The Cream of BEAM Plus (2018)

A General Sharing of BEAM Plus Certification Data

(This paper provides a **gist** of the CPD Event "Cream of BEAM Plus" seminar held on 28.8.2018.

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 2018, 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 proportion of Gold-rated projects has significantly increased in the last period. The percentage has risen to 41% as compared to 23% to 26% in the previous two years.

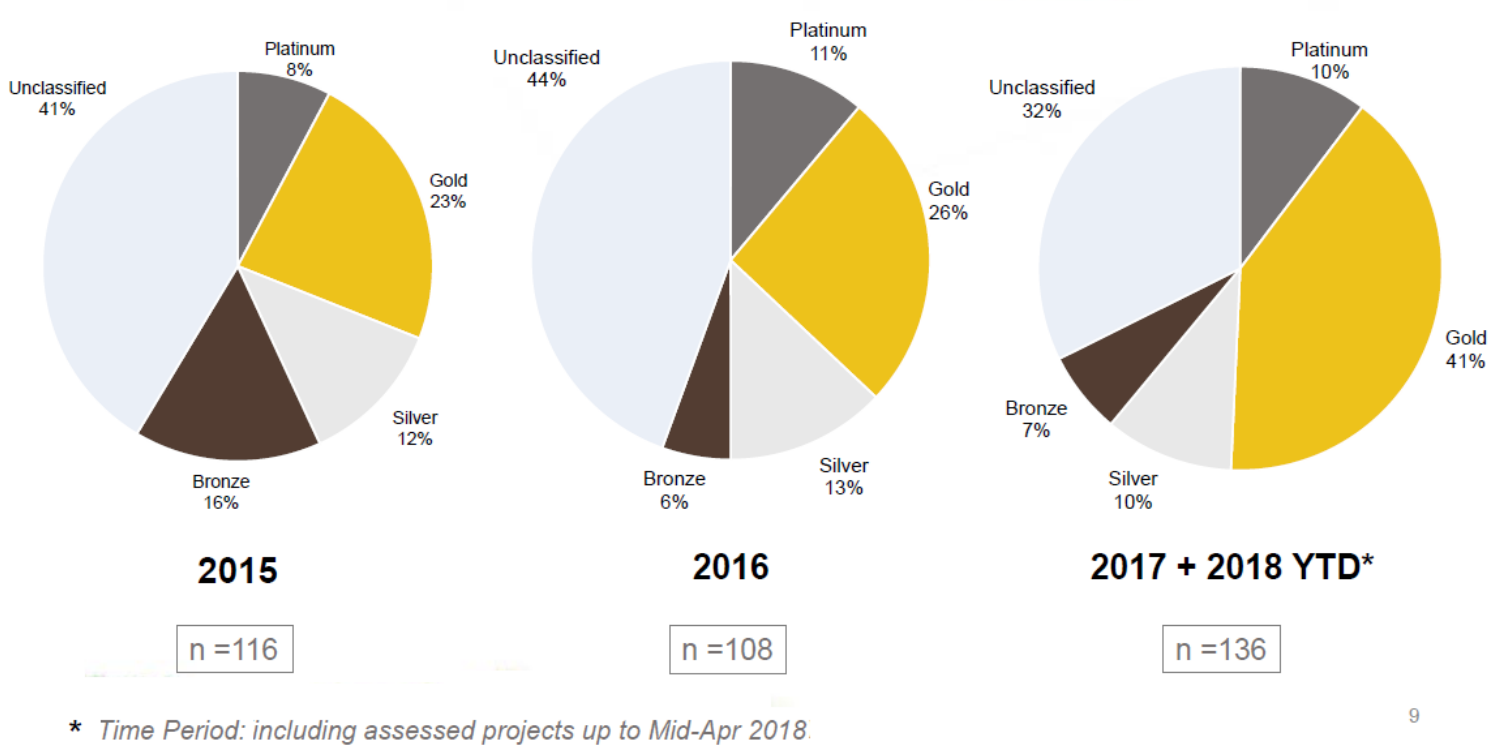

Figure 1 Grading distribution of NB projects in 2015, 2016 and 2017/18

SCORING

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

