

Major Revision of BEAM Plus Existing Buildings v2.0

1st Stakeholder Engagement Exercise

April 2023

Content

- Introduction
- Our Progress
- Highlights of Review & Research
- Proposed Framework of BEAM Plus EB v3.0
- Feedback



EB v2.0
Launched in 2016

Upgrade



EB v3.0

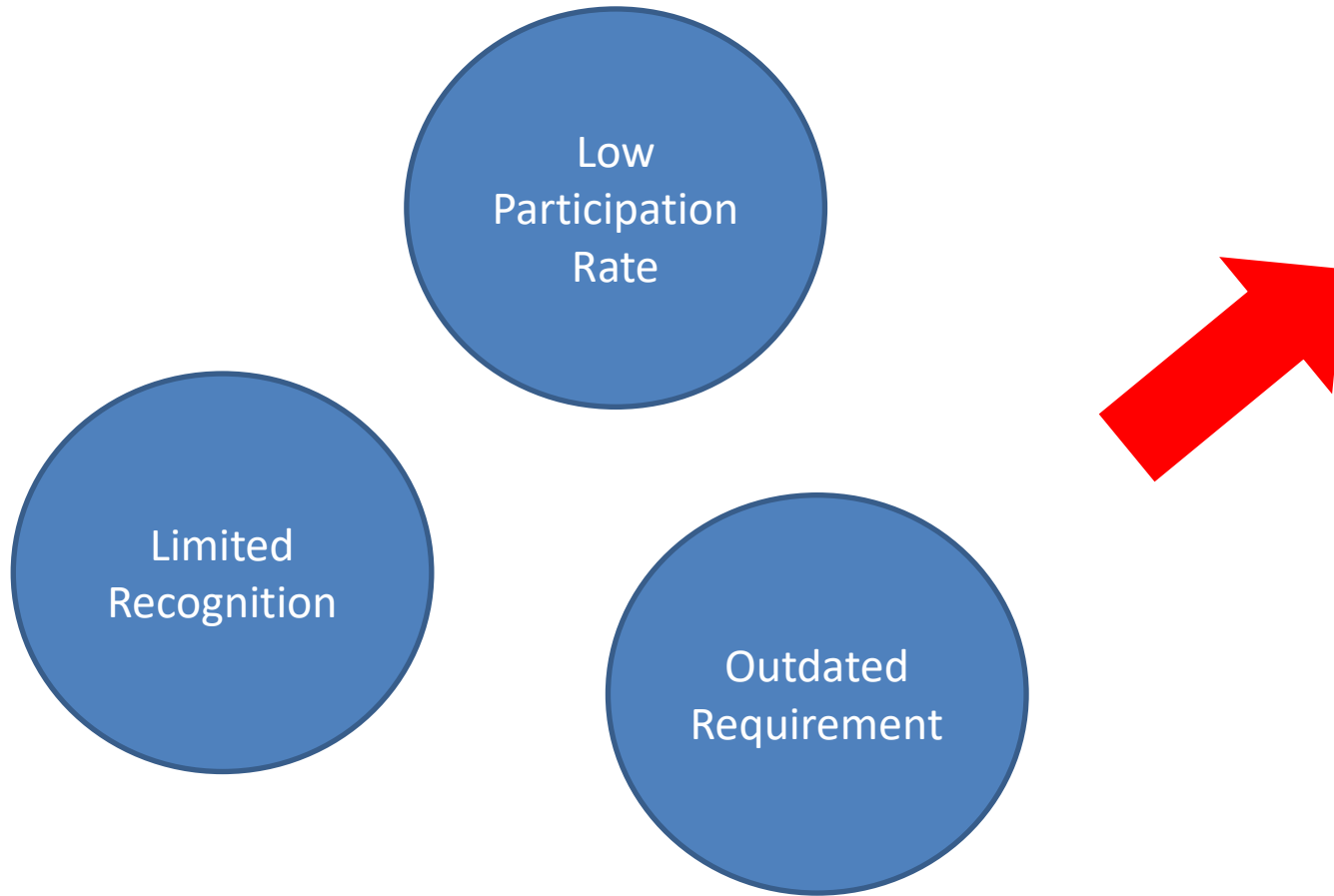
Major Revision of BEAM Plus Existing Buildings v2.0

Introduction



Introduction

The three key problems of EB v2.0:

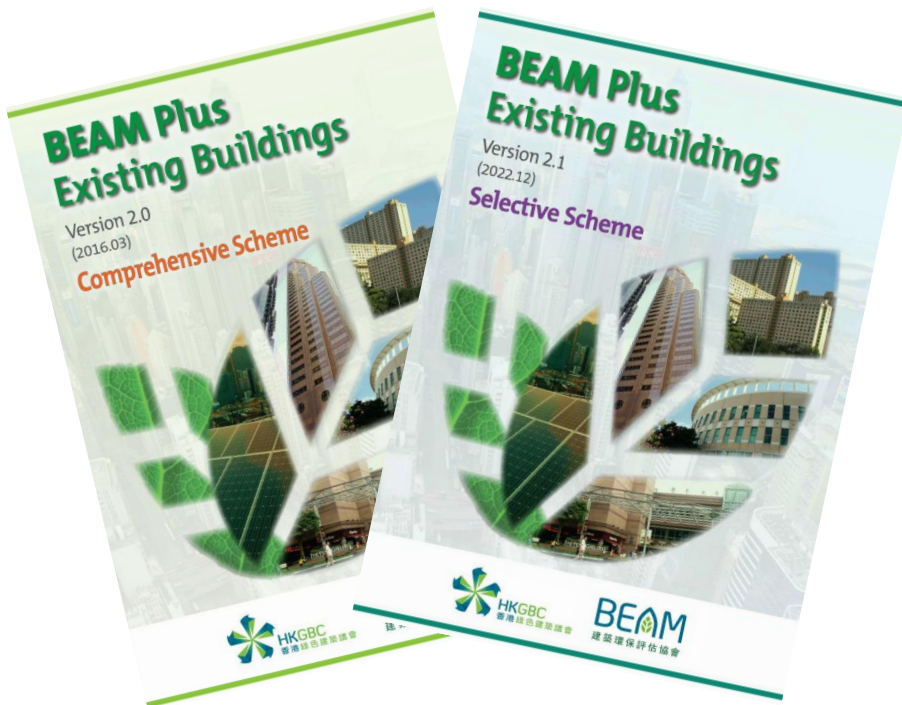


EB v3.0 needs to break this chain, but how?

-
1. Market Driven
 2. Simplification
 3. Able to utilise the certification result

Revamp of EB v2.0

Development of BEAM Plus Existing Schools Manual – To meet the market need:



EB v2.0

Launched in 2016



- Simplicity of certification/
submittal

EB v3.0

- 1 Manual
- 1 Technical Guidebook
- Chinese Version

- Quantifiable
Achievement

- Flexibility to
allow different
green attainment

- ESG/ Green Finance
- Carbon Neutrality
- Climate Risk/
Adaptation

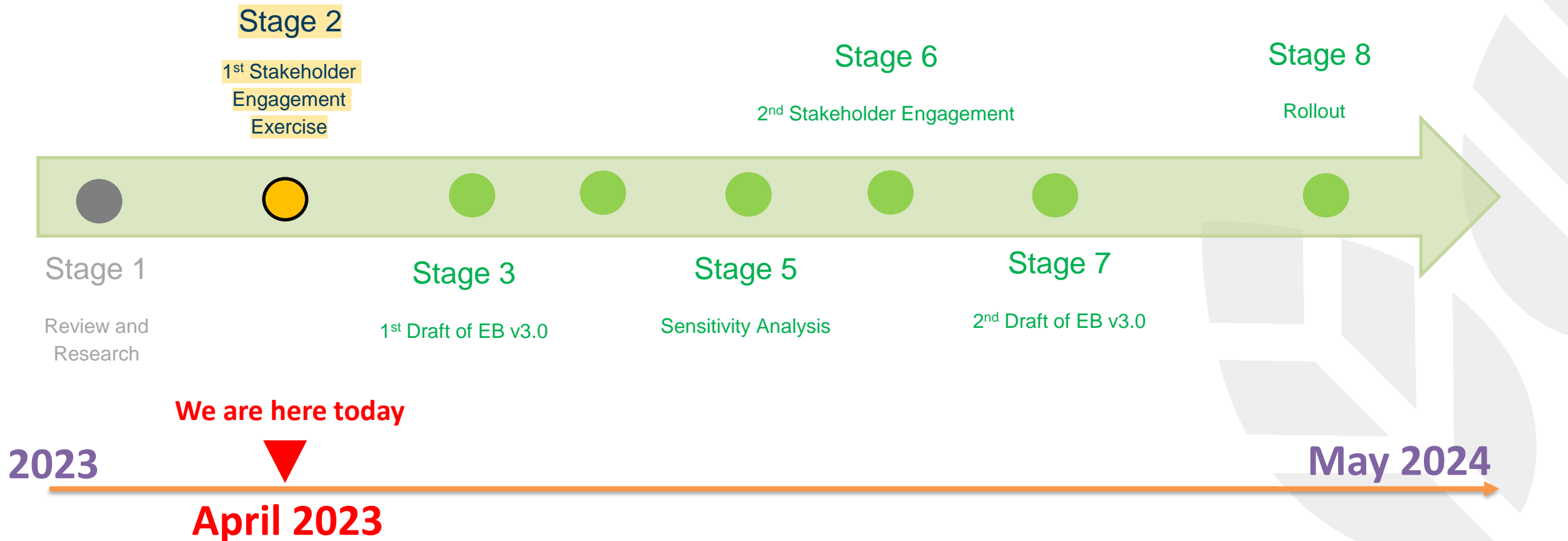
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Our Progress



