CONCEPT OF GREEN BUILDING AND SUSTAINABLE DEVELPOMENT

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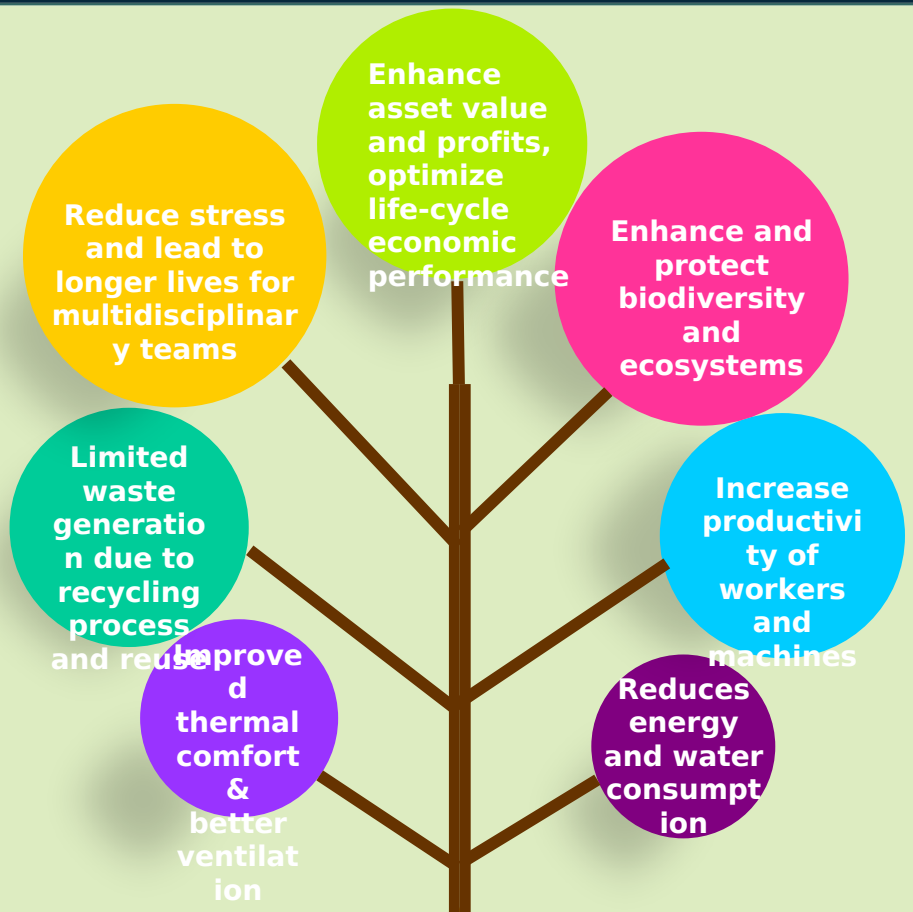
Concept of Green Building

- A ‘Green’ building eliminates negative impacts, and can create positive impacts, on our climate and natural environment.
- Green buildings preserve precious natural resources and improve our quality of life.



Benefits of a Green building concept

Concept of Sustainable Development

- It is a development that meets the needs of present without compromising the needs of future generations to come.
- Incorporates and integrates a variety of strategies during the design, construction and operation of building projects.
- As more than 40% population is living in the cities so these cities should be made Sustainable first.
- The basic objectives: reduce consumption of non-renewable resources, minimize waste, and create healthy, productive environments.

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1 Conservation of Ecosystem

3 Conservation of Biodiversity

5 Conservation of Cultural heritage

Principles of Sustainable Development

2 Population Control

4 Conservation of Human Resource

6 Sustainable Development of Society

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LEED India Concept

- The Indian Green Building Council(IGBC) Designed and started the Leadership in Energy and Environmental Design (LEED – India) system is called Green Building Rating System.
- LEED provides a framework for healthy, highly efficient, and cost-saving green buildings.

