Baker Neighborhood Energy Efficiency Workshop

BAKER HISTORIC NEIGHBORHOOD ASSOCIATION

Energy Efficiency Workshop



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Denver Energy Challenge

- Free energy advising service from the City and County of Denver
 - Originated from grant funding from the U.S. Department of Energy's Better Buildings Neighborhood program
- We help to ease the process of completing home energy upgrades to...
 - Improve energy efficiency
 - Improve comfort
 - Improve indoor air quality

Energy Advising Process

- Complete a phone or inhome consultation
- Receive a tailored Energy Action Report
- Gather estimates or get energy audit
- Review estimates, determine rebate pathway
- Complete work!



Energy Loan

- Low-interest loans for energy upgrades!
- As low as 2.75% for residential
- Easy online application, no appraisal required
- Energy upgrade is the collateral
- Must participate in the Denver Energy Challenge





New loan program helps offset energy costs

Call or Click

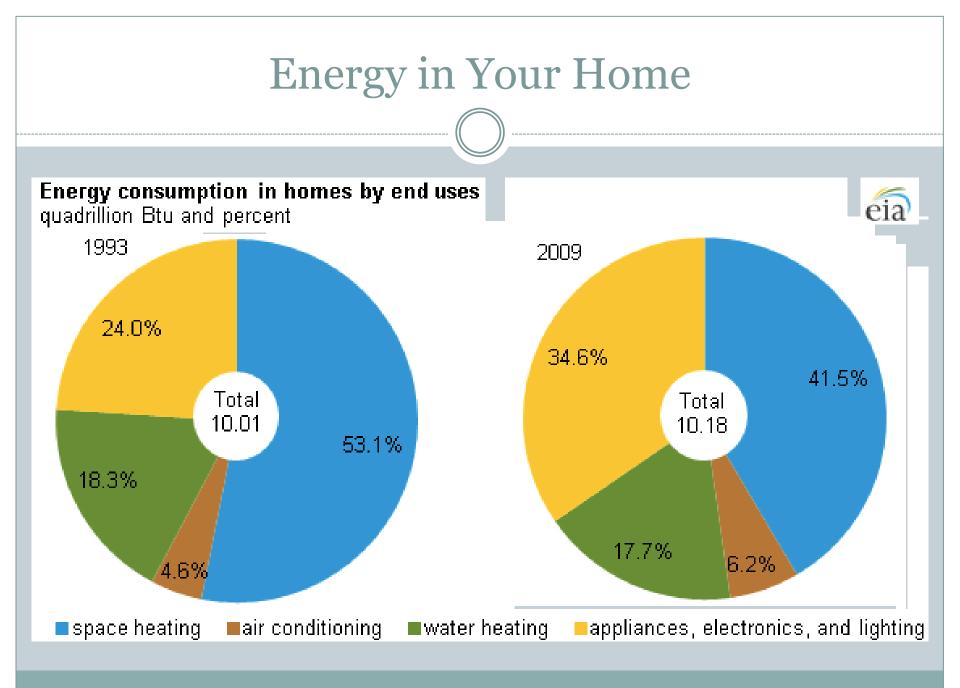




or visit DenverEnergy.org

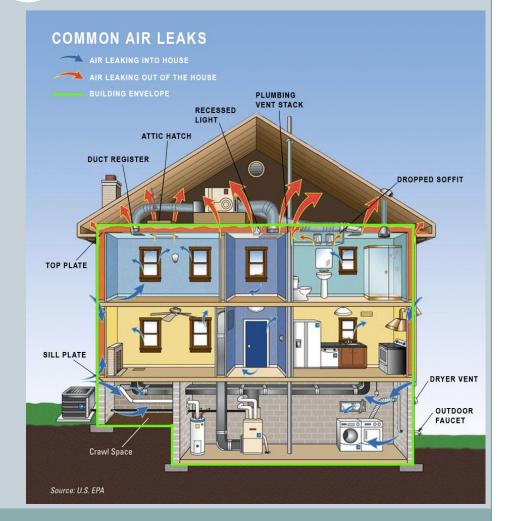
• Why are we doing this?

• 40% of the energy used in the US comes from residential and commercial buildings, and we want to take people from assessment to action.



