

Facility Resource Energy Data (FRED) is a software tool designed to integrate and automate the collection, analysis, and distribution of utility-related data. FRED manages a complex set of tasks:

- Collect, validate, and process data from diverse sources – utility meters, data loggers, clerk's spreadsheets, and ODBC-compliant databases
- Control software like Microsoft Excel™ and SRC's Metrix™ to perform advanced analysis of the data
- Deliver the resulting information to end-users via local area network or the Internet.

FRED was designed for the specific needs of the U.S. Department of Energy's Hanford Site, providing access to electric, steam, natural gas, water, and other Site utility data. FRED's local area network module provides data access and other advanced features; the administrator module handles data collection and processing; and an Internet module provides access to registered users via the World Wide Web.

FRED is not a utility management and accounting software package – it is a systems integration control tool, providing pre- and post-processing of data for existing software, and managing other modules with distinct functions. FRED exchanges data with and controls standard utility-management software tools, thereby taking advantage of their advanced features.

The range of potential applications include military bases, federal agencies, industrial complexes, universities, schools, commercial and corporate facilities, hospitals, chain stores, and others – anywhere users need access to data and a flexible, modular tool to do the job. Experience has shown that a customized tool is often necessary to solve site-specific logistical problems. The flexible, modular nature of FRED makes it ideal for custom applications.

Background

FRED was designed with the specific needs of the U.S. Department of Energy's Hanford Site in mind, providing access to electric, steam, natural gas, water, and other Site utility data. FRED's local area network module provides data access and other advanced features, while an Internet module provides access to registered users via the World Wide Web.

Approach

FRED helps energy managers and rate-payers access, understand, and interpret dynamic data. Traditionally, this information was presented on a hard copy bill received in the mail. Even where computers are used, data streams are often manually controlled and manipulated rather than fully automated. FRED was developed to give facility and program managers needed access to continuous utility data and utility personnel a more efficient data processing system.

The software solution addresses several important goals:

- **Accessibility** – Be accessible by a large number of people.
- **Low Cost** – Have minimal maintenance requirements and users should be able to monitor energy usage without cost.
- **Linkable** – Link to data stored and maintained at various locations across the site in a variety of data formats.
- **Flexibility** – Be flexible to accommodate changing needs and additional features.
- **Automated** – Be automated where possible. The same data should not need to be entered and re-entered in different locations.
- **User Friendly** – Provide an easy-to-use graphical environment that can be used by inexperienced users.

Development

FRED uses Microsoft Windows™ features like Dynamic Data Exchange (DDE), Object Linking and Embedding

(OLE), and query databases using Structured Query Language (SQL) via Open Database Connectivity (ODBC) calls. FRED links to various databases across the Hanford Site, thereby ensuring the most up-to-date data available. FRED imports data as ASCII or spreadsheet files, interacts with other software (Microsoft Excel, Microsoft Access™, Metrix™), and presents the data to the user as a graphic on the screen, a printed report with graphics, or on disk in Microsoft Excel format.

The local area network (LAN) Module was developed in the Asymetrix Toolbook environment to provide a flexible modular tool that can be distributed without additional licensing costs. FRED's Internet Module provides registered users access to reports via the Internet.

