Global Cooling Prize

Need for a breakthrough innovation in comfort cooling technology

Global Cooling Prize

The Prize was launched on Nov 12, 2018 by Dr. Harsh Vardhan and other senior dignitaries

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Agenda

The Cooling Challenge –
Why we need the Global Cooling Prize

About the Global Cooling Prize

Prize Criteria-
Details of the technical criteria

Evaluation of the Prize Criteria-
Phase wise details of the prize

Next Steps with Global Cooling Prize

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The Cooling Challenge

.... a call to action

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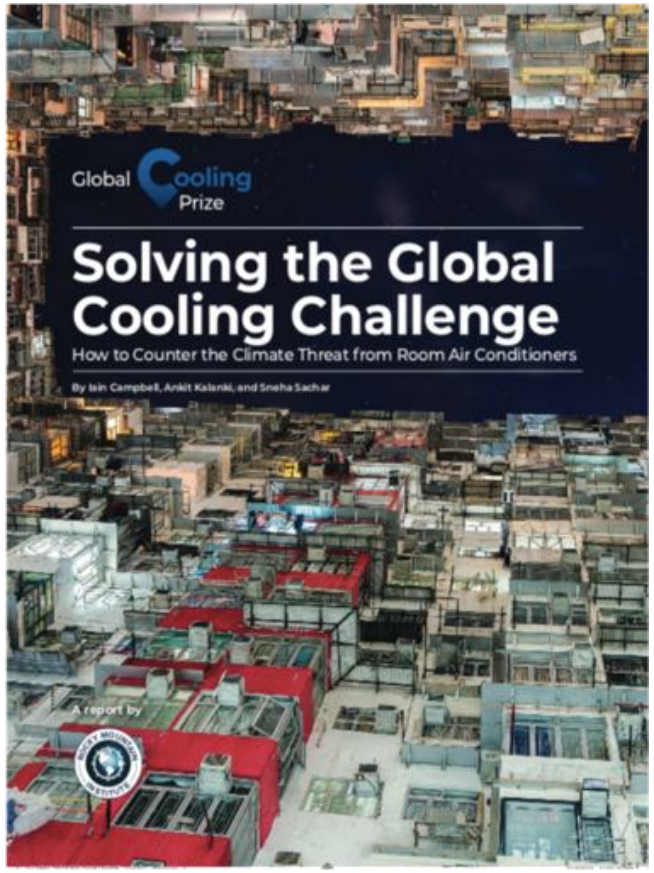
Increasing demand for comfort cooling represents one of the biggest end-use risks to our climate goals and will bring major challenges in future…



- Warming global temperatures and the most populous and warm parts of the world seeing large increases in population, urbanization, and purchasing power—creates ripe conditions for an exponential rise in the cooling demand
- Total number of room air conditioners (RACs) in operation could grow fourfold from an estimated 1.2 billion now to 4.5 billion in 2050[1]
- Incremental demand associated with RACs of ~5400 TWh would be equivalent to the annual electricity consumption of US, Japan and Germany
- New power generation capacity of ~2,000 GW would be required to meet the RACs demand, equivalent to USD 1.4 trillion of capital spending[2]
- RACs-related emissions could result in over 0.5°C in global warming impact by 2100

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[1] Room air conditioner (RAC) is defined as a self contained or split system air conditioner typically up to size of 15KW capacity used in residential cooling but can also be used in commercial sector.
[2] The construction cost of a natural gas power plant ($696/kW) was considered as benchmark. Also, this does not include additional cost for associated grid infrastructure

Our impact analysis of projected room air conditioners growth shows that…

- Conventional solutions do not bring us anywhere close to neutralizing the climate impact of the exponential growth in room air conditioners
- We cannot solve this magnitude of growth by adding renewables alone
  - 2017, our record year of solar growth with 94 GW of generation deployed globally - eclipsed by the incremental load of new RACs added to the grid, estimated at ~ 100 GW
- The world needs a radical change in comfort cooling technology
  - one that can effectively and assuredly offset the exponential increase in cooling energy demand and put us on a path to cooling with less warming

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About the Global Cooling Prize

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First-of-its-kind Innovation Challenge

- Aims to identify a residential cooling solution that has five times lower climate impact
- Provides a common platform to incumbents, start-ups, innovators, experts and research institutes working in air conditioning space to innovate and accelerate the transition to the next generation cooling technology

