Making Green Homes Affordably

Jason La Fleur
jlafleur@alliancees.org

alliance for environmental sustainability

www.LEEDforHomesIllinois.org

Who is AES?

The Alliance for Environmental Sustainability (AES) is a 501(c)3 non-profit organization with a mission of providing sustainable building education to the general public and building industry.

A resource dedicated to helping people understand the options available for designing, building and occupying structures that offer environmentally friendly alternatives, energy efficient products and improved indoor air quality.

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Why Green Homes?

Energy Costs are Reported to be the Second Largest After Shelter Expense

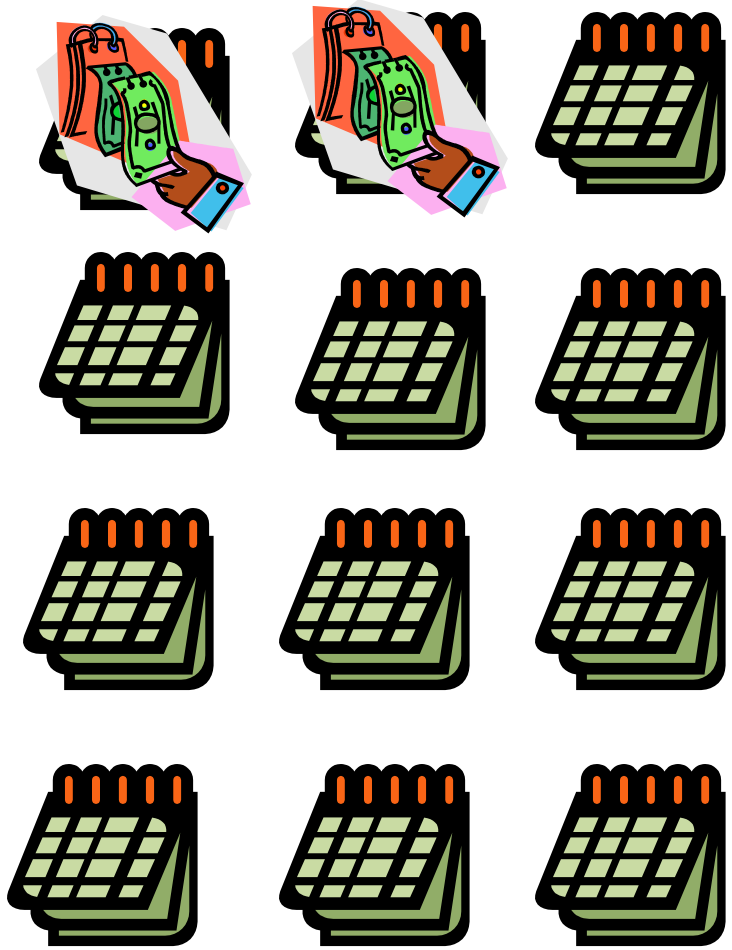
- A factor in mortgage defaults
- A contributor to homelessness
- The very-low to low-moderate income families are especially at risk
- High energy burdens can increase health and safety risks in homes

Rising energy costs impact household budgets

- 2008 average after tax income $52,586
- Energy costs >$6,200

  ~ 12-1/2%, of 1-1/2 months' income

ACCCE 7/25/08



Where does it all go?

Breakdown of Home Energy Use

Home Space Heating	50%
Water Heating	15.3%
Lighting	6.8%
Home Space Cooling	6.4%
Refrigeration	4.6%
Electronics	2.8%
Washer/Dryer	3.2%
Cooking	3.9%
Computers	6%
Others	3.9%

