



BLCC Software Workshop

Eric Oliver, PE, CEM, LEED

EMO Energy Solutions, LLC

August 7, 2006

www.emoenergy.com



BLCC Software Workshop

Life Cycle Cost Analysis (LCCA)

- **Method to Compare alternative designs that have different Initial and Operating Costs**
 - **Energy Costs**
 - **Water Costs**
 - **Maintenance Costs**
 - **Replacement Costs**
- **Includes time value of money over study period**
 - **Projected Utility Rate Changes**
 - **Effect of Delaying Implementation**
 - **Effect of Increase in replacement equipment Costs**



BLCC Software Workshop

Development of BLCC Software

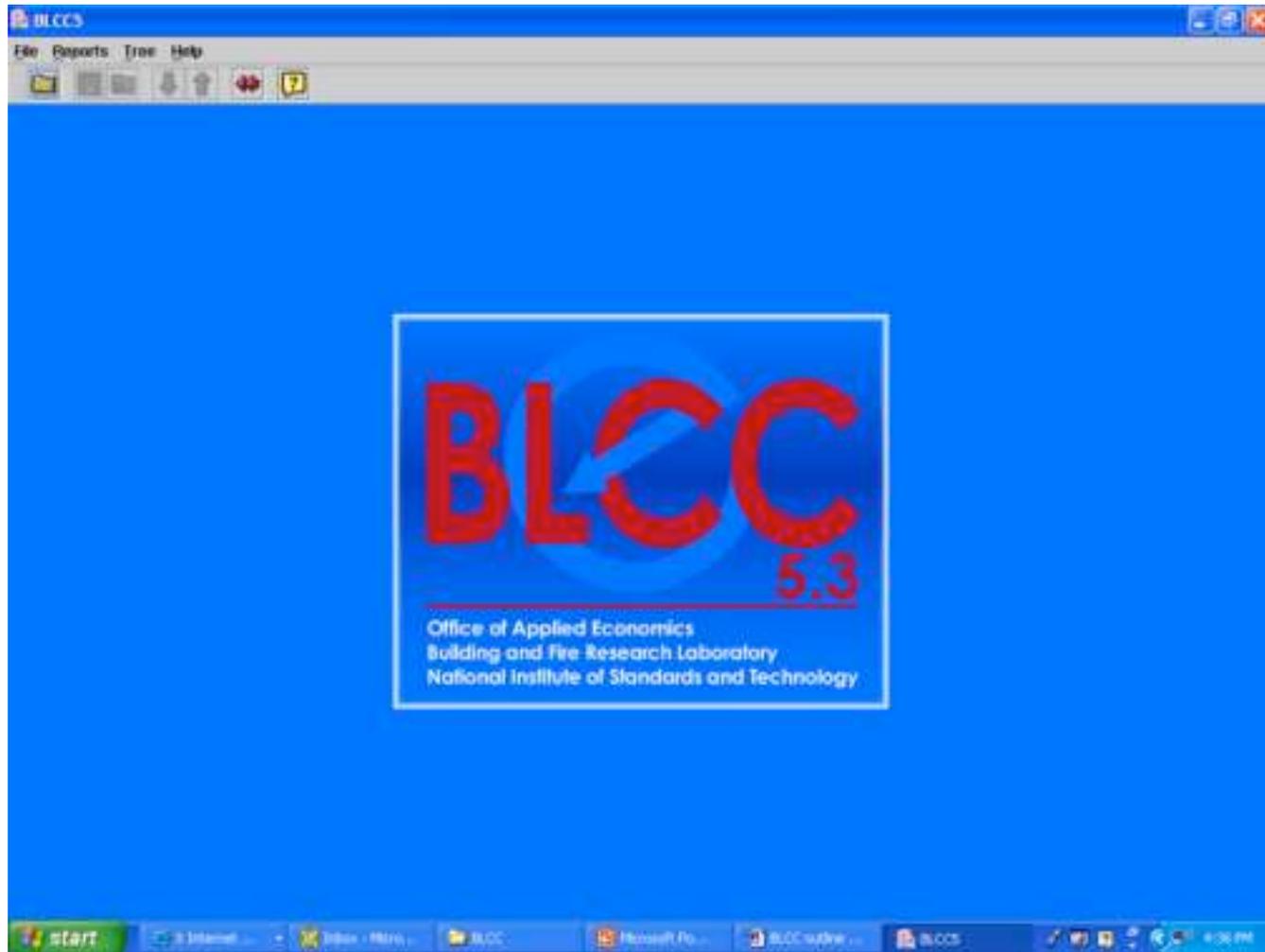
- **Developed by the National Institute of Standards and Technology (NIST)**
- **Originally DOS based program**
- **BLCC5 is a windowed version of its predecessor, the DOS-based BLCC 4.9-06.**
- **Supporting Documents:**
 - Handbook 135, the *Life-Cycle Costing Manual for the Federal Energy Management Program (FEMP)*
 - The Annual Supplement to Handbook 135 (ASHB 135), *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis*

