How to Complete the Detailed Technical Application

July 02, 2019
Today’s Presenters

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Available to Answer Questions

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Manager, Rocky Mountain Institute
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# Housekeeping & Agenda

## Housekeeping
- Webinar is being recorded
- Ask questions in the chat area by clicking on the question mark on the right side of your screen
- All past webinars are available on the past events page of the Global Cooling Prize Website

## Agenda
1. The Global Cooling Prize Timeline
2. The Detailed Technical Application
3. Performance Evaluation of your Cooling Solution
4. Questions
Global Cooling Prize Timeline
Global Cooling Prize will continue for a period of two years

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 12, 2018</td>
<td>Participant portal launched and Intent to Apply form opened</td>
</tr>
<tr>
<td>June 30, 2019</td>
<td>Deadline to submit Participant “Intent to Apply”</td>
</tr>
<tr>
<td>August 31, 2019</td>
<td>Deadline to submit Detailed Technical Application</td>
</tr>
<tr>
<td>July - October 2019</td>
<td>Evaluation of Technical Applications and Selection of Finalists</td>
</tr>
<tr>
<td>November 2019</td>
<td>Announcement of up to top 10 finalists and Finalist Ceremony</td>
</tr>
<tr>
<td>November 2019 - April, 2020</td>
<td>Prototype development phase</td>
</tr>
<tr>
<td>May – September 2020</td>
<td>Prototype testing in India</td>
</tr>
<tr>
<td>October - November 2020</td>
<td>Final Evaluation, Presentations and Award Ceremony</td>
</tr>
</tbody>
</table>
The Detailed Technical Application
All judging will be done by the Technical Review Committee

Omar Abdelaziz
Managing Director, CLEAT Consulting (Formerly at Oak Ridge National Laboratory)

William Sisson
Executive Director, North America, World Business Council for Sustainable Development

Iain Campbell
Senior Fellow, Rocky Mountain Institute and Chairperson of the Technical Review Committee

Dr. Sukumar Devotta
Former Director, Council of Scientific and Industrial Research-National Environmental Engineering Research Institute (CSIR-NEERI)

Gabby Dreyfus
Senior Scientist, Institute for Governance & Sustainable Development

Prof. S C Mullick
Former Professor, Indian Institute of Technology Delhi

Prof. Srinivasa Murthy
Professor, Interdisciplinary Centre for Energy Research (ICER), Indian Institute of Science Bangalore

Dr. Toby Peters
Professor, Cold Economy, University of Birmingham

Nihar Shah
Deputy Leader, International Energy Studies Group, Lawrence Berkeley National Laboratory
1. Terms and Conditions

- Can also be accessed at: https://applicant.globalcoolingprize.org/terms/
- Must be accepted to submit your application

If you don’t check this box, you won’t be able to submit your application.

**Tell us about your team**
- Team leader and correspondence details (section 4.1 – 4.5)
- Organization and team members (section 5.1 – 5.5)
- Partner organizations and its members (section 5.6 – 5.7)

**Provide information on Intellectual Property Rights**
- Provide details on your IP, if you hold or have filed (6.1 – 6.2)
- Teams are responsible for the protection their IP and for ensuring they do not infringe on any third party IP rights, including the rights of their organization if their organization has IP ownership provisions for the designs developed by its employees.
- Teams should take any and all measures to secure IP rights prior to submitting the technical application.
- We will endeavor to ensure that your submissions are handled appropriately during the review process so as to maintain confidentiality.

- If you select “Individual” in section 4, you do not need to fill out section 5 – *About your organization*.
- If you want to update your team members or organization details from the Intent to Apply form, you may do so.
- If you have more than one idea and want to submit multiple technical applications, you must choose a different team leader to submit it.
- All three of these sections will not affect your final score, but are for our information to ensure timely and accurate communications.
7. About Your Proposed Cooling Solution

**7.1 Core Innovation**
- Brief discussion on the key innovation of your cooling solution.
- Include innovation in component, materials, design etc.

