Value Engineering in Conestoga's APFM Program

CONESTOGA
Connect Life and Learning

Julia Biedermann PhD PEng
Chair, School of Engineering & IT
Conestoga College ITAL

Tammy Dow M.Sc.Eng, P.Eng, CVS
Project Manager
HDR Corporation

Architecture – Project & Facility Management

- Bachelor of Applied Technology, 4 year degree
- Architecture program with a focus on project & facility management
- Accredited by IFMA
- Project-based curriculum
- Two technical elective streams
  - Project Management & Facility Management

Technical Elective Streams

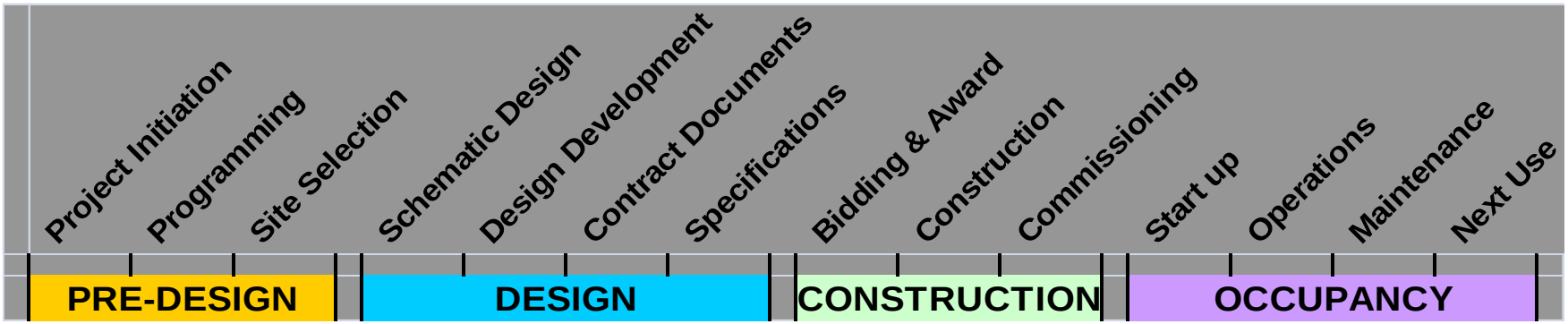
PROJECT MANAGEMENT

- Development Economics
- Construction Risk Management
- Construction Quality Management
- Construction Planning & Scheduling
- Value Engineering & Life Cycle Costing

FACILITY MANAGEMENT

- Facility Operation & Maintenance
- Utilities Management
- Computer Aided Facility Mgt
- Advanced Building Performance & Automation
- Facility Planning & Mgt III

Why Value Engineering?



Curriculum considers projects from inception to operation & next use.

Goal is often the lowest life cycle cost over the life of the facility.

Course Requirements

- 45 hour class over 15 weeks (3hrs/week)
- 16 students in the class
  - 4 groups of 4
- Students conducted a Value Engineering Study
  - Prepare a VE Report for the client
  - VE Presentation to the client

