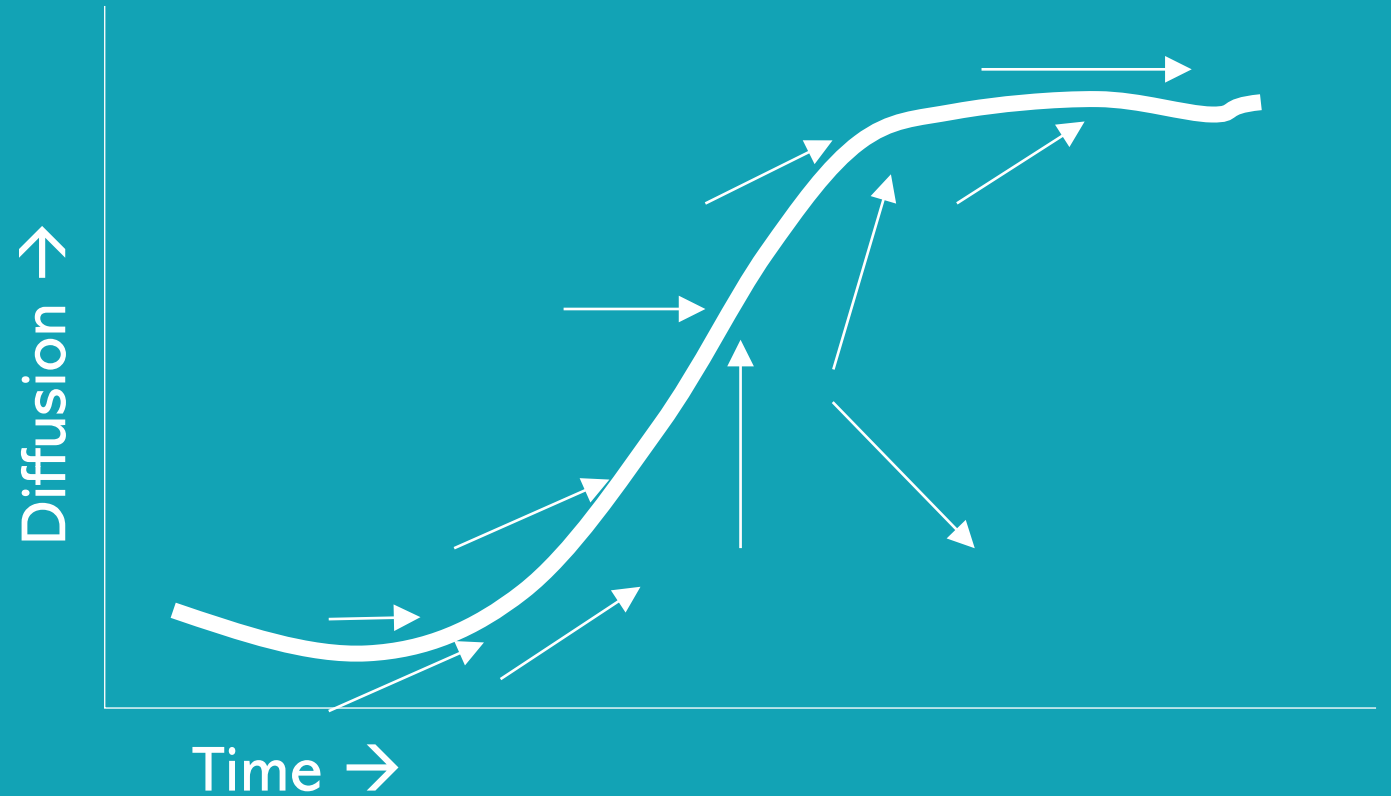
- Supporting DLI implementation for EESL



Building Green
Approach and Insights for Market Transformation

Strategic process of market intervention that aims to alter market behavior by:

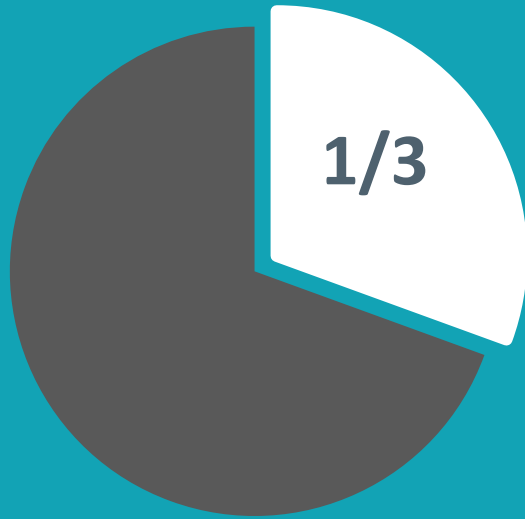
1. Removing identifying barriers
2. Leveraging opportunities to further internalization sustainable measures as a matter of standard practice.



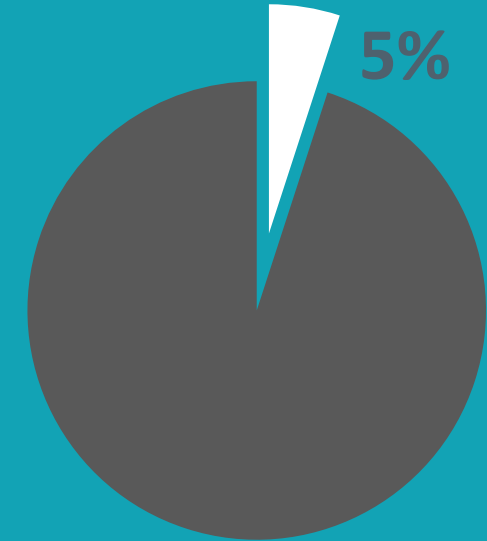
Market Transformation

Accumulation of multiple influences

Green buildings provide resilience against climate change impacts and there is a pressing need to accelerate adoption of green strategies and technologies.

