

# OMEGA CENTER FOR SUSTAINABLE LIVING

Rhinebeck, New York



ENVS 664

October 20, 2010

Pitchayanin Sukholthaman

# About OCSL

- **Location:** Rhinebeck, NY
- **Building type:** Interpretive Center, Laboratory
- **Area:** 6,250 ft<sup>2</sup> (4.5 acres)
- **Project scope:** a single building
- **Project cost:** \$2,800,000 (land excluded)
- **Completion:** May 2009



# About OCSL (cont.)

- Omega Center for Sustainable Living (OCSL) is an organization under Omega Institute for Holistic Studies.
- In 2005, it wanted to replace the wastewater septic system by using alternative methods, which were able to complete a closed hydrological loop in water use.
- It has set out the use of water system and building as a teaching tool in their educational program designed around the ecological impact of their campus.

# About OCSL (cont.)

- OCSL today serves as the heart of Omega's environmental initiatives.
- OCSL declares itself as an environmental education center and natural water reclamation facility to meet the highest standards currently available in sustainable architecture.



# About OCSL (cont.)

- **OCSL's criteria of the natural water reclamation system:**
  - Water reclamation using **zero chemicals**
  - Water reclamation using **low energy**
  - **Educational opportunities** for individuals and groups

# Building Elements



# Building Elements - SITE

- OCSL is located on **195 acres** in Hudson Valley, Rhinebeck, New York.
- The building was built on **an old landfill**
- The site was cleared before the construction started.



# Building Elements - Water reclamation

- **Rainwater** is collected, purified, and then used for site maintenance and in the building's toilets.
- All water on the campus is used and purified in a closed hydrological loop by the **Eco Machine™**
  - Maximum capacity of purifying water is 52,000 gallons /day
  - Takes approximately 36 hours to process wastewater
  - Water is purified by microscopic algae, fungi, bacteria, plants, and snails

# Building Elements - Water reclamation

- **Seven Steps of Eco Machine™**
  - Solid settlement tanks
  - Equalization tanks
  - Anoxic tanks
  - Constructed wetlands
  - Aerated lagoons
  - Recirculating sand filter
  - Dispersal fields



# Building Elements - Energy

- Systems are supplied by **100% energy from the 211 photovoltaic solar panels** that integrated into the building.
- Use of **100% geothermal energy** for heating and cooling the building
- **Energy reduction** is achieved in the greenhouse,
  - Vent windows are able to open or close to control the amount of solar radiation.

# Building Elements - Electricity

- OCSL is a **net zero energy building**.
- Three solar arrays generate electricity more than what the OCSL can use on an annual basis.
  - Generate 134.20 kilowatt per day
  - Demand 132.77 kilowatt per day

# Building Elements - Materials

- OCSL's building materials were selected to **avoid harmful chemicals**.
  - New wood materials came from the Forest Stewardship Council (FSC) certified sources.
  - Concretes were sourced locally
  - Recycled metal, cardboard, rigid foam, and wood



# Building Elements – Indoor environmental quality

- **Operable windows** are applied to provide wellbeing and enjoyment to visitors.
- **Floor plan** orients in an east-west axis for the best control of daylighting.
- **Evaluation of building materials** for durability, environmental impact, and impact on indoor air quality

# GREEN HONORS

- ***Living Building Challenge™ Certification, 2010***
  - Achieved full certification under the Living Building Challenge™ from Cascadia Region Green Building Council
- ***LEED Platinum Certification, 2010:***
  - Achieved the highest green building designation available from the U.S. Green Building Council
- ***AIA/COTE 2010 Top Ten Projects Award***
  - Received the green building industry's highest award for sustainable design excellence.
- ***High Performance Building Designation from NYSERDA, 2009:***
  - The performance exceeded 30% of designated code of the New York State Energy Research and Development Authority

# WHAT TO BE IMPROVED?

- The OCSL should conduct a **life cycle assessment** of all elements to make sure that its sustainable goal is achieved.
- It has to focus on its **monitoring and evaluation process**.
  - It is very important to ensure that all elements in the Eco Machine™ are properly functioned.
  - To avoid contaminated water that will be released to natural water resource

# CONCLUSION

- The OCSL building is a **very green building and green interior**.
  - It integrates the most cutting edge technology, finest design of green building, environmental friendly materials, and the latest wastewater treatment technologies under one roof.
  - If all systems of the building are able to work effectively and efficiently in long term
  - It is considered one of the greenest buildings in the world



Thank You

