

ENERGY INDEPENDENCE



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Minnow brook April 28, 2011



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Sustainability Goal

The Federal Focus on Energy Independence lays the basis for Programs to Reduce Energy Demand and Generate Green Energy



**Earth day
4/22/2011**

Implement solutions for dealing with Climate Change





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Green Technology Solutions Needed Now

Projected World energy consumption increase

57% by 2020

200 – 300% by 2050.



**\$4.00 /Gal
in 2008...**



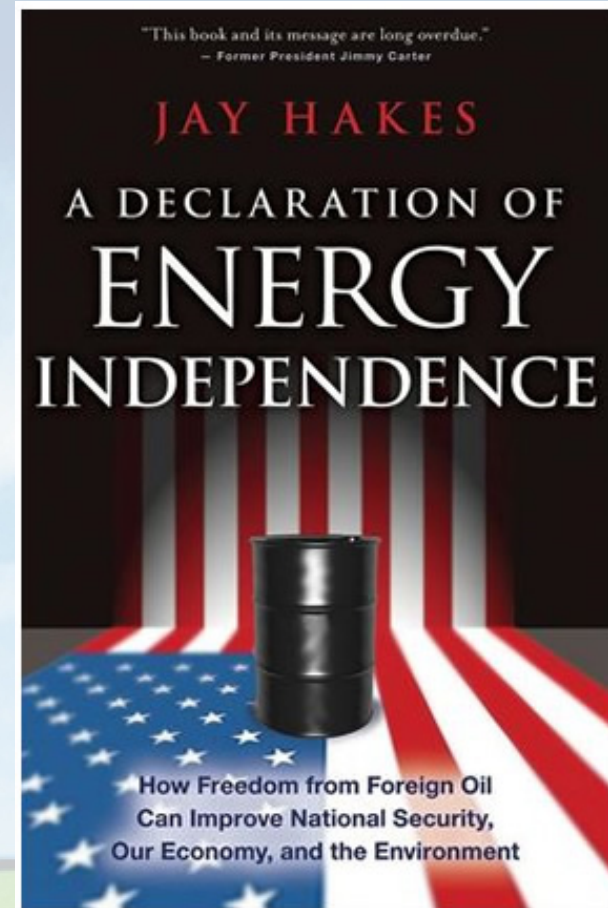
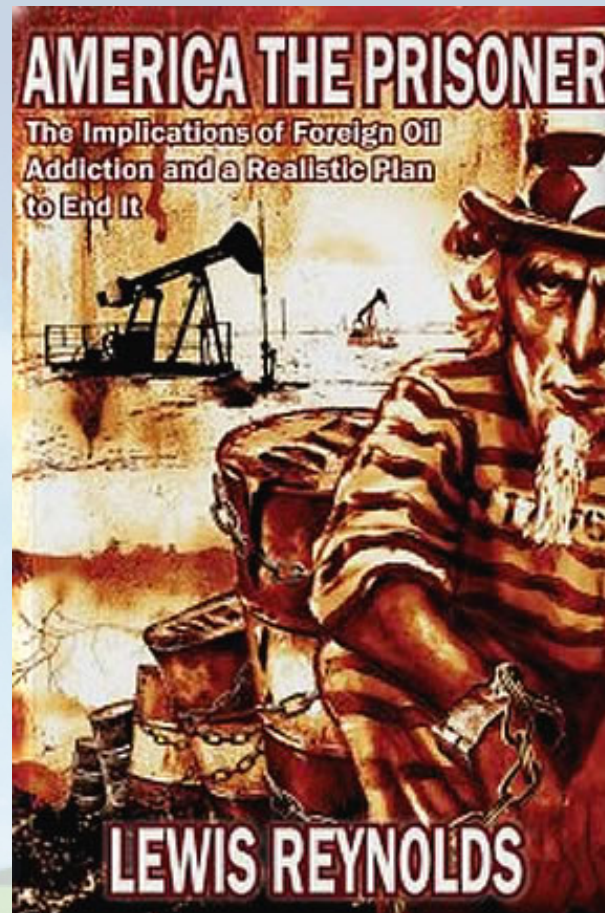


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ENERGY

INDEPENDENCE

American **Energy** Independence.com





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Green means.. Economic Development.. Making money..



Save energy & natural resources.
Create healthy and productive
environment for people.





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POTENTIAL ETHICS ISSUES WITH GREEN SOLUTIONS

- ***Conventional
Solution More costly
and more fee for the
Consultant***
- ***North Country DE
filter Water System..***
- ***SC Village STP
upgrade- \$20 Million
Vs. \$650,000.***
- ***DDee STP Upgrade \$5
Million Vs. \$400,000***





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Reasons for Going Green??

- ***Independence from Foreign oil - over 50% imported.***
- ***Stop Billions of Dollars Going out***
- ***Cost of Protecting Oil sources***
- ***Health care costs going up***
- ***Climate change -***





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Tools for smart Energy Solutions?

GREEN ?

LEED ?



Sustainable planning?





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Leadership in Energy & Environmental Design

A leading-edge system for designing, constructing, operating and certifying the world's greenest buildings.





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What is “Green” Design?

Five broad areas:

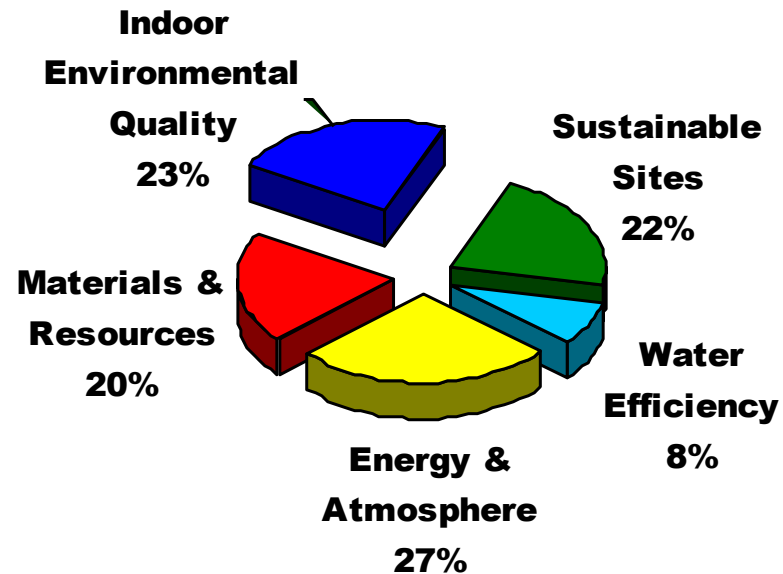
- Sustainable site planning
- Safeguarding water and water efficiency
- Energy efficiency and renewable energy
- Conservation of materials and resources
- Indoor environmental quality





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LEED™ Point Distribution



Five LEED credit categories





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Technical Overview of LEED™

- Whole-building approach, collaborative, integrated design and construction process
- Optimizes environmental and economic factors
- Four levels of certification
 - LEED Certified 26 - 32 points
 - Silver Level 33 - 38 points
 - Gold Level 39 - 51 points
 - Platinum Level 52+ points (69 max.)





