

GREENPRINT ROCHESTER, NEW YORK:
TURNING GREEN INTO GROWTH



**CHARRETTE ORGANIZERS
AND ACKNOWLEDGMENTS**

We would like to offer our special thanks to U.S. Sen. Hillary Rodham Clinton. Her visionary leadership in support of Rochester, New York's first "greenprint" charrette will showcase local commitment to sustainability and its importance as an engine of economic growth.

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OPPORTUNITY

Rochester, New York's combination of corporate and academic expertise in alternative energy and fuels uniquely positions the city and surrounding region to use sustainability as an engine of economic development.

Rising energy costs have not only increased market demand for alternative energy solutions, but they've also made energy efficiency and effective use of alternative fuels a competitive advantage for corporations — and for localities — that can help businesses keep their energy costs low and provide a healthy environment that attracts and retains top performing employees.

While Rochester has highly differentiated local expertise, it lacks a comprehensive sustainability agenda that helps regional organizations take optimum advantage of the resources in their own backyard. Rochester needs that agenda – a set of achievable, approachable, measurable goals – to help the community harness its potential through action.

Early innovation by cities such as Pittsburgh, Pennsylvania; Grand Rapids, Michigan; Chicago, Illinois; Austin, Texas; San Jose, California; and Portland, Oregon clearly shows that a focus on sustainability leads to broad-based community benefits, including economic development. Moreover, these cities and dozens more point to green building as an effective approach to coalescing civic action around an immediate, measurable, and cost-effective agenda.

In the experience of the U.S. Green Building Council and its membership, a commitment to green building is an effective first step for the following reasons:

- Green buildings are actionable. Diverse community stakeholders can make an immediate change tomorrow to move toward sustainability.
- Green buildings mean greener bottom lines. More than a decade's worth of results have

proven that green buildings save money, and typically pay back any additional first costs in operational savings within their first year of occupancy.

- Everyone in the community interacts with buildings, so everyone can benefit. Americans spend 90% of their time indoors; buildings are human habitat, and have an enormous impact on our health and well-being. Greener, healthier buildings support a healthier community.
- Green buildings support local industry. The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System™ specifically rewards using locally produced products and materials, which creates a strong incentive for building owners and developers to support local businesses.
- Green buildings create better jobs. To build green buildings, design and construction professionals learn new and innovative approaches to professional practices. This knowledge gives them a competitive edge that is highly valued in the marketplace.
- Green buildings change minds. A frequent obstacle to winning support for a sustainability agenda is the commonly held misperception that green costs more and that the challenge is too big to tackle. Involvement in a green building project dispels those myths, and teaches by experience a practical approach to moving towards sustainability.

The positive experiences of dozens of diverse cities all across the country have forged the way for Rochester to step forward as a leader in this arena.





GREEN BUILDING LEADERSHIP

The evidence is now overwhelming: green buildings are not only more environmentally responsible, they're also more profitable and healthier.

The message has resonated across the country and is steadily transforming the built environment. In 2000, the U.S. Green Building Council introduced the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. Today, there are more than 6,000 LEED registered or certified buildings.

Numerous local municipalities and counties are leaders in this effort. More than 60 local governments have passed requirements to ensure new public buildings achieve a LEED rating. Dozens of jurisdictions have also adopted market incentives to drive the transformation of the private sector.

EXECUTIVE SUMMARY

TURNING GREEN INTO GROWTH

Greenprint Rochester, New York — a charrette organized and presented for Rochester by the Office of Senator Hillary Rodham Clinton, the Greater Rochester Enterprise, and the U.S. Green Building Council — convened local leaders with a wide range of expertise to learn about the benefits of a green building program and to embark on the development of an action plan. The resulting “Greenprint” harnesses this commitment to sustainability as an engine for economic growth in the Rochester community.

The one-day charrette attracted more than 50 attendees, including architects, engineers, educators, city planners, corporate leaders, and a variety of other specialists.

The participants formed five groups to explore Rochester’s strengths and opportunities, as well as weaknesses and threats. With this assessment as a backdrop, their efforts culminated in the development of a robust and practicable action agenda for the Greater Rochester Region.

These actions are synthesized here into the Green Dozen.

BACKGROUND

Over the last few years, Rochester has made significant strides toward a more sustainable future. In early 2000, the city unveiled its Renaissance 2010 campaign, which featured environmental stewardship as a principal pillar. Citizens welcomed the broad environmental goals and embraced the strategies to meet them. In addition, the Greater Rochester Enterprise (GRE), a regional economic development organization dedicated to improving economic performance in the Rochester/Finger Lakes region, has long seen enormous “green” development opportunities, promoting a regional center for balanced and renewable energy; high performance and energy-efficient buildings; and smart growth.

Recognizing the opportunity for green growth in Rochester, U.S. Sen. Hillary Rodham Clinton organized a charrette, pulling together a hosting partnership of GRE, Stantec Consulting Inc., an international architectural and engineering firm, and the U.S. Green Building Council, a non-profit coalition of industry leaders working to promote buildings that are environmentally responsible, profitable and healthy. Local development, design and business leaders gathered for the charrette on Oct. 30, 2006 to turn green into growth. The event sought to give local industry leaders practical tools to move toward “green” building, and to help move Rochester toward the goal of being a clean energy leader.

WHAT AN EXCITING AND IMPORTANT MOMENT FOR ROCHESTER, NEW YORK.



U.S. Senator Hillary Rodham Clinton

I am proud to be part of it, and prouder still to see the culmination of so much hard work. Now it is time to put this “greenprint” into action – and the Rochester metropolitan area is primed to do it.

During my many visits to Rochester over the past several years, I recognized that this community is home to a cluster of innovative companies and universities promoting renewable energy technologies like bio-fuels and wind power as well as energy efficiency in our buildings and vehicles. We can point to energy efficient design at the Frito-Lay Distribution Center, the expansion of the Strong National Museum of Play,[®] fuel cell development at Delphi and General Motors, among many other examples of progress. Soon we can also point to Renaissance Square, which will break ground in the spring.