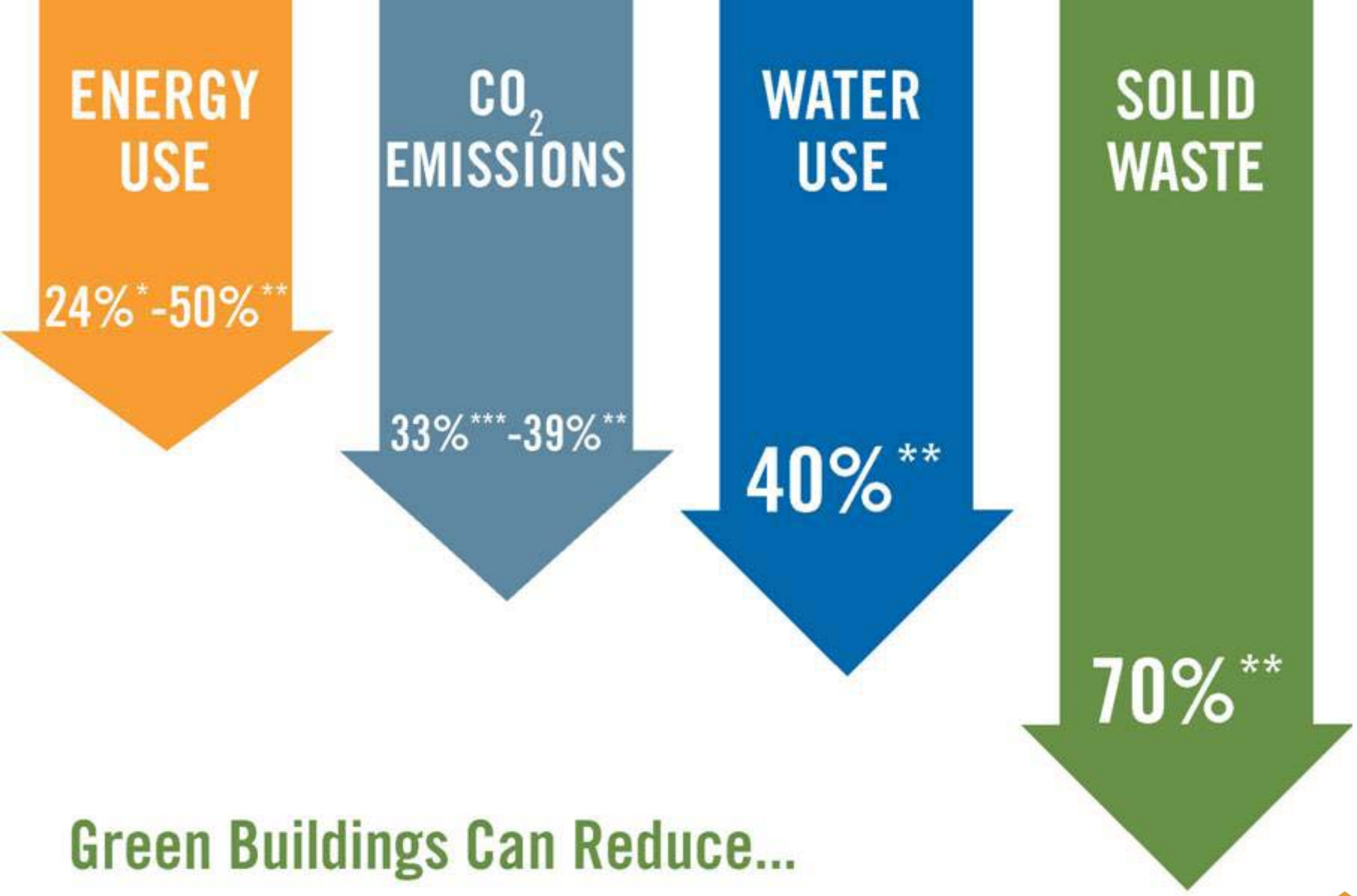
What do you think Green Buildings can reduce the most?

A. Energy Use

B. CO_2 Emissions

C. Water Use

D. Solid Waste



Green Buildings Can Reduce...

* Turner, C. & Frankel, M. (2008). Energy performance of LEED for New Construction buildings: Final report.
** Kats, G. (2003). The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force.
*** GSA Public Buildings Service (2008). Assessing green building performance: A post occupancy evaluation of 12 GSA buildings.

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PERCEPTION


REALITY

Today's Green Homes

Benefits of a Green Home

- Healthier (better indoor air quality)
- Increased comfort
- Conserve water and energy
- Lower operating costs
- Increased durability (lower maintenance cost)
- Increased occupant safety
- Reduced construction and demolition waste
- Environmentally responsible

According to Green Home Owners, Top 3 Benefits of a Green Home are:

Green Building is all about the Triple Bottom Line:
People, Planet, Profit

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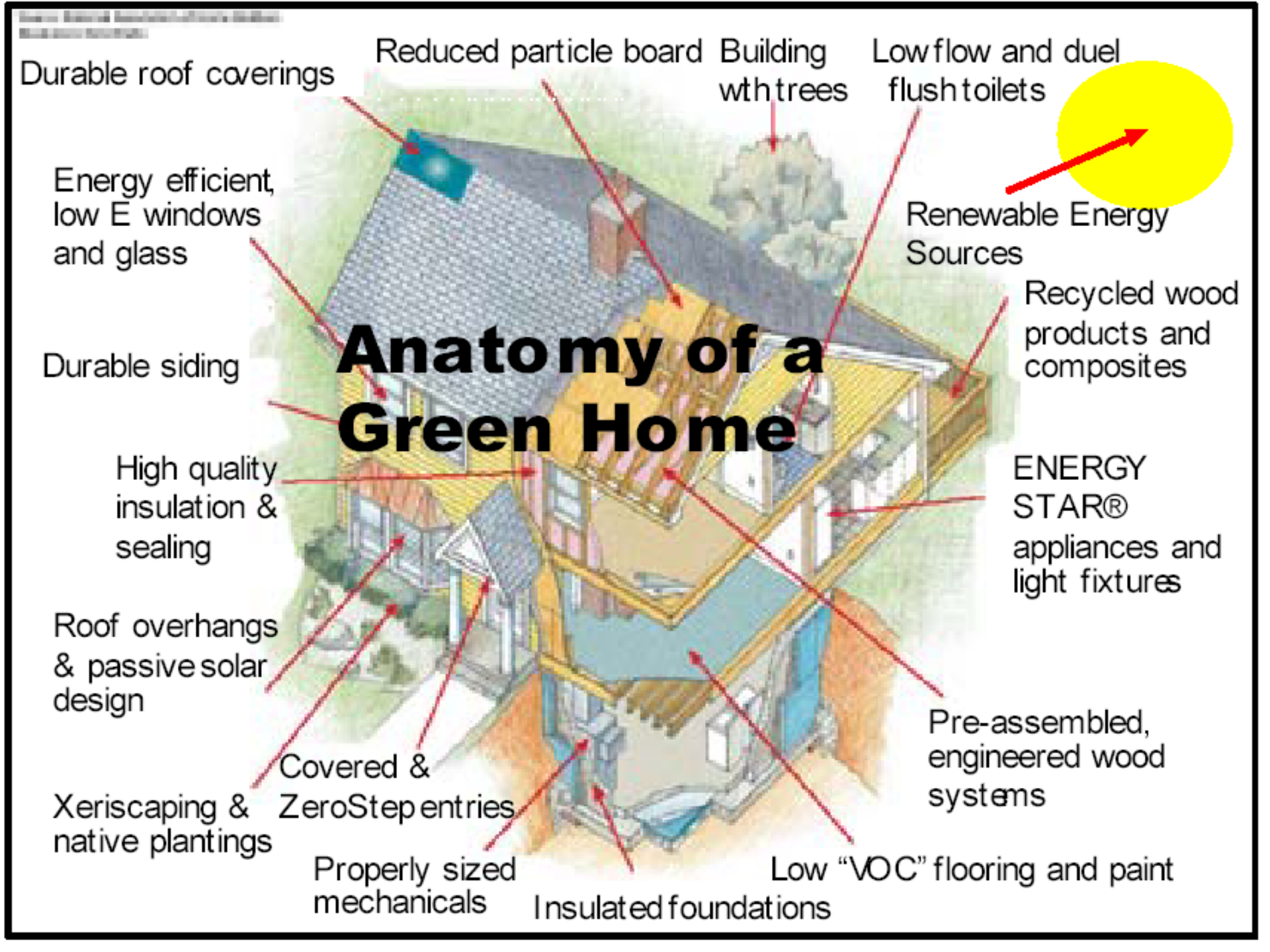
Source: SmartMarket Report, McGraw Hill Construction, 2008