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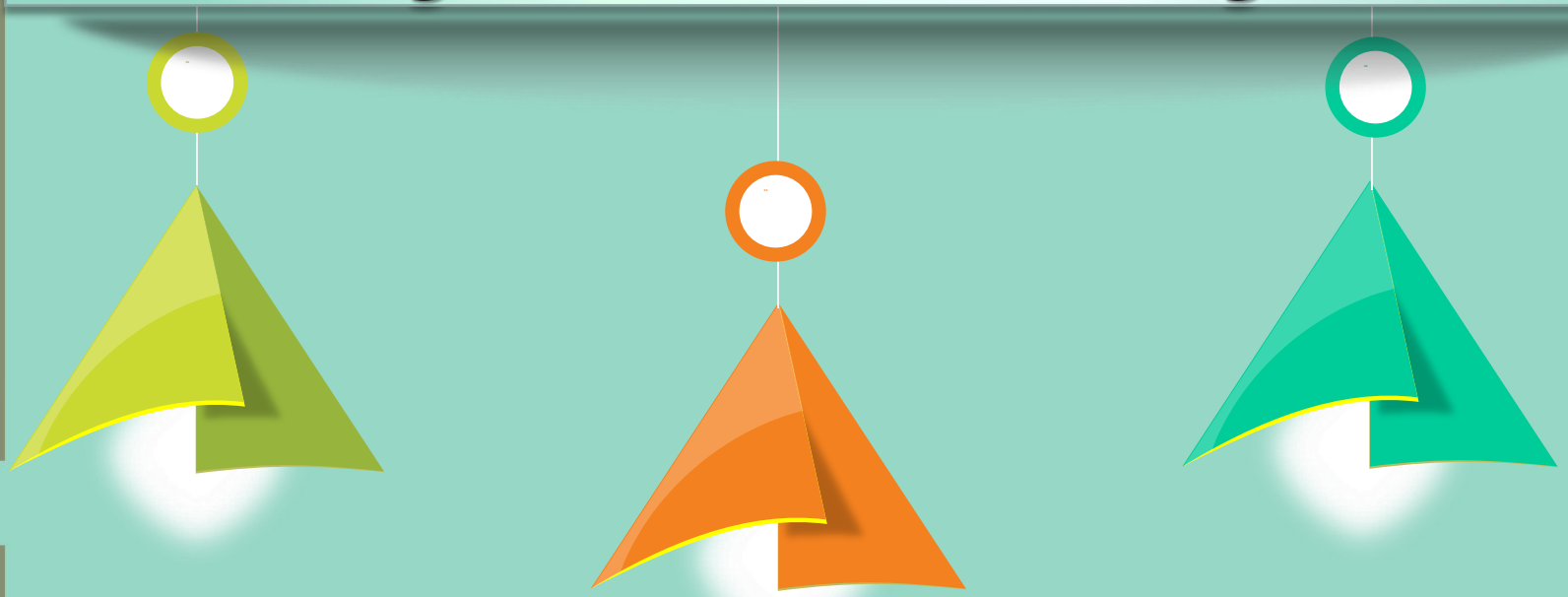
Advantages of Green Building Materials



- Reduced maintenance costs over the life of the building
- Greater design flexibility

- Energy conservation
- Improved occupant health and productivity

- Life cycle cost saving
- Lower costs associated with changing space configurations

