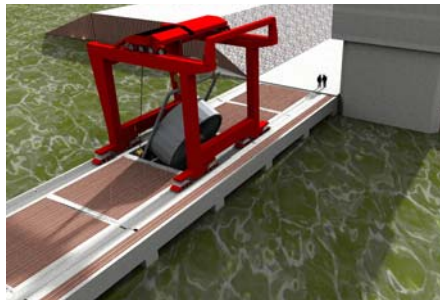
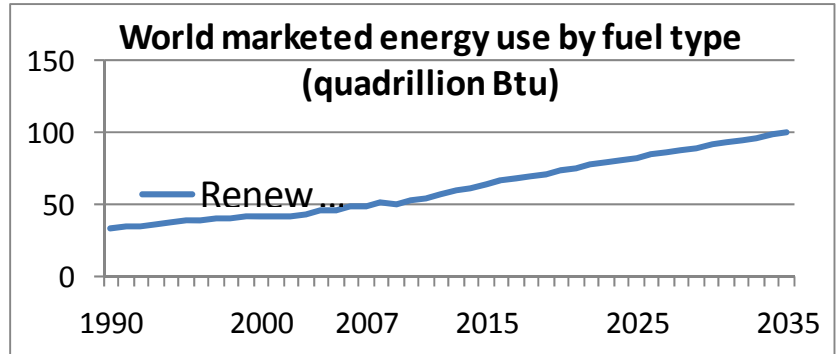


Energy Efficiency & Renewable Energy

The development of renewable energy resources and the conservation of energy through energy efficiency has received considerable focus for the past several years and will continue to be an area of growth and development for years to come. Klingner & Associates understands the importance of Renewable Energy

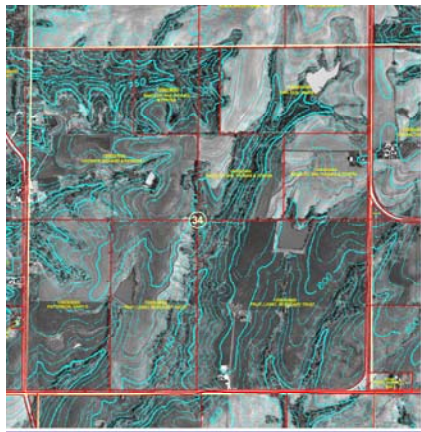
Development and Energy Efficiency and has been an early leader in the Renewable Energy Development and Energy Conservation field. Klingner has an extensive and innovative history including one of the State of Illinois' first municipal owned geothermal buildings, completed in 1984 for the Village of Camp Point, Illinois. More recently, under Klingner's guidance (and along with Mead & Hunt of Madison, Wisconsin serving as a sub-consultant), the City of Quincy, Illinois has been issued preliminary permits for the development of low-head hydropower at Lock and Dam Nos. 21, 24, and 25 on the Mississippi River. These projects



will be the first in the United States to use a new and revolutionary very low head or VLH technology developed by MJ2 Technologies S.A.R.L of



Millau, France. These turbines were selected for the project based on their ability to efficiently convert low head water conditions to electrical power as well as their fish friendly operation. Project construction for the hydropower project at Lock and Dam No. 21 is to start in 2012 and should be completed by January 1, 2014. Klingner has also



Sections: 27, 28, 33, 34

**Legend**

- Parcel Lines
- Section Lines
- Section Number
- Contour Lines
- Parcel I.D. No.
- Property Owner

Scale: Feet  
 0 500 1000

**Sources**  
 Contour Data: USGS 1:50,000  
 Parcel Data: Adams County Parcel Data  
 Section Data: Adams County Parcel Data  
 All Data Provided by M2 Data (Phone 612-290-0000)

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provided assistance to the City of Burlington, Iowa for hydropower development at Lock and Dam No. 18 by assisting in the procurement of a preliminary permit for the site and the development of a feasibility study.

In addition to the development of hydroelectric power, Klingner has also provided consulting services for wind energy development. Klingner provided environmental permitting, GIS/Mapping/Topographical Elevation site planning, cost estimating on civil works, and economic development coordination with Pike County and Adams County Illinois on project alternatives, as well as wind power environmental impact studies for northeast Missouri.

Photos: (top) Graphed data from Energy Information Administration; (left) rendering-Quincy Area Hydropower Project Crane View of Turbine; (right) Lock & Dam 21; (bottom) Mapping Section Chart of GIS for wind energy project

# Energy Efficiency & Renewable Energy

Klingner & Associates' **design philosophy** is to incorporate energy efficiency into all of our projects. In doing this, we take a **whole-building approach** rather than just concentrating on separate systems or components. Taking this approach requires coordination with the architect and the structural engineer to design a building envelope that contributes to the overall energy efficiency of the building. It does not make sense to have energy efficient systems in a building with a poor building envelope. A good building envelope provides multiple benefits – reduced heat loss/gain, lower initial HVAC cost, reduced HVAC operating costs, and improved occupant comfort.



We look at how insulation systems, HVAC, windows, lighting systems, lighting controls, and hot water usage relate to the overall building efficiency. This allows us to design buildings that are energy-efficient, yet cost-effective to build. Knowing how these systems interrelate improves **overall** building energy efficiency, not just individual systems within the building. Checking utility bills for



buildings designed by Klingner & Associates has shown that our buildings have significantly lower annual operating costs than comparably-sized buildings from other design firms.

Klingner & Associates identifies new technologies and incorporates them into our designs when it is cost effective. New technologies such as LED lighting offer reduced operating costs and lower maintenance. We have successfully designed several projects which are 100% LED lighting (see photos).



LED lighting for energy conservation in public facilities will become more and more important.

Benefits of LED lighting include:

- Energy Conservation
- Cost effective
- Aesthetic effects
- Complements other sustainable development
- Health and safety benefits (reduction of light pollution and heat generation)

We continue to research new technologies to provide our clients with more efficient buildings, such as more efficient hot water heating and ventilation energy recovery.

Photos (top to bottom) - LED Lighting at: Quincy Park District Washington Park, Quincy Park District Bob Mays Park, Quincy Bay Bridge LED lighting concept.