The Cream of BEAM Plus (2019)
A General Sharing of BEAM Plus Certification Data

(This paper provides a **gist** of the CPD Event "Cream of BEAM Plus" seminar held on 12.9.2019.

For further details, readers are advised to view the video on HKGBC On-line Training Portal.)

INTRODUCTION

"The Cream of BEAM Plus" is a paper published regularly to disseminate the performance of BEAM Plus-certified green buildings. In this paper, the study period is extended to mid-April 2019, providing readers with more updated analysis.

GRADING DISTRIBUTION

The NB projects were analysed in terms of their grading distribution throughout the latest three years. The results are given in Figure 1. It can be seen that the proportions of Gold-rated projects in 2017 and 2018 are greater than that in 2016. The percentage has risen to 35 - 41% as compared to 26% in the past.
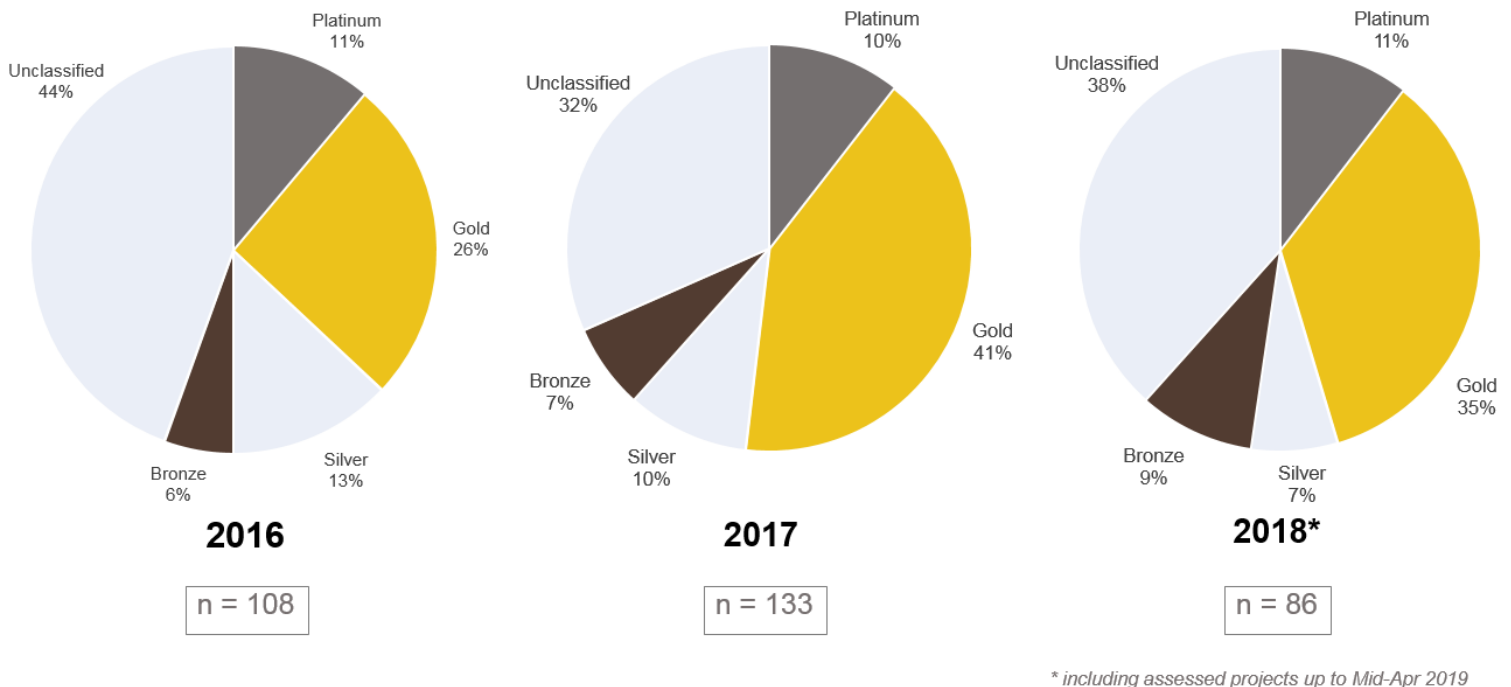

including assessed projects up to Mid-Apr 2019

Figure 1   Grading distribution of NB projects in 2016 to 2018 (including data up to Apr 19)