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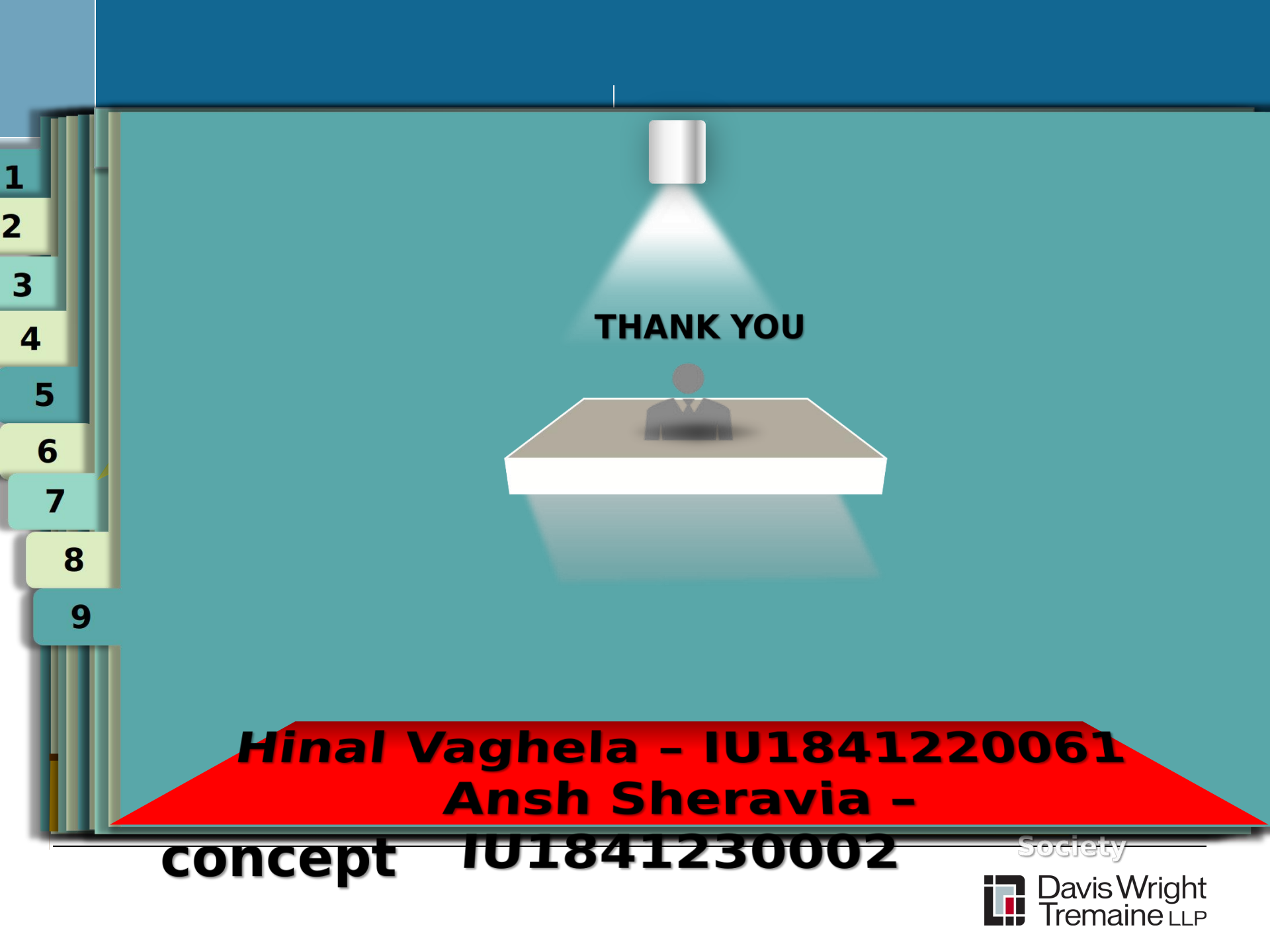
Conclusion

- With the convergence of urbanization, globalization and rapidly changing and expanding economy, using these energy materials will help the world as well as India in satisfying the shortage of building materials and also environmental degradation.
- Green building will also provide tangible and significant return on investment to contractors, architects and building owners.



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What is a “Green Building”

“Green” Buildings are high performance structures that also meet certain standards for reducing natural resource consumption

What is a “Green Building”?

- “Green” or “Sustainable” buildings are characterized by:
  - efficient management of energy and water resources
  - management of material resources and waste
  - restoration and protection of environmental quality
  - enhancement and protection of health and indoor environmental quality
  - reinforcement of natural systems
  - analysis of the life cycle costs and benefits of materials and methods
  - integration of the design decision-making process

What is a “Green Building”

- “Metrics” for such “green” benefits are articulated and certified by LEED, BuiltGreen or other organizations
- Green standards measure different environmental qualities of buildings
- Each has a different emphasis and purpose

What is a “Green Building”?

- Green Building standards include:
  - **Leadership in Energy and Environmental Design (LEED)**
  - **Green Globes**
  - **Model Green Homebuilding Guidelines**
  - **BuiltGreen**
  - **Energy Star**
  - **Living Building**

Why go “Green”?

- Green makes business sense
  - Increased flexibility to allow for longer building and TI useful life and reuse of materials
  - Improved building performance
  - Increased revenue (higher rents/sales price, improved productivity, fewer/shorter vacancies)
  - Lower cost (utilities, costs of conversion)

Why Go “Green”?

- Going “Green” is the “right thing”
  - reduce carbon consumption,
  - energy independence,
  - encourage community,
  - preserve natural systems

Is “Green” real or just a marketing fad?

- Does certification under LEED or any of the other “Green” rating systems bring meaningful environmental or economic benefit?

