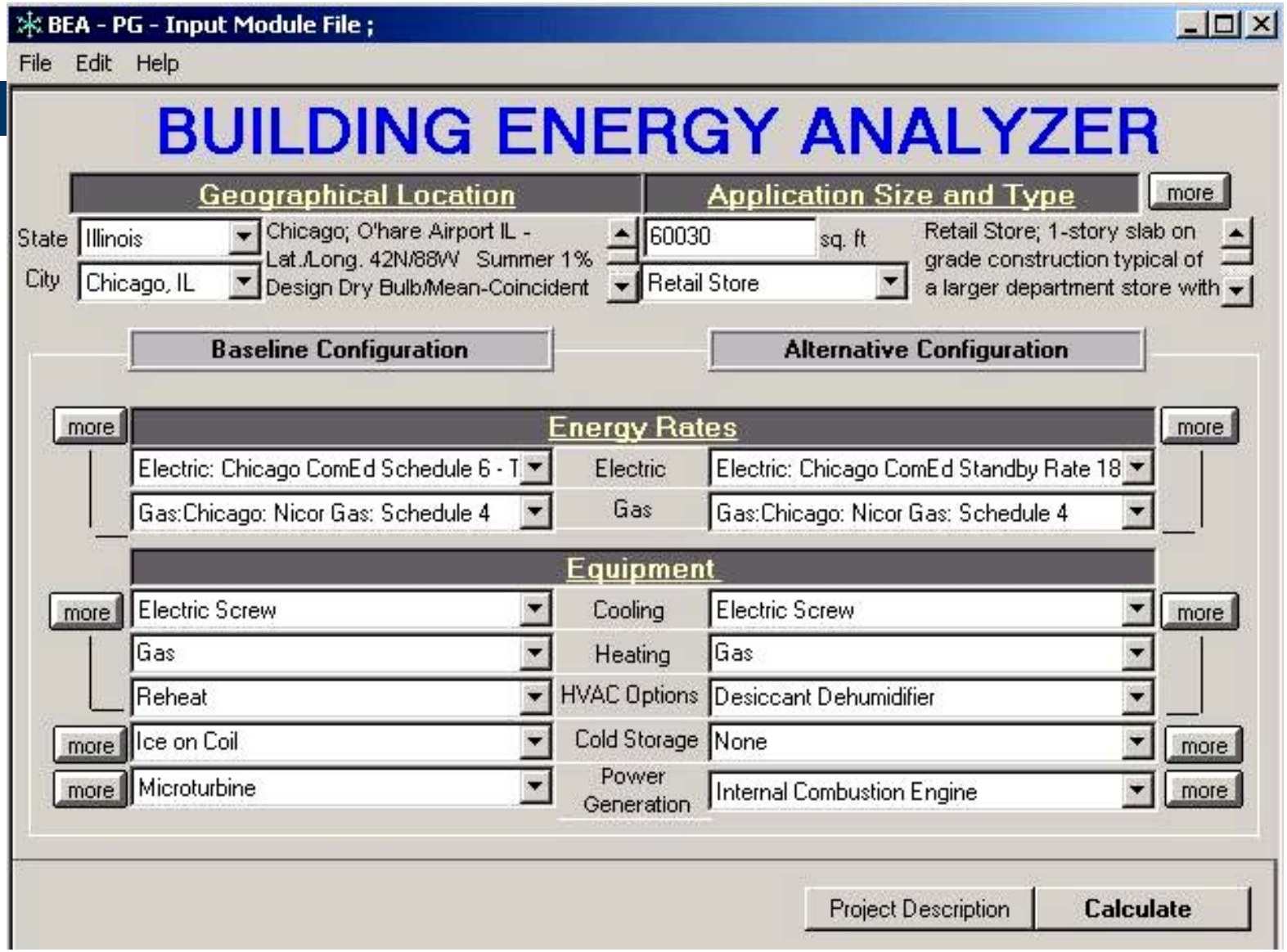
# Building Energy Analyzer (BEA)

- Developed by InterEnergy Software (Gas Technology Institute)
- Primary use:  Screening of CHP applications in commercial buildings using DOE-2 simulation engine
- Provides grid-based baseline comparison
- Data libraries: 8 types of generation equipment, 17 types of HVAC equipment, utility rates, weather, 15 specific building types (e.g., hospital, office, hotel, school, retail)
- CHP applications: Hot water, space heating/cooling, thermal storage, dehumidification
- Analysis duration/time step:  maximum of 35 years; monthly
- Economic analyses:  cash flow, payback, IRR
- Cost: $800  (http://www.interenergysoftware.com/)