Based on my experience, I hosted two conferences as part of “New Jobs for New York” focusing on alternative energy here to connect investors with upstate businesses, research institutions, and entrepreneurs. And after shining a light on Rochester’s assets, I joined many local leaders in recognizing that it was time to light a spark under the incredible potential for growth. My office contacted the U.S. Green Building Council to initiate a public-private partnership and in meetings with Mayor Robert Duffy, County Executive Maggie Brooks, Greater Rochester Enterprise, the University of Rochester, Rochester Institute of Technology, as well as local businesses and citizens, we turned our ideas into a plan of action — and turned Rochester into the first city in America to have a “greenprint” developed in partnership with the U.S. Green Building Council and the local community.

It is a tremendous action agenda, one I am proud to stand behind. As a nation, we face great challenges — but the talents, creativity, and skill of American businesses, researchers, and workers are far greater. Rochester is a case in point. That is why this “greenprint” represents such a triumph. We are turning green into growth, good ideas into good jobs, and big challenges into even bigger opportunities. We can create 21st century jobs in the 21st century energy industry. We can end our dependence on foreign oil. We can foster sustainable development and economic growth. Energy independence will protect our security, safeguard our environment, help our economy, and create new high-paying jobs for New Yorkers and Americans. And Rochester can and will be a leader.



THE GREEN DOZEN

- 1 ADOPT LEED® FOR ALL PUBLIC BUILDINGS, AND DEVELOP PUBLIC INCENTIVES FOR PRIVATE GREEN BUILDING DEVELOPMENT**
- 2 ACHIEVE LEED CERTIFICATION FOR RENAISSANCE SQUARE**
- 3 RECYCLE AND REUSE CONSTRUCTION WASTE**
- 4 CONVERT ROCHESTER'S HIGH FALLS INTO A HYDROGEN PRODUCTION FACILITY**
- 5 INCREASE SUSTAINABLE AWARENESS AND EDUCATION**
- 6 IMPROVE AND "GREEN" PUBLIC TRANSPORTATION**
- 7 "GREEN" ROCHESTER'S SCHOOLS AND CURRICULA**
- 8 ESTABLISH A SUSTAINABILITY RESOURCE CENTER**
- 9 ESTABLISH A ROCHESTER BRANCH OF THE NEW YORK UPSTATE CHAPTER OF THE U.S. GREEN BUILDING COUNCIL**
- 10 PARTNER WITH THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)**
- 11 USE RENEWABLE ENERGY**
- 12 PROVIDE LOCAL TRAINING OPPORTUNITIES**

Sustainability is a process, not an event. This agenda is dynamic: As Rochester and the surrounding region undertake these initiatives, the "Green Dozen" should be revisited periodically over time, and evolve in harmony with the region's experience.

To develop the Rochester, New York Greenprint, participants proposed numerous achievable actions that would move the city and region toward its vision of a sustainable community. The following Green Dozen were developed to provide a holistic approach, and enhance environmental, social and economic outcomes.

1 ADOPT LEED® FOR ALL PUBLIC BUILDINGS, AND DEVELOP PUBLIC INCENTIVES FOR PRIVATE GREEN BUILDING DEVELOPMENT

ACTIONS

Adopt LEED for public buildings.

Provide incentives for the private sector to achieve LEED ratings.

Promote lower lending rates and cheaper insurance agreements for green buildings.

IMMEDIATE NEXT STEPS WOULD INCLUDE:

- Adopt green building practice for all City of Rochester buildings. This action is typically taken either through Mayoral proclamation or by action of the City Council. Sample language is available from USGBC at www.usgbc.org.
- Convene a Rochester city task force made up of local stakeholders including GRE, the Upstate New York Chapter of USGBC, and representatives of the local building owner and developer community with the aim of developing recommendations for locally-effective incentives. A comprehensive list of incentives used in other cities is available from USGBC at www.usgbc.org.

CONTEXT

With billions of square feet of space under their control, state and local government agencies are major consumers of design and construction-related services. Since the building design and procurement processes for both the public and the private sectors are typically guided by local ordinances and state regulations, local governments can encourage green buildings by setting an example and creating local demand by mandating green design strategies for their own facilities, as well as providing incentives and guidelines for the private sector. In addition, the reduction of risk associated with green buildings, if taken into consideration by lending institutions large and small, will provide even greater incentive to build according to green building principles.

OPPORTUNITY

Charrette participants agreed that both local and regional government policymakers should require that new public buildings and major renovations be built according to the Leadership in Energy and Environmental Design (LEED) rating system. In doing so, Rochester would become a leading example for the private sector and for other jurisdictions. To date, 12 federal agencies, 18 states including New York, and 62 local jurisdictions have made similar commitments to LEED, which was established in 2000 by the U.S. Green Building Council.

Local government should also engage the private sector by encouraging private building owners to achieve LEED ratings through various incentives. Numerous localities across the country have initiated tax breaks, density bonuses, grants, expedited permitting, and reduced fees and waivers for projects achieving LEED certification. By issuing a range of incentives, Rochester would speed green building practices in the private sector, and accelerate market transformation.

Area leaders should also promote lower lending rates to finance green buildings. Last October, Fireman's Fund, a California-based insurer, received regulatory approval to offer a 5 percent discount for property insurance on LEED certified commercial buildings. Lower lending rates and discounted insurance agreements based on green buildings' lower energy consumption, reduced operating costs, and improved indoor air quality will further spur the proliferation of green buildings.

Participants also suggested that the state consider revising building-related legislation, such as Wick's Law, to allow for greater efficiency.

2 ACHIEVE LEED CERTIFICATION FOR RENAISSANCE SQUARE

ACTION

Ensure Renaissance Square is built and constructed to comply with LEED.

CONTEXT

Renaissance Square, the single largest development project in Monroe County's history, is a 2-1/2 block project located at the geographic center of the Greater Rochester Region on the northwest corner of the Main & Clinton intersection. With an anticipated development cost of \$230 million, the innovative project consists of three major components:

- 1 a new and expanded downtown campus for Monroe Community College;
- 2 a transit center for local and long distance bus service;
- 3 a new performing arts center with two theater venues: a 2,200-seat Broadway roadhouse and a 150-seat community space.

