



NTU SUSTAINABILITY CHALLENGE 2023

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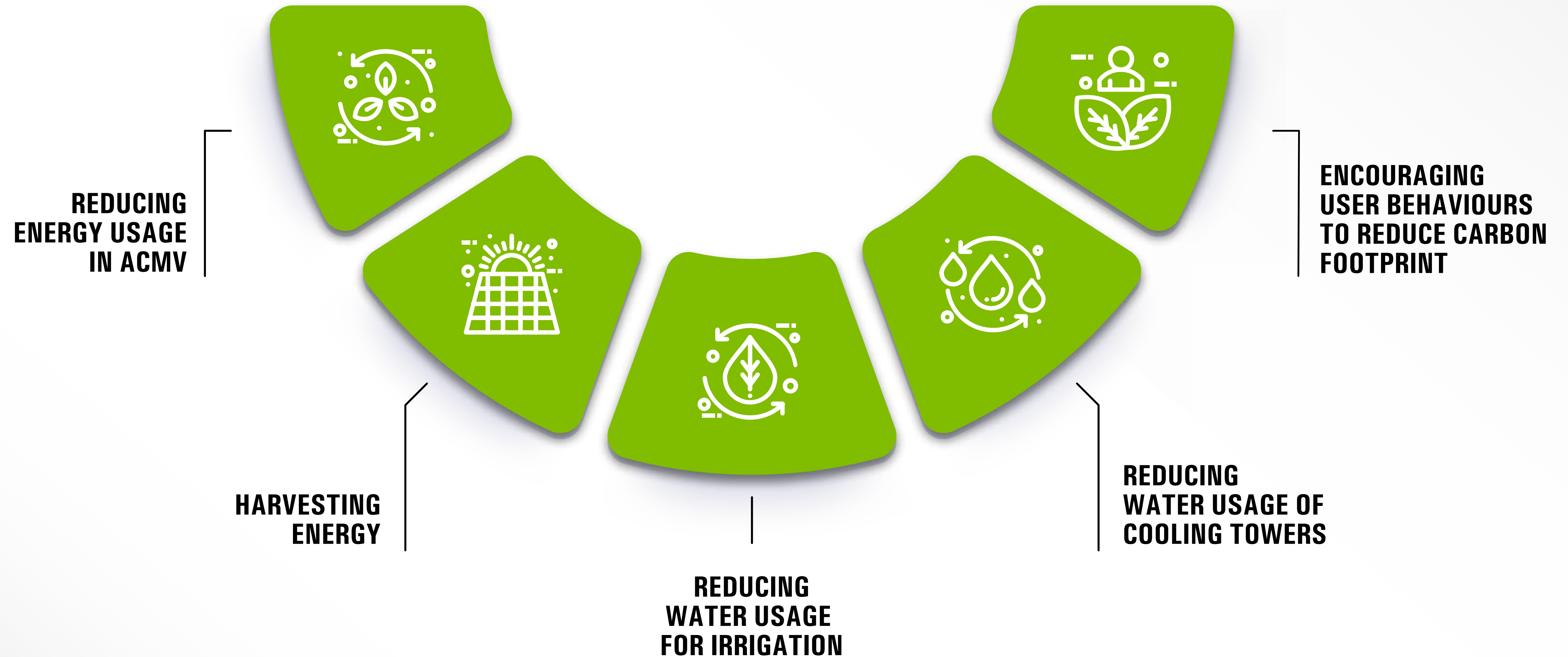
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ARE YOU WORKING ON THESE TOPICS?



WHAT ARE WE LOOKING FOR?



Reducing energy usage of Air Conditioning and Mechanical Ventilation (ACMV) systems

Air conditioning and mechanical ventilation systems account for a significant portion of energy consumption in NTU buildings. NTU would like to look for innovative solutions that can reduce the energy consumption of already efficient ACMV systems, such as the real-time automated optimisation of ACMV controls.

ASSESSMENT CRITERIA:

- **Feasibility:** The solution should be easily adapted for implementation in various building environments, including both new and existing structures within NTU. The solution should also be able to comply with all applicable local codes.
- **Ease of Implementation:** The solution should be able to integrate easily with existing ACMV infrastructure and associated systems without requiring major modifications or disruptions to the operation.
- **Cost-Effectiveness:** The solution should offer a reasonable return on investment and demonstrate potential for cost savings.
- **Energy Savings:** The proposed solution should demonstrate its ability to achieve significant energy savings compared to traditional or existing systems.