Our Progress

Project timeline and our progress



Major Revision of BEAM Plus Existing Buildings v2.0

Highlights of Review and Research (R&R)



Highlights of Review and Research (R&R)

Findings to share:

EB Rating Tools'
Trend

Performance
Categories

Sustainability
Elements

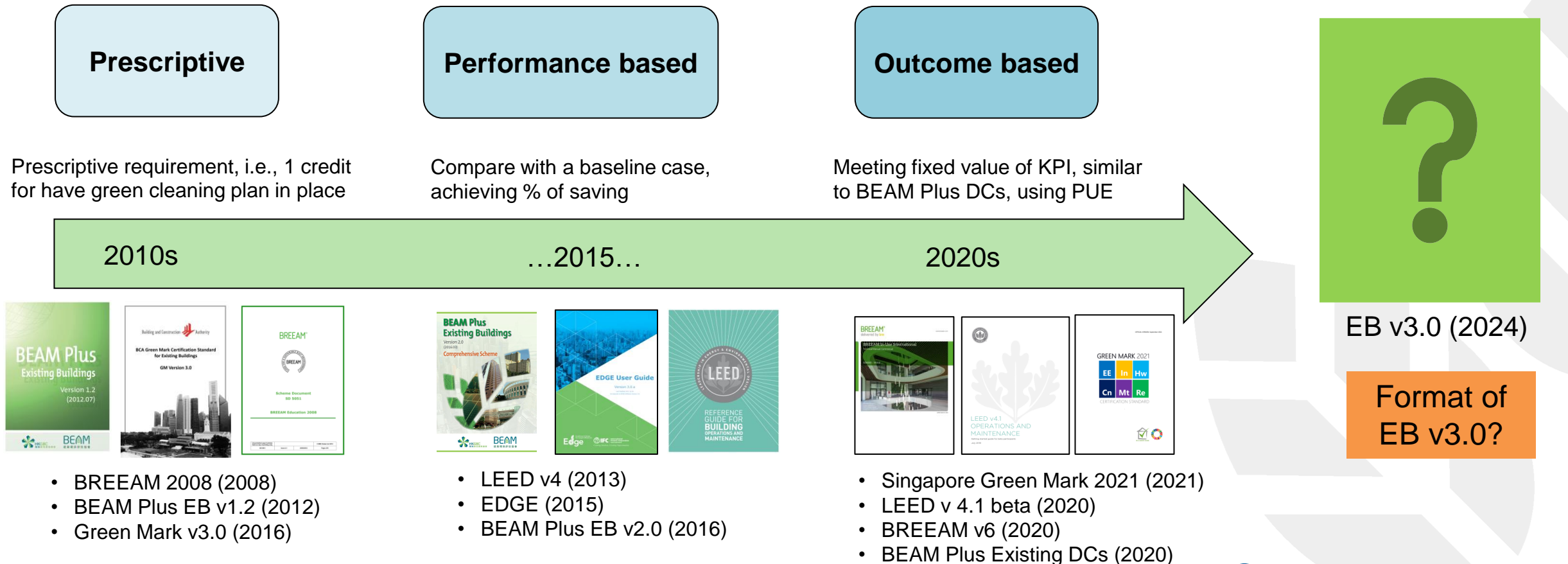
Materiality
Analysis

Mapping with
Sustainability Hot
Topics

Framework of EB
v3.0

R&R– Highlights

1. Green Building Rating Tool's Trend (1) – Modern rating tools



On to next page... 10

R&R– Highlights

1. Green Building Rating Tool’s Trend (2) – Outcome based

BREEAM In-Use International Technical Manual: Commercial Version 6.0.0

for each fuel type. As for the reference baseline, the carbon emission factor for electricity varies according to the country of assessment, but the emission factors for non-electrical consumption are fixed. The only exception to this is for district heating and cooling systems where it is possible to enter the actual emissions factor for the system where known.

Establishing final score

The operational energy rating is then calculated by comparing the assessed CO₂e emissions to the reference CO₂e emissions using a sliding scale with maximum of 50 credits being awarded for a zero carbon building and zero credits awarded where the assessed emissions are more than four times the reference emissions. An additional five exemplary credits are available for buildings that are carbon positive. Table 32 shows the operational energy performance scale and the number of credits awarded.

Table 32 Operational energy performance scale and credits awarded.

Credits	Actual kgCO ₂ e/m ² / Benchmark CO ₂ e/m ²	Credits	Actual kgCO ₂ e/m ² / Benchmark CO ₂ e/m ²
0	>4	39	<0.21 to 0.18
1	<4 to 3.81	40	<0.18 to 0.16
2	<3.81 to 3.63	41	<0.16 to 0.13
3	<3.63 to 3.45	42	<0.13 to 0.11
4	<3.45 to 3.27	43	<0.11 to 0.09
5	<3.27 to 3.11	44	<0.09 to 0.07
6	<3.11 to 2.95	45	<0.07 to 0.06
7	<2.95 to 2.79	46	<0.06 to 0.04
8	<2.79 to 2.64	47	<0.04 to 0.03
9	<2.64 to 2.5	48	<0.03 to 0.02
10	<2.5 to 2.36	49	<0.02 to 0.01
11	<2.36 to 2.22	50	<0.01 to 0
12	<2.22 to 2.09	50+1 exemplary	<0 to -0.2
13	<2.09 to 1.97	50+2 exemplary	<-0.2 to -0.04
14	<1.97 to 1.85	50+3 exemplary	<-0.04 to -0.6
15	<1.85 to 1.74	50+4 exemplary	<-0.6 to -0.8
16	<1.74 to 1.63	50+1 exemplary	<-0.8 to -1
17	<1.63 to 1.52		
18	<1.52 to 1.42		
19	<1.42 to 1.33		
20	<1.33 to 1.24		
21	<1.24 to 1.15		
22	<1.15 to 1.06		
23	<1.06 to 0.99		
24	<0.99 to 0.91		
25	<0.91 to 0.84		
26	<0.84 to 0.77		
27	<0.77 to 0.71		
28	<0.71 to 0.65		
29	<0.65 to 0.59		
30	<0.59 to 0.53		
31	<0.53 to 0.48		
32	<0.48 to 0.44		
33	<0.44 to 0.39		
34	<0.39 to 0.35		
35	<0.35 to 0.31		
36	<0.31 to 0.28		
37	<0.28 to 0.24		
38	<0.24 to 0.21		

BREEAM v6 (2020)

MR Prerequisite: Waste Performance

This prerequisite applies to

- ▶ O+M: Existing Buildings (3-8 points)
- ▶ O+M: Interiors (3-8 points)

Intent

To track and reduce the waste that is generated by building or landfills and incinerators.

Requirements

Have in place storage locations for recyclable materials, including glass, plastics, and metals. Safely store and dispose of batteries, wired and portable fixtures).

Track and measure all ongoing waste and durable goods waste

Measure the total weight of waste (in lbs., kg, or tons) that is generated and diverted from landfills and incineration facilities for one full year. Facility renovations waste.

Input generated and diverted waste totals and calculate a Waste Performance Score

Obtain a minimum waste performance score of 40. Additional points for waste performance scores above 40, according to Table 1.

Table 1. LEED Points for Waste Performance

Waste Performance Score	LEED Points
40 (Required)	3 (Required)
44	4
57	5
69	6
82	7
94	8

Waste performance score

The waste performance score rates the resource consumption of a building (waste generated and diverted) against the consumption of performing buildings.

The score is a value from 1-100 based on the project's total weight of waste diverted from landfills and incineration facilities.

WE Prerequisite: Water Performance

This prerequisite applies to

- ▶ O+M: Existing Buildings (6-15 points)
- ▶ O+M: Interiors (6-15 points)

Intent

To support water management and reduce water consumption.