**7.2 Detailed description**
- Details on underlying principle and process.
- Details of key components, working fluids, controls etc.

**7.3 Schematic**
- Upload a schematic showing complete process flow.
- Label all components, power/heat source.

**7.4 Technology readiness level**
- Provide the readiness level of your solution.
- Use the link provided in application for assessment.
- Submit any photo or test results.
8. Performance of the cooling solution will be compared to the baseline AC unit’s performance

**Baseline AC unit details**

- A 1.5 TR (5.3 kW), fixed speed, EER 3.5 W/W room air conditioner (RAC) using R22 refrigerant that is...
- Installed in a space with total cooling load of 1.5 TR in a composite climate like New Delhi, India
- Consumes 2,969 kWh/year based on maintaining indoor conditions below 27°C DBT and 60% RH at all times over the full year
- Has an installed cost to consumer of about US $534 (excluding any standard installation labor costs and taxes)

**Old baseline refrigerant:** R410A with GWP 2088 (IPCC AR4 report)

**Revised baseline refrigerant:** R22 with GWP 1760 (IPCC AR5 report)

**Reason for update:**
- Baseline AC unit should be reflective and representative of the most commonly sold RAC by the industry leader with the highest market share in India.
- Baseline RAC unit identified earlier is no longer being produced in the market.
- Ensuring consistency in comparing all the cooling solutions with the same baseline AC unit across all stages of the prize.

**Old baseline cost:** US $546, based on 2017 USD to INR exchange rate

**Revised baseline cost:** US $534, based on 2018 USD to INR exchange rate

**Reason for update:**
- Actual retail price of the baseline AC unit (excluding installation labor cost and any taxes) procured for testing purposes.
- Update to the currency exchange rate base year.
Performance Evaluation of your Cooling Solution

Requirements for each prize criteria
9. Climate Impact criteria (1/4)

- Your proposed cooling solution must have one-fifth or 80% lower climate impact than the climate impact of baseline AC unit.

- Through a combination of reduced grid electricity consumption and low GWP refrigerant (if any is used) considering 80:20 weighting for electricity and refrigerant respectively, to arrive at the overall climate impact.

- Points will be awarded ratably between 0 – 100 based on level of reduction achieved from the baseline i.e. 0 points for no reduction and 100 points for 100% reduction.

- Minimum 80 points are required to compete in the competition.

**Example evaluation of the climate impact:** Consider a proposed cooling solution that has ISEER 5.2 W/W rating consuming 1336 kWh/year and using R290, a hydrocarbon refrigerant with a GWP of 3.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Proposed cooling solution</th>
<th>% reduction achieved</th>
<th>Assigned Weight</th>
<th>Weighted Score</th>
<th>Total Achieved reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid Electricity Consumption</td>
<td>2969</td>
<td>1336</td>
<td>55%</td>
<td>80%</td>
<td>44%</td>
<td>~64%</td>
</tr>
<tr>
<td>Refrigerant GWP</td>
<td>1760</td>
<td>3</td>
<td>99.8%</td>
<td>20%</td>
<td>19.97%</td>
<td></td>
</tr>
</tbody>
</table>

Use the Prize Criteria Tool ([to be updated soon to reflect the new baseline GWP](https://globalcoolingprize.org/prize-details/prize-criteria-tool/)) to assess the climate impact score of your cooling solution. Access it [here](https://globalcoolingprize.org/prize-details/prize-criteria-tool/).
9. Climate Impact criteria (2/4)

Steps to complete the Climate Impact criteria section

- Study the hourly cooling loads profile for a typical apartment in climate conditions of New Delhi, India.
- Determine the annual electricity consumption of your cooling solution to meet the given cooling loads.
- Show your analysis and results in the excel template “Grid Electricity Consumption” (template is discussed in next slide).
- Upload the completed excel template under question 9.2.
- Provide refrigerant details such as GWP, ODP, charge quantity.
- Discuss the innovation that reduces the climate impact of the cooling solution under question 9.11

