

HUD's Phase II Energy Action Plan



Energy-Efficient Affordable Homes for the 21st Century:

Energy Efficiency and Energy Conservation At HUD

RESNET Building Performance Conference

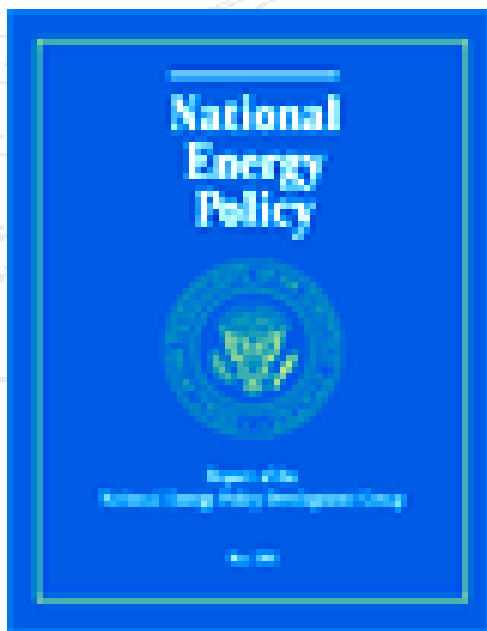
February 27, 2006

Premise

Improving home energy efficiency:

- Reduces dependence on foreign oil
- Increases the nation's energy security
- Increases housing affordability

National Energy Policy



“Conservation and energy efficiency are crucial components of a national energy plan.

Greater energy efficiency helps the United States reduce the likelihood of energy shortages, emissions and the volatility of energy prices.”

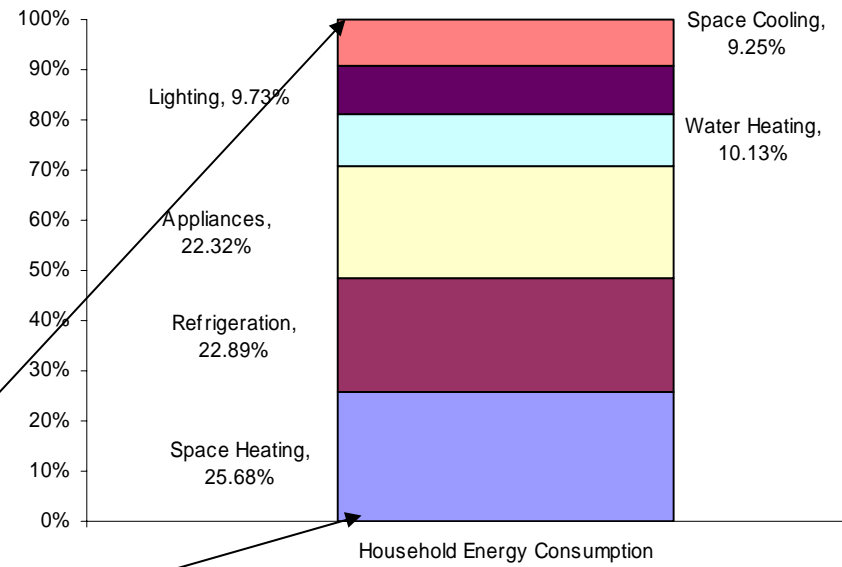
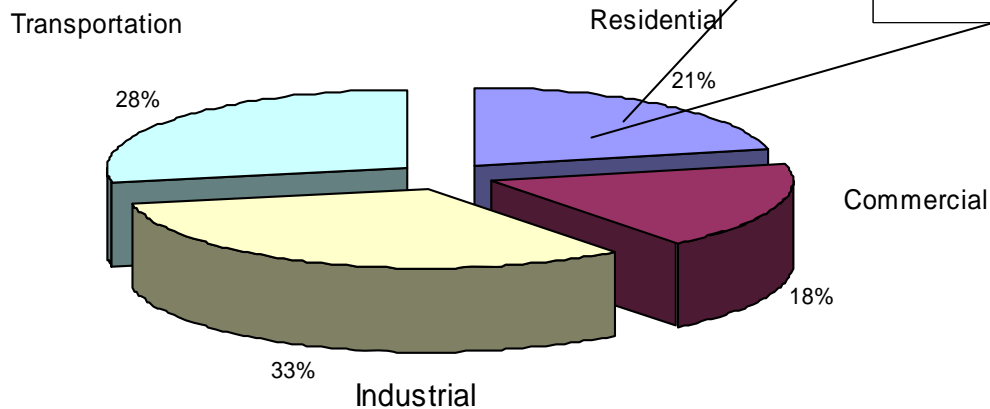
President George W. Bush
May 2001

Homes Use 1/5 Of All Energy in U.S.