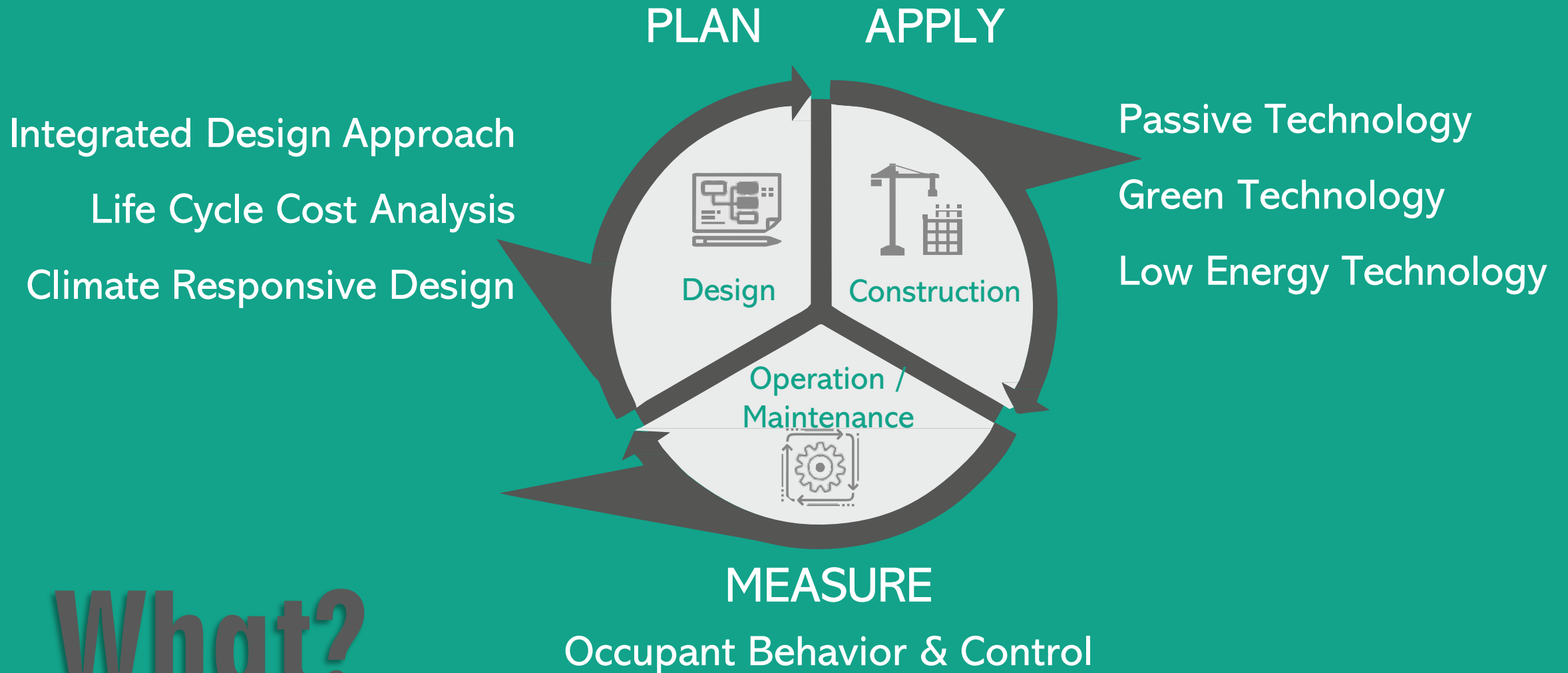


Building sector
Electricity consumption



Green Building share in
Building Sector

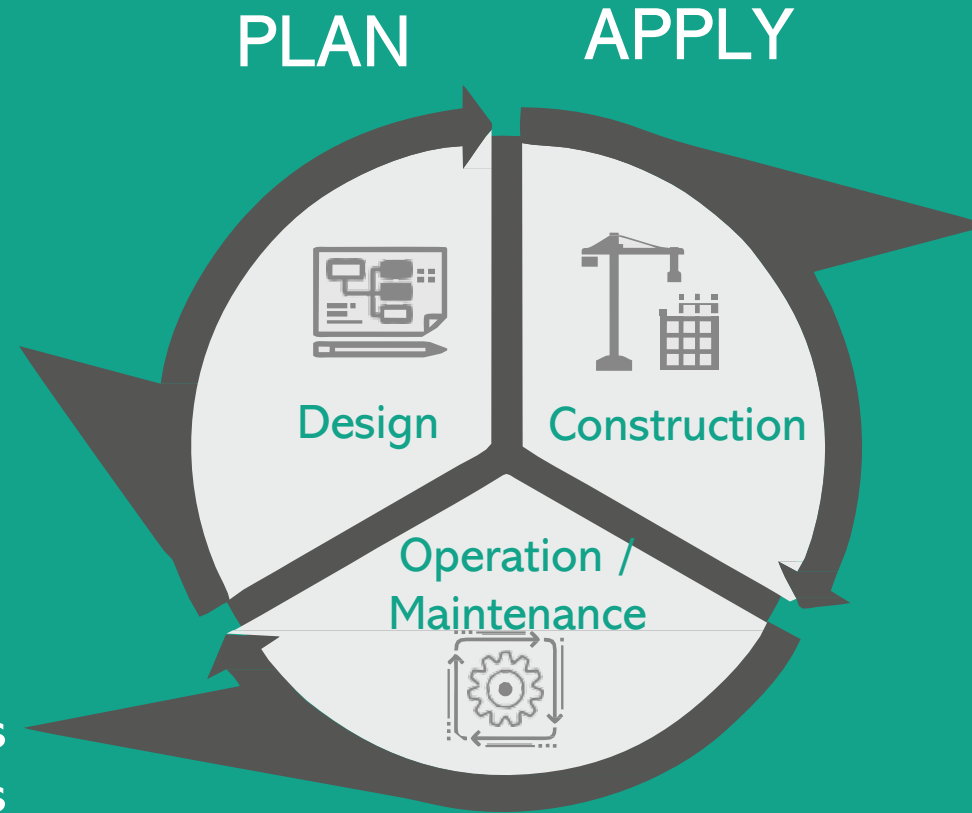
Why?



What?

Across all life stages of a project

Architects
Cost Consultants
Developers
Interior Designers
Landscape Designers
MEP Engineers
Project Managers
Special Expert Consultants
Structural Engineers
Urban Planners



Manufacturers /
Suppliers
Technology Providers

Users/ Occupants
Facility Managers

Who?

