

Appendix F: Green Building Codes and Standards

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F.1 Building Codes for Greensburg – Introductory Discussion

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National Renewable Energy Laboratory

Building Codes for Greensburg – Introductory Discussion



City of Greensburg, KS

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October 22, 2008

Topics

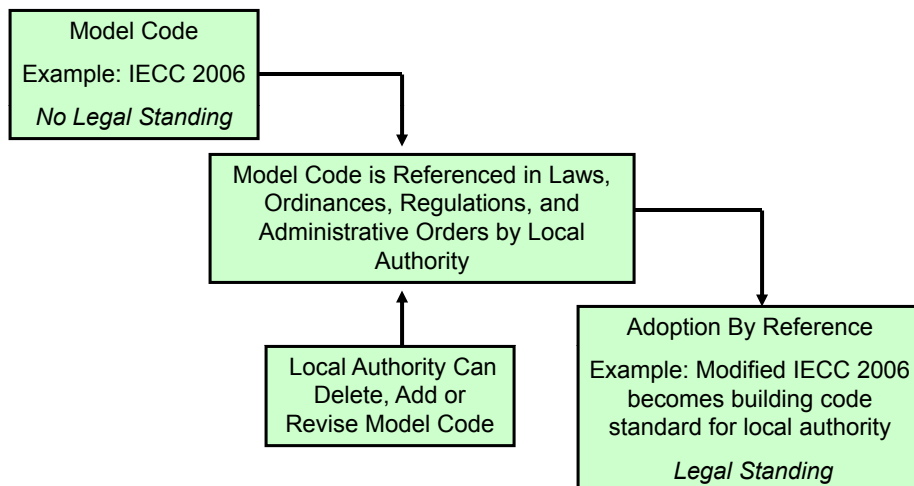
- Project Goal and Scope
 - Building Codes Overview
 - Green Building Programs Overview
 - Energy Considerations
 - What's Happening Today
 - Examples from Other Communities
 - Greensburg Commitments
 - Greensburg Suggestions
 - Questions and Feedback
 - Next Steps
- } *Green Building Approaches*
- } *Examples*
- } *Greensburg*

City Goals and NREL Project Scope

- Primary City Goal – Demonstrate a strong city position on sustainability through city policies affecting all buildings
 - Gordon Stull has confirmed “...the City can adopt a ‘green code’ if carefully and reasonably crafted.”
- Secondary City Goals
 - Garner support from businesses and residents
 - Strike a balance between ideals and practicality
- Scope of NREL Project
 - Analyze options and make recommendations
 - Assist in discussions with stakeholders
 - Assist in training and education of city staff and stakeholders

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Building Code Adoption Process



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Building Codes (National and International)

- Written in a format and in sufficient detail to guide architects, builders, and city enforcement officials
- Traditionally focused on building safety and occupant health issues
- Established by lengthy, inclusive processes
 - American National Standards Institute (ANSI) develops standards for building components and materials, comprehensive building standards
 - International Code Council develops a family of model buildings codes (IRC, IBC, IECC, etc.)
 - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) develops standards for mechanical systems and components, comprehensive energy, and building standards
- Green building codes just now being developed

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Residential Model Building Codes

Current

- 2003 IRC (International Residential Code)
 - Very modest insulation requirements: walls R13, roof R26, windows R1.3
- 2003 IECC (International Energy Conservation Code)
 - Modest insulation requirements: walls, roof, windows
 - Includes prescriptive and performance path
 - Includes air sealing
 - Includes duct insulation and sealing
- 2006 IECC
 - Better insulation requirements: walls R13, roof R38, windows R2.5
 - Likely equates to 15% better than IECC 2003
 - Likely meets Energy Star level
 - Includes prescriptive and performance path
 - Includes air sealing
 - Includes duct insulation and sealing

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Residential Model Building Codes (cont.)

In Development

- 2009 IECC
 - Similar to 2006 IECC
 - Only insulation increase is windows R2.9
- “30% Solution”
 - Suggested amendment to 2006 IECC
 - Not adopted by International Code Council
 - Good insulation values: walls R20, roof R49, windows R2.9
 - Likely equates to 30% better than 2003 IECC
 - Improves air sealing requirements
- ANSI/NAHB National Green Building Standard
 - Based on National Association of Home Builders (NAHB) Model Green Home Building Guidelines
 - Coverage parallels Leadership in Energy and Environmental Design (LEED), residential
 - Has four achievement levels, based on points
 - For energy efficiency, offers prescriptive or performance path
 - In addition, has a full compliment of “green” criteria: site, resources, water, indoor environmental quality, and operations and maintenance

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Commercial Model Building Codes

Current

- ASHRAE Standard 90.1
 - Originally developed as an energy efficiency code in the 70s
 - Worst energy performing building you can legally build
 - At least 14% savings over 90.1 required for LEED minimum
 - Energy costs basis — no green requirements
 - Revised every three years

In Development

- ASHRAE Standard 189
 - Applicable to new commercial buildings and major renovation projects and will address
 - Energy efficiency
 - A building's impact on the atmosphere
 - Sustainable sites
 - Water use efficiency
 - Materials and resources
 - Indoor environmental quality
 - At least a year out

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Green Building Programs

- Written to encourage new building practices
 - Offers builders the opportunity to go above and beyond the current building code
- Each program developed independently
- International, national, state, or local recognition based on specific criteria and certification levels
- Marketing benefits to owners, builders, and architects
- Significant competition (for fame) among the various programs

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Examples

- U.S. Green Building Council: LEED
- NAHB: Green Building Program
- Environmental Protection Agency: Energy Star
- Department of Energy: Builder's Challenge
- Build It Green (non-profit in California): Green Points
- Built Green™ organizations in several states

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Prescriptive vs Performance-based Codes (Energy Use)

- Current building codes are prescriptive
 - Prescribes the minimum construction details required
 - Example: Details minimums for R value for walls and roofs, U factor for windows, watts/sq ft for lighting, HVAC equipment efficiencies
- Green building programs are both prescriptive and performance-based
 - Focus on certification and ranking
 - Requires predicting energy performance of a design (or constructed building) and comparing to a baseline building design
 - Example: 30% energy (or energy cost) savings compared to IECC 2003
 - More flexibility in how to meet the requirement
 - Requires software tool to predict energy savings from building design details; e.g., Home Energy Rating System (HERS)