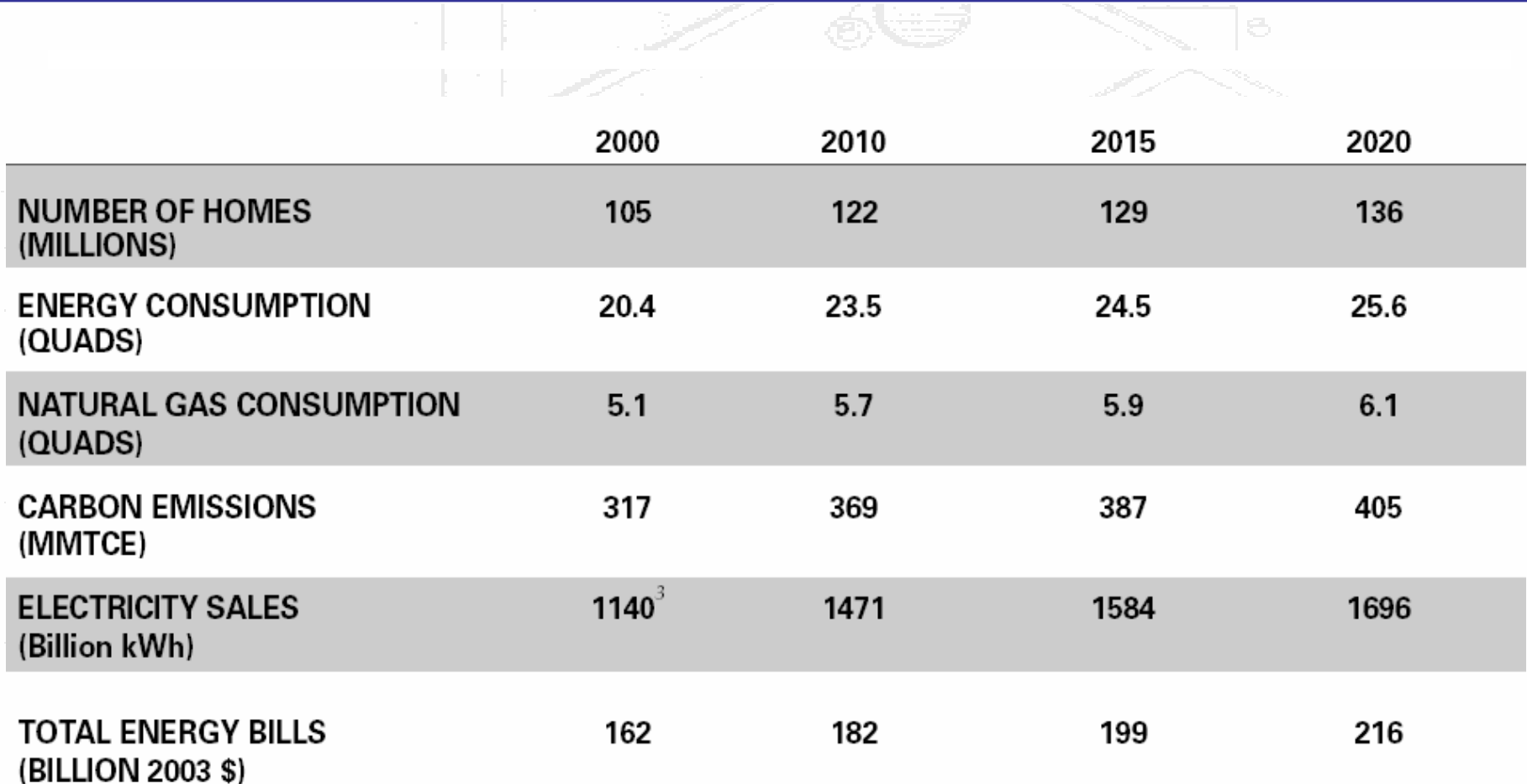
In 2004, residential sector

- consumed 21% of U.S. energy
- spent \$160 billion a year

Total U.S. Energy Consumption 100 Quads in 2004



Overview of Energy Use and US Homes



	2000	2010	2015	2020
NUMBER OF HOMES (MILLIONS)	105	122	129	136
ENERGY CONSUMPTION (QUADS)	20.4	23.5	24.5	25.6
NATURAL GAS CONSUMPTION (QUADS)	5.1	5.7	5.9	6.1
CARBON EMISSIONS (MMTCE)	317	369	387	405
ELECTRICITY SALES (Billion kWh)	1140 ³	1471	1584	1696
TOTAL ENERGY BILLS (BILLION 2003 \$)	162	182	199	216

Energy Costs after Katrina

**Average household will pay
\$257 more
for heating this winter**

**Natural gas customers
will pay up to \$349 more (in the Midwest)**

***Colder weather will raise expenditures
significantly***

Sample Regional Projections

Most Recent Estimated Increases This Winter...

