

# Sustainable Building

A presentation by the City of Hailey's  
Sustainable Building and Planning Committee

Spring/Summer 2009

# About the Committee

The Hailey Sustainable Building and Planning Advisory Committee composed of City officials and local professionals has been formed at the request of Hailey's City Council.

The Committee has been given the task of creating recommendations for the City Council's consideration on construction techniques and policies to benefit new construction projects and possibly remodels.

## **Composed of:**

Architects, Builders, Suppliers, Building officials, Planning and Zoning members, Environmental groups....



# What is Sustainable or “Green” Building

- ▶ The use of design and construction methods and materials that are resource efficient and that will not compromise the health of the environment or the associated health and well-being of the building's occupants, builders, the general public, or future generations.
- ▶ An outcome of a design which focuses on increasing the efficiency of resource use — energy, water, and materials— while reducing building impacts on human health and the environment during the building's lifecycle, through better siting, design, construction, operation, maintenance, and removal.
- ▶ Sustainable building is the use of a more Energy & Resource-efficient model of home construction, renovation, operation, maintenance and demolition that saves resources; while providing a return on investment to the home owner.

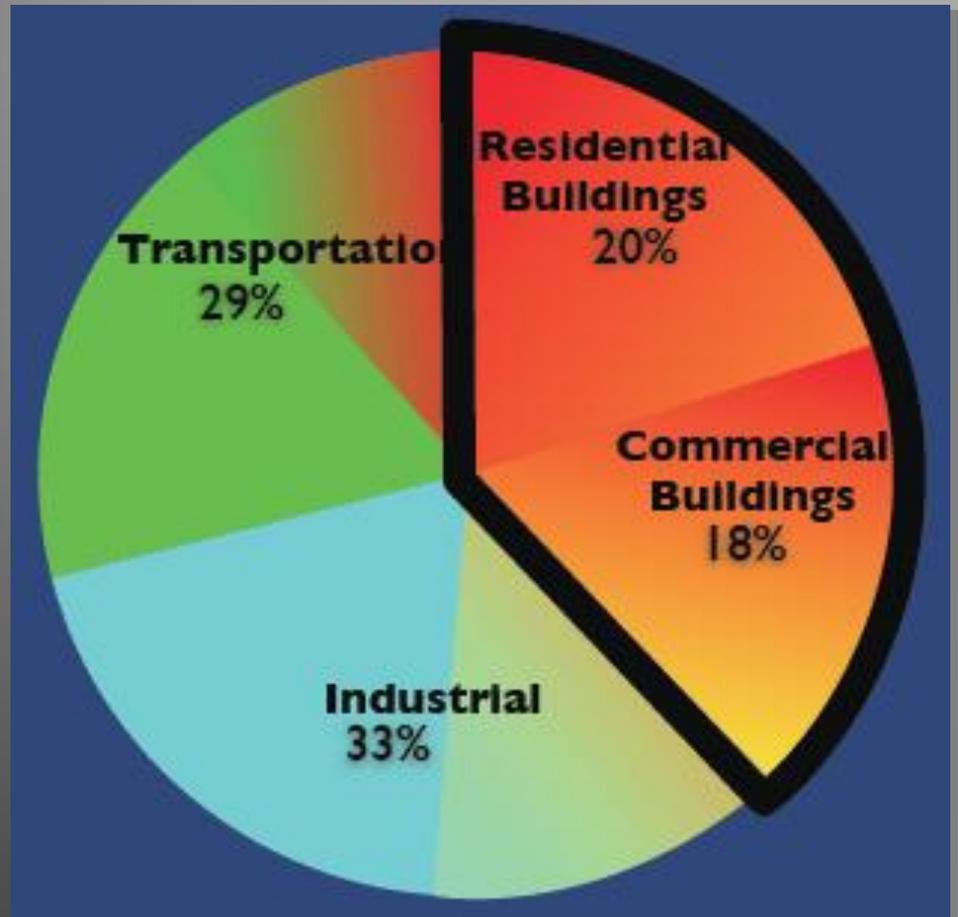
Is “Green” Building a fad or is it  
Going to become the new higher  
building standard?