The current schedule calls for the project to be completed in 2010.

OPPORTUNITY

Ensuring that this signature development achieves LEED certification will pave the way and provide an example for many additional local green building projects. LEED buildings have been shown to increase employee productivity, help companies retain employees, and improve occupant health. Because LEED provides independent, third-party certification, it validates the owner's achievement, and assures owners that their building is healthier for the environment, for the people who occupy it, and for the bottom line.

Nationally, the number of LEED registered or certified buildings continues to grow, and now exceeds 6,000 buildings, the equivalent of nearly a billion square feet. Every business day, \$100 million worth of construction registers with LEED. Similarly, building product manufacturers continue to roll out new green product lines, from eco-friendlier roofs to sustainable furniture, to respond to the growing demand in the marketplace. Prominent businesses, such as Bank of America, The PNC Financial Services Group, and Starbucks, to name just a few, have embraced green buildings as a standard business practice.

LEED RATING SYSTEM

LEED (Leadership in Energy and Environmental Design) is used to rate the overall environmental performance of buildings; measuring such factors as energy efficiency, water efficiency, relationship to the site and community, and how healthy the building is for its occupants. LEED is widely used by governments at all levels; universities; developers; corporations; and other building owners who want to improve the performance of their buildings.

EVERY BUSINESS DAY:

\$100 million worth of
construction registers with LEED

50 people
attend a USGBC training course

20 people
become LEED Accredited Professionals

4 organizations
join USGBC

3 RECYCLE AND REUSE CONSTRUCTION WASTE

ACTIONS

Create a state-of-the art recycling system to better manage commercial waste and construction materials.

Promote a region-coordinated effort.

Adopt strategic purchasing of cost-competitive, eco-friendly products.

CONTEXT

Green building represents a significant opportunity to reduce waste. Buildings in the U.S. consume 40% of raw materials, and construction and demolition waste accounts for 25% of municipal solid waste. On average, green buildings save 70% of solid waste, while 80% of LEED-certified buildings divert at least 50% of construction and demolition waste.

Xerox, a major Rochester employer, has been a leader in this arena, proving better planning can drastically reduce waste. As part of its environmental management program, the company concurrently pursues three goals: efficient use of materials and energy; minimal use of hazardous substances; and low emissions and noise. In 1999 alone, Xerox diverted 163 million pounds of material from landfills. That same year, the company's products produced energy savings of 387 million-kilowatt hours.

OPPORTUNITY

Given the large amount of commercial waste created at the city level, charrette participants urged the creation of a state-of-the art recycling system to manage commercial materials and waste as a way to realize cost efficiencies.

Implementing more effective waste management would be promoted via a city-county coordinated effort, including regional coordination with Buffalo and Syracuse to establish a more robust system. The program should involve local waste haulers and focus on both construction and deconstruction waste. In addition, the City of Rochester can play a leadership role by promoting greater recycling and implementing a waste prevention program through strategic purchasing of cost-competitive products made from recycled materials.

4 CONVERT HIGH FALLS INTO A HYDROGEN PRODUCTION FACILITY

ACTION

Pursue opportunities to develop a Hydrogen Village, including the conversion of High Falls into a hydrogen production facility.

CONTEXT

The Hydrogen Village is a large scale demonstration and development project that will showcase the Greater Rochester Region as a leader in the alternative energy sector, and help to accelerate the development of hydrogen and fuel-cell technologies. The Village will become a magnet for companies performing advanced research, development, and demonstration of new energy technologies and products, and will also serve as an educational platform for academic institutions, technicians, policy makers, and the general public.

OPPORTUNITY

As envisioned, the Hydrogen Village will utilize the renewable hydropower resources of High Falls in downtown Rochester to create and store hydrogen through an electrolysis process. This hydrogen will then be used in stationary and mobile applications within the Village, providing power to buildings and fuel for vehicles. It is also anticipated that additional renewable energy technologies, including solar, will be showcased in the Village, and that buildings in the Village will use the most advanced energy efficiency products and technologies available.

This project would attract leading companies from the energy sector as partners and participants, who would take advantage of the infrastructure for their own product development needs, and tap into the growing body of expertise in the region. The result will be a thriving cluster of activity, helping not only to advance the local economy, but also to accelerate the growth of the industry.

5 INCREASE SUSTAINABLE AWARENESS AND EDUCATION

ACTIONS

Increase sustainable awareness.

Provide educational opportunities and resources about green building and alternative energy.

Implement a public relations campaign.

CONTEXT

Providing the market with the information and resources that it needs to build green is an essential step toward greater market transformation. In order to educate owners, designers, builders and occupants about the benefits of green building and using LEED, the U.S. Green Building Council (USGBC) offers a variety of educational workshops. Each year, hundreds of public workshops are offered across the country, from in-depth reviews of the LEED rating system, to half-day sessions on everything from cost-benefit analyses to energy modeling. The workshops meet a growing need among a diverse set of industry leaders who want to learn more. This year, nearly 100,000 people actively engaged with USGBC via workshops, web sessions, and the annual Greenbuild International Conference and Expo.

As general awareness continues to rise — green building is featured in the national media more than 3,000 times a month — demand for buildings that promote the “triple bottom line” will continue to propel the market. Misperceptions must still be debunked, however. For instance, early critics of green building suggested that construction costs would far exceed the costs associated with conventional building. Several studies have proved there is little to no increase in first costs. In late 2003, a study of 33 LEED buildings across the country showed that the average construction premium was a mere 1.84 percent.

OPPORTUNITY

Through concerted local efforts to celebrate and promote green building and renewable energy sources, Rochester will reach out to stakeholders to grow consumer awareness. To connect with a broader audience, the region should initiate a public relations and educational campaign, including public service announcements to broadcast recent studies and address misconceptions.