A Global Competition

- Attracts talent from across sectors and around the world to design a residential cooling solution that leapfrogs existing technologies
- Starting in India, the Prize aims to expand to major air conditioning growth markets including China, Indonesia, and Brazil

Focus on Commercialization and Mass Adoption

- Led by a global coalition of partners to drive the incubation, commercialization and ultimately mass adoption of the climate friendly residential cooling solution across the potential markets

Support from Leading National and International Institutions

- Supported by Mission Innovation and Government of India

We aim to spur climate-friendly innovation and accelerate transition to next generation technology while…

…looking at the problem from a whole-systems lens

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Our Prize criteria will ensure the room air conditioner solution works for emerging economies, in challenging conditions

Weighting for final evaluation: Climate criteria: **71.5%**, affordability criteria: **28.5%**

CLIMATE
One-fifth of the life-time climate impact (electricity and refrigerant) of the baseline unit[1]

AFFORDABILITY
At assessed industrial scale, will cost less than 2x cost of the baseline unit to consumers

REFRIGERANTS IF USED
Zero ODP, lower toxicity (Class A) and compliance with international safety standards

EMISSIONS
Zero onsite emissions from any captive energy or power source

POWER
Consumes less than 700W at rated cooling capacity

OPERATION
Maintains at or below 27°C DBT and 60% RH for the duration of the test period

WATER
Consumes less than 14 liters per day for onsite use

SCALABILITY
Usable in existing homes, no “designed in” solution; less than 2x volumetric size of the baseline unit

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[1] The baseline unit represents the most common RAC product sold in India and is in accordance with the BEE defined ISEER rating for a 3 star AC in 2018. It is equivalent to EER 3.5 of a 5 star AC in 2016-17.

** The prize supplementary criteria are under review for finalization which will be completed within 60 days of the launch and the indicated prize supplementary criteria are to be considered as directional guidance until full ratification has been secured.

Evaluation of the Prize Criteria

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Evaluation will occur across three phases

1 Application Review & Screening

- Applicants will submit documents providing information on how they meet prize criteria
- A subset (~10) will be selected for interim award and testing
- Interim award of **US $ 200,000 will be given to each of top 10 finalist** for development of 2 prototypes

2 Lab & Field Testing

- A combination of lab and real-world testing will be done to evaluate each prototype against the baseline unit based on the Prize Criteria

3 Final Assessment

- Results from field and lab testing will be combined together with the cost assessment to rank the finalists- subject to fulfillment of all the "Supplementary Criteria"
- The final winner will be selected based on **71.5% weighting to climate impact** and **28.5% weighting to the assessed cost performance**
- The final winner will be awarded the prize money of **US $ 1 million**.

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Application requirements and Timeline

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Phase 1 of the Global Cooling Prize is underway…

- REGISTER AND COMPLETE PROFILE

  - ✓ Register at www.globalcoolingprize.org/apply for applying to the Prize
  - ✓ Stay informed about application deadlines, get useful resources and participate in forums

- SUBMIT PARTICIPANT "INTENT TO APPLY" FORM- June 30, 2019

  - ✓ Complete a simple online form to showcase your intent to participate
  - ✓ What we ask is a few simple questions to know:
    - ➢ your team
    - ➢ your innovative cooling technology
    - ➢ your understanding of the Prize Criteria

- SUBMIT DETAILED TECHNICAL APPLICATION FORM- August 31, 2019

  - ✓ Comprehensive information about the innovative cooling technology along with a detailed schematic, design calculations, technical drawings, showcasing the achievement of the Prize Criteria

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Global Cooling Prize will continue for a period of two years

November 12, 2018	• Participant portal launched and Intent to Apply form opened
June 30, 2019	• Deadline to submit Participant “Intent to Apply”
August 31, 2019	• Deadline to submit Detailed Technical Application
July - October, 2019	• Evaluation of Technical Applications and Selection of Finalists
November, 2019	• Announcement of top 10 finalists and Interim Awards
November, 2019 - April, 2020	• Prototype development phase
May – September, 2020	• Prototype testing in India
October - November, 2020	• Final Evaluation, Presentations and Award Ceremony

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Thank you

Visit us: www.globalcoolingprize.org

Apply at: www.globalcoolingprize.org/apply/

Contact us at: info@globalcoolingprize.org