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Home Energy Rating System (HERS)

- HERS index is an energy efficiency scoring system
 - Maintained by Residential Energy Services Network (RESNET) since 1981; trains and monitors raters, provides info, etc.
 - <http://www.natresnet.org/ratings/default.htm>
- A HERS index score used by some cities
- HERS Reference Home (based on the 2006 IECC) scores a HERS index of 100
- Net zero energy home scores a HERS index of 0
- Lower HERS index = more energy efficient

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What's Happening Today

- Dynamic field
 - New green building codes being considered
 - New green building programs keep popping up
- Green building codes and green building programs converging
- Diverse examples
 - San Francisco, CA
 - Santa Monica, CA
 - Boulder, CO
 - Frisco, TX
 - Marin County, CA

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San Francisco, CA

- Green building requirements for all new construction, enacted September 2008
- Requirements for low-rise residential include
 - 25 Green Points Rating
 - Run by Build It Green, a Californian non-profit
 - Organization created prescriptive rating system
 - A 25 point rating includes a 15% improvement over California Title 24 energy requirements
 - Required Green Point Rating rises over the next 4 years until a 75 Green Point Rating is achieved
- <http://sfenvironment.org/>

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Santa Monica, CA

- Green building requirements for all new construction enacted in May, 2008
- Energy efficiency requirements
 - Building meets California's Title 24, 2005 Energy Efficiency Standards, or
 - Municipal code contains prescriptive requirements for energy-efficient building systems
- Landscape, water conservation, construction waste management, and material selection are prescriptive
- Santa Monica is an example of a city creating their own prescriptive requirements for a green building program
- Future of the program may include the incorporation of HERS rating
- <http://greenbuildings.santa-monica.org/>

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Frisco, TX

- Rapidly growing suburb of Dallas
- Program enacted in May 2001, updated in 2007
- Required residential building code includes the following for all new construction
 - Minimum energy efficiency standard
 - Energy Star® designation for single-family residence, or
 - May be amended with a score of 83 or below on the HERS index
 - Every home must be tested
 - The minimum standard for indoor air quality of single-family residential structures shall be the ASHRAE Standard 62.2 as it stands or may be amended
 - Other prescriptive measures include: indoor air quality, energy efficiency, and water conservation
- http://www.ci.frisco.tx.us/Projects_Programs/Green_Building/index.aspx?id=155

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Boulder, CO

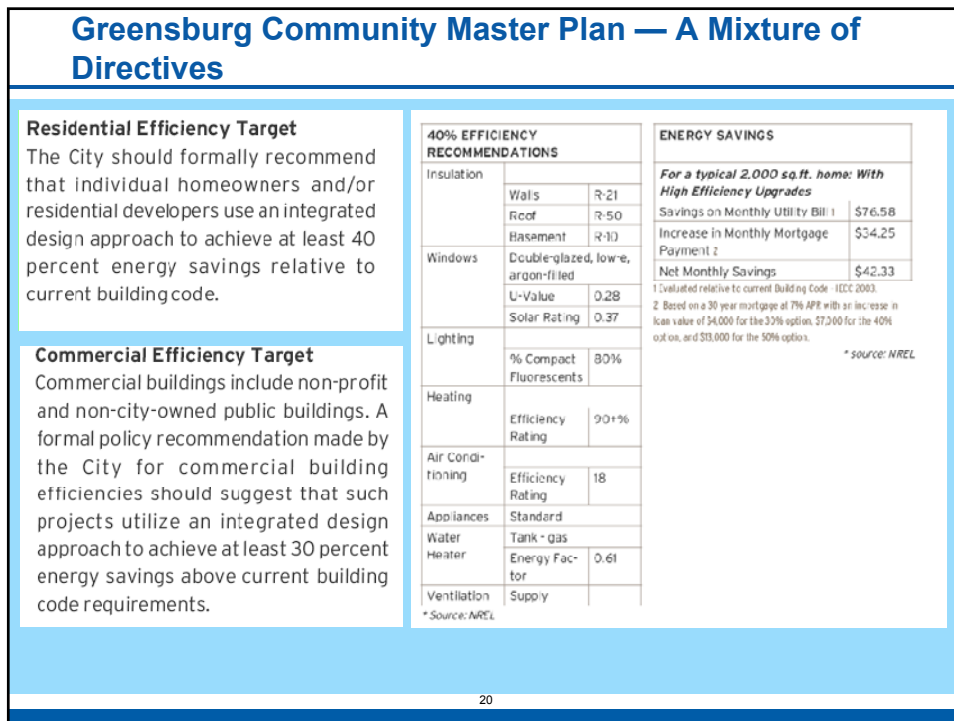
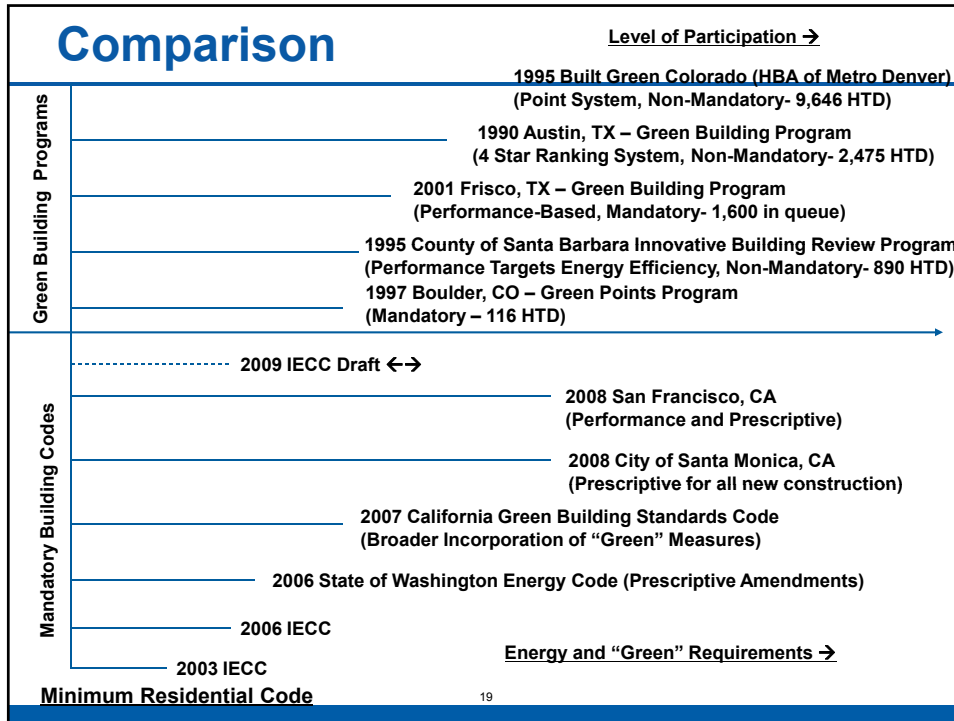
- Green Points Program enacted 2008 (previous version 1997)
- Mandatory for all new residential construction
- Energy efficiency requirements include
 - A HERS index score better than the 2006 IECC
 - Up to 3,000 sq ft, 30% Percent = 70 HERS index score
 - 3,001 - 5,000 sq ft, 50 % = 60 HERS index score
 - Verification of HERS index score by RESNET accredited rater
- Prescriptive mandates for Green Point Certification
 - Demolition management
 - Construction waste recycling
- http://ci.boulder.co.us/index.php?option=com_content&task=view&id=208&Itemid=489