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CREATING SUSTAINABLE COMMUNITIES

COMMITMENT TO PLACE | ECONOMIC JUSTICE | ENVIRONMENTAL STEWARDSHIP



***4th Annual Conference
June 8-10, 2006
Burlington, Vermont***





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Building Sustainable Cities:

***Scandinavia's "Eco-
Municipalities" Show the Way***

- ***Since 1997...
Sustainable
Sweden Offers
Tours to some of
the country's 70
"eco-
municipalities.
"Esam, Umeå.....***





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Local Monroe County Initiatives

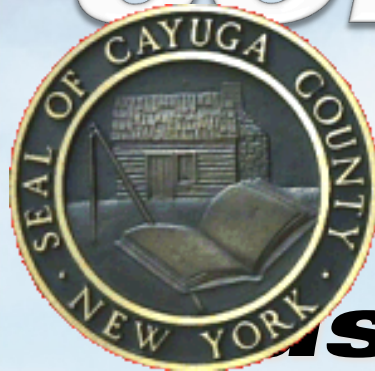
- ***GRE “Green Print” for Rochester 07***
- ***Town of Brighton - Green Task Force-identified Key action areas’ 08***
- ***Town of Irondequoit - Green Task Force completed the Action Plan for Long term Master Plan***





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CAYUGA COUNTY QUALITY COMMUNITIES



**Sustainable Growth
Communities
Strategic Planning
May 31, 2008**





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List of Potential Stakeholders

- **Supervisors, Mayors & County Board and Administration**
- **Engineering & Buildings**
- **Treasurer / Purchasing**
- **Environmental Services**
- **Planning & Zoning**
- **Public Works, Water, WWTP, Transportation**
- **Fire Protection, Street Lighting**
- **Public safety - Police**
- **Parks and Recreation**
- **Social Services**
- **Chamber of Commerce**
- **Industrial Development Agency**





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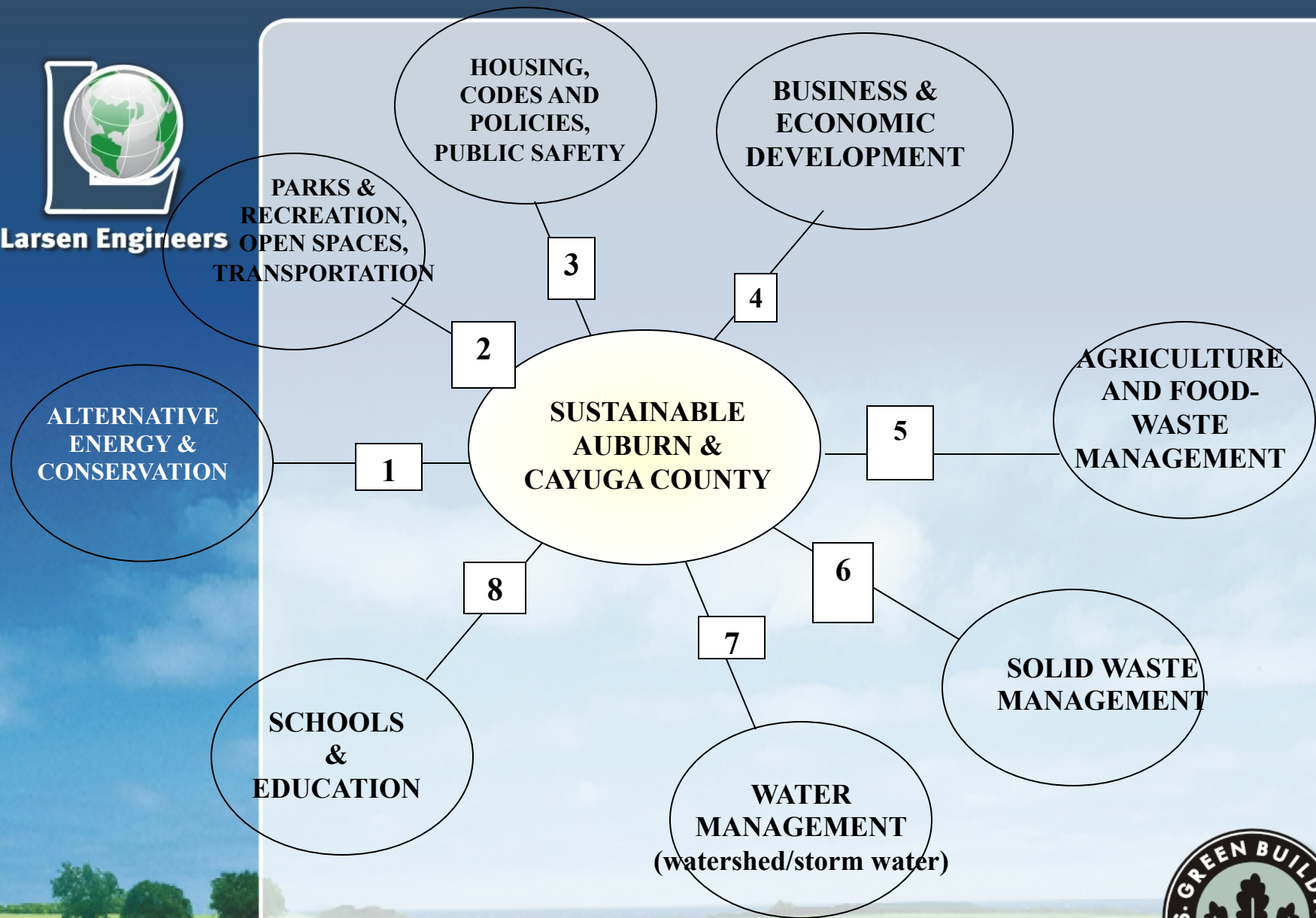
Steps for Undertaking Green Community Initiatives

- **Involve all major departments in training and assessment of current practices**
- **Hold joint meetings to brainstorm ideas for conservation and savings in operating costs**
- **Prepare a Work Plan with various departments involving Engineering, Environmental, Parks, Planning, highway, Building facilities, Purchasing etc.**
- **Adopt Sustainable Green Plan and inform the residents**
- **Promote Federal & state grants and incentive for**





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8 FOCUS AREAS FOR SUSTAINABLE GREEN PLANNING





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Examples of Green Projects

- ***Energy,***
- ***Water***
- ***Waste Management***
- ***Storm water management***
- ***Healthy Living***





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Storm Water Management

Austin, TX
Rainwater
Harvesting



Santa Monica, CA
Run-off
Mitigation

Portland, OR
- Swales and
Storm water
Planters:
Mississippi
Commons
Project

- removes an
average of
500,000
gallons of
storm
water from
the





Agriculture and Food-Waste Management

- ***Santa Monica, CA***
 - Zero-Waste***
 - Farmers' Market***
 - Local Foods***
 - Plymouth***
- ***Burlington, VT***
 - Intervale Compost***



University of VT



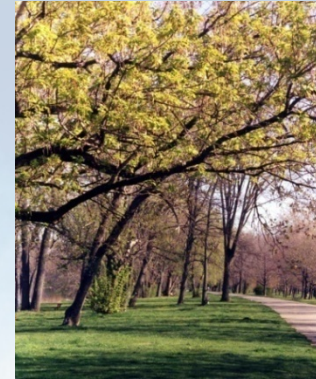
(Food waste at Middlebury College: Occasionally, dining services provide a bin for students to scrape their leftovers into and then they weigh the waste to promote consciousness and responsibility)



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Open Spaces and Transportation

- **Austin,
TX**
- **Burlington,
VT**
- **Grand
Rapids
MI**





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Air Quality and Clean Fuels

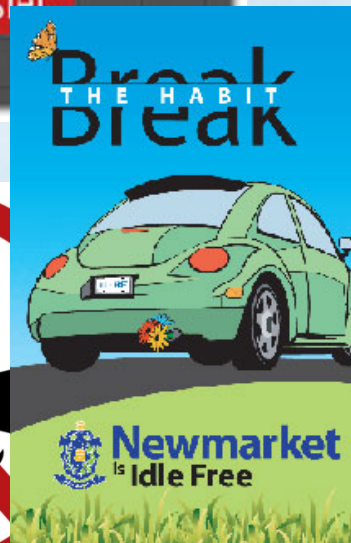
- **Santa Monica, CA**
 - "Clean Air Vehicle" Decals

