

Investigating the Environmental Life Cycle Assessment, Performance, and Costing of Expanded Polystyrene for Construction Materials and Supplies

Impact: Insulating concrete forms (ICFs) are expanded or extruded polystyrene forms that stay in place as part of poured concrete walls. It has been proposed that the benefits of ICFs include high-performance energy savings, increased indoor air quality, solid structural performance, efficient construction activity, and reduced site disturbance. ICFs have been around for several years, and while the market is growing steadily, ICFs have not made a full market breakthrough. Certifying the economic and environmental impacts of using ICFs will result in increased demand for ICFs for new commercial and residential construction, as well as potentially exponential growth in production and jobs.

Project Overview: This project will investigate the environmental and economic benefits associated with ICFs. The project team will conduct an environmental life cycle assessment (LCA) that includes a life cycle cost breakdown, as well as perform a comparative analysis of ICFs and traditional construction methods to assess the product's environmental and economic performance. Project results will include a third-party validated LCA that will establish environmental metrics and benchmarks and recommend process improvements.

Tegrant Corporation is currently the largest ICF manufacturer in North America. With this analysis of ICFs economic and environmental impacts, Tegrant will be expanding its current marketing strategy to include small contractors, large homebuilders, commercial builders, and resort owners/developers.

GBA Product Innovation Grant Amount: \$100,000

Leadership Team: The project team includes the University of Pittsburgh's Dr. Melissa Bilec, who is Co-Director of the Center for Sustainable Transportation Infrastructure, Assistant Director of Education and Outreach at the Mascaro Sustainability Initiative, and Research Assistant Professor in the Department of Civil and Environmental Engineering. Fellow University of Pittsburgh faculty on the project team include Dr. Amy E. Landis, Assistant Professor in the Department of Civil and Environmental Engineering, and Dr. Kim L. Needy, P.E., CPIM, Associate Professor in the Department of Industrial Engineering. The private sector partner is Tegrant Corporation, represented by Robert Niklewicz, Vice President of Engineering, and Kevin Grogan, Vice President of Marketing and Business Development.

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