

# The R-STRIPE System for Deep Energy Retrofits

Team R-STRIPE, Chester, Connecticut.

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The R-STRIPE Robotic Retrofit System combines robotics and a novel patented insulating panel to slash the cost, time and disruption of a building deep-energy retrofit. R-STRIPE is rapidly scalable by rolling out a network of regional operations with established construction industry partners. Our initial target market focus is the 7.6 million housing units in larger (5+ unit) multifamily buildings in colder climates (Climate Zone 5 and above) constructed prior to 2000. The estimated value for deep-energy retrofits in this market is \$380 billion but the ultimate potential is much greater as the system is applicable to most types of residential and commercial buildings.

R-STRIPE takes a holistic approach from initial scoping of the project to final completion by reengineering the value chain to increase system efficiency. The process begins with onsite drone mapping to create a 3D digital model of the building and site that is used to plan, program and coordinate all activities.

Removal of the existing cladding, trim and other features and installation of new water and air barriers is accomplished with a programmed robot that also captures detailed measurements of the building exterior and underlying structure to update the 3D building model. The insulated wall and roof panels are custom-designed to include windows, doors, conduits, ducts, and load-bearing attachments and then built in an automated microfactory. The microfactory also panelizes wall and roof cladding and prefabricates all trim. After transportation to the site, the panels, cladding and trim are installed using robotic equipment and the heat-pump systems for heating, cooling, ventilating and water heating are installed to complete the retrofit.

## Team Leaders:

**Peter Harding:** Peter is Vice President of a leading residential energy consulting and engineering firm. He is a Certified Passive House Consultant and HERS Rater and prior to entering the energy efficiency industry was a management consultant specializing in supply chain strategy. His expertise in building science, energy auditing, energy conservation, construction, supply chain strategy and business management is essential to the team.

**Joel Edelstein:** Joel co-founded Frame Logic Digital, an engineering services provider for the film and television industry. With demanding clients such as Warner Brothers, Columbia Pictures, HBO, Showtime and Netflix, his work encompassed color science, data management, systems engineering, software development and mobile datacenter deployment. Frame Logic was the primary on-set digital imaging contractor for more than \$500M of film production between 2008 and 2013. In 2013 Joel spun off a new company, Triglyph LLC, to focus on software and hardware research and development. His company now specializes in CNC and robotics, designing tools to help small and medium-sized business take advantage of the upcoming robotics revolution.

## Team Advisors:

**Ronald Penton:** Ron is a Senior Project Manager with a regional construction company who has led over 150 projects from initial conception through design & pre-construction planning into full construction. Ron brings over 40 years' experience in project estimating, procurement, negotiations, scheduling and construction to the team.

## Team Connector:

MakeHaven, New Haven, CT