# National Energy Consumption

Buildings are the #1 in Energy Use

**38%**

Ouch!- Shouldn't something be done to improve this?

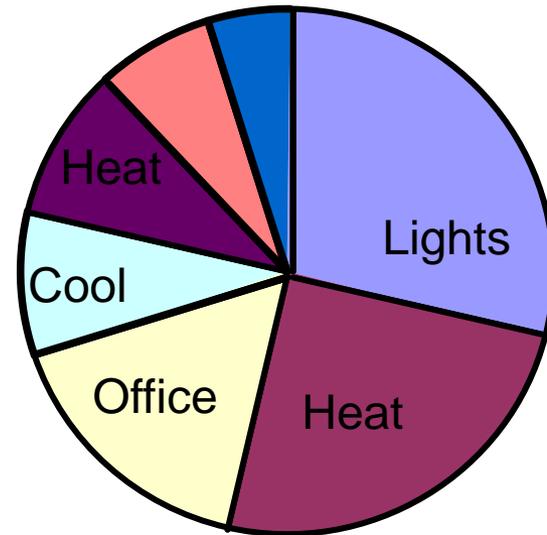


U.S. Energy Consumption

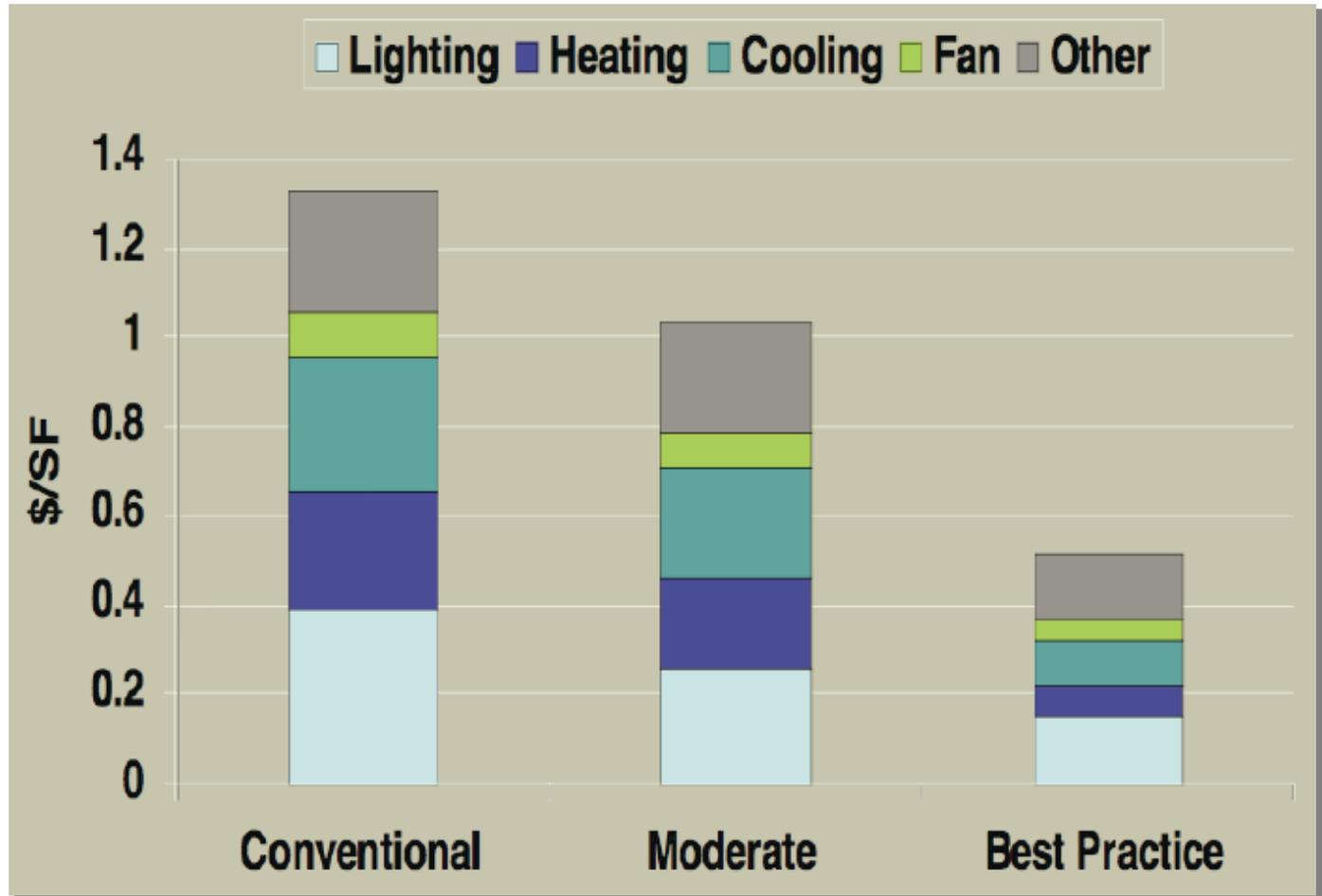
# Building Energy Use Components

Notice the areas where easy improvements can be made:

Lighting	29%
Space Heating	25%
Office Equipment	16%
Space Cooling	9%
Water Heating	9%
Ventilation	7%
Misc	5%