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Marin County, CA

- County level green building implementation
- Prescriptive checklist for home builders
- County-wide residential green building rating system administers the program
- County service “BEST (Building Energy Efficient Structures Today)” provides free energy efficiency and green building consulting
- Energy efficiency requirements to exceed Title 24 by 15%
- <http://www.marinsustainability.org>

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More from the Plan

SUSTAINABLE GUIDELINES

For the encouragement of sustainable and energy efficient re-construction in the residential sector, the following guidelines are recommended:

Energy Efficiency: design and construct homes to provide a Home Energy Rating System (HERS) score of 60 or lower (note: this represents a house with energy consumption 40% below that of a house built to the International Residential Code)

Indoor Air Quality: construct homes to meet the requirements of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Standard 62.2 "Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings" and use only power-vented sealed combustion appliances.

Durability: design and construct homes in accordance with the "Energy Star Indoor Air Package, version 2, Section I, Moisture Control" at www.energystar.gov.

Water Conservation: select high efficiency fixtures for sinks (kitchen and bath), showers and toilets. Use the criteria of LEED-H (LEED for Homes) Water Efficiency, WE, Credit 3.1. See www.usgbc.org.

Efficient Lighting: provide an Energy Star Advanced Lighting Package. See www.energystar.gov.

Position for future Solar Applications: orient one major roof slope to the south.

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General Suggestions

- Use something already drafted
 - So you don't have to develop all the details
- Choose something likely to be a nationally accepted green building code
 - Nationally accepted means easier recognition and marketability
 - Less change and adjustment later

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Preliminary Residential Suggestions

- ANSI/NAHB National Green Building Standard
 - Pros: Most complete, nationally recognized, consensus standard
 - A fully sustainable building standard
 - Offers flexibility of prescriptive or performance path
 - Offers several achievement levels
 - Cons: Somewhat complex to navigate
 - Requires significant documentation, certification, and testing
 - Requires builder action in all areas of the design: site, resources, energy, water, indoor air quality, and operations and maintenance

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Preliminary Residential Suggestions (cont.)

- IECC 2006 with “30% Solution” modifications
 - Pros: Achieves good energy efficiency level (30% better than IECC 2003)
 - Offers flexibility of prescriptive or performance path
 - Based on nationally accepted code, IECC
 - Builder not required to address other sustainability criteria
 - Cons: Builder not required to address other sustainability criteria
 - 30% modifications have not currently been adopted by ICC

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Preliminary Residential Suggestions (cont.)

- IECC 2006 with “30% Solution” for energy and ANSI/NAHB for other green criteria
 - Pros: Achieves the 30% improved energy performance and includes all green criteria
 - Cons: Not likely to ever be a nationally accepted consensus standard

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Preliminary Commercial Suggestion

- ASHRAE Standard 189
 - Pros: Most complete, nationally recognized, consensus standard
 - Addresses all green aspects
 - Applicable to new commercial buildings and major renovation projects
 - Can be customized (i.e., leave out PV requirement)
 - Cons: Somewhat complex to navigate
 - Requires significant documentation, certification, and testing
 - Requires builder action in all areas of the design: site, resources, energy, water, indoor air quality, and operations and maintenance

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Questions to Resolve

- How far towards full sustainability? Energy, water, other, all?
- Which code, program, or combination?
 - Greensburg-specific modifications?
- Incentives?
- Costs?
 - City will need a staff person or consultant with green building skills
 - Extra costs of green buildings
 - Formal certification costs
- Phasing?
 - Compliance levels
 - Implementation

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Questions to Resolve (cont.)

- Stakeholder involvement?
 - Resident representatives
 - Business representatives/Chamber of Commerce
 - Locally active builders and architects
 - Planning commission
 - City staff
 - City Council (decision makers)

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Reference

Fourteen Points to Consider when Developing a Green Building Program or Ordinance

1. Understand and assess the direction desired by the local council or board. Without strong political backing, gaining support for funding, staffing and other resources will prove more difficult.
2. Consider the pros and cons of a mandatory versus voluntary program and choose the one most appropriate for the jurisdiction. Consider the use of development agreements as an option to introduce green building features into the local process one step at a time.
3. Research local cities' and counties' green programs and ordinances for possible use as models.
4. Consider taking a "working group" approach consisting of a balanced mix of stakeholders including elected officials, governmental staff members, developers and builders, and the public at large.
5. Work with the Planning Commission and use its meetings as a platform for workshops and public participation.
6. Conduct a "sustainability workshop" to illustrate how green building is connected to a host of related issues and help garner support from special interest groups.
7. Select green building guidelines or standards that are appropriate for your jurisdiction and, when possible, are already used in your region.
8. Consult with legal counsel to ensure that proposed guidelines or standards do not conflict with other state or local regulations. In the case of an ordinance, be sure that it is legally defensible.
9. Consider the use of outside resources for green building plan check and inspection.
10. Keep compliance thresholds realistic and try not to address them until the end of the development process.
11. Keep the "triple-bottom line"—environment, economy and social equity—in mind to ensure a sense of fairness for all parties.
12. Determine how the program or ordinance will be staffed and funded.
13. Select a staff member to champion the development process.
14. Provide education about green building principles and your jurisdiction's program or ordinance to staff members, developers, builders and residents.