Industry Partnership for the Project

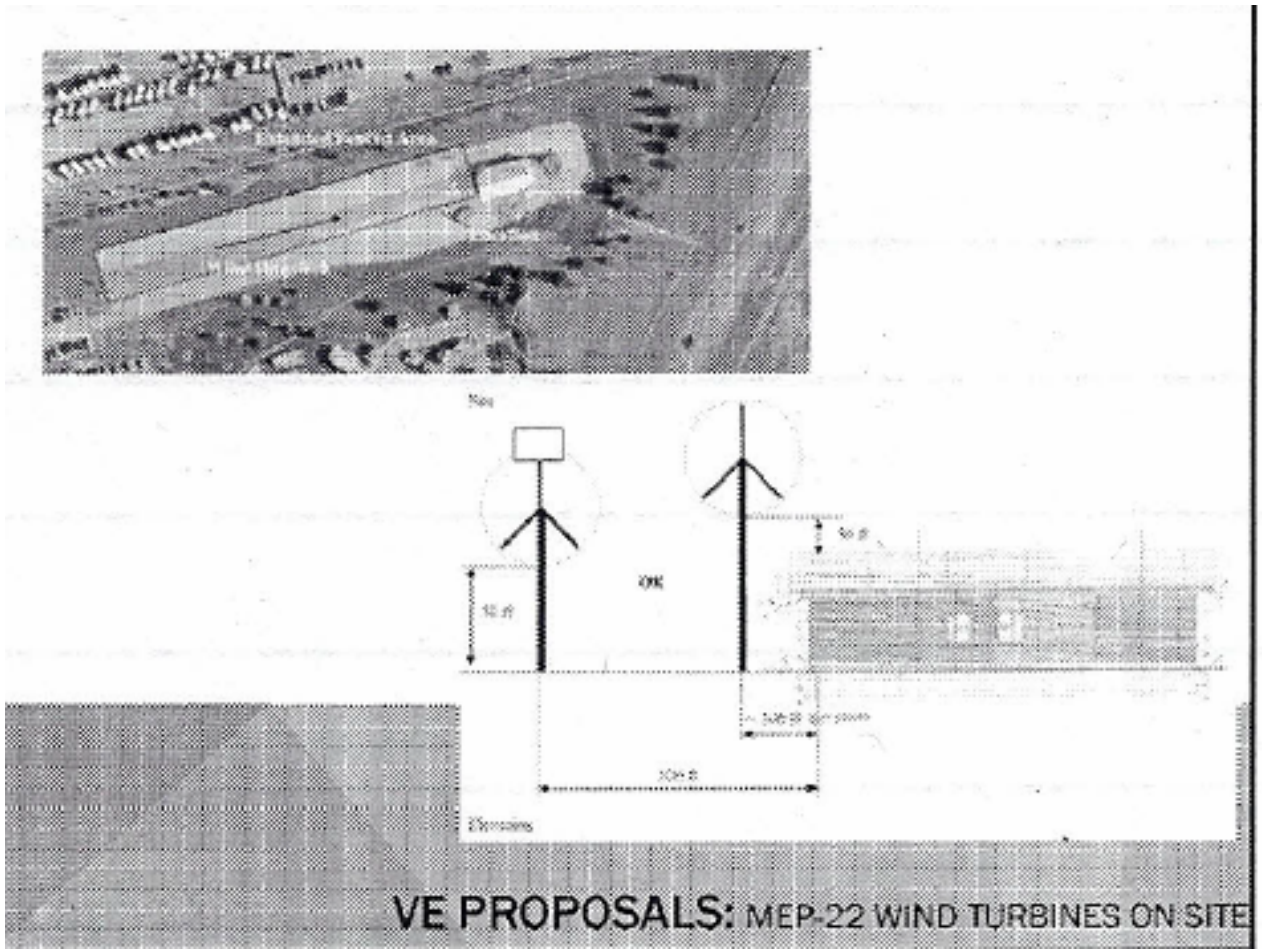
- Important that the course be taught in the context of a real life project

- **Client:** Region of Waterloo
- **Project:** Voice Radio Building and Tower, Cambridge
- **Value Engineering:** How can the building be run off green energy?