What makes a green home?


Durable roof coverings
Reduced particle board
Building wth trees
Low flow and duel flush toilets
Energy efficient, low E windows and glass
Renewable Energy Sources
Recycled wood products and composites
Anatomy of a Green Home
Durable siding
High quality insulation & sealing
ENERGY STAR® appliances and light fixtures
Roof overhangs & passive solar design
Pre-assembled, engineered wood systems
Covered & ZeroStep entries
Xeriscaping & native plantings
Properly sized mechanicals
Insulated foundations
Low "VOC" flooring and paint

How Do You Define Green?

Builder A

Builder B

Builder C

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ANIMALS
HIPPOPOTAMUS
ZEBRA
Nutrition Facts
Serving Size 8 crackers (28g
Servings Per Container About 2
Amount Per Serving
Calories 120 Calories From Fat 30
% Daily Value*
Total Fat 3.5g 5%
Saturated Fat 1g 5%
Trans Fat 0g
Polyunsaturated Fat 1.5g
Monounsaturated Fat 0.5g
Cholesterol 0mg 0%
Sodium 140mg 6%
Total Carbohydrate 22g 7%
Dietary Fiber Less than 1g 3%
Sugars 7g
Protein 2g
Vitamin A 0% • Vitamin C 0%
Calcium 10% • Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet.
CONTINUED ON OTHER SIDE

LEED = Leadership in Energy and Environmental Design

LEED® Facts

Brinshore Development
Highland Park, IL

LEED for Homes
Certified on: November 2009

Gold	74
Locations & Linkages	10
Sustainable Sites	18
Water Efficiency	7
Energy & Atmosphere	19
Materials & Resources	2
Indoor Environmental Quality	11
Innovation & Design	5
Awareness & Education	2

Hyacinth Place
Highland Park, IL

Hyacinth Place

Highland Park, IL

LEED Gold (Nov 2009)

4 Multi-Family rental units, 11 Single-family Townhouses (sold at 120% AMI)
Units average 1,550 s.f., with 3 bedrooms, 2 baths

Efficient envelope, geothermal heating and cooling, blown insulation, reflective roofing, energy star lighting, all contributed to a HERS rating of **68**