# Energy Operating Costs



Code Based  
Building

Energy Star/  
LEED  
Certified Building

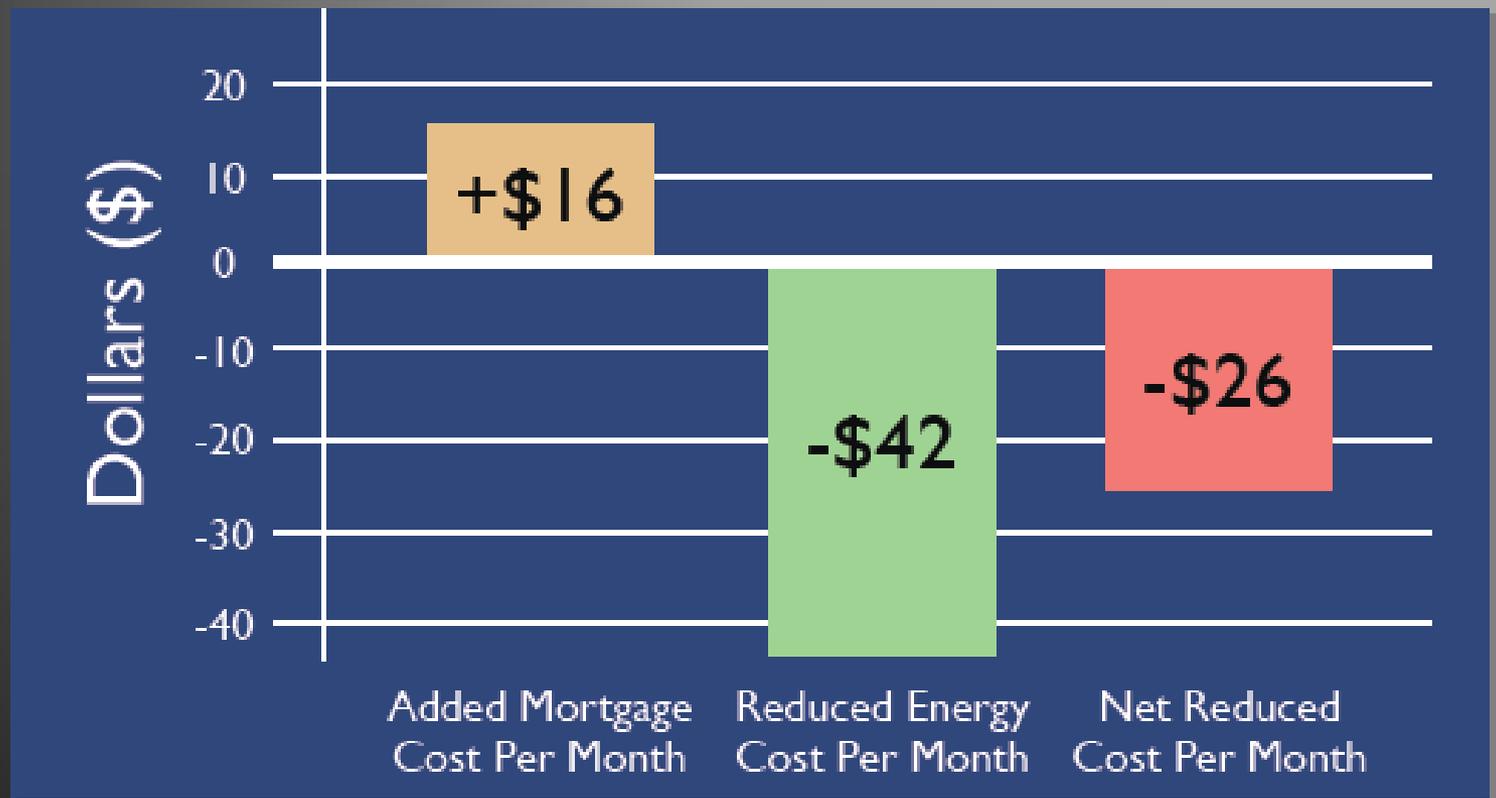
LEED Gold,  
Platinum Building

Costs Savings can easily be 30% or more

# The Building Owner's Perspective

## Why buy/ build “Green”?

Increased Purchasing Power/ Monthly Savings– keeping money in your pocket...



Yeah- That's what we are talking about!

# “Green” Building Programs

- ▶ ENERGY STAR Certification or equivalent program
- ▶ Leadership in Energy and Environmental Design (LEED) Green Building Rating System or equivalent program.
- ▶ Alternative programs which have been created specifically to address the following counties’ and cities’ location and needs:
  - Boulder, CO
  - Teton County, WY
  - Taos, NM
  - Eagle County, CO
  - Pitkin County, CO



# ENERGY STAR



## NORTHWEST ENERGY STAR HOMES CERTIFICATION REQUIREMENTS Single Family Homes

NWBOP 1  
Natural Gas Fired Furnaces &  
Electric Heat Pumps

- ▶ A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy
- ▶ Promotes energy efficient products and practices for residences and businesses 30% better than 2006 IECC
- ▶ Energy performance rating system to measure current energy performance, set goals, track savings, and reward improvements
- ▶ Residential 870,000 homes and Businesses have used for more than 30,000 buildings across the country

Builder Option Packages (BOPs) are a prescriptive method for labeling new homes ENERGY STAR. All requirements of the NWBOP shall be met in order to qualify a home for Northwest ENERGY STAR Homes certification and verification by a Northwest ENERGY STAR Homes Verifier.

