

IPRO 319

Feasibility Assessment for Sustainable Hydroelectric Facilities in Northeastern Illinois

IPRO 319's objective is to determine the feasibility of converting one or more existing dams on the Fox River into low impact hydroelectric facilities, based upon the project's economic viability, stakeholders, permitting, and certification processes. In the end we have found that it is not economically feasible at this time, although we feel there are more reasons that profit to continue, such as environmental preservation and sustainable energy development. The next step is to find investors to fund the project and submit permitting applications.

1. Economic assessment:

- a. Develop an economic analysis that balances realistic results with inherent limitations.
 - i. Employ a series of filters to recognize best candidate(s).
 - ii. Investigate possible turbines.
 - iii. Examine existing hydroelectric facilities.
 - iv. Generate potential output for each dam.
 - v. Develop cost report.
 - vi. Compare cost with benefit.
 - vii. Adapt as complications arise.
- b. Three dams emerged as the best possible sites Elgin north, Geneva, and Stolp Island west. The projected return on this project is seventeen years, much higher than the investor friendly number of ten or fewer years.

2. Stakeholders:

- a. Environmental Groups and Objectives Identified
 - i. Sierra Club, Valley of Fox Group, Fiends of the Fox River, Fox River Ecosystem-Partnership, Illinois Smallmouth Alliance, etc.
 1. Want dams removed or modified with fish passages and portages for recreation
 2. We chose a fish friendly turbine that can act similar to fish passage
- b. Owner of Dams and Support Identified
 - i. Found which dams are owned by state (Geneva) and owned by city (Stolp Island, Elgin)
 - ii. Both the cities of Elgin and Aurora said if the project is feasible then they would support the project
 - iii. For state owned dams a proposal would need to be submitted to various departments before support is given
- c. Utility Company Identified
 - i. ComEd powers Elgin and Aurora but was unable to provide a Power Purchase Agreement at this time
 - ii. Geneva is powered by a Wisconsin company and wishes to soon provide its own power such as hydroelectric

3. Permitting

- a. Determine the authorities responsible for the issuance of required permits
 - i. Permits are issued by USCOE, IDNR/OWR, IEPA, FERC, and DOI
- b. Summarize the permitting process
 - i. Joint application for USCOE, IDNR/OWR, and IEPA
- c. Determine the length of time required for the permitting process
 - i. Permitting process takes on average 4 years

4. Certification

- a. Illinois Sustainable Energy Plan
 - i. Renewable Portfolio Standard
 1. 2% of total energy come from renewable sources in 2006
 2. increase by 1% each year until 2012 when 8% of energy will be from renewable sources
 3. 75% of the renewable energy is to come from wind power
 4. Low environmental impact hydropower is included in the other 25% of renewable sources
- b. Our project will show how low impact hydropower is an unused resource in Illinois that has a great potential as a renewable energy source.

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