

HKGBC ACT-Shop

Driving Retro-commissioning to The Private Sector

18 MAY 2017



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2. ACT-Shop Active Training
3. Way Forward – Any Opportunities

RECAP -

ACT-SHOP CASES

First Batch - Saving Summary

Suggested Re-tuning Work	Bldg A	Bldg B	Bldg C	Bldg D	Bldg E
Internal Floor Area (m ²)	36,218	4,485	150,000	45,000	20,349
Chillers					
Reduce chiller operation (N-1) to achieve higher overall COP	5-6% <1 year		3-5% 3-5 year		3-5% <1 year
Increase Tcws	1-3% <1 year		1-3% <1 year		1-3% <1 year
Max. demand shedding	0-1% <1 year	1-3% <1 year	0-1% <1 year	1-2% <1 year	0-1% <1 year
Pumps (chilled water flow)					
Re-tune bypass valve setting			1-3% <1 year	1-3% <1 year	1-3% <1 year
Install differential pressure sensors at the critical path	1-3% <1 year				1-3% <1 year
Install VSD on the existing chilled water pumps	N/A	3-5% 3-5 year	3-5% 3-5 year		N/A
Cooling towers					
Reactive cooling tower (CT) optimisation	N/A	N/A	1-3% <1 year	N/A	1-3% <1 year