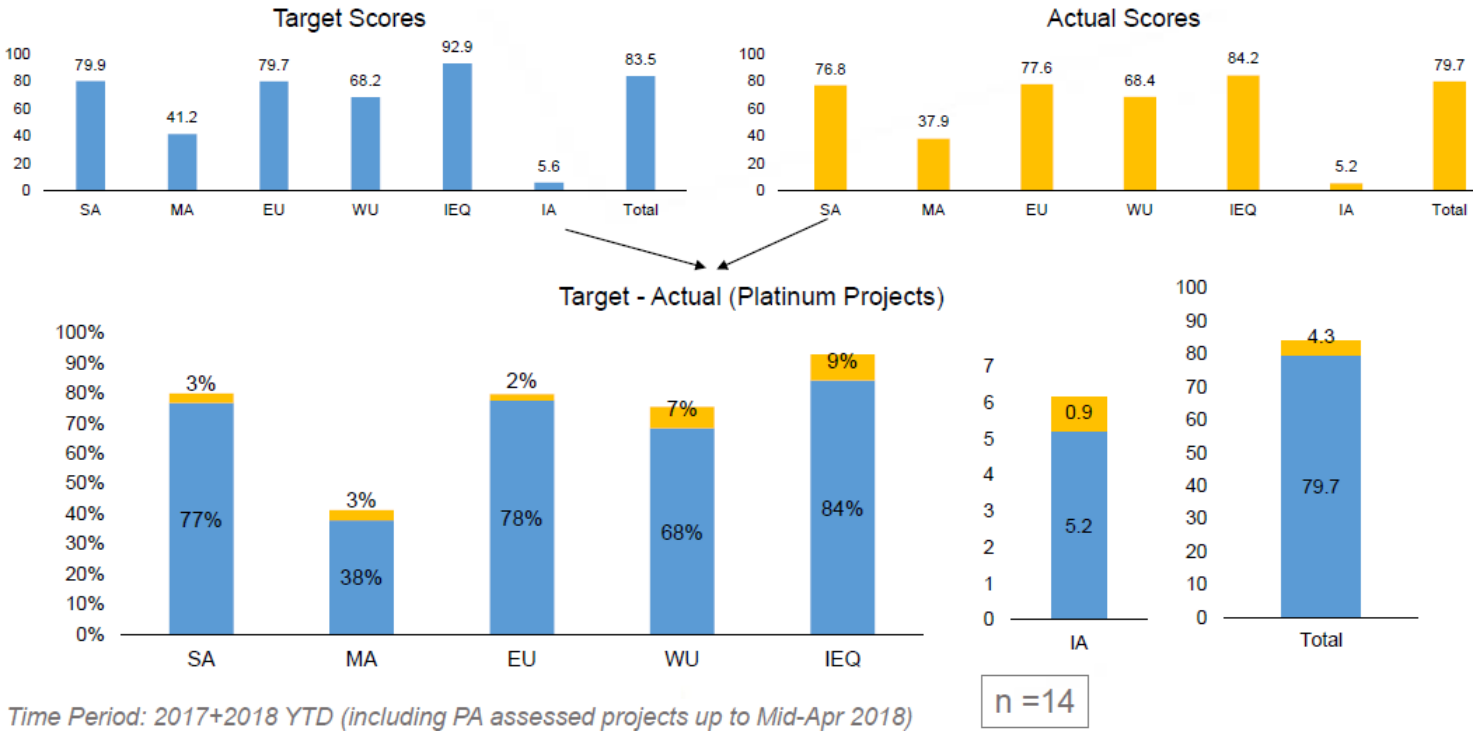

Figure 2 Target vs Actual Scores of PA Platinum NB projects

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

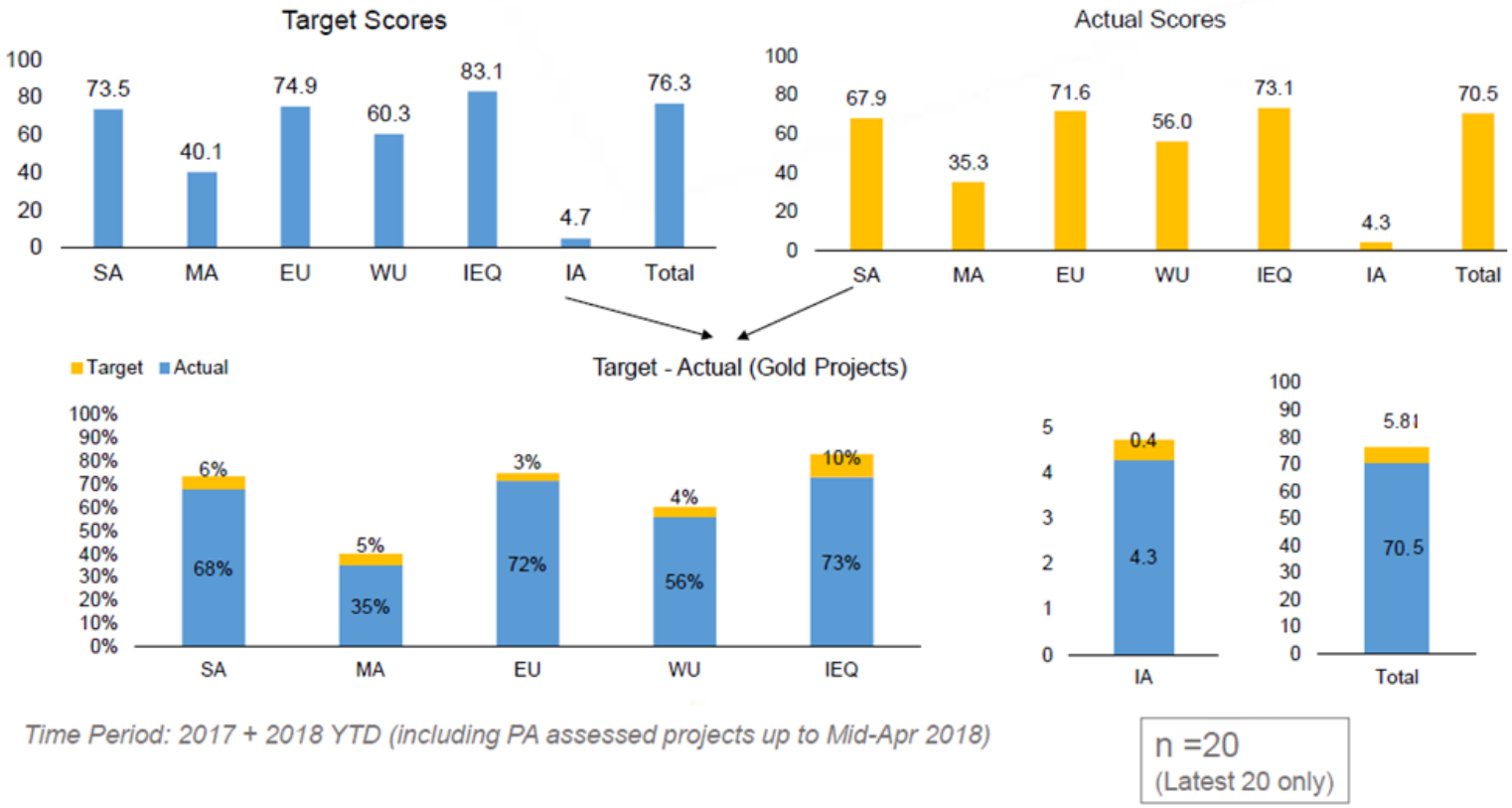

Figure 3 Target vs Actual Scores of PA Gold NB projects

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)

2017 + 2018 YTD

n (Gold or above): 69
n (all ratings): 136

	Credit	Gold or above	All
EU10d	Commissioning report	1.00	0.72
WU06	Effluent Discharge to Foul Sewers	1.00	0.69
MA08b	Avoid ozone depleting substance in insulation materials	1.00	0.68
EU10a	Commissioning Specifications	1.00	0.72
MA08a	Refrigerants (LCGWP + LCODP x 1e5 < 775)	1.00	0.67
EU10c	Commissioning (appoint agent, use approved forms)	1.00	0.72
EU11a	Operations and Maintenance Manual	1.00	0.73
IEQ04	De-odourising system for refuse collection rooms	0.99	0.70
SA13	Water Pollution During Construction	0.99	0.68
SA10	Environmental Management Plan	0.99	0.69
EU11b	Energy Management Manual	0.99	0.72
IEQ02	Plumbing and Drainage (venting, access, water seal …)	0.98	0.71
SA04	Site Design Appraisal (50% achievement of UDG)	0.97	0.67
IEQ07	Indoor Sources of Air Pollution	0.97	0.71
SA11	Air Pollution During Construction	0.96	0.66

Table 2 Least achieved credits (NB)