Requirements

Have permanently installed water meters that measure the total potable water consumption and base building energy use over twelve consecutive months.

For Interiors projects, have permanently installed sub-meters that measure any fixtures or fittings in the project scope. Alternately, interiors projects may use occupancy and base building water use over twelve consecutive months.

Measure total potable water use on a monthly basis for twelve consecutive months. Input the twelve months of potable water use data and calculate a water performance score.

Obtain a minimum water performance score of 40. Additional points for water performance scores above 40, according to Table 1.

Water Performance Score	LEED Points
40 (Required)	6 (Required)
44	7
50	8
57	9
64	10
70	11
77	12
84	13
90	14
97	15

EA Prerequisite: Energy Performance

This prerequisite applies to

- ▶ O+M: Existing Buildings (13-33 points)
- ▶ O+M: Interiors (13-33 points)

Intent

To support energy management and reduce environmental and economic harms associated with excessive energy use by reducing greenhouse gas emissions and achieving higher levels of operating energy performance.

Requirements

Have permanently installed energy meters or submeters that measure total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, etc.). Utility-owned meters capable of aggregating total project energy use are acceptable.

For Interiors projects, have permanently installed sub-meters that measure all electricity and fossil fuels for equipment within the project scope. Alternately, interiors projects may use occupancy and base building energy use over twelve consecutive months.

Calibrate meters within the manufacturer's recommended interval if the project owner, management organization, or tenant owns the meter. Meters owned by third parties (e.g., utilities or governments) are exempt.

Measure the project's energy use on a monthly basis for twelve consecutive months (one full year). Use the twelve months of energy use data to obtain an energy performance score.

LEED points are based on project energy performance across two metrics: greenhouse gas emissions and source energy.

Table 1. LEED Points for GHG Emissions Score

GHG Emissions Score	LEED Points
40 (Required)	6.5 (Required)
41	7
44	7.5
47	8
50	8.5
54	9
57	9.5
60	10
63	10.5

TABLE 1B Pathway 1 Energy Use Intensity (EUI) Quick look up table

Building Type	Gold TM EE >50%	Platinum EE >55%	SLE EE >60%
Commercial			
Office Buildings (Large) (GFA > 15,000sqm)	155	140	115
Office Buildings (Small) (GFA < 15,000sqm)	135	120	100
Hotels (Large) (GFA > 15,000sqm)	230	220	190
Hotels (Small) (GFA < 15,000sqm)	180	160	140
Retail Malls	240	210	160
Educational			
IL (University, Polytechnics and ITE)	130	120	90
Private Schools and Colleges	110	100	80
Junior Colleges (MOE)	60	50	40
Secondary Schools (MOE)	40	35	30
Primary Schools (MOE)	40	35	30
Healthcare			
Hospitals (Private and General)	375	340	300
Community Hospitals	230	210	185
Polyclinics	150	135	120
Nursing/Youth Homes	90	80	70
Other Non-Residential			
Mixed Developments	by GFA mix		
Community Centres	150	125	110
civic Buildings	80	70	60
Cultural Institutions	180	140	120
Ports and Recreation Centres	110	80	50
Religious/Places of Worship	NA		
Industrial			
High Tech Industrial Buildings	NA		
Light Industrial Buildings	NA		
Warehouses, Workshops and Others	NA		
Additional Notes			
AC Total System Efficiency	New	Existing	
EUI occupancy rate	0.8 kW/RT	0.9kW/RT	
Renewable Energy included	100% (design)	≥60%	
	On-Site		

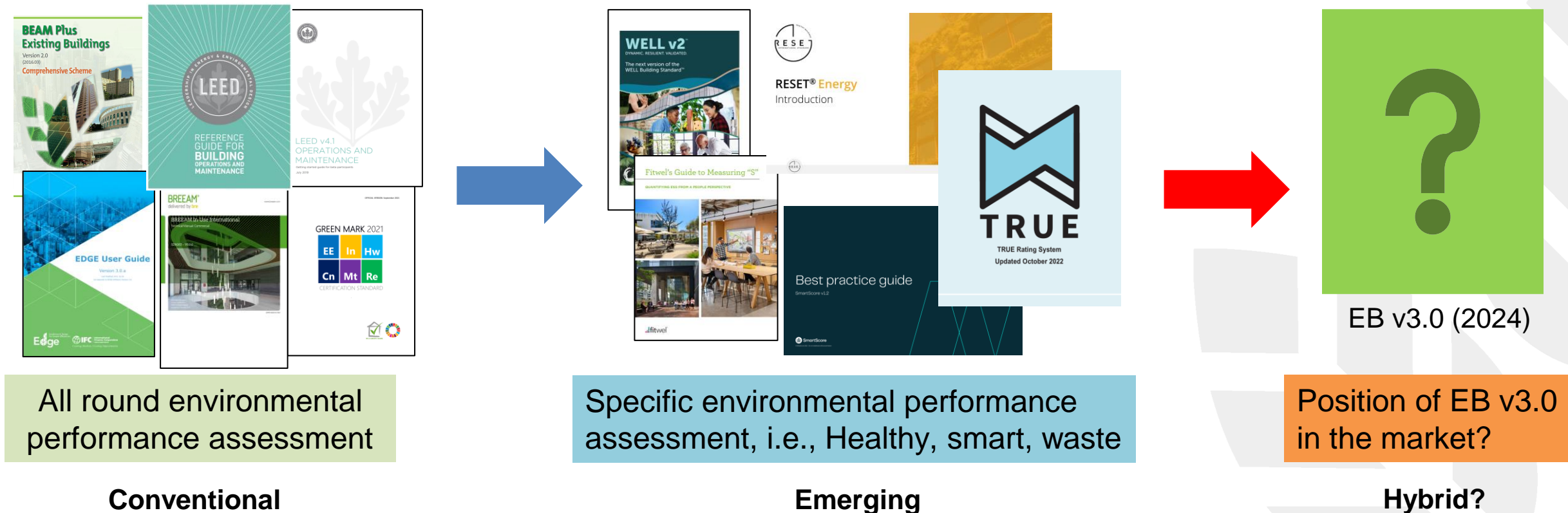
Singapore Green Mark 2021

LEED v 4.1 beta (2020)

On to next page... 11

R&R– Highlights

1. Green Building Rating Tool's Trend (3) – From all round to specific certification



R&R– Highlights

2. Performance Categories Analysis (1) – Gap analysis

Conventional Performance Categories

Management

Site Aspect

Material &
Waste

Energy use

Water Use

Indoor
Environmental
Quality

- Conventional categories cannot reflect the **latest market need** and **sustainability trend**.
- The **actual contribution**, i.e., Under BEAM Plus v2.0, EU 1 – Energy Management (focus is put on **governance**, instead of energy use, the contribution of this credit is to enhance company's governance, energy efficiency is only a by-product, actual saving cannot be measured)
- Benchmarking on **credit allocations**, **comparing performance categories** is no longer up-to-date.

A more comprehensive and in-depth benchmarking is needed.

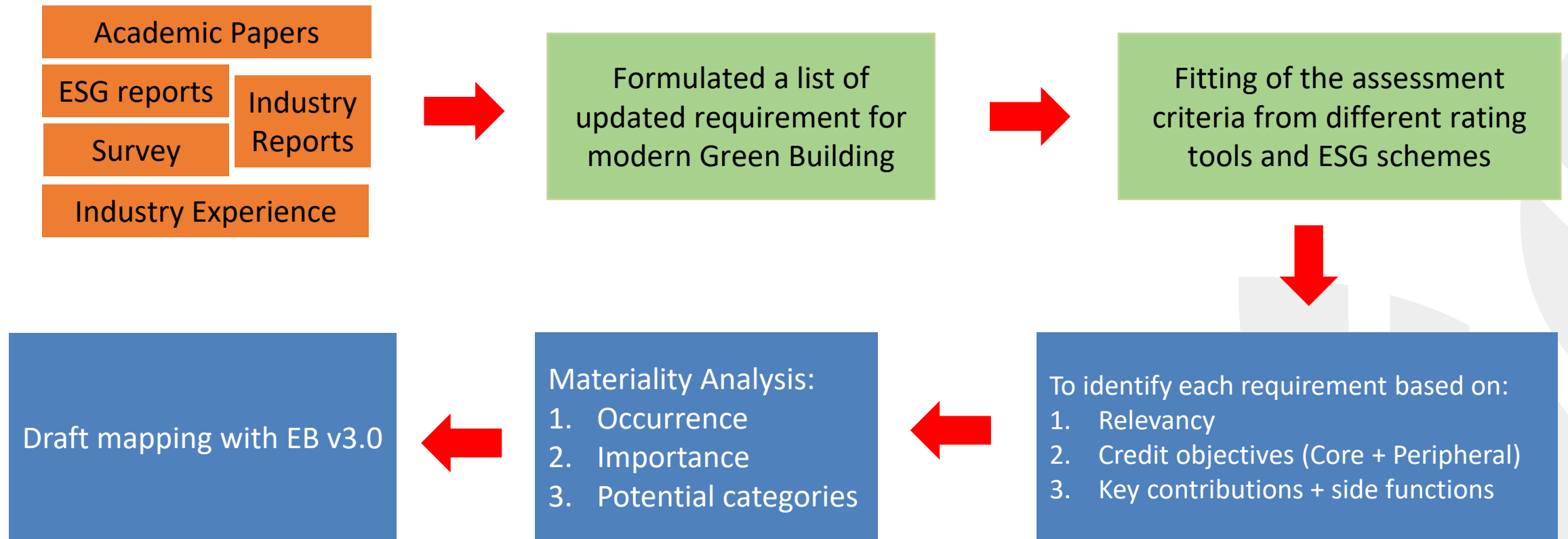
BEAM Plus Existing Buildings Version 2.0 Comprehensive Scheme		Energy Use (EU) EU 1 Energy Management
	EU 1	Energy Management
Exclusion	None.	
Objective	To encourage high level management to involve in the improvement of energy efficiency and conservation.	
Credit Attainable	4	
Credit Requirement	a) Energy Management Policy 1 credit for an energy management policy endorsed by top management. b) Energy Management Plan 1 credit for energy management plan covering less than 3 years. 2 credits for energy management plan covering 3 years or more. c) Appointment of Energy Warden 1 credit for appointing an Energy Warden in the Building Management Company.	