Available for free download:

www1.eere.energy.gov/femp/information/download_blcc.html



BLCC Home Window





Introduction to BLLC

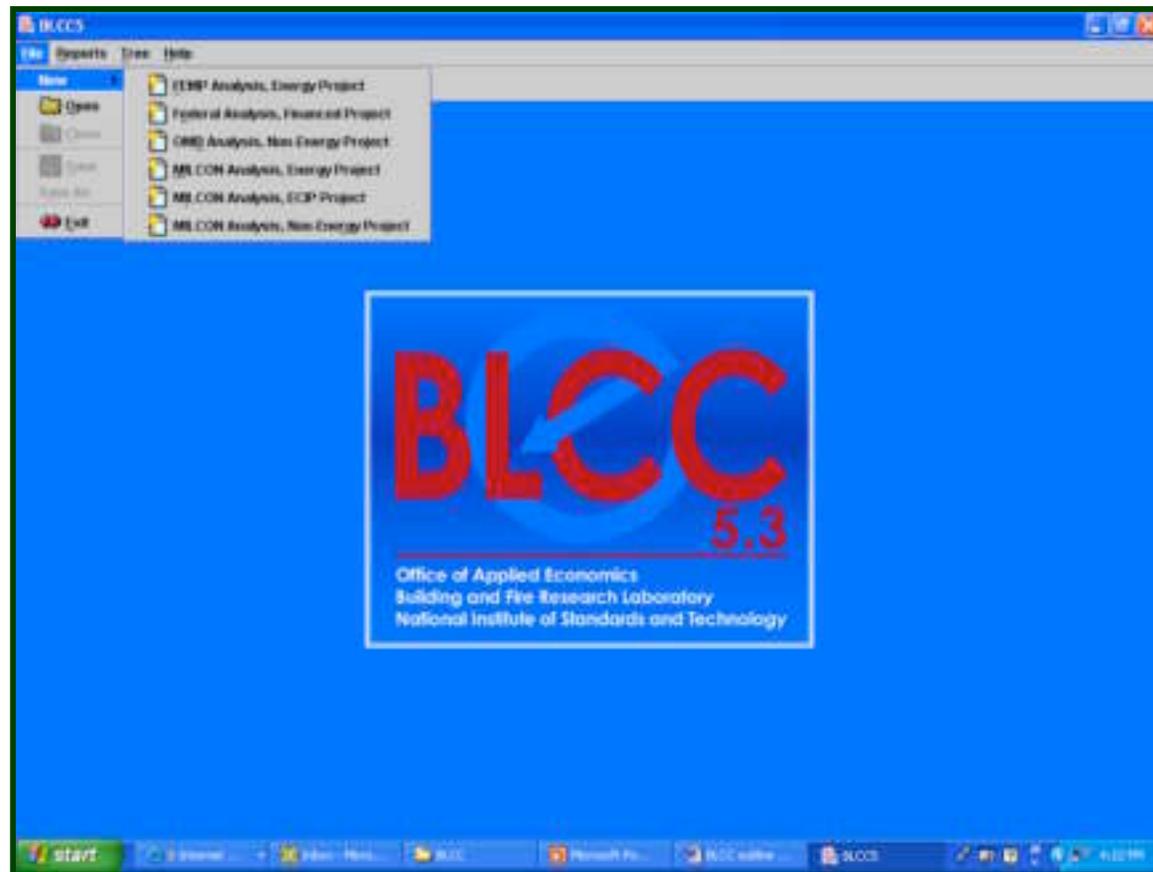
Six Modules

- 1. FEMP Analysis, Energy Project**
for energy and water conservation and renewable energy projects under the FEMP rules based on 10 CFR 436
- 2. Federal Analysis, Financed Project**
for federal projects financed through Energy Savings Performance Contracts (ESPC) or Utility Energy Services Contracts (UESC) as authorized by Executive Order 13123 (6/99)
- 3. OMB Analysis, Non-Energy Project**
Projects subject to OMB Circular A-94 for non-energy, federal government construction projects, but not water resource projects;
- 4. MILCON Analysis, Energy Project**
for energy and water conservation and renewable energy projects in military construction
- 5. MILCON Analysis, ECIP Project**
for energy and water conservation projects under the Energy Conservation Investment Program (ECIP)
- 6. MILCON Analysis, Non-Energy Project**
for military construction designs that are not primarily intended for energy or water conservation.