(nos. on RHS are the proportion of projects that attain full marks in the credit items; the green item is item with rising trend in achievement rate when compared to the previous two years; red items are those with declining trend in achievement rate when compared to the previous two years)

2017 + 2018 YTD

n (Gold or above): 69
n (all ratings): 136

	Credit	Gold or above	All
MA03	Prefabrication	0.11	0.05
WU04b	Grey water recycling	0.10	0.05
EU03B	Embodied Energy in Building Structural Elements	0.10	0.05
IEQ13b	Room air distribution	0.09	0.04
MA04b	Flexible engineering services	0.09	0.04
MA01B	Building Reuse (90% reused)	0.09	0.04
IEQ11b	Exhaust System for Tenant Fit-out	0.08	0.04
MA04c	Structural Adaptability	0.08	0.06
WU02	Monitoring and Control	0.07	0.04
MA04a	Spatial Adaptability	0.06	0.03
MA07b	Recycled Materials in Building Structure	0.03	0.02
SA01B	Site Contamination Assessment + Rehabilitation	0.02	0.01
MA07c	Recycled Materials in Interior Components	0.01	0.01
MA05	Rapidly Renewable Materials	0.01	0.01
IEQ19B	Impact Noise Isolation between floors	0.00	0.00

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	Sample (n)	% Average Reduction (exclude nil submission)
Platinum	69	26%
Gold	167	22%
Silver	76	17%
Bronze	70	16%

Time Period: 2010 - Present (including PA assessed projects up to Mid-Apr 2018)

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	Sample (n)	% Average Reduction (exclude nil submission)
Platinum	69	43%
Gold	167	37%
Silver	77	35%
Bronze	69	34%

Time Period: 2010 - Present (including PA assessed projects up to Mid-Apr 2018)

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

$$\text{Contested Rate} = \frac{Contested}{Total - NA - NS}$$

Gold or above, PA Projects n = 69

Credit		Contested Rate (%)	Total Submitted Projects
MA05	Rapidly Renewable Materials	100%	1
IEQ11b	**Exhaust System for Tenant Fit-out**	**73%**	**11**
IEQ19B	Noise Isolation	67%	6
IA01	**Innovative Techniques**	**60%**	**25**
MA07b	Recycled Materials - Building structure	60%	5
IA02	**Performance Enhancements**	**59%**	**59**
MA04c	Adaptability and Deconstruction - Structural adaptability	50%	10
MA04a	Adaptability and Deconstruction - Spatial adaptability	50%	8
MA07c	Recycled Materials - Interior Components	50%	2
EU09	**Energy Efficient Appliances**	**34%**	**35**
MA04b	Adaptability and Deconstruction - Flexible engineering services	33%	9

Credit		Contested Rate (%)	Total Submitted Projects
WU02	Monitoring and Control	33%	9
EU03	**Embodied Energy in Structural Elements**	**33%**	**61**
EU01P	Option 2 Alternative route: Passive Design	30%	10
EU03B	Embodied Energy in Building Structural Elements	30%	10
IEQ12a	**Ventilation in Common Areas - Ventilation by any means**	**29%**	**42**
IEQ10	**Background Ventilation**	**27%**	**15**
SA04B	**Site Design Appraisal**	**26%**	**54**
EU07	**Air-Conditioning Units**	**26%**	**31**
IEQ20	**Background Noise**	**26%**	**35**
IEQ13b	Thermal Comport in Air-Conditioned Premises - Room air distribution	25%	8
IEQ18	Room Acoustics	24%	29

Time Period: 2017+2018YTD (including PA assessed projects up to Mid-Apr 2018)

INNOVATIONS AND ADDITIONS

The IA1 (innovative techniques) items adopted by the 2017/18 NB projects include:

- Innovative BIM applications
- Innovative Internet Project Communication Centre (IPCC)
- Smart metering system
- Innovative design to reduce building footprint (hence reduce destroy to natural greenery)
- Re-use the existing structure for the new building
- Eco-friendly joss paper burner for residential development
- Underground stormwater chamber for flood management
- 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)
- 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
- IPCC
- Food waste decomposer
- Zero irrigation system (IA2 + WU3)
- 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 thirteen EB V2.0 Platinum projects. Their mean Target scores versus mean Actual scores 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.