Green – Real or Just Marketing

- LEED has been widely criticized :
  - Focus is not on key factors in current climate change crisis – CO2 and energy
  - Looks only at prescriptive design, not measurable performance
  - Favors bells and whistles, not basic good design
  - Too complicated, bureaucratic and expensive

Green – Real or Just Marketing

- LEED not necessarily valued in marketplace
  - 2009 RICS Study: LEED rating did not statistically improve rents while Energy Star rating associated with rents higher by 3.3%

“Defining Success Together”

- Because of various standards and outcomes, it is important to work with client to understand just what client wants to achieve in undertaking a “green building” project

“Defining Success Together”

- Green Building legal issues revolve around:
  - Identifying parties’ “values” and negotiating agreements that result in “wins”
  - Allocating risks, benefits, burdens and responsibilities
  - Anticipating and avoiding unnecessary trouble

Overview of Green Building

- Green Building Standards
- Green Building Incentives
- Green Building Leasing
- Green Building Design and Construction

Green Building Standards

- **LEED – Leadership in Energy and Environmental Design**
  - Administered by the U. S. Green Building Council
  - Voluntary, consensus-based system

LEED Basics – Why LEED?

- The “built environment” accounts for approximately:
  - 40% of global consumption of raw materials
  - 37% of primary U. S. energy consumption (operations)
  - 68% of U. S. electricity consumption
  - 12% of U. S. potable water consumption
  - 40% of U. S. sold waste stream
  - 35% of U. S. carbon dioxide emissions

LEED Basics – Why LEED?

- Advertised as:
  - Reducing environmental impact
  - Reducing operating costs
  - Increasing occupant comfort and productivity
- Other potential benefits:
  - Higher rents?
  - Higher sales price?

LEED Basics – Rating Systems

- New Construction
- Existing Buildings: O&M
- Commercial Interiors
- Core and Shell
- Schools
- Homes

LEED Basics – Pilot Rating Systems

- **Neighborhood Development**
  - *Encourage healthy living* by creating compact, walkable, vibrant, mixed-use neighborhoods with good connections to nearby communities.
  - *Reduce urban sprawl*
  - *Protect threatened species*
  - *Increase transportation choice and decrease automobile dependence*.
- 8 LEED-ND Pilot projects in Washington
  - Including -- Thorton Place, South Lake Union

LEED Basics – Pilot Rating Systems

- Retail
- Health Care
  - In cooperation with the Green Building for Health Care rating system

LEED Basics

- LEED updated in 2009
  - **Harmonization** – prior systems, with wisdom from Credit Interpretation Rulings, consolidated and aligned
  - **Credit Weightings** – credits have different weight depending on how most affect energy efficiency and CO2 reduction
  - **Regionalization** – credits prioritized based on regionally important environmental issues

LEED Basics – Rating System Example (LEED 2009-NC)

Category	Prerequisites	Credits	Possible points
Sustainable Sites (SS)	1	8	26
Water Efficiency (WE)	1	3	10
Energy & Atmosphere (EA)	3	6	35
Materials & Resources (MR)	1	7	15
Indoor Environmental Quality (EQ)	2	8	15
Innovation & Design Process (ID)	None	2	5
Regional Priority	None	1	4
Totals:	*8*	*35*	*110*

LEED Basics – Category Examples

- Sustainable Sites (SS)
  - Site Selection
  - Density and Connectivity
  - Brownfield Redevelopment
  - Alternative Transportation
  - Site Development – Habitat/Open Space
  - Stormwater Control
  - Reduction of “Heat Island” Effect
  - Light Pollution Reduction

LEED Basics – Category Examples

- Water Efficiency
  - Water Use Reduction
  - Water Efficient Landscaping
  - Innovative Wastewater Technology

LEED Basics – Category Examples

- Energy & Atmosphere (EA)
  - Energy Efficiency
  - Renewable Energy
  - Building Commissioning

LEED Basics – Category Examples

- Materials & Resources (MR)
  - Building Reuse
  - Construction Waste Management
  - Materials Reuse
  - Recycled Materials
  - Regional Materials
  - Rapidly Renewing Materials
  - Certified Wood

LEED Basics – Category Examples

- Indoor Environmental Quality (EQ)
  - Ventilation
  - Low-Emitting Materials
  - Controllable Systems: Lighting - Thermal
  - Thermal Comfort
  - Daylight & Views

LEED Basics – Certification

- Certification is dependent upon number of points earned
- LEED-NC 100 base points + 6 Innovation in Design and 4 Regional Priority points