Second Batch – General Summary

- Target Participant
 - 20+ Developers in Hong Kong
 - 5+1 participants

Total Floor Area Summary

Batch 1	Batch 2
250,000 m ²	1,100,000 m ²

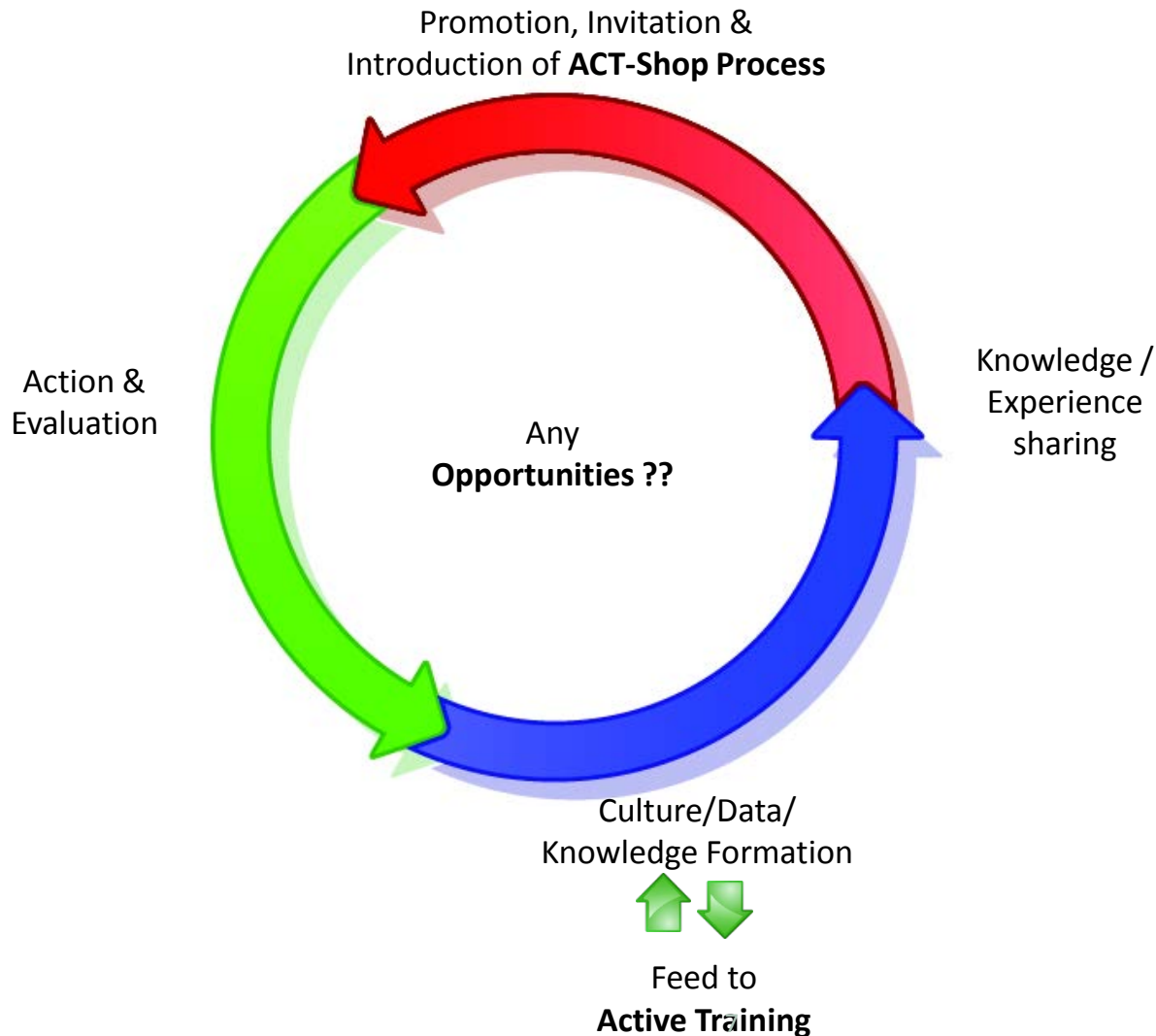
2nd Batch Summary

<u>Building Case</u>	<u>IFA (m²)</u>	No. of Chiller Plant
F	693,371	5
G	97,986	2
H	95,122	4
I	96,518	3
J	72,299	2
K	7,600	2

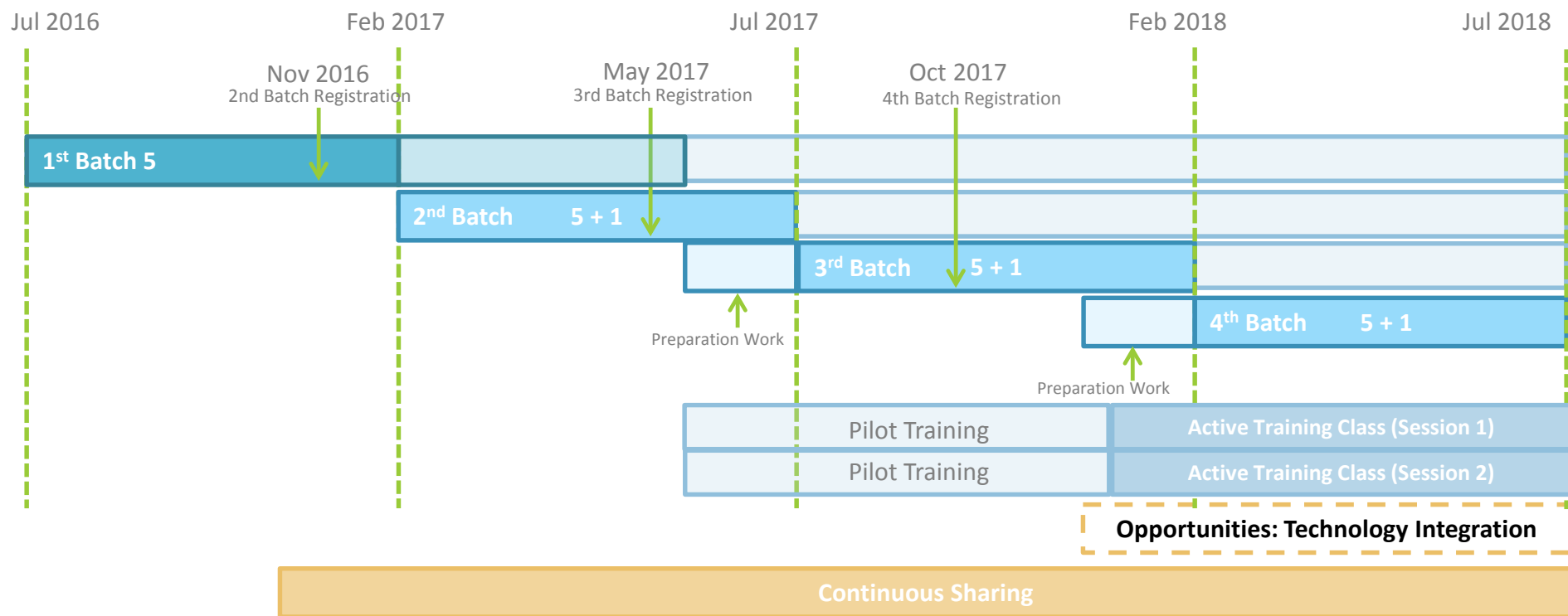
ACT-SHOP

ACTIVE TRAINING

Sustainable / Organic model



Programme Timeline – ACT-Shop Series



ACT-Shop Series

ACT-Shop

- Build up knowledge & competence of the participating building operators/services providers
- Target
 - At least one building from the 20+ large commercial building owners + a few other pilot cases
 - On-going knowledge update