Across all life stages of a project



How : 5A approach

For conducting barrier analysis

A VAILABILITY

Availability of professional expertise

Availability of information and tools

A WARENESS

Awareness amongst end-users of benefits

Existing channels for increasing awareness

A CCESSIBILITY

Access to subject experts and tools

Existing demonstration projects

A FFORDABILITY

Enabling government policies and incentives

Time & effort required wrt conventional approach

A CCEPTANCE

Viability as an alternative to conventional

End-user acceptability and uptake

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Integrated Design Approach



Life Cycle Cost Analysis



Climate Responsive Design



Green Technology

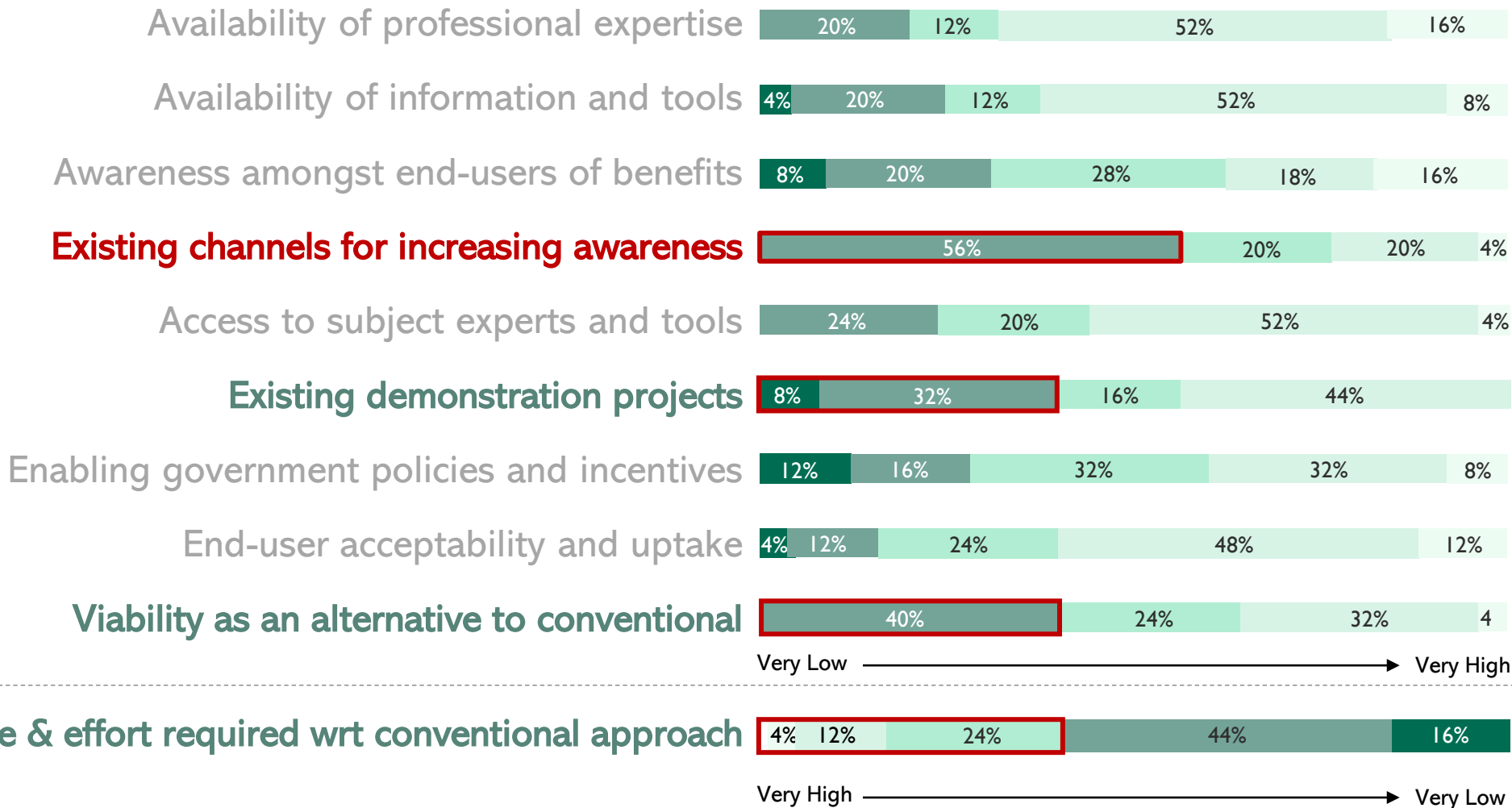


Occupant Behavior & Control



Results





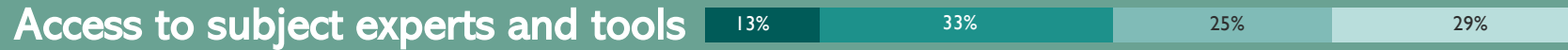
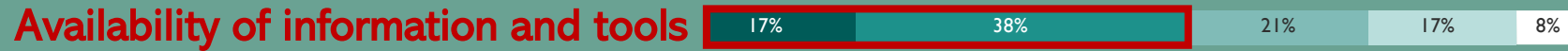
> 50%
 feel the need of
 increasing awareness.

~40% emphasise
 on the need for
 demonstration projects
 and find IDA time and
 effort consuming.

Integrated Design Approach

Building Green, Approach & Insights for Market Transformation

Post COVID-19
75% of respondents
 have emphasized on
 importance of IDA



Very Low —————> Very High



Very High —————> Very Low

> 55%

feel the lack of professional expertise, information and tools.