SCORING

The mean Target vs mean Actual scores of 9 latest PA Platinum NB projects were analysed. The results are given in Figure 2.
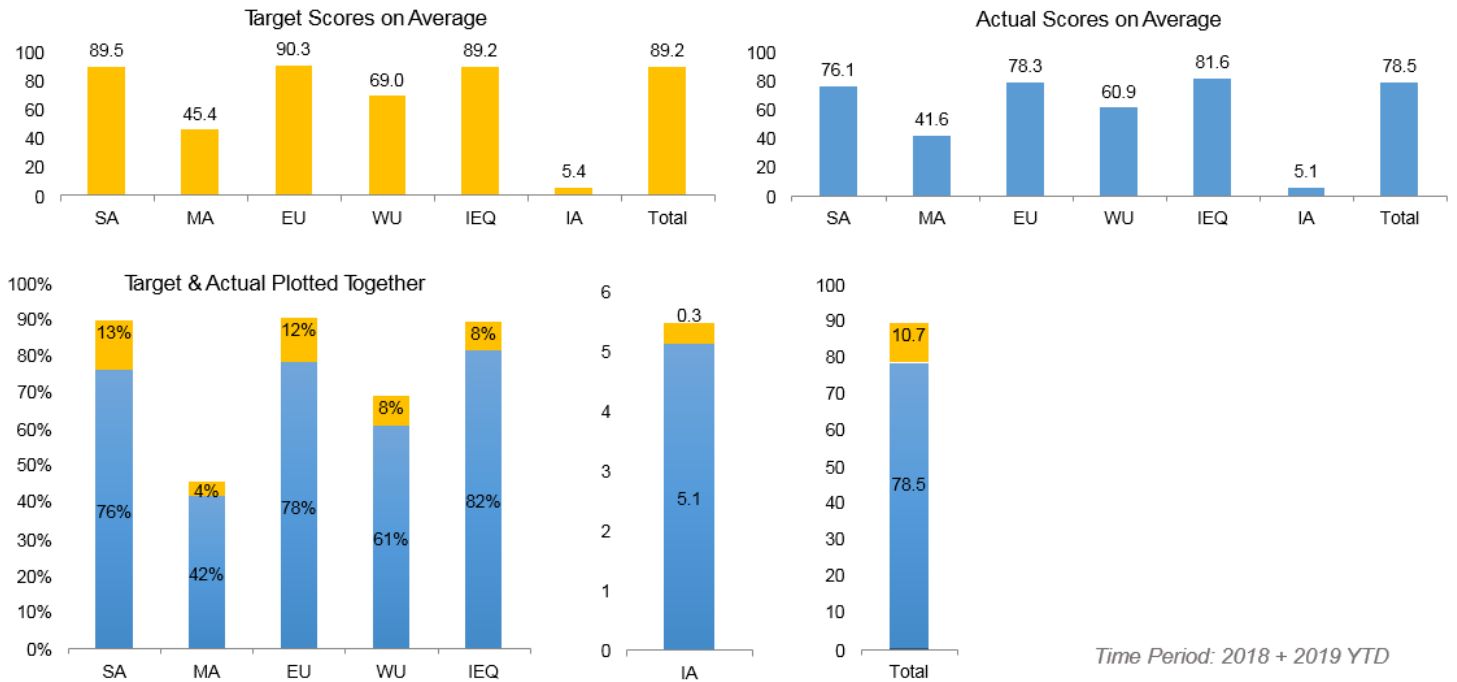

Figure 2   Target vs Actual Scores of 9 Latest PA Platinum NB projects

Besides Platinum projects, the mean Target vs mean Actual scores of the latest 31 PA *Gold* NB projects were analysed. The results are given in Figure 3.
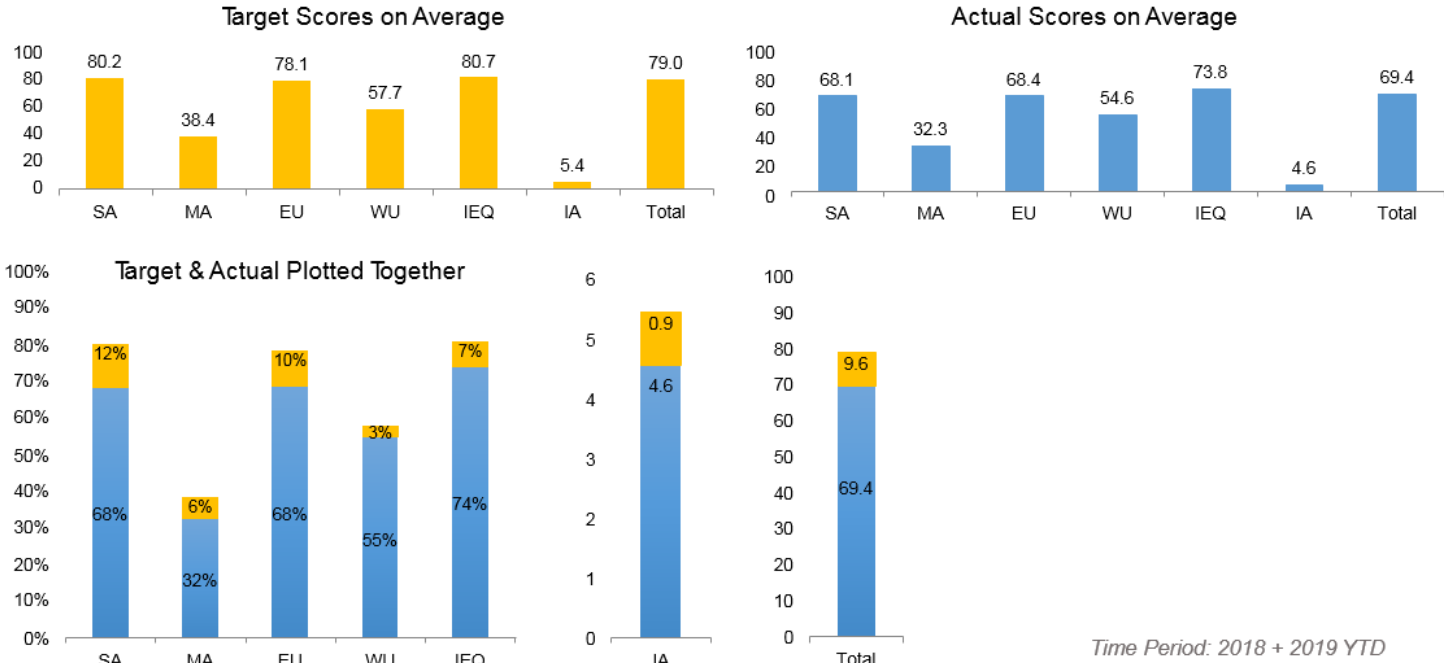
Figure 3   Target vs Actual Scores of 31 Latest PA Gold NB projects