Bruck, Peter; Building Safety Journal, August 2007, pp. 22-23

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Next Steps

- Choose best recommendation — Late November
- Meet with stakeholders for discussion — December/January
- Finalize recommendation — January
- Present to City Council — January

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F.2 Greensburg Green Building Codes

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National Renewable Energy Laboratory

Greensburg Green Building Codes



Greensburg, KS
City Leadership

Alex Dane
Lynn Billman
John Holton



December 11, 2008

Outline

- Recommendations for Building Codes
- Recommendations for Phasing
- Recommendations for Incentives
 - Existing Federal and State Programs
 - Possible State Opportunities
 - Suggested Greensburg Incentives
 - Possible Greensburg Incentive Opportunities

Greensburg Green Building Standard

- **Recommendation:** Adopt “ANSI/NAHB National Green Building Standard (NGBS), Version 2.0”
 - NGBS is a nationally recognized consensus standard
- **Phase 1: Energy Efficiency**
 - 35% energy savings is set as the threshold level
 - Options and incentives proposed for energy savings above 35%
 - Use supporting sections of Chapter 6 and Chapter 9 (Indoor Air Quality) as mandatory requirements
 - Use Chapter 7 of the NGBS, and the supporting sections of Chapter 9
- **Phase 2: Water Efficiency Requirements**
 - Use Chapter 8 of the NGBS
- **Phase 3: Entire “Greensburg Green Building Standard”**
 - Use all Chapters of the NGBS

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National Green Building Standard

- NGBSv2 was drafted and sent to the International Code Council (ICC), where it is known as ICC-700-2008: National Green Building Standard
- NGBS is now in the hands of the American National Standards Institute (ANSI) and ICC for approval
- Approval is estimated to occur in mid-January
- National Association of Home Builders (NAHB) has confirmed that it will certify the NGBS within a week of its approval by ANSI

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National Green Building Standard

Comparison of Additional Costs as a Percentage of House Cost

Dallas production house cost of \$172,700 is represented.

Rating System	Bronze/Certified	Silver	Gold	Emerald/ Platinum
GBG	1.0 – 1.4%	2.3 – 3.4%	4.7 – 6.4%	NA
NGBSv2	1.1 – 1.7%	2.8 – 3.1%	6.9 – 7.6%	16.3 – 16.9%
LEED-H	3.6 – 5.6%	5.1 – 7.4%	11.2 – 13.5%	17.3 – 22.9%



Note: All 3 of these programs are in their infancy, so costs are likely to change as the programs develop.



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Greensburg Green Building Standard

- Uses a Point System
 - Illustrates performance levels of the green building standard
 - Allows City to adjust levels of phasing
 - Allows City to appropriately incentivize certain levels of performance
 - Uses the point system from an identifiable program with benchmarked goals

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Why 35% Energy Efficiency?

Table 3.2
Architecture 2030 Challenge Interim Code Equivalents

Code/Standard	Commercial	Residential
ASHRAE 90.1-2004	30% below	
ASHRAE 90.1-2007	25% below	
ASHRAE 189 (in progress)	0	
IECC 2006	30% below	30% below
California Title 24 2005		15-20% below
California Title 24 2008	10% below	
Oregon Energy Code	25% below	30% below
Washington Energy Code	25% below	25-30% below
RESNET HERS Index		65 or less
LEED NC 2.2/Home	New: EA credit #1: 6 pts Renovations: EA credit #1: 8 pts	HERS Index 65
LEED 2009 (in progress)	New: EA credit #1: 7 pts Renovation: EA credit #1: 9 pts	
GBI Standard	PATH A, 8.1.1.1: 150 pts	
EECC Option (prescriptive path)		EC: 154
NBI Option (prescriptive path)	New: core performance with enhanced measures	

Source: Architecture 2030

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Proposed Phase 1: Residential Energy Efficiency Standard

- Compliance with Chapter 7 is mandatory (Bronze Level)
 - A minimum score of 70 points is required
 - This provides a 35% energy efficiency level
- Compliance with the following sections of Chapters 6 and 9 are mandatory and no points are given
 - Foundation drains, drip edges and flashing
 - Pollutant source control
 - Pollutant control
 - Moisture management
 - Innovative practices: kitchen make-up air
- Scoring as follows

	Required	Voluntary→		
	Bronze	Silver	Gold	Emerald
Ch. 7 Energy	70	70	100	120

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Proposed Phase 2: Add Water Efficiency Standard

- Add requirements of Chapter 8
- Score as follows

	Mandatory	Voluntary→		
	Bronze	Silver	Gold	Emerald
Ch. 7 Energy	70	70	100	120
Ch. 8 Water	14	26	41	60
Total	84	96	141	180

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Proposed Phase 3: Complete Greensburg Green Building Standard

- Add in the balance of the “ANSI/NAHB National Green Building Standard”. This includes Chapters 4,5,6,10, and the remaining optional sections of Chapter 9

	Mandatory	Voluntary→		
	Bronze	Silver	Gold	Emerald
Ch. 5 Lot Design	39	66	93	119
Ch. 6 Resources	45	79	113	146
Ch. 7 Energy	70	70	100	120
Ch. 8 Water	14	26	41	60
Ch. 9 Indoor Env. Quality	36	65	100	140
Ch. 10 Ops. and Maint.	8	10	11	12
Additional	50	100	100	100
Total	262	416	558	597

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Existing Federal and State Incentives

- For builders – *Federal Energy Efficient Home Tax Credit*
 - All new residential built to the Bronze Level (mandatory) for all phases, will provide at least a 35% energy efficiency level
- All builders are eligible for
 - \$1000 tax credit for each home achieving better than 30% energy efficiency over 2003 IECC
- For the higher levels of performance (NGBS Gold and Emerald)
 - \$2000 tax credit for each home achieving better than 50% energy efficiency over 2003 IECC

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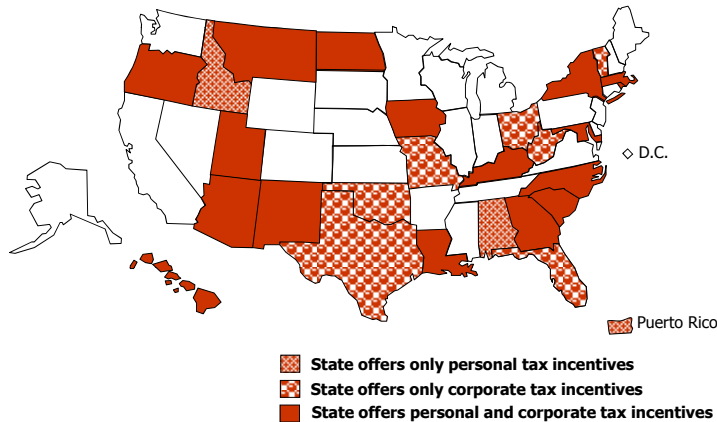
Existing Federal and State Incentives (cont.)