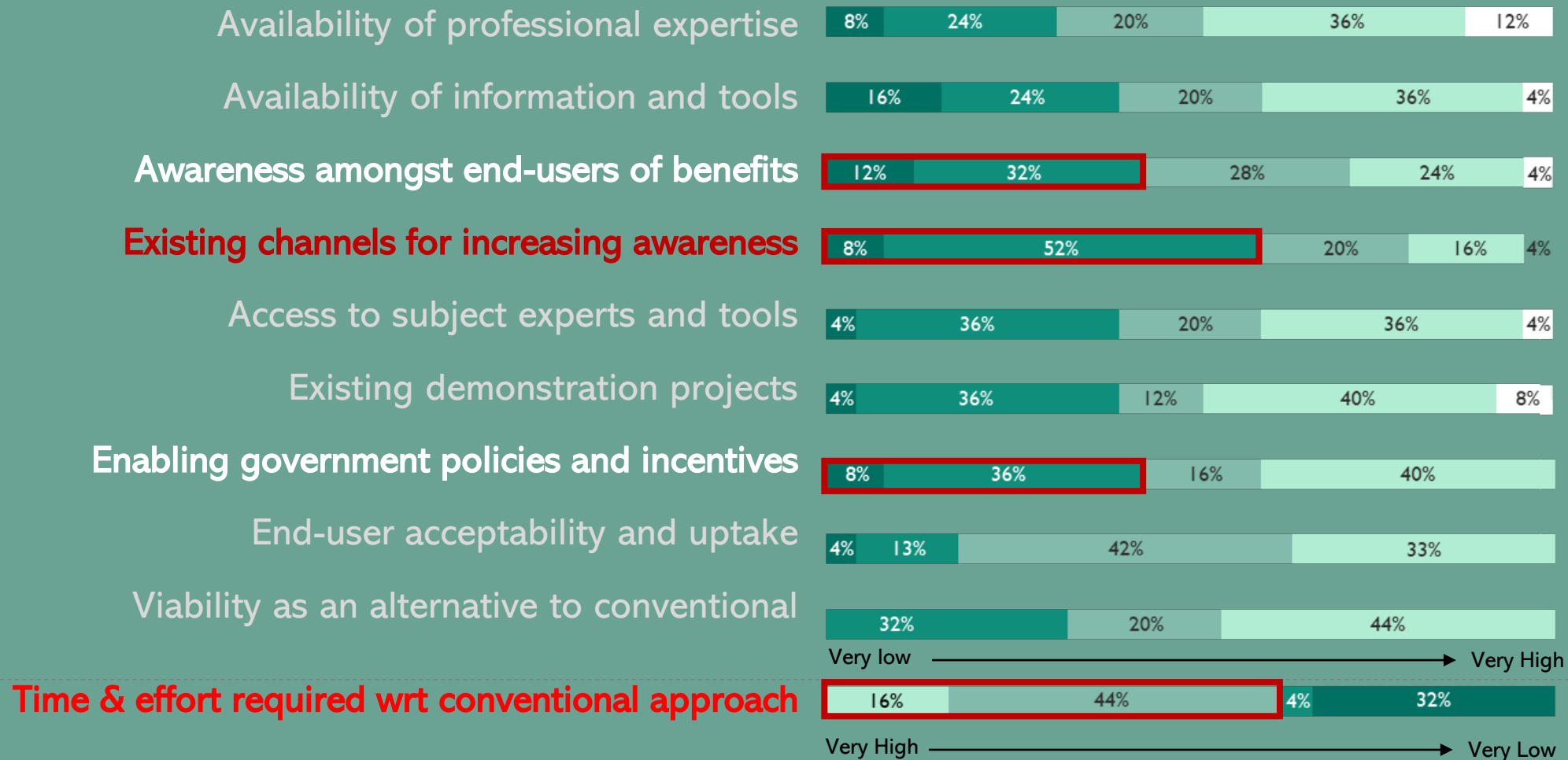
~ 40%

feel the need of intervention required towards increasing awareness and access and making LCCA affordable.

Post COVID-19

44% respondents feel its importance is same as before, adjudging LCCA of least relative importance

Life Cycle Cost Analysis

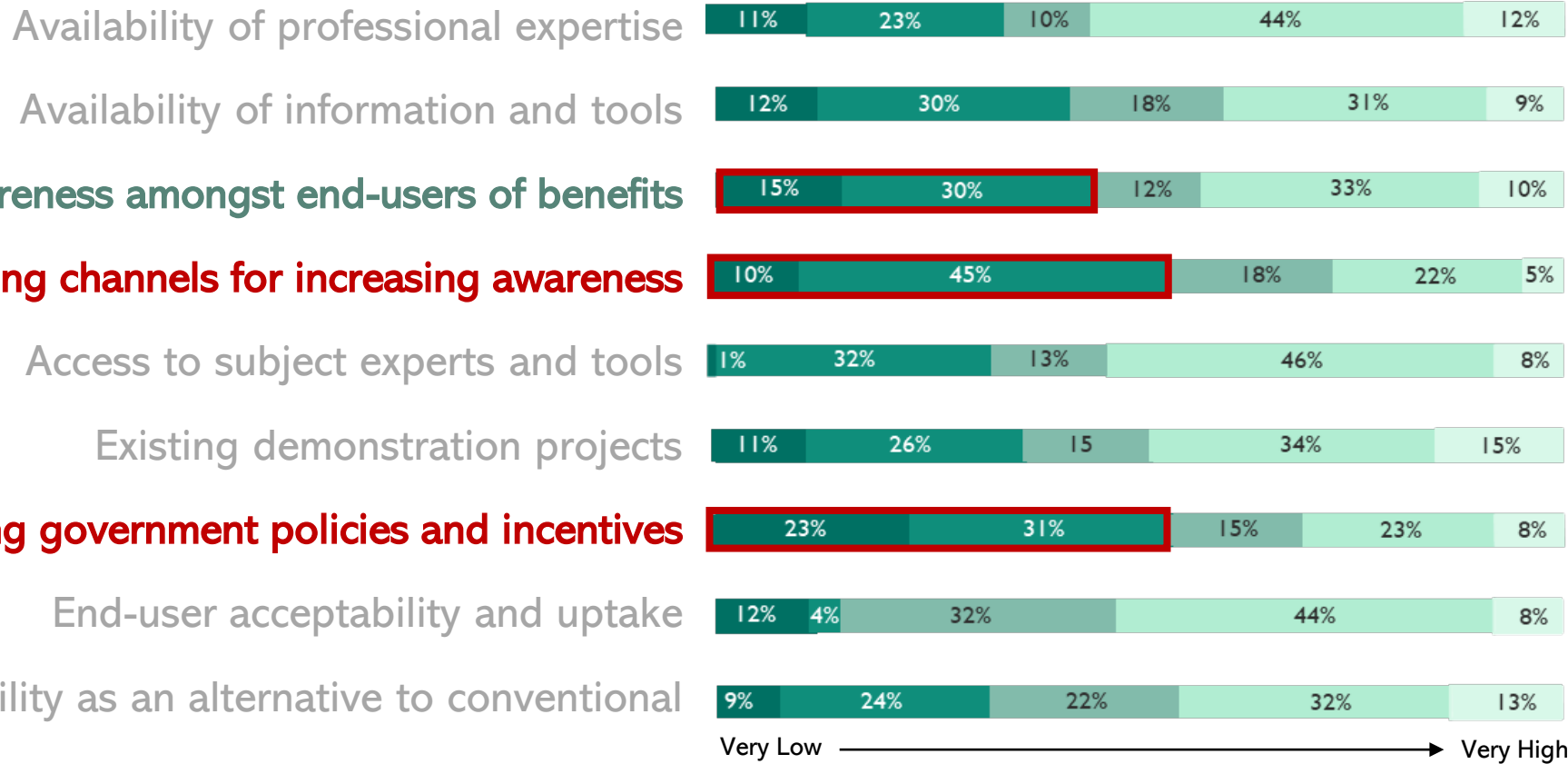


> 60%
 find Climate responsive design requires more time and effort and there are not enough existing channels to increase awareness.