CREDIT ACHIEVEMENT RATES

The most achieved and the least achieved credits are listed in Tables 1 and 2 respectively.

Table 1   Most achieved credits (NB)

(nos. on RHS are the proportion of projects that attain full marks in the credit items)

Zoom into the Upper End
(2018 + 2019 YTD)

n (Gold or above): 59
n (all ratings): 141

	Credit	Gold or Above	All
IA3	BEAM Pro	1.00	0.69
IEQ4	De-odourising system for refuse collection rooms	1.00	0.66
EU10a	Commissioning Specifications	1.00	0.66
EU11a	Operations and maintenance manual	1.00	0.66
IEQ2	Plumbing and Drainage (venting, access, water seal …)	1.00	0.66
SA4	Site Design Appraisal (50% achievement of UDG)	1.00	0.63
SA10	Environmental Management Plan	1.00	0.63
SA11	Air Pollution During Construction	1.00	0.62
MA8b	Avoid ozone depleting substance in insulation materials	1.00	0.61
EU10c	Commissioning (appoint agent, use approved forms)	0.98	0.66
EU11b	Energy management manual	0.98	0.65
WU6	Effluent Discharge to Foul Sewers	0.98	0.61
MA8a	Refrigerants (LCGWP + LCODP x 1e5 < 775)	0.98	0.60
SA12	Noise During Construction	0.98	0.60
EU10d	Commissioning report	0.97	0.65
SA13	Water Pollution During Construction	0.97	0.61
EU10b	Commissioning plan	0.95	0.63
IEQ22	Access for Persons with Disability	0.95	0.61

Table 2   Least achieved credits (NB)

(nos. on RHS are the proportion of projects that attain full marks in the credit items)

Zoom into the Lower End
(2018 + 2019 YTD)

n (Gold or above): 59
n (all ratings): 141

Credit		Gold or Above	All
IEQ13b	Room air distribution (diffusers satisfy ADPI)	0.11	0.04
IEQ11b	Local exhaust for tenant fit-out	0.10	0.05
EU6	Renewable energy systems	0.10	0.05
MA4b	Flexible engineering services	0.10	0.05
WU4b	Grey water recycling	0.10	0.05
WU4c	Harvesting and/or recycling leads to a reduction of 10%	0.10	0.05
MA1	Building reuse (60% of structure reused)	0.09	0.03
EU3B	Use materials with low embodied energy	0.08	0.05
MA4a	Spatial adaptability	0.07	0.04
MA7b	Recycled materials in building structure	0.07	0.04
MA3	Prefabrication	0.07	0.03
MA7c	Recycled materials in interior components	0.07	0.03
MA1B	Building reuse (90% of structure reused)	0.05	0.02
IEQ19B	Impact noise isolation between floors	0.04	0.02
SA8b	Elevated temperature (shading + cool roof)	0.03	0.01
WU2	Water leakage detection	0.03	0.01
SA1B	Site contamination assessment + rehabilitation	0.02	0.01

ENERGY REDUCTION TREND

The mean annual energy reduction (EU1) achieved by NB projects from Bronze to Platinum are given in Table 3.

Table 3   Trend of energy saving in NB projects

Provisional Rating	No. of projects	% Average Reduction (exclude "nil submission")
Platinum	77	27%
Gold	190	22%
Silver	78	17%
Bronze	73	16%

Time Period: 2010 - Present (including PA assessed projects up to Mid-Apr 2019)

WATER REDUCTION TREND

The mean potable water reduction (WU1) achieved by NB projects from Bronze to Platinum are given in Table 4.