- For homeowners – *Federal Residential Energy Tax Credit*
 - A tax credit of 10% of the cost of building envelope improvements, up to a \$500 limit; various details apply
- For low-income homeowners – *Kansas Energy Efficiency Program (KEEP)*
 - Kansas Housing Resources Corp. will provide 50% of the loan amount needed to make energy efficient improvements, at zero interest, up to \$7,500; balance of the loan through Sunflower Bank; lowers interest rate to make energy efficiency improvements more affordable; weatherization grants also available
- For homeowners – *Federal Energy Efficient Mortgages*
 - The Federal Housing Administration (FHA) allows lenders to add up to 100% of energy efficiency improvements to an existing mortgage loan by insuring a loan of up to 5% of a home's appraised value, with certain restrictions

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Kansas Tax Incentives Compared to Other States

State Income Tax Credits and Deductions for Renewables



DSIRE: www.dsireusa.org

September 2008

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Opportunities for State Level Incentives

- Urge Kansas legislature to amend state income tax code per following examples
 - Idaho – Insulation Income Tax Deduction: 100% of material and labor
 - Missouri – Energy Efficiency Improvement Deduction: 100% of improvements, \$2000 max
 - Oklahoma – Energy Efficient Residential Construction Tax Credit: \$2,000 and \$4,000 tax credits, depending on energy efficiency above IECC 2003
 - Oregon – Residential Tax Credit: Various tax credits for energy efficient appliances and HVAC, up to 25% of net purchase price
 - Arizona – Income Tax Subtraction: 5% of sales price of energy efficient home, \$5,000 max

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Recommended Greensburg Incentive Program

- Partial Waiver of Fees (permit, water meter, sewer, and street repair)
- Recognition Program for Builder and Owner
- Expedited Plan Review
 - Likely implementation when significant increase of applications occurs

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Recommended Greensburg Incentive Program

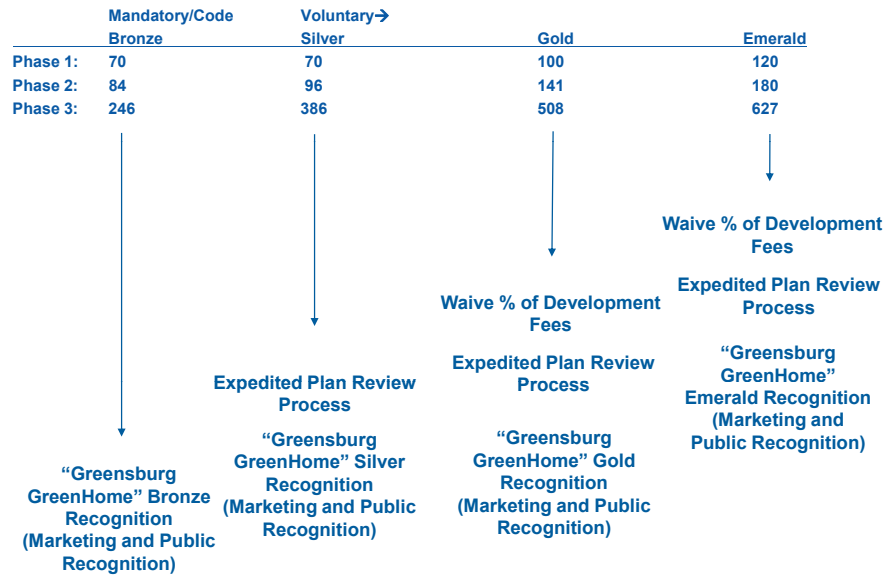
- Partial Waiver of Fees
 - Current Greensburg residential development fees
 - \$35 per required permit
 - \$950 (1-in meter) or \$1250 2”(2-in meter) – new water meter
 - \$100 sewer hook up
 - \$350 street repair

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Recommended Greensburg Incentive Program

- Recognition Program for Builders and Owners
 - Plaques for homes
 - Signs for builders
 - Publicity
 - Groundbreaking ceremonies

Proposed Phasing of Greensburg Incentives



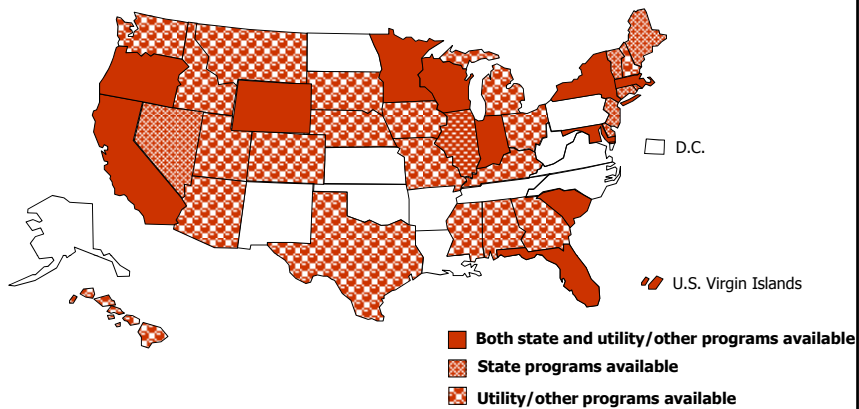
Possible Greensburg Incentive Programs

- Greensburg/Kansas Power Pool Rebate Program and Partnership
- Property Tax Reduction
- Energy Efficiency/Renewable Energy (EE/RE) Bond Issuance

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Greensburg/Kansas Power Pool (KPP) Rebate Program

Rebate Programs for Renewable Energy Technologies



DSIRE: www.dsireusa.org

September 2008

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Greensburg/KPP Rebate Program (cont.)

