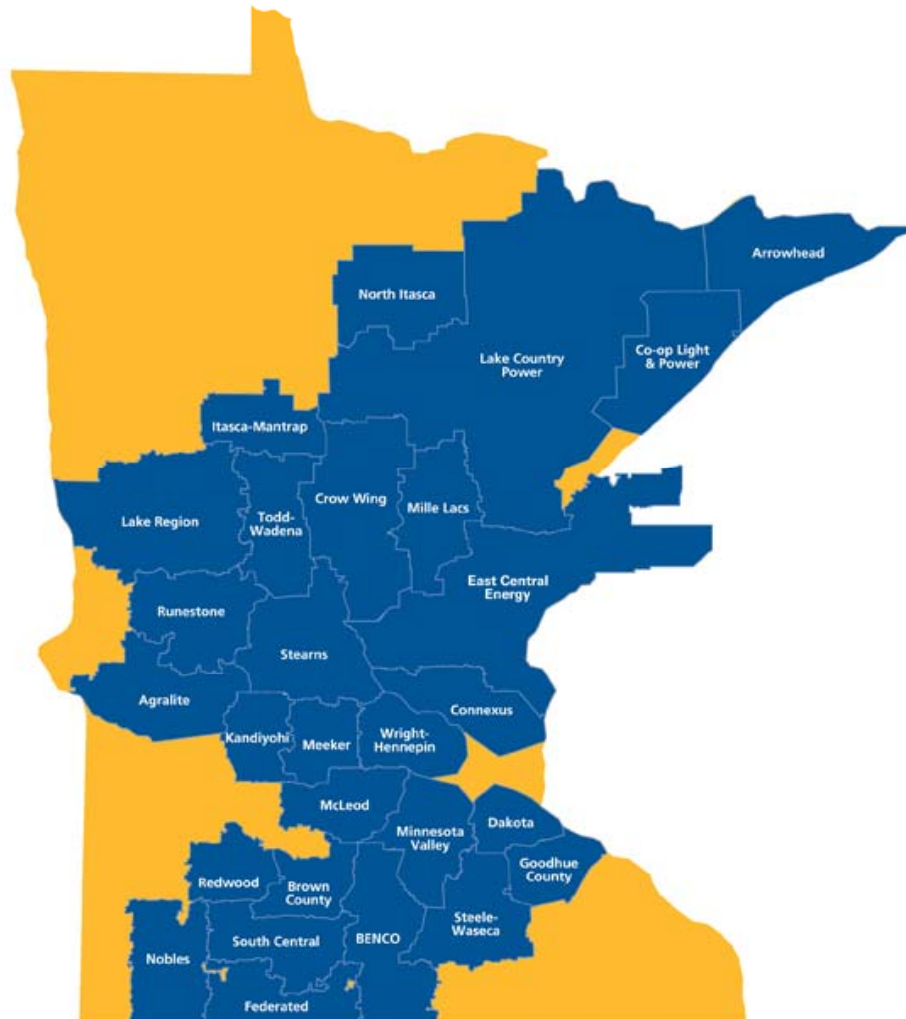


# Sustainable Design: It's More Than Energy!



Image Provided By Perkins + Will

# Great River Energy



- Wholesale generation and transmission electric utility
- Serve 28 retail distribution cooperatives across Minnesota and into Wisconsin
- 34 member Board of Directors

