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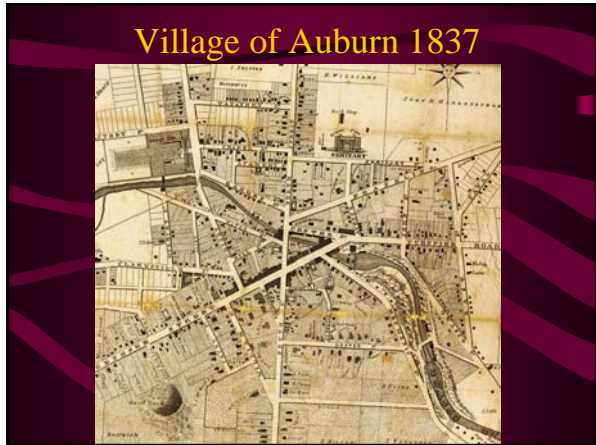
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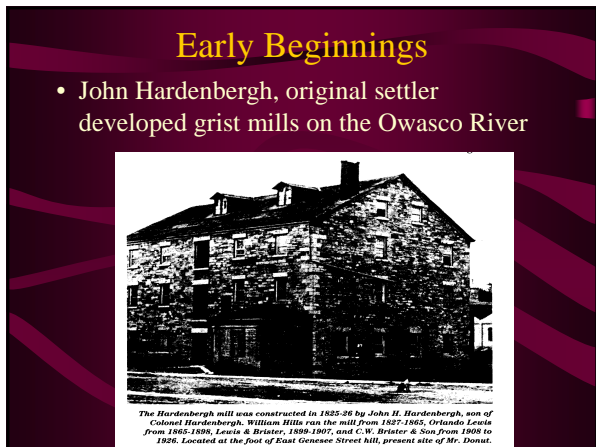
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### Mill Street Dam

- First site redeveloped by city in 1973
- 21 feet of head
- Capacity 410 kw production
- Power sold to NYSEG for \$0.06 per kw until power purchase agreement until 1997.
- In current operation current reimbursement from NYSEG about \$0.02 / kw avoided cost
- Need to wheel energy to city hall (Net metering)

*The Big Dam, Oswego River, near Auburn, N.Y.*

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### Auburn Public Power Authority

- Energy program begun by Mayor Paul Lattimore.
- City Council established Local Law #1 of 1980 creating a public power authority.
- Approved by the voters by referendum
- Created a joint task force with Cayuga County to work on hydro-power.
- Resulted in NYSEG hydro portion of bill....

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### Lattimore Geothermal Well

- Mayor Paul Lattimore, Sr. solicits funding in the early 1980's from U.S. Dept. of Energy & NYSERDA for a hot water heat transfer demonstration project, first east of the Mississippi.
- Water injection well drilled 5,300 feet deep at East Middle School / Cayuga Community College.
- Converted to Natural gas usage since 1991= 95% heating demands year round.
- Auburn Schools completes a feasibility study in 2003 to expand additional energy uses which is underway.

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## Methane Gas Project at City of Auburn Landfill

- Connected 34 vertical 8-12" gas wells
- Currently using landfill #1 and has expanded into landfill #2, cell #1etc.
- Currently producing over 200 million cubic feet per year of quality gas – 42% methane.
- Subsurface connection to the city's adjacent wastewater treatment plant incinerator
- City cost avoidance of approximately \$800,000 per year from NYSEG gas purchases (in 2000).

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## Methane Gas Project #1



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## Methane Gas Project #1

- Overall cost approximately \$1.8m
- Payback period at 2.25 years without DEC grant at old gas rates.
- Engineers – Barton & Loguidice, PC of Syracuse
- New York State Department of Environmental Conservation (DEC) landfill closure grant of \$904,000.
- New York Conference Of Mayors (NYCOM) Local Gov. Achievement Award 2002

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## Memorial City Hall – Geothermal Project

- NYSERDA sponsored feasibility study by John Manning / Beardsley Design Associates of Auburn, New York
- McQuay International new water source heat pump units used (made in Auburn, NY)
- PASCO control system and computer energy system program.
- NYCOM Local Gov. Achievement Award 2004
- First Geothermal City Hall in ?