- Viable nation-wide practice
- Utilities require improvements to be Energy Star® rated
- Sample utility rebates nationwide
 - Electric water heater \$50 - \$100
 - Heat pumps \$200 - \$1000
 - Room air conditioner \$50
 - Clothes washers \$50 - \$150
 - Refrigerator \$30 - \$200
 - Dishwasher \$50
 - High performance windows \$1/sq ft
 - Insulation \$0.10 sq ft
 - Programmable thermostat \$20 - \$25 (KCP&L free)

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Property Tax Reduction

- Property Tax Abatement Program – Certified residential buildings qualify for percentage reduction of property tax
 - Existing programs
 - Nevada
 - New York
 - Maryland
 - *Limitation* – Kansas programs would be subject to State amending its Constitution to allow for local property tax adjustments

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Energy Efficiency/Renewable Energy Bond Issuance

- “Sustainable Energy Financing District”
 - Initial costs are covered by Municipal/District EE/RE Bond
 - Cities that have implemented include
 - Palm Desert, CA (Energy Independence Program)
 - Berkeley, CA (FIRST Initiative)
 - Boulder, CO
- Energy improvements funded through special tax district model
 - Homeowner payback is based on a 20-year model, with taxes transferred at time of sale
- Potential issues
 - Legal ability of Greensburg to form property tax districts
 - Existing usage is primary intended for financing PV systems

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Commercial Building Code Phase I

- ASHRAE Advanced Energy Design Guides achieve 30% energy savings over ANSI/ASHRAE/IESNA Standard 90.1-1999
- Available today
 - Small Office Buildings
 - Small Retail Buildings
 - Small Warehouses and Self-Storage Buildings
 - K-12 School Buildings
- Recommend Greensburg Commercial Building Code Phase I — adopt “Climate Zone 4 Recommendations Table” for the appropriate type of building

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F.3 Greensburg Green Building Program, Residential Recommendations

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Greensburg Green Building Program



Residential Recommendations
Greensburg, KS
City Leadership

Alex Dane
Lynn Billman
John Holton



February 11, 2009

NREL is a national laboratory of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy operated by the Alliance for Sustainable Energy, LLC

Greensburg Green Building Program

- National Green Building Standard
- Partnerships with Kansas Building Industry Association (KBIA), National Association of Home Builders (NAHB), and Local Home Builders Associations (HBAs)
- Partnership Specifics
- Incentives and Benefits for Greensburg
- Recommended Steps

National Green Building Standard

Recommendation: Utilize ICC-700 National Green Building Standard (NGBS) as the foundation for Greensburg's green building goals

- The NGBSv2 was drafted and sent to the International Code Council (ICC), where it is known as ICC-700-2008: **National Green Building Standard**
- The NGBS is **now approved** by the American National Standards Institute (ANSI) and ICC
- The NAHB has confirmed that it will certify the NGBS within a week of its approval by ANSI

KBIA, NAHB, and Local HBAs

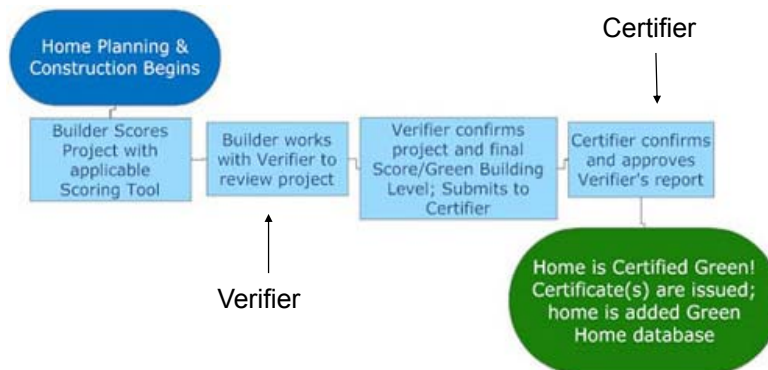
- These associations support the NGBS, but do not yet support it as a mandatory code
- These associations have indicated a strong interest in being partners for Greensburg in implementing a voluntary "pilot residential green building program"

Why Consider a Voluntary Program First Instead of Mandatory Codes?

- Partnership with KBIA ,NAHB, and HBAs could provide
 - Training
 - Education
 - Financial incentives
 - Extra media visibility
- A voluntary green building program gives builders a chance to understand green building techniques gradually

Partnership Specifics

NAHB “Green” Home Certification Process



Partnership Specifics

Verifier Qualifications

- 1 year of acceptable professional experience in home building and green building practices, *or*
- 12 hours of acceptable green training, *or*
- Designation by NAHB as a Certified Green Building Professional (CGBP), *or*
- Professional certification from Green Advantage (U.S. Green Building Council), *or*
- Green Building Certification from National Association of the Remodelers Industry (NARI)
- Leadership in Energy and Environmental Design (LEED) Accredited Professionals (APs) or Home Energy Rating Systems (HERS) raters can be verifiers

Partnership Specifics (cont.)

Certifier and Certification

- After the verification process has been completed, the verifier submits evidence that the points needed to achieve the certification level being sought have been verified per the program criteria
- The NAHB Research Center will review the documentation provided by the verifier and award the **Certified Green Home certificate**

Greensburg Pilot Program Support from KBIA and NAHB

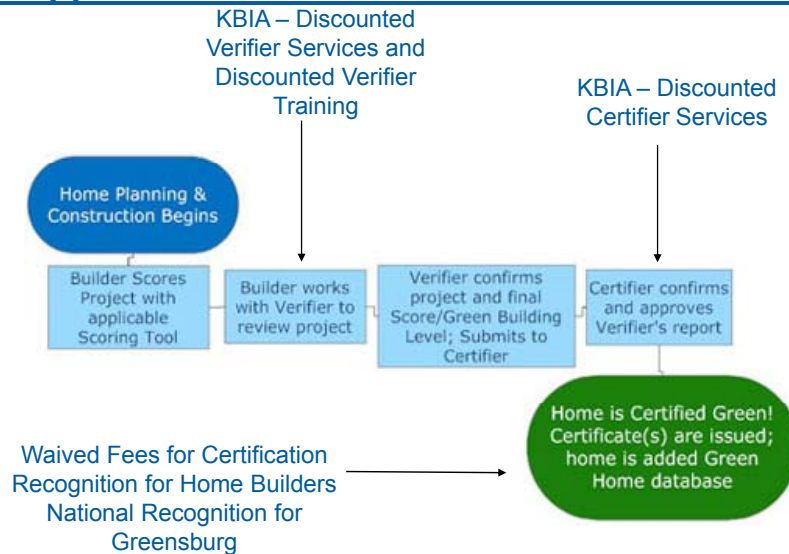
Costs of Verification and Certification

- Certifications
 - The fee to have a “green” home certified through the NAHB Research Center is \$200 per home for NAHB members and \$500 per home for non-members; does not include verification services
- Verifiers
 - Pay the annual \$125 verifier listing fee set by the NAHB Research Center
 - Attend an annual continuing education seminar approved by the NGBP
 - Maintain appropriate records and be available for periodic audit of their verification process at least annually by the NAHB Research Center