> 40%
 suggested that there should be more enabling governmental policies and incentives to increase uptake of this approach.

Post COVID 19
82% of the respondents have highlighted it's increased value depicting a large swing in perception.

Climate Responsive Design



45% indicated a low level of awareness of the benefits of green technologies

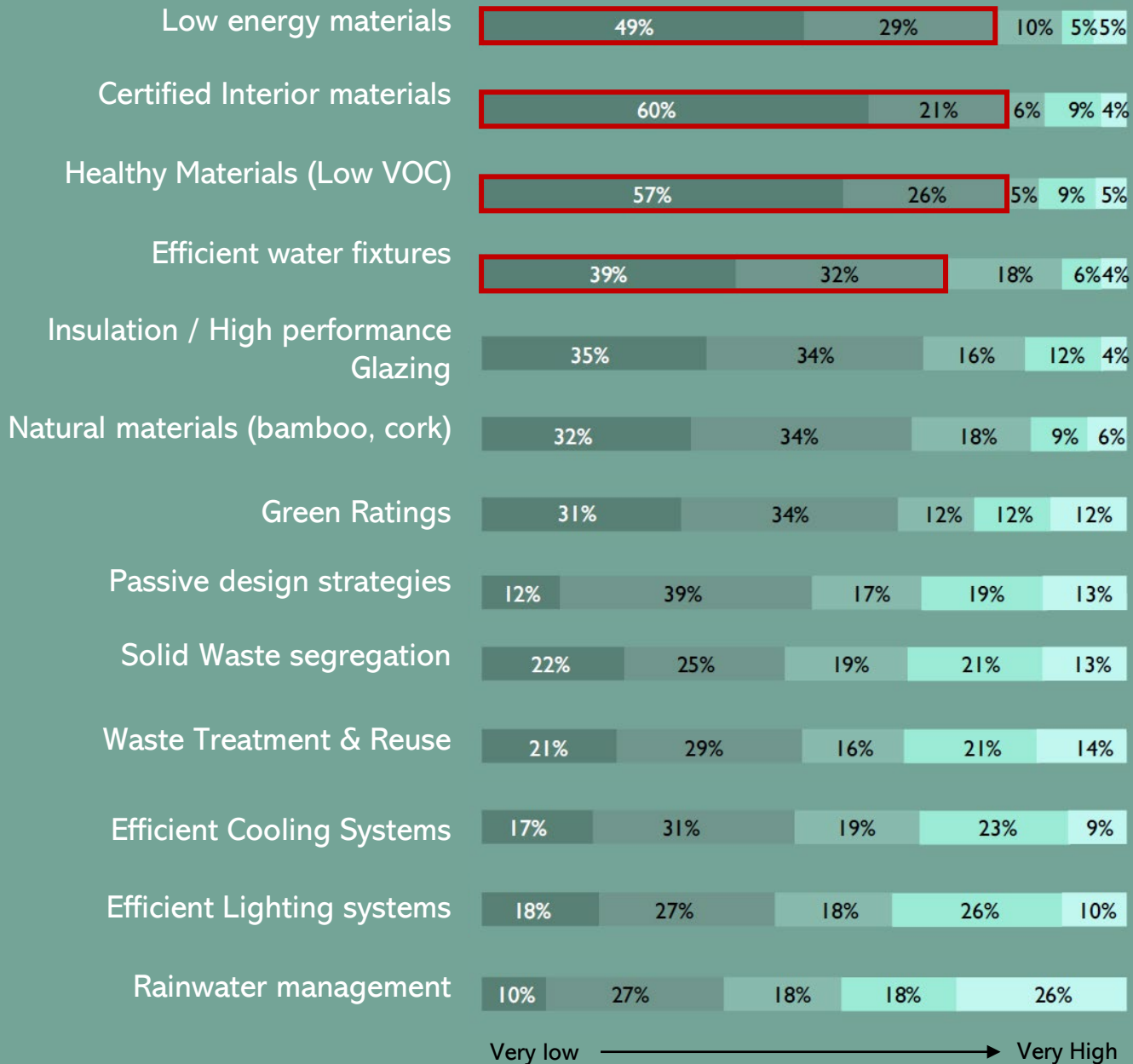
55% feel the need for more channels to create awareness and have enabling policies and incentives.



Post COVID 19

Self sufficiency is a rising priority among **83%** of respondents

Green Technology

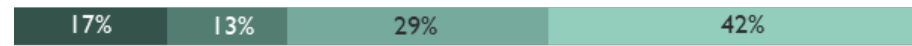


Respondents were not much aware of low-VOC materials and finishes (83%), health product declarations (HPDs)(81%), low-embodied energy materials (78%), and low-flow plumbing fixtures (71%).

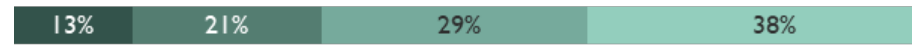
Respondents were generally more aware of solid waste and wastewater technologies, rainwater harvesting, and energy-efficient technologies compared to other green building technologies.

User Familiarity on Green Strategies

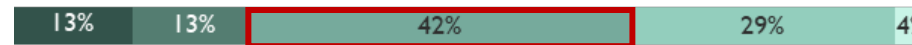
Availability of professional expertise



Availability of information and tools



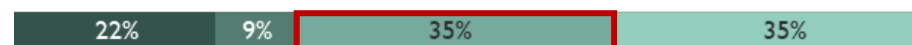
Awareness amongst end-users of benefits



Existing channels for increasing awareness



Access to subject experts and tools



Existing demonstration projects



Enabling government policies and incentives



End-user acceptability and uptake



Viability as an alternative to conventional



Very low —————> Very High

Time & effort required wrt conventional approach



Very High —————> Very Low

> 1/3rd have maintained a neutral stance on occupant behavior & control. This indicates lack of awareness.