Insulation																			
Ceiling		R-38	Flat or vaulted.																
Wall		R-21	R-19 is optional with advanced framing techniques.																
Floors Over Unconditioned Space		R-30	Insulation in floor joist cavity. Perimeter insulation not allowed.																
Slab Floors	Unheated	R-10 Perimeter	Applies to all concrete slab floors above or below grade. R-5 thermal break at slab edge. Perimeter insulation shall be installed for a distance of 2 feet vertical, horizontal, or combined distance. In areas east of the Cascade mountains, 4 feet is recommended.																
	Heated Radiant	R-10 Full Slab																	
Basement Wall		R-19	Below grade walls can extend up to 24 inches above grade.																
Windows & Doors																			
Glazing	Windows	U-0.35																	
	Skylights	U-0.50	Skylight area shall not exceed 5% of heated floor area.																
	Max. Glazing Area	21% of Heated Floor Area	Combined window and skylight area. Up to 1% of heated floor area exempt.																
Doors		R-5	One door up to 28 ft <sup>2</sup> exempt.																
Ducts																			
Insulation		R-8	Ducts inside heated space exempt.																
Sealing		Mastic	Tapes not allowed.																
Max. Leakage		<0.06 CFM per ft <sup>2</sup> OR 75 CFM Total @ 50Pa	All forced air heating and cooling system ducts shall be installed according to Northwest ENERGY STAR Homes Specifications for sizing and leakage. Performance testing is required.																
Ventilation & Air Sealing																			
Ventilation System		Exhaust Ventilation	Local code requirements are deemed to satisfy this requirement.																
Envelope tightness		7.0 ACH @ 50 Pa	Local code requirements for air sealing are deemed to satisfy this requirement.																
Heating & Cooling Equipment																			
Gas Furnace		90 AFUE	Installed according to Northwest ENERGY STAR Homes specifications for sizing, controls, airflow and refrigerant charge. Performance testing is required.																
Heat Pump		8.5 HSPF* / SEER 13																	
Air Conditioner		SEER 13	* As of July 1, 2006 any home initiated in the Northwest ENERGY STAR Homes database utilizing a heat pump must be an 8.5 HSPF. Homes initiated prior to July 1, 2006 will qualify with an 8.0 HSPF/SEER 13 heat pump.																
Water Heating																			
Natural Gas	≤ 60 gal	0.61	Gas commercial tank water heaters may be used if they have standby losses that do not exceed the following (btu/hr):																
	> 60 gal	0.60																	
Electric	≤ 70 gal	0.93																	
	> 70 gal	0.92																	
			<table border="1"> <thead> <tr> <th>Gallons</th> <th>70-74</th> <th>75-79</th> <th>80-84</th> <th>85-89</th> <th>90-94</th> <th>95-99</th> <th>100+</th> </tr> </thead> <tbody> <tr> <td>Max Standby Loss</td> <td>930</td> <td>960</td> <td>980</td> <td>1010</td> <td>1030</td> <td>1060</td> <td>1080</td> </tr> </tbody> </table>	Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+	Max Standby Loss	930	960	980	1010	1030	1060	1080
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Appliances & Lighting																			
Appliances		ENERGY STAR Qualified	Applies to built-in appliances only.																
Lighting		ENERGY STAR Qualified	A minimum of 50% of sockets to be either ENERGY STAR bulbs, fixtures, or both																

# Energy Code Comparisons

<b>Feature</b>	<b>2003 IECC Climate Zone 16</b>	<b>2006 IECC</b>	<b>Northwest Energy Star (Assume Gas Furnace)</b>
Ceiling Insulation	R-38	R-49	R-38
Wall Insulation	R-19	19	R-21 or R-19 Advanced
Floors Over Unconditioned Space	R-19	30	R-30
Slab Floors - Unheated	R-14 (4 ft)	R-10 (4 ft)	R-10 (2ft)
Slab Floors - Heated	R-16 (4 ft)	R-15 (4 ft)	R-10 (Full Slab)
Basement Wall Insulation	R-18	R-10 Cont R-13 Between Framing	R-19
Windows – Vertical	U-0.35	U-0.35	U-0.35
Windows – Skylight	U-0.35	U-0.60	U-0.50
Window Area	Based on 15% glass to wall area	Unlimited / 18% base case if using performance approach	≤ 21% Conditioned Floor Area
Doors	U-0.35	U-0.35	R-5
Building Envelope Air Leakage Testing	Not Required	Not Required	Required
Furnace Efficiency	78% AFUE	78% AFUE	90% AFUE
Air Conditioner Efficiency	13 SEER	13 SEER	13 SEER
Duct R-Value	R-8	R-8	R-8

# LEED Leadership in Energy and Environmental Design

## LEED for Homes or LEED NC

The nationally accepted benchmark for the design, construction and operation of high performance green buildings.