Greensburg Pilot Program Support from KBIA and NAHB

- NAHB potentially can offer
 - National recognition of Greensburg
- KBIA potentially can offer
 - Discounted verifier training and verifier services
 - Discounted certifier services
 - Waived state-level fees for certification
 - Recognition for home builders
 - NGBS training and orientation for builders
 - Facilitated builder-to-builder discussions in the region

Greensburg Pilot Program with NAHB and KBIA Support



From www.nahbgreen.org

Incentives and Benefits for Greensburg

How Does Pilot Green Building Program Benefit Greensburg?

- Verification and certification is managed by a 3rd Party
- Develops state and national media exposure for ICC-700, local builders, and Greensburg
- Allows for a green building “learning curve” to occur among homebuilders (eases transition)
- Creates incentive to develop in Greensburg without discouraging growth with regulation
- Creates a receptive environment for shifts in building code
- Feasibility and affordability

Recommended Steps

- Greensburg Pilot Program Formal Agreement and Timeline Creation with KBIA
- Outreach to Builder Community with KBIA and HBA Support

Model Commercial Building Code

Current

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 90.1 2007
 - Energy efficient design requirements for commercial buildings
 - Revised every 3 years
 - 2007 version is more stringent than the 2004 90.1 version
 - 2007 version is more stringent than IECC 2006

Recommended Commercial Building Code

- Adopt
 - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1 (2007 version)

- Voluntarily Utilize
 - ASHRAE advanced energy design guides (30% better than 90.1, 2004)
 - Small Office Buildings
 - Small Retail Buildings
 - Small Warehouses and Self-Storage Buildings
 - K-12 School Buildings

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Future Commercial Building Codes

- In Development
 - ASHRAE 90.1, 2010
 - ASHRAE Standard 189 Green Building Standard for Commercial Buildings
 - Applicable to new commercial buildings and major renovation projects and will address
 - Energy efficiency
 - A building's impact on the atmosphere
 - Sustainable sites
 - Water use efficiency
 - Materials and resources
 - Indoor environmental quality

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F.4 Recommendations for the Greensburg Green Building Program

Alex Dane, John Holton, Lynn Billman
National Renewable Energy Laboratory

Recommendations for the Greensburg Green Building Program

Prepared by NREL Building Codes Team (Dane, Holton, Billman) 3/16/09

What is Green Building?

Green Building is a general name for incorporating the practice of sustainable construction and building techniques which result in an efficient, healthful and durable building system with reduced environmental impact. Many builders for years have constructed homes and commercial buildings that are energy efficient and long lasting. Thus, “green building” is nothing new. Over the past decade numerous rating systems, codes and assessment tools have been created by industry, government and professional associations to standard building best practices and create rating systems to award levels of achievement.

Why is Green Building Important?

Green building has a triple bottom line: environmental, social and economic. Green buildings require less energy to heat and cool, light and operate, resulting in lower utility bills for the owner or renter. The increase in water and energy efficiency along with higher levels of indoor air quality, improve the health of the occupants and the natural environment. Green building also has social ramifications; it encourages communities to think about their resource consumption and allows for a greater understanding of sustainable practices. Hundreds of communities have recognized the effort to build green as one of the chief priorities of their municipality, realizing the benefits financially, economically and socially. These communities and cities have risen to the top of the green movement and are nationally and internationally recognized for their building practices and commitment to improving quality of life and quality of environment.

Why is Green Building Important to Greensburg?

The reconstruction effort in Greensburg will be greatly enhanced with a commitment to green building in the residential and commercial sectors. By adopting a green building program for both commercial and residential construction Greensburg will garner more national legitimacy as one the greenest cities in the nation, if not the world. The City of Greensburg is already setting the example for its citizens, as the municipal buildings, schools and hospitals are built to a LEED-Platinum Level. Now, with national attention on energy efficiency and green building, it is the opportune moment for the City to commit itself to both residential and commercial green building. The Kansas Building Industry Association (KBIA) is posed to partner with Greensburg and local builders to implement a residential green building program. Commercial building standards for green construction are feasible and attainable for builders in the area as well.

How Does Greensburg Implement a Green Building Program?

For Greensburg to incorporate the concept of green across their community, it is necessary to address both residential and commercial construction. The commitment to green building lies in a combination of adjusting the City’s building codes and forging partnerships to create incentives. Fortunately Greensburg does not have to re-invent the wheel. Industry recognized and approved building codes exist for both residential and commercial. The adoption of these codes

is significant in terms of the National agenda as well. Opportunities for funding energy efficiency efforts and building code revisions are found in the legislative language of the American Recovery and Reinvestment Act, also known as “The Stimulus Bill”. There are opportunities for cities like Greensburg to apply for funding through the Energy Efficiency and Conservation Block Grant (EECBG) Program, which grants funding for a variety of energy related projects including green building code adoption. The following recommendations are made by the technical team from the National Renewable Energy Laboratory.

Adopt IECC 2006 for Residential and Commercial Construction

Greensburg’s first step to strengthen its residential and commercial building code should be the adoption of the International Energy Conservation Code 2006 (IECC 2006). This is a feasible and attainable step, which will augment, but not replace, the International Residential and Building Code (IRC & IBC) currently in place. The IECC will be a credible benchmark for new residential and commercial construction in Greensburg. It is also the ground level energy efficiency goal of the National Green Building Standard.

Residential Green Building Program “Greensburg GreenHome”

The residential green building program should start with the adoption and mandatory enforcement of IECC 2006. To go above code, a green residential building program should also be created. With this in mind, the NREL technical team looked to market-driven solutions to further advance green building in Greensburg.