**COOLING LOAD PROFILE (NEW DELHI, INDIA)**

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Time</th>
<th>Sensible Cooling Load [kJ]</th>
<th>Latent Cooling Load [kJ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-May</td>
<td>1:00:00</td>
<td>4359</td>
<td>1605</td>
</tr>
<tr>
<td>10-May</td>
<td>2:00:00</td>
<td>4125</td>
<td>1541</td>
</tr>
<tr>
<td>10-May</td>
<td>3:00:00</td>
<td>3885</td>
<td>1501</td>
</tr>
<tr>
<td>10-May</td>
<td>4:00:00</td>
<td>3660</td>
<td>1487</td>
</tr>
<tr>
<td>10-May</td>
<td>5:00:00</td>
<td>3691</td>
<td>1528</td>
</tr>
<tr>
<td>10-May</td>
<td>6:00:00</td>
<td>3843</td>
<td>1598</td>
</tr>
<tr>
<td>10-May</td>
<td>7:00:00</td>
<td>4559</td>
<td>1946</td>
</tr>
<tr>
<td>10-May</td>
<td>8:00:00</td>
<td>7836</td>
<td>3687</td>
</tr>
<tr>
<td>10-May</td>
<td>9:00:00</td>
<td>6320</td>
<td>1882</td>
</tr>
<tr>
<td>10-May</td>
<td>10:00:00</td>
<td>7172</td>
<td>1525</td>
</tr>
<tr>
<td>10-May</td>
<td>11:00:00</td>
<td>7557</td>
<td>1344</td>
</tr>
<tr>
<td>10-May</td>
<td>12:00:00</td>
<td>7625</td>
<td>1291</td>
</tr>
<tr>
<td>10-May</td>
<td>13:00:00</td>
<td>8734</td>
<td>1441</td>
</tr>
<tr>
<td>10-May</td>
<td>14:00:00</td>
<td>7670</td>
<td>1355</td>
</tr>
<tr>
<td>10-May</td>
<td>15:00:00</td>
<td>7560</td>
<td>1398</td>
</tr>
<tr>
<td>10-May</td>
<td>16:00:00</td>
<td>7456</td>
<td>1353</td>
</tr>
<tr>
<td>10-May</td>
<td>17:00:00</td>
<td>7268</td>
<td>1310</td>
</tr>
<tr>
<td>10-May</td>
<td>18:00:00</td>
<td>10522</td>
<td>2833</td>
</tr>
<tr>
<td>10-May</td>
<td>19:00:00</td>
<td>8284</td>
<td>3063</td>
</tr>
<tr>
<td>10-May</td>
<td>20:00:00</td>
<td>6765</td>
<td>2225</td>
</tr>
<tr>
<td>10-May</td>
<td>21:00:00</td>
<td>6339</td>
<td>1997</td>
</tr>
<tr>
<td>10-May</td>
<td>22:00:00</td>
<td>6136</td>
<td>2117</td>
</tr>
<tr>
<td>10-May</td>
<td>23:00:00</td>
<td>5458</td>
<td>1818</td>
</tr>
<tr>
<td>10-May</td>
<td>24:00:00</td>
<td>5158</td>
<td>1631</td>
</tr>
</tbody>
</table>

- **Annual Sensible Cooling Load** 27,760,544 kJ
- **Annual Latent Cooling Load** 9,755,145 kJ
- **Total Annual Cooling Load** 37,515,688 kJ
9. Climate Impact criteria (3/4)

- An excel template “Grid Electricity Consumption” is provided to show your analysis and results. The template has 3 input tabs – Grid electricity consumption, List of Assumptions and Calculations.

Based on TMY3 weather file for New Delhi, India. Provided as part of the technical application.