Occupant Behavior & Control

Post COVID 19

82% feel End-user awareness programs are important.

	Integrated Design Approach	Life Cycle Cost Analysis	Climate Responsive Design	Green Technology	Occupant Behavior & Control
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A VAILABILITY



A WARENESS



A CCESSIBILITY



A FFORDABILITY

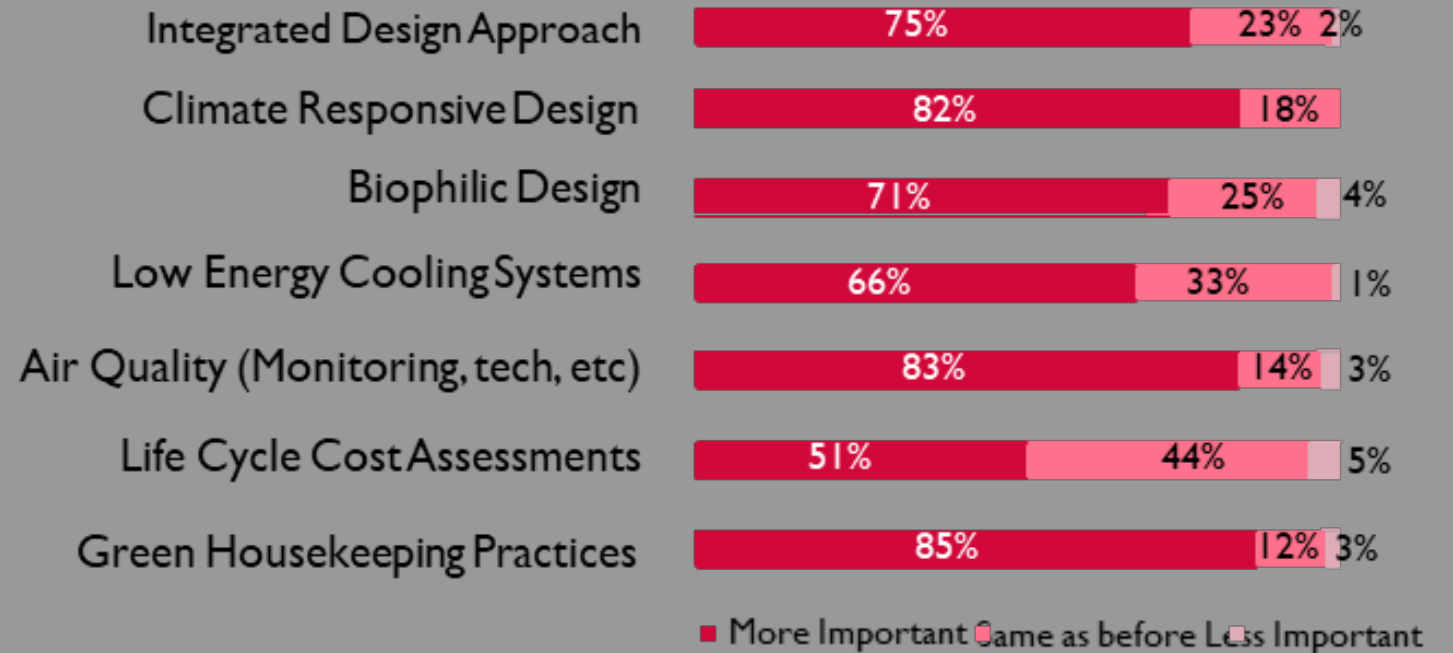


A CCEPTANCE

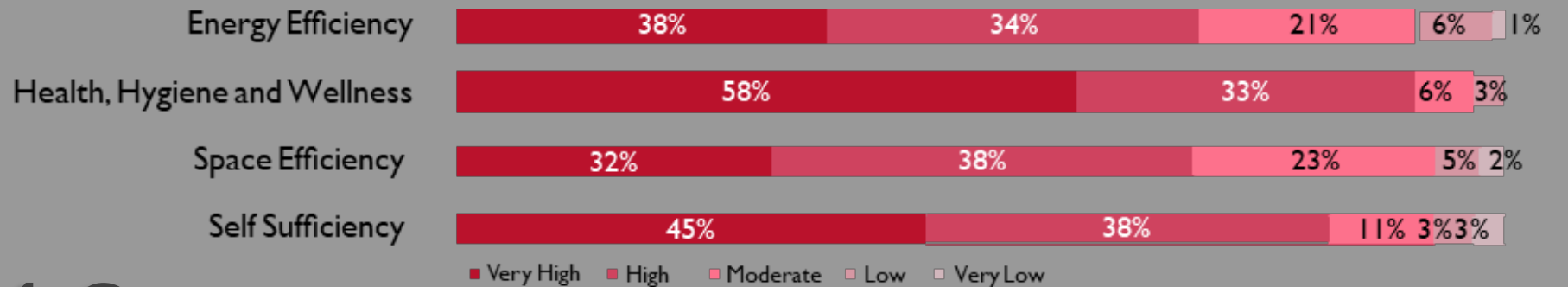


Summary of key barriers

Relative importance of strategies post COVID-19



Prioritization in future built environments.



