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University of Dayton

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NEWS

Monday June 15, 2015

Rewarding Energy Investments

City governments that subsidize energy upgrades for local residents or businesses could see a multi-million-dollar return on investment, according to University of Dayton research published in the international journal *Energy* and soon to be presented at the American Society of Mechanical Engineers 2015 International Design Engineering Technical Conferences.

In the study published in *Energy*, researchers examined utility bills for Hamilton County, Ohio, residences and calculated \$6.34 million invested in insulation and furnace upgrades could result in a economic impact of about \$9.2 million in 10 to 15 years, including the creation of 47 jobs.

The research, which will be presented at the ASME conference later this summer, also shows a \$14 million investment in energy upgrades for Montgomery County, Ohio, manufacturers could result in a local economic impact of \$22 million in 10-15 years, including 106 jobs.

Much of the initial direct investment — for wages of local workers and materials from local companies — would be made within a couple years. Indirect economic impact would come in the form of money spent with secondary suppliers and on fuel to transport supplies, among others. The remaining impact would come from the residents' savings they put back into the community.

"That's extra money residents can spend in restaurants and movie theaters," said assistant professor of mechanical engineering Jun-Ki Choi, the lead author on both studies and a prolific scholar who helped write a book and 60 published articles in the last decade.

The group has yet to present its findings to any city governments. When they do, the first step would be to show how the Choi and his group could help create individual energy models for each residence

based upon historical energy data and available building data, Choi said. From these models, savings estimates and cost implications can be estimated for various cost-saving measures or upgrades.

The studies are the latest in a series of papers published by researchers in the University's mechanical and aerospace engineering department, renewable and clean energy program and the new Hanley Sustainability Institute. Choi, mechanical engineering professor Kevin Hallinan, University of Dayton Hanley Sustainability Institute Director of Research Bob Brecha and masters student Drew Morrison wrote the study that appeared in *Energy*. Choi, Hallinan, Brecha and mechanical and aerospace engineering department chair Kelly Kissock wrote the study to be presented at the ASME conference.

Choi, Hallinan and Kissock also work in the University's award-winning Industrial Assessment Center and Building Energy Center that offer low- or no-cost energy audits. The Industrial Assessment Center has won top awards from the U.S. Department of Energy and the state of Ohio.

The American Council for an Energy-Efficient Economy named Kissock a "champion of energy efficiency." He also served on the Midwestern Governors Association Energy Efficiency Advisory Group.

Hallinan worked with Clinton County, Ohio, hit hard by shipping company DHL's decision to move to Kentucky in 2008, to develop Dropoly, a free online energy reduction game that shows users where they can reduce energy costs. He also worked with Energize Clinton County on short- to medium-term energy reduction.

Since 2006, Brecha has spent summers at the Potsdam Institute for Climate Change Research in Germany with economists and scientists investigating a more sustainable world energy system that avoids economic consequences while reducing greenhouse gas emissions. He also serves as the coordinator for the University's sustainability, energy and environment minor.

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