



### Healthy Homes, Healthy Lives Phase 2

The Healthy Homes, Healthy Lives Study is entering its second phase. This study is a continuation of the first Healthy Homes study which lasted from 2003 to 2006.

#### Mission of the 2006 – 2009 Study: “Healthy Homes Phase 2”

In this study, funded by the U.S. Department of Housing and Urban Development [HUD], Advanced Energy and its study partners will examine humidity, allergens and indoor air quality in homes that have been retrofitted with a Healthy Homes Intervention Package. The package includes:

1. Retrofit with **mechanically controlled humidity**;
2. Upgraded heating, ventilation and air conditioning [HVAC] **filtration system**; and
3. Upgraded **ventilation** to dilute indoor air with a measured amount of **outdoor air** and **high-performance exhaust ventilation** in kitchen and bathrooms

We will be examining whether the Healthy Homes intervention provides added benefits in a house that already has tight ducts and a tight building envelope. The overall objective of the study is to identify better building practices related to health in housing and specifically to address the prevalence of asthma triggers in home environments. Study results will be used to disseminate information in an easy-to-use format for builders, health care providers and consumers.

Our primary study hypotheses are as follows:

1. The Healthy Homes Intervention Package maintains indoor relative humidity at or below 50% RH -- the level at which dust mites begin to thrive. Control of relative humidity is also relevant to suppressing mold and insects.
2. The Healthy Homes Intervention Package prevents or retards re-establishment of house dust mites over time relative to control dwellings.
3. The Healthy Homes Intervention Package reduces levels of other indoor allergens in retrofitted houses relative to control houses.

The secondary study hypotheses are:

1. The Healthy Homes Intervention Package results in reduction of volatile organic compounds and particulates relative to control houses.
2. The dehumidification and ventilation strategy can be delivered affordably, without excessive energy use for heating and cooling compared to control houses.

#### Methodology

We will enroll 40 houses in the central region of North Carolina. Data will be collected over a 12 to 18 month period. Allergen levels and other indoor air quality measures will be examined for correlation with building science parameters such as temperature and relative humidity. We will use submeters to collect energy use data for heating, cooling, and hot water.

We will also re-enroll 30 homeowners from Phase 1 of this study and continue to monitor indoor conditions in their houses. This will provide a comprehensive picture of change in allergens over time. The Phase 1 homeowners moved into their new homes in between December 2003-2004.

Participating houses will be measured 5 times during the course of the study. Measurements include:



## Healthy Homes, Healthy Lives

Eight different allergens, from five locations in the house, in four seasons

- Dust Mite (Der F 1 and Der P 1),
- Cat (Fel d 1)
- Dog (Can f 1)
- Fungal allergen (*Alternaria alternate*)
- Endotoxin
- Roach (Bal g 1)
- Rodent allergen (Rat n 1 and MUPs)

Relative humidity in bedroom, crawlspace, and at thermostat

Volatile Organic Compound levels (single season)

Particle levels

Radon

House and duct tightness

Visible moisture damage/visible mold

Energy use for space conditioning & dehumidification

This study also incorporates an exploratory pediatric asthma quality of life survey.

### Results

Results on the impacts of the interventions on different indoor conditions and energy use will be published to members of the public health sector and medical community, healthy homes networks, energy efficiency contractors, building scientists, and Healthy Homes study partners [HUD, National Institute of Environmental Health Sciences [NIEHS], Center for Environmental Medicine at UNC and Habitat for Humanity affiliates]. Participating homeowners will receive a report on their homes' performance, as will participating Habitat for Humanity Affiliates.

### Funding

Healthy Homes Phase 2 is funded by the U.S. Department of Housing and Urban Development [HUD], contract number NCLHH0147-04.

Additional support is provided by project partners, including Advanced Energy, National Institute of Environmental Health Sciences [NIEHS], Center for Environmental Medicine, Asthma, and Lung Biology at the University of North Carolina, School of Medicine, and Habitat for Humanity.

### Timeline

Interventions and measurement for Healthy Homes Phase 2 will occur during summer 2007 and measurement will continue through 2009.

### About Advanced Energy

Advanced Energy is a nonprofit organization that works to create economic, environmental and societal benefits through innovative and market-based approaches to energy issues. Our Applied building Science Team provides training and consultation to improve the health, safety, durability and energy efficiency in buildings.

### More information

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