- **Burlington, Vermont**
 - 10% Challenge

- **Toronto, Canada**
 - Anti-Idling bylaws



Don't idle your vehicle
Breathe easier





Retrofit Vehicles for Idling Power- save Gas Improve Air Quality





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Alternative Energy and Conservation

**Philadelph
hia, PA**

**Million
Solar
Roofs
Comm
unity**

**Partner
ships**

**Keene,
NH**

**Geothe
rmal
Syste
m**

**-Bio-
diesel**



BIODIESEL





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Energy Conservation via LED



50% savings and 20 +year lamp life

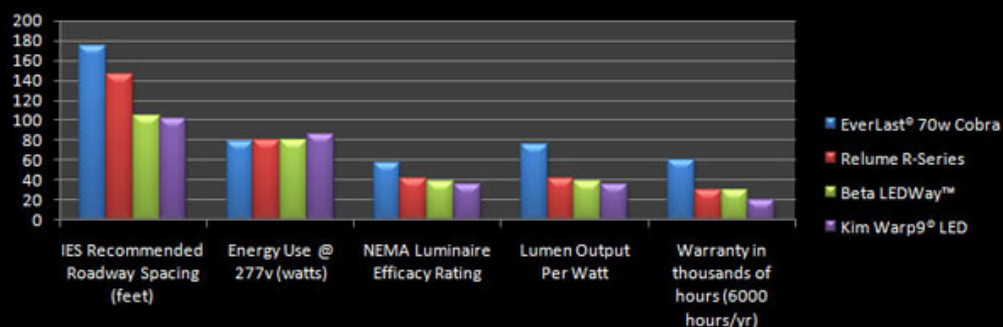




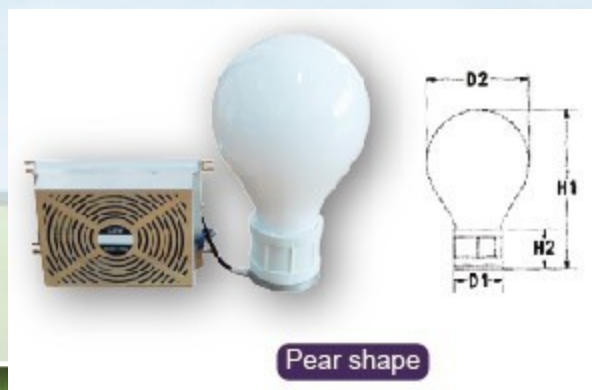
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Energy Conservation with Induction Lighting

EverLast® vs. LED Street Lighting



❖ UC Davis Parking Garage - Compares HPS (top level) to new EverLast® Induction (lower levels)





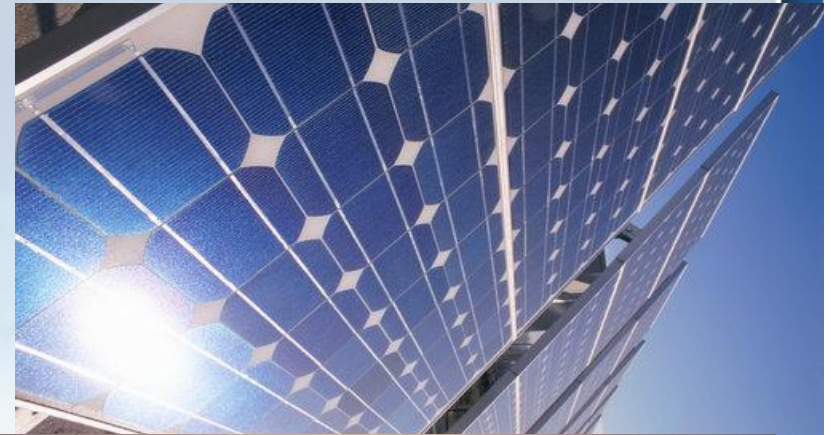
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Alternative Energy and Conservation

- **Austin,
TX**
 - Wash
Wise
Rebate
Progra
m

- Light
bulb
excha
nge
progra
m

- **Chula
Vista, CA**
 - Energy
Efficie





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Solar PV Power Systems

***GIGP
Grant
provides
20% of
the
facility's***





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Greenkill YMCA Lodge NYC LEED GOLD building

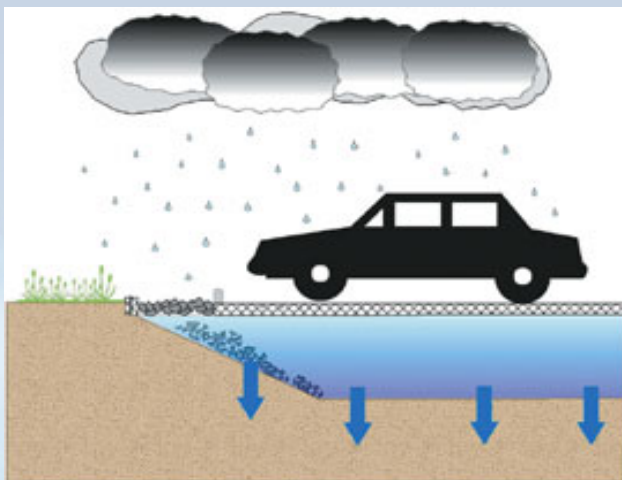




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Ground Water Recharge Systems

Franklin Institute in Philadelphia, PA
Constructed in 1970's



Source - Cahill Assoc.



Rainfall runs off traditional impervious asphalt (center drive) but drains through porous asphalt parking spaces.

With the right soil conditions and careful design, installations retain their ability to infiltrate.

By Michele C. Adams
STORMCOM





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Harbec Plastics Green Manufacturer



Stormwater Recycled for Process and Fire Protection. 950,000 Gallon storage Pond created on the rear side





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**Underground storm water management makes perfect sense-offering:
More efficient land development,
Preservation of green space,
Groundwater recharge and reclamation of
water for future use.**





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Kansas City Mayor Breaks Ground on First Corporate Rain Garden ...April 25, 2006

- * Mayor Kay Barnes launches
- the City's "10,000 Rain
Gardens" initiative.**

***"The 10,000 Rain Gardens
initiative" - reach out to the
community and engage the
public in a proactive and
creative solution to some of
our wet-weather problems,"
Mayor Barnes***

- * "Through this effort, Kansas
City - recognized as a national
role model in public**





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Green Living Roofs

*Pre Grown Modular Extensive
System*



Toronto Study

Savings

Energy 22%

Stormwater 38%

Urban Heat Island 25%

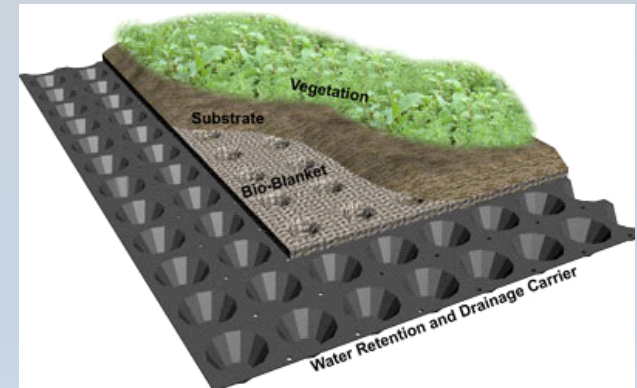
CSO 15%





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Unique Features:



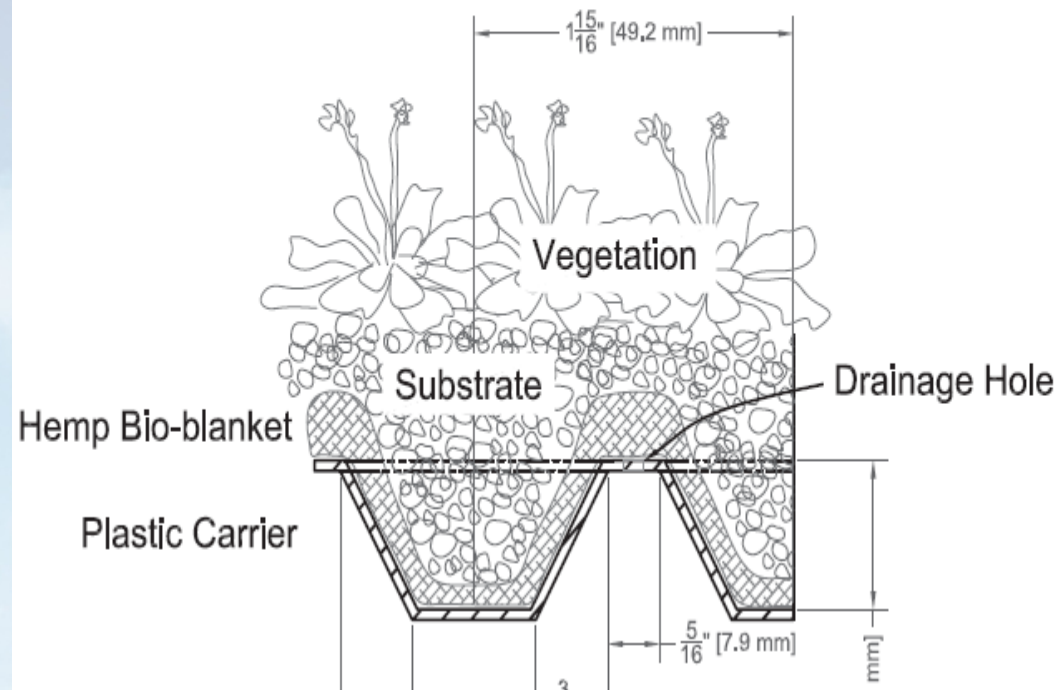
- ***Water retention and conservation***
- ***Water wicking properties***
- ***Modularity and mat properties all in one***
- ***Ability to adjust weight, depth, and plant selections***
- ***Erosion control properties due to the dimpled Bio-Blanket***





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Water Management and Conservation



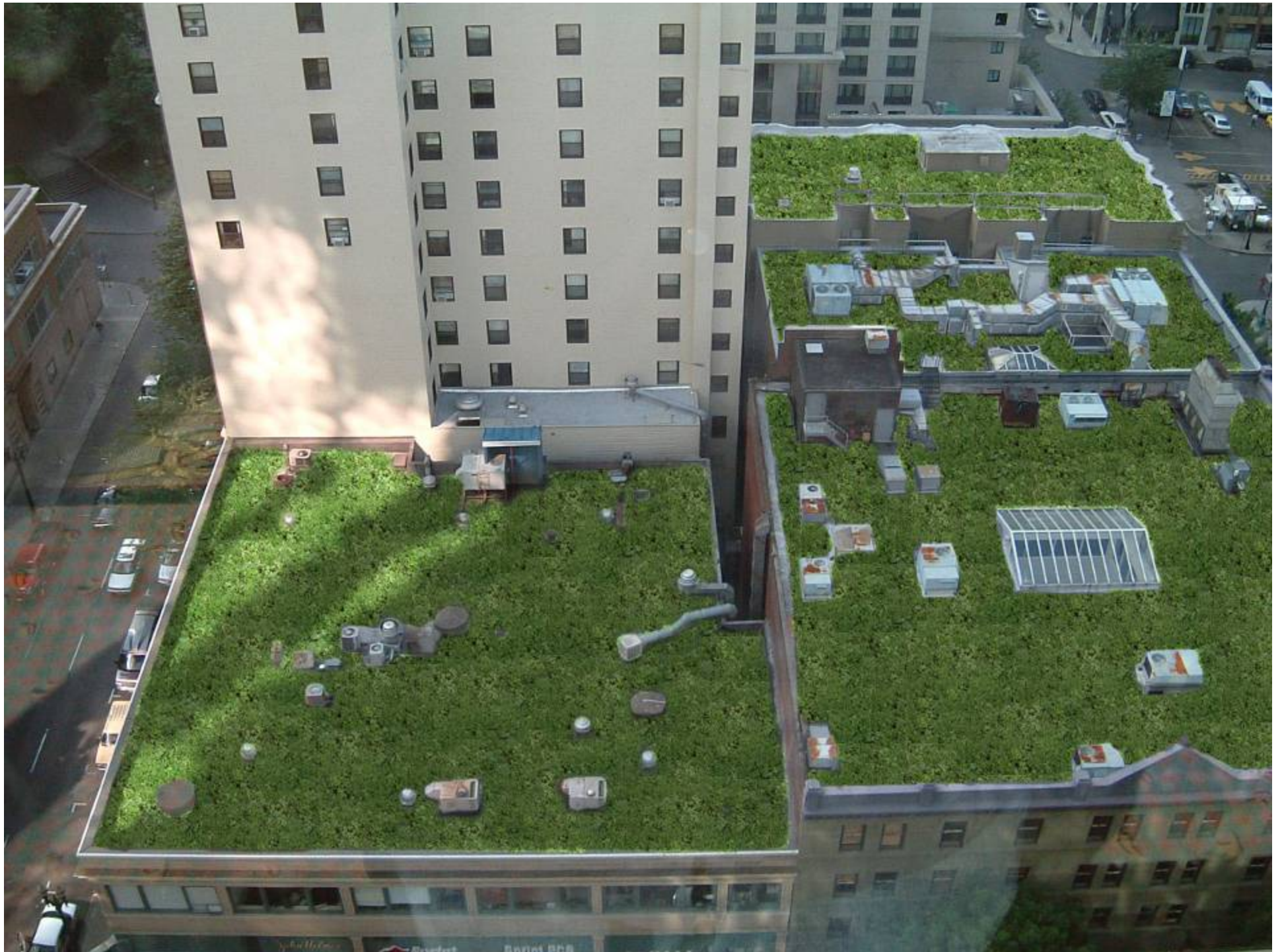


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Modularity









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***Plug in Hybrids are
coming Tomorrow
Regular gas- 100+
MPG***



Solar Powered Electric Vehicle Charging Station





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Quiet and efficient electric vehicle proves ideal for Islawrffordd Caravan Park





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Freedom from dependence on Oil ?



Cost = 4-6 Cents/KWH

Natures gift of wind is helping some areas develop clean renewable energy in the Nation. Upstate New York has good potential.





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China building first 10-GW wind farm

Sat Aug 8, 2009 EDT

- ***JIUQUAN (Reuters) - China started construction of the country's first 10-gigawatt wind power base in Jiuquan of northwest Gansu province on Saturday as Beijing seeks more clean power to fuel its fast economic growth.***
- ***China, the world's second-largest energy user, has said it would bring its total wind power capacity to 100 GW by 2020 from the current 12 GW, part of a broad***





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AeroVironment Installs Wind Turbines on Roof of Kettle Foods Factory - *November 15, 2007*

- **Monrovia,
Calif. –
AeroVironm
ent, Inc. (AV)
Wind
system
Beloit, Wis.,
manufacturi
ng facility of
Kettle
Foods.
installation
includes 18**



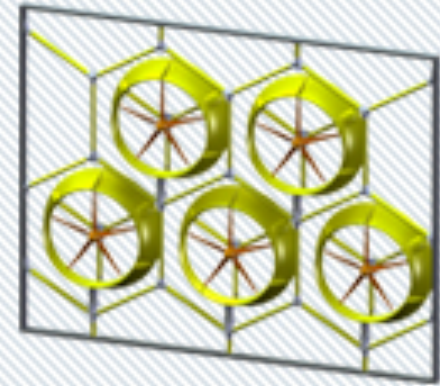


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Taiwanese Wind turbines for Urban Application



JPC-1000





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Wind Tamer - made in Geneseo NY