- Midwest: Natural gas + 41%
- Northeast: Heating oil: + 24%
- Midwest: Propane + 19%
- South: Electricity + 14%

Winter heating costs doubled last 5 years

Winter heating costs for average family			
	'01-'02	'05-'06	% Increase
Natural gas	\$465	\$1,000	115%
Heating Oil	\$627	\$1,474	135%
Electricity	\$666	\$787	18%

Source: Energy Information Administration, January 10, 2006

Utilities and Housing Affordability

Energy Costs Are:

- Second-largest shelter expense
- A factor in mortgage defaults

*Low-moderate income families
are especially at risk*

Partnerships for Home Energy Efficiency



- July 2005 - Partnership for Home Energy Efficiency
 - **Focuses on all 110 million existing homes**
- September 2002 - MOU between HUD, EPA, DOE
 - **Expands Energy Star purchases in HUD buildings**



Partnerships for Home Energy Efficiency

- Coordinated effort of DOE, HUD, and EPA
- In partnership with public and private sectors
- Meet important policy objectives
 - Energy efficiency as part of National Energy Policy
 - Reduce greenhouse gas emissions as part of President's commitment to reduce US intensity by 18% by 2012

Goal

Help households save
10 percent or more on home energy bills
over the next 10 years



Benefits

- Savings of \$20 billion a year
- Reduce demand for natural gas by more than 1 quad
- Avoid need for more than 40 (600 MW) power plants
- Avoid greenhouse gas emissions equivalent to 25 million vehicles

Why Existing Homes Now?

- **Address**
 - rising energy prices
 - possible natural gas shortages
 - air pollution and greenhouse gas emissions
 - affordable housing pressures
- **Many opportunities to work with industry**
 - Home improvement is big business – Harvard Joint Ctr
 - Many homes built in 1970s due for remodeling
 - Major retailers moving into rehab/remodeling work
 - Many utilities/program sponsors promoting energy efficiency solutions
 - Manufacturers looking to promote efficient products

Overview of Initiative Activities

- **Expand efforts to promote ENERGY STAR products**
 - Add additional products
 - Coordinated national outreach campaigns
- **Develop/promote new energy efficiency services – beyond products**
 - Contractor credentialing programs and QA/QC mechanisms
 - New ENERGY STAR Services -- Home Performance with ENERGY STAR and Proper HVAC installation
 - Best-practice guides for re-modelers
 - Coop Extension - DOE
- **Promote energy efficiency in affordable housing**
 - HUD Energy Action Plan
 - DOE Weatherization Program
- **Continue innovative research and bring into the field**
 - Net “Zero Energy Home”

Key Milestones

Fall 2005

- ▶ National outreach on energy-efficient lighting
- ▶ National outreach on energy-efficient heating equipment and the how-to's of home sealing
- ▶ Expansion of Home Performance with ENERGY STAR to new regions
- ▶ Revised energy efficiency specifications for ENERGY STAR new homes
- ▶ Protocols for energy-efficient remodeling of existing homes initiated
- ▶ HUD Phase II Energy Action Plan for single and multifamily homes initiated
- ▶ DOE release of HVAC Best Practices guides for home remodelers

Winter/Spring 2006

- ▶ New accreditation standards and quality assurance criteria for home contractors
- ▶ DOE release of 30 percent HVAC Best Practice Builder Guides
- ▶ New ENERGY STAR guidelines for proper installation and verification of HVAC equipment
- ▶ DOE release of Energy Efficient Remodeler Training

Summer/Fall 2006

- ▶ Fall ENERGY STAR campaigns for energy-efficient lighting, heating equipment, and home sealing
- ▶ Expansion of Home Performance with ENERGY STAR to new regions
- ▶ HUD release of home improvement protocols for remodeler industry
- ▶ DOE research on homes that achieve 30 percent whole home energy savings completed
- ▶ DOE launch of research on homes that achieve 50 percent whole home energy savings



New government portal:

www.energysavers.gov

PARTNERSHIPS FOR Home Energy Efficiency

Would you like to save money
on your home energy bills?
Not sure where to start?
We can guide you...

- HOMEOWNERS
- CONTRACTORS & BUILDERS
- BUILDING MANAGERS
- REALTORS & OTHERS
- STATE AGENCIES



Energy Efficient Rehab Advisor

Address  <http://rehabadvisor.pathnet.org/index.asp> 

ENERGY EFFICIENT REHAB ADVISOR

[HOME](#) | [ABOUT](#) 

WELCOME TO THE ENERGY EFFICIENT REHAB ADVISOR!

This Advisor describes the U.S. Department of Housing and Urban Development's (HUD) guidelines for conducting energy efficient housing rehabilitation. HUD recommends following these guidelines when undertaking any type of renovation project in single family and multifamily housing, whether it is privately-owned or public housing.