- Hourly cooling loads in a typical apartment in New Delhi, India met by a 1.5 TR cooling system based on RMI’s energy simulation model.
- Participants should use the given cooling load profiles only to determine their solution’s performance to allow for consistency in evaluation.
- Indoor conditions – DBT and RH - in the space based on the energy simulation and represents the overall system behavior.
- Participants are not expected to maintain the exact indoor conditions – the prize criteria only requires maintaining indoor conditions below 27°C DBT and 60% RH (discussed in Operation Criteria section).
- Participants should provide hourly electricity consumption of the cooling solution for purposes of evaluation.
- Participants should determine the electricity consumption while optimizing their cooling solution to meet the sensible and latent cooling load profiles when the outdoor air temperature is above 20°C only.
9. Climate Impact criteria (4/4)

### List of Assumptions

<table>
<thead>
<tr>
<th>Number</th>
<th>Assumption Parameter</th>
<th>Value</th>
<th>Unit</th>
<th>Rationale</th>
<th>Source (if online source, provide a link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Example: Condensing Unit Heat Exchanger UA value</td>
<td>Example: 1.3</td>
<td>Example: (kW/K)</td>
<td>Example: UA value of brand X heat exchanger</td>
<td>Example: <a href="http://www.example.com">www.example.com</a></td>
</tr>
</tbody>
</table>

- Include all the assumptions used in your solution’s design that impact the electricity consumption.
- Example assumptions include overall conductance of heat exchanger, air flow rate, system pressure and temperature, solar PV efficiency, etc.
- Include any the performance curves or graphs used for determining the electricity use.

### Calculations

- Show any calculations to determine the electricity use.
- Use formulae with clear reference to input values.
- Provide reference to any graphs or values used from “List of Assumptions” sheet.

Similar format is followed for excel templates - **Power Draw** (question 11.3), **Water Usage** (question 12.2) and **Cooling Capacity** (question 17.1)
10. Affordability criteria (1/3)

• Your proposed cooling solution must cost the consumer no more than twice (2X) the baseline AC unit cost at an assumed manufacturing scale of 100,000 units.

• Total installed cost to consumer – Bill of material cost and Other costs and margins

• Bill of material (BoM) cost includes the following costs:
  § cooling unit
  § consumables and
  § materials required for installation

• Other costs and margins include overhead costs, production labor costs, profits, dealer margins etc. Based on research, it is assumed that the “Other costs and margins” are 60% of the total installed cost to consumer.

• This fixed factor of “Other costs and margins” will be added to the “BoM cost” for all the cooling solutions.

• Based on the baseline cost of US $534, the proposed cooling solution’s total installed cost to consumer, when scaled at 100,000 units per year, must be no more than US $1,068 (excluding standard installation labor costs comparable to the baseline unit and any taxes).

• Points will be awarded ratably between 0 (5x baseline cost)– 40 (zero cost) based on the level of cost achieved. Minimum 24 points will be required to compete in the competition.

Use the Prize Criteria Tool (to be updated soon to reflect the new baseline GWP) to assess the affordability score of your cooling solution. Access it https://globalcoolingprize.org/prize-details/prize-criteria-tool/
10. Affordability criteria (2/3)

Steps to complete the Affordability criteria section

- Include the Bill of Material details along with cost estimates in the excel template “Total Installed Cost to Consumer” (template is discussed in next slide).
- Cost estimates must be reported in US $.
- Upload the completed excel template under question 10.2.
- Provide a description of analysis for cost estimation under question 10.3.

10.1. ESTIMATED BILL OF MATERIAL COST (US $) *

Please provide an estimate of the “Unit bill of materials” for your proposed cooling solution at a manufacturing scale of 100,000 units in US $.

Please enter a number greater than or equal to 0.

10.2. SHOW US YOUR WORK *

Please upload the completed “Total Installed Cost to Consumer” excel worksheet which includes the installed cost of your proposed solution using the attached excel template “Total Installed Cost to Consumer” and information noted in the instructions section above.

Before uploading the completed template, please ensure that the filename is in the format specified: FirstName_LastName_TotalInstalledCosttoConsumer_GCPTechnicalApplication.