- 884 LEED Certified Projects
- 7,936 LEED Registered Projects

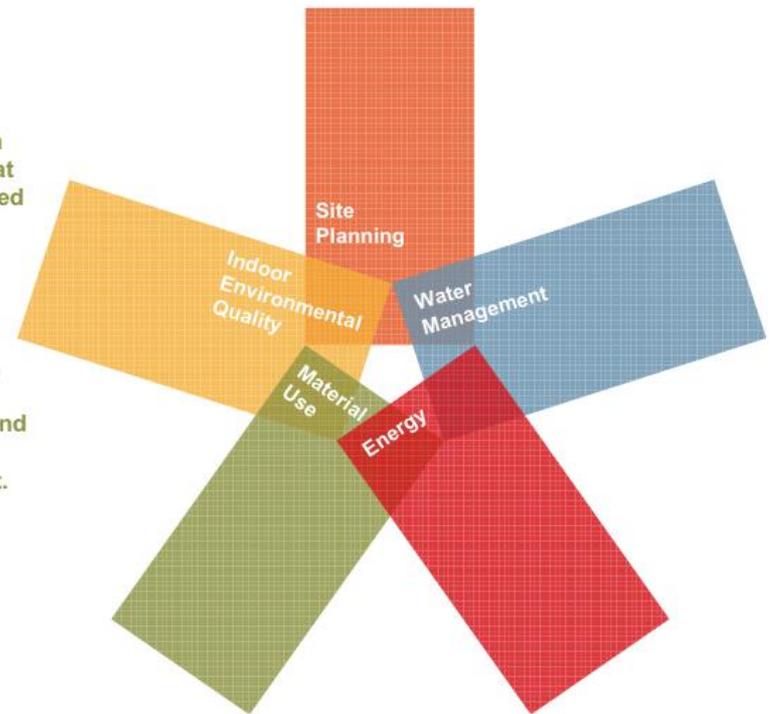


# LEED Rating

LEED rates performance in five key areas of human and environmental health:

- sustainable site development
- water savings
- energy efficiency
- materials selection
- indoor environmental quality

**What is green building?**  
Design and construction practices that meet specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.



# Boulder City, Colorado

## Green Points and Green Building Program

- Mandatory
- Energy efficiency requirements for Commercial, Residential, remodels, and additions.
- Additional green points required for all residential construction.
- Green points are available in multiple categories (water conservation, sustainable materials, etc.)
- At least 50% of construction waste must be recycled.
- If there is demolition involved – at least 65% of the materials from the demolished structure must be diverted from the landfill.



Type of Project	Square footage	Required HERS index	Energy Efficiency above Code
New Construction	Up to 3,000	70	30%
	3,001 to 5,000	60	50%
	5,001 and Up	35	75%
Multi-Unit Dwellings	Applies to all	70	30%

# Teton County, Wyoming

## Green Building Program

- ▶ Voluntary Certification Program
- ▶ Residential only
- ▶ Point based Checklist Minimums to meet. LEED is integrated

The following are mandatory building standards for all construction:

- ▶ Glazing shall not exceed 30% of gross floor area above grade
- ▶ All exterior landscape lighting shall be solar powered
- ▶ Interior lighting fixtures shall be limited to 50% maximum use of incandescent lighting
- ▶ Limited number of fireplaces based on lot size

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PowerPC G4 processor  
are needed to see this picture.

# Taos, New Mexico

## High Performance building Program

- ▶ Mandatory program applies to all new construction, remodels, and additions
- ▶ All residential must meet HERS rating of 85 for Phase I, 80 for Phase II, 75 for Phase III, and 70 for Phase IV.
- ▶ All commercial must meet minimum LEED Certification, with 3 points in water conservation.
- ▶ Allows for fees in-lieu fees of complying with standards, which go towards assisting low income citizens with energy efficiency home projects



# Eagle County, Colorado

## Eco– Green Build

- ▶ Mandatory for all residential, commercial, and additions/reconstructions over 50% of existing floor area.
- ▶ Focuses primarily on energy efficiency and material efficient building design and construction practices.
- ▶ Points system based on sq. ft. for residential construction
- ▶ Financial incentive for those that go beyond required points
- ▶ Applicant can pay fees in-lieu of meeting requirements.
- ▶ Building permit rebate offered

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decompressor  
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# Aspen/ Pitkin County Colorado Efficient Building Program

- ▶ **Mandatory for Residential only**
- ▶ **Larger buildings have higher performance standards:** Higher performance goals for energy efficiency; on-site renewable energy requirements and points required for “green” standards.
- ▶ **Limit amount of exterior energy:** Exterior energy applications (i.e. snowmelt, spas, etc.) have been limited to 240,000,000 BTU’s per year for residential buildings.
- ▶ **Renewable energy requirement:** Homeowners must provide at 50% of their snowmelt, pools and spa energy needs from renewable energy sources.
- ▶ **Minimum efficient building program points:** The Efficient Building Program requires a minimum number of points, based on the house size, to be scored across various categories.

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# Survey and Interactive Q&A

- We thank you for your time, interest, feedback, and support for a higher building standard for our Community