The Advisor's energy efficiency recommendations are based on [ENERGY STAR®](#) specifications, where applicable. ENERGY STAR is the government-backed symbol for energy efficiency.

Incorporating energy efficiency into your rehab project is a significant step toward achieving High Performance Housing -- housing that is energy efficient, durable, sustainable and healthy. Click on the following icons to learn about these benefits.



Enter your profile below to **Get Started!** You can also find [general information](#) on energy efficiency topics, like air sealing and insulation. Please send your comments and suggestions on the Advisor to info@rehabadvisor.com.























									
Comfort	Durability	Maintenance	Indoor Air Quality	Operating Costs	Quiet Operation	Control	Environment	Water Use	Freezing Problems

BUILD YOUR PROFILE

YOUR BUILDING	YOUR ROLE	YOUR CLIMATE	YOUR BUILDING AGE	SUBMIT
Select an Item... 	Select an Item... 	Select an Item... 	Select an Item... 	

...Provides Advice to Homeowners

Address  <http://rehabadvisor.pathnet.org/audience.asp?Project=1&BuildingType=2&UserRole=1&ClimateType=5&BuildingAge=1> 

Rehab Calculator	MEASURE	ADDED COST	SAVINGS	PAYBACK	BENEFITS
Web Links	Programmable Thermostat - Install an ENERGY STAR qualified programmable thermostat.	.11 \$/sf	.08 \$/sf/yr	1.4 years	 
Glossary	Seal Air Leaks - Bring in a professional home sealer to reduce leaks around windows, doors, floor, ceiling, plumbing and electrical features in your building.	.25 \$/sf	.04 \$/sf/yr	7.1 years	   
	Windows - When replacing or adding windows or skylights, choose those with a U-factor of 0.75 or less and a Solar Heat Gain Coefficient of 0.40 or less.	1.50 \$/sf*	.21 \$/sf/yr*	7.1 years	 
	Insulate Floors - Insulate floors above unconditioned space to at least R-25. Insulate interior floors above conditioned spaces to at least R-19.	.35 \$/sf	.04 \$/sf/yr	7.8 years	  
	Insulate Ceilings - Insulate ceilings in all top floor units to at least R-49.	.35 \$/sf	.04 \$/sf/yr	8.8 years	   
	Insulate Walls - Insulate exterior walls to at least R-19.	.47 \$/sf	.05 \$/sf/yr	9.4 years	   
	Radiant Barriers - Install radiant barriers in the attic over apartment units.				  

How does HUD spend

\$4 billion

each year on utilities?

HUD's Outlays for Energy

More than 10 percent of budget

1. \$1.1 billion in public housing operating subsidies – 1.1 million units
2. \$2.9 billion through Section 8 utility allowances – 2.1 million units
3. Additional \$ in multifamily central heating and cooling – 1.6 million units
4. Also new construction and rehabilitation:
 - 175,000 rehab units/year through CDBG
 - 20,000 new construction via HOME, CDBG, HOPE VI & Section 202-811 for the elderly and disabled
 - Linked to Low Income Housing Tax Credits