Introduction to BLLC

Sample: FEMP Analysis: Energy Project





Step 1. General Information

The screenshot displays the 'FEMP Analysis, Energy Project' software interface. The 'General Information' tab is active, showing the following fields and options:

- General Information:** Includes fields for Name (EPA Laboratory), Location (California), Analyst (Phil Wirtzek), and Comment.
- Discounting Convention:** Radio buttons for End-of-Year Discounting and Mid-Year Discounting.
- Analysis Information:** Radio buttons for Constant Dollar Analysis and Current Dollar Analysis. A Real Discount Rate field is set to 3.0%.
- Tip:** A scrollable text area containing the following text:
 - For locations outside the contiguous United States, the selection of U.S. Average may be appropriate.
 - Annually recurring costs can be discounted from the end of the year (FEMP) or the middle of the year (DoC) to the Base Date.
 - Constant-dollar amounts and real discount and escalation rates exclude general inflation.
 - Current-dollar amounts and nominal discount and escalation rates include general inflation.
 - FEMP discount and inflation rates, valid for energy and water conservation and renewable energy analyses conducted between April 1, 2005 and March 31, 2006:
 - Discount rates: 3.0% real
 - 4.9% nominal
 - Inflation rate: 1.8%



Step 2. Key Dates

FEMP Analysis - Energy Project

File Reports Tree Help

Project

General Information Key Dates Add Alternative

General Information

Base Date:	August	2008
Service Date (from Base Date):	1 year 0 months	
Length of Study Period:	16 years 0 months	

Tip

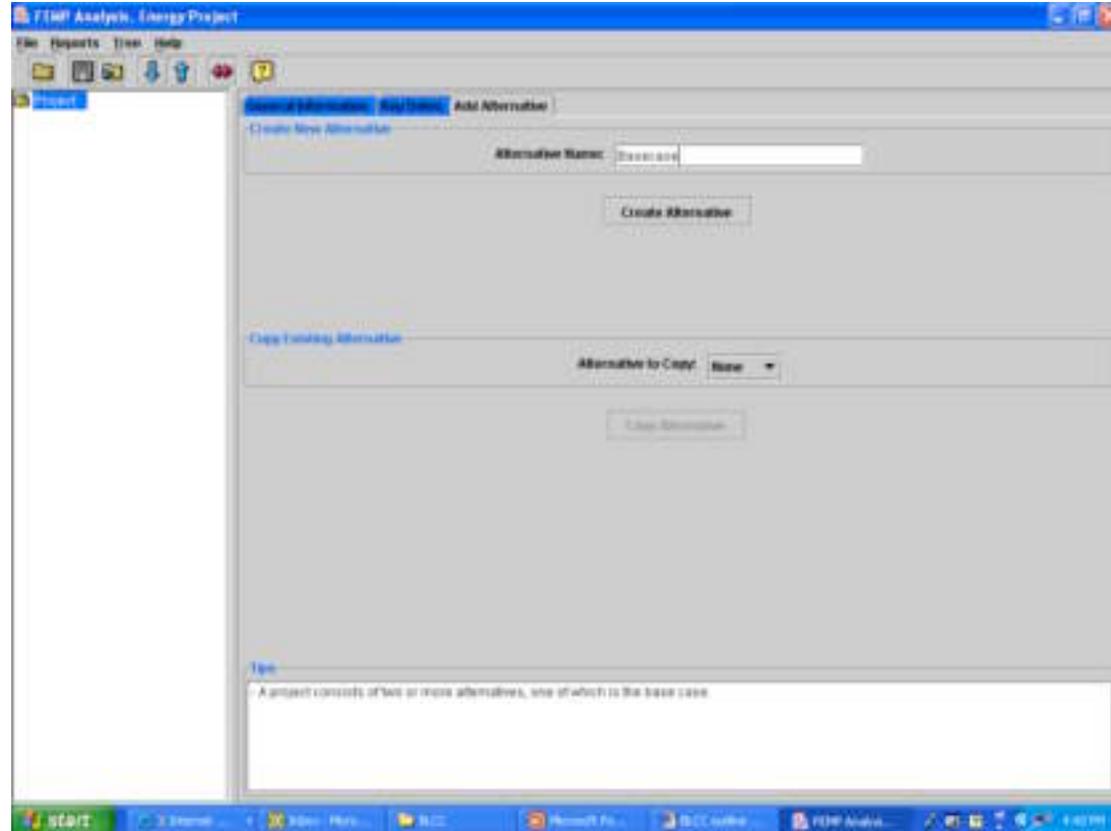
- Base Date is beginning of Study Period.
- Operational costs and replacement costs are timed from Service Date.
- Length of Study Period includes Planning/Construction/Installation Period and Service Period. Service Period cannot exceed 25 years in FEMP analyses.
- Add 'Y' to number of years and 'm' to number of months, e.g., 2y 4m or enter 'Y' for Remaining (years in study period)