10.3. DISCUSS YOUR ANALYSIS *

Explain how your proposed cooling solution achieves the affordability criteria. In your explanation, discuss the analysis and justification on how you foresee the cost of key components of your proposed cooling solution when produced at scale.
10. Affordability criteria (3/3)

- An excel template “Total Installed Cost to Consumer” is provided for submitting the bill of materials and cost estimate analysis.
- The template has 3 input tabs – Unit bill of materials, Cost of consumables and Cost of external components.

<table>
<thead>
<tr>
<th>Unit bill of materials</th>
<th>Cost of consumables</th>
<th>Cost of external components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include details of all the components used in manufacturing one assembled unit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Include details of any renewable energy source or battery storage components integrated to the unit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example: include the details and cost of component such as compressor, heat exchanger, fan etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Include details of all the consumable materials that are required for the start-up of your cooling solution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example: include the details and cost of materials such as refrigerant, desiccant, lubricants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Include details of all the external components or equipment that is required to ensure the full-functionality of your cooling solution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example: include the details and cost of component such as piping, tank.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Common instructions for all tabs

- Provide an estimate for the cost of each component, consumable etc. when it is manufactured or procured at a scale of 100,000 units.
- Provide an evidence to the cost estimates. This includes any assumption or cost reduction curve along with supporting rationale and reference to the source.
- If the invoice or supporting documentation is in a currency other than US $, provide the currency exchange details in the specified format.
11. Power criteria

- Your proposed solution should consume no more than 700 W of power from the grid.

Steps to complete the Power criteria section

- Determine the power demand of your cooling solution to meet the given cooling loads in New Delhi, India.
- Show your analysis and results in the excel template “Power Draw.”
- Provide details of power consuming components in “Technical specs-Components” tab of the excel template.
- Upload the completed excel template under question 11.3.
- Discuss the innovation that reduces power demand of the cooling solution under question 11.4.

11.1. RATED POWER DRAW

Please provide the rated power draw (W) of your proposed cooling solution at design cooling capacity.

Please enter a number greater than or equal to 0.

11.2. MAXIMUM POWER DRAW

Please provide the maximum power draw (W) value determined over a 15-minute interval when meeting the simulated hourly cooling load.

Please enter a number greater than or equal to 0.

11.3. SHOW US YOUR WORK

Please upload the completed “Power Draw” excel worksheet which includes a detailed analysis of the power demand of your proposed solution and technical specification of components using the attached excel template - “Power Draw” and information noted in the instructions section above.

Before uploading the completed template, please ensure that the filename is in the format specified: FirstName_LastName_PowerDraw_CCPTechnicalApplication.

11.4. DISCUSS YOUR ANALYSIS

Explain how your proposed cooling solution achieves the maximum power draw criteria and reduces power demand.
12. Water criteria

Your proposed solution should consume no more than 14 liters of water per day when averaged over a year, if any is used. The maximum daily water consumption should not exceed 28 liters, if any is used.

Steps to complete the Water criteria section

- Determine the water usage of your cooling solution to meet the cooling loads in New Delhi, India.
- If the cooling solution does not consume water, leave question 12.2 and 12.3 blank.
- If the cooling solution consumes water, show your analysis and results in the excel template “Water Usage.”
- Upload the completed excel template under question 12.2.
- Discuss the innovation that reduces water usage of the cooling solution under question 12.3.

12.1. WATER USAGE

Please provide the daily water usage (averaged over a year) of your proposed cooling solution in liters (L). If your cooling solution does not consume water, enter "0".

Please enter a number greater than or equal to 0.

12.2. SHOW US YOUR WORK

Please upload the completed "Water Usage" excel worksheet which includes a detailed analysis of the water consumption of your proposed cooling solution using the attached excel template “Water Usage” and information noted in the instructions section above.

Before uploading the completed template, please ensure that the filename is in the format specified: FirstName_LastName_WaterUsage_GCPTechnicalApplication.

If you entered "0" under 12.1. Water Usage, you can skip this question.

12.3. DISCUSS YOUR ANALYSIS

Explain how your proposed cooling solution optimally utilizes water for operation and achieves the criteria requirement.