LEED Basics – Certification

2009 LEED-NC Certification Levels	
Certified:	40 - 49 points
Silver:	50 - 59 points
Gold:	60 - 79 points
Platinum:	80 points and above

LEED Basics

2009 Minimum Program Requirements

1. Must comply with environmental laws
2. Must be a complete, permanent building or space
3. Must use a reasonable site boundary
4. Must comply with minimum floor area requirements
5. Must comply with minimum occupancy rates
6. Must commit to sharing whole-building energy and water usage data
7. Must comply with a minimum building area to site area ratio

LEED Basics

- Must commit to sharing whole-building energy and water usage data
  - for a period of at least 5 years
  - in a free, accessible, and secure online tool or, if necessary, taking any action to authorize the collection of information directly from service or utility providers
  - must carry forward if the building or space changes ownership or lessee

LEED Basics

- **Decertification**
- MPR “Preamble” contains this “Note”:
- “CERTIFICATION MAY BE REVOKED FROM ANY LEED PROJECT UPON GAINING KNOWLEDGE OF NON-COMPLIANCE WITH ANY APPLICABLE MPR”

GREEN GLOBES

- Environmental impacts assessed on a 1,000 point scale in multiple categories:
  - Energy
  - Indoor Environment
  - Site
  - Water
  - Resources
  - Emissions
  - Project/Environmental Management

Green Globes

- After achieving a threshold of at least 35% of the total number of 1,000 points, new and existing commercial buildings can be certified for their environmental achievements and sustainability by pursuing Green Globes certification that assigns a rating of one to four globes

Green Globes

- Two Categories
  - New Construction
  - Continual Improvement of Existing Buildings

Green Globes

- New Construction – 2 Stages
  - Stage I -- review of construction documents, working drawings, landscape designs, energy analysis, LCA documentation, commissioning reports, etc.
  - Stage II -- onsite walk through, review of additional documentation, and interview of key team members.

Green Globes

- Continual Improvement of Existing Buildings
  - extensive documentation review and an on-site visit with a walk through and interview of facility manager and chief engineer

Energy Star

- A program of the US Environmental Protection Agency
- Focuses on energy consumption
- Different tools for residential and commercial buildings

Energy Star -- Residential

- Home Energy Rating System (HERS) Index established by the Residential Energy Services Network (http://www.natresnet.org/).
- Home meeting the 2006 International Energy Conservation Code scores “100” and a net zero energy home scores “0”.
- Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home.
- To qualify for Energy Star, a home in Washington State (Climate Zones 4, 5 or 6) must achieve a HERS Index score of 85 or lower.

Energy Star - Commercial

- “National Energy Performance Rating System” -- scale of 1-100.
- A building that scores 75 or above on this scale (placing its energy performance among the top 25 percent among similar buildings nationwide) can earn an Energy Star label.
- Energy Star also offers an energy management tool, Portfolio Manager, on the energystar.gov web site.

Government Requirements/Incentives

- Approaches
  - Mandating compliance with specific standards like LEED
  - Requiring measurement and public reporting of energy use on an on-going basis
  - Incenting compliance with standards by offering bonuses, expedited processing, etc.
  - Government procurement: Structures of at least a certain size must comply
  - Adoption of codes

Governmental Green Requirements and Incentives

- Federal
  - tax incentives to the private sector
  - require federal agencies to adopt green building principles

Federal Green Incentives

- Energy Policy Act of 2005 (amended 2008) -- tax deduction of up to $1.80 per square foot for commercial buildings, placed in service on or before December 31, 2013, that achieved 50 percent energy reduction.

Federal Green Incentives

- Executive Order No. 13423 (2007) - require federal agencies to reduce greenhouse gases by reducing energy usage and to reduce water usage by targeted amounts by 2015

Federal Green Incentives

- EO 13423 also requires federal agencies to comply with the 2006 “Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding” regarding energy efficiency, sustainable building design and practices, siting, high performance buildings, recycling materials, reuse of building materials, water conservation, indoor environmental quality, and the like.

Federal Green Incentives

- 2009 American Reinvestment and Recovery Act
  - $4.5 billion to the U.S. General Services Administration ("GSA") for green building projects
  - $2.7 billion in formula grants to states, territories, local governments, and Indian tribes under the Energy Efficiency and Conservation Block Grant (EECBG) Program
  - More

Federal Green Incentives

Pending Waxman-Markley *American Clean Energy and Security Act of 2009*, H.R. 2454 calls for the creation of a national building label that would measure and disclose the energy performance of commercial property and homes.

