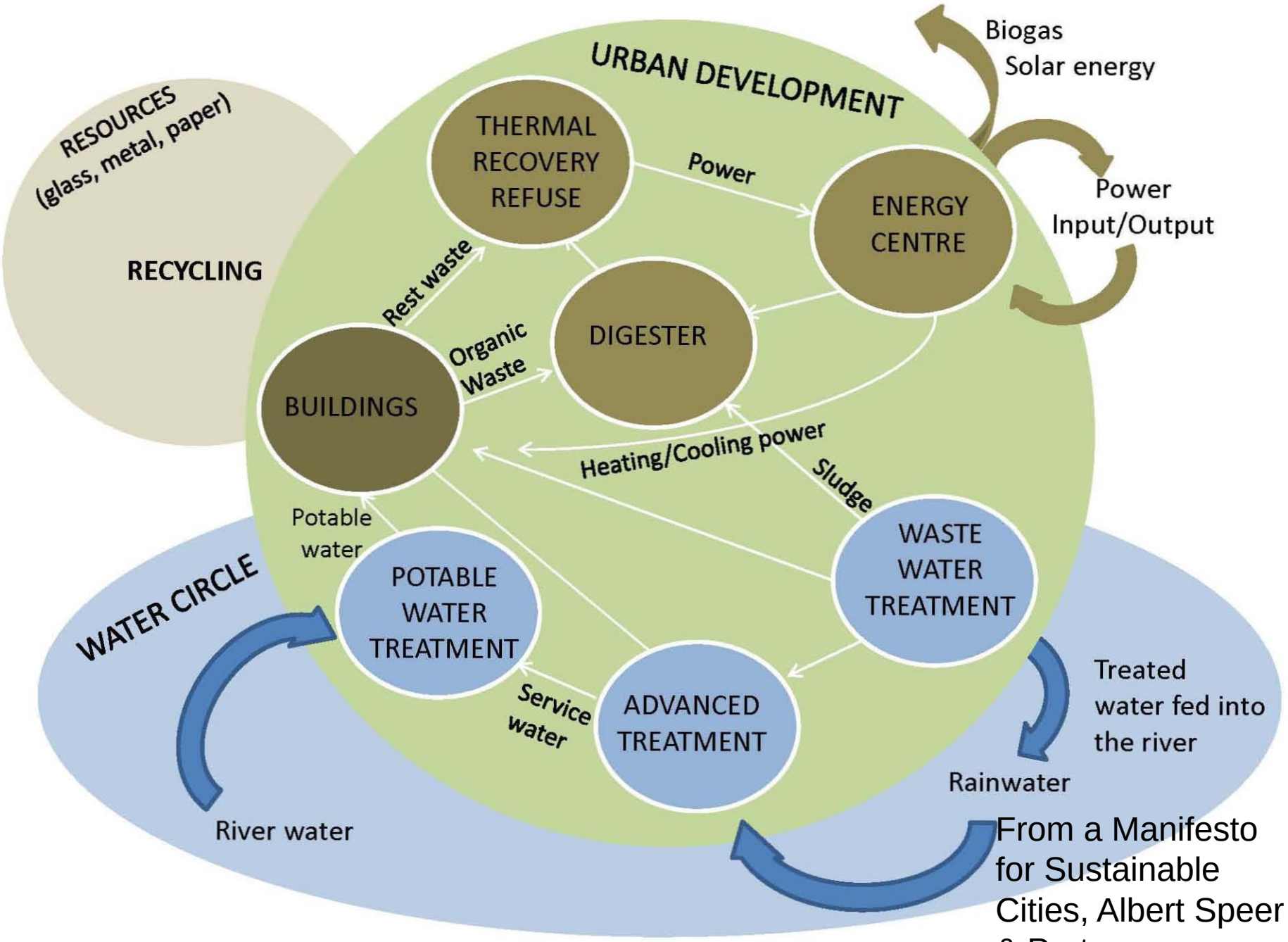
SUSTAINABLE INITIATIVES

City of Whitewater, Wisconsin

the capacity to endure…

City of Whitewater Initiatives

- US Mayors Climate Protection Agreement/Energy Independence/Energy Efficiency Projects
- Stormwater Management
- Water & Wastewater Improvements
- Lakes Management
- Whitewater University Technology Park & Innovation Center