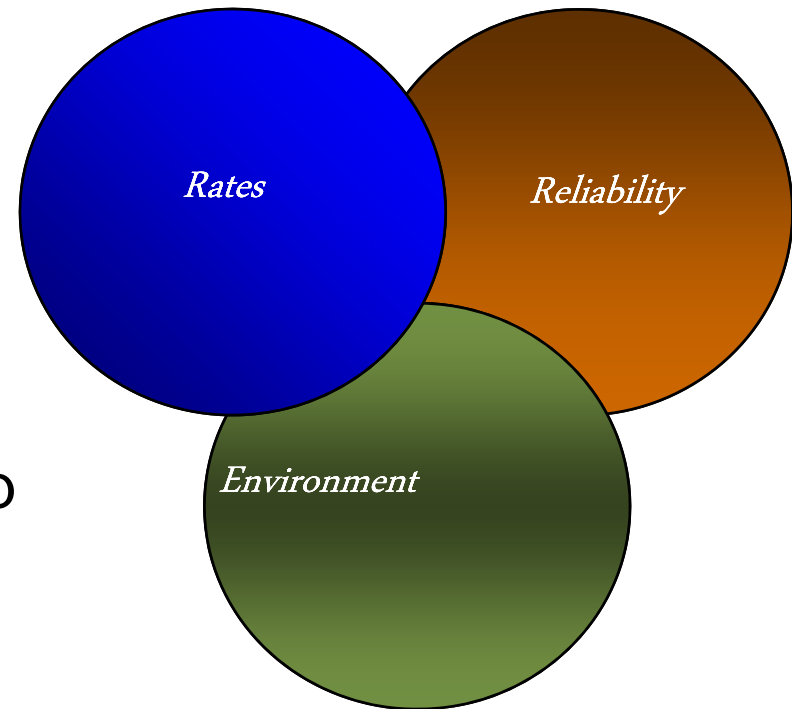
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# Our Commitment

- ▶ **Triple Bottom Line:**
  - Competitive rates
  - Reliable electric service
  - Environmental stewardship



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# Why a New HQ Building

- Outgrown present facility in Elk River
- Regulations on locations of facilities {FERC & NERC}
- Public Relations

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# KEY DRIVERS OF PROJECT

## Efficient/Effective Environment

- ☐ Energy Efficient
- ☐ Show Energy Efficient Technologies that can be Transferred to Co-op customers
- ☐ Achieve a first in environmentally responsible design
- ☐ On-Site Renewable Power
- ☐ Highest Level LEED Building

## Workplace Environment

- ☐ Privacy for Heads Down Work (80% open office / 20% closed office)
- ☐ Visual Access and Intersections for Collaboration
- ☐ Openness and Natural Light
- ☐ Productive and Healthy
- ☐ Comfortable Collaborative Setting
- ☐ Work Efficiency
- ☐ Hard Working Building

## Flexibility to Support

- ☐ Growth and Business
- ☐ Business Models could change
- ☐ Changing Demographics

## Welcoming Environment

- ☐ Welcoming for Co-op members
- ☐ Large meetings (300-500 people at times)
- ☐ Place for Co-op members to meet

## Conference Center

Board Room  
Conference Rooms  
Training Rooms  
Business Center

## Amenities

Pantry/Coffee  
Huddle Rooms  
Conference Rooms  
Company Store  
Cafeteria  
Fitness Center/Locker Rooms