- Two ratings -- a performance grade based on utility bills and other operating characteristics, and an asset grade (also known as a design grade) that would assess a building's energy efficiency potential based on computer energy models.
- New label to be based on the Energy Star program, as well as the HERS Index, and programs at the Department of Energy

Washington State Green Incentives

- Focus on green construction of new and remodeled state and state funded facilities.
  - Ch. 39.35D RCW
    - state-funded projects over 5,000 square feet achieve LEED Silver certification or better.
    - new public school construction must be LEED Silver or certified through the Washington Sustainable School Design Protocol
    - CTED recently established the Evergreen Sustainable Development Standard to comply with RCW 39.35D.080 for affordable housing projects funded from the Washington State Housing Trust Fund (HTF) under Chapter 43.185 RCW.

Washington State Green Incentives

- Efficiency First! Act (SB 5854, Chapter 423 Laws of 2009)
  - Requires utilities to track and disclose energy use data for large public buildings and private, non-residential buildings using the Energy Star Portfolio Manager data and ratings.
  - Tracking is to begin on January 1, 2010 and disclosure is to begin by January 1, 2011 for buildings greater than 50,000 square feet and by January 1, 2012 for buildings greater than 10,000 square feet.
  - Building owners must disclose the Energy Star Portfolio Manager data and ratings to prospective buyers, lessees or lenders for the most recent continuously occupied twelve-month period.
  - CTED to recommend to the legislature by the end of 2009 a methodology to determine an energy performance score for residential buildings.

Local Green Incentives

- King County
  - King County Executive Order FES 9-3 (AEP) (Oct. 25, 2001) requires all new public construction projects to seek LEED certification and encourages the application of LEED criteria to building retrofits and tenant improvements.

Local Green Incentives

- King County
  - Green Building Grants Program
    - $25,000 for LEED Gold and $35,000 for LEED Platinum certification for new construction or major renovation in the county, but outside the City of Seattle.
    - Special consideration will be given to projects incorporating low-impact development (LID) strategies, and to projects pursuing LEED for Existing Buildings (LEED-EB) and LEED for Existing Buildings: Operations & Maintenance (LEED-EB:O&M) certification
    - 2009 grant application period closes September 30

Local Green Initiatives

- King County
  - Built Green incentive for single-family residential and community development projects throughout Seattle and King County includes grants ranging from $2,500 for a 4-star single family project to $20,000 for a 10 or more unit 5-star project. (2009 Grant Application period closed Sept. 18)
  - Special “Green Track” through the permitting process with a team trained in LEED and Built Green standards plus 3 -15 “free” project staff hours based on Built Green status

Local Green Incentives

- Seattle
  - Requires LEED Silver certification of all city-owned projects and renovations over 5,000 square feet.
  - Encourages private construction to incorporate LEED design standards into new and existing buildings by providing various economic incentives for energy and water conservation.
  - Gives a height or density bonus to commercial or residential projects that achieve at least LEED Silver certification and contribute to affordable housing.
  - Seattle City Light also offers grants totaling up to 60 percent of the cost of qualifying energy-economizing improvements such as lighting, HVAC, controls, transformers, insulation, window glazing, and process improvements.

Local Green Incentives

Seattle “Green Building Capital Initiative”

- proposed for Commercial and Multi-Family (ordinance expected this fall)
- Mandatory measurement and disclosure of Energy Star Portfolio Manager energy performance benchmarking data and ratings.

Local Green Initiatives

- Seattle “Green Building Capital Initiative”
  - Beginning in 2010 for commercial buildings larger than 50,000 square feet, multifamily buildings 20+ units.
  - Beginning in 2011 for commercial buildings larger than 25,000 square feet, multifamily buildings between 10-19 units.
  - Beginning in 2012 for commercial buildings larger than 10,000 square feet, multifamily buildings between 5-9 units.
  - Reported through EPA secure server with automatic downloads to the City

Green Building Issues - Leasing

- Landlords and Tenants may have competing economic interests in "Green Building"
  - Landlords want to recover higher costs of Green Building
  - Tenants want to benefit from lower operating costs

Green Building Issues - Leasing

- Key is to align respective control with responsibility and costs with benefits
  - E.g. – Landlord responsible for maintaining “green” performance of Shell and Core; Tenant responsible for “green” performance of TIs and equipment