Post COVID-19

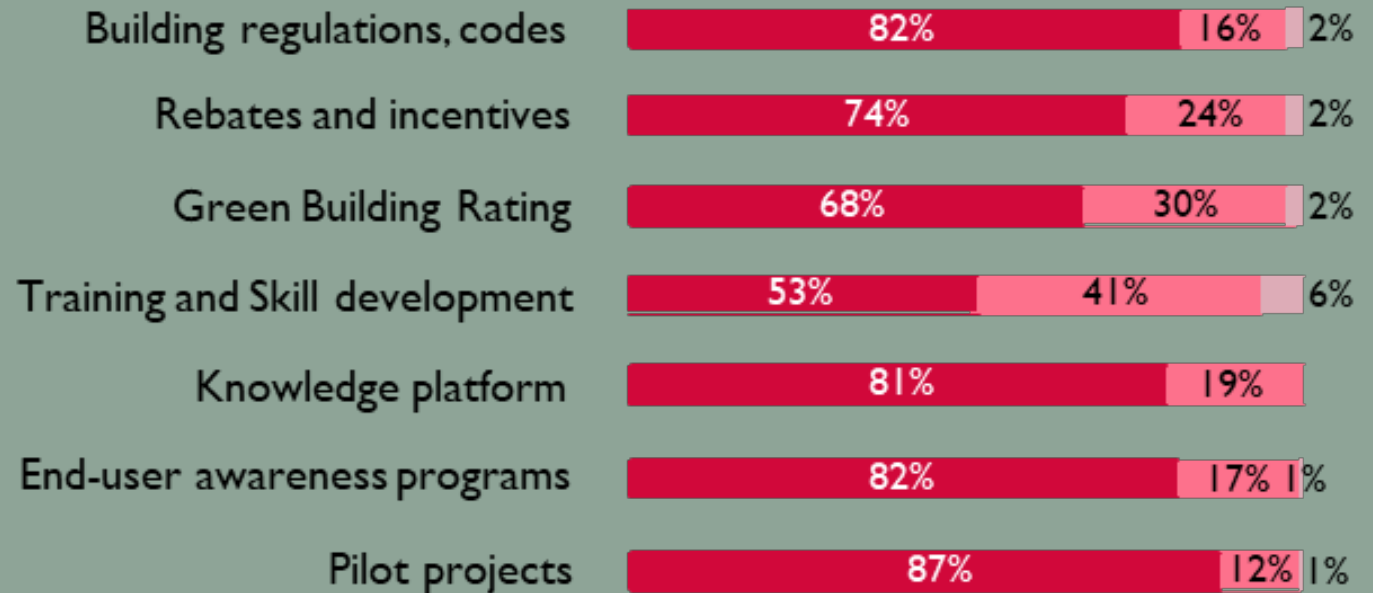
Training & capacity building

Pilot Implementation

Policy improvements

Outreach and Media

Instruments for accelerating green and healthy buildings post COVID-19



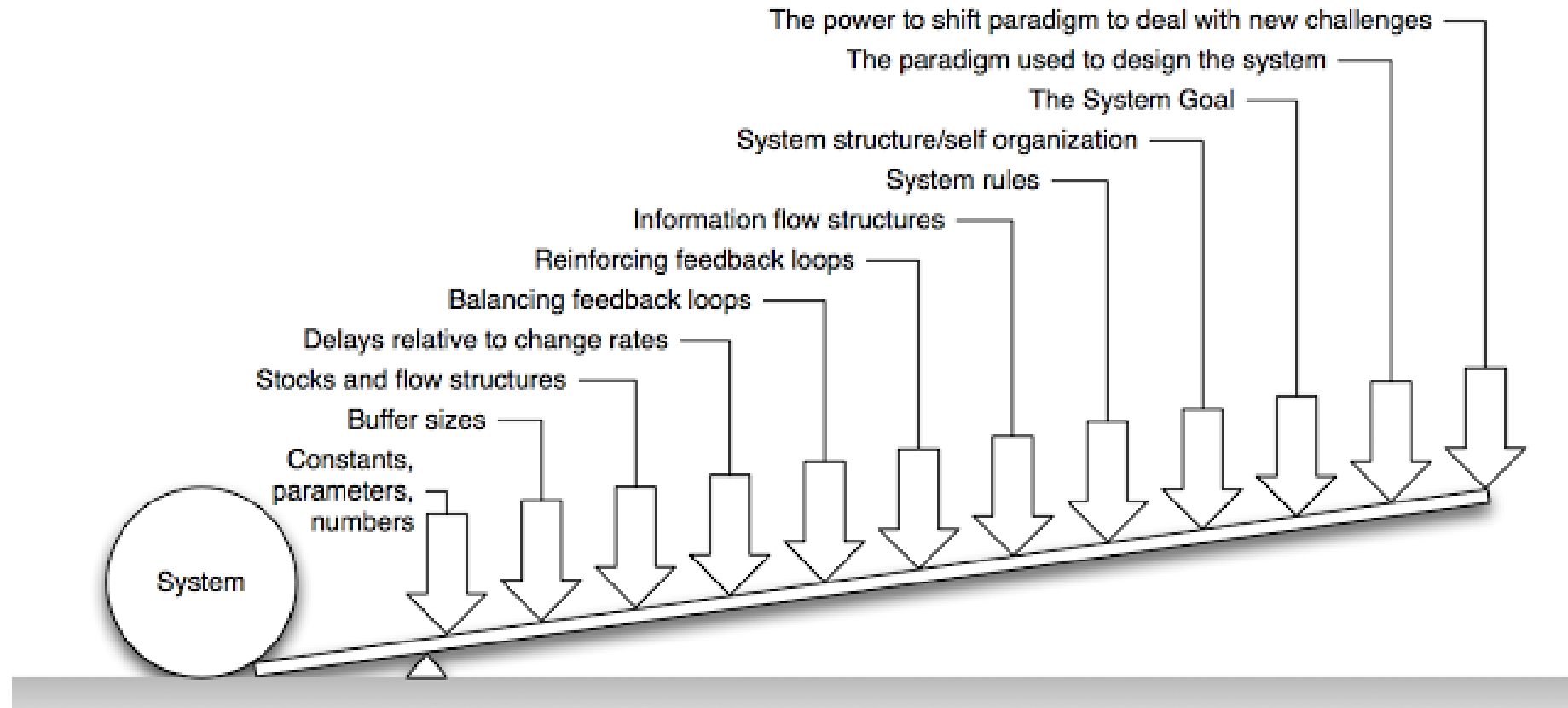
What Next?

Training &
capacity building

Pilot
Implementation

Policy
improvements

Outreach and
Media



Source: Thinking in Systems: A Primer (Leverage Points: Places to Intervene in a System), Donella Meadows

Building Green, Approach & Insights for Market Transformation



Success Story

Building Green, Approach & Insights for Market Transformation



UNNAT JYOTI BY AFFORDABLE LED FOR ALL

UJALA



A promotional graphic for EESL's LED bulb program. It features the EESL logo in the top left corner. The main text reads "LED Bulbs Starting Rs.99" with the hashtag "#LEDTheWay" below it. To the right is a cartoon character of a lightbulb with a smiling face, arms, and legs, holding a small globe with a cityscape and trees. The background is a dark green with a stylized cityscape and trees. At the bottom, it says "SNAPDEAL PARTNERS WITH EESL FOR THE DOMESTIC EFFICIENT LIGHTING PROGRAM (DELP)".