## Underground Parking

## In-Board Offices



# Internal and External Consensus

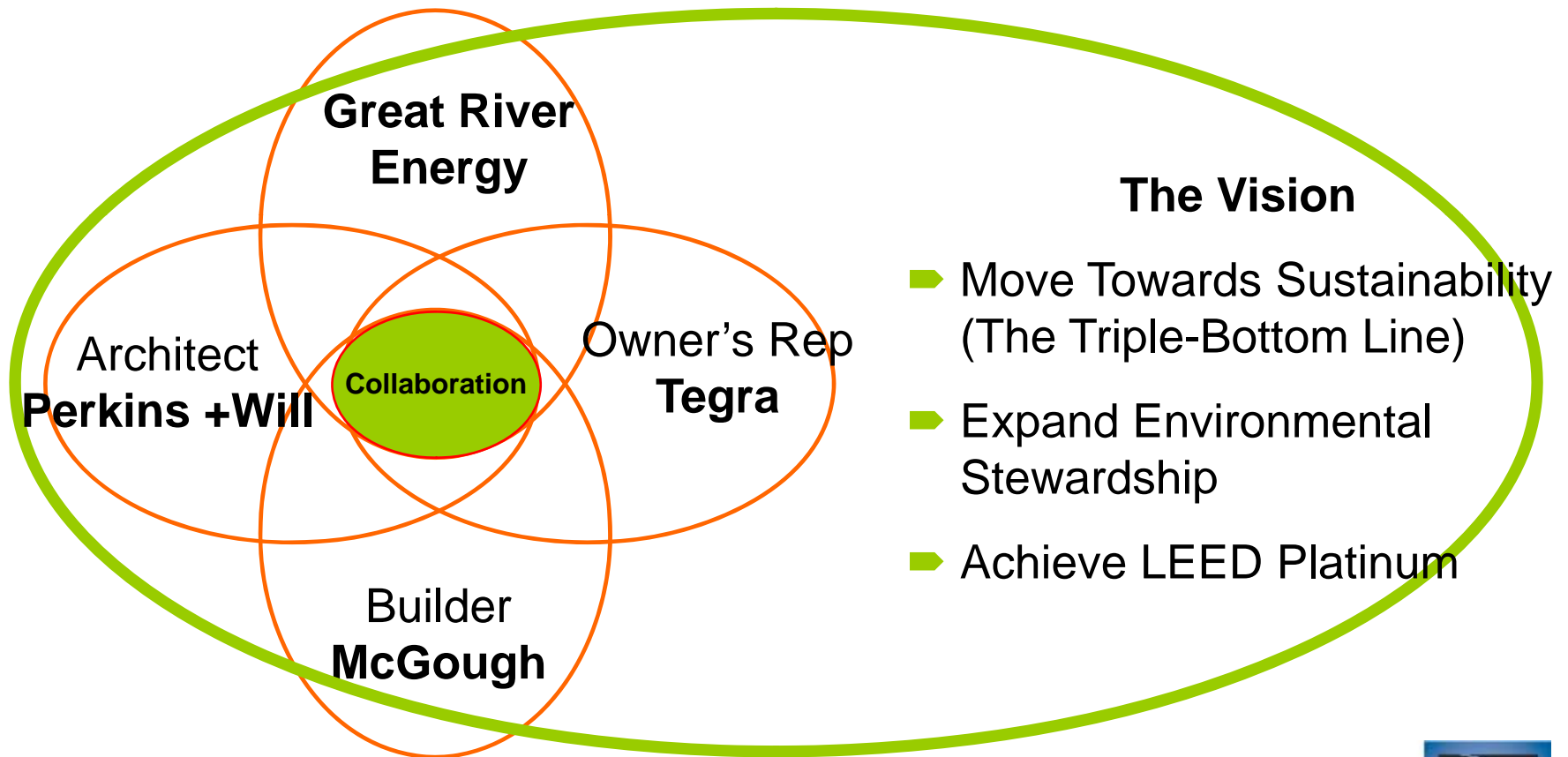
- Employees toured area buildings
  - identify features they liked and disliked
  - design driven by employee comments
- Interviewed managers and conducted employee focus groups
- Collected input from stakeholders:
  - Member cooperatives
  - City of Maple Grove
  - Metropolitan Council
  - Other regulatory authorities

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# Vision & Team Approach



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# Challenges & Resolutions

- Infrastructure
  - Wind turbine approval
  - Geothermal rights
  - Traffic management
- Landscaping and park district requirements
- Developing partnerships
  - Government agencies
  - Community stakeholders

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# Why LEED?

