

# Shantonio Birch's challenge details for challenge:

## Solar Prize Round 6

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### Explanation

Getting to a place where augmented space heating and cooling can be widely deployed may require collaboration with the following key enablers at the nation's national laboratories .

Pacific Northwest National Laboratory (PNNL) - VOLTTRON (cf. Intelligent Load Control). We seek partnership with a PNNL laboratory staff or someone with complementary skills to build out our IoT capabilities as well as to test it against building energy use data. We have begun preliminary conversations about using VOLTTRON to develop of prototype with folks familiar with the topic, but would like to get more hands-on training or assistance (over a 3 month period) in order to accelerate integration to our hardware (c.f. smart wallboard and smart wallpaper).

Oak Ridge National Laboratory (ORNL) - Whole-of-Wall Performance Test. We seek partnership with ORNL to perform a Whole-of-Wall Performance and Natural Exposure Test. While we were a finalist for the ORNL Innovation Crossroads Program (Cohort 6), in which we detailed our testing needs, we ultimately were not selected. We continue to see the value in having a partnership with ORNL to test and characterize the performance of our smart wallboard and/or smart wallpaper.

National Renewable Energy Laboratory (NREL) - We seek partnership with NREL to extend the capabilities (i.e., the energy density) of our thermal energy storage (TES) materials. Achieving 100% electrification within our target market, requires effective TES solutions that are both responsive to heating and cooling. Furthermore, our smart wallpaper (being a heat pump) would also need to be optimized and integrated with TES to get to our goal of augmented space heating and cooling. NREL has been at the forefront of advancing the viability of TES and a partnership with a dedicated research scientist within the Buildings directorate will be crucial toward selecting the right PCM material for our particular technology as well as to identify partners whose goals also align with our energy equity and environmental justice mission.

### Key Needs

- Procurement of Raw Materials (2 / 5): We have identified several neat PCM suppliers and microencapsulation companies within our network. Nevertheless, we may need assistance with sourcing sustainable and high-performance thermoelectric materials that can be used in the built environment without any regulatory barriers.
- Fabrication & Prototyping (4 / 5): We may need access to a sheet extrusion and roll-to-roll processing facility to downsizing our smart wallboard into a smart wallpaper.
- Business Development & Commercialization (2 / 5): We are in constant searching for co-founders to add to the team. In particular, we seek an in-house systems engineer who is familiar with and/or can quickly navigate the VOLTTRON platform. In addition to this, we seek assistance with performing TEA/LCA for our particular business model. TEA, in particular, will be used to make the best economic case for our business model based on several sensitivity factors (including carbon credit, etc.).
- Testing and Validation (5 / 5): We seek assistance with performing hotbox tests, whole-of-wall performance tests, natural exposure tests, field testing and pilot testing (in pre-1980's building stocks).
- Funding & Investments (5 / 5): We seek non-dilutive funding opportunities to hire the talent(s) we need to quickly prove out our business models. In particular, we seek to perform a

technoeconomic analysis and a life cycle assessment. We also seek discretionary funding to hire part-time staff(s) to assist the founder and CEO to accelerate the commercialization process.

- Hardware Development (4 / 5): We may need access to a sheet extrusion and roll-to-roll processing facility to downsizing our smart wallboard into a smart wallpaper.
- Software Development (5 / 5): We seek assistance with building out of intelligent load control capabilities. This could be in collaboration with PNNL (cf. VOLTTRON).
- Legal, Insurance, and Public Policy (3 / 5): We seek assistance with identifying partners with state and local government to ensure that our technology fits within the scope of current and future regulations around building/energy codes.

## Matches

1. [BlochSoft Technologies Inc](#): 87.56%
2. [Zpryme](#): 85.05%
3. [Positive Deviancy](#): 85.04%
4. [IoT Conduit](#): 85.03%
5. [New Mexico Clean Energy Resilience and Growth](#): 83.81%
6. [Circuit Launch](#): 83.79%
7. [University of North Dakota Energy and Environmental Research Center \(EERC\)](#): 82.56%
8. [GoSun](#): 82.56%
9. [HomeMe Group, Inc.](#): 82.55%
10. [Coe Student Innovation Center - University of Wyoming](#): 82.53%