Active Training

- Reinforcement and Extending to Industry

Technical integration

- Facilitate development of BIM & fully utilisation of BMS

Continuous Sharing

- Forums
 - Experience sharing with EMSD & Industry
 - Best Practice Notes
-

Active Training



Objectives

- Knowledgeable client
- Knowledgeable services providers
- Knowledgeable services / product



**As a MAINSTREAM in
Industrial O&M
Practices**



Active Training



Target Participants

- Building Managers / Engineers / Operators
 - Service / Product Providers / Contractors
- Work Together
- Mode of training - Semi-ACT-Shop
 - **Go through** the essential **process** of retro-commissioning
 - **Use real data** from participants' buildings
 - Participants are expected to:
 - Have **in-depth knowledge/skills** and know how retro-commissioning works
 - **Lead** in-house team / service provider to carry out retro-commissioning
 - Provide **specification & requirements** to service providers when contract out the process

Active Training



Training module for pilot being establishing Module Structure

- Theory
 - Basic theories on HVAC relating to energy efficiency
 - Basic mathematical and analytical methods used during the training
- Knowledge based retro-commissioning based on real case and data
 - Data collections, screening and data analysis,
 - Identifying opportunities
 - Saving estimates and evaluation
 - Practical methods on implementing improvements
 - Measurement and verification
 - Exercises with participants' data
- Technology sharing by suppliers
 - Performance characteristics of major equipment/BMS/services/design
 - New technologies
- Industry updates
 - Government, other institutions or other speakers
- Group or individual project (optional)
 - An energy saving project report demonstrating what has learnt (saving estimation, implementation, measurement & verification)
- Future modules on knowledge based energy management

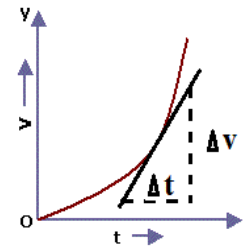


WAY FORWARD – ANY OPPORTUNITIES



Extending

Accelerating



Leveraging on commercial values

- Merge technology with people
- Hotels and FM managed buildings
- Create value and edge for Facility management companies
- Include services/product providers for ACT-Shop and training
- Link available incentive schemes