39%

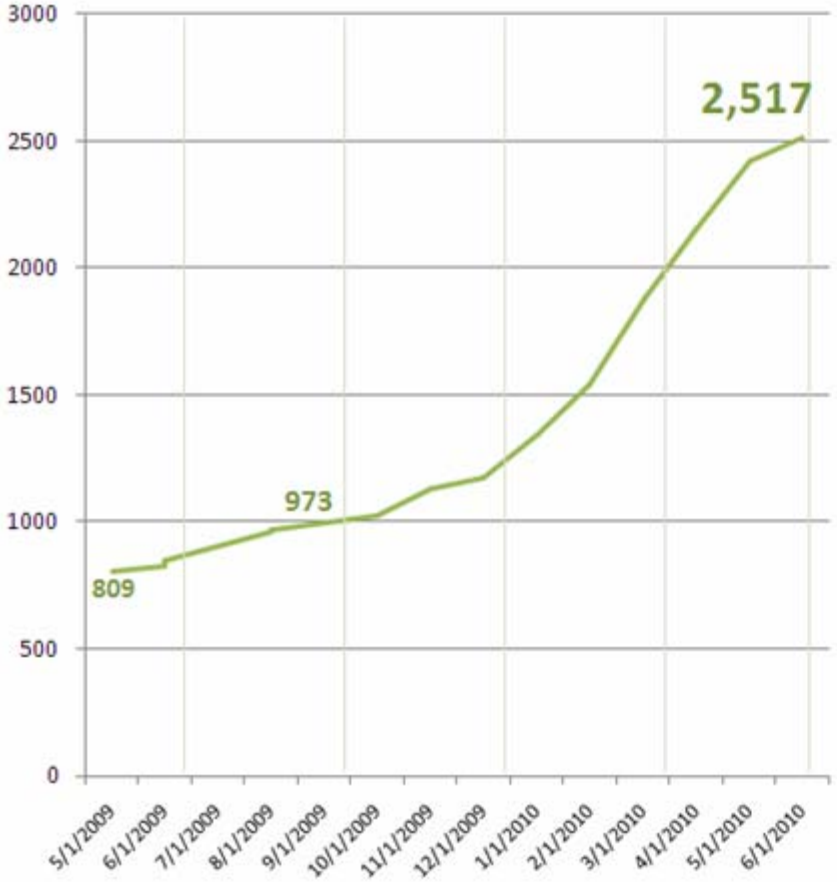
of Certified LEED Homes are

Affordable Homes

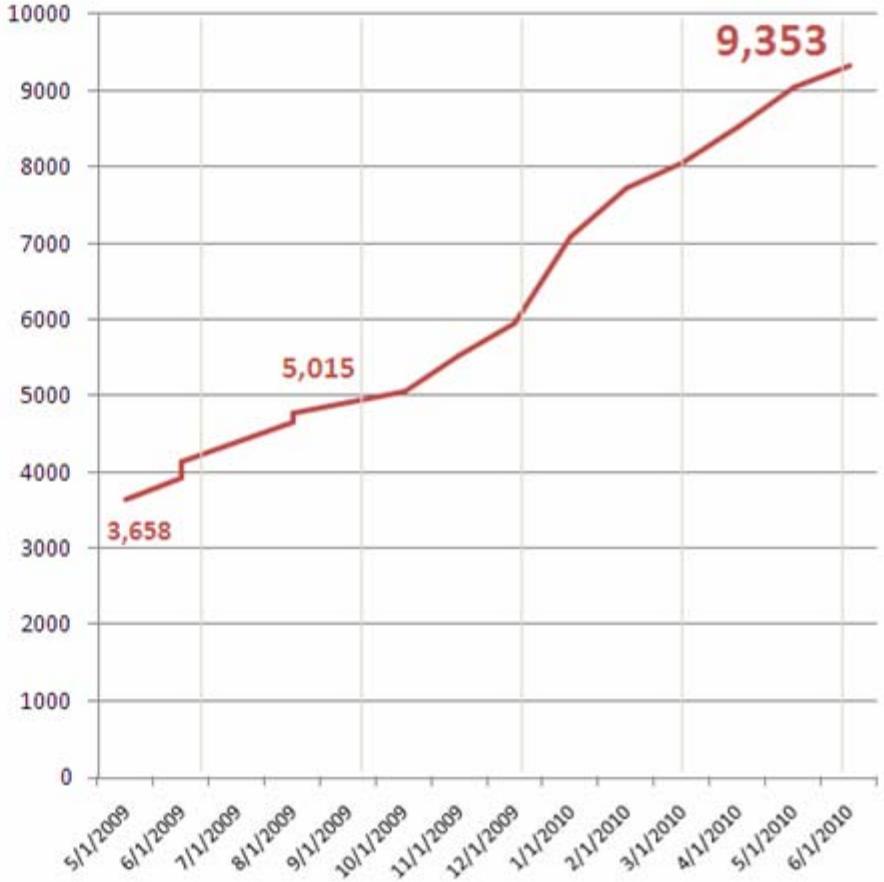
From those guidelines for eligibility for HDF funds: Low income housing is defined as less than or equal to 80% of the local area median income (AMI) or the local jurisdiction standard of affordable housing. We mandate that the number of affordable, low income units must be at least 75% of the units in each building.

LEED for Homes: Affordable

Certifications



Registrations



How Does LEED Define a Green Home?

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FOR HOMES

How Does LEED Define a Green Home?

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USGBC has four levels of LEED:

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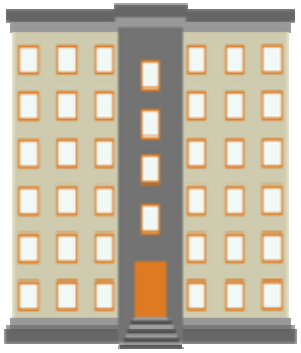
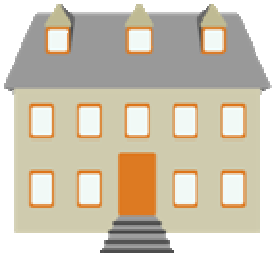
Program Scope and Applicable Building Types

Single-Family Homes



Mixed Use / Mid-Rise



Low-Rise Multifamily

Single-Family Production

Gut Rehab

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Multi-Family: 2 LEED Options

	LEED for Homes*	LEED for New Construction
Typical building type	Residential	Commercial
Rating system focus	Living units	Building systems
Building size	1-6 stories	4+ stories
Documentation	Light	Moderate
Delivery	Provider	Owners/APs
Typical Cost	**$**	**$$$**