From a Manifesto for Sustainable Cities, Albert Speer & Partner

The U.S. Mayors Climate Protection Agreement

City of Whitewater Endorsed This Agreement in 2006 and is still pursuing the following goals:

1. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;
2. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;
3. Increase the use of clean, alternative energy by, for example, investing in "green tags", advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology;
4. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money;
5. Purchase only Energy Star equipment and appliances for City use;
6. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;
7. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production;
8. Increase recycling rates in City operations and in the community;
9. Maintain healthy urban forests; promote tree planting to increase shading and to absorb C02; and
10. Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

Make Energy Efficiency a Priority Through Building Code Improvements, Retrofitting City Facilities with Energy Efficient Lighting…

In 2006 the City Executed a $750,000 Performance Contract with Honeywell International Inc. for the Following :

- Lighting Retrofit
- HVAC System Upgrades
- Temperature Control System Improvements
- Building Envelope
- LED Traffic Signals
- Vending Miser

and urging employees to conserve energy and save money

Make Energy Efficiency a Priority Through Building Code Improvements, Retrofitting City Facilities with Energy Efficient Lighting…

Cost Avoidance Summary (Year 1)

Energy Cost Avoidance	$ 43,745
Operational Savings	$ 10,000
Installation Period Savings	$ 28,990
Utility Rebate	$ 20,548
Total Cost Avoidance	**$103,283**

Total Annual Guarantee Beyond 1st Year $ 55,371

and urging employees to conserve energy and save money

Make Energy Efficiency a Priority Through Building Code Improvements, Retrofitting City Facilities with Energy Efficient Lighting…

Utility Savings by Measure (Year 1)

• Lighting Retrofit	$ 9,995
• HVAC System Upgrades	$ 8,054
• Temp Control System Improvements	$11,092
• Building Envelope	$ 5,421
• LED Traffic Signals	$ 7,770
• Vending Misers	$ 1,414
Total	**$43,745**

and urging employees to conserve energy and save money

City of Whitewater Resolution Adopting "25 x 25" State Goals For Energy Independence and Becoming an ENERGY INDEPENDENT COMMUNITY

Whereas, Wisconsin Governor James Doyle has created the Office of Energy Independence and established the following goals:

1. Generating 25% of electricity and transportation fuels from renewable sources by 2025 ("25 x 25")
2. Capturing 10% of the emerging bio industry and renewable energy market by 2030
3. Becoming a national leader in groundbreaking energy research; and

Whereas, the Whitewater Common Council has taken numerous actions in recent years to have its facilities become more energy efficient and has indicated its support for renewable energy and the investigation of alternative fuels when it adopted the U.S. Conference of Mayors Resolution on Global Climate Change in 2006; and

Whereas, the Office of Energy Independence is seeking partnerships with local governments in furtherance of the State of Wisconsin's efforts to achieve the "25 x 25" goals;

Whereas, the City of Whitewater will benefit from such a partnership with the State of Wisconsin;

Now Therefore Be It Resolved, by the Common Council of the City of Whitewater , Walworth and Jefferson Counties, Wisconsin that the City of Whitewater herby declares itself a partner with the State of Wisconsin in pursuit of the "25 x 25" goals for energy independence

City of Whitewater's Energy Independence Resolution

- Adopted The State of Wisconsin 25 x 25 Energy Independence Goals
- Wisconsin Energy Independent Community-One of Ten Wisconsin Pilot Communities in 2010
- Completed/Adopted on Long-Range Energy Efficiency Plan with WUSD and UWW to Reduce Community Reliance on Fossil Fuels (Renewable Energy Sources) by 25% by 2025
- Received Energy Efficiency and Conservation Block Grant (EECBG) in 2010-LED Street Light Conversions, Program for Various Energy Efficiency Programs

Energy Efficiency Block Grant (EEBG) Projects

- Boiler System Replacement and Variable Frequency Drive Installation at Whitewater Safety Building
- Replacement of Variable Air Volume System and Variable Frequency Drive Installation at Public Library Building
- Installation of High Efficiency Boiler System at White Memorial Building (Whitewater Cultural Arts Center)
- Replace 150W High Pressure Sodium (HPS)Street Lights to 50W LED Lights
- Replace 70W High Pressure Sodium (HPS)Bollard Lights to 15W LED Lights
- Replace 400W High Pressure Sodium (HPS)Parking Lot Lights to 75W LED Lights

Note: All new street lights installed in the City will be LED rather than HPS.