Government
/institutional



Large
consumers/self-
owned



Buildings managed by
FM



Hotel



Other multi-owned
buildings



Pilots, Tech. Guide

ACT- Shop, active training

Integrating technology -
people

Creating value and edge for
FM

Developing data/experience
for hotels

Incentive opportunities





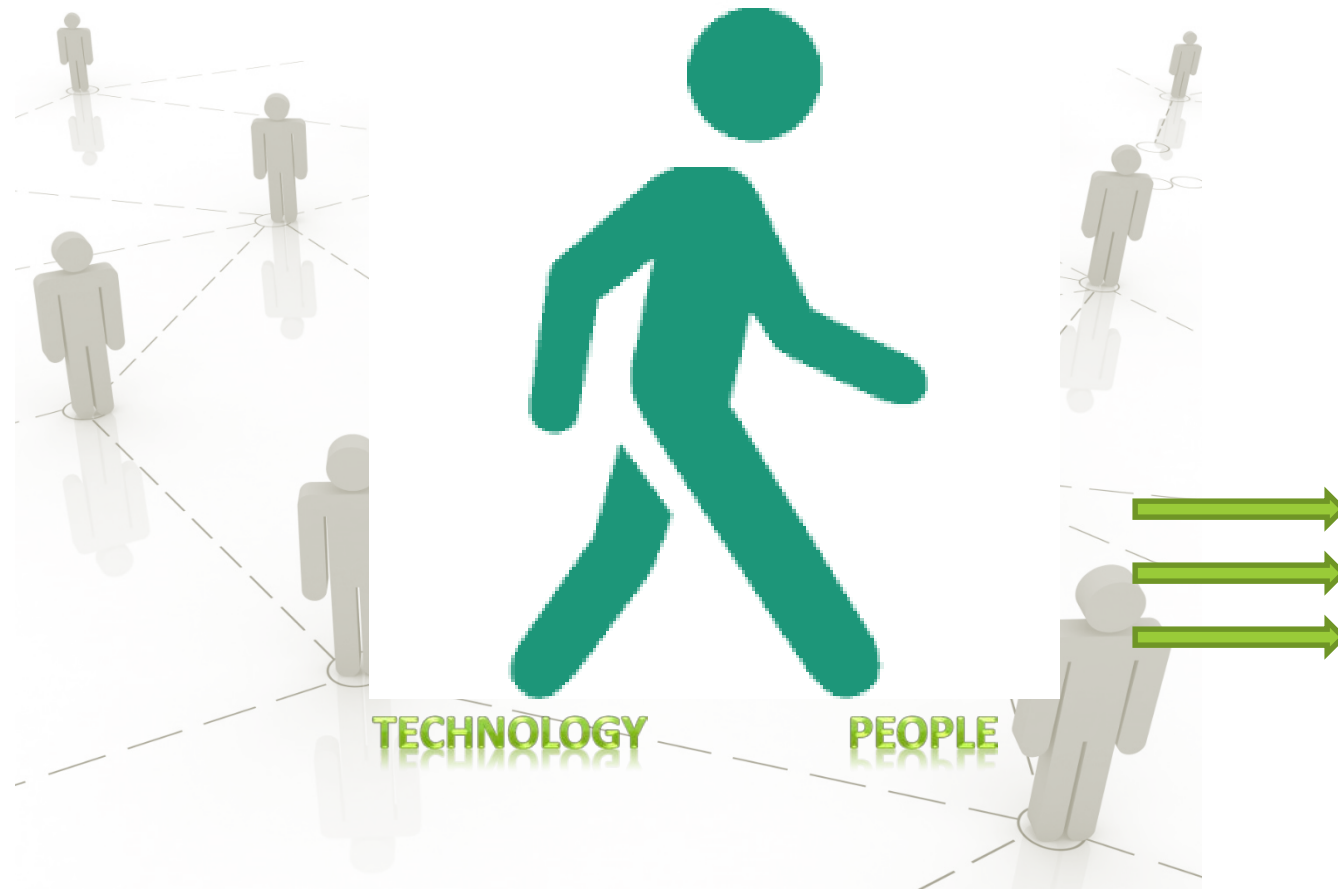
Will Facility managers be interested in selling RCx ?



Considerations

- Growing demand from client on energy saving and green operation
- Corporate branding on CSR
- Create value for client at a low cost as RCx focuses on low cost optimisation
- Trained on-site staff can carry out the work
- An added edge to secure FM contracts
- Get additional remuneration on managing retro-fitting works

Moving Forward



Technology & People Integration

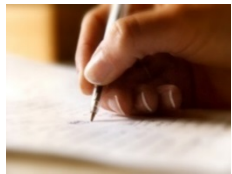
- Pneumatic Control
- Gauges, thermometer, utility metres

- Digital Control
- Functional automation

- Natural Curve Control
- Data/Information Display

- Building Analytic & Smart grid system

Technology



PUT TO USE

Knowledge-based

ACT-Shop

Drivers

PEOPLE

Experience-based

User's Needs



Questions



How good?
How bad?



Are we getting better?
Benchmarking picture?

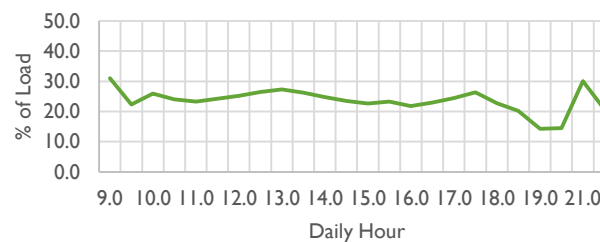


Any actions to improve
system performance?