*** Includes midrise pilot (4-6 stories)**

Greenbuild 2009

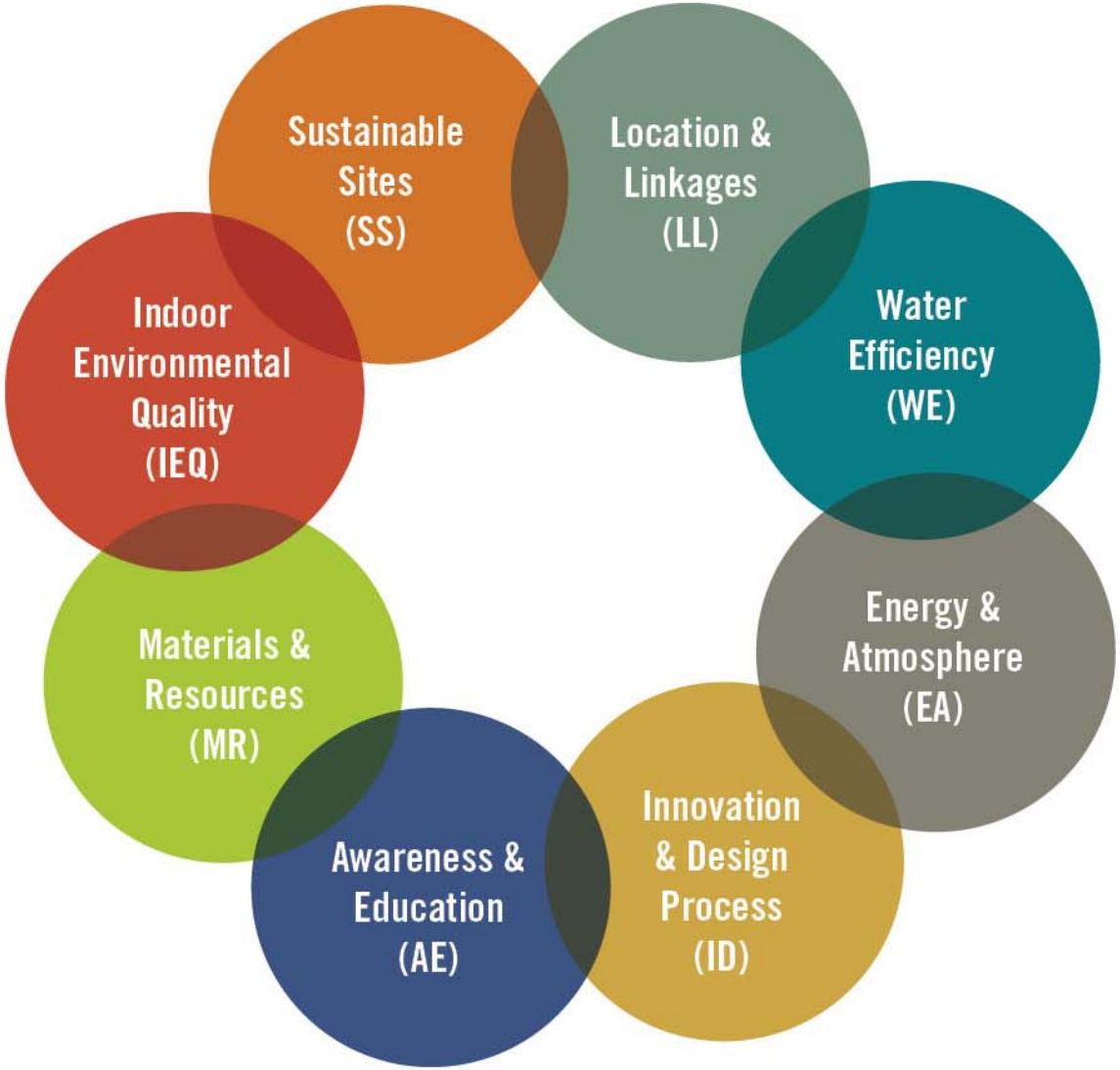
Presentation comparing LEED NC and LEED-H Midrise

- **LEED Midrise cost: $40 – 60k 2-4 months after CO**
- **LEED NC cost: $180 – 200k 6-9 months after CO**

"Lessons learned in the Midrise pilot" Jeff Oberdorfer, First Community Housing

Credit Categories

Designing with LEED



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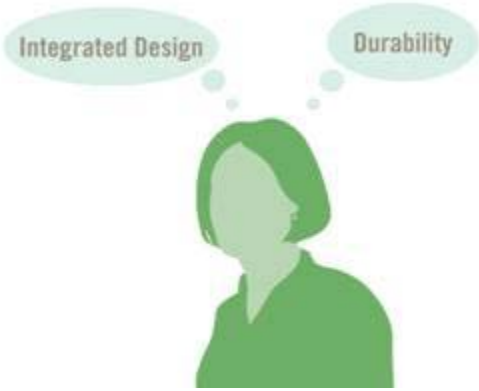
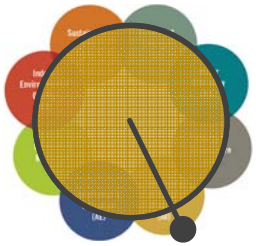
Innovation & Design Process (ID)

- Include all team members
- Draft LEED Score Card
- Define member roles
- Get help / training if needed
- Brainstorming 1+1=5

1. **Integrated** Project Planning
2. **Durability** Management Process
3. Innovative or Regional Design





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Innovation & Design Process (ID)