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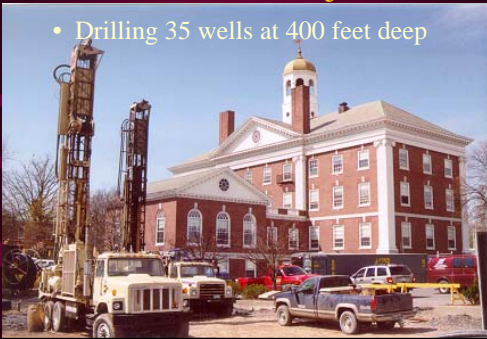
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## Auburn Memorial City Hall Geothermal Project

- Drilling 35 wells at 400 feet deep



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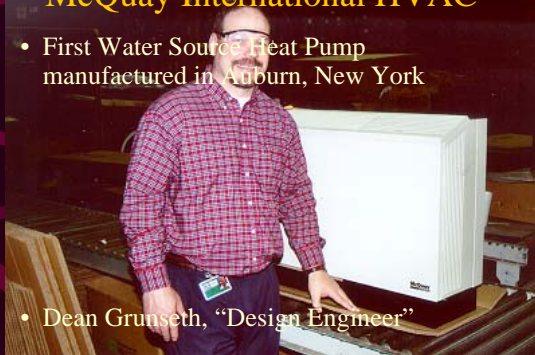
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## McQuay International HVAC

- First Water Source Heat Pump manufactured in Auburn, New York



- Dean Grunseth, "Design Engineer"

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### Combined Heat & Power Project – Sludge Digester at WWTP

- Initial feasibility study – lost \$1,000,000 per year in operating expenses due to Natural Gas –Energy cost increases.
- Utilized a NYSERDA grant to evaluate conversion of the incinerator to a “bioenergy digester”.



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### Methane Digester Project



- NYSERDA Feasibility study completed – Cayuga Co and City of Auburn.
- Phase 1 – reduce natural gas use at Sludge Incinerator and explore alternative disposal methods while converting landfill methane to electric generation – Power STP plant (save \$600k / yr)
- Phase 2 – construct sludge digester and produce additional power for business expansion at Technology Park. (est. income \$2.6m)
- Proposed \$11.6 m project with Public-Private partnership to build own operate with city retaining green energy attributes.

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## Municipal Sludge Digester Examples



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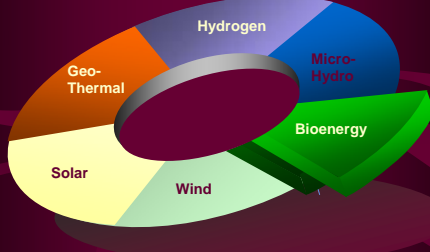
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## Bioenergy As a Part of Renewable Portfolio



Developing A Sustainable Renewable Bioenergy Enterprises is Currently a Significant element of the overall economic development Initiative in Auburn.

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## Digester Grants Received:

- \$1m – NYSERDA
- \$891,000 – Congressman Boehlert from U.S. Dept. of Energy (DOE). Phase 1 implementation.
- \$241,000 – Senator Clinton / Schumer from U.S. DOE – feasibility study.
- \$492,000 – Senator Clinton / Schumer from U.S. DOE – infrastructure distribution system.
- \$9.6 M commitment form CH Auburn, LLC to build, own and Operate the plant.

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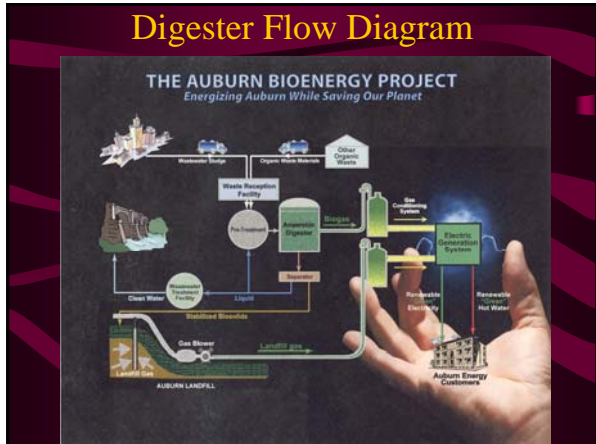
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## Digester Flow Diagram