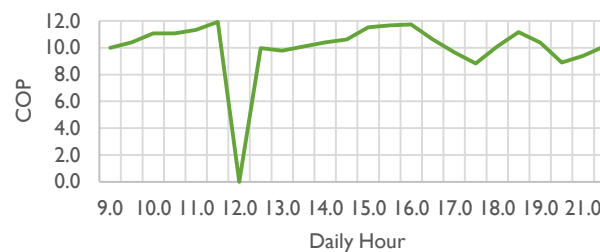


Solutions

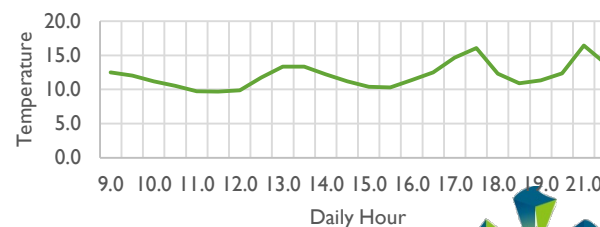
Chiller Load Percentage Daily Profile



Coefficient of Performance Daily Profile



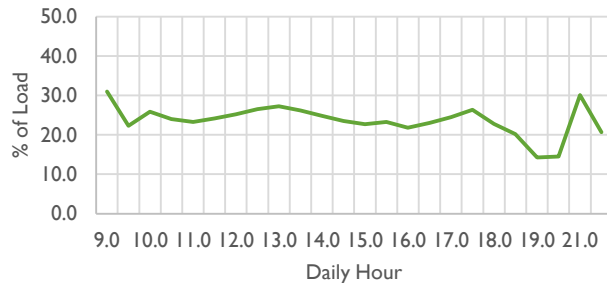
Approach Temperature Daily Profile



Customising User's Needs

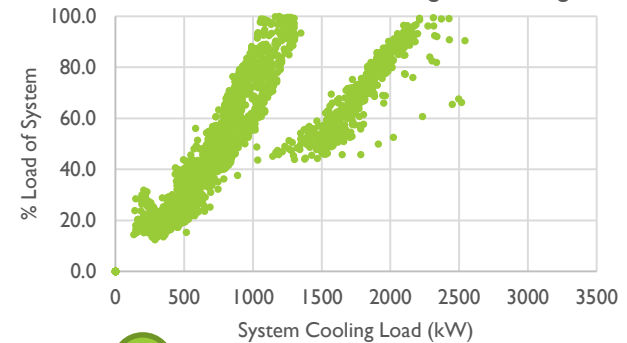
How good? How bad?

Chiller Load Percentage Daily Profile



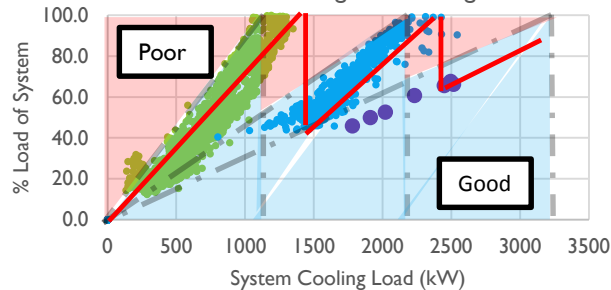
1 Daily Profile from Logsheet / BMS

Chiller Load Percentage vs Cooling Load



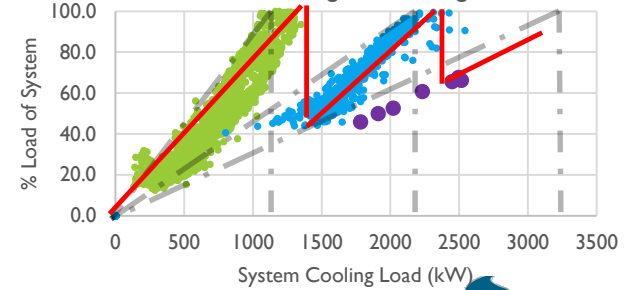
2 Plotting parameters against demand and weather condition