Establishing a local branch of the New York Upstate Chapter of USGBC — also one of the “Green Dozen” — is a critical step toward the achievement of this goal since education and advocacy are components of USGBC’s mission and goals.

6 IMPROVE AND “GREEN” PUBLIC TRANSPORTATION

ACTIONS

Retrofit the public transportation fleet to utilize alternative fuels.

Promote transit-oriented development and smart growth, which provides people with greater access to various public transportation modes.

CONTEXT

In May 2006, U.S. Sen. Hillary Clinton, along with U.S. Sen. Charles Schumer, secured \$4 million in federal funding for Rochester Institute of Technology (RIT) to study alternative fuel sources and issues related to life-cycle engineering. The funding led to the creation of RIT’s Alternative Energy Technology for Sustainable Transportation Systems program within the Center for Integrated Manufacturing Studies. The initiative is focused on expanding the use of alternative fuels (fuels other than gasoline and diesel); extending the life cycle of vehicles; and promoting the use of remanufactured components. The program will develop ways to improve the performance, service life, and safety of America’s public transportation options, including buses, vans, subway cars, and commuter rail cars.

OPPORTUNITY

As a city and a region, the area can reduce its future oil and energy consumption by bringing more people within easy access of public transportation, park & rides, bike paths, and pedestrian routes. To this end, local government should encourage transit-oriented development (TOD) and other smart growth initiatives to make public transportation more accessible. In addition, the region should look for more efficient, less polluting fuel alternatives for its local public transportation fleet. Finally, the area should build on cutting-edge research being done at the Rochester Institute of Technology (RIT).

Other leading cities have initiated similar efforts through city-wide purchasing policies requiring all new additions to the city’s fleet to be alternative or flex-fuel vehicles.

Rochester may also look to participate in USGBC's LEED for Neighborhood Development pilot program. Begun in early 2007, this program gives developers and local communities alike the opportunity to learn alongside USGBC about how to complement green building through the application of smart growth and other strategies. Technical support, including publications and educational workshops, will be available from USGBC.

Additional support for green public transportation initiatives including bike paths is available from the Institute for Transportation & Development Policy at www.itdp.org.

7 "GREEN" ROCHESTER'S SCHOOLS AND CURRICULA

ACTIONS

Promote the construction of green schools.

Infuse the local teaching curriculum with lessons in sustainability.

CONTEXT

Schools strive to provide a safe and healthy environment to fulfill their potential as places of learning. But conventional schools, which house roughly 55 million students and teachers in the United States (approximately 20% of our nation's population), are too often designed without considering factors that maximize learning. Green, high-performance schools, which drastically reduce operating costs by saving energy and water, have also shown to enhance student learning, improve student health, and increase school quality and competitiveness.

In the recent study "Greening America's Schools: Costs and Benefits," Greg Kats found that green, high-performance schools cost less than 2 percent more to build than conventional schools, but provide financial benefits 20 times as large. Furthermore, research has linked health and productivity with specific building design operation attributes, such as indoor air quality and control over work environment.

School-specific studies overwhelmingly show a positive correlation between green building design and health and productivity, including reduced rates of absenteeism and higher test scores. Over the last few years, in an effort to realize similar gains, 31 universities or colleges have made a range of commitments to achieve LEED certification with their buildings. Moreover, in a five-year time span, the green building construction market has grown from zero in 2000 to \$33 billion at the end of 2004, which provides universities and colleges with the opportunity to support emerging green builders and to take advantage of research opportunities and potential demonstration projects.

OPPORTUNITY

Rochester will benefit from sustainable practices for generations to come when it maximizes educational opportunities by teaching sustainable practices. At the Rochester Institute of Technology, in response to students' growing interest in sustainability engineering, the Kate Gleason College of Engineering has launched a multidisciplinary minor in sustainable product development. The new minor targets students interested in exploring strategies for developing and delivering sustainable product systems. The minor will enhance students' understanding of the three dimensions of sustainability—economic, ethical and environmental—and it will increase their awareness of the need for sustainable approaches to product development.

The learning experience transcends the classroom with the construction of high-performance green schools, which create an interactive space where students live and breathe an eco-friendly educational catalyst. The green schools themselves become invaluable components of the learning curriculum, helping advance sustainable education among student bodies. For example, students at Homewood Middle School in Alabama learn everyday from a unique teacher: their 190,000 square foot building, which features abundant natural daylight, recycled materials, and waterless urinals. The school is a standing tool often used to teach about the environment, resource use, architecture and design. With a \$600 million capital investment anticipated in the Greater Rochester Region's K-12 schools, building green schools is a cost-effective way to not only enhance student learning and promote sustainable practices within curricula, but also to provide healthier places of learning.

School-specific green building resources are available from USGBC, including the LEED for Schools green building rating system and supporting reference guide and workshops.

State and local jurisdictions, most notably the State of Pennsylvania, offer financial incentives for K-12 schools to become LEED-certified. Examples of local incentive programs including legislative language is available from USGBC at www.usgbc.org.

Organizations including the Alliance to Save Energy and The Earth Day Network offer K-12 oriented curriculum support for energy efficiency and green building.

The Solar Energy Industries Association (www.seia.org) offers resources including funding opportunities for solar demonstration projects including programs targeted at schools.

8 ESTABLISH A SUSTAINABILITY RESOURCE CENTER

ACTION

Create a sustainability resource center.

CONTEXT

Information drives change. Charrette participants would like to make information about sustainability more accessible and visible by pulling into one place all the Rochester-relevant information on various programmatic goals; projects; tools and resources; participating partners; performance measurements; and market transformation strategies.

OPPORTUNITY

The establishment of this center will provide access to design advice; green building strategies; technical resources; practical alternative energy options; and potential financial assistance opportunities. Dedicated to advancing green building, energy efficiency and renewable energy, the center would provide a one-stop shop for pertinent materials, research and support. The center, which could be located at the Greater Rochester Enterprise headquarters, will also draw on regional expertise and know-how and from the newest thinking being developed at local universities.