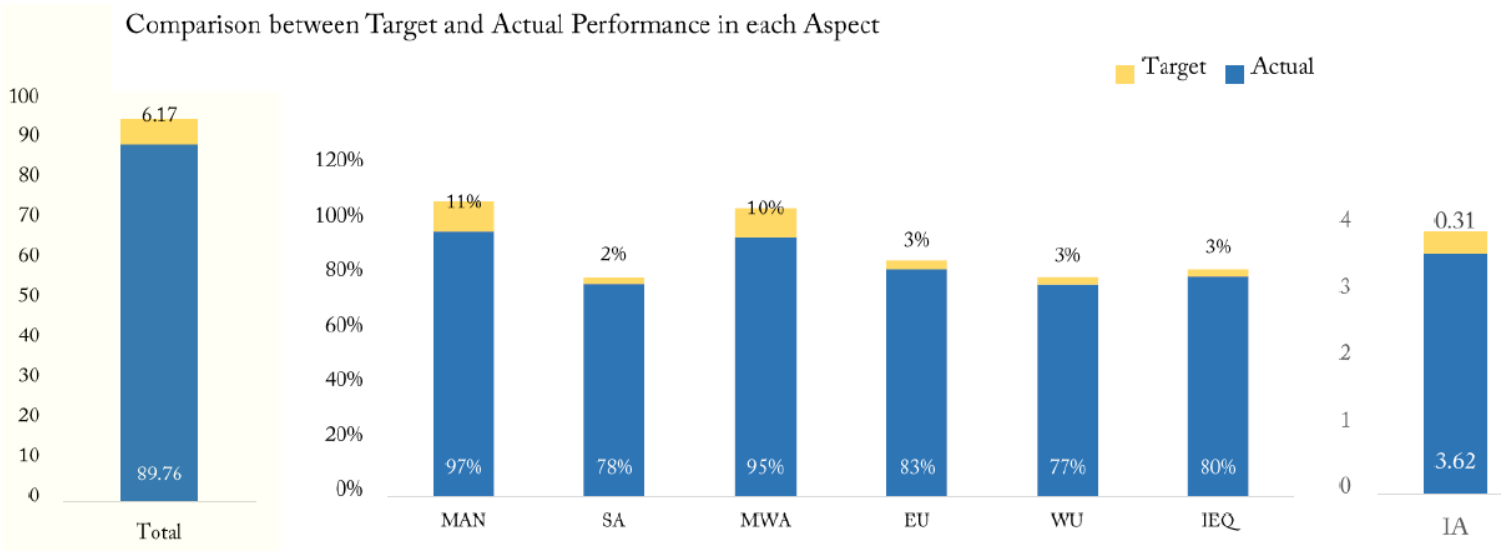

Figure 4 Target vs Actual Scores of EB V2.0 Platinum projects

Table 6 Most achieved credits (EB V2.0)

Credit		Achievement Rate
MAN02	Environmental, Social and Governance (ESG) Disclosure	100%
MAN02B	Environmental, Social and Governance (ESG) Disclosure	100%
MAN10	Integrated Pest Management	100%
SA06	Corporate Social Responsibility Facilities/ Services	100%
SA07	Amenities for Operation and Maintenance	100%
MWA04	Waste Management Plan	100%
MWA08a	Action to Waste Reduction - Implementation of the Waste Management Plan	100%
MWA08c	Action to Waste Reduction - Waste and Recycling Records	100%
EU01a	Energy Management - Energy Management Policy	100%
EU01c	Energy Management - Appointment of Energy Warden	100%
WU03	Cooling Tower Water	100%
WU07	Water Metering	100%
IEQ07	Control of Environmental Tobacco Smoke	100%
IEQ08	IAQ Monitoring	100%

Achievement means full mark 13 Platinum Projects

Table 7 Least achieved credits (EB V2.0)

Credit		Achievement Rate
MAN06c	Building Services Operation and Maintenance - Assessment of Operation & Maintenance Practice	0%
MAN12B	Green Lease	0%
SA04	Heat Island Reduction	0%
SA04B	Heat Island Reduction	0%
MWA01	Materials Purchasing Practices	0%
MWA01B	Materials Purchasing Practices	0%
MWA02B	Use of Certified Green Products	0%
EU04aB	Energy Benchmarking and Improvement - Benchmarking	0%
EU04bB	Energy Benchmarking and Improvement - Self-Improvement	0%
EU04c	Energy Benchmarking and Improvement - Peak Electricity Demand Reduction	0%
EU05B	Enhancement	0%
WU02B	Water Use For Irrigation	0%
WU04B	Water Recycling	0%
WU12	Quality Water Supply Scheme for Buildings – Flushing Water	0%
IEQ01	Building Users Satisfaction Survey on Indoor Comfort	0%
IEQ10B	Interior Lighting in Normally Occupied Areas	0%
IEQ11	Interior Lighting in Areas Not Normally Occupied	0%
IEQ14B	Noise Isolation	0%
IA05B	Provision of Electrical Vehicle Charging Stations	0%