EU 1 in fact, is focus on enhancing governance and facility management.

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R&R– Highlights

2. Performance Categories Analysis (2) – Study approach



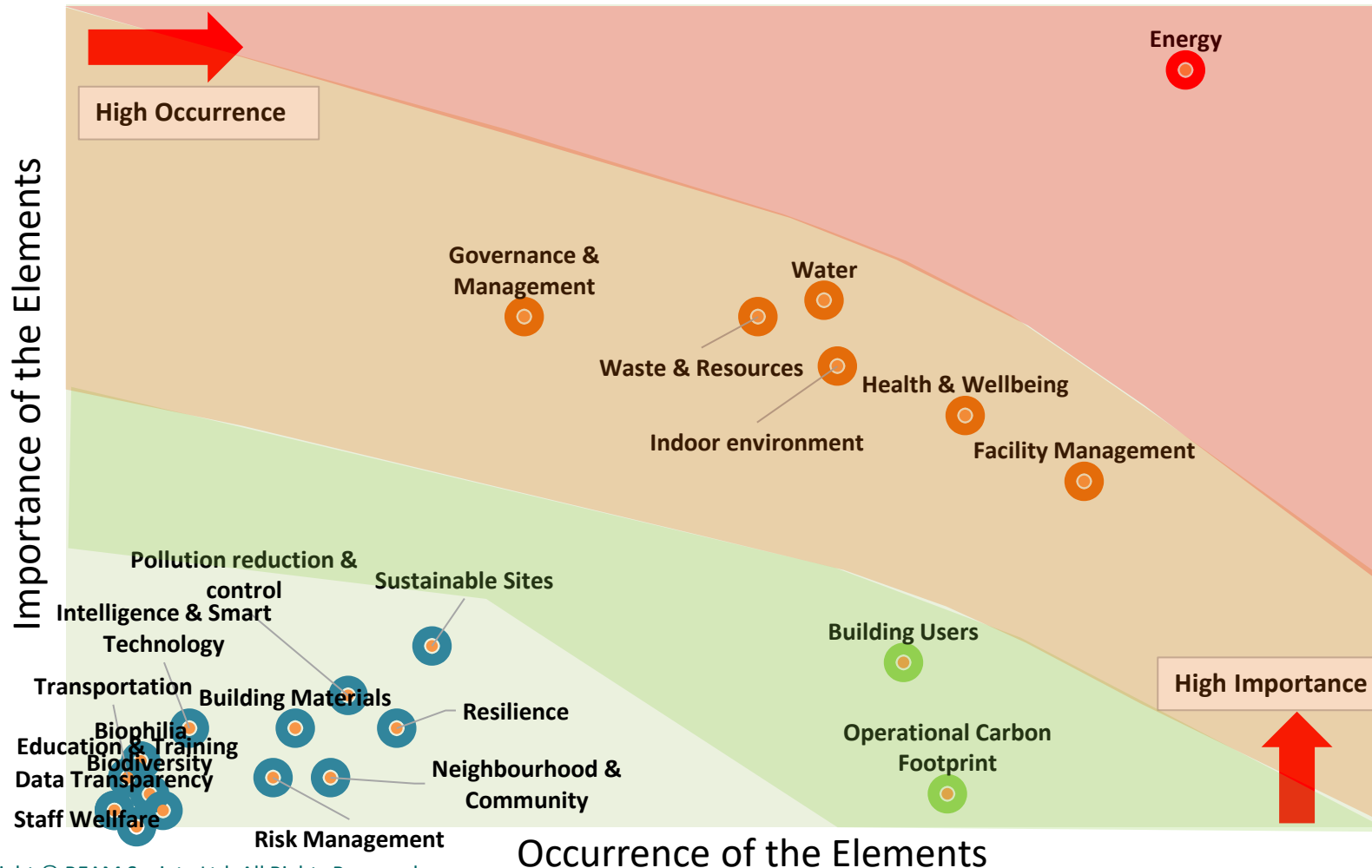
R&R– Highlights

3. Modern Green Building Elements

Energy	Water	Waste & Resources	Building Material	Operational Carbon Footprint	Embodied Carbon
Intelligence & Smart Technology	Pollution Reduction & Control	Indoor Environment	Health & Wellbeing	Resilience	Facility Management
Biodiversity	Governance & Management	Education & Training	Transportation	Neighbourhood & Community	Sustainable Sites
Building Users	Risk Management	Emergency Response	Staff Welfare	Data Transparency	Biophilia

R&R– Highlights

4. Materiality Analysis - Overview



- Tier 1 elements:
(most critical element with the highest occurrence and contribution on green building)
- Tier 2 elements:
(important elements with high occurrence and contribution on green building)
- Tier 3 elements:
(high occurrence element with in-direct contribution)
- Tier 4 elements:
(relatively less important for existing buildings, perceived by individual functions/ new concept to existing buildings)

R&R– Highlights

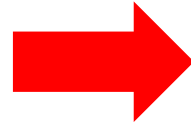
5. Mapping with Sustainability Hot Topics (1)

ESG Reporting

ESG Benchmarking

Climate Action

Green Finance



- **Questionnaire format**
- **Lack of data credibility**
- **Environmental (Use of KPI)**
- **Social (Use of KPI)**
- **Governance (Descriptive)**
- **Climate Action (Descriptive)**
- **Green Loan (use of KPI)**

R&R– Highlights

5. Mapping with Sustainability Hot Topics (2)

Environmental

- Building level
- Energy
- Water
- Waste
- Green house gas emissions
- Consumptions
- Intensity
- Reduction Target



Can be mapped with green building rating tools' performance index

Social

- Building level + Human scale
- Soft side
- People (Staff, tenant, building users)
- Community
- Education & Training
- Healthy & Wellbeing
- KPI + Descriptive



Can be mapped with emerging rating tools' requirement, i.e., Healthy building concept

Governance

- Corporate Level
- Top Management commitment
- Leadership
- Policy-wise
- Descriptive
- Internal (Company-wise)+ External (Supplier + Tenant)



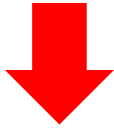
A new section on EB v3.0 should be formulated to assess the governance of the building management

R&R– Highlights

5. Mapping with Sustainability Hot Topics (3)

Climate Action

- Governance (Descriptive)
- Climate-related risks (Descriptive)
- Strategy (Descriptive)
- Metric and Targets (Quantitative)



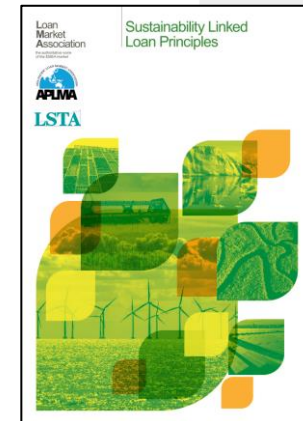
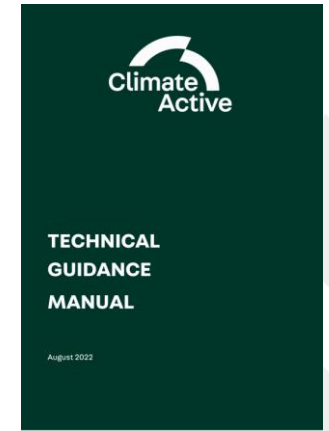
- A new section on EB v3.0 should be formulated to assess the governance on climate resilience