9 ESTABLISH A ROCHESTER BRANCH OF THE NEW YORK UPSTATE CHAPTER OF THE U.S. GREEN BUILDING COUNCIL

ACTION

Create a Rochester Branch of USGBC's New York Upstate Chapter to centralize and coordinate local efforts and provide a forum to exchange ideas and information.

CONTEXT

The New York Upstate Chapter of the U.S. Green Building Council will work with the Greater Rochester Region to offer collaboration, representation, and resources available within the area. The Rochester Branch of the New York Upstate Chapter would have regional representation on the chapter board of directors. Board members from the Greater Rochester area would also serve as liaisons to convey local information to the chapter, collaborate on opportunities for education and training, and would also act as chapter resources within the Eastern region of the New York Upstate Chapter.

OPPORTUNITY

The Greater Rochester Region will create a network of interested stakeholders to provide a local voice for green building that can accelerate change and help shape the future of green building practices in Rochester. The branch could hold regular meetings for those interested in green building, and provide critical educational and information opportunities to the broader community. Establishing a local branch is essential to achieving the educational aims of the "Green Dozen."

10 PARTNER WITH NYSERDA

ACTION

Develop a partnership with the New York State Energy Research and Development Authority (NYSERDA).

CONTEXT

NYSERDA administers thousands of projects, from smart loans for building commissioning to local government energy-efficient product procurement programs. With a wide range of incentives for financial and technical assistance, NYSERDA offers municipalities numerous ways to handle various energy and environmental needs. Several NYSERDA programs — such as its high-performance green buildings program, its municipal water and wastewater treatment, and its energy audit program — assist New York localities to advance sustainable solutions to difficult energy and environmental problems. NYSERDA has successfully developed and brought into use more than 170 innovative, energy-efficient, and environmentally beneficial products, processes, and services. NYSERDA has had an impact on more than 1,000 energy-efficient and green building projects in the state through its standing offer programs. The public benefit corporation contributes both to the State's economic growth and environmental protection.

In one long-standing partnership, the Rochester City School District (RCSD) teamed up with NYSERDA to improve the energy efficiency, indoor environment, and comfort of more than 50 RCSD buildings. As a result of its district-wide energy efficiency program, RCSD became the first organization in New York State to receive the U.S. Environmental Protection Agency (EPA) ENERGY STAR® Leader Award, conferred on organizations achieving a 10% improvement in their overall energy efficiency.

RCSD received this award for installing an advanced energy management system; installing energy-efficient lighting, retro-commissioning four buildings; and upgrading HVAC systems, boilers, and electric motors. The total cost of the energy efficiency program was \$20.56 million, with NYSERDA funding more than \$1 million from its New York Energy \$martSM programs. The results will save more than 6,858,500 kWh of electricity and more than 49,000 MMBtu of fossil fuels. The energy efficiency improvements provide an annual utility savings of more than \$725,000 and displace thousands of pounds of harmful emissions.

OPPORTUNITY

NYSERDA offers technical assistance, incentives, and training programs for energy efficiency and green buildings. In addition, NYSERDA can offer assistance in developing community-wide sustainability resolutions. NYSERDA will continue to present the city and the region with numerous opportunities to promote renewable energy and green building construction and renovation. For example, when Flower City Management wanted to renovate its 11-story, 71,000 sq. ft. historic art-deco Medical Arts Building, it sought to convert office and commercial space to a mixed-use building while meeting LEED benchmarks. NYSERDA offered grants to Flower City that allowed the company to install an energy efficient geothermal system for heating and cooling and to follow LEED guidelines. The project diverted 1 million pounds of construction waste and is estimated to save \$1.6 million over 20 years.

WHO IS NYSERDA?

For more than three decades, the New York State Energy Research and Development Authority (NYSERDA) has funded research into energy supply and efficiency, as well as energy-related environmental issues.

The public benefit corporation manages the New York Energy \$martSM program in cooperation with the NYS Service Commission. The program, designed to support certain public benefit programs, provides energy efficiency services,

including those directed at the low-income sector, research and development, and environmental protection activities. Projects are funded by a charge on the electricity transmitted and distributed by the State's investor-owned utilities.

Other NYSERDA programs outline broad energy and environmental challenges, and then publicly request proposals, from any private or institutional entity, to submit project plans addressing those issues.

These are known as Program Opportunity Notices (PONs), and are posted year-round and cover the complete range of energy and related environmental topics. For example, a PON might offer funding for the development of specific kind of fuel, such as ethanol, from cellulosic feed stock; or, development of wind or other alternative power systems within the State.

For more information about NYSERDA visit www.nyserda.org.

11 USE RENEWABLE ENERGY

ACTIONS

Adopt an integrated approach for meeting energy needs, focusing on a greater consumption of renewable energy.

Provide incentives for using renewable energy.

CONTEXT

Today, renewable sources provide only 6% of all the energy used in the United States. But according to a recent RAND Corporation study renewable resources could produce four times as much with little or no additional costs. The study found that renewable sources of energy could produce 25% of the electricity and motor vehicle fuels used in the United States by 2025 at little or no additional cost if fossil fuel prices remain high and the cost of producing renewable energy continues falling at the pace of historical trends.

For Harbec Plastics, which is locally based, using electricity exclusively from the grid wasn't an option. It would have been much too costly to air condition its plastics injection molding plant, which produces very high temperatures. Instead, the company employed a viable and environmentally-friendly solution. Harbec installed a 250 kilowatt wind turbine and twenty-five microturbines to generate the electricity needed to heat and cool the plant. The decision yielded \$165,000 per year in energy cost savings and a 90% reduction in emissions of carbon dioxide.

OPPORTUNITY

The region has the natural capacity to support several renewable energy sources. To provide an integrated approach for meeting energy needs, charrette participants agreed that the local potential for some of these sources – particularly wind, hydro, geothermal and solar power — needs to be further explored and evaluated.

As an incentive to promote investment in renewable energy sources, the region should establish a “loading order” that favors renewable energy. For example, other jurisdictions have created a loading order or preference for energy investment. Energy efficiency is often defined as the first priority, followed by renewable energy. After exhausting all cost-effective energy efficiency and renewable energy options, investment in conventional energy infrastructure is the last option for meeting needs.