Utility Allowances: \$2.9 Billion

Public and Indian Housing

- Public Housing - \$320 million

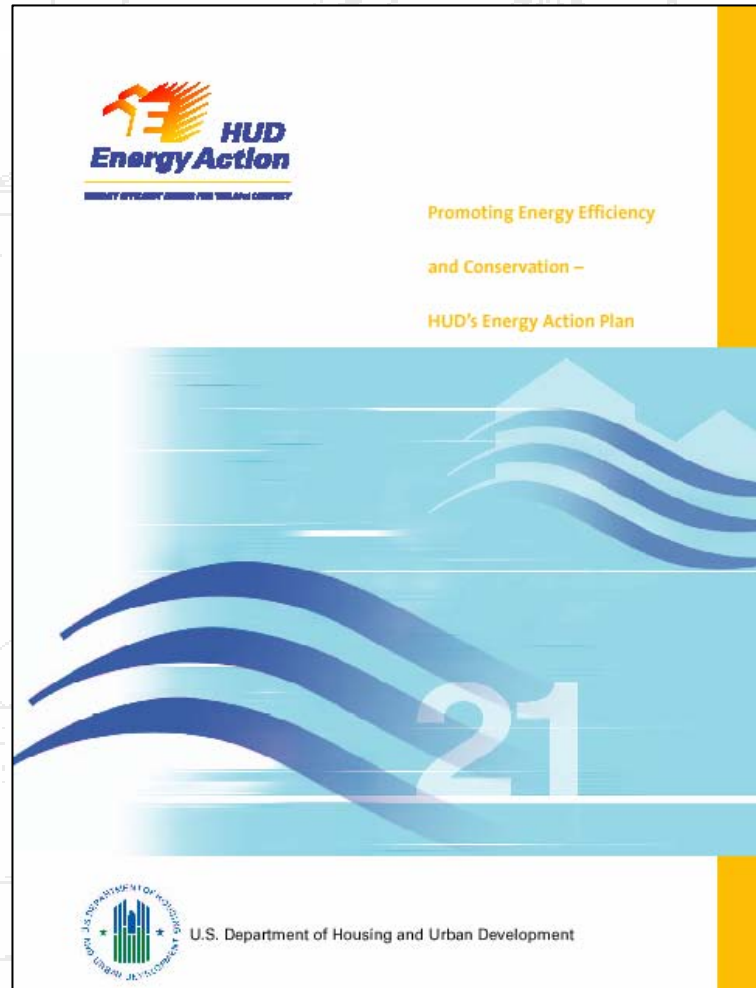
Tenant-Based Vouchers

- Section 8 Vouchers - \$1.96 billion

Assisted Housing:

- Section 8 Mod rehab - \$20.1 million
- Section 8 New & substantial rehab - \$318 million
- Other (includes 202/811) - \$140 million

HUD's 21-Point Energy Action Plan



www.hud.gov/energy

21 Actions in Six Key Areas

- I. Interagency partnerships with DOE and EPA
- II. Provide information, training and technical assistance
- III. Strengthen rewards and incentives for energy efficiency
- IV. Strengthen energy standards and program requirements
- V. Implement management and monitoring of HUD's energy programs
- VI. Conduct policy analysis and technology research

Institutionalizing Energy Efficiency

- Work with EPA, national partners to promote Energy Star in new and existing housing
- Training and information
- Priority rating points for energy efficiency in competitive SuperNOFA/grant awards
- Regional Coordinators – strong actions in southeast, southwest, California, New England

Homeownership and Assisted Housing

Single Family

- Feature Energy Efficient Mortgages (EEMs) for up to \$8,000 higher loan amount
- Simplify regulatory requirements for EEMs
- Improve tracking and evaluate performance of EEMs

Multifamily

- Initiate multifamily weatherization partnerships
- Energy efficiency training for assisted multifamily managers and staff
- Improve tracking and monitoring

3 Improvements

1. Improved tracking
2. Issued new Mortgagee Letter
 - Consolidates guidance
 - Clarifies procedures
 - Establishes IECC 2003 as standard for new construction
3. Lender training

Promoted Energy Star in HOME-CDBG

- Provided information to 1,000 cities and counties
- 49 communities in New England now use Energy Star for rehab, new construction
- Created web training module for HOME
- Established data collection system - begins FY 2007
- Combined Heat and Power (CHP)

FOR EXAMPLE...

Folsom Dore Apts – San Francisco



- HOME-funded
- PATH Demonstration
- High-efficiency HVAC system
- Energy Star Appliances
- High-performing windows

Expanded Efficiency in Public Housing

- Increased number of energy performance contracts by 25%
- Encouraged energy in new HOPE VI projects
- Publicized buying Energy Star products & appliances
- Created Public Housing Energy Conservation Clearinghouse
- Initiated long-term utility benchmarking project

SOME EXAMPLES...

Danbury Housing Authority



- Energy Performance Contract
- Combined Heat and Power
- Electricity reduced from 1.25 million to 200,000 kWh
- Energy cost reduced by \$40,000 annually
- No initial costs to the Housing Authority or HUD

Chattanooga Housing Authority

PHA Size: 3,109 units.

ESCO: Honeywell

Contract Cost: \$9.9 million

Energy Savings:

**\$1.4 million/year - \$16.6 million
over 12 years.**

HUD Incentive: Add-On Subsidy

PHA Cost Benefit:

