

# Software Design and Development Capabilities of Architectural Energy Corporation

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## General Capabilities

Architectural Energy Corporation (AEC) has been developing software for commercial release, to meet client specifications, and for in-house use since it was founded in 1982. The primary focus of these software projects has always been building energy engineering and codes. Many of the projects are database related –specifically the collection, storage and visualization of data. Recently, AEC has begun developing energy-related applications for the World Wide Web.

AEC's staff includes seven software developers with wide-ranging experience. Four of the developers have advanced degrees in building energy engineering and three have advanced degrees in computer science related fields. The programming staff is dedicated to keeping abreast of the latest advances in programming languages, environments, and techniques through continuing education and direct project experience in order to meet your specific building related software needs.

## Specific Capabilities

Developers at AEC have experience in the following programming languages, development environments, and computing platforms:

- C
- C++
- DemoShield, InstallShield
- Visual Basic (VB) and Visual Basic for Applications (VBA)
- Java, Java Beans
- FORTRAN
- LabView
- MS Access, SQL-Server, Sybase, JDBC, ODBC, FoxPro
- Microsoft Foundation Classes (MFC), Active-X
- HTML
- DOS, Windows 3.1, Windows 95/98, Windows NT, Unix (HP-UX, Linux)

## Software Applications Resume

Commercial software products developed, maintained and marketed by AEC include:

- **ENFORMA® Portable Diagnostic Solutions software** – A unique building system diagnostic package designed to create monitoring plans; program data loggers; and provide analysis tools for determining operational issues of HVAC, controls, and lighting systems.
- **DataManager™** – Allows a user to program AEC's MicroDataLogger Portable Data Acquisition system and create trend plots with the resulting logger data or export the data to a spreadsheet.
- **DG Pro™ Distributed Generation Screening Tool**– A screening tool for determining the economic feasibility of distributed power generation.
- **REM/Rate Home Energy Rating software™** – Most widely used rating software in the home energy rating software industry. In addition to calculating a rating score for homes, REM/Rate software calculates the economic benefits of energy-efficient designs and establishes compliance with MEC and other building codes.

- **REM/Design Home Energy Analysis software™** – REM/Design software calculates the economic benefits of energy-efficient home designs and establishes compliance with MEC and other building codes.

A sampling of custom software products AEC has recently developed for specific clients, include:

- **Atrium** – AEC was part of Honeywell’s Diamond development team, now known as Atrium. AEC designed and implemented a database and application to manage information about a building. The Atrium platform supplies web-based applications with information to perform analysis and optimization of building performance.
- **Data Visualization Tool** - Developed for a large utility company. A Visual Basic application that provides distributed access to a large hierarchical database of electric metered data. Charts, tables, and reports can be defined using innovative designers. New data can be calculated from existing information and visualized using an extensive set of filters and functions.
- **DVT** - Developed for Colorado School of Mines. This Visual Basic application is capable of automatically importing data from building monitoring and control systems (STAEFA in this case) into a database. This building data can then be used for equipment monitoring, performance evaluation, and tenant billing. DVT is capable of producing accurate tenant energy bills based on actual building energy consumption.
- **OAC** - Developed for PG&E’s Food Service Technology Center (FSTC). This Java applet (=Internet application) calculates outdoor heating and cooling loads for over 250 U.S. and Canadian locations. The OAC uses a subset from TMY2 weather data for its calculations. This easy-to-use applet can run on a local PC or over the Internet. It has the look and feel of a familiar application on any Java compliant platform, including Windows, Macintosh, and Unix systems.
- **REM/Gold** - Developed for Johns Manville. A C++ application that analyzes the economic benefit of upgrading insulation levels in homes.
- **Performance Home MH** - Developed for Johns Manville. A C++ application that analyzes the economic benefit of upgrading insulation levels in pre-manufactured homes and determines if those homes meet federal energy efficiency requirements.
- **Gold 90.1** - Developed for Johns Manville. A C++ application that determines if designs for metal buildings are in compliance with ASHRAE/IES Standard 90.1-1989.

Software developed primarily for use at AEC includes:

- **Survey-IT™** - An MS Access application used to enter and store data collected during energy-related building audits. Survey-IT has been used to collect data from over 600 buildings over the past 3 years. Different variations have been created that allow unique queries to be made on the data for reports or use by other applications like Model-IT.
- **Model-IT™** - A C++ application that reads databases created by Survey-IT, writes input files for the DOE-2 building energy simulation program, runs DOE-2, and organizes DOE-2 output into database tables.
- **TLC** - A Visual Basic application operated on a Windows NT system that provides 24-hour total laboratory control. TLC controls HVAC and equipment and laboratory instrumentation at AEC’s Commercial Kitchen Ventilation Laboratory in Wood Dale, IL. In addition to controlling supply and exhaust fans for an airtight room, this system processes and records approximately 100 different inputs from various laboratory instruments, ranging from air pressures to high accuracy temperature measurement.