Table 4   Trend of potable water saving in NB projects

Provisional Rating	No. of projects	% Average Reduction (exclude "nil submission")
Platinum	77	43%
Gold	190	37%
Silver	78	35%
Bronze	73	35%

Time Period: 2010 - Present (including PA assessed projects up to Mid-Apr 2019)

CONTESTED RATES

The contested rates of credits in Gold or above NB PA projects are shown in Table 5. Reasons of contesting were explained in the seminar.

Table 5 Contested rates of credits in descending order

Credit		Contested Rate (%)	Total Submitted Projects
IEQ19B	Noise Isolation	100%	1
IEQ11b	Local exhaust	88%	8
WU02	Monitoring and Control	67%	3
IEQ13b	Room air distribution	67%	3
IA01	Innovative Techniques	63%	8
WU03	Water Efficient Irrigation	50%	8
EU07	Air-Conditioning Units	50%	14
WU04cB	A combination	43%	7
IEQ12a	Ventilation by any means	42%	19
IEQ20	Background Boise	36%	22
IEQ12bB	Use of natural ventilation	33%	9
IEQ18	Room Acoustics	33%	15
IEQ21	Indoor Vibration	30%	33
IEQ16B	Interior Lighting in Normally Occupied Areas	29%	17
WU04a	Harvested rainwater	29%	7
IA02	Performance Enhancements	28%	36
IEQ19	Noise Isolation	27%	15
MA04b	Flexible engineering services	25%	4
MA10	Demolition Waste Reduction	23%	13
IEQ03	Biological Contamination	23%	26

(Gold or above, PA Projects)   n = 40

6

INNOVATIONS AND ADDITIONS

The IA1 (innovative techniques) items adopted by the 2018/19 NB projects include:

- Earth-tube air pre-cooling system
- Chilled ceiling AC system
- Passive chilled beam AC system
- PAU with Pinnacle System to decouple latent load from sensible load, used in conjunction with chilled beam AC system and dedicated OA system
- Solar desiccant dehumidification system
- Daylight autonomy system (sun-tracking internal window blinds)
- Home health system (smart home panel)
- Modular integrated construction (MiC)
- Recycling trees as mulch for landscaping
- Circular economy applied to salvaged materials
- C&D waste disposal tracking system (RFID)
- Mobile phone charging bikes
- Other innovations as detailed in the training video

The IA2 (performance enhancement) items include:

- EV charging for more than 50% of car parking spaces (as per BEAM Circular 2014.118)
- Social engagement as stated in BEAM Plus Manual Section 7 – IA2 paragraphs
- Twin-tank system for fresh and flushing water
- Two-level lighting system in residential building corridors and staircases
- Hard-paved construction sites
- Multi-sensory maps
- BIM
- Electronic project management system (paperless)
- Food waste decomposer
- SA8b - elevated temperature (e.g. 100% roof area as cool roof/green roof)
- MA6 - use of sustainable timber (e.g. 100% adoption)
- MA7a – recycled materials in external pavers (e.g. more than 95%)
- Other items as detailed in the training video.

Existing Buildings (EB V2.0)

The study also analysed the performance of 20 EB Comprehensive Scheme Platinum projects. Their scoring analyses are given in Figure 4. The most achieved and least achieved credits are given in Tables 6 and 7. The IA submission rates are given in Figure 5.
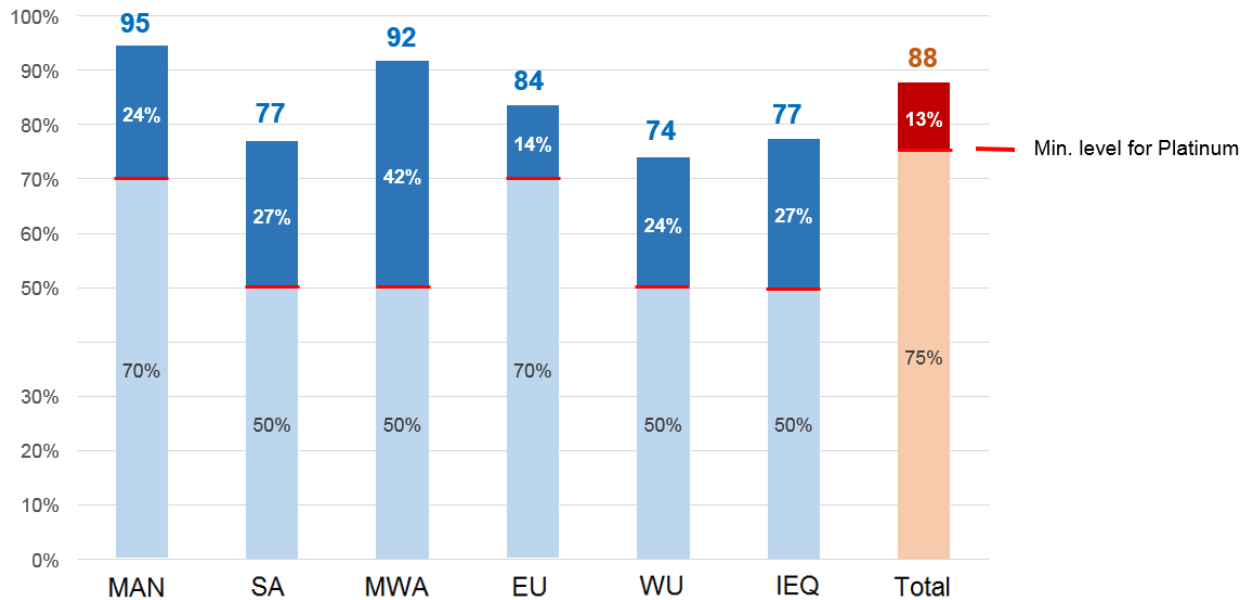