In the United States alone, buildings account for:

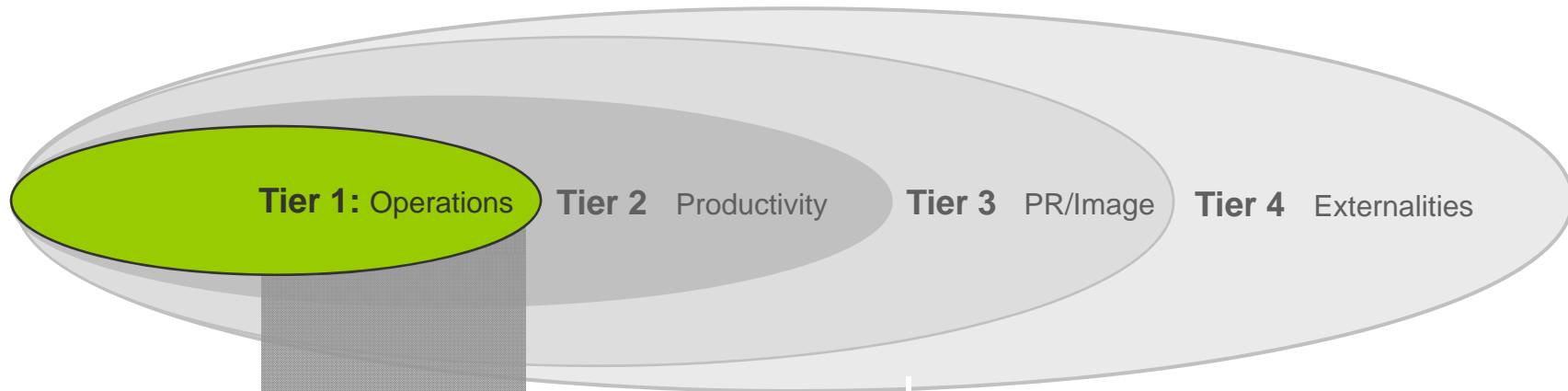
72% of electricity consumption,  
39% of energy use,  
38% of all carbon dioxide (CO<sub>2</sub>) emissions,  
40% of raw materials use,  
30% of waste output (136 million tons annually), and  
14% of potable water consumption.

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## Four Tiers of Economic Benefit from Green Buildings



Payback Scenarios		Energy & Water	1.5%/ Yr Improvement	Image Value	Externalities	TOTAL
Baseline	1 yr	\$92,389.00	\$505,500	\$16,000	\$22,500	<u>\$636,389</u>
Private - Owner Occupied	6 yrs	\$707,927	\$3,873,375	\$122,599	\$172,405	<u>\$4,876,307</u>
2015 Expansion	7.5 yrs	\$935,181	\$5,116,777	\$161,955	\$227,750	<u>\$6,441,663</u>
Institutional/Public	10 yrs	\$1,183,299	\$6,474,341	\$204,925	\$288,175	<u>\$8,150,740</u>
Half Life Major Systems	20 yrs	\$2,649,392	\$14,495,964		\$645,221	<u>\$18,249,400</u>
Full Life of Major Systems	40 yrs	\$7,267,623	\$39,764,297		\$1,769,924	<u>\$50,060,457</u>

Examples:  
 Displacement Ventilation  
 GT Heat Pump  
 Daylight Dimming  
 Rainwater Harvesting  
 Daylight Harvesting

Examples :  
 Indoor Air Quality  
 Raised Floor System  
 Low Ambient/Task Lighting  
 Individual Controls

Examples:  
 Legislative Lobby  
 Regulation  
 Customer Education  
 Environmental Outreach

Example:  
 CO2 Tax-(\$9/ton Xcel)

Note: Escalated for inflation at the 100 year average of 3%

# Local Trends

- Local governments creating more stringent conservation ordinances
  - Wind turbine restrictions
  - Allowance for photovoltaics
  - Water conservation requirements
  - Incorporating more LEED elements

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# State Trends

- On May 25, 2007, Governor Pawlenty signed into law the **Next Generation Energy Act of 2007** setting a roadmap towards a smarter energy future and requiring utilities provide technical assistance for commercial or residential projects that incorporate green building principles in their construction.
- ***The Act established a goal of 100 commercial buildings achieving LEED certification, or equivalent, by December 31, 2010***