City of Whitewater Comprehensive Plan

Adopted Plan (February, 2010) Available on CityWebsite contains numerous sustainable goals and objectives in the following:

- Agriculture Resources
- Natural Resources
- Land Use
- Education

Scheduled for adoption in late 2009

Whitewater Stormwater Management

- Wisconsin Pollutant Discharge Elimination System permit issued in 2006 for Stormwater discharge
- Stormwater Utility created in 2007
- Mandated by USEPA and WIDNR for municipalities with populations greater than 10,000
- Major Permit Requirement: Removal of 20% total suspended solids by March 2008 and 40% total suspended solids by March 2013 from Stormwater discharges

Permit Requirements

- Public education and outreach
- Public involvement
- Illicit discharge detection and elimination
- Construction site pollutant control
- Post construction stormwater management
- Pollution prevention
- Stormwater quality management
- Stormwater system map
- Annual report to the DNR

Whitewater Organized the Rock River Stormwater Group (RRSG)

- The RRSG membership consists of Rock River Basin municipalities with or without discharge permits, WDNR, villages, and partners who need and want to help with the public education and outreach for storm water management.
- Whitewater serves as focal point for RRSG

Stormwater management public education and outreach

Public Education and Outreach Key Messages

- Pollutants such as suspended solids or nutrients get conveyed to the local lakes and streams via street gutters and storm water piping
- Sustainable techniques at homes can benefit the environment
  - rain gardens
  - rain barrels
  - detention ponds

Rain Gardens

•A planted depression that allows rainwater runoff from impervious urban areas like roofs, driveways, walkways, and compacted lawn areas the opportunity to be absorbed
•This reduces rain runoff by allowing storm water to soak into the ground (as opposed to flowing into storm drains and surface waters
•Rain gardens can cut down on the amount of pollution reaching creeks and streams by up to 30%.

Rain Barrels

Harvesting Rainwater with Rain Barrels

- Can be used for retention of stormwater for release at a later time

- Many homes use small scale rain barrels to harvest minute quantities of water for landscaping/gardening applications

Detention Basin

- A storm water management facility that is designed to protect against flooding and, in some cases, downstream erosion by storing water for a limited period of a time

Moraine View Park Detention Basin Constructed in 2008

Efficiency in Wastewater Systems Initiatives
2010-2011 Whitewater Upgrades ($5.7m Project)

- **Influent Pumps**: Replacement of (3) shaft driven, 50 hp pumps with (4) dry pit submersible 60 hp pumps. Variable Frequency Drives (VFDs) will control the operating ranges for all pumps.
- **Screenings washer/compactor**: This new unit will replace an older compactor only unit. The advantages are a much dryer and cleaner product to be landfilled. Unnecessarily landfilled soluble wastes will now remain in process for more thorough treatment. A dryer product should mean reductions in landfill costs.
- **Primary and Secondary Clarifier rebuilds**: (2) primary and (2) secondary clarifiers will be refurbished to extend there operating life another 20 years.
- **Sludge/Scum pumps**: New pumps will be placed in the primary and secondary solids buildings. Through the use of automated valves, dedicated scum pumps will no longer be needed. Therefore we are cutting the maintenance and installation costs associated with two pumps. Also, VFD's will be placed on the primary solid pumps for more consistent and efficient pumping.

Efficiency in Wastewater Systems Initiatives

2010-2011 Whitewater Upgrades ($5.7m Project)

- **Tertiary filtration**: Existing anthracite tertiary filters will be cleaned, completely refurbished and updated with new controls to allow for adjustable, fully automated operation.
- **Disinfection**: Gas chlorine and sulfur dioxide systems will be replaced with the installation of an Ultraviolet (UV) disinfection system. This will eliminate the safety concerns associated with gaseous chlorine.
- **Anaerobic Digestion**: Approx. 25% of the project is comprised of work in this area. All floating digester covers will be removed, inspected and repaired as needed. Solids mixing systems will be updated to a jet mix system. This will help eliminate settling along with easing maintenance tasks. All gas safety equipment will be replaced with new equipment. Piping modifications will be made to increase system flexibility. The supernatant pumping system and a recirculation pump will also be updated.