Green Loan

- Focus on KPI
- Resources saving
- Building level
- Energy
- Water
- Waste



- Can be mapped with green building rating tools' performance index



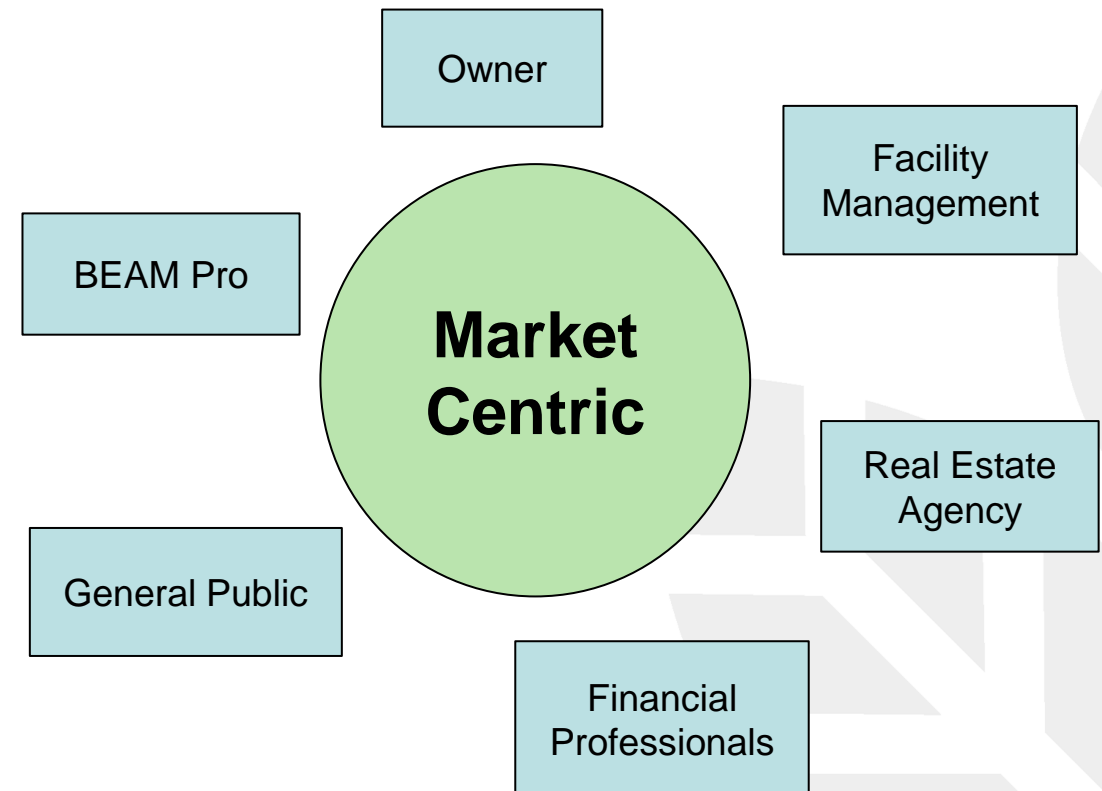
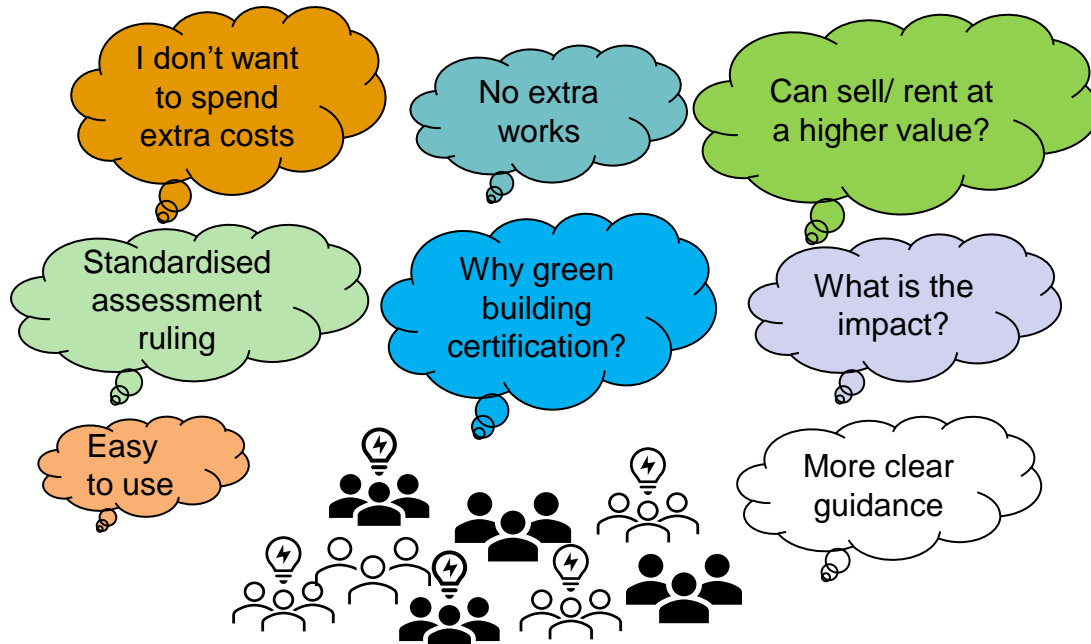
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Proposed Framework of BEAM Plus EB v3.0



1. Key Principle – Market Centric

- Think from the end user's perspective
- To fit the need of different stakeholders
- Fit the market need



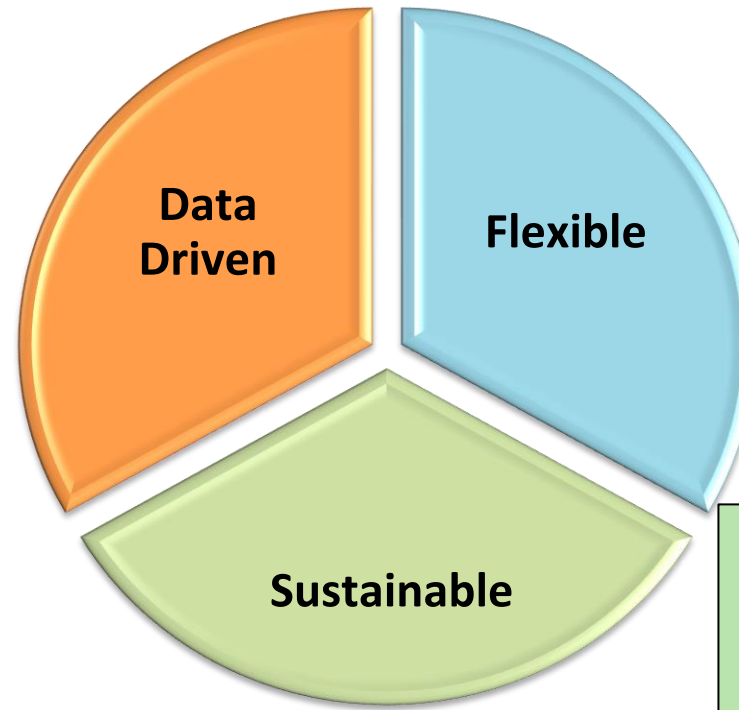
2. Design Concepts - DFS

- Embrace the three design concepts to achieve the Key Principle – Market Centric

- Metric based, i.e., EUI, GHG Emission
- Use of KPI as assessment requirement, i.e., kWh/m²/annum, CO₂e/m²/annum
- Setup the targeted KPI by specific range of value

Benefit:

- Simple and quantifiable
- Easy for comparison & benchmarking
- Enable the development of green building database for Hong Kong



- Outcome based assessment framework
- Multiple certifications

Benefit:

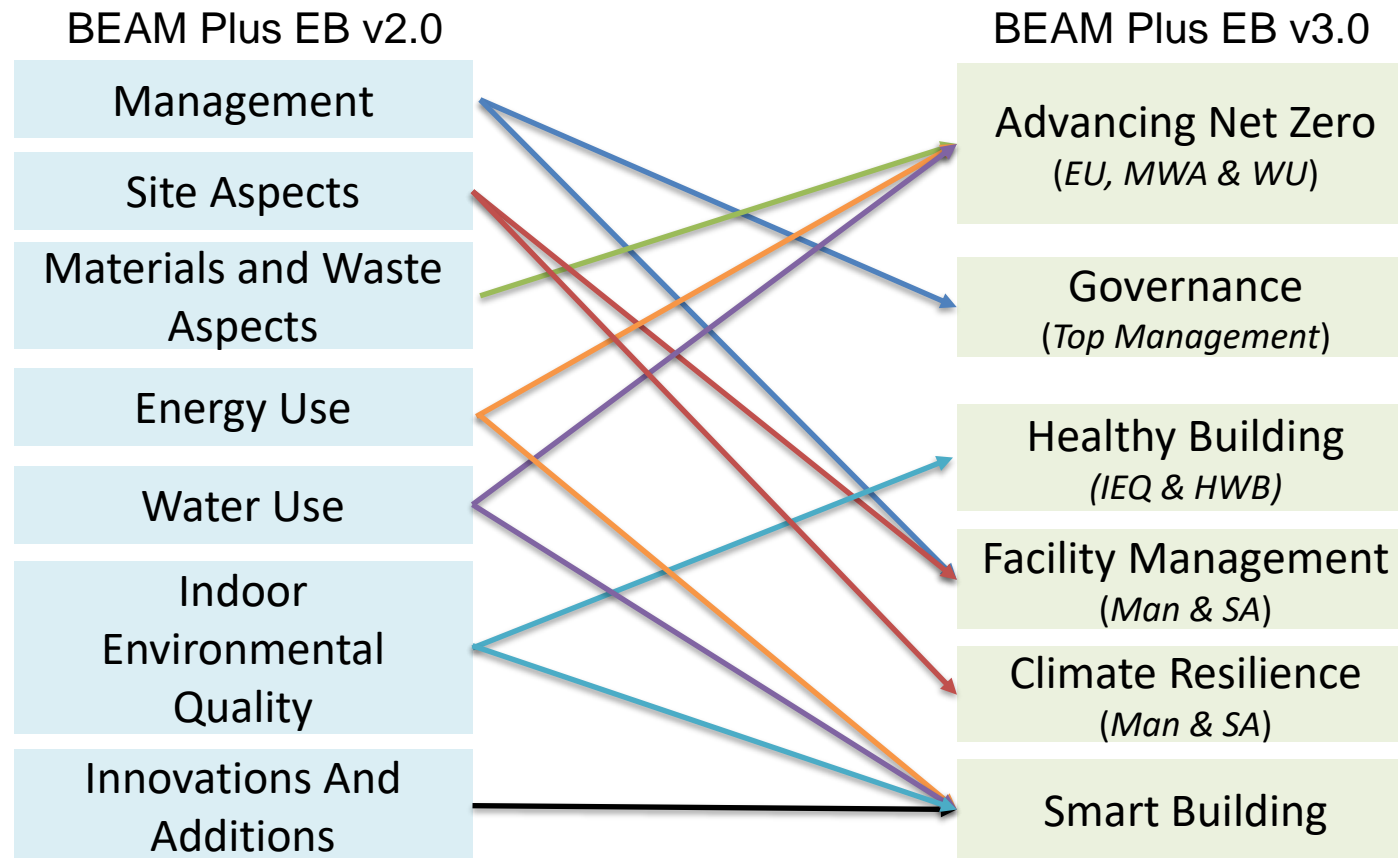
- Easy for Owner and Applicant
- Cost-effective, no extra cost for owner to spend for certification
- Greater flexibility to owner in respect of their operational need, adopting their own strategies

- Outcome based result aligns with various sustainable hot topics
- Multiple certifications

Benefit:

- Owner can exercise the certification results for other sustainability business activities
- Numerical based requirement enables continues monitoring building performance, promote improvement and help owner to achieve environmental target
- Easy and promote recertification

3. Conceptual Framework of EB v3.0 (1) – Proposed Performance Categories



Proposed Performance Categories:

- Align with the global green building & sustainability trends
- Fit the market needs
- Can be correlated with BEAM Plus family
- Tentative and subject to further development

On to next page...

3. Conceptual Framework of EB v3.0 (2) – Focus of Performance Categories

Advancing Net Zero

- Actions taken to **reduce emissions** from **operational** and **embodied carbon**, with residual emissions compensated for via compensation activities in the transition to net zero emissions.

Governance

- This refers to a company's governance **policies** and **practices**. It refers to the governance variables of **decision-making**, **polycymaking** and the **distribution of rights** and **responsibilities** among various participants in a building.

Healthy Building

- The nexus of global health and sustainable development goals, operating across five pillars of health – **physical**, **psychological**, and **social health** and **well-being** of people in buildings and the **built environment**.

Facility Management

- Facilities management (FM) sustainability is an **organisation's process** looking at the design of maintainability to ensure resources efficient maintenance systems in buildings and operates to minimise its harmful impact on the environment and people.

Climate Resilience

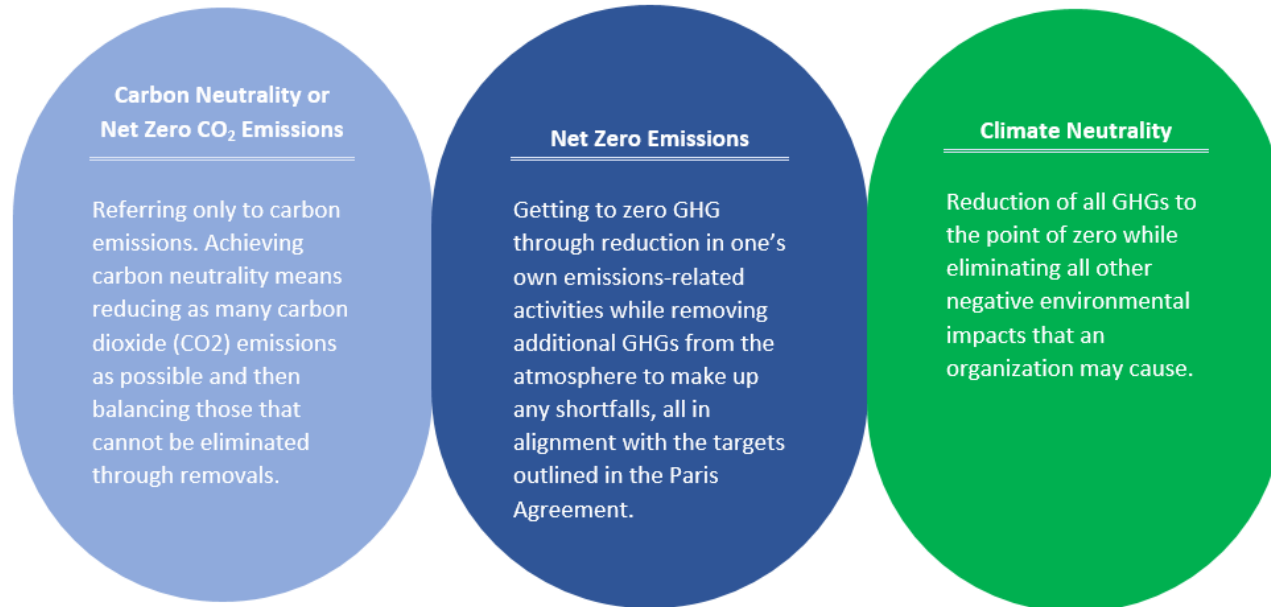
- Evaluates buildings on their **climate mitigation** and **adaptation practices** and encourages the use of natural resources and solutions in exercising circularity.

Smart Building

- Focus on the application of relevant **smart technologies** and **systems** in **retrofitting** and **operation** of buildings that enable a fully integrated, automated and responsive building operation reducing environmental impacts and enhancing building performance.

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3. Conceptual Framework of EB v3.0 (3) – Key direction