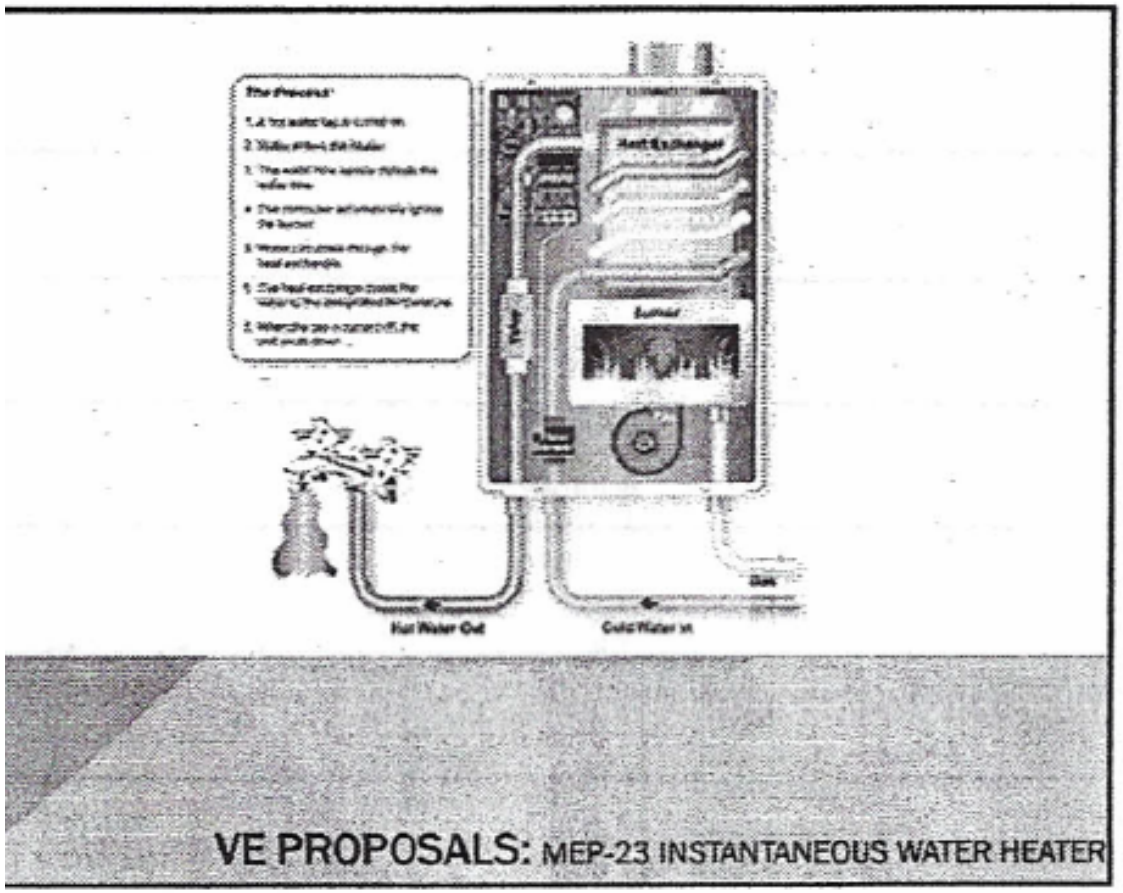
Support Provided

- Materials provided to the students
  - RFP for the building construction
  - Drawings
  - Utility usage data
- Answers to student questions
- Site Visit lead by the Region
- Presentations attended by Region rep.