…Recovering Whitewater Wastewater Treatment Methane for Energy Production

Focus on Energy/Digester Study

- Partnered with Strand Associates, Wisconsin Focus on Energy and WE Energies
- Develop relationships with interested parties and investigate the feasibility of treating “outside” (agricultural/industrial/commercial) waste at the facility
- Beneficial uses of the methane or “Biogas” and other byproducts will also be included in this study. Cost benefits and long term cost factors will be additional driving factors at the conclusion of the study.

Whitewater's Involvement with WDNR Mercury Green Tier Charter

- Partnering with WIDNR, MEG (Municipal Environmental Group) and 14 other communities around the state
- Goal of reducing local mercury discharges to the wastewater collection system and inevitably the environment
- The Charter was signed on February 28, 2008
- Committed period of 3 years
- Whitewater has worked and communicated with commercial, academic, clinical and dental businesses in the community
- Results: trend of decreased levels of mercury
  - dental offices that use amalgam (mercury alloy)fillings have installed amalgam separators in their facility to capture fine particulates of the mercury containing waste.
  - City has adopted a mercury amalgam ordinance to help enforce and verify that the separators are being properly maintained now and into the future

Whitewater Lakes Management Initiative

- WIDNR Lakes Management Planning Grant received in 2009
- Partnership - Trippe & Cravath Lakes Improvement Committee and the City of Whitewater
- The City has teamed with the Southeast Wisconsin Regional Planning Commission (SEWRPC) and the University of Wisconsin-Whitewater to complete a lakes management plan
- The plan is being authored by Dr. Jeff Thornton of SEWRPC, a portion of the plan included a community survey that was distributed in June of 2009
- The survey was written by Dr. Mark Eiswerth of UW-Whitewater
- The plan has been adopted by the City Council with implementation to follow

Whitewater University Technology Park

The mission of the Whitewater University Technology Park is to create and foster durable businesses and jobs through a close alignment of UWW's research and educational competencies and the resources of the City of Whitewater. The Park serves as a foundation for a diversified and robust regional economy through the attraction of new residents, utilization of UWW faculty, staff and student expertise and the retention of alumni talent.

Attributes

- The park will establish an innovation center which offers space, facilities, expertise and services to technology-based entrepreneurs and businesses.
- Scientific and technological advancement will be promoted through the development of green and sustainable facilities.
- The Whitewater University Technology Park is established to enhance the area's quality of life, provide higher property values through improved building standards, and to strive for living wages and sustainable economic development.

The Whitewater-University Technology Park will serve as the areas leader in the use of Green Technology.

Whitewater University Technology Park

The Innovation Center will be one of the first LEED Gold certified buildings in Whitewater as well as southern Wisconsin…less impact on our environment and offering more comfortable workplace for employees.

"Alternative energy solutions and methods are encouraged."

Whitewater Innovation Center Sustainable Design Standards

- Optimize Solar Orientation of the Building
- Optimize the relative percentage of insulated building wall and high performing glass
- The use of geothermal ground conductivity to heat and cool the building
- The use of energy recovery ventilators within the buildings air handling units
- The use of displacement ventilation in meeting and common areas to increase comfort and save energy
- The use of photovoltaic panels to generate electricity (104 PV Panels-Generating 20Kw)
- Reduction of impervious site areas by sharing approximately 35% of the required parking lot with neighboring City Park

104 PV Panels will generate up to 20kw

Figure 3: Photovoltaic support framing with roof base flashing and HVAC units

LEED Certification

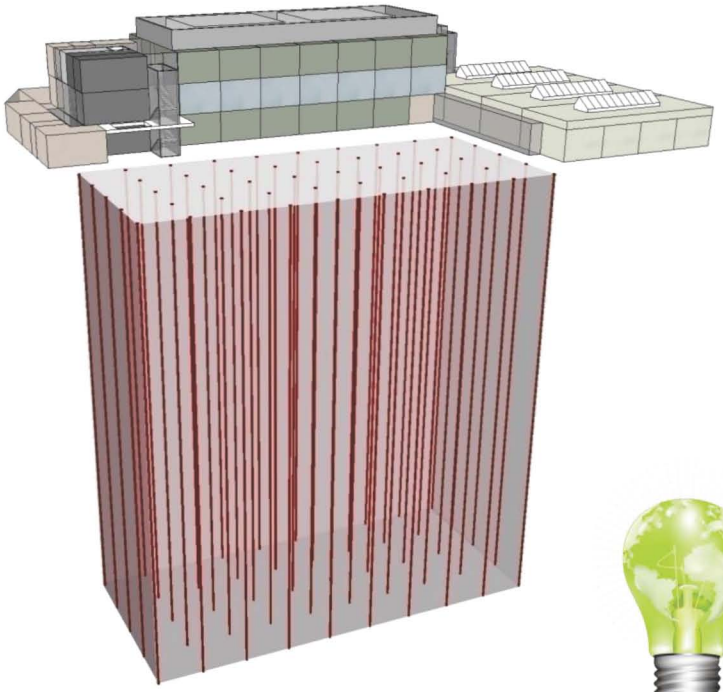
LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