Source: IPCC

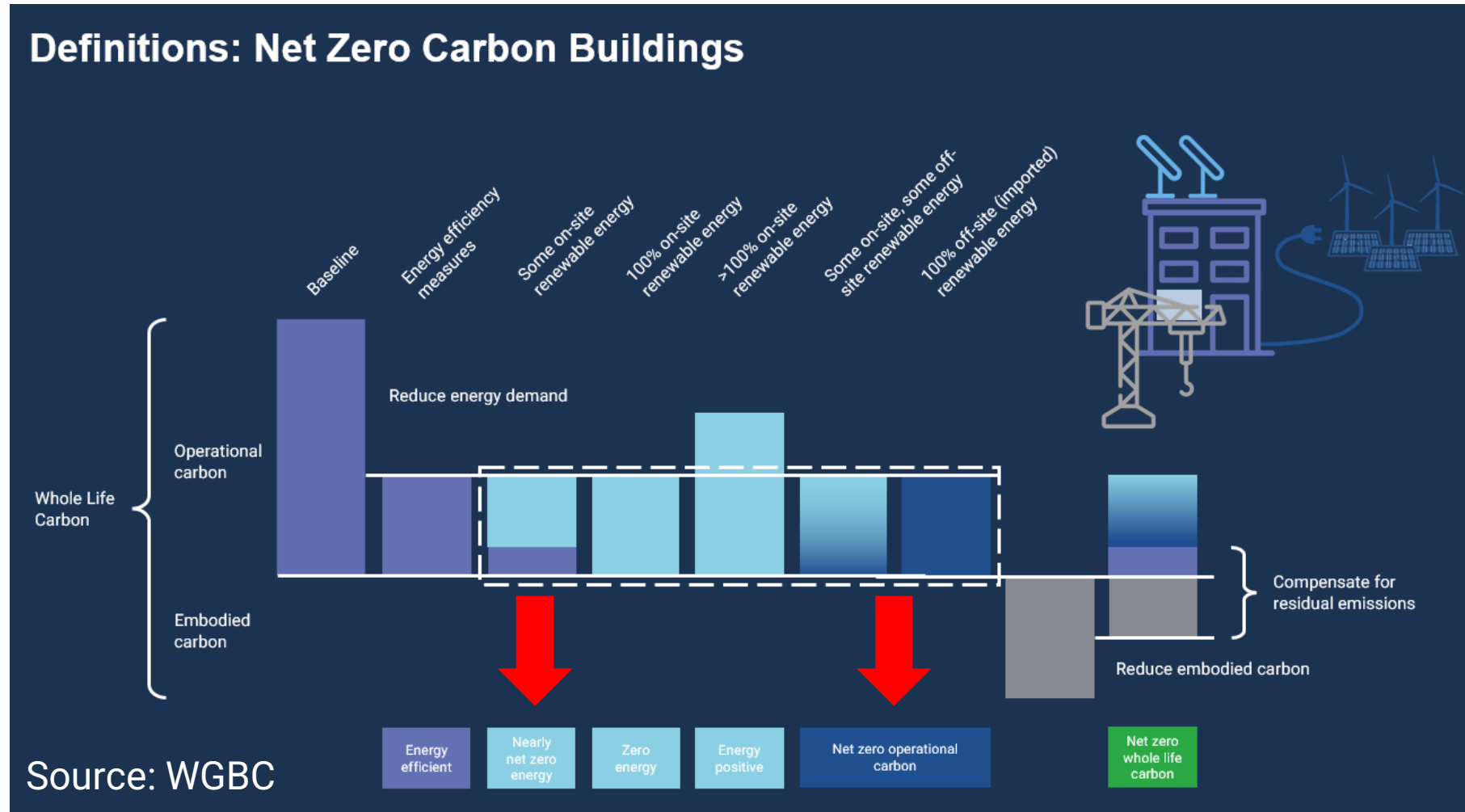
Carbon Neutrality vs Net Zero

	Carbon Neutrality	Net Zero
Level of ambition	<ul style="list-style-type: none">Allows for emissions to be created with no specified level of reduction requiredOffsetting them through purchasing carbon credits to prevent greenhouse gases from entering the atmosphere	<ul style="list-style-type: none">Achieve a 90% reduction in scope 1, 2 and 3 emissions by 2050.The residual emissions can be neutralised through carbon removal projects
Scope	Only covers direct emissions (scopes 1 and 2), with optional additions of indirect emissions (scope 3)	Must cover direct and indirect emissions (scopes 1, 2 and 3)
Time frame	Short term	Short term (by 2030) + Long term (by 2050)

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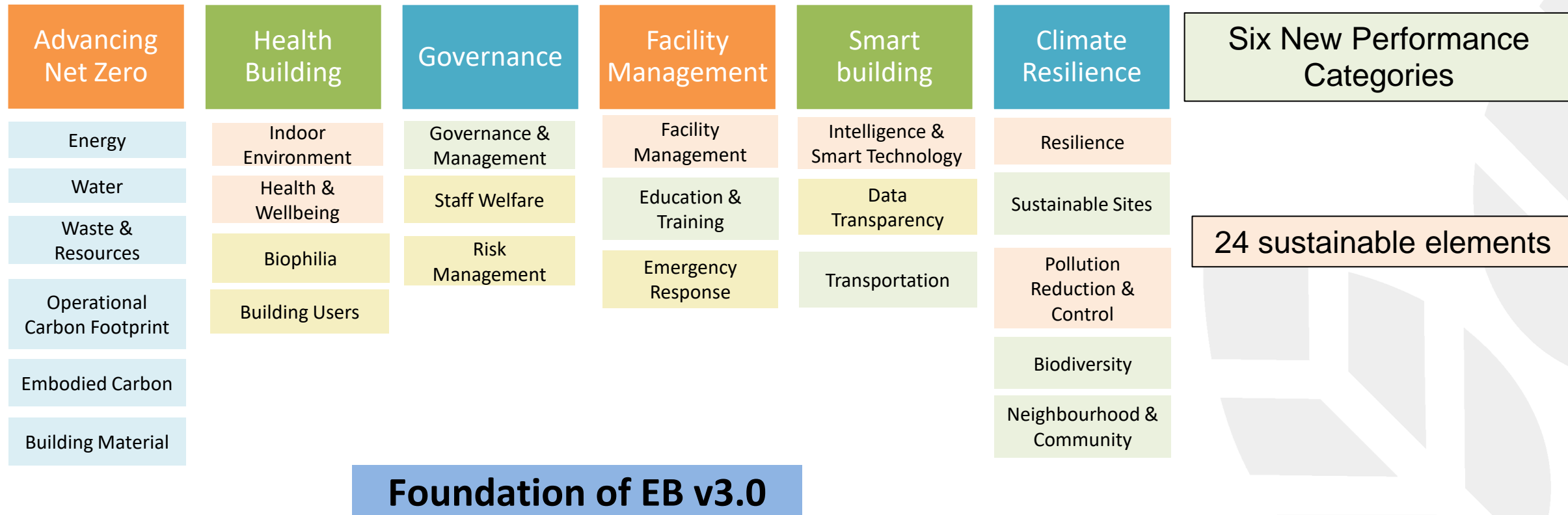
BEAM Plus EB v3.0

3. Conceptual Framework of EB v3.0 (4) – Key direction



BEAM Plus EB v3.0

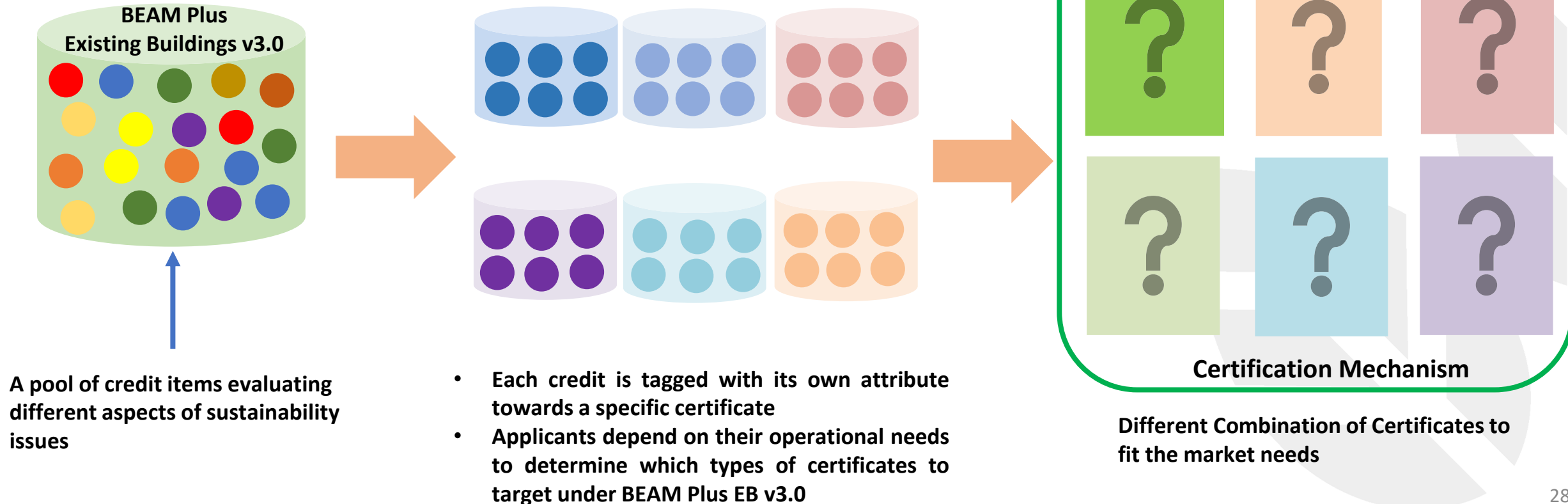
3. Conceptual Framework of EB v3.0 (5) – Foundation of EB v3.0