Construction Costs

- Many green features have no additional cost

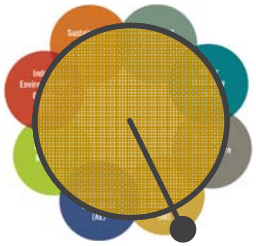
  e.g. orientation on the East-West axis, proper placement of shade trees

- Some green features result in a cost-savings

  e.g. reducing construction waste, putting in less turf, optimal value engineering

- Other green measures have an initial increased cost, but result in long term savings

  e.g. solar hot water heating, radiant heating



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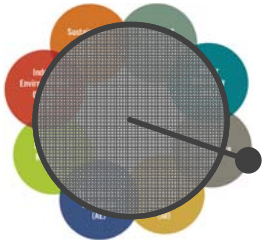
Energy and Atmosphere (EA)

1. Optimize Energy Performance **
2. Insulation
3. Air Infiltration
4. Windows
5. Heating & Cooling Distribution
6. Space Heating and Cooling Equipment
7. Water Heating **
8. Lighting
9. Appliances
10. Renewable Energy
11. Residential Refrigerant Management **



Home Energy Rating System (HERS)

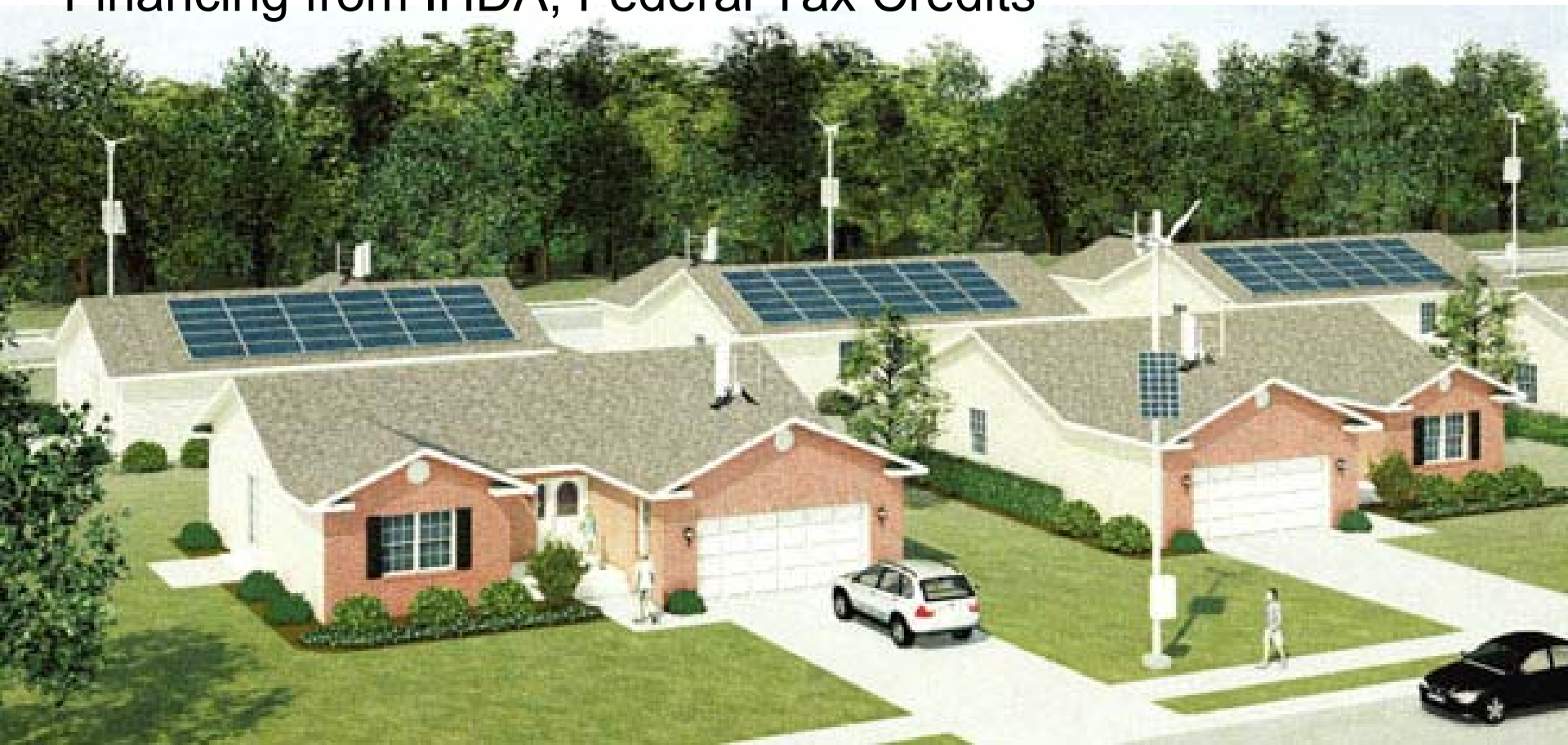
Performance Testing:

- Heating and cooling
- Water heating
- Lighting
- Appliances
- Building envelope

Lexington Farms – 32 LEED Platinum single-family homes

Jerseyville, IL (between Springfield and St Louis)