12 PROVIDE LOCAL TRAINING OPPORTUNITIES

ACTION

Promote and encourage opportunities for green building training and skills development.

CONTEXT

As the market embraces high-performance green buildings, the demand for professionals with applicable green building training will continue to increase. At the local level, training and educating professionals on how to design, construct, and operate buildings that conserve resources and energy will be an ongoing endeavor as new green technologies, techniques, and products flood the building market.

In addition to a series of training workshops, the U.S. Green Building Council developed the LEED Professional Accreditation program to prepare and train industry professionals with the knowledge and skills needed to successfully steward a green building project from design to certification. Since the program's launch in 2001, there are more than 30,000 LEED Accredited Professionals (LEED APs), including 2,283 in New York. Projects seeking LEED certification are eligible to receive credit towards that goal if there is a LEED AP on the design team, which is a powerful incentive for professional development.

OPPORTUNITY

Local government, businesses, and non-profit organizations should promote and encourage opportunities for green building training and skills development, both with the U.S. Green Building Council and local venues. The Rochester Green Business Network (RGBN), which partnered with the Rochester Institute of Technology and High Tech Rochester, has created the Environmental Management System Assistance Program (EMSAP) to offer free environmental management training and development assistance to small businesses in the Greater Rochester Region.



ROCHESTER'S GOLDEN CHIP

Frito-Lay opens LEED Gold distribution center.

In June of 2005, Frito-Lay officially opened the doors to a state-of-the-art, environmentally responsible distribution center in Rochester, NY. The snack company planned for the center to serve as a model of resource conservation through an array of innovative systems in renewable energy, alternative lighting, energy efficiency standards, and environmentally intelligent choices.

The project features integrated photovoltaic panels to make on-site solar energy viable; permeable parking “fields” rather than asphalt parking lots to mitigate stormwater runoff; and an abundance of windows and skylights to ensure optimal natural sunlight.

The 43,000-square-foot office and warehouse complex earned LEED certification from USGBC; achieving a Gold level rating, one of the highest energy efficient standards in the industry. At the time, the distribution center was one of only two buildings in the state to achieve LEED Gold certification.

The facility was developed by Frito-Lay with support from William McDonough and Partners, as the lead designer; Stantec Consulting, Inc. of Rochester, as the architect and engineer of record, and the Haskell Company, which served as the construction manager.

The project also received financial support from the state. The New York State Energy Research and Development Authority, through its New York Energy \$martSM New Construction Program, provided \$185,579 as an incentive to offset some of the costs associated with implementing the energy efficiency improvements and to assist in the LEED certification process.

Just seven months ago, the distribution center received the 2006 Diamond Award in the Building/Technology Systems category from the American Consulting Engineers Council of New York (ACECNY). The award is the top design honor bestowed by ACEC. Stantec Consulting Inc., which provided architecture and engineering services for the project, accepted the award at the organization's annual banquet in New York City last April.

Recently, the American Institute of Architects Rochester Chapter gave the building its 2007 Design for Excellence Merit Award.

Frito-Lay called the distribution center a landmark in its “quest for sustainable growth.”

PARTICIPANT OBSERVATIONS

Greenprint Rochester, New York brought together a wide range of local leaders in building design, government, academia, policy, and sustainability to discuss and explore the strengths and opportunities, as well as the weaknesses and threats, in the Rochester area. The 50-plus participants, more than 85 percent of whom were from the Rochester area, built a contextual record of the metropolitan area. The record, the product of open and direct input from attendees, was the basis for the consensus phase of the charrette: identifying achievable actions.

During this exploratory phase, participants were asked the following two questions:

- 1 What do you see as either strengths or weaknesses that the greater Rochester area already has within the region to advance more green building practices? (human resources, natural resources, economic conditions, regulatory conditions, etc.)
- 2 What opportunities or threats from outside the region can you identify that could accelerate or hinder the growth of green building activities?

The section below is organized by these categories of inquiry: building on strengths, recognizing weaknesses, taking advantage of opportunities, and avoiding threats. The observations made by participants were also grouped by subject area.



A STRONG LEED

In its \$37 million expansion, the Strong National Museum of Play thought big and planned “green.” The museum, which doubled in size, was designed and built in compliance with the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) green building rating system. With the help of a LEED accredited professional, the architectural design, construction, energy systems, and management practices strived for LEED environmental conservation standards.

So, in addition to Upstate New York’s first and only indoor butterfly garden, the expansion also included many environmentally-friendly features, such as aerators, low flow lavatories, and flush valves that use 20% less water; mechanical systems that reduce energy cost by 20%; and a Construction Waste Management Plan that diverted 50% of construction, demolition, and land-clearing debris from landfill disposal.

1. BUILDING ON STRENGTHS

HUMAN CAPITAL

- The area has a flexible workforce.
- The area has a highly-educated populous.
- The community is tight and integrated.
- The area includes a strong base of knowledge and leaders.

NATURAL RESOURCES

- There are several opportunities for renewable energy.
- The area has proximity to waterways.
- There is potential for hydropower: the Genesee River, Lake Ontario, the Erie Canal and the Saint Lawrence River.
- There is potential for wind power, including offshore.
- There is potential for solar power.

ECONOMIC CONDITIONS

- The area has an economic history of resilience.
- It is the center of imaging capabilities (research and manufacturing): precision machining, high manufacturing skill-sets.
- The high-tech light industry here is open to change. Companies like Kodak can reinvent themselves since they have transferable technology.
- There is potential for existing industries to convert to or transform into alternative energy manufacturing.
- The area fosters strong small businesses.
- This area includes the food industry.

COMMUNITY CHARACTERISTICS

- There is a healthy park system.
- There is a large amount of green space.
- There are many recreational trails, museums, performing arts opportunities.
- The area has available affordable housing.
- This is a strong culture.
- The area has a lower cost of living.