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# National Trends

- U.S. Green Building Council – LEED certification (started in 2000)
- North Dakota LEED
  - 3 certified – GRE is one of 3 certified projects
  - 40 registered – in progress of certification



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\* Per USGBC website 9/9/10

# Commercial LEED Registered Projects

## Total Currently Registered

As of June 2010

27,581





# Commercial LEED Certified Projects (cumulative)

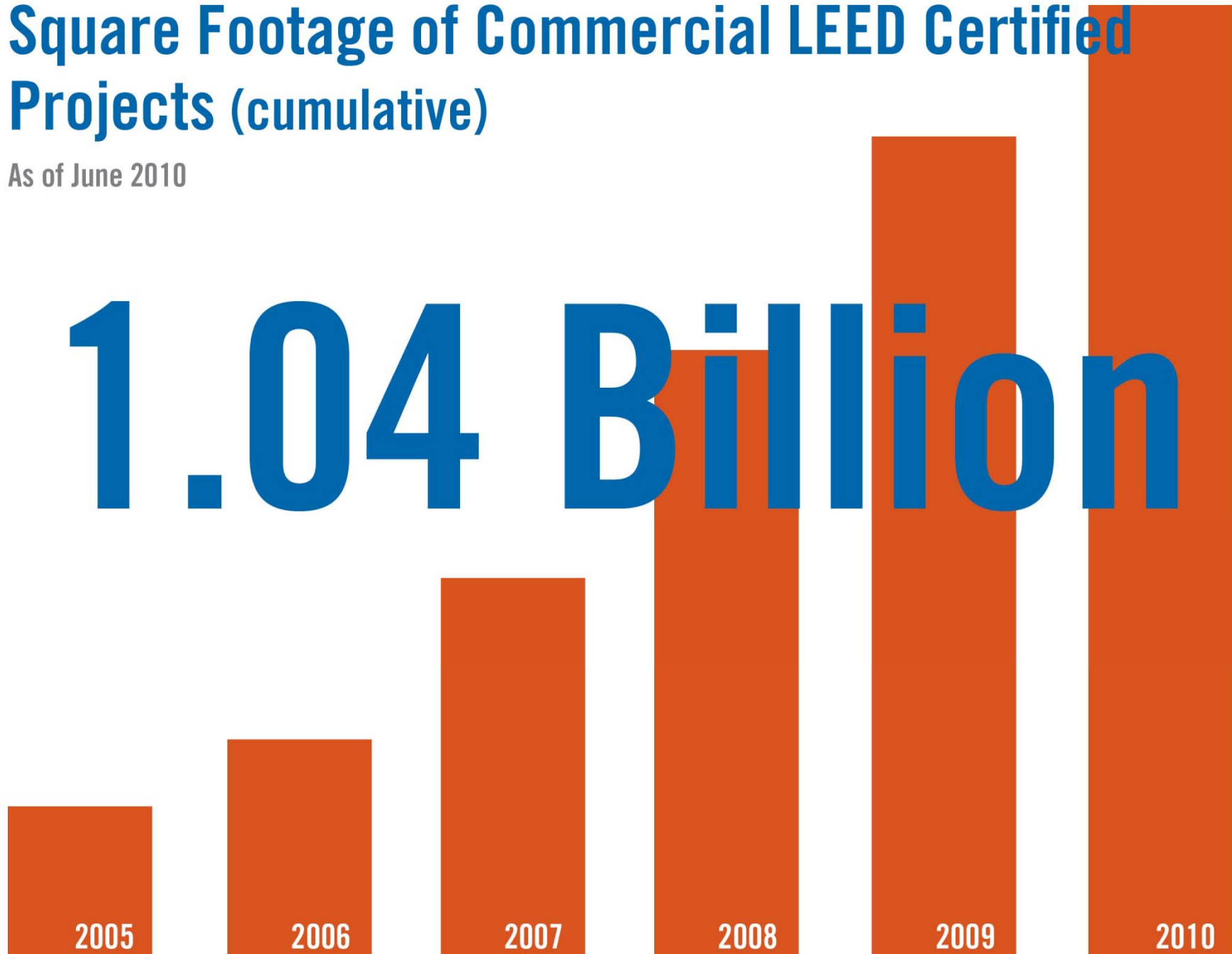
As of June 2010



# Square Footage of Commercial LEED Certified Projects (cumulative)

As of June 2010

# 1.04 Billion



# New Headquarters

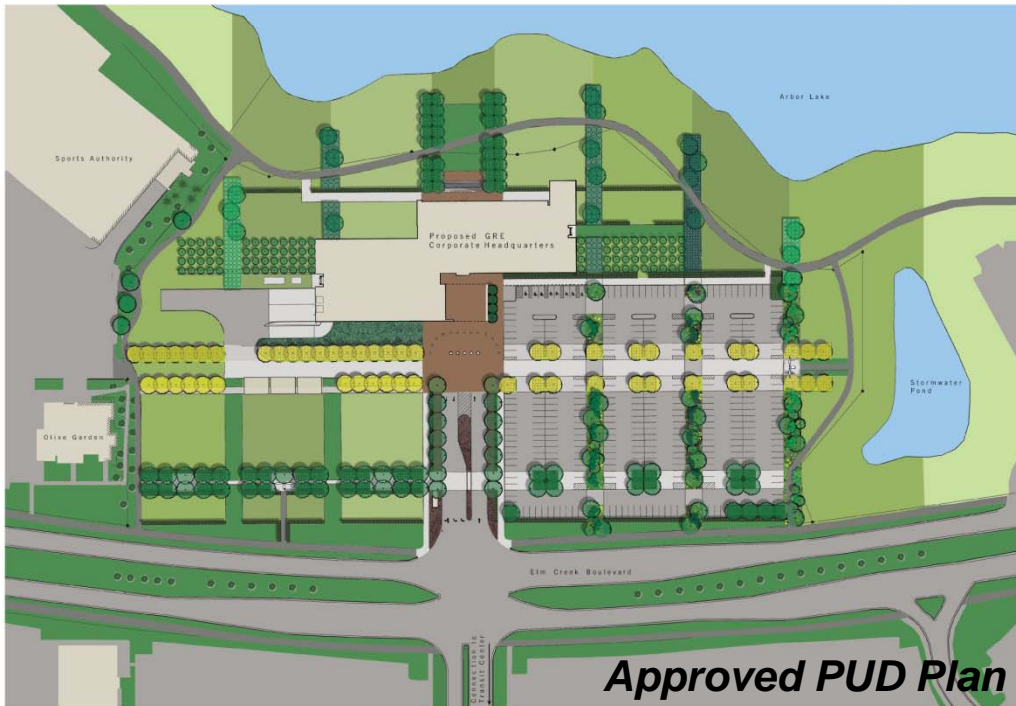
- 1st LEED Platinum building in Minnesota
- 5Th LEED NC 2.2 Platinum in the world
- 56 points achieved (52 required)
- Six LEED Categories
  - Sustainable sites 12 points
  - Water Efficiency 5 points
  - Energy & Atmosphere 16 points
  - Materials & Resources 6 points
  - Indoor Environmental Quality 13 points
  - Innovation & Design Process 4 points

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# Building Platinum LEED



## Building & Site Basics

- Location: Maple Grove, MN (Arbor Lakes development)
- Construction: December 2006 to April 2008
- Opened: April 22, 2008
- Site: 12.5 acres
- Building: 166,000 square feet office + 11,000 square feet garage space = 177,000 square feet
- Up to 350 employees