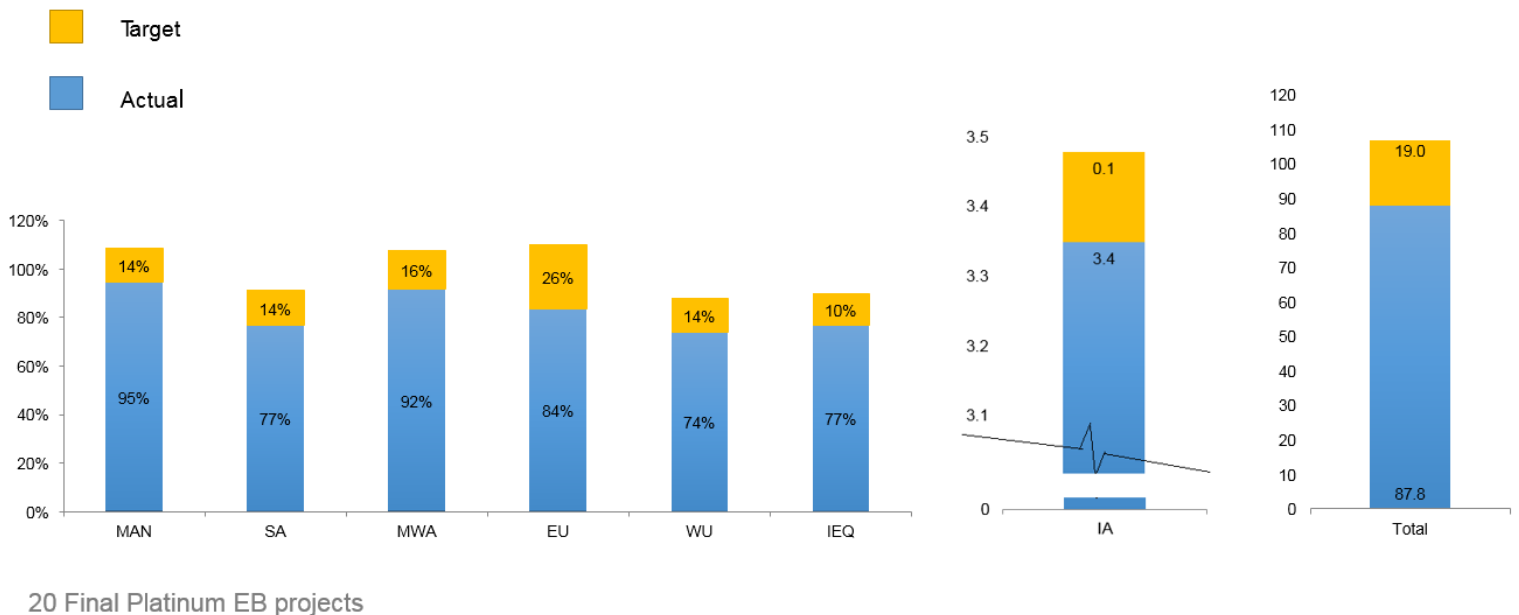Figure 4a Category scores of EB Comprehensive Platinum projects

Figure 4b   Target vs Actual Scores of EB Comprehensive Platinum projects

8

Table 6　Most achieved credits (EB Comprehensive)

Credit		Achievement Rate
MAN02	Environmental, Social and Governance (ESG) Disclosure	100%
SA07	Amenities for Operation and Maintenance	100%
MWA04	Waste Management Plan	100%
EU01a	Energy Management Policy	100%
IEQ08	IAQ Monitoring	100%
MWA08a	Implementation of the Waste Management Plan	96%
MWA08c	Waste and Recycling Records	96%
EU01c	Appointment of Energy Warden	96%
EU02c	Data Analysis	96%
MAN04a	Staff and Technical Resources	91%
SA06	Corporate Social Responsibility Facilities/ Services	91%
WU07	Water Metering	91%

20 FA Platinum, 1 PA Platinum and 3 PA Gold Projects

Table 7　Least achieved credits (EB Comprehensive)