INFRASTRUCTURE

- The area has a multi-modal little commercial port activity.
- The area has an international airport.
- The area has an aging building stock, fit for recycling.
- There is a strong bus system.
- There is little or no traffic and congestion, an aspect of living and working in Rochester that should be preserved.

EDUCATION

- The area houses numerous post-secondary institutions: University of Rochester, Rochester Institute of Technology, Roberts Wesleyan College, St. John Fisher College,

- Nazareth College, and SUNY Rochester Educational Opportunity Center.
- Some schools are adopting sustainability into various curriculums.
- Local schools are producing world-class research.
- Some schools lead the country in health care and biomedical research.

TRADITION

- There have been successful private and public examples of environmental projects.
- There is a tradition of innovation.
- There is a tradition of philanthropy.
- There is a tradition of public and private environmental stewardship.

SUPPORT SYSTEMS

- Some sophisticated interest groups and non-profits have already been established.
- Area leaders are committed.
- The New York State Energy Research and Development Authority (NYSERDA) is designed to support certain public benefit programs and energy efficiency services, including those directed at the low-income sector, research and development, and environmental protection activities.

2. RECOGNIZING WEAKNESSES

HUMAN CAPITAL

- There is metropolitan population growth, but not in the city.

ECONOMIC CONDITIONS

- There is a lack of building owner understanding of sustainable facilities.
- There is a perception among industries that building green costs more.
- There are high energy costs.
- The construction sector is sometimes conservative.
- The area has little venture capital.
- The area has high property tax rates.
- There is too much regulation.
- There is a low tolerance for risk.
- There is ongoing downsizing of large industrial firms.
- There is a first-cost mentality among businesses. While less money is spent initially, they lose money in high utility or maintenance costs.
- There are no interest-rate breaks offered by local banks.

COMMUNITY CHARACTERISTICS

- Urban poverty persists.
- Crime is a continuing problem.

- Crescent around downtown is decaying more than downtown or other areas.
- Downtown office vacancy level is relatively high.

INFRASTRUCTURE

- There is an aging building stock.
- Some city housing is abandoned.
- There is limited public transportation.
- There is a low percentage of owner-occupied houses.
- There is limited air travel destinations, and airfare is too costly.
- Traveling outside of the city is difficult.
- Train connections are unreliable.

EDUCATION

- Graduates don't stay in the area.
- There are failing urban schools.
- There is a lack of regional thinking.
- There is a feeling of disconnectedness.
- There is no strong coordination between local and regional planning.
- Some institutions are parochial and resistant to change.
- Contractors and designers and owners are hesitant to build things in new ways. Stuck in old ways. It is changing, but slowly.

POLICY

- Some codes are outdated, including parking and fire-lane codes.
- There is limited net metering, not true metering.

3. TAKING ADVANTAGE OF OPPORTUNITIES

HUMAN CAPITAL

- High-tech industry expertise proliferates.

NATURAL RESOURCES

- This area is ideal for geothermal power.
- This area could support hydro and wind power.
- The area could support hydrogen power.

ECONOMIC CONDITIONS

- Wegmans is evaluating stores to meet LEED; initial costs more than made up for by operating costs.
- There is a potential for brownfield development along Genesee River.
- The area is part of a large regional economy (Rochester, Buffalo, Toronto).
- Food processing companies are headquartered in area.
- Downsizing of large industries (Kodak, Xerox, others) could create opportunities.

COMMUNITY CHARACTERISTICS

- There is a plan to spend \$600 million in K-12 school upgrades.

INFRASTRUCTURE

- There is an opportunity to use rail/monorail to bring the Lake to the City.

SUPPORT SYSTEMS

- NYSERDA grants are available.
- Some NYSERDA initiatives are specific to local efforts.

POLICY

- There is a need to improve waste reduction.
- There is an opportunity to move early in a green policy direction.
- There is a need for smart codes to be put in place to help designers and builders.
- Opportunities exist as new mayor reviewing policies and business practices.

4. AVOIDING THREATS

HUMAN CAPITAL

- Mechanics are not trained to install new technologies.

ECONOMIC CONDITIONS

- Competition is undermining new industries and firms.
- There is an entrenched belief that the bottom line is only economic.
- There is a lack of investment capital.
- There is a lack of desire to take risks.

EDUCATION

- There is little sustainable awareness; people do not understand the benefits of sustainable design.
- There is a disconnect between graduate schools and manufacturing.

POLICY

- Taxes are high in this region.
- There is a need for better/more public and private partnerships.
- The area is short on public funds.
- There is government apathy for alternative energy.

ALTERNATIVE ENERGY RIGHT HERE, RIGHT NOW IN ROCHESTER, NEW YORK

The Rochester region is uniquely positioned to be a leading alternative energy center. Our assets are perfectly aligned — we have materials and precision manufacturing expertise, a skilled workforce adept at managing complex electro-mechanical and chemical products, and university research and development already underway to find smarter energy solutions.

In Rochester, there are numerous companies and universities focused right now on research and development in four key alternative energy sectors: fuel cell, bio fuels, solar energy, and wind energy. They are working on technologies to power your car, light your way, and heat your home without relying on traditional sources of energy.

By maximizing the use of knowledge and expertise right here in our own community, Rochester has the keys to unlock development of next generation alternative energy solutions that will create a whole new lifestyle for generations to come.

Rochester leaders are banding together to collaborate on initiatives that can ensure Rochester's assets are leveraged to create alternative energy solutions that will reduce our country's dependence on foreign oil.