LED Bulbs Starting
Rs.99
#LEDTheWay

SNAPDEAL PARTNERS WITH EESL FOR THE DOMESTIC EFFICIENT LIGHTING PROGRAM (DELP)

Success Story

Building Green, Approach & Insights for Market Transformation

STAR RATING FOR BUILDINGS

Energy Performance
Index: **kWh/ sq m/ year**

Name of the Building : _____
 Category of Building : _____
 Type : _____
 Climatic Zone : _____
 Connected Load : _____
 Build-up Area : _____

ENERGY & LIFE
Sustainable
Buildings

POWER SAVINGS GUIDE

ENERGY EFFICIENCY
3.10*
EER (W/W)

Label Period : 1st Jan 2016 - 31st Dec 2017

Appliance/Type : RAC / XXX
 Brand : XXX
 Model/Year : ABC/YYYY
 Cooling Capacity (W) : XXXX
 Power Consumption (W) : XXXX
 Variable Speed Compressor : Yes/No
 Heat Pump : Yes/No

ENERGY & LIFE
Sustainable
Buildings

*Under test conditions, when tested in accordance with IS 1351. Actual electricity consumption will depend on how the appliance is being used.

POWER SAVINGS GUIDE

ELECTRICITY CONSUMPTION
700*
UNITS PER YEAR

Appliance : Refrigerator
 Brand : XX
 Model / Year : XX / YYYY
 Type : XX
 Gross Volume : XX Liters
 Storage Volume : XX Liters

ENERGY & LIFE
Sustainable
Buildings

*Under test conditions, when tested in accordance with relevant standards. Actual electricity consumption will depend on how the appliance is being used.

Residential Energy Label
EPI : 25 kWh/m².year

ENERGY & LIFE
Sustainable
Buildings

1800 173465

Success Story



करो **WASTAGE** का **Switch off**,
खरीदो 5 स्टार रेटेड
उपकरण

बेरा में ऊर्जा दक्षता सुनिश्चित करने हेतु बीईई के कुछ प्रयास:

- एस एंड एल (कमकम और कलिंग)
- डीएसएम (मैपिंग और प्रमोशन)
- इंजीनियरी (सुनिश्चित करना और प्रमोशन)
- बीएटी (सुनिश्चित करना और प्रमोशन)

WASTAGE का **Switch off**
INDIA का **SWITCH ON**

ऊर्जा दक्षता ब्यूरो (बी ई ई)
 कौमो तल, मेवा भवन, आर.के. गुप्त, नई दिल्ली-110 066 (भारत)

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AC के तापमान में 1 डिग्री की बढ़त ऊर्जा की बचत

हर एक डिग्री बढ़ाने से 6% की बचत सालाना 1500 रुपये घर के लिए और 2500 करोड़ इंडिया की बचत

#1 डिग्री और

बिजली बचाएंगे तो रोशन होगा इंडिया

आराम चुनें | 24 से 26 डिग्री AC का तापमान, स्वास्थ्य के लिए अनुकूल और आरामदायक है

ऊर्जा दक्षता ब्यूरो (बी ई ई)
 कौमो तल, मेवा भवन, आर.के. गुप्त, नई दिल्ली-110 066 (भारत)

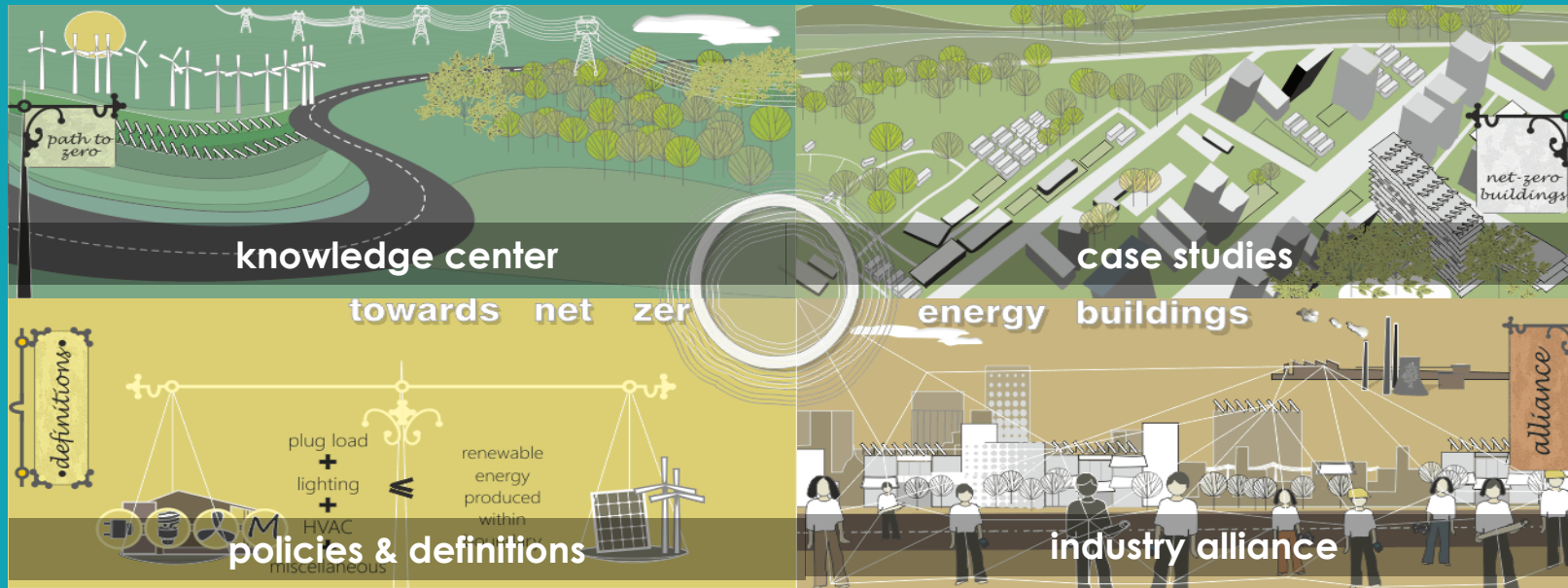
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Success Story

Building Green, Approach & Insights for Market Transformation

NZEB Knowledge Portal

one stop site for information on NZEBs



www.nzeb.in

Success Story

Building Green, Approach & Insights for Market Transformation



Vision and Roadmap For Green & Energy Efficient Buildings





Thank You

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