12.4. [OPTIONAL] TEST CERTIFICATE

If you have a prototype that has been tested in a national or international accredited laboratory, please submit the test certificate with information on the cooling performance of the solution and water requirement.
13. Onsite emissions criteria

- Your proposed solution should not use any fossil fuel based combustion sources to generate power or heat energy.

Steps to complete the Emissions criteria section

- Complete all questions from 13.1 to 13.2 (unless marked optional).
- Declare that schematic uploaded (question 7.3) details the power or heating source used under question 13.1.
- Declare that no fossil fuel based power source or heating medium is used under question 13.2.
14. Refrigerant compliance criteria

- Your proposed solution should use a refrigerant that has a zero ozone depleting potential (ODP); lower toxicity (ISO 817); and complies with international standards on refrigerant safety (IEC 60335-2-40 or ISO 5149).

Steps to complete the Refrigerant compliance section

- Declare that refrigerant used complies with the environmental and safety standards for use in residential application under question 14.1.

- Participants choosing to use flammable refrigerant should determine the allowable refrigerant charge based on a room size of 25 square meters to comply with the IEC 60335-2-40 standard.

- Upload any safety certifications if already in compliance to the international standards mentioned or any national standard under question 14.2.

14.1. REFRIGERANT SAFETY *

Does your proposed cooling solution use a refrigerant that can be safely used in air conditioners operating in homes without any risk to the health and safety of the occupants from its operation?

- If your cooling solution does not use any refrigerant, select "NO REFRIGERANT USED."

For the purpose of this competition, the use of a refrigerant in an air conditioner is considered "safe" if it complies with the more stringent of the international standard ISO 5149 or IEC 60335-2-40 or the national standard of India where testing will be undertaken.

- YES
- NO
- No Refrigerant Used

14.2. [OPTIONAL] SAFETY CERTIFICATIONS

Please provide a copy of the certifications if your prototype has been approved to comply with ISO 817 or ISO 5149 or IEC 60335-2-40 standards.

Before uploading a file, please ensure that the filename is in the format specified: FirstName_LastName_FileName_GCPPrototypeApplication.

You can upload multiple files here.
15. Scalability criteria

• Your proposed solution should have a total volumetric size less than 0.52 m$^3$ and includes size of any external component and integrated renewable energy source. It should be usable in existing homes.

Steps to complete the Scalability criteria section

✔ Upload technical drawings of the cooling solution clearly showing dimensions of all components under question 15.2.

✔ Provide information on size of any external components integrated with the cooling solution under question 15.3.

✔ Discuss installation requirement in an existing apartment building and modifications or upgrades if any are required under question 15.4.

Scalability Criteria is updated (old 0.42 m$^3$) to reflect the updated baseline AC unit specifications. (refer slide 12 for baseline AC unit)
16. Materials criteria

- Your proposed solution should be developed with regard to minimal usage of rare earth materials and materials with high embodied carbon such that there are no unintended consequences.

Steps to complete the Materials criteria section

☑ Discuss the use of any rare earth material or materials with high embodied carbon in your cooling solution and how you plan to minimize their use under question 16.1.

☑ Provide details on type and quantity of materials used in the bill of materials (BoM) submitted under question 10.2.

Please fill the form using the instructions provided above and share the necessary requirements along with supporting documentation for verification

16.1. MATERIALS USAGE

Please discuss if the production of your cooling solution requires components that use significant quantity of rare earth materials or materials with high embodied carbon.

0 of 3500 max characters

Previous  Next  Save and Continue Later
17. Operations criteria

- Your proposed solution should be designed to have 1.5 TR (5.3 kW) cooling capacity at standard outdoor conditions and maintain indoor conditions below 27°C DBT and 60% RH.

Steps to complete the Operations criteria section

- Determine the cooling capacity of your solution while meeting the given cooling loads for outdoor weather conditions of above 20°C DBT in New Delhi, India.

- Provide any **unmet hours** for which the solution does not meet the indoor conditions in “cooling capacity” tab of the excel template (template is discussed in next slide).