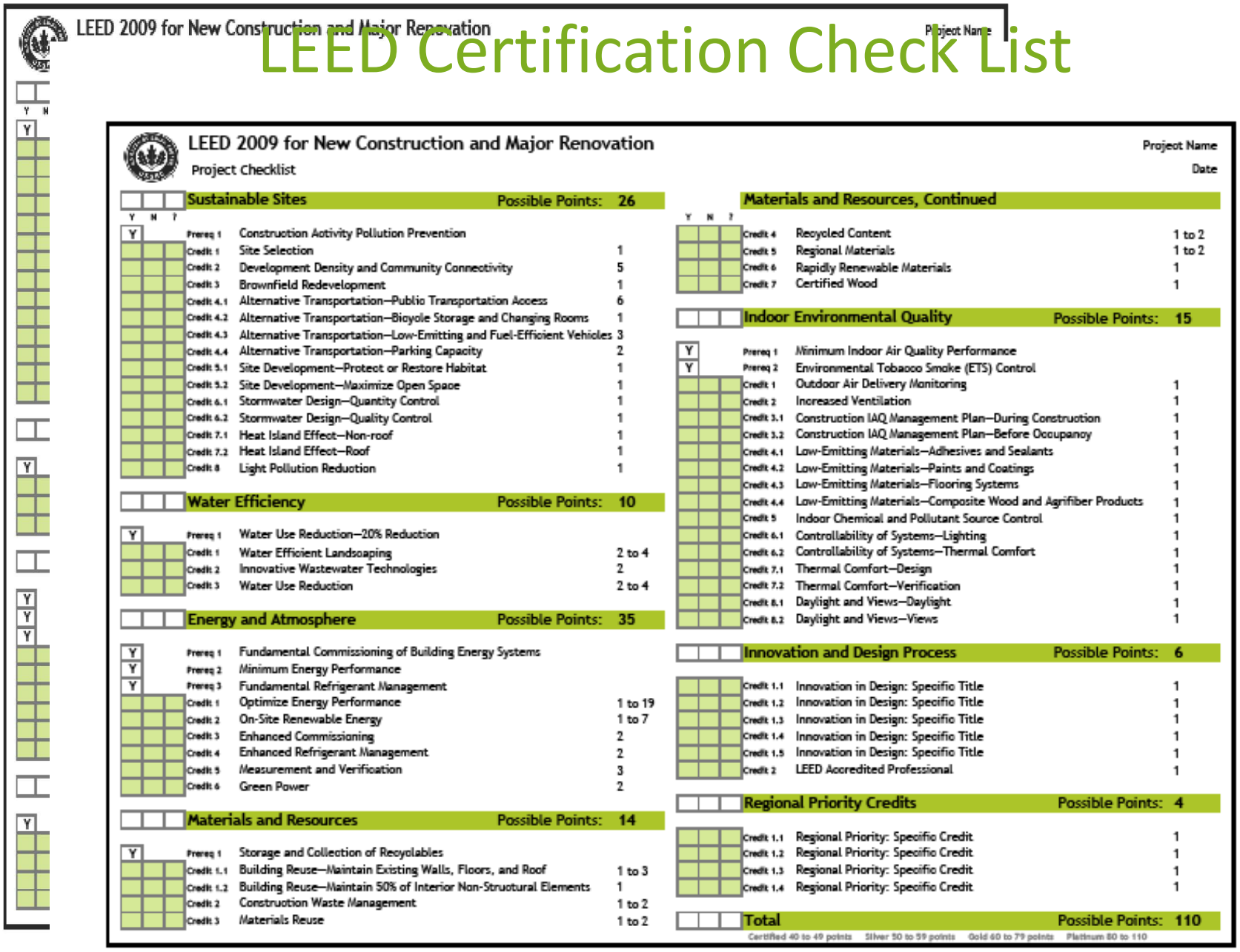
LEED is flexible enough to apply to all building types – commercial as well as residential. It works throughout the building lifecycle – design and construction, operations and maintenance, tenant fitout, and significant retrofit. And LEED for Neighborhood Development extends the benefits of LEED beyond the building footprint into the neighborhood it serves.