**Energy: \$3.1 million (PFS cost
benefit)**

**Cost Avoidance: \$6.5 million (Heat
Pumps)**



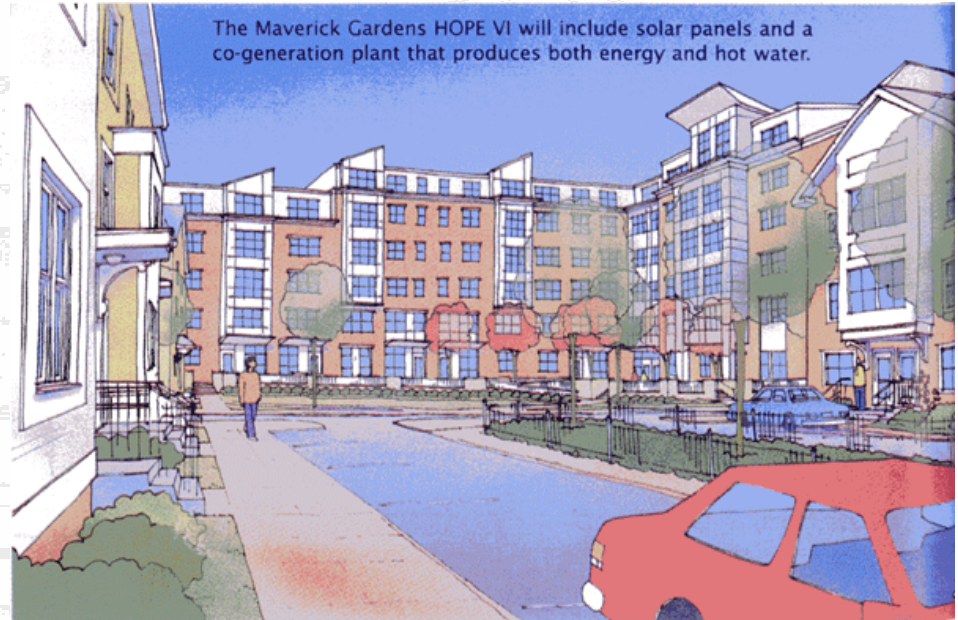
Churchill Homes - Holyoke MA

- 50 new wood-framed, 3-story buildings
- Achieved Energy Star
 - Advanced framing
 - High efficiency boilers/DHW combinations
 - Controlled ventilation
- 30 percent more energy efficient than standard construction



Maverick Gardens - Boston

- Photovoltaics
 - 40.8 kW
- Cogeneration
 - Microturbine, absorption chiller
- Energy Star
- HERS 88-89
- LEED



Public Housing Clearinghouse

The screenshot shows a Microsoft Internet Explorer browser window displaying the Public Housing Energy Conservation Clearinghouse website. The browser's address bar shows the URL: <http://www.hud.gov/offices/pih/programs/ph/phecc/>. The website header includes the HUD logo and the text "Homes & Communities US Department of Housing and Urban Development". The main navigation menu on the left lists categories such as "Public and Indian Housing", "HUD news", "Homes", "Communities", "Working with HUD", "Resources", and "Tools". The main content area features the title "Public and Indian Housing" and "Public Housing Energy Conservation Clearinghouse". A "News" section highlights "Mold and Hurricane Rebuilding" with a brief description and a list of links to related articles. A "Jump to..." section provides quick access to various topics like "Energy Performance Contracting" and "Education Materials for Residents". A search bar is also present, along with a "Website Spotlight" section. The browser's taskbar at the bottom shows several open applications, including "New Memo - Lotu...", "Public Housing En...", "2006 Managem...", "Microsoft Word", and "Microsoft PowerP...", with the system clock showing 10:29 AM.

Public Housing Energy Conservation Clearinghouse - HUD - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Print

Address <http://www.hud.gov/offices/pih/programs/ph/phecc/> Go Links

Homes & Communities
US Department of Housing and Urban Development

Public and Indian Housing

- Public housing
- PHECC
 - PIH Utility Policies
 - Incentives & Funding
 - Utility Allowances
 - Success Stories
 - Cost Reduction Toolbox
 - Energy Star, etc.
 - Training & Conferences
 - Resources & Links
 - Newsletter
 - Contact Us

HUD news

Homes

Communities

Working with HUD

Resources

Tools

- Webcasts
- Mailing lists
- Contact us
- Help

FIRSTGOV.gov
The U.S. Government's Official Web Portal

Public and Indian Housing

En español | Text only | Search/index

Public Housing Energy Conservation Clearinghouse

News

Mold and Hurricane Rebuilding

The following resources discuss mold in hurricane and flood damaged housing. Mold is a major health hazard and can become difficult to control if not dealt with promptly and properly.

- [Mold Removal Guidelines for Your Flooded Home](#)
- [The ABC's of Returning to Flooded Buildings](#)
- [Initial Restoration for Flooded Buildings](#)
- [Seminars:](#) "Moisture, Wind, Energy Management in Post Katrina/Rita Residential and Commercial Design" and "Rebuilding and Restoring Homes for the Gulf Coast Region" -- December 15th in Baton Rouge, Louisiana

[More PHECC information on hurricane rebuilding.](#)

Best Practices for Household Mold and Moisture Prevention
A new report, *Controlling and Preventing*

Information by State

- Print version
- Email this to a friend

Jump to...

- Energy Performance Contracting
- Education Materials for Residents
- PIH Utility Policies
- Incentives & Funding
- Utility Allowances
- Success Stories
- Cost Reduction Toolbox
- Energy Star, etc.
- Training & Conferences
- Resources & Links
- Newsletter
- Contact Us

Search

Can't find what you're looking for? [Search HUD.gov](#) for more information.