Partnership with KBIA

The solution developed is a complementary partnership with Kansas Building Industry Association. Presently, a memorandum of understanding is being developed to create a mutually beneficial relationship for both the City and KBIA to participate in a green building pilot program over the next two years. KBIA is an affiliate of the National Association of Home Builders (NAHB). KBIA serves as an advocate for Kansas’ housing industry, and as a corporate channel through which builders contribute time, money and services to local community service projects and education initiatives. KBIA has recently endorsed the National Green Building Standard (ICC700-2008); a standard developed by a consensus process through the American National Standards Institute (ANSI) and adopted by the International Code Council (ICC). This guiding document is a credible source and provides national recognition for green building techniques and practices.

Greensburg GreenHome Pilot Program

The voluntary Greensburg GreenHome Pilot Program is a resource and support program for residential homebuilders in Greensburg. The verification and certification of the green building process and completed home will be managed by a third party. The third party services are subsidized by KBIA for builders in Greensburg. KBIA will also provide training and incentives for builders building to the National Green Building Standard in Greensburg. This is a beneficial relationship for the City and KBIA. The City benefits by having a green residential building

program incentivized by an association recognized statewide and composed of homebuilders. Builders in the area benefit by the KBIA provided training in green building techniques and NGBS. Finally, KBIA benefits from increased visibility and marketing for their green building program and endorsement of the NGBS by a Kansas community recognized for its sustainability achievements.

Benefits

- Simplifies verification and certification by using a third party
- Develops state and national media exposure for NGBS, local builders, and Greensburg
- Allows for a green building “learning curve” to occur among homebuilders (eases transition)
- Encourages growth with minimal regulation change right now, and incentives to go beyond the minimum
- Creates a receptive environment for shifts in building code
- Feasibility and Affordability

Commercial Green Building Program “Greensburg GreenBusiness”

Commercial building codes should be updated in Greensburg, and the adoption of IECC 2006 will satisfy this need. It is the current industry standard that the NREL technical team recommends for Greensburg. Along with this baseline code, Greensburg should recommend that architects voluntarily use ASHRAE Advanced Energy Design Guidelines. These easy-to-use workbooks guide engineers and architects to implement advanced techniques beyond the 60.1-2007 Standard to save 30% more energy. There are four specialized design guides:

- Small Office Buildings
- Small Retail Buildings
- Small Warehouse and Self Storage
- K-12 School Buildings

By adopting the IECC 2006 code Greensburg would be placing itself as one of the leaders in Kansas on model commercial energy codes. The voluntary utilization of the Advanced Energy Design Guidelines affords the builder the option to go above and beyond code. Commercial building owners and developers also have the option to build to a LEED certification level. This option carries with it the benefits of building above and beyond, including a greater incorporation of green techniques, and publicity and recognition by the City and the U.S.G.B.C.

Incentive System for the Greensburg Green Building Program

Both the residential GreenHome program and commercial GreenBusiness program should be incentivized by the City. Development fees and permitting cost have the potential to be raised across the City. Discounts on the new fee rate can be made at different levels corresponding with different levels of achievement. In the case of the Greensburg GreenHome program, for example,

different levels of development fees could be waived by the City for increased levels of performance from Bronze to Emerald. In the case of the commercial building codes, development fees could be waived for the incorporation of the Advanced Energy Design Guidelines. Public recognition and acknowledgment can also be powerful incentives.

Steps to Implementing the Greensburg Green Building Program

1. Review and approve terms of agreement in Memorandum of Understanding with KBIA
2. Approve Greensburg GreenHome and Greensburg GreenBusiness programs through City Council
3. Signing ceremony with KBIA – May 2 or 3?
4. Implementation of Greensburg GreenHome Building Program
 - a. Discuss with KBIA
 - b. KBIA provides orientation on the NGBS and GreenHome Program
 - c. Schedule training for builders and green program verifiers
 - d. Partnership with Greensburg Greentown for public outreach and citizen education
 - e. Create press release and media materials
 - f. KBIA and Greensburg Greentown produce package of information on Greensburg GreenHome for:
 - i. Builders
 - ii. Homeowners
 - iii. Home Verifiers
 - iv. City
5. Implementation of Greensburg GreenBusiness Program
 - a. City engineers and building code officials review IECC 2006 and ASHRAE Advanced Energy Design Guidelines
 - b. Based on consensus and ability to administer, officials make recommendation to city council to approve
 - c. City council approves new commercial building code.
 - d. Greensburg Greentown works to publicize new commercial codes.

**F.5 NAHB Green Commitment to City of Greensburg, Kansas
Memo**

National Association of Home Builders



CONSTRUCTION CODES & STANDARDS

April 1, 2009

RE: NAHBGreen Commitment to City of Greensburg Kansas

Dear Interested Parties:

On behalf of the National Association of Home Builders (NAHB)—an organization of 200,000 members that will construct 80 percent of the new housing units projected for 2009, I am pleased to hear of the endorsement of a voluntary, green building program currently being considered by the City of Greensburg, Kansas. Based on the only American National Standards Institute-approved green building standard, the ICC-700 2008 National Green Building Standard, and utilizing the National Green Building Certification, the proposed program will do much to not only move Greensburg forward, but do so in an effective “green” direction.

NAHB’s National Green Building Program, or NAHBGreen, is a set of resources and tools that allow any home, anywhere to go green. Through education, construction rigor and accurate home performance, NAHBGreen brings national, state and local home building industries together for America’s green homeowners. Now, home builders and remodelers all over the country can take advantage of this voluntary, market-driven and cost-effective way to think green, build green and sell green—especially Greensburg’s builders and remodelers.

To that end, NAHBGreen is committed to working through the state affiliate, the Kansas Building Industry Association, and NAHBGreen’s numerous partners and services to assist in every way possible. This assistance includes exploring potential sponsors to defer the costs of certification and verification in the National Green Building Certification to the Greensburg program’s builders, as well as promotional and technical assistance as appropriate.

We look forward to working with you during this process. If you have any questions, please do not hesitate to call my office at 1-800-368-5242 ext. 8547.

Thank you for your consideration, and much luck in your ongoing efforts.

Sincerely,
Carlos Martín, PhD
Assistant Staff Vice President