WHAT ARE WE LOOKING FOR?



Harvesting energy from the untapped environment

A large majority of rooftop surfaces at NTU have already been installed with conventional photovoltaic (PV) solutions to harness solar energy. NTU is looking for innovative solutions that can harvest energy from untapped surfaces or spaces in NTU, such as novel solar energy harvesting or low-speed wind turbine solutions.

ASSESSMENT CRITERIA:

- **Feasibility:** The solution should be realistically implementable across NTU's campus using current technology or technology likely to be readily available in the near future and should be applicable to the geophysical conditions in NTU campus.
- **Direct Electricity Generation:** Solutions that generate electricity at output voltages and frequencies compatible with Singapore Electrical standards will be favorably considered.
- **Cost-Effectiveness:** The solution should offer a reasonable return on investment.

WHAT ARE WE LOOKING FOR?



Reducing frequency and usage of water for irrigation

In order to conserve valuable water resources, NTU is reviewing the practice of using potable water for the irrigation of plants in planter boxes within multi-storey academic buildings, including the ARC and the HIVE. To that end, NTU is looking for innovative irrigation solutions to be used in the landscaping of the campus.

ASSESSMENT CRITERIA:

- **Feasibility:** The solution should be realistically implementable across NTU's campus using current technology or technology likely to be readily available in the near future.
- **Durability and Robustness:** The solution should be resilient and easy to maintain, perform consistently.
- **Ease of Implementation:** The solution should not require complex configurations, extensive setup, or rigorous training.
- **Environmentally Friendly:** The solution should not have any adverse effect on the biodiversity of the environment.

WHAT ARE WE LOOKING FOR?



Reducing water usage of cooling towers

Water consumption of cooling towers is a major contributor to the overall consumption of potable water. As such, NTU would like to explore innovative solutions to reduce potable water usage of cooling towers, taking into consideration the existing piping and infrastructure of our existing buildings, as well as limited space for water storage.

ASSESSMENT CRITERIA:

- **Feasibility:** The solution should be realistically implementable across NTU's campus using current technology or technology likely to be readily available in the near future.
- **Ease of Implementation:** The solution should not require extensive modification of existing infrastructure and current piping system.
- **Ease of Maintenance:** The solution should require minimal maintenance without the need for proprietary equipment or labour.

WHAT ARE WE LOOKING FOR?



Encouraging behaviours that reduce carbon footprint

One of the challenges faced by NTU is to encourage user behaviour change and create a long term orientation towards sustainability within NTU's community. NTU would like to cultivate resource conscious behaviour within the campus, with an aim to reduce carbon emissions. As such, NTU is calling for advanced hardware or software solutions that can encourage behaviours that reduce the carbon footprint within the NTU campus.

ASSESSMENT CRITERIA:

- **Feasibility:** The solution should be realistically implementable across NTU's campus using current technology or technology likely to be readily available in the near future.
- **Intuitive:** The solution should be user-centric and relatable to users.
- **Engagement and Motivation:** The solution should be able to appeal and incentivize the targeted audiences.
- **Capabilities:** Proposals will be considered based on the merits of their capabilities to improve user behaviors. Data analytics or AI capabilities will be favorably considered.

KEY DATES



27 June 2023
Briefing Session



18 August 2023
Applications Closed



Late September
Winners Announced

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pilot location**



**Support from
subject-matter
experts**

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ABOUT THE CHALLENGE

As a leading research-intensive university, Nanyang Technological University, Singapore (NTU Singapore) acknowledges the need and responsibility to respond to environmental, social, and economic challenges. Over the years, NTU Singapore has built its strengths in sustainability through a wide range of offerings and achievements in education, research, technological innovation, artistic creativity and service to society.

To build on this momentum to do our part for the environment, the University has a 15-year manifesto that will guide its actions and solidify its reputation as one of the global leaders in sustainability.

In line with the 15-year manifesto, NTU Singapore and Enterprise Singapore are co-organising the inaugural NTU Sustainability Challenge 2023 to bring together innovators and researchers to leverage on technology to co-develop eco-friendly solutions that can address environmental issues in-campus.

Come join us for the NTU Sustainability Challenge 2023 today!

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