Green Building Issues - Leasing

- Both Landlord and Tenant should covenant not to act in manner that jeaopardizes “green” certifications or grants or financing

Green Building Issues - Leasing

- Best to establish expectations and responsibilities in Letter of Intent – including applicable “Green” certification standard
- Lease forms should complement to applicable standard

Green Building Issues - Leasing

- Wide range of documentation
  - Simple “intend to comply with LEED” paragraph
  - “Green Addendum”
  - Model Green Leases – e.g. BOMA
  - “Green” Work Letter

Green Issues – Design/Construction

- Identifying client goals
- Contracting to achieve those goals
- Liability when goals are not met
- Insuring against failure
- Commissioning/ongoing maintenance and operations

Design/Construction – Identifying Client Goals

- **What is the desired result?**
  - LEED certification?
    - Where are the credits to be gained?
    - What limitations exist? Existing land-use codes, CC&Rs may limit design choices
  - Tax credit?
    - Timing: If the tax credit requires placing the building in service by a certain date, how will that date be met?
  - Moral/ethical values of sustainability? How to define them?
  - Cost
    - Any project involves tradeoffs – no client will want a "green result" if its cost cannot be justified

Design/Construction – Contracting Models

- Traditional model
  - Owner contracts for design, then contracts separately with contractor for construction
- Design/Build
  - Owner contracts with one entity to provide design and construction
- Integrated Delivery
  - Similar to design/build

Design/Construction – Design Contract Issues

Traditional Model: Owner contracts with architect

- Need to be sure design contract embodies and does not hinder client goals
- Cost: May need more extensive design development phase to more clearly define goals, costs, tradeoffs
- Architectual standard of care
  - Typical contracts do not place burden on architect to achieve green results in a vacuum – need specific undertaking regarding design, timing to meet client goals
  - AIA commits an architect only to "consider" green issues and discuss them with owner, unless the architect agrees to assume a greater role

Design/Construction – Design Contract Issues

- Insurance
  - Typical insurance does not cover contractual undertakings (e.g. breach of warranty, breach of contract)
  - Need to define architect's standard of care such that failure to design green result results in breach
  - Green-specific insurance products are limited to non-existent

Design/Construction – Design Contract Issues

- **Typical contract clauses may limit owner's rights in the event of failure**
  - AIA documents contain mutual waiver of claims for consequential damages
    - Is the loss of a tax credit due to defective design "consequential damages"?
    - Lost anticipated increase in rents?
    - Lost financing?

Design/Construction – Design Contract Issues

- **Who is responsible for administering the LEED process? AIA Form B214**
  - Architect undertakes specific duties
  - May not be adequate, depending on client goals

Design/Construction – Construction Contract Issues

- **Identify client goals – to what extent does achieving them depend upon the contractor?**
  - Achieving the design
  - Timing: Qualifying for a tax credit may require placing the building in service by a date certain; who assumes the liability for late completion?
  - Construction process: Some LEED credits apply to the construction process, like recyling of building materials, generally control of the environmental impacts of the construction process

Design/Construction – Construction Contract Issues

- **Achieving the result: Does the contractor clearly undertake work that is necessary to achieve the result?**
  - Timing
  - Construction process
  - Substitutions
  - Commissioning

Design/Construction – Construction Contract Issues

- How does the contract allocate the risk of failure?
  - Consider warranties
  - Consider liquidated damages/performance bonuses
    - If green goal depends on completion by a certain date, the contract should say so and include damages/incentives
  - Do other contract clauses potentially impair or change the allocation of risk?
    - Consequential damages limitation

Design/Construction – Lessons from the Trenches

Shaw Development v. Southern Builders

- $7.5 million, 23-unit condo project in Maryland completed in 2006
- Desired LEED Silver rating
- Contractor brought suit for balance owed
- Owner counterclaimed for damages of $635,000 in part relating to lost tax credits when contractor failed to complete in time to recover them
- Settled for undetermined sum
- Specification included LEED requirements, but contract documents were not clear as to undertaking of the contractor
- Counterclaim alleged breach of contract and negligence

Conclusions

- Green Building Certifications present a moving target
- Critical to work with clients early and continuously to determine goals and objectives
- Focus on objective performance measures and clear allocation of risks and responsibilities
- Green building issues are presented in nearly every phase of development – look for opportunities to improve old practices and “boiler plate”
- Don’t get bogged down, but don’t be afraid to innovate