Local intranet

start | New Memo - Lotu... | Public Housing En... | 2006 Managem... | Microsoft Word | Microsoft PowerP... | 10:29 AM

Phase II Overview

- Expand multifamily strategy
- Look at Section 8 utility allowances
- Build home energy partnerships with state city, county, non-profit partners
- Increase awareness in affordable housing industry
- Track and measure savings
- *Other*

Energy Policy Act of 2005



- Requires HUD to develop an integrated energy strategy for public & assisted housing
 - Due August, 2006
 - Opportunities for public comment
- Also requires HUD to implement specific measures in public housing (Energy Star)

Partnership for Advancing Technology in Housing (PATH)

Encourages the use of technology to
improve the affordability and value of new
and existing homes



PATH

PARTNERSHIP FOR ADVANCING TECHNOLOGY IN HOUSING

Panelized Wall and Roof Systems



- Panelized Structural Insulated Panels (SIPS)
- Provides added insulation:
 - R-24 Walls
 - R-40 Roofs

Claretian Associates
South Chicago, Illinois

Tankless Gas Water-Heaters



**Madera I Model Home
Gainesville, Florida**

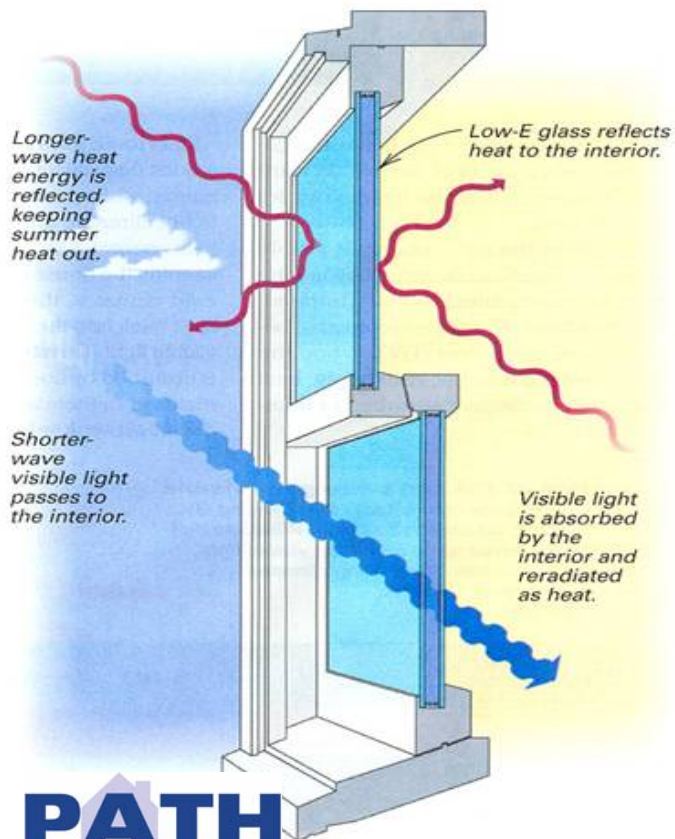
- Provides instantaneous hot water
- Eliminates transmission, standby losses

Energy-Efficient Lighting, Appliances, Controls



High Performance Windows

Low-E glass reflects heat energy while admitting visible light. This keeps heat out during the summer and during the winter. In the winter, low-angle visible light passes into the house and is absorbed by the home's interior.



Low E-Windows
reflect heat while
admitting light

Reduced Energy Costs by 50 Percent



- Advanced Framing
- Unvented Crawlspace
- Low-E Windows
- Optimized Heating and Cooling
- Tankless Gas Water-Heater
- Energy Star appliances