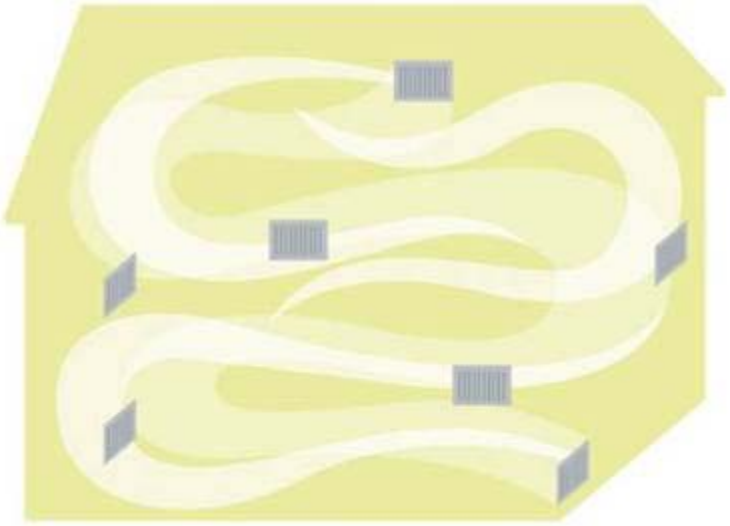
- Rented at $590 / mo to families earning < $41,000
- Net-zero = 1,230 sf homes without utility bills
- Financing from IHDA, Federal Tax Credits

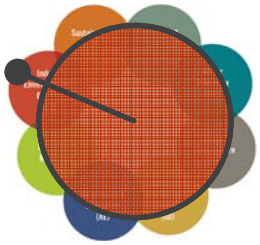


Indoor Environmental Quality (EQ)

*6 point minimum

1. Energy star with IAP **
2. Combustion Venting
3. Moisture Control
4. Outdoor Air Ventilation **
5. Local Exhaust **
6. Distribution of Space Heating and Cooling
7. Air Filtering **
8. Contaminant Control **
9. Radon Protection
10. Garage Pollutant Protection





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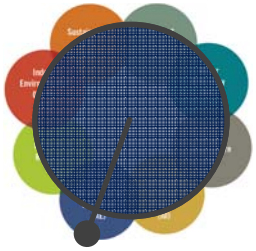
Awareness & Education (AE)

1. Education of Homeowner or Tenant

   & Public Awareness

2. Education of Building Manager



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Cornerstone Senior Apartments

Largest LEED Gold development in Ohio

31% more energy efficient than conventional construction

Water efficient plumbing fixtures reduce water by 350,000 gallons/year.

Ventilation provided by continuously running Energy Star bath fan.

Developer: NRP Group was named the NAHB's 2009 Multifamily Development Firm of the Year

Extensive training provided to building managers and tenants.

Economics and Value

VALUE OF 3RD PARTY CERTIFICATION

INDEPENDENT
VERIFICATION OF ACHIEVEMENTS
QUALITY ASSURANCE
AUDITABLE RESULTS

LEED provides accountability to funding sources

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LEED Homes are Healthy Homes

"One of our tenants has severe asthma. We offered to move them into our LEED certified project. Once they moved into the LEED building the asthma symptoms were significantly reduced."

— Harold J. Mast Director, Genesis Non-Profit Housing Corporation

According to Green Home Owners, Top 3 Benefits of a Green Home are:

Green Building is all about the Triple Bottom Line:
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Source: SmartMarket Report, McGraw Hill Construction, 2008

Cost of LEED Homes

- Potential learning curve costs
- Design and construction costs
- Verification
- Registration/Certification costs

Single family: $2,500 - $3,000

Multi family: Depends on total # of units
Typically $300 - $1,000 per unit

Why LEED for Homes?

- National program, internationally-recognized standard
- Rigorous, true third-party certification
- Required third-party Performance Testing
- Partner to many regional green programs
- Homeowner assurance of home's green measures through thrid-party verification
- Strong marketing support for LEED in 2009-2010
- Superior way to differentiate your offering

LEED → "Leadership" for Market Innovators

Resources

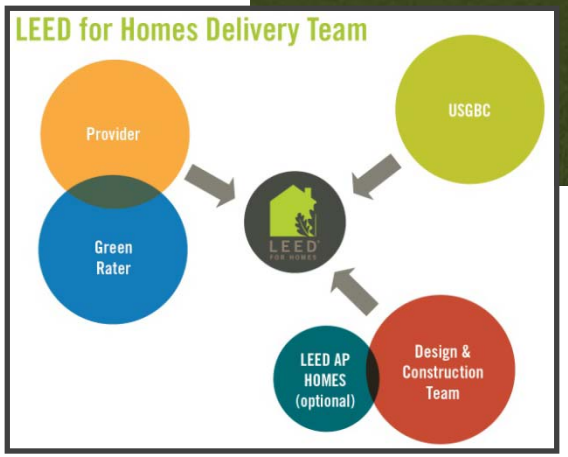
Green for LEED

The Home Depot Foundation Grant

- Goal: To recognize and reward the resource efficiencies of affordable housing
- Helps cover LEED for Homes registration, verification, and certification fees.

THE HOME DEPOT FOUNDATION

Affordable and Green:
The Greenbuild Legacy Home Project



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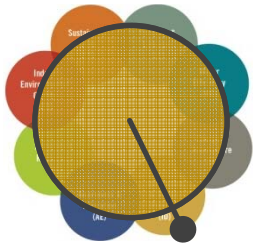
Innovation & Design Process (ID)

Insulated Concrete Forms (ICF's)

Conventional 'Stick' Built Construction

Same floor plan, elevation, & mechanicals but different construction!