- ***Urban Wind Gardens on 40 ft. poles***
- ***Lake Ontario shore***



Financial Incentives Available





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Jet Pro Micro Turbine 5 KW

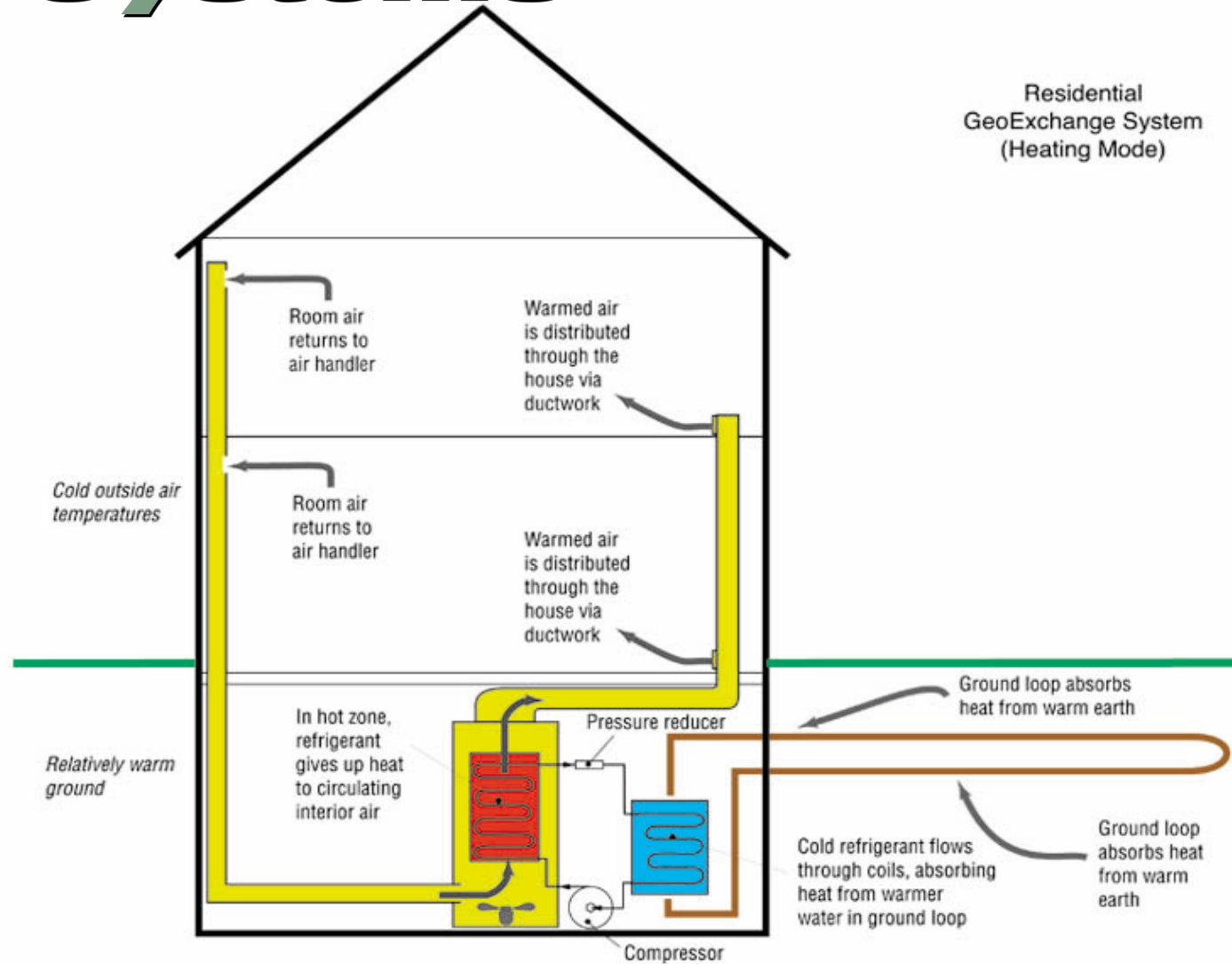




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Geo-thermal Energy Systems

Residential
GeoExchange System
(Heating Mode)

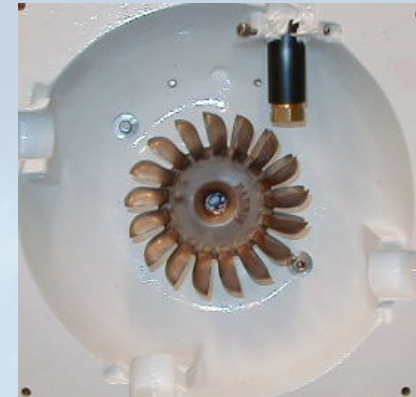
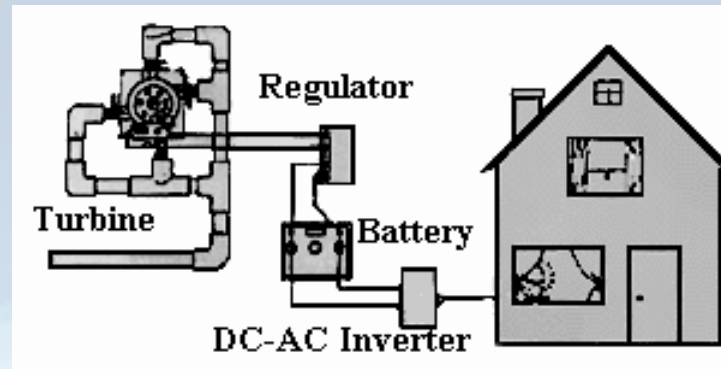




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Micro-Hydro power

Heads of 10 to 600 feet and flow rates of 10 to 250 GPM



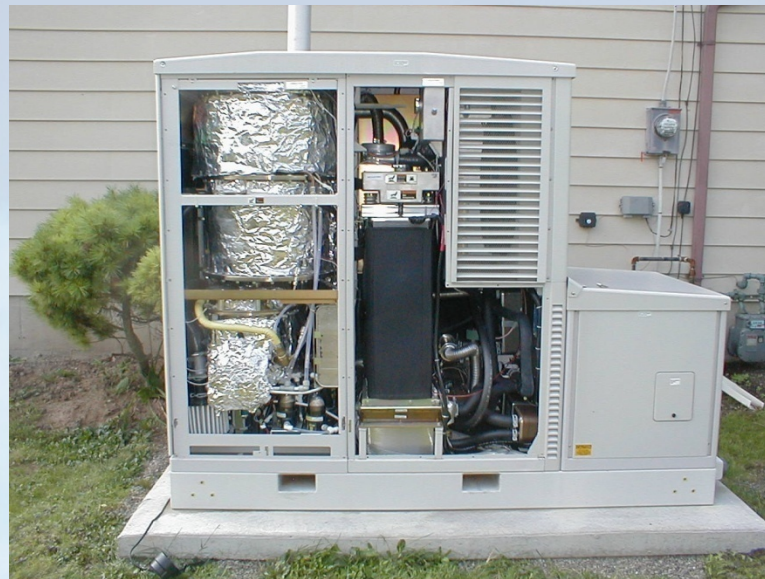
$$W \text{ (watts)} = H \text{ (head or fall)} \times \text{Flow (gallons /minute)} \times .18 \times .30$$





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Residential Fuel Cell Power



National Fuel
Demo Project.