Heat Reclaim Chiller and Water Source Heat Pump (Geoexchange)

- Heat recovery chillers with zone cooling through VAV boxes
- Chiller condenser water provided from geoexchange field
- Closed loop, vertical bore field
  - 60 deep wells 275’ deep



LEED Certification Check List



LEED 2009 for New Construction and Major Renovation

Project Checklist

Project Name

Date

Y	N	?			
Sustainable Sites				Possible Points:	26
Y			Prereq 1	Construction Activity Pollution Prevention	
			Credit 1	Site Selection	1
			Credit 2	Development Density and Community Connectivity	5
			Credit 3	Brownfield Redevelopment	1
			Credit 4.1	Alternative Transportation—Public Transportation Access	6
			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
			Credit 4.4	Alternative Transportation—Parking Capacity	2
			Credit 5.1	Site Development—Protect or Restore Habitat	1
			Credit 5.2	Site Development—Maximize Open Space	1
			Credit 6.1	Stormwater Design—Quantity Control	1
			Credit 6.2	Stormwater Design—Quality Control	1
			Credit 7.1	Heat Island Effect—Non-roof	1
			Credit 7.2	Heat Island Effect—Roof	1
			Credit 8	Light Pollution Reduction	1
Water Efficiency				Possible Points:	10
Y			Prereq 1	Water Use Reduction—20% Reduction	
			Credit 1	Water Efficient Landscaping	2 to 4
			Credit 2	Innovative Wastewater Technologies	2
			Credit 3	Water Use Reduction	2 to 4
Energy and Atmosphere				Possible Points:	35
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
			Credit 1	Optimize Energy Performance	1 to 19
			Credit 2	On-Site Renewable Energy	1 to 7
			Credit 3	Enhanced Commissioning	2
			Credit 4	Enhanced Refrigerant Management	2
			Credit 5	Measurement and Verification	3
			Credit 6	Green Power	2
Materials and Resources				Possible Points:	14
Y			Prereq 1	Storage and Collection of Recyclables	
			Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
			Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
			Credit 2	Construction Waste Management	1 to 2
			Credit 3	Materials Reuse	1 to 2

Y	N	?			
Materials and Resources, Continued					
			Credit 4	Recycled Content	1 to 2
			Credit 5	Regional Materials	1 to 2
			Credit 6	Rapidly Renewable Materials	1
			Credit 7	Certified Wood	1
Indoor Environmental Quality				Possible Points:	15
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
			Credit 1	Outdoor Air Delivery Monitoring	1
			Credit 2	Increased Ventilation	1
			Credit 3.1	Construction IAQ Management Plan—During Construction	1
			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
			Credit 5	Indoor Chemical and Pollutant Source Control	1
			Credit 6.1	Controllability of Systems—Lighting	1
			Credit 6.2	Controllability of Systems—Thermal Comfort	1
			Credit 7.1	Thermal Comfort—Design	1
			Credit 7.2	Thermal Comfort—Verification	1
			Credit 8.1	Daylight and Views—Daylight	1
			Credit 8.2	Daylight and Views—Views	1
Innovation and Design Process				Possible Points:	6
			Credit 1.1	Innovation in Design: Specific Title	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
			Credit 2	LEED Accredited Professional	1
Regional Priority Credits				Possible Points:	4
			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1
Total				Possible Points:	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED Certification Point System

Goal = Silver or Gold!

LEED® for Commercial Interiors

Total Possible Points**	110*
Sustainable Sites	21
Water Efficiency	11
Energy & Atmosphere	37
Materials & Resources	14
Indoor Environmental Quality	17

** Out of a possible 100 points + 10 bonus points*

*** Certified 40+ points, Silver 50+ points, Gold 60+ points, Platinum 80+ points*

Innovation in Design	6
Regional Priority	4

Think of it like the nutrition label on a box of crackers: LEED provides the same kind of important detail about the green aspects of a building that, taken together, deliver higher performance.

Leadership, Innovation and Environmental Stewardship