GREAT RIVER ENERGY CORPORATE HEADQUARTERS - MAPLE GROVE, MINNESOTA  
LANDSCAPE SITE PLAN



PERKINS  
+ WILL  
JANUARY 17, 2006

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# Energy Conservation

- **Approx 12% Onsite Renewables**
  - 72 kW photovoltaics
  - 200 kW wind energy
- **Daylight Harvesting**
  - Reduces artificial lighting loads
  - Dimmable lighting, motion sensors



*Ground-mounted solar panel*



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# Energy/Materials Conservation



## ► Materials

- 40% portland cement replaced with flyash (coal by-product) in structure
- 20% regionally harvested, extracted, recovered materials

## ► Underfloor Displacement Ventilation

- Raised floor system
- CO2 detectors increase fresh air flow

## ► Lake Geothermal Heating & Cooling System

- Dependent on the City's Arbor Lake
- 36 miles pipe sitting on Lake bottom

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# Water Conservation



## ► Rainwater Collection

- 20,000 gallon cistern
  - Rainwater in toilets / urinals
  - Dual flush / faucet aerators
- Raingardens
  - Excess water flow to City's stormwater pond
  - Collected water used to irrigate non-native plantings on site
- Uses 90% less drinkable water than standard corporate campus (1.6 million gallons annually)



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# Water Conservation



*Minnesota native prairie grasses*



*U of M-bred apples*

## ► Native Landscaping

- Minnesota native species on site and living roof
  - 6 acres of seeded native prairie grasses
- No site irrigation required for native species
  - Small areas of turf grass define the edges of the site and require ongoing irrigation
- University of Minnesota-bred orchard tree
  - Apples, plums and pears

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# Community Interest

- More than 11,200 people toured the building since April 2008
- Provide educational features internally and externally for the public
- Educational signage provided on trails and inside the building
- On-site kiosks showcase live energy and water conservation information – also available through external website



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# Great River Energy Maple Grove HQ Awards

- Fresh Artistic Brilliant award for Best Sustainable Design, International Interior Design
- First Place, 2008 Building Excellence Award, Aggregate and Ready Mix Associate of Minnesota
- Governor's Award for Pollution Prevention, Minnesota Pollution Control Agency
- Public Education in Planning Award, Minnesota Chapter of the American Planning Association
- Engineering Excellence Award, American Council of Engineering Companies (ACEC)
- ARC Awards, Consulting-Specifying Engineer
- TEKNE Award, Minnesota High Tech Association
- Project of the Year Award (chosen from the Seven Wonders), Minnesota Society of Professional Engineers (MSPE)
- Leadership Award, Minnesota Waste Wise
- 2008 North Metro Business of the Year Award, North Metro Mayors Association Board

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# Maple Grove HQ Energy Star facility

- GRE's Maple Grove headquarters was granted the Energy Star label from the Environmental Protection Agency (EPA)
- The Energy Star is mark of superior energy performance buildings
- GRE's Maple Grove HQ achieved a score of 90, on scale of 1-100

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# Benefits of Going Green

## Environmental benefits:

- Enhance and protect ecosystems and biodiversity
- Improve air and water quality
- Reduce solid waste
- Conserve natural resources

## Economic benefits:

- Reduce operating costs
- Enhance asset value and profits
- Improve employee productivity and satisfaction
- Optimize life-cycle economic performance

## Health and community benefits:

- Improve air, thermal, and acoustic environments
- Enhance occupant comfort and health
- Minimize strain on local infrastructure
- Contribute to overall quality of life

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# Would We Do It Again?

Yes!

**Great River Energy  
Bismarck Office Building**  
1611 East Century Ave., Ste 200,  
Bismarck, ND 58503

**Achieved LEED GOLD!**

*All future Great River Energy  
facilities will be built sustainable!*



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# Questions

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# Thank You!



*Image Provided By Perkins + Will*

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