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Step 3. Add Alternative

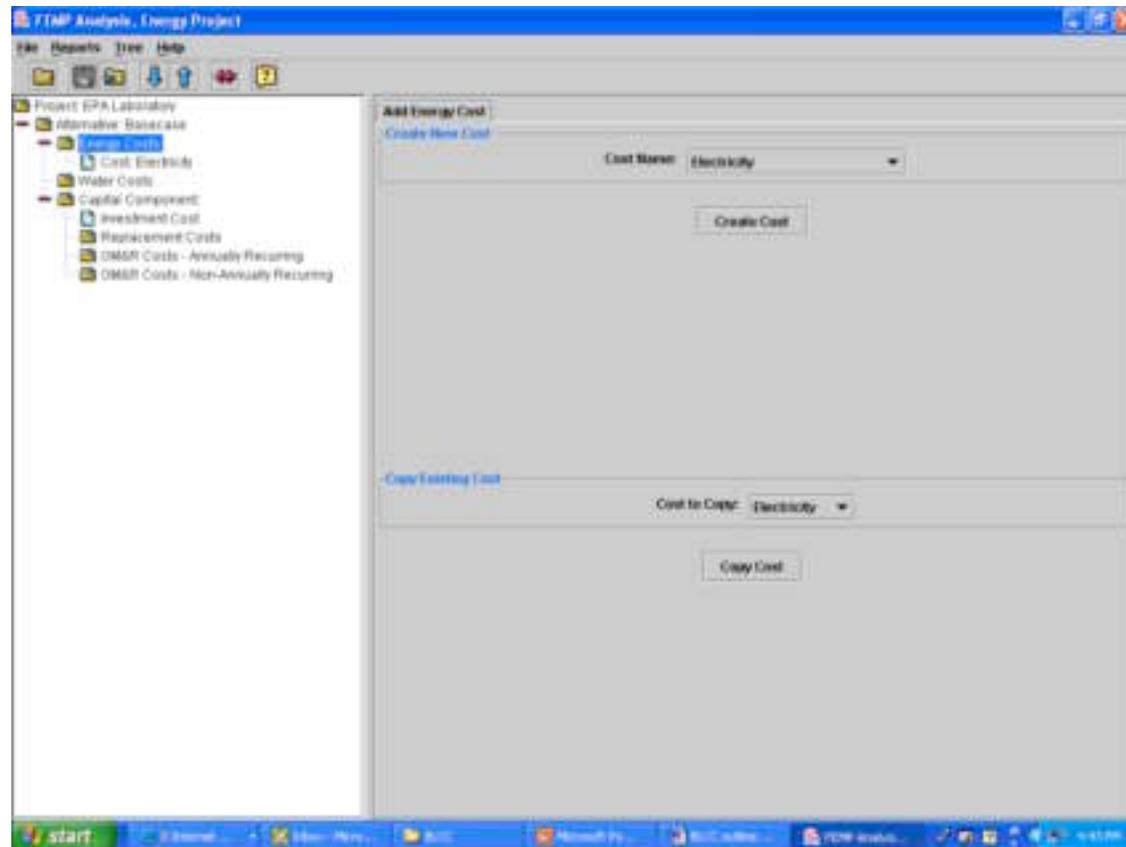
Create basecase





Step 3. Add Alternative

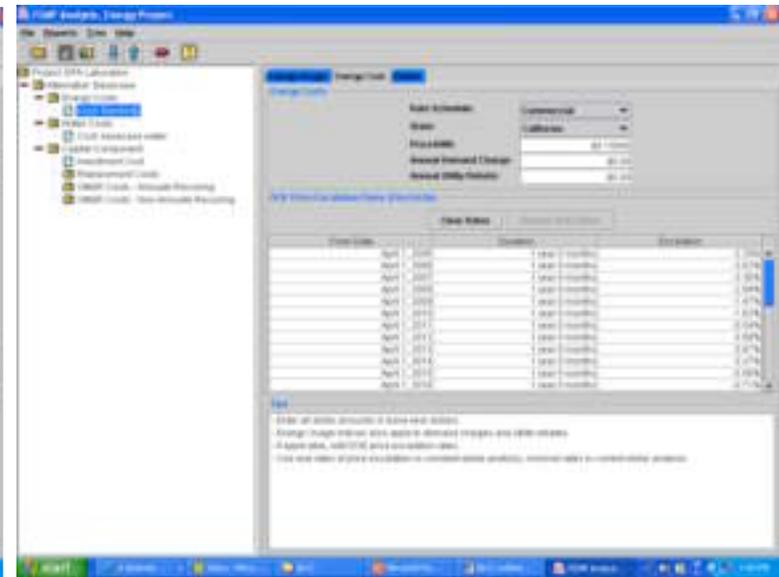
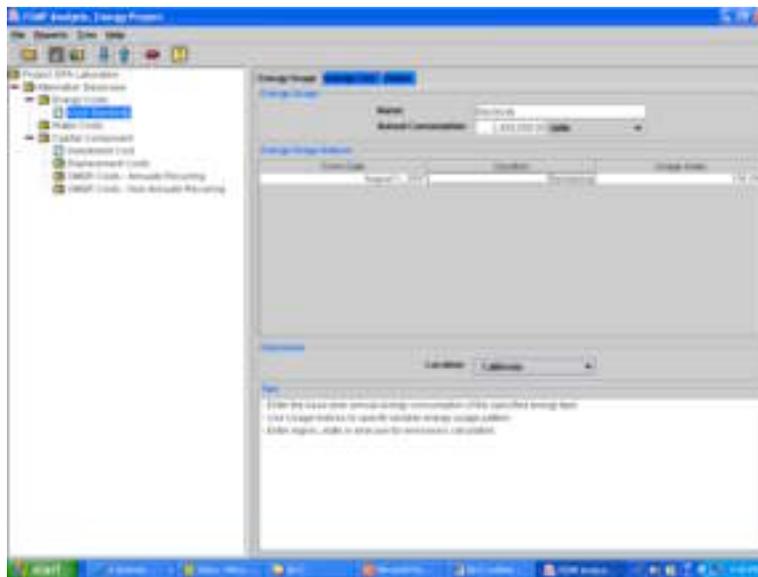
Add Basecase Costs





Step 3. Add Alternative

Add Basecase Costs





Step 3. Add Alternative

Add Water Basecase Costs (if applicable)

Project: EPA Laboratory

- Alternative: Basecase
- Energy Costs
- Water Costs
- Capital Components
- Investment Cost
- Replacement Costs
- OM&R Costs - Annually Recurring
- OM&R Costs - Non-Annually Recurring

Water Costs

Name: Basecase Water
Units: Liters

Annual Water Demand

Season	Units/Year	Population
Summer	0.000	0.00000
Winter	0.000	0.00000

Annual Water Disposal

Season	Units/Year	Population
Summer	0.000	0.00000
Winter	0.000	0.00000

Tips

- Enter all dollar amounts in base-year dollars.
- Use real rates of price escalation in constant-dollar analysis; nominal rates in constant-dollar analysis.
- Use Usage Indices to specify variable water usage and disposal.



Step 3. Add Alternative

Add Capital Investment Costs

The screenshot displays the 'FEP Analysis, Energy Project' software interface. The left sidebar shows a project tree with 'Alternative: BaseCase' selected, and 'Investment Cost' highlighted under 'Capital Component: BaseCase HWC'. The main window is titled 'Investment Cost' and contains the following fields:

- Initial Cost:**
 - Initial Cost (Base Year Dollars): \$1,200,000.00
 - Annual Rate of Increase: 5.00%
 - Expected Life (from Service Date): 15 years 0 months
 - Residual Value Factor (% of Initial Cost): 1.00%
- Cost Phasing of Initial Cost:**
 - Cost Adjustment Factor: 0.00%
 - Table with columns: Years/Months (from Date), Date, Percent.