Achievement means full mark 13 Platinum Projects

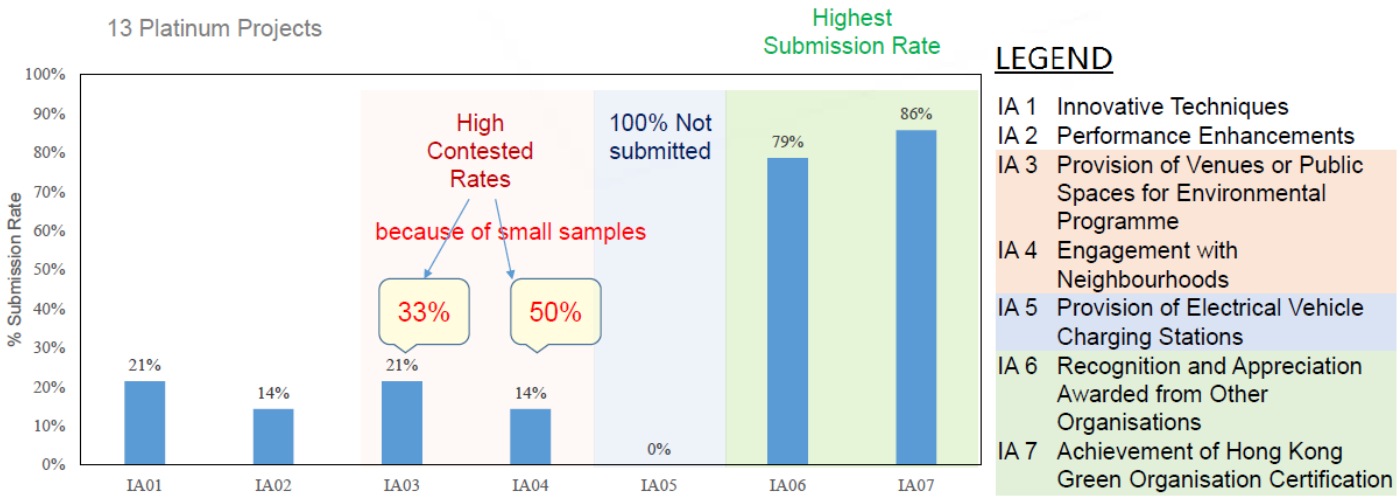

Figure 5 IA submission rates of EB V2.0 Platinum projects

BEAM Plus Interiors (BI)

The study also analysed the performance of twelve BI Platinum projects. Their mean category scores are given in Figure 6. The most achieved and least achieved credits are given in Table 8. The numbers of projects pursuing IV1 items are given in Table 9.