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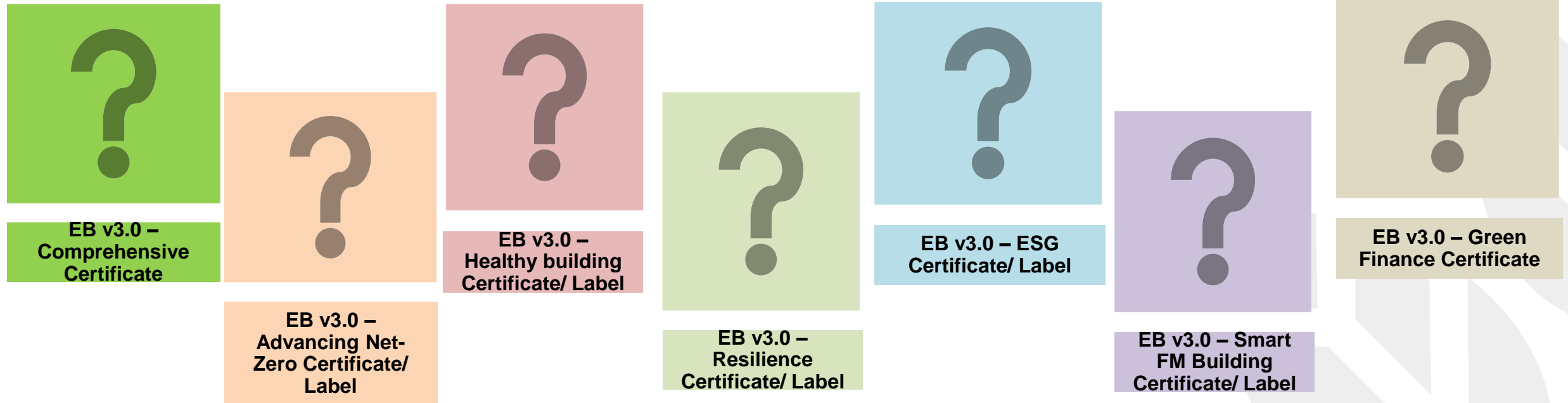
3. Conceptual Framework of EB v3.0 (6) – How does it work?

A Multiple Certification Mechanism

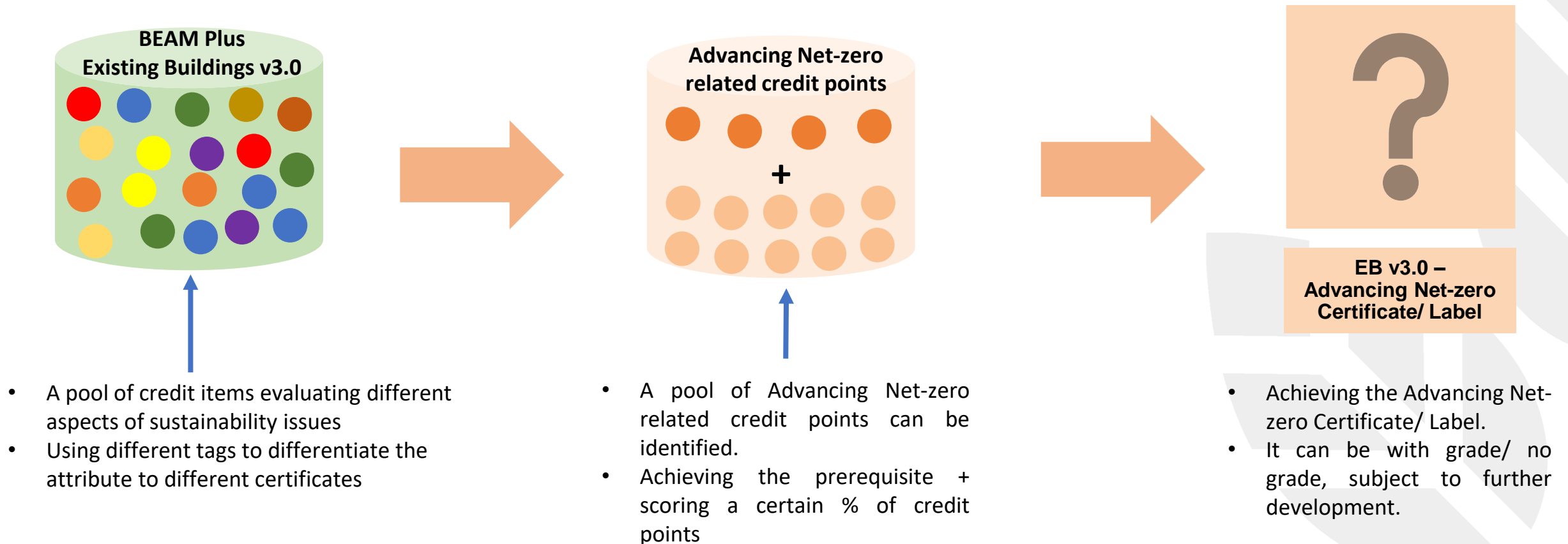


BEAM Plus EB v3.0

3. Conceptual Framework of EB v3.0 (7) – Multiple Certificates

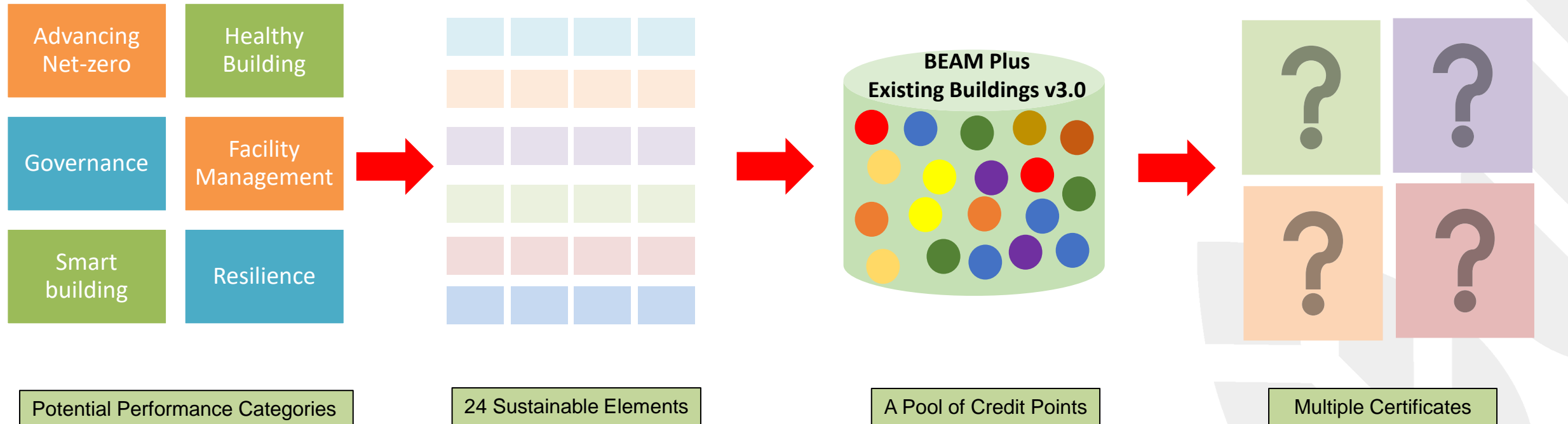


3. Conceptual Framework of EB v3.0 (8) – Certification Example



BEAM Plus EB v3.0

Summary of conceptual Framework of EB v3.0 :



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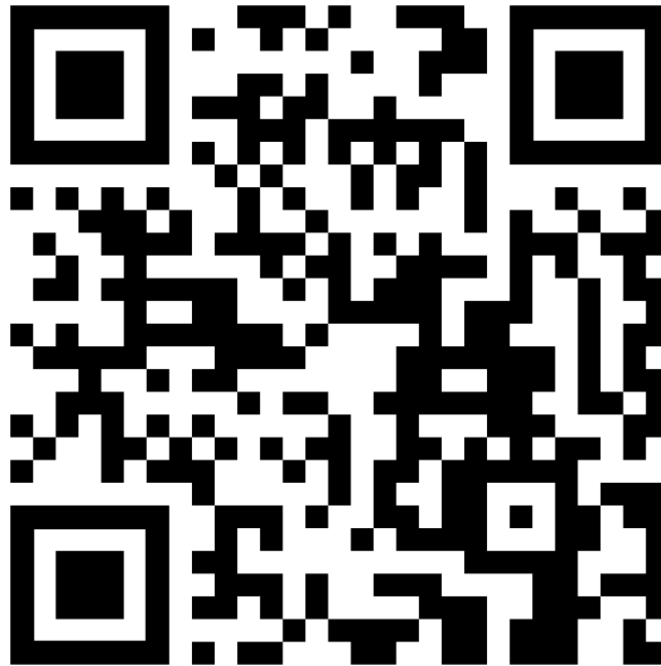
Feedback



Feedback

On-line Survey

Please scan & share your experience!



Your feedback & ideas are **important!**
Feel free to share with your friends and colleagues.





建築環保評估協會

Thank You

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