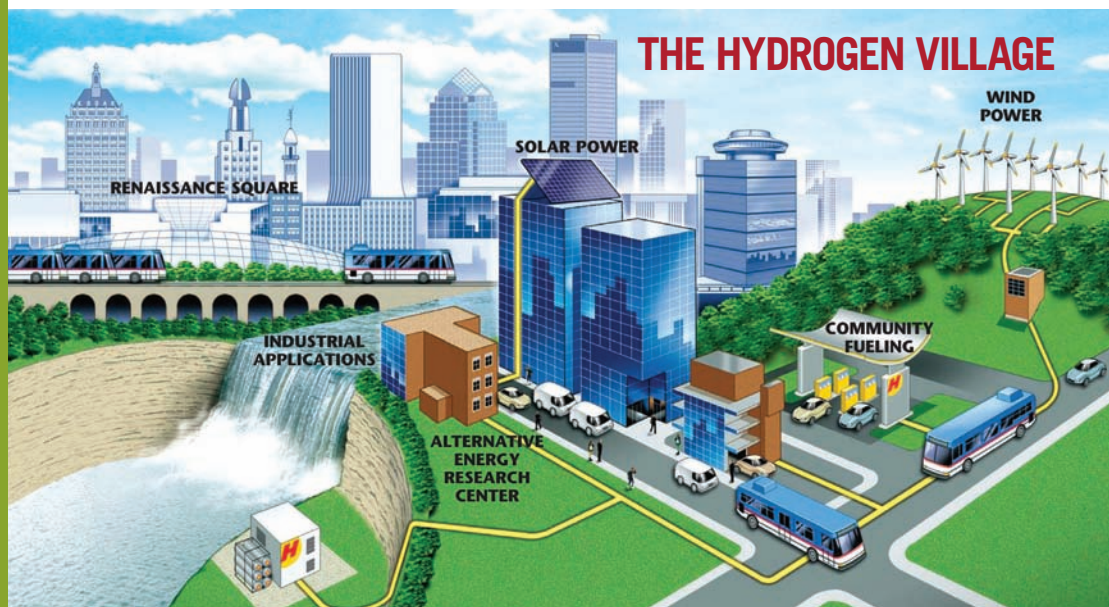
It's not just the right thing to do to preserve our environment. It's the right thing to do to help generate economic development that will further revitalize the Rochester Region.

FUEL CELLS

- General Motors' fuel cell R&D center in Honeoye Falls is one of only four such centers in the world and is a leading fuel-cell site for the company. Its 300 researchers, who are focused on fuel cells for generator and automotive use, maintain one of the highest per-capita patent rates in all of GM.
- Delphi's technical center in Rochester is the company's leading site for fuel cells in the United States. The center employs some 450 researchers, many of them involved in fuel-cell research for generator and automotive use.
- Rochester Institute of Technology is home to the Advanced Fuel Cell Research Laboratory and is the site of one of only four Hydrogen Technology Learning Centers in the country. In addition, RIT's Center for Integrated Manufacturing Studies recently received a \$1.35 million federal grant to purchase equipment and conduct research of fuel cell life cycles, environmental impact and disposal.
- We have technological expertise in thin films, ceramics and microelectronic systems. Alfred University is a national leader in ceramics, a key component of solid-oxide fuel cells, and a reason our region is part of New York's "ceramics corridor."
- The Fuel Cell 2007 conference will be held in Rochester, June 14-15, 2007. This conference will attract more than 200 fuel cell experts to our community for a two day seminar on best practices in this emerging alternative energy sector.

WIND ENERGY:

- New York represents a huge market opportunity for a wind turbine manufacturer. More than 2,000 new wind turbines are projected to be installed in New York State as part of the state Public Service Commission's order to have 25 percent of New York's electricity derived from renewable energy by 2013. The logistics and cost prompt manufacturers to seek opportunities to locate operations close to the market.
- Rochester has a strong potential supplier base that includes more than 60 companies with related expertise to manufacture components of the wind turbine.
- The Rochester Region is home to the 10-turbine, 6.6-megawatt Wethersfield Wind Farm in Wyoming County, which has been in operation since 2000. In addition, several other wind farm installation projects are in development in the region, including the Dairy Hills Wind Farm in Wyoming County, which calls for 68 two-megawatt turbines to provide electricity to 40,000 households.



ETHANOL AND BIODIESEL

- New York's first state-of-the-art dry mill ethanol plant – Western New York Energy, LLC, an \$87 million investment – will be built in Orleans County, in the Rochester Region. The new facility is expected to produce 50 million gallons of ethanol a year.
- Empire Biofuels, an ethanol refining company, plans to invest \$87 million to build a 50 million gallon per year corn-to-ethanol refinery in Seneca County, in the Rochester Region.
- Mascoma Corp. plans to invest \$29.8 million to build the nation's first cellulosic ethanol demonstration plant in Rochester's Monroe County. This plant will use wood chips, paper pulp, and certain grasses to create approximately 500,000 gallons of ethanol each year. Genencor, another Rochester-based company, will provide Mascoma with the enzymes to help make the ethanol.
- The rich agricultural base in this region provides the necessary feed stock to support ethanol production.
- The New York State Agricultural Experiment Station, located in Geneva, NY, and affiliated with Cornell University, is a national leader in agricultural research and development. Research is underway to support biofuels technologies and production facilities at the Experiment Station and the adjacent Cornell Agriculture and Food Technology Park, including next generation cellulosic ethanol.

SOLAR ENERGY:

- Rochester has expertise in “cleanroom type” operations at the Infotonics Technology Center, University of Rochester and Rochester Institute of Technology, which are necessary to manufacture solar panels.
- Eastman Kodak and ExxonMobil Films are leading local companies with the thin film materials expertise needed to develop next generation solar panel technology.
- RIT has research and development underway at its NanoPower Research Labs to support the solar energy sector.

TALENTED WORKFORCE:

The Greater Rochester Region has the talent and technology needed to support and grow the alternative energy industry.

- We have a highly skilled workforce. Rochester is No. 1 in patents per worker. Rochester boasts 2.33 patents per 1,000 workers, while the U.S. average is 0.40 patents per 1,000 workers.
- The Renewable Energy Network of Entrepreneurs in Western New York (RENEW NY) is one of the few business incubators in the country dedicated to helping early stage renewable energy companies start and grow in Western New York.
- We have a critical mass of professionals with alternative energy expertise, including engineers, chemists, physicists, and material scientists.

“We will eventually get the right energy policy in America. We want Rochester at the forefront to take advantage of those opportunities.”

U.S. Sen. Hillary Rodham Clinton

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