# Input to BEA Is Through On-Screen Windows



# BEA Output Is Through On-screen or Printed Tables

3 of 4 | 75% | Total:1 | 100% | 1 of 1

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Input/Output Data Short Report

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OUTPUT DATA

| BASELINE | | | ALTERNATIVE | | |
|---|---|---|---|---|---|
| **HVAC and POWER GENERATION EQUIPMENT DESIGN CAPACITY** | | | | | |
| Cooling Capacity: | 203.17 | RT | Cooling Capacity: | 159.17 | RT |
| Heating Capacity: | 0 | Btu/hr | Heating Capacity: | 3,182,000 | Btu/hr |
| Total Supply Air: | 137,488 | CFM | Total Supply Air: | 137,488 | CFM |
| Outside Air: | 9,627 | CFM | Outside Air: | 9,627 | CFM |
| Cold Storage: | 0.00 | MMBtu | Cold Storage: | 0.00 | MMBtu |
| Power Generation: | 0 | kW | Power Generation: | 101 | kW |
| **QUALITY OF HUMIDITY CONTROL - TOTAL ANNUALY DURING OCCUPIED HOURS** | | | | | |
| Hours @ RH> 80 % | 101 | | Hours @ RH> 70 % | 0 | |
| **ANNUAL ELECTRIC ENERGY CONSUMPTION/GENERATION and GRID SUPPLIED ELECTRIC UTILITY COST** | | | | | |
| Total Consumption: | 2,413,875 | kWh | Total Consumption: | 630,910 | kWh |
| Utility Supplied: | 2,420,228 | kWh | Utility Supplied: | 349,303 | kWh |
| Generated On-Site: | 0 | kWh | Generated On-Site: | 288,024 | kWh |
| Elec. Gen. Overproduction: | 0 | % | Elec. Gen. Overproduction: | 2 | % |
| Cooling: | $ 122,745 | | Cooling: | $ 4,545 | |
| Desiccant Dehumidifier: | $ 0 | | Desiccant Dehumidifier: | $ 0 | |
| Heating/Reheating: | $ 0 | | Heating/Reheating: | $ 277 | |
| Fans: | $ 5,946 | | Fans: | $ 1,567 | |
| Refrigeration: | $ 0 | | Refrigeration: | $ 0 | |
| Other Electric: | $ 32,083 | | Other Electric: | $ 6,790 | |
| Stand by Charge: | $ 0 | | Stand by Charge: | $ 3,607 | |
| Grid Electric Energy Cost: | $ 160,774 | | Grid Electric Energy Cost: | $ 16,786 | |
| **ANNUAL NATURAL GAS ENERGY CONSUMPTION and GAS UTILITY COST** | | | | | |
| Total Consumption: | 129 | MMBtu | Total Consumption: | 22,808 | MMBtu |
| Building Consumption: | 129 | MMBtu | Building Consumption: | 19,005 | MMBtu |
| Power Generation Consumption: | 0 | MMBtu | Power Generation Consumption: | 3,803 | MMBtu |
| Recoverable Thermal Energy: | 0 | MMBtu | Recoverable Thermal Energy: | 1,563 | MMBtu |
| Recovered Thermal Energy: | 0 | MMBtu | Recovered Thermal Energy: | 28 | MMBtu |
| Cooling: | $ 0 | | Cooling: | $ 0 | |
| Desiccant Dehumidifier: | $ 0 | | Desiccant Dehumidifier: | $ 2,936 | |
| Heating/Reheating: | $ 306 | | Heating/Reheating: | $ 55,872 | |
| Power Generation: | $ 0 | | Power Generation: | $ 11,518 | |
| Other Gas: | $ 346 | | Other Gas: | $ 215 | |
| Gas Energy Cost: | $ 652 | | Gas Energy Cost: | $ 70,539 | |
| **TOTAL ELECTRIC and GAS UTILITY COSTS** | | | | | |
| Annual Energy Cost | $ 161,426 | | Annual Energy Cost | $ 88,765 | |
| | | | Note: Includes generator O&M cost of | $ 1,440 | |