Credit		Achievement Rate
MAN12B	Green Lease	0%
SA04B	Heat Island Reduction	0%
MWA01	Materials Purchasing Practices	0%
MWA01B	Materials Purchasing Practices	0%
MWA02B	Use of Certified Green Products	0%
EU04bB	Self-Improvement	0%
EU05B	Enhancement	0%
WU02B	Water Use For Irrigation	0%
WU04B	Water Recycling	0%
WU12	Quality Water Supply Scheme for Buildings – Flushing Water	0%
IEQ10B	Interior Lighting in Normally Occupied Areas	0%
IEQ14B	Noise Isolation	0%
IA05B	Provision of Electrical Vehicle Charging Stations	0%

20 FA Platinum, 1 PA Platinum and 3 PA Gold Projects

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Submission rate

LEGEND

IA 1 Innovative Techniques
IA 2 Performance Enhancement
IA 3 Provision of Venues or Public
       Spaces for Environmental
       Programme
IA 4 Engagement with
       Neighbourhoods
IA 5 Provision of Electrical Vehicle
       Charging Stations
IA 6 Recognition and Appreciation
       Awarded from Other
       Organisations
IA 7 Achievement of Hong Kong
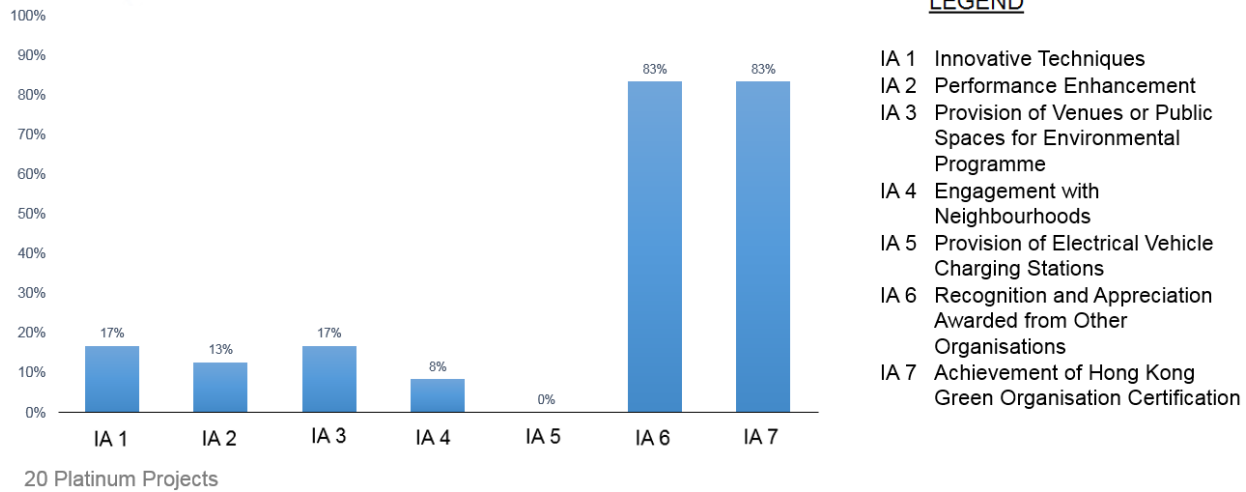   Green Organisation Certification

20 Platinum Projects

Figure 5   IA submission rates of EB Comprehensive Platinum projects

Within IA1, the adopted innovations include:

- Nano-treatment to elevator surfaces to improve IAQ;

- Automatic fill cleaning machine for cooling towers;

- Curtain wall opening guard for connecting temporary exhaust fans during renovation;

- Cloud-based workplace temperature control system (Comfy App).

For EB Selective Scheme, the study has included 15 projects. Their scores are as follows:
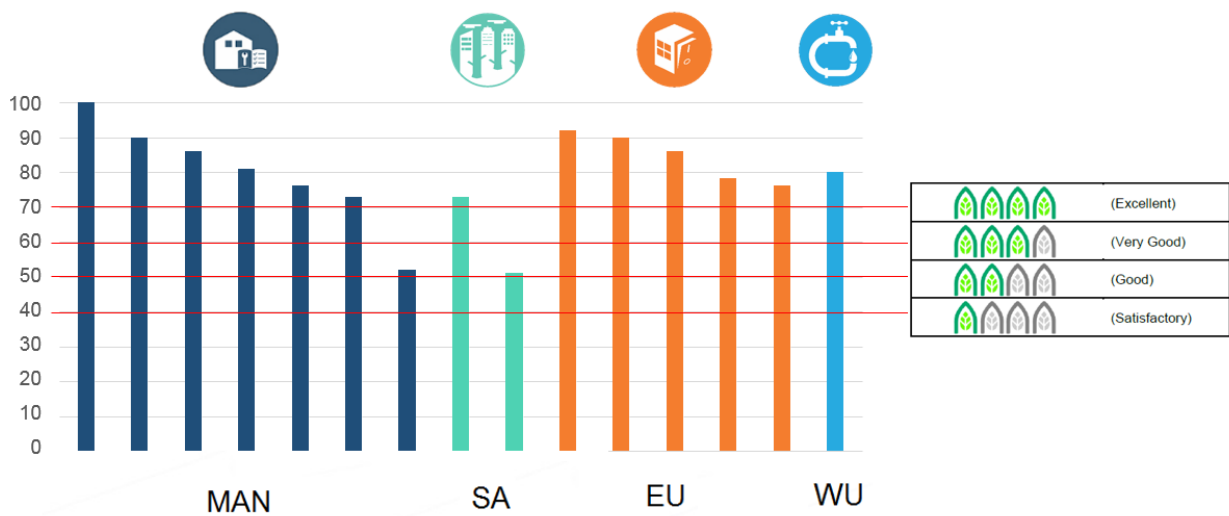