The Building Envelope

- The boundary that separates inside from outside
- Goal: Stop water, slow heat, control air.
- Insulation and "air sealing"
 - Very important and costeffective
- Windows and doors
 - Still important, but less cost-effective.



Attic Space – Insulation!

- Look for a minimum of R-49
- Details are important!
- Make sure to air seal!
- Rebates available



Crawlspace – Insulation!

Steps:

- Wrap foundation walls with at least R-15
- Seal the rim joists
- Cover exposed floor (dirt) with vapor barrier What to consider before?
- Have I noticed moisture/water build up?
- Have I tested for radon?

Mechanical Equipment

• Furnace or Boiler

- Up to 98% efficiency!
- Staging/modulating equipment
- Sealed combustion

• Air Conditioner or Evaporative Cooler

- Traditional air conditioning is energy intensive; behavior is key!
- Evaporative cooler is likely to use up to 80% less energy than AC
- Whole House Fan and Passive Cooling

Lighting, Appliances, and Electronics

Lighting

- LEDs and CFLs will cut lighting-related energy consumption by 80%
- Appliances: Refrigerator, Clothes washer/dryer, dishwasher
- Extras: numerous fridges? Electric space heaters? Hot tub?
- Behavior is key!
- General rule: look for the Energy Star label!

Call or Click





or visit DenverEnergy.org

Energy Efficiency in Older Homes and Building

BRITTANY PAIGE BRYANT ASSOCIATE CITY PLANNER DEC-HISTORICAL ADVISOR & DENVER LANDMARK PRESERVATION STAFF

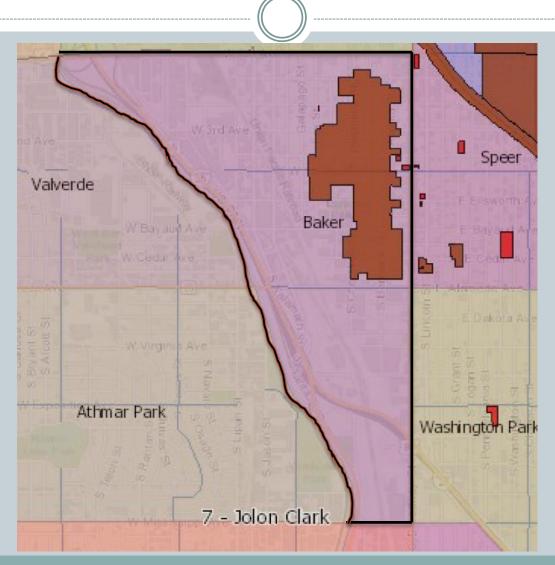
Two Types of Reviews for Older Homes

- **1.** DEC Historic Review
- 2. Denver Landmark Review

• If you use the loan, your property may be subject to:

- o Both review types,
- o Only one review type, OR
- Neither review type

Baker Neighborhood with the Baker Historic District



<u>Key</u> Pink=Statistical Baker Neighborhood

Brown=Baker Historic District

Red=Individual Denver Landmarks

DEC Historical Review vs. Denver Landmark Review

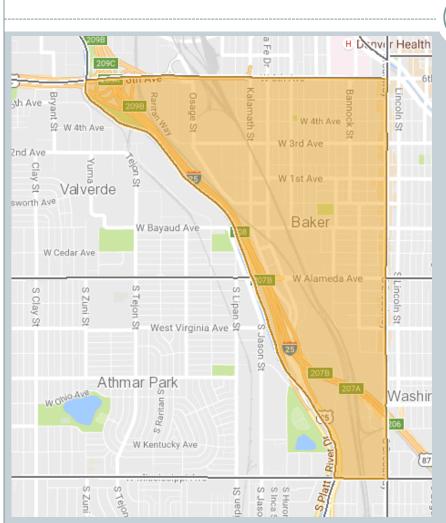
DEC Historical Review

- For all structures 50 years or older
- Section 106 of the National Historic Preservation Act mandates federal agencies undergo a review process for all federally funded and permitted projects that will impact sites listed on the National Register of Historic Places or eligible for listing
- Must identify historic properties and what effect, if any, the project may have on historic properties
- Any negative effects must be mitigated