Years/Months (from Date)	Date	Percent
0 years 0 months	August 1, 2008	100.0%

Tips:

- Initial Cost is incurred at the Base Date or phased in during the PVC Period.
- Enter expected rate of equipment price increase during Study Period.
- Enter Cost Adjustment Factor for phased-in initial investment cost.
- Use real rates in constant-dollar analysis, nominal rates in current-dollar analysis.



Step 3. Add Alternative

Add Replacement Costs

Replacement Cost

Capital Replacement Cost

Name:	Replacement compressors
Years/Months (from Service Date):	10 years 0 months
Amount:	\$100,000.00
Annual Rate of Increase:	3.00%
Expected Life:	0 years 0 months
Residual Value Factor:	0.00%

Tip

- Enter years and months from Service Date.
- Enter the amount in base-year dollars.
- Use real rates of increase in constant-dollar analysis, nominal rates in current-dollar analysis.
- Enter the Residual Value Factor as a percent of initial replacement cost.



Step 3. Add Alternative

Add OM&R Costs

The screenshot shows the 'FEMP Analysis, Energy Project' software interface. The left sidebar displays a tree view of project components, with 'Annually Recurring O&M Cost' selected. The main window displays the 'Annually Recurring O&M Cost' dialog box, which includes the following fields:

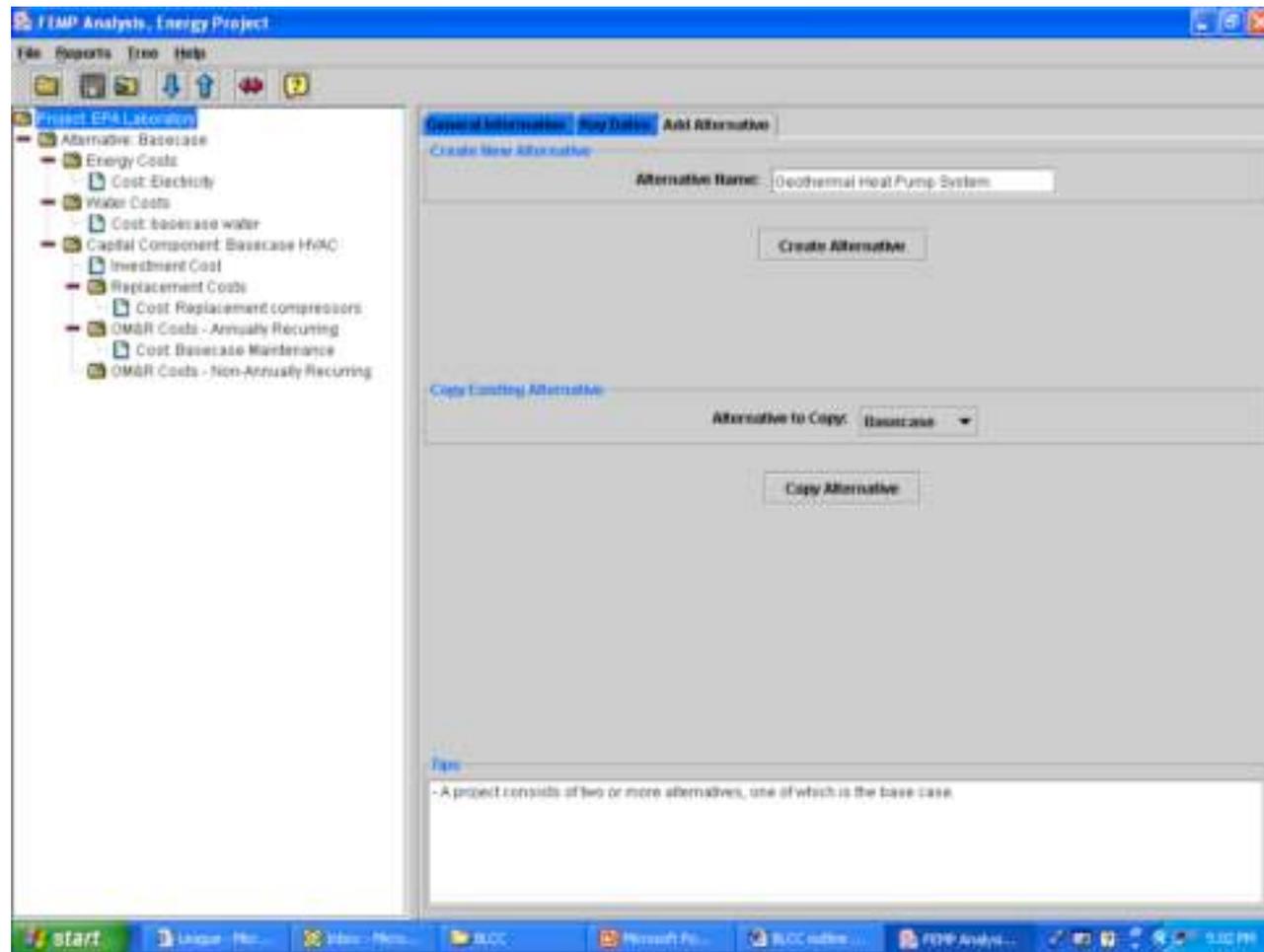
Name:	Basecase Maintenance
Amount:	\$93,000.00
Annual Rate of Increase:	2.00%

