



Tender Ref No: JTC22T0033

28 June 2022

To: All Applicants

## **CORRIGENDUM NO. 2**

### **JTC INNOVATION CHALLENGE 2022**

#### Challenge Statement 3: Real time automated optimisation of air-conditioning system

Please take note of the following clarifications to the above Innovation Challenge in response to queries raised by applicants, which shall form part of the original Innovation Challenge document issued.

<b>S/N</b>	<b>Query</b>	<b>Response</b>
<b>General</b>		
1	What is the percentage (%) for the overheads or indirect cost for all challenge statements?	IHLs and Research Entities can price in their Overheads as a line item in Section C of the Proposal.
<b>Challenge statement: Real time automated optimisation of air-conditioning system</b>		
2	What is the benchmark for efficiency of chiller system?	If you would like to reference the GESPC benchmark, it is 0.629 kW/RT
3	Can we proposed for entire building	Yes if you are able to work within the budget. But for budgeting purposes, we are currently limiting it to the stated levels.
4	Are you open to cloud solution?	We are open to all relevant and plausible solutions proposed.

S/N	Query	Response
5	Are you open to installing physical sensors?	We are open. Do provide the type of sensor and its purpose in the submission.
6	Does the Air-conditioning System comes with Variable Speed Drive (VSD)? If yes, does it link with the Building Management System (BMS)?	Air handling Unit (AHU), Chilled water pump (CHWP) and Cooling Towers(CT) comes with VSD. They are all linked to the BMS.
7	The thermal comfort conditions for different areas such as badminton hall and data center should be different. Is there any pre-defined/preferred thermal comfort conditions i.e. indoor temperature & relative humidity, etc. for each specific room?	For badminton hall, the space is conditioned via AHU/VAV network and based on a room temperature set point 23 to 25°C. For data centre, there is a separate Computer Room Air Conditioning (CRAC) system, which is not linked to BMS.
8	Is the Comfy integrated with JCI BMS?	Comfy is currently only sending signals (via Comfy gateway) to JCI BMS to the respective VAVs to open the damper to 70% for 10 mins. After 10 mins, damper will return to the original settings.
9	Are all the staff in JTC summit using the Comfy app to adjust the thermal comfort level?	The Comfy app does not adjust the thermal comfort, but rather it introduces more airflow upon request to cool the space.
10	Can we use the data from Comfy for the occupant comfort level?	Comfy data should only be used as an indication that the space might be experiencing some form of warmth or coldness. This is because individual user requests are ad hoc, hence it should not be completely used to determine the occupant comfort level.
11	What's the communication protocol?	Currently, Comfy's gateway is hardwired to Summit's BMS.
12	For the occupants comfort level evaluation, will it be a dedicated team for this challenge or all the staff inside the JTC summit?	Applicants can propose the approach to measure occupant comfort and the subsequent method of evaluation..

S/N	Query	Response
13	Can we request for chiller plant & AHU equipment data sheet.	Yes available.
14	Can we request for major equipment and device datasheet such as Chiller, AHU, pump, fan, VFD, valves	Please see <b>Annex A</b> .
15	Can you advice on the size and power rating of the AHU/FCU? Alternatively, we can source if you can provide the brand and model.	
16	How many AHUs can be used for this challenge?	
17	Based on your slides, we will prioritise on the chiller water systems and the air side systems for level 1 (meeting rooms), Level 2 (auditorium), level 4 (badminton halls), level 6 (data centre and office), level 9 (offices), and level 10 (data centre). Can you advice on the no. of chiller water systems, no. of cooling tower and no. of air side systems (AHU/FCU) servicing these areas?	<p>The number of equipment are as follows:            Chillers: 4            Cooling Towers: 5            AHUs:</p> <ul style="list-style-type: none"> <li>L1: 4 AHUs</li> <li>L2: 6 AHUs</li> <li>L4: 2 AHUs</li> <li>L9: 2 AHUs</li> <li>L10: 2 AHUs</li> </ul> <p>For L10, there are separate CRAC units that are <b>not</b> connected to BMS.</p>
18	Will asset register be made available (i.e. Number of pump, rating of the pumps, equipment controlled by BMS). needed to compute some savings.	Refer to the responses to S/N 13 to 17.
19	Does the JCI BMS include the lighting control?	Yes, It includes lighting schedules.
20	Can you advice on the parameters readout from your BMS system such as energy consumption, temperature, humidity, CO <sub>2</sub> , flow rate, etc. on the chiller plant and air side systems? Can the BMS provide additional information such as cooling load, Total system efficiency, and Total system heat balance?	<p>Yes, most of these points are available; however, some may require replacement.</p> <p>We will provide the trendlog to the successful applicant, if requested.</p>

Corrigendum No. 2

Yours faithfully,

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(This is an electronic document. No signature is required)