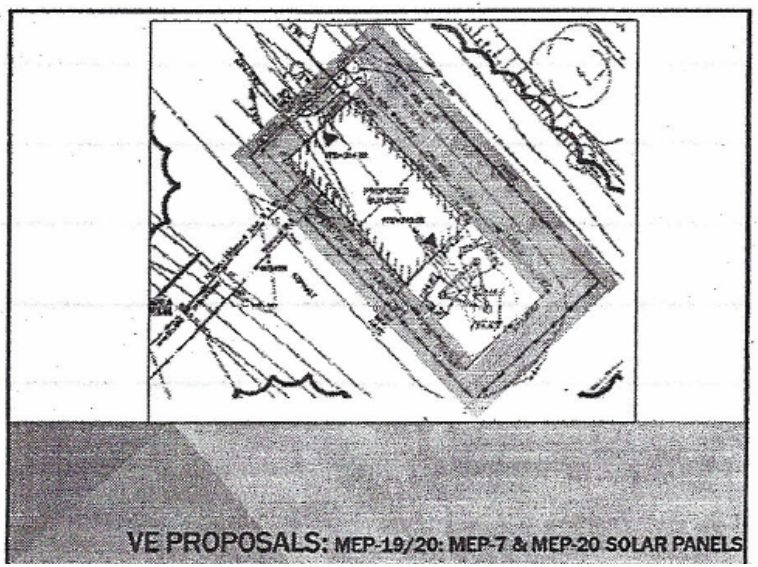
Student Ideas

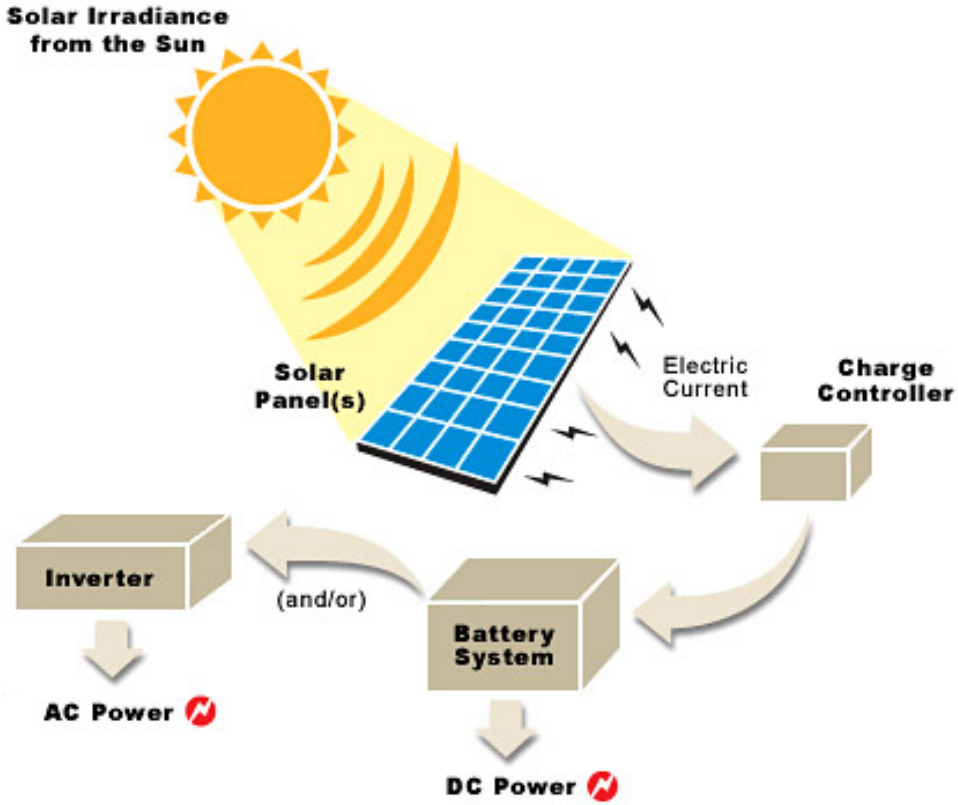


Student Ideas



Student Ideas





Student Ideas

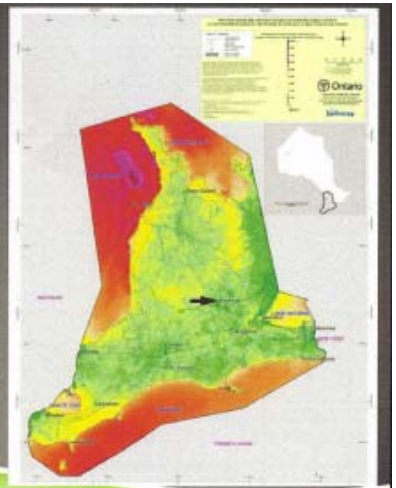
PROPOSALS 3
WIND TURBINE ON SITE

Wind Power Density Map

Kitchener-Waterloo Area

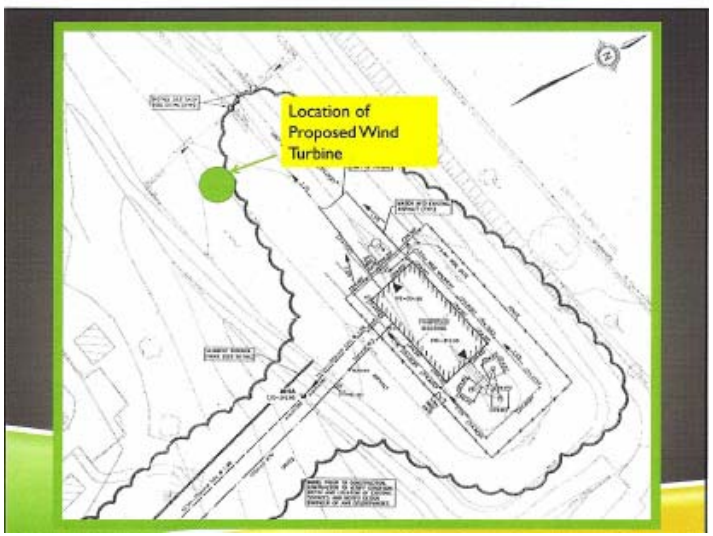
Average Wind Density at 50':

200 W/m2



PROPOSALS 3
WIND TURBINE ON SITE

- Advantages
  - $ competitive with Coal Fired Plants
  - Clean- No pollutants
  - Service life
  - Income Source
- Disadvantages
  - Noise
  - Inconsistent
  - High initial cost + Installation
  - Adequate space needed
  - Height Issue (Guidelines)



PROPOSALS 3
WIND TURBINE

Initial Cost	$165,000.00
Tax (13% HST)	$21,450.00
Government Incentive (10%)	($16,500.00)
Total Initial Cost	$169,950.00
Maintenance	$4,301.00
Income	($340,008.41)
Repairs	$1,687.46
Salvage Value	($8,376.27)
Total Present Worth	($172,446.21)

Benefits

- Students obtained experience in:
  - Working with a real client
  - Value Engineering on a real project related to their field of study
  - Report writing and presenting for a real client

Benefits

- Region of Waterloo
  - Value Engineering of their project
  - "***This was a very positive experience. It provided new ideas that may have not been considered.***"
  - Most of the groups dealt with large 'green ticket items' and not just smaller tasks like new lightbulbs etc.
  - The student recommendations will be reviewed when the building is to be retrofitted
  - Will provide projects for future VE courses

Going Forward

- Value Engineering & Life Cycle Costing course will continue to be offered
- Essential that we continue to use a real life project related to the built environment