Below the fields, there is a 'Yes' button and a list of instructions:

- Enter amount in base-year dollars.
- Do not include energy or water costs.
- Use real rates of increase in constant dollar analysis, nominal rates in current dollar analysis.
- Use Usage Indices to specify variable O&M pattern.



Add Alternative Design





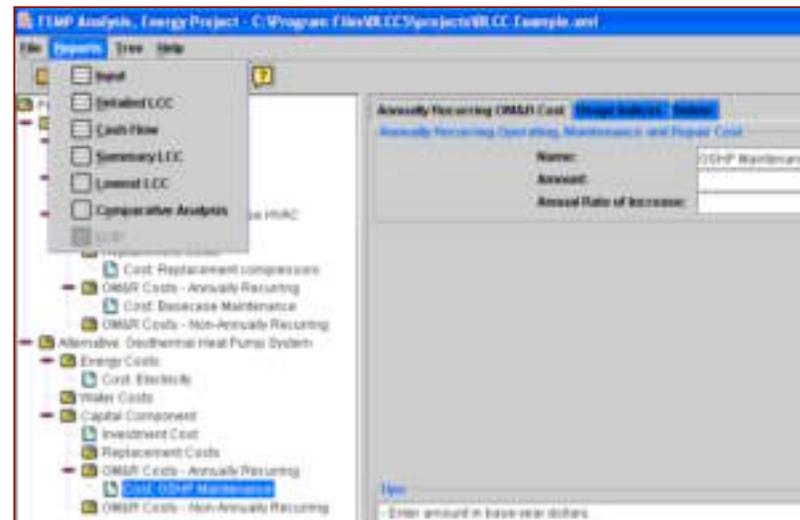
Add Alternative Design

The screenshot displays the 'FEMP Analysis, Energy Project' software interface. The left-hand tree view shows a project structure for 'Project: EPA Laboratory'. Under the 'Alternative: Geothermal Heat Pump System' (which is highlighted in blue), there are sub-items for 'Energy Costs', 'Water Costs', 'Capital Component', 'Investment Cost', 'Replacement Costs', 'OM&R Costs - Annually Recurring', and 'OM&R Costs - Non-Annually Recurring'. The right-hand pane is titled 'General Information' and contains a 'General Alternative Information' section with a 'Name' field set to 'Geothermal Heat Pump System' and an empty 'Comment' field. Below this, a 'Tips' section provides instructions: '- One of the alternatives can be the do-nothing case' and '- Enter Energy and Water Costs at the alternative level, other OM&R and Replacement costs at the component level.' The Windows taskbar at the bottom shows the 'start' button and several open applications, including 'League - Plo...', '360s - Plo...', 'BLC', 'Microsoft P...', 'BCC online...', and 'FEMP Analysis...'. The system clock indicates '8:03 PM'.



Generate Reports

- Detailed LCC
- Cash Flow
- Summary LCC
- Lowest LCC
- Comparative Analysis





Other Modules

Federal Analysis: Financed Project

1. No Study Period
2. Operation Costs and Maintenance Costs start at Start Date
3. Add "Annually Recurring Contract Costs"
 1. Annual Contract Payment
 2. Debt Service, or
 3. Performance Period Expense



Federal Analysis: Financed Project

Federal Analysis - Financed Project

File Reports Tree Help

PROJECT

- Alternative basecase
 - Contract Costs - Annually
 - Cost Debt Service
 - Contract Costs - Non-Ann
 - Energy Costs
 - Cost Electricity
 - Water Costs
 - Capital Component
 - Investment Cost**
 - Replacement Costs
 - OM&R Costs - Annual
 - OM&R Costs - Non-Ann