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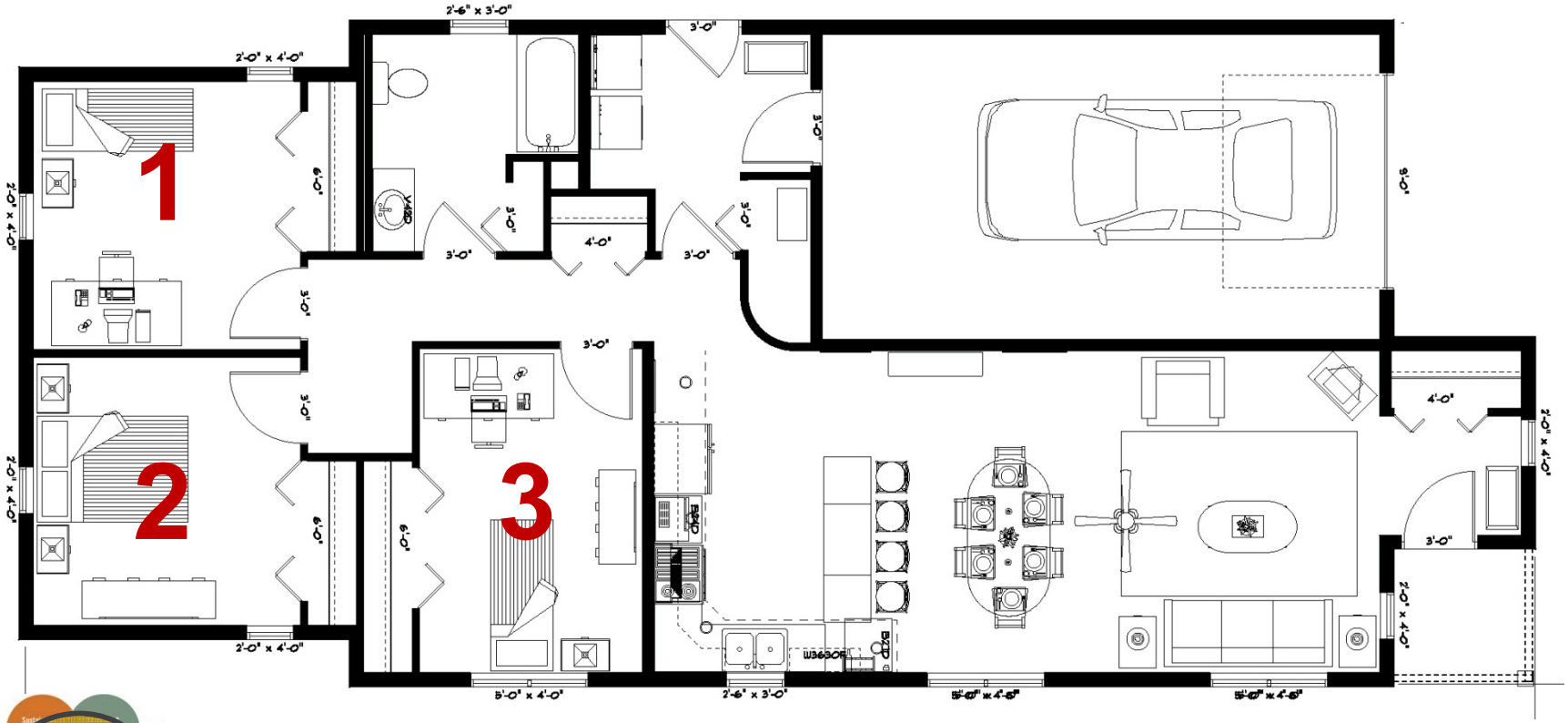
Innovation & Design Process (ID)



1,200 sq feet

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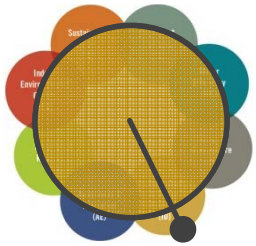
Innovation & Design Process (ID)

More wonky stuff .....

Project Specific: 3 bedrooms

1900 SF	45 pts	60 pts	75 pts	90 pts
1200 SF	35 pts	50 pts	65 pts	80 pts
2500 SF	52 pts	67 pts	82 pts	97 pts



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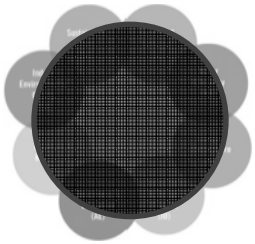
Project “Legacy”

- Projected Platinum Rating(s)
- “No-Cost” Design Strategies
- Program Performance Comparison
- Healthier indoor air quality
- More comfortable & More durable (less maintenance)
- 45% more energy-efficient based on initial energy model



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Green and Affordable Offsite Tour: Sat 11/20
Half day: $45

Tour of two Lake County Habitat for Humanity

Green Affordable Housing Summit: Nov 16 - 17
$300 ($150 for NFP / Public sector attendees)

WWW.GREENBUILDEXPO.ORG

Making Green Homes Affordably

Jason La Fleur
jlafleur@alliancees.org
708-848-4980

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