Chiller Load Percentage vs Cooling Load



4 Identify "Good" and "Poor" Area

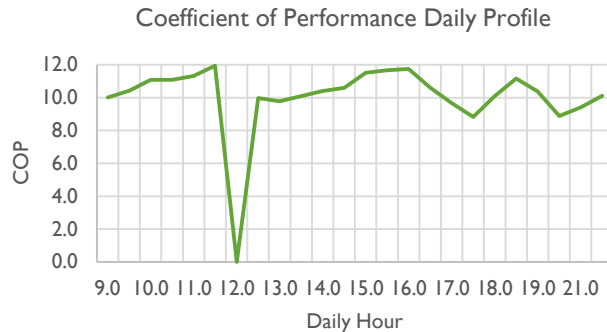
Chiller Load Percentage vs Cooling Load



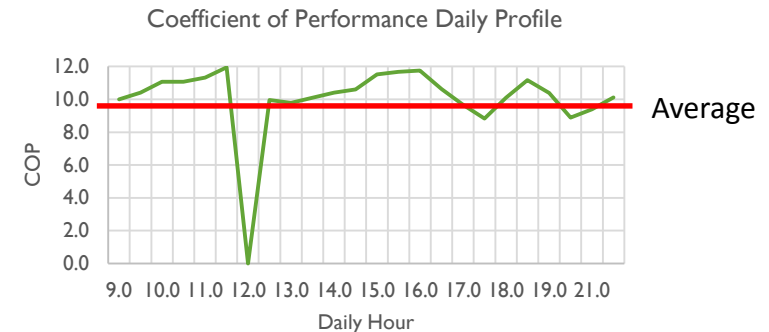
3 Draw Design Curve & Customisation Curve

Customising User's Needs

Are we getting better? Benchmarking picture?



1 Daily Profile from Logsheet / BMS



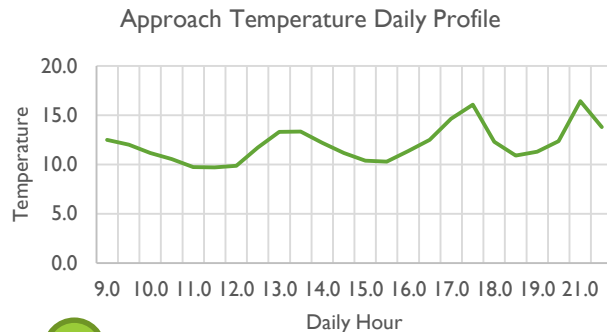
2 Identify average base line from varies time interval



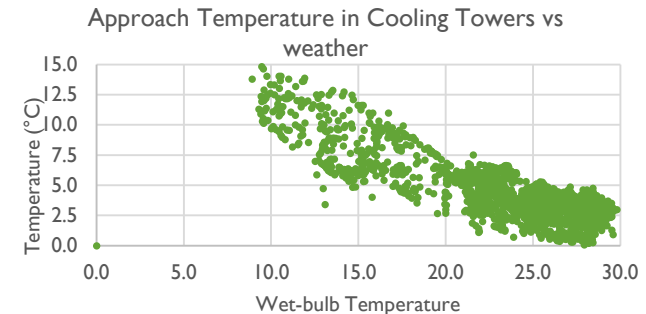
3 COP Customisation Benchmarking

Customising User's Needs

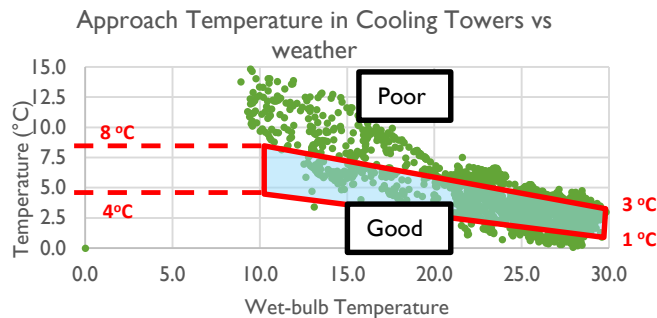
Any actions to improve system performance?



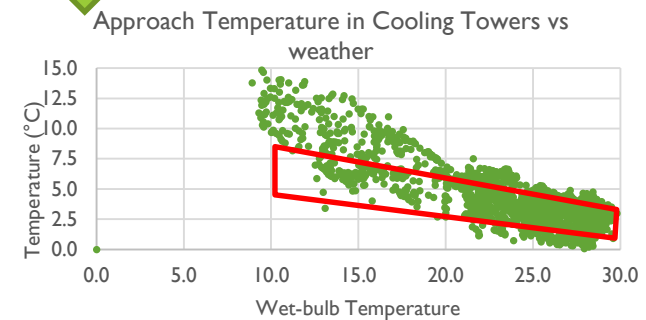
1 Daily Profile from Logsheet / BMS



2 Plotting parameters against weather condition



4 Evaluate space of improvement



3 Draw upper limit and lower limit boundary

*Thank
you*

Invitation for Expression of Interest (Eoi) to Participate as the “ACT-Shop” Pilot Project:

www.hkgbc.org.hk/eng/Eoi.aspx