Natural gas
fired. Buffalo,
NY





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GIGP EFC FUNDING

- ***\$432M in Economic Recovery Funds provided by the EPA for Clean Water Infrastructure Projects in New York State***
- ***20% of clean water funds must be reserved for “Green Innovation” projects***
- ***\$35M placed in***





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EXAMPLE ENERGY EFFICIENCY PROJECTS

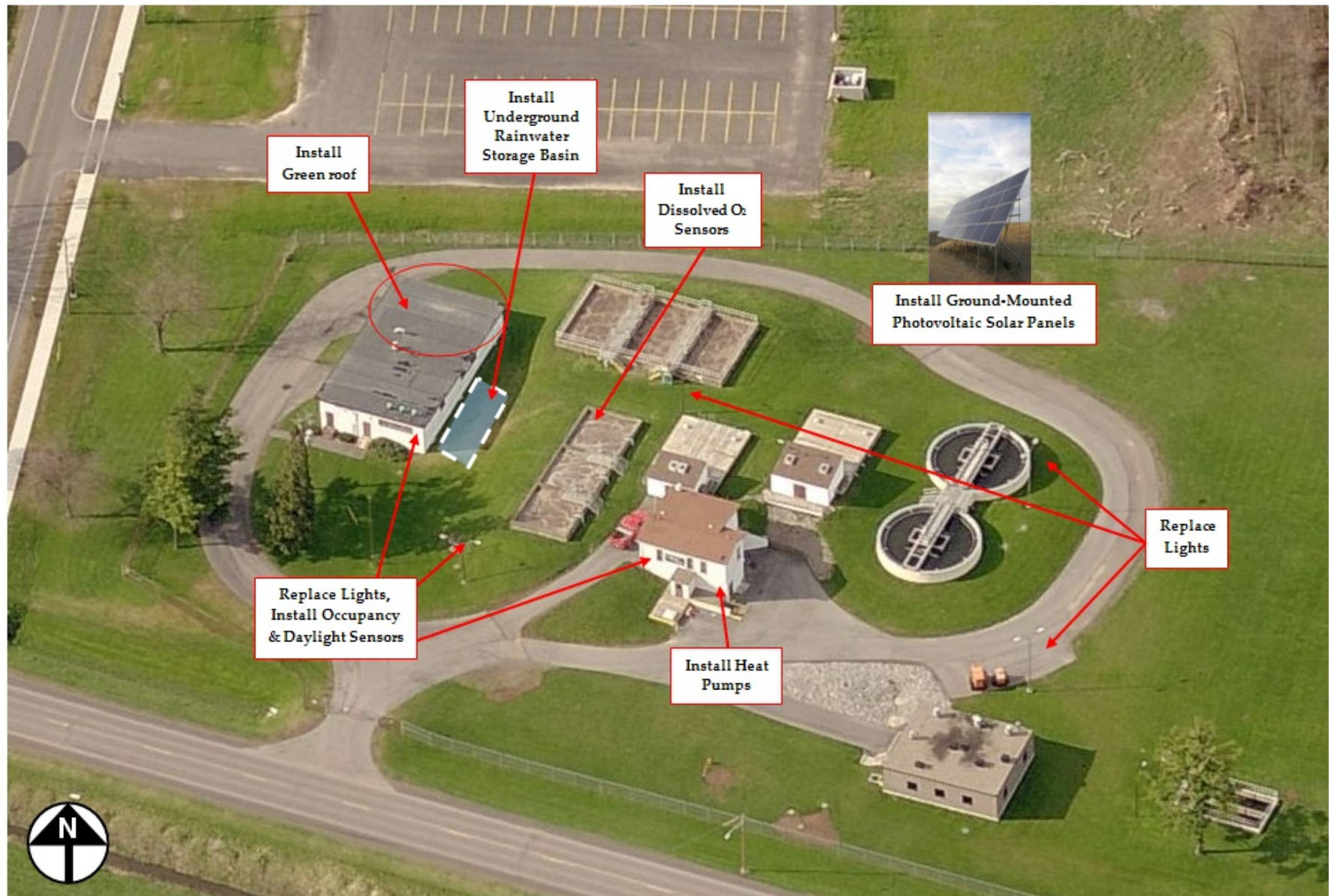
- ***Energy efficient retrofits and upgrades for pumps and treatment processes***
- ***Producing clean power on-site for treatment systems (wind, solar, hydroelectric, etc.)***
- ***Leak detection***



Williamson (T) Wastewater Treatment Plant



VILLAGE OF LYONS WASTE WATER TREATMENT PLANT





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Remote net metering by farm and non- residential customer-

***Apr 13, 2011:
REPORTED***

***Apr 7, 2011: PRINT
NUMBER 6270A***

***Apr 7, 2011: AMEND
AND RECOMMIT TO
ENERGY***

***Mar 11, 2011:
REFERRED TO***

Call your Assemblymen to support this Law





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Business and Economic Development

Putney, Vermont:

- **Green technology park, brownfield remediation and multi-use ecovillage**
- **Cogeneration, green roofs, etc**

Epping, New Hampshire:

- **Operating costs reduced through sustainable utilities; new businesses attracted**

Cape Charles, Virginia:

- **Port of Cape Charles Sustainable**





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High Performance Manufacturing

***Sustainable Green
Assessments to
reduce operating
costs and increase
profitability***





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Sustainable Green Assessment of Industrial Plants

***Team of experts
evaluate the facility
and implement
Sustainable
Conservation
measure. Savings
provide the funds to
pay off the Capital***



investment over 2 to 5



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Demand Side Management ?

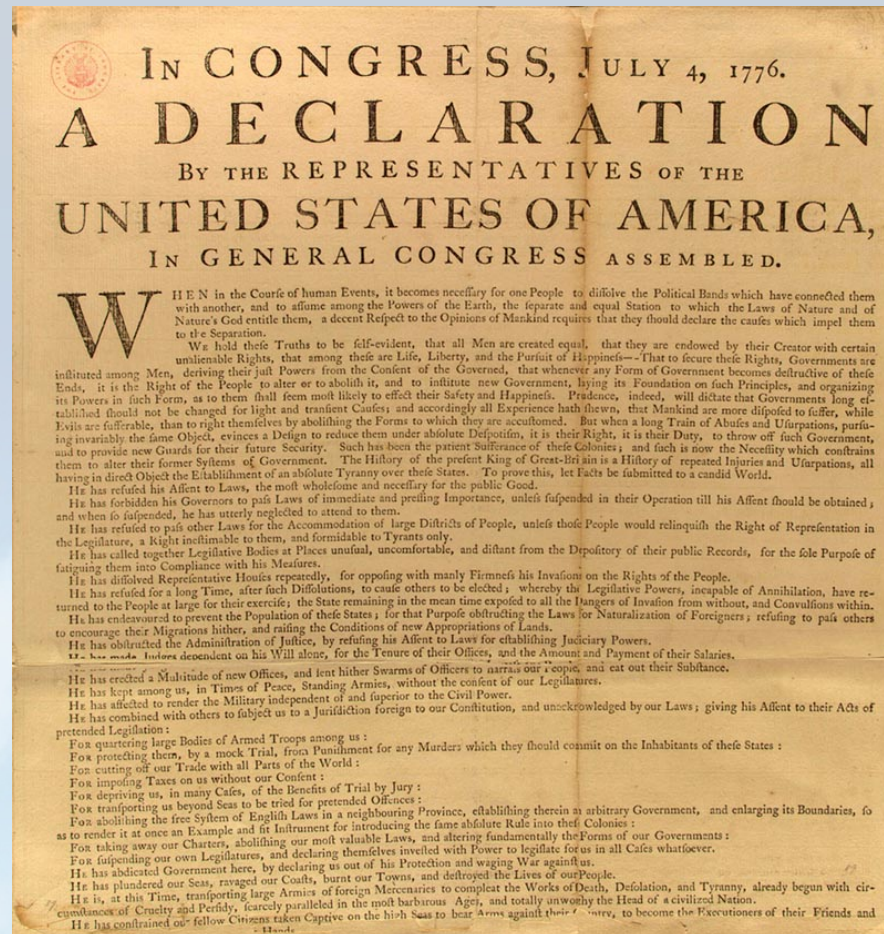
Capital improvements paid
from future energy and operating cost
savings

How it works





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July 4th 2025 – Village/Town Achieves Net Zero Energy Independence Goal





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February 2011



**Former President Bill Clinton
Distinguished Speaker**



**Tom Vilsack
Secretary of Agriculture
Keynote Address**

**Renewable Energy Opportunities Discussed at
Agriculture Outlook Forum**

By Wayne Maloney, USDA Office of Communications,



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WELCOME TO
Stahlbush Island Farms



***Location: Oregon's lush
Willamette Valley***

***Environmentally friendly farm
and food processor, Sustainable
agriculture***

***Philosophy : farming practices
should leave the soil, air, water,
plant life, animals and people
healthier.***

***Sustainability is a continuing
journey.***





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Stahlbush Island Farm, Oregon State

With Anaerobic Digester, Stahlbush Island Farm is completely energy independent!





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Net Zero City **UNDER** **CONSTRUCTION**

- **A place where innovation, technology and sustainability meet and create a new kind of city. Imagine**
- **A vibrant and beautiful city, powered by renewable energy, innovative building practices and new standards in sustainable living.**



■ **Welcome to Meador City**



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CITY

Under Construction in United Arab Emirates (UAE)



Initiated in 2006, the project is projected to cost US\$22 billion - 8 years to build, first phase to be completed in 2009





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MASDAR-A NEW GREEN CITY IN ABU DHABI UAE



The city will cover (2.3 sq mi) for housing 45,000 to 50,000 people and 1,500 businesses





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MASDAR- A GREEN CITY ABU DHABI, U. ARAB



Automobiles will be banned within the city;
People travelling via public mass transit
connected to outside network of roads





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H2PIA World's First Hydrogen City- Denmark, May 2006



Conceptual Visionary Project





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***Village of
Medina,
Orleans
County N.Y.
Energy Audits,
Energy Conservation
Measures,
Green Retrofits,
Green power etc.
has started the
Journey toward
Energy
Independence...2020?***

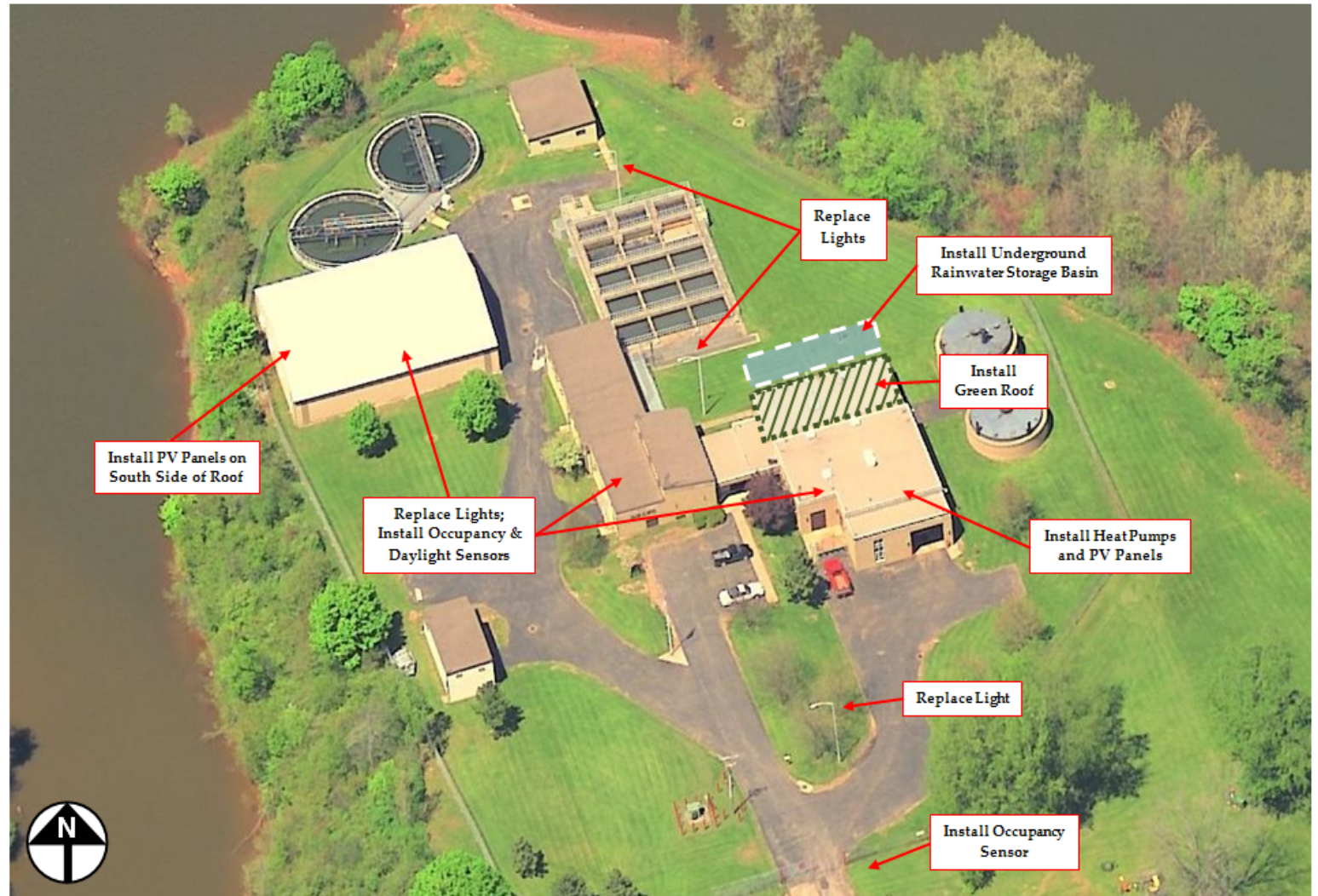




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GIGP- Project in progress

VILLAGE OF MEDINA
WASTE WATER TREATMENT PLANT





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Compost Facility



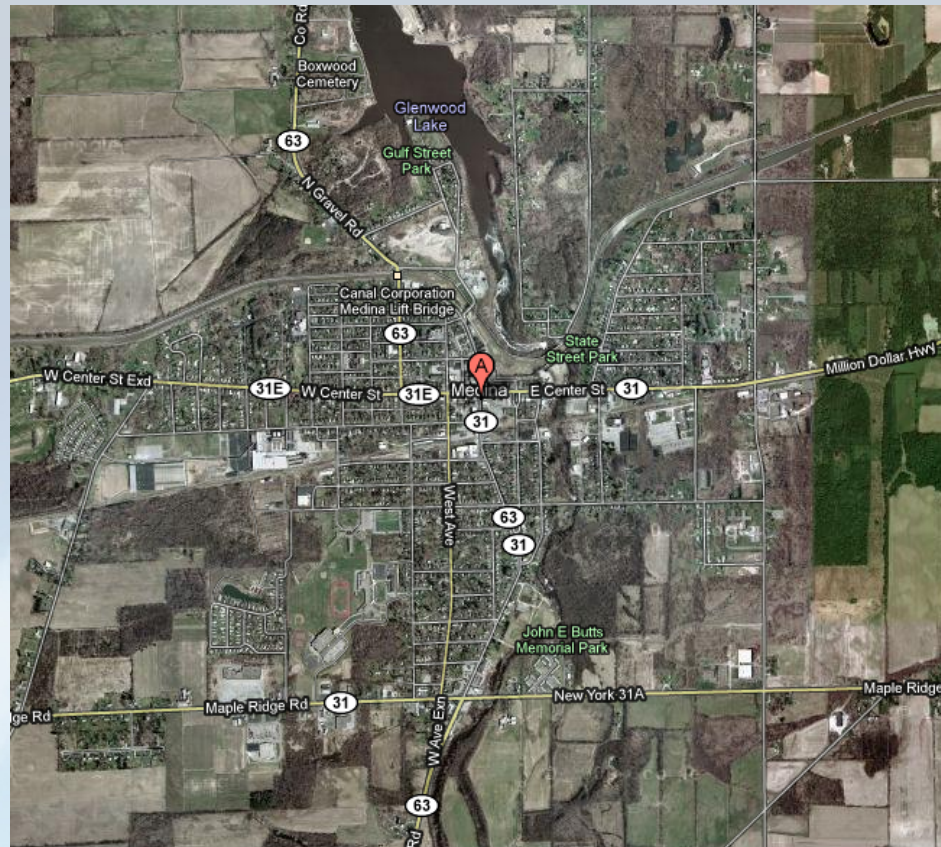
With solar panel installed on south facing side of building, Net energy production made it to be the Greenest compost plant- Excess Power Producer





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Medina- Street Lights



Replace 66 Metal Halide lights with energy efficient
Induction lighting, on Main St. and Center St.

Savings:

40,253 kWh/year

\$6,922/year

Cost:

\$18,678

Simple payback time:

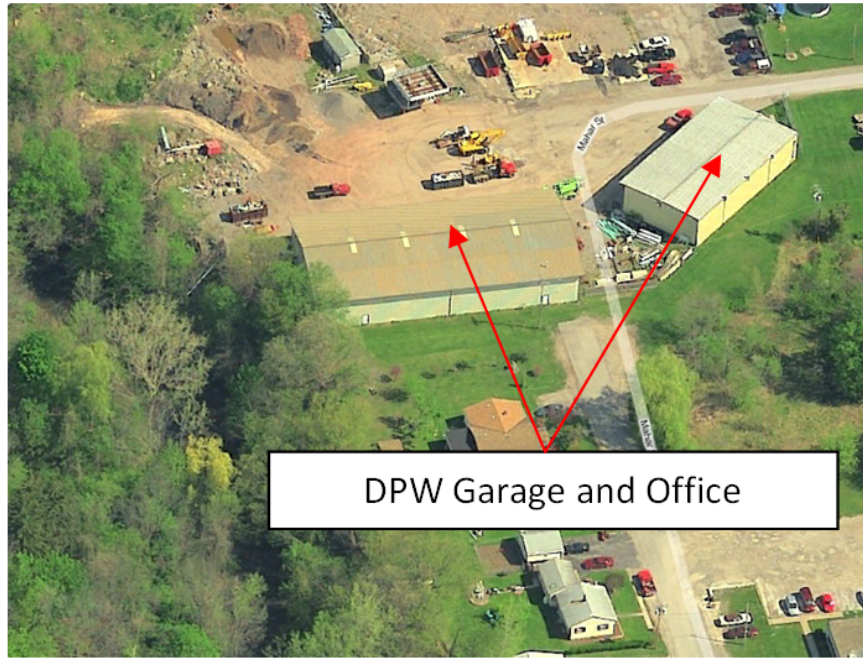
2.7 years





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Medina- DPW Garage and Office



DPW Garage and Office

Replace existing Metal Halide lights with Induction lighting

Savings:

14,265 kWh/year

\$2,535/year

Cost:

\$7,479

Simple payback time:

2.95 years

Air circulation to reduce need for heating and cooling, 'Airius'

Savings: ?

Simple payback time:

2-4 years

Replace furnace filters frequently to maintain efficiency





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Medina- Village Hall



Replace current boiler with high efficiency Crown boiler and insulate pipes

Savings:

1,589 therms/year

\$2,064/year

Cost:

\$8,560

Simple payback time:

4.95 and 0.88 years

“Vending Miser” and de-lamping in the ambulance bay

Savings:

2,095 kWh/year

\$251/year

Cost:

\$229

Simple payback time:

0.91 years





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plug power

POWER
POWER AHEAD



GenSys

Hydrogen Overview

Hydrogen—The Fuel of the Future Providing Energy Today



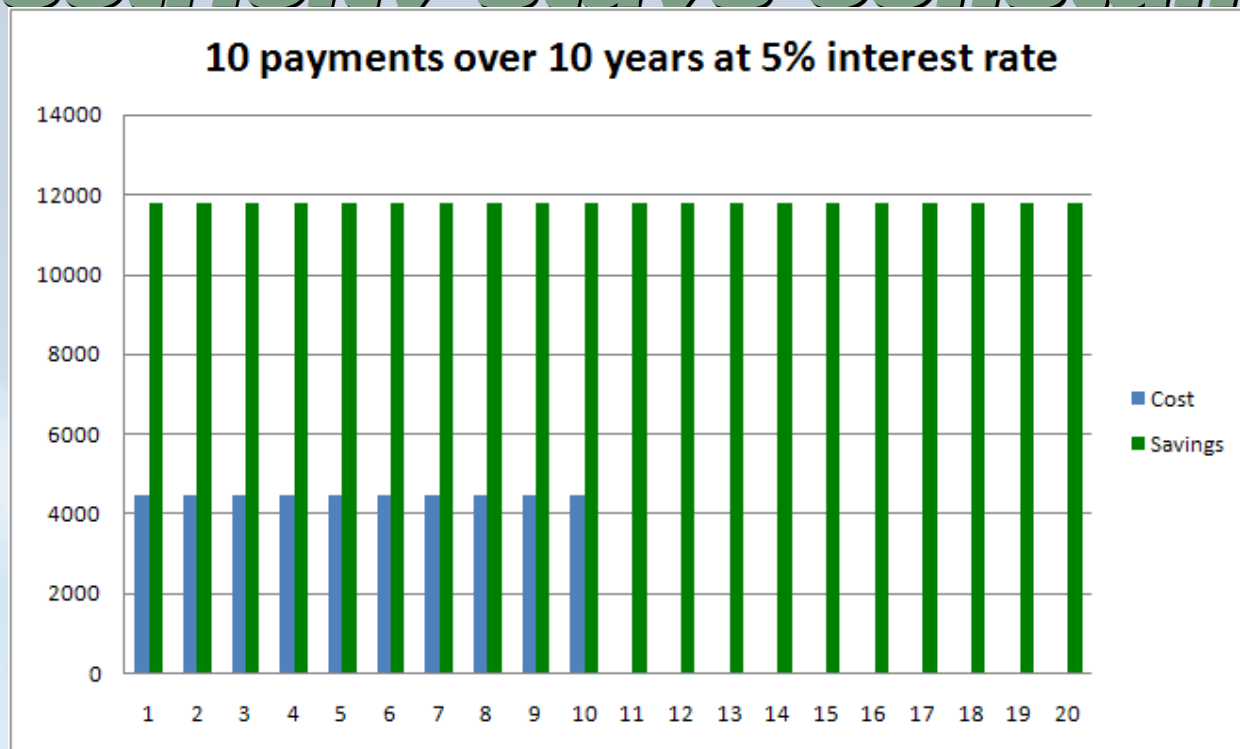
**Grid-Connected,
Combined Heat and Power**





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Savings over 20 years, assuming cost of electricity stays constant



Total payment for \$35,000 loan over 10 years is \$44,548

Savings each year for years 1-10 is \$7,317; savings for each year 11-20 is \$11,772

Total savings over years 1-20 is \$190,898

Village sees savings every year





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Summary of Green Benefits

- ***National recognition, destination point***
- ***Promotes sustainability***
- ***Saves money- energy, water and natural resources***
- ***Creates healthy environment***
- ***Develops smart communities attracting new development***
- ***Control tax rates via***





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**“Green Solutions
-It is the right thing to do...
for a better tomorrow....”**

**SERVE THE CLIENT
BENEFIT THE COMMUNITY
PROTECT THE ENVIRONMENT
585-272-7310**

www.larsen-engineers.com