Figure 6   Scores of 15 EB Selective Scheme projects

10

The commonly achieved and least achieved credits in the EB Selective Scheme projects are as follows:

Table 8   Commonly achieved credits and credits with high "not submitted" rate (EB Selective)

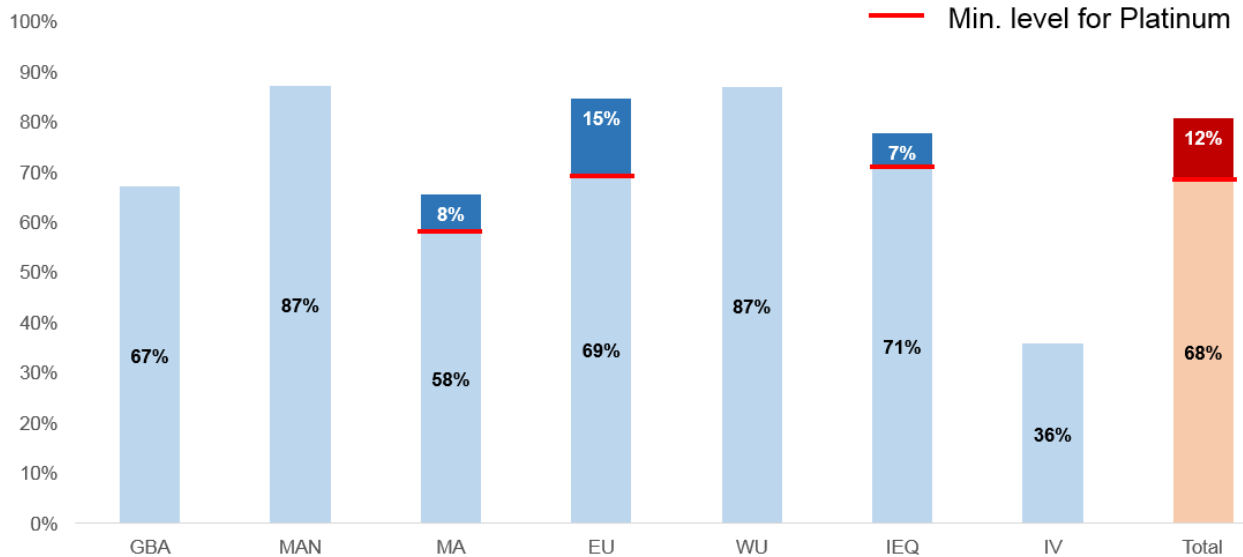| Credit head / subhead	Description	Achievement Rate
EU1a	Energy Management Plan	100%
EU2b	Data Collection Record	100%
EU2d	Carbon Audit Report	100%
EU3a	Energy Efficient Practices	100%
EU1b	Appointment of Energy Warden	80%
EU4b	Self-Improvement	80%
EU6	Educational and Promotional Programme	80%
MAN13	User Guidance	100%
MAN12	Integrated Pest Management	100%
MAN15	Educational and Promotional Programme	100%
MAN8	Building Services Operation and Maintenance	100%
MAN10a	Renovation Management Plan	86%
MAN16B	Obtained environmental award / certification scheme / campaign	86%
MAN9B	Electronic Operation and Maintenance Platform	86%
MAN7b	External Areas and Facilities	75%
MAN5b	Staff Training	71%
MAN5a	Staff and Technical Resources	71%
MAN1	Green Purchasing Plan	71%
MAN3a	Disclosure of Sustainability Policy and Targets	71%