Putting It All Together

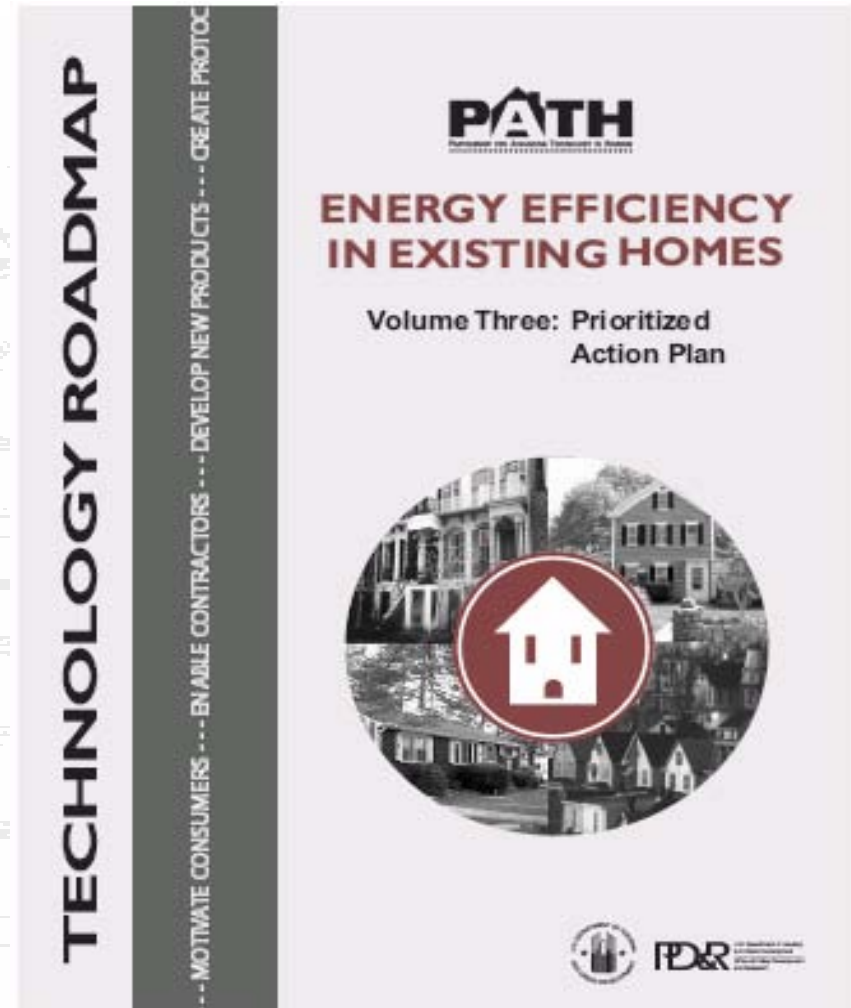


- Advanced Framing
- Unvented Crawlspace
- Low-E Windows
- Optimized HVAC
 - 92% Condensing Furnace
 - 13 SEER Air-Conditioning
- Tankless Gas Water-Heater
- Energy Star Appliances
- HERS 89 -90



PATH Roadmap for Energy Efficiency in Existing Homes

- PATH identified energy efficiency in existing homes as an area requiring attention
- Significant untapped potential for energy savings



Roadmap Strategies

Impact of PATH Energy Efficiency Strategies on Retrofit Investment

	Top Priority Near Term	Second Priority Medium Term	Third Priority Longer Term
Demand-Side Strategies	<p>Strategy 1 Provide Consumer Incentives for Implementation</p>	<p>Strategy 6 Develop a Performance Monitoring System for Energy-Consuming Equipment</p>	<p>Strategy 7 Increase the Value Consumers Associate with Energy Efficiency</p> <p>Strategy 8 Build Credibility for Service Providers</p>
LOW LEVEL OF RETROFIT INVESTMENT	INCREASED RETROFIT INVESTMENT	ADDITIONAL GROWTH IN INVESTMENT	CONTINUED GROWTH IN INVESTMENT
Supply-Side Strategies	<p>Strategy 2 Motivate Service Providers to Deliver Energy-Efficient Solutions</p>	<p>Strategy 3 Develop a Single Industry Protocol for Practitioners</p> <p>Strategy 4 Improve Retrofit Building Envelope Technologies</p> <p>Strategy 5 Enable Practitioners to Deliver Energy-Efficient Solutions</p>	<p>Strategy 8 Build Credibility for Service Providers</p>

Implementing the Roadmap

1. Uniform guidelines or protocols for energy efficient remodeling
2. Develop standard retrofit packages for for specific housing types
3. BPI contractor credentialing and certification (with DOE and EPA)
4. Field evaluations
5. R&D (with DOE)
 - Low-e Storm Windows
 - High performance electrochromic windows

Uniform Remodeling Protocols

- First phase initiated September, 2005
 - Partnership with remodeling industry
- Aimed at
 - Boosting credibility and knowledge of trade contractors, remodelers
 - Providing homeowners with credible, reliable information
- Builds on existing methods, guidelines
 - Home Energy Rating Systems (HERS)
 - Home Performance with Energy Star
 - California, New York protocols/technical standards

Standard Retrofit Packages for Local Housing Types

- Identify standard approaches for particular housing types
 - E.g. Chicago bungalow, Baltimore row house
- Develop and test retrofit packages
 - Test in four locations (to be selected)
- Streamline energy efficient retrofits packages for
- Underway in Spring 2007

For More Information

- www.energysavers.gov
 - Government-wide portal for energy information
- www.hud.gov/energy
 - HUD Energy Action Plan
- www.pathnet.org
 - Partnership for Advancing Technology in Housing
- www.energystar.gov
 - EPA's Energy Star web site
- <http://www.hud.gov/offices/pih/programs/ph/phecc/>
 - Public Housing Energy Conservation Clearinghouse
- <http://www.hud.gov/offices/cpd/energyenviron/energy/>
 - CPD's energy web site