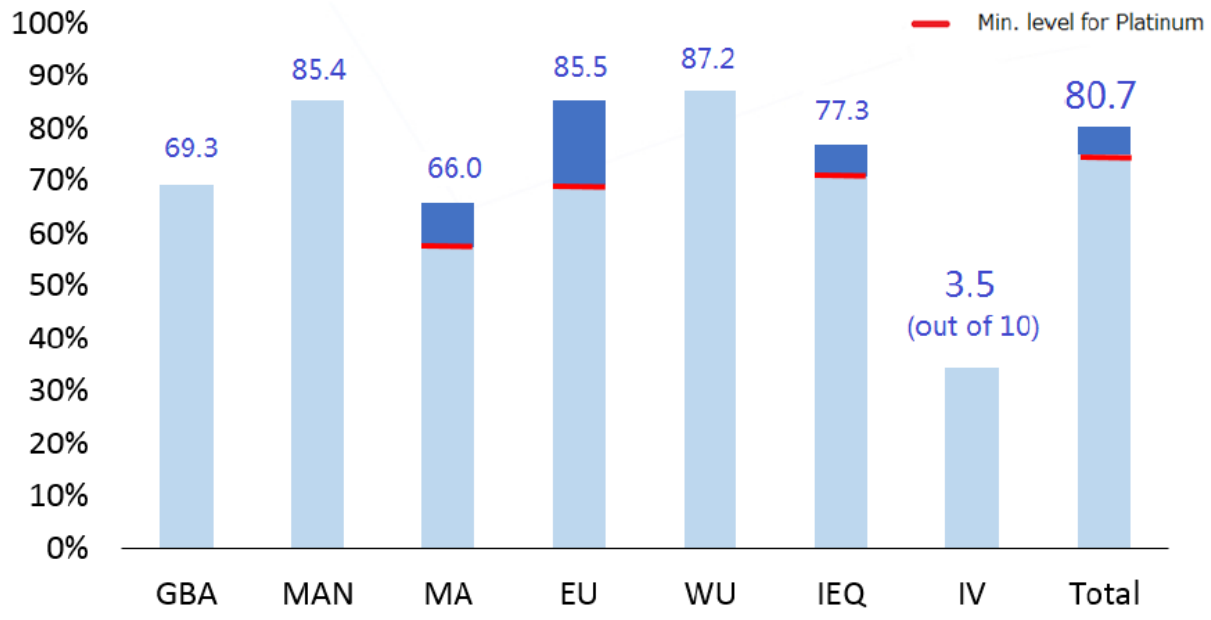

Figure 6 Mean category scores of BI Platinum projects

Table 8 Most and least achieved credits (BI)

Most Achieved Credits

	Credit	Achievement Rate
EU 4	Operations & Maintenance	100%
IEQ 1	Indoor Air Quality	100%
IEQ 3	Minimum Ventilation Performance	100%
IEQ 7b	Thermal Comfort - Relative humidity	100%
IEQ 7c	Thermal Comfort - Air movement	100%
MA 10	Ozone Depleting Substances	100%
MAN 3	Construction Noise	100%
MAN 6	User Guidance	100%
EU 3a	Commissioning - Commissioning planning	92%
EU 3b	Commissioning - Commissioning reports	92%
MA 1	Waste Recycling Facilities	92%
MA 6c	Sustainable Flooring Products - Environmentally Manufactured Materials	92%
MAN 1	BEAM Professional	92%
MAN 4	Green Cleaning	92%
WU 4	No Bottled Water	92%

Less Achieved Credits

	Credit	Achievement Rate
GBA 1	Green Building Attributes	15%
IEQ 11	Acoustics	15%
IEQ 6	Uncontrolled Ventilation (Air Tightness Test of Premises)	8%
MA 7a	Sustainable Ceiling Products - Rapidly Renewable Materials / Recycled Materials / Sustainable Timber	8%
MA 8a	Sustainable Wall and Door Products - Rapidly Renewable Materials / Recycled Materials / Sustainable Timber	8%
MA 9	Zero PVC	8%

12 Platinum BI Projects

Table 9 IV1 techniques adopted by BI Platinum projects

Listed innovations mentioned in **Appendix 9.4**

		No. of projects
1.	Real Time Energy Monitoring Display	5
2.	Outstanding Energy Performance	5
3.	IAQ Excellent Class	3
4.	Renewable Energy Systems	2
5.	Temporary protection made from recyceld materials	2
6.	Waste Recycle Facilities for business specific materials	2
7.	Certification	2
8.	Mixed mode ventilation systems	1
9.	Air-conditioning condensate reuse	1
10.	Energy/Carbon audit	1
11.	Partition System	1
12.	Efficient hot water heating	0

CONCLUSION

For NB, this study finds that the proportion of projects achieving Gold has expanded significantly in 2017/18 as compared to the previous years 2016 and 2015. Use of interior and structural materials with higher recycled contents is not yet popular and has room for further expansion. IEQ and IA are the two categories with relatively more contested cases. Moreover, IA2 is more popular than IA1 in terms of submission rate.

For EB V2.0, this study finds that the Platinum buildings are strong in MAN and MWA aspects. However, there is still room for increasing the adoption rates in green lease, heat island reduction, use of certified green products and provision of EV charging facilities.

For BI, this study finds that a wide range of IV1 and IV2 measures are adopted. Use of recycled or rapidly renewable materials is one possible area of improvement.

FURTHER INFORMATION

The above article gives selected key points 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/