Technical Assistance Request

Project Abstract

ThermoVerse, LLC is developing a minimally invasive envelope thermal management system to address the decarbonization of buildings and their communities. This solution addresses the need for cost-effective and sensible heating and cooling in >40 million low-to-middle-income U.S. households and is timely as existing retrofits tend to either breach old building codes or exacerbate inequities within underserved communities concerning the pricing and allocation of energy resources.

Critical Need for This Technology

The U.S. Department of Energy (DOE) has a goal to reduce the carbon footprint of U.S. buildings, transportation, agriculture and industry by 50% by 2030. Consistent with this goal, our team is developing a minimally invasive envelope thermal management system that could improve HVAC controls and thermal management in a wide range of enclosure systems. This innovation is timely as space heating and cooling comprise approximately 12-25% of global energy consumption and contribute to 40% of global carbon emissions. Furthermore, without such radical undertakings, existing efforts to electrify and transition our global energy infrastructure may prove harmful to already disadvantaged populations who are bearing the brunt of disproportionate energy burdens associated with energy reduction, urban heat islands, and extreme weather (e.g., deep freeze and heat waves).

Key Needs

Procurement of Raw Materials:

- Identify sustainable and high-performance thermoelectric materials that can be used in the built environment without any regulatory barriers.
- Evaluate the performance and cost of different materials.
- Select the most suitable materials for the application.

Fabrication & Prototyping:

- Develop a process for downsizing the smart wall panel into a smart wallpaper.
- Identify and access a sheet extrusion and roll-to-roll processing facility.
- Fabricate and prototype the smart wall panel and wallpaper.
- Business Development & Commercialization:
- Perform TEA/LCA for the business model.
- Identify and recruit co-founders with the necessary skills and experience.

Testing and Validation:

- Develop test plans for hotbox tests, whole-of-wall performance tests, natural exposure tests, field testing, and pilot testing.
- Conduct the tests and collect data.
- Analyze the data and validate the performance of the smart wallpaper.

Software/Controller Development:

- Develop intelligent load control capabilities for the smart wallpaper.

- Integrate the software with the hardware.

Legal, Insurance, and Public Policy:

- Identify and partner with state and local government agencies to ensure that the smart wallpaper meets all applicable regulations.

We are grateful for any assistance that you can provide. Please contact us at birch@thermoverse.com if you have any questions or would like to learn more about our project.