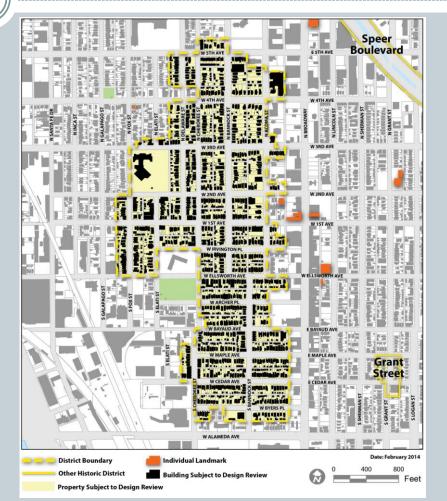
Denver Landmark Review

- Only for structures within the Baker Historic District Boundary OR Individually listed as a Denver Landmark
- Review of all exterior work including windows, simple mechanical (AC, Attic fans, etc.)
- Denver Landmark Preservation must issue a Certificate of Appropriateness prior to work commencing
- To preserve key historic features and ensue compatibility with designated historic buildings, sites, and districts.

Baker Neighborhood & Baker Historic District



DEC Historic Review applies to this entire area



Denver Landmark Review applies to the buildings within the yellow boundary and the orange Individual Landmarks

National Register of Historic Places

- A building that is 50 years or older must be evaluated for historic potential by the DEC historic preservation advisor
- May already be listed on the National Register-the nation's official list of districts, sites, structures and object worthy of preservation and are officially designated "historic properties"
- Eligible for listing on the National Register based on the Criteria for Evaluation

National Register Criteria for Evaluation

The quality of significance in American history, architecture, archaeology, engineering, and culture in districts, sites, buildings, structures and objects that possess integrity of location, design, setting materials, workmanship, feeling, and association, and:

- a. That are associated with events that have made a significant contribution to the broad patters of our history; or
- b. That are associated with the lives of significant persons in or past; or
- c. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d. That have yielded or may likely to yield, information important in history or prehistory.

Energy Efficiency in Older Homes

- Masonry walls, such as those found in Baker, have inherent thermal characteristics that keep the buildings cooler in summer and warmer in winterthe rate of heat transfer is slowed by masonry walls
- Steeply pitched roofs help shed snow and increase solar heat gain for colder climates
- Operable windows provide natural ventilation and light can reduce energy consumption.
- Typically in older buildings the ratio of glass to wall is less than 20% and heat loss through windows is likely minimal

Prioritize Energy Upgrades

Minimal Change-little impact on historic fabric

• Operational Changes

- Programmable thermostats
- Use shades and curtains to control heat gain and loss through windows
- Use operable windows, shutters, awnings and vents as originally intended to control temperature and ventilation
- Install LEDs and CFLs
- Upgrade Equipment & Appliances
- Reduce air leakage
- Consider attic insulation over wall insulation
- Weather strip doors and windows
- Consider storm windows prior to replacing windows
- Insulate basements and crawlspaces
- Seal and insulate ducts and pipes

More Change-may impact historic fabric

- Windows replacements
- Wall insulation
- Installing new roofing

Insulation

- Determine where the thermal boundary of the building is
- Rigid foam and some spray insulation may be appropriate for the roof and crawlspace/basement insulation
- Use blown-in insulation for walls. Cellulose or fiberglass recommended. Use "borate only" cellulose as sulfates in other types of cellulose insulation may react with the moisture in the air and corrode many metals (i.e. 100 year old nails)
- NEVER use spray foam to insulate walls-will expand and can result in structural stress, is not reversible
- If insulating masonry walls, be sure to monitor the wall as the insulation will result in reduction of the drying rate of the wall
- Only use vapor barriers on exposed earth

Mechanical

- Place AC units and Evap. Coolers in locations that are minimally visible from the public right-of-way
- Replace old heating systems, AC, water heaters, and old appliances
- Insulate ducts and pipes, specifically ones located in unconditioned spaces
- Use curtains and shutters!
- Place all new vents on secondary facades where they will be minimally visible
- Place Solar Panel on the rear portion of the roof where it will be minimally visible from the public right-of-way

Windows

- Original windows add historic character to your home
- Consider storm windows first
- Only replace if necessary, i.e. too deteriorated to repair
- Retain the proportions of the opening
- Replace in-kind
- Match the existing window operation, size, design, number of panes, muntin profile, color, and reflective qualities of the glass