Investment Cost

Initial Cost

Initial Cost Paid by Agency (Base Year \$):	\$0.00
Initial Cost Financed (Base Year \$):	\$0.00
Annual Rate of Increase:	1.00%
Expected Life (from Base Date):	0 years 0 months
Residual Value Factor (% of Total Investment):	0.00%

Cost Phasing of Initial Cost

Cost Adjustment Factor: 1.00%

Years/Months (from Date)	Date	Portion
0 years 0 months	August 1, 2005	100.0%

Tip

- Initial (Investment) Costs Paid by Agency in base-year dollars are costs not included in annual Contract Payment (e.g., down-payment).
- Sum of Initial (Investment) Cost Paid by Agency and Initial (Investment) Cost Financed is used to calculate Residual Value.
- Enter expected rate of equipment price increase during Study Period.
- Enter Cost Adjustment Factor for phased-in initial investment cost.
- Use real rates of increase in constant-dollar analysis, nominal rates in current-dollar analysis.

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Other Modules

OMB Analysis: Non-Energy Project

- 1. Length of Study Period includes Planning/Construction/Installation Period and Service Period.**
- 2. OMB analyses allow unlimited study periods.**
- 3. Initial Cost is incurred at the Base Date or phased in during the P/C Period.**



Other Modules

MILCON Analysis: Energy Project

- 1. Operational costs and replacement costs are timed from Beneficial Occupancy Date**
- 2. Length of Study Period includes Planning/Construction/Installation Period and Beneficial Occupancy Period (Service Period)**
- 3. Beneficial Occupancy Period cannot exceed 25 years for energy or water conservation or renewable energy project.**



MILCON Analysis: Energy Project

Investment Cost

Initial Cost

Initial Cost (Base Year Dollars): \$0.00
Annual Rate of Increase: 0.00%
Expected Life (from BOC): 0 years 0 months
Residual Value Factor (% of Initial Cost): 0.00%

Cost Phasing of Initial Cost

Cost Adjustment Factor: 0.00%

Years/Months (from Date)	Date	Portion
0 years 0 months	August 1, 2006	100.0%

Tips:

- Use Cost Phasing feature if initial costs are incurred at Midpoint of Construction or any other date during PIC period.
- Enter expected rate of equipment price increase during Study Period.
- Enter Cost Adjustment Factor for phased-in initial investment cost.
- Use real rates in constant dollar analysis, nominal rates in current dollar analysis.



Other Modules

MILCON Analysis: ECIP Project

- 1. For New Construction**
- 2. Enter the differences in construction cost, SIOH and design cost for alternative relative to base case.**
- 3. Suggested default for SIOH is 6%, for Design Cost 10% of construction cost.**
- 4. Enter all added/reduced recurring costs**



Other Modules

MILCON Analysis: Non-Energy Project

- 1. Length of Study Period includes Planning/Construction/Installation Period and Beneficial Occupancy Period (Service Period).**
- 2. Beneficial Occupancy Period cannot exceed 25 years for energy or water conservation or renewable energy project.**
- 3. Operational costs and replacement costs are timed from Beneficial Occupancy Date**
- 4. OMB discount rates apply to MILCON design projects that are not primarily energy or water conservation projects.**
 - 1. HELP - Performing OMB Analyses - 2005 OMB Discount Rates.***



BLCC Walk-through

The screenshot displays the FEMP Analysis software interface. The title bar reads "FEMP Analysis, Energy Project - C:\Program Files\BLCC\projects\BLCC Example.xml". The menu bar includes "File", "Reports", "Tools", and "Help".

Project: EPA Laboratory

- Alternative: Basecase
 - Energy Costs
 - Cost: Electricity
 - Water Costs
 - Cost: basecase water
 - Capital Component: Basecase HVAC
 - Investment Cost
 - Replacement Costs
 - Cost: Replacement compressors
 - OM&R Costs - Annually Recurring
 - Cost: Basecase Maintenance
 - OM&R Costs - Non-Annually Recurring
- Alternative: Geothermal Heat Pump System
 - Energy Costs
 - Cost: Electricity
 - Water Costs
 - Capital Component
 - Investment Cost
 - Replacement Costs
 - OM&R Costs - Annually Recurring
 - Cost: GSHP Maintenance
 - OM&R Costs - Non-Annually Recurring