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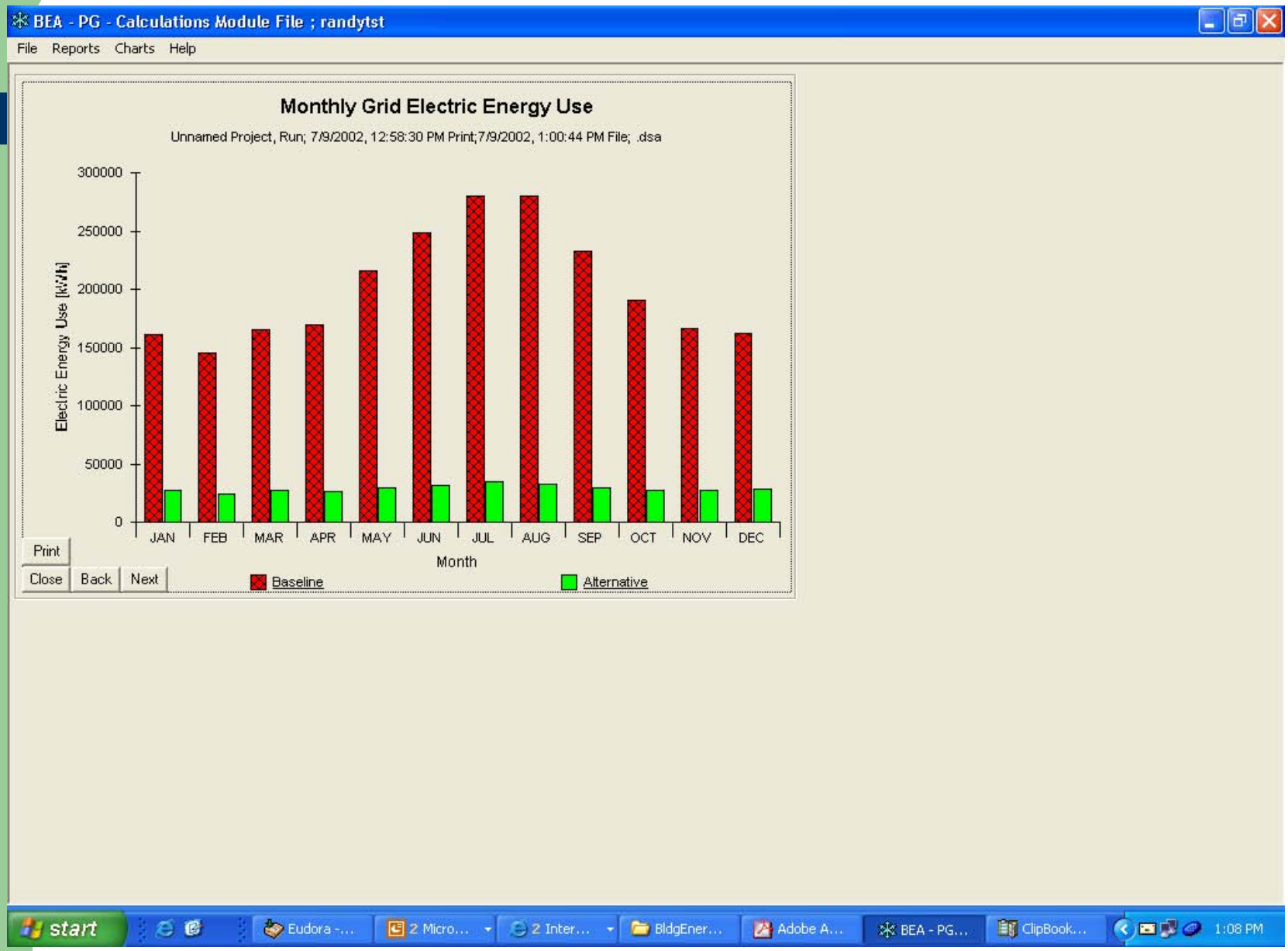
# . . . And A Selection of Graphs



# Building Energy Analyzer Output

- Tabular reports
  - Two levels of detail
  - Baseline and alternative results on annual or monthly basis
- Nine charts
  - Monthly and annual energy use and cost of electricity and gas
  - Humidity levels
  - Power generation heat recovery utilization