The Setty Family Foundation: 2021 Applied Engineering Challenge

ASHRAE's stated goals and objectives include: extending the reach of heating, ventilating, air-conditioning and refrigeration (HVAC&R) information, connecting with others, and educating and adapting today's technology for tomorrow to local and global communities to serve humanity and promote a sustainable world. Many engineering and sustainability challenges exist in the world. The 2021 Setty Family Foundation Applied Engineering Challenge (AEC) is intended to stimulate student-led groups to find engineering solutions for designing self-sustaining, interconnected communities.

Introduction: The built environment continues to expand as the world population grows. Therefore, it is imperative to design commercial and residential buildings as sustainably as possible to reduce their impact on Earth's natural resources. With this growth, many times highly productive agricultural land gives way to urban expansion. The concept of indoor farming has been gaining traction in recent years due to these trends as well as other driving forces such as energy and water requirements and locally sourcing food supply chains. Looking to the future, what if new single or multi-family residential buildings included a growth room as part of their standard design?

Scope: Design an indoor farming system to meet the needs of your local community with regards to single or multi-family residential construction. The system can be designed for new or renovation construction types. The system should identify issues and provide solutions and/or next steps to solve these problems. The system shall take into account multiple system variables, including space temperatures, humidity, lighting, acoustics, and outdoor conditions to determine the best course of action to be integrated into a residence.

Constraints: Designs should accommodate single-family residences (4,000 ft2 or smaller) or multi-family residences (20,000 ft2 or smaller. Assume the residences have heating, cooling, and ventilation systems that meet all ASHRAE standards. Designs shall consider all types of HVAC systems (constant volume, VAV, heat pumps etc.) that could be used in single or multi-family residential construction in your local area.

Submission: Entries must be submitted electronically by June 8, 2021 to the ASHRAE Society FTP site established for this purpose. The submission must be limited to a 25-page maximum technical report. Awards will be presented to the winners at the 2022 ASHRAE Winter Meeting to be held in Las Vegas, Nevada, United States of America

Additional information can be found on: https://www.ashrae.org/communities/student-zone/competitions/2021-applied-engineering-challenge

Mentorship and advice will be provided to the team by industry professionals such as local ASHRAE chapter members, or faculty advisors.