

## Part 1                      Energy Efficiency

### EC 1-2                      Air-conditioning System

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Criteria	Credit Available	Credit Claimed
(a) Option 1: Fixed Metrics	33	
<b>OR</b>		
(b) Option 2: EUI Benchmarking	33	

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#### Strategies:

**Documentary Evidences:**

*Order of documents to be submitted accordingly and clearly labeled.*

	Actual Assessment	Submitter	Assessor
1.	Detailed calculations of the overall improvement in equipment/system efficiency of the air-conditioning plants/ showing the design cooling system capacity and the system efficiency (including individual equipment efficiency).	<input type="checkbox"/>	<input type="checkbox"/>
2.	Calculation and technical data of the designed system efficiency of chillers at part load condition.	<input type="checkbox"/>	<input type="checkbox"/>
3.	Technical product information of all air-conditioning and system which included chillers, chilled water pumps, condenser water pumps, cooling towers.	<input type="checkbox"/>	<input type="checkbox"/>
4.	Schematic drawings showing the air-conditioning system	<input type="checkbox"/>	<input type="checkbox"/>
5.	Schedules of the air-conditioning system.	<input type="checkbox"/>	<input type="checkbox"/>
<i>Air Distribution System</i>			
1.	Detailed calculations of the overall improvement for air distribution system.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Technical product information of all AHUs, FCUs, and etc.	<input type="checkbox"/>	<input type="checkbox"/>
3.	AHUs and FCUs schedule and schematic drawing	<input type="checkbox"/>	<input type="checkbox"/>
<i>Provision of permanent measuring instrument</i>			
1.	Instrument's calibration certificates from accredited laboratory or batch calibration certificates from manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Summary of instruments, standard and measurement accuracy to be presented in the prescribed format.	<input type="checkbox"/>	<input type="checkbox"/>
3.	Technical specification of the digital power meters, flow meters and temperature sensors.	<input type="checkbox"/>	<input type="checkbox"/>

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*Verification of water-cooled chilled water plant instrumentation*

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|----|--|--------------------------|--------------------------|
| 1. | Computation of the percent heat balance that is the total heat gain and total heat rejected must be within $\pm 5\%$ for 80% of the sampled credits over the normal building operations hours accordance with AHRI550/590. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Detailed calculations of the overall uncertainty of measurement of the resultant chiller plant efficiency in kW/RT to be within $\pm 5\%$ of the true value based on instrumentation specification.                        | <input type="checkbox"/> | <input type="checkbox"/> |

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*(f) and (g)*

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|----|--|--------------------------|--------------------------|
| 1. | Extracts of the tender specification showing the requirements to incorporate these control devices.    | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Plan layouts showing the locations and the types of control devices used to regulate fresh air intake. | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Technical product specification of the control devices.  | <input type="checkbox"/> | <input type="checkbox"/> |

Site Verification		Submitter	Assessor
1.	Detailed calculations of the overall improvement in equipment/system efficiency of the air-conditioning plants/ units showing the design cooling system capacity and the system efficiency (including individual equipment efficiency).	<input type="checkbox"/>	<input type="checkbox"/>
2.	Calculation and technical data of the designed system efficiency of chillers at part load condition.	<input type="checkbox"/>	<input type="checkbox"/>
3.	Technical product information of all air-conditioning and system which included chillers, chilled water pumps, condenser water pumps, cooling towers and its purchase and delivery orders.	<input type="checkbox"/>	<input type="checkbox"/>
4.	As-built schematic drawings showing the air-conditioning system.	<input type="checkbox"/>	<input type="checkbox"/>
5.	As-built schedules of the air-conditioning system.	<input type="checkbox"/>	<input type="checkbox"/>
6.	Photographic evidences	<input type="checkbox"/>	<input type="checkbox"/>
7.	Test and commissioning report of the air conditioning system	<input type="checkbox"/>	<input type="checkbox"/>

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*Provision of permanent measuring instrument*

1.	Detailed calculations of the overall improvement for air distribution system.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Technical product information of all AHUs, FCUs and its purchase and delivery orders.	<input type="checkbox"/>	<input type="checkbox"/>
3.	As built schedule and schematic drawing for the AHUs and FCUs	<input type="checkbox"/>	<input type="checkbox"/>

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*Verification of water cooled chilled water plant instrumentation*

1.	Instrument's calibration certificates from accredited laboratory or batch calibration certificates from manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Schematic drawing showing the location of the digital power meters, flow meters and temperature sensors.	<input type="checkbox"/>	<input type="checkbox"/>
3.	Summary of instruments, standard and measurement accuracy to be presented in the prescribed format.	<input type="checkbox"/>	<input type="checkbox"/>

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*Verification of water cooled chilled water plant instrumentation*

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|----|---|--------------------------|--------------------------|
| 1. | Computation of the percent heat balance that is the total heat gain and total heat rejected must be within $\pm 5\%$ for 80% of the sampled credits over the normal building operations hours accordance with AHRI 550/590. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Operating system efficiency during building operations hours  | <input type="checkbox"/> | <input type="checkbox"/> |

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*(f) and (g)*

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|----|---|--------------------------|--------------------------|
| 1. | As-built plan layouts showing the locations and the types of control devices used to regulate fresh air intake. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Product catalogue and its purchase / delivery order of the control devices and CO2 sensor                       | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Photographic evidences during installation.   | <input type="checkbox"/> | <input type="checkbox"/> |