12 projects: 7 MAN and 5 EU

Not Submitted

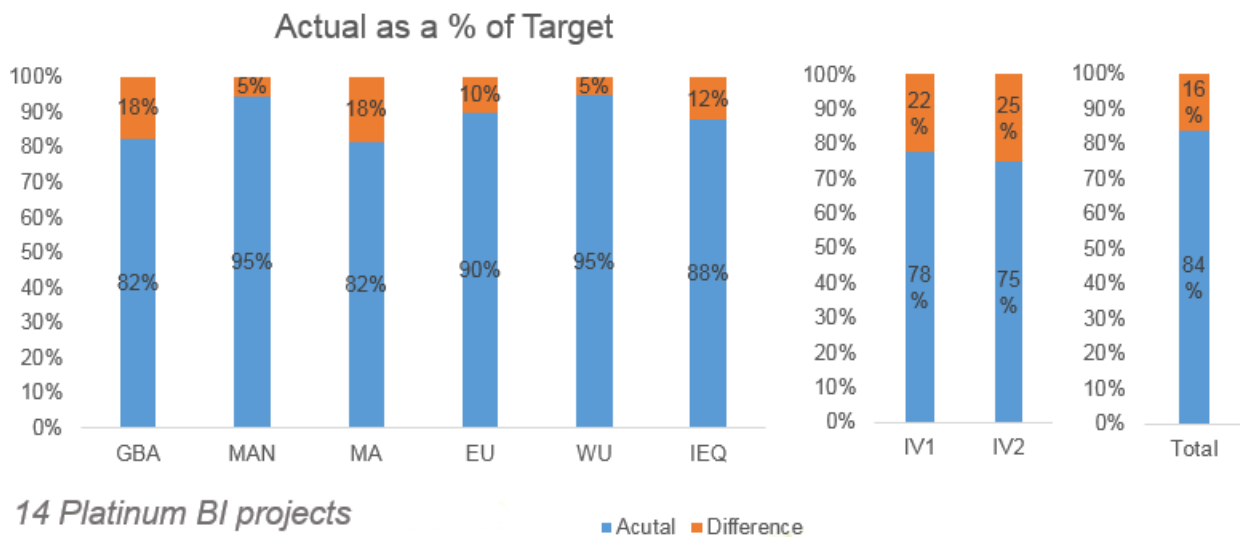| Credit	Description	NS Rate
EU7b	Performance Enhancements	80%
EU7a	Innovative Techniques	80%
MAN16	Recognition and Appreciation Awarded from Other Organisations	100%
MAN3b	ESG Reporting	71%

BEAM Plus Interiors (BI)

The study also analysed the performance of 14 BI Platinum projects. Their scoring analyses are given in Figure 7. The most achieved and least achieved credits are given in Table 9. The numbers of projects pursuing IV1 items are given in Table 10.

14 Platinum BI projects

Figure 7a   Mean category scores of BI Platinum projects

Figure 7b   Actual as a percentage of target in BI Platinum projects

12

Table 9   Most and least achieved credits (BI)

Most Achieved Credits

Credit	Description	Achievement Rate
MAN6	User Guidance	100%
MA10	Ozone Depleting Substances	100%
IEQ1	Indoor Air Quality	100%
IEQ7b	Thermal Comfort	100%
IEQ7c	Thermal Comfort	100%
MAN3	Construction Noise	95%
MAN4	Green Cleaning	95%
MA1	Waste Recycling Facilities	95%
MA6c	Sustainable Flooring Products	95%
EU3a	Commissioning	95%
EU3b	Commissioning	95%
MAN1	BEAM Professional	89%
MAN2	Construction IAQ Management	89%
WU1	Water Quality Survey	89%
IEQ3	Minimum Ventilation Performance	89%
IEQ7a	Thermal Comfort	89%

Less Achieved Credits

Credit	Description	Achievement Rate
EU1	Energy Performance – Performance-based Approach	26%
MA4	Modular Design Materials	26%
MA7a	Sustainable Ceiling Products	21%
GBA1	Green Building Attributes	11%
IEQ11	Acoustics	11%
MA8a	Sustainable Wall and Door Products	11%
MA9	Zero PVC	11%
IEQ6	Reduce Uncontrolled Ventilation (Air Tightness Test)	5%

14 Platinum, 3 Gold and 2 Silver BI Projects

Table 10   IV1 techniques versus the no. of projects (descending order) in the case of BI

Appendix 9.4

		No of projects
1	Real Time Energy Monitoring Display	7
2	IAQ Excellent Class	7
3	Partition System	3
4	Renewable Energy Systems	3
5	Temporary Protection Made From Recycled Materials	2
6	Waste Recycle Facilities For Business Specific Materials	2
7	Certification	2
8	Air-conditioning Condensate Reuse	1
9	Energy/ Carbon Audit	1
10	Outstanding Energy Performance	1
11	Mixed Mode Ventilation Systems	1

14 Platinum, 3 Gold and 2 Silver BI Projects

Other un-listed innovations adopted by BI projects include:

- Exercising equipment to promote healthy and active living
- Energy-generating exercising machines
- Reused-bottle wall
- Indoor hydroponic farming
- Education for visitors
- BIM model with O&M database
- Adoption of Oceanic Global Guide to minimize the use of plastic in offices
- Provision of "Room for Moms" to cater for the need of female employees

FURTHER INFORMATION

The above information gives selected key statistics of the seminar. If readers want to appreciate the full findings of the study, they are advised to watch the video footage which is available on the following On-line Training Portal: http://onlinecpdtraining.hkgbc.org.hk/

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