- Show your analysis and results in the excel template “Cooling Capacity.”

- Upload the completed excel template under **question 17.1**.

- Upload any test results if the cooling solution has been tested under **question 17.2**.

- Proposed solutions should be optimized to meet the cooling load profiles and maintain the indoor conditions below 27°C DBT and 60% RH **for all the times when the outdoor air temperature is above 20°C only**.

- **No penalty** for not maintaining the indoor conditions below 27°C DBT and 60% RH when the outdoor air temperatures are **below 20°C DBT**.

- An **unmet hours allowance of 3.4% of the annual hours** will be considered - the unmet hours will only be measured when the outdoor air temperature is above 20°C DBT.
## 17. Operations criteria

- An excel template “Cooling Capacity” is provided to show your analysis and results. The template has 3 input tabs – Cooling Capacity, List of Assumptions and Calculations.

### Cooling Capacity

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Time</th>
<th>Outdoor Dry Bulb Temperature [°C]</th>
<th>Outdoor Relative Humidity [%]</th>
<th>Sensible Cooling Load [KJ]</th>
<th>Latent Cooling Load [KJ]</th>
<th>Indoor Dry Bulb Temperature [°C]</th>
<th>Indoor Relative Humidity [%]</th>
<th>Proposed Cooling Solution - Cooling Capacity [kW]</th>
<th>Proposed Cooling Solution - fraction of time when the cooling load is not met [%]</th>
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- Similar information was discussed in Slide 16 – Climate Impact criteria.
- List of Assumptions and Calculations tab are same to other templates.
- Cooling capacity data should be provided (similar to electricity consumption, power draw, water consumption in respective templates) for all times when outdoor air temperatures are above 20°C DBT.
- Provide any unmet hours duration for which desired indoor conditions are not maintained when outdoor air temperatures are above 20°C DBT.
- Cooling solutions performance and ability to maintain desired indoor conditions will not be evaluated when outdoor air temperature is below 20°C DBT.
Final few steps to complete the detailed technical application

Section 18

- Share any additional information about your cooling solution.
- Upload any additional documents about your cooling solution.
- All questions are OPTIONAL.

Section 19

- Opportunity to share your Technical Application with a financial or industry investor interested in your cooling technology.
- All questions are OPTIONAL. Your response will not affect your application evaluation.
- By selecting “No”, the technical application will not be shared with anyone outside the Global Cooling Prize coalition.
- By selecting "Yes" Information will only be shared to interested investors that have registered with the Global Cooling Prize and executed an identical NDA to that of the members of the Global Cooling Prize Organizers.

Section 20

- Sign the Declaration page of the technical application.
- Review the completed technical application.
- Click SUBMIT to complete the submission of the detailed technical application.
If the Technical Application has any missing information, the relevant sections will get highlighted in Red.

An Error message is shown at the top of screen.

All the sections with incomplete information will be highlighted in Red.

Directly move to “Next Page with errors.” Click Submit once all errors are resolved.
After clicking Submit, you will receive an email confirming your submission and a link to download the submitted form.

**Detailed Technical Application**

Thank you for submitting the Detailed Technical Application form.

We have sent your completed form to you via the primary contact email provided in the form. You may download a PDF of your completed form here: [Download PDF]

The Technical Review Committee will now evaluate your application and may reach out to you in case of any questions or clarifications based on the information provided.

We will communicate the results of Technical Application evaluations to all the participants in October 2019.

Please [contact us](mailto:) if you have any questions.

**We wish you All the Best!**

You can now go back to your [Home page](mailto:).
Thank you!

- Please feel free to send in your questions by clicking on the question mark icon now
- Also, please check out the FAQ page on our website for answers to commonly asked questions: https://globalcoolingprize.org/prize-details/faq/
Next Webinar

1. Questions and Clarifications on the Detailed Technical Application
   • August 6th, 4:00 pm GMT
   • August 7th, 4:00 am GMT
Global Cooling Prize

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