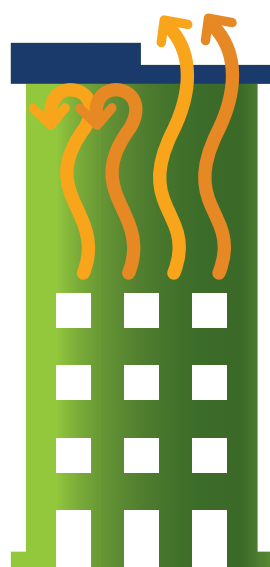


## OPPORTUNITY

How much energy is used for heating, ventilation and air conditioning (HVAC) in U.S. office buildings?

**37%**  
**OF ENERGY**  
goes to HVAC<sup>1</sup>



A large percentage routinely escapes through the building envelope

## TECHNOLOGY

How do VIPs save energy?

**R-50 INSULATION VALUE**

within a thin profile, 1" compared to 15" for conventional

## M&amp;V

Where did Measurement and Verification occur?

**OAK RIDGE NATIONAL LABORATORY** evaluated the performance of a VIP retrofit provided by Thermal Visions, Inc. at the US Post Office and Courthouse in Camden, New Jersey

## RESULTS

How did VIPs perform in M&V?

**8-10%**  
**ENERGY SAVINGS**  
when compared to code-compliant roofs<sup>2</sup>

**ROBUST PERFORMANCE**  
with proper planning<sup>3</sup>

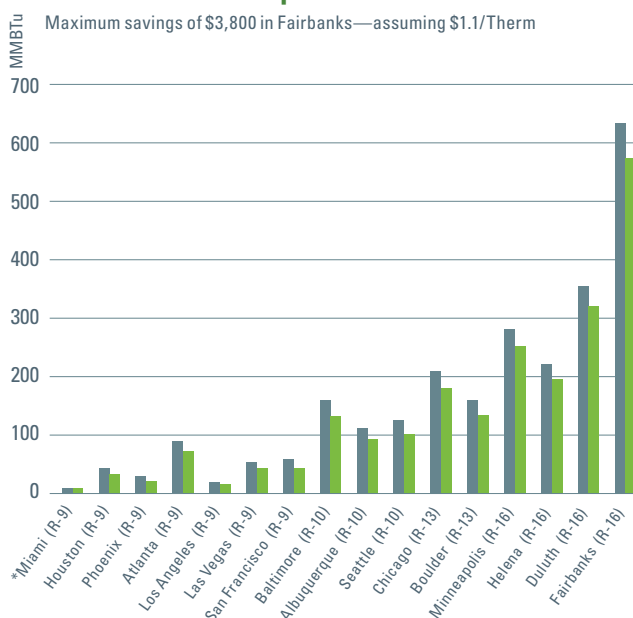
**SAVINGS FOR R-50**  
greatest in single-story buildings in extreme climates<sup>4</sup>

**Modeled Energy Use in a Single-Story Office Building**

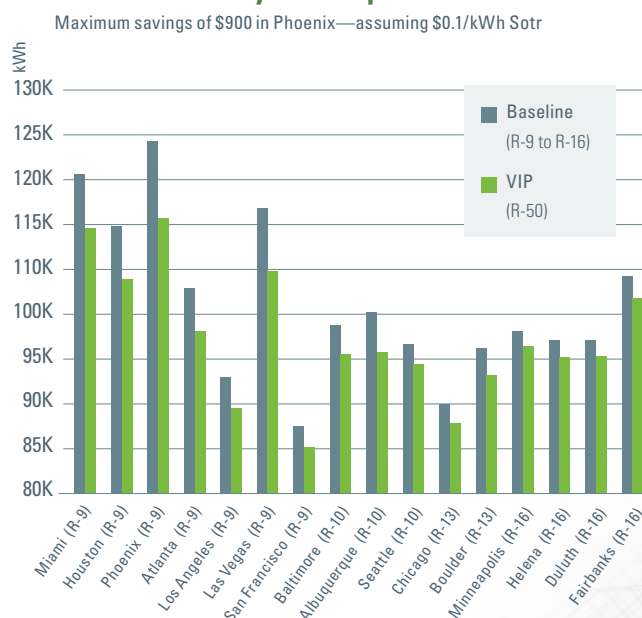
Largest savings in extreme climate zones, such as Fairbanks and Phoenix

**Annual Gas Consumption**

Maximum savings of \$3,800 in Fairbanks—assuming \$1.1/Therm

**Annual Electricity Consumption**

Maximum savings of \$900 in Phoenix—assuming \$0.1/kWh Sotr



\*Cities listed by climate zone from Hot-Humid (1A) to Subarctic (8A)<sup>1</sup>

## DEPLOYMENT

Where does M&V recommend deploying VIPs?

**RETROFITS**

where R-50 is required and installing conventional insulation necessitates costly alterations

<sup>1</sup>Vacuum Insulated Panels in a Roofing Application Camden U.S. Post Office and Courthouse Camden, New Jersey. Dan Howett, Therese Stovall, Mahabir Bhandari, Kaushik Biswas (ORNL), March 2014, p.1 <sup>2</sup>Ibid, p.15 <sup>3</sup>Ibid, p.2 <sup>4</sup>Ibid, p.2