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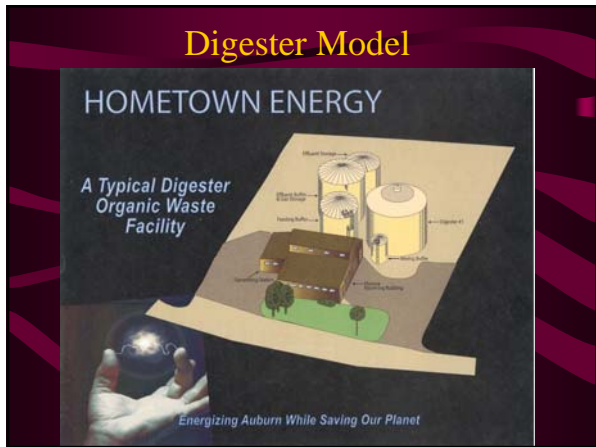
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## Digester Model



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## Aerial View Auburn Landfill & Waste Water Treatment Facility



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## Preliminary Design Bio Digester




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## Cayuga Wind Turbines

an early stage Wind turbine manufacturing and distribution company focused on wind turbines and related equipment and services in the medium-scale, or "Intermediate" scale power range (50kW to ≤ 750kW)

 <p><b>Small (&lt;50 kW)</b></p> <ul style="list-style-type: none"> <li>• Homes</li> <li>• Small Farms</li> <li>• Commercial Sector</li> <li>• Remote Application</li> <li>• Hybrid Systems</li> </ul>	 <p><b>Intermediate (50 ≤ 750 kW)</b></p> <ul style="list-style-type: none"> <li>• Village Power</li> <li>• Farms</li> <li>• Hybrid Systems</li> <li>• Distributed Power</li> <li>• Coop Power</li> <li>• Municipal Utility Power</li> <li>• Community Wind</li> </ul>
 <p><b>Large (750 kW - 2+MW)</b></p> <ul style="list-style-type: none"> <li>• Central-Station Wind Farms</li> </ul>	

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## CWT's Intermediate Wind Turbines Target Market & WTG Sizes

### Intermediate (50 ≤ 750 kW)

Village Power Farms	50 - 300 kW
Commercial Sector, Schools	125 kW
Hybrid Systems	225 - 400kW
Distributed Power	50 - 300 kW
Coop Power	600 - 750 kW
Municipal Utility Power	600 - 750 kW
Community Wind	600 - 750 kW




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## Cooperative Efforts

- With Cayuga County Public Utility Service Agency (Public Power formed in 2006) – submitted Intermunicipal DOS grant applications with the City of Auburn.
- Host “Sustainable Community Plan” charrette NYS DOS grant with City of Auburn and Cayuga County.
- Cornell University – Cornell Center for Technology, Enterprise, and Commercialization project with Cayuga Wind Turbines –
- Formation of a “Alternate Energy Independence Center of Excellence”.

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## Short Term Projects:

- New York Power Authority (NYPA) Projects.
  - Energy Conservation Project and Geothermal heat pump system Police & Fire Station.
  - Energy Management System Installed
- CH Auburn, LLC together with ECOTS and Stearns & Wheeler Engineers are finalizing design plans with summer 2008 construction underway.
- Reconstruct Mill St. Hydro Site and develop a method to use generated hydro-electric power at our own city facilities – (net-metering).

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## Long Term Projects:

- Tech Park potential city energy transfer stations & transmission lines. (digester phases 2-3)
- Hydro evaluation – begin with State Dam and transfer power to Auburn Water Filtration Plant. (Gorlov Turbine)
- Drilling of natural gas wells, etc. at landfill site. Casey Park / Falcon Park Stadium sites.
- Evaluation of NYSEG electrical system and potential acquisition. (with Cayuga Co.)
- “Blue Energy Concept” – Off-the-grid energy. Fire / Police Stations for emergency issues and potential assistance through the Homeland Security Program.

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## Thank You:

- Auburn has a strong manufacturing base – McQuay, Goulds Pumps, Auburn Armature, etc.
- Positive connections with many organizations such as the New York Power Authority, NYSERDA, NYS DOS, etc.
- Over a 25 year history of developing energy projects beginning with strong leadership and community support.
- Cultivation of new manufacturing energy enterprises such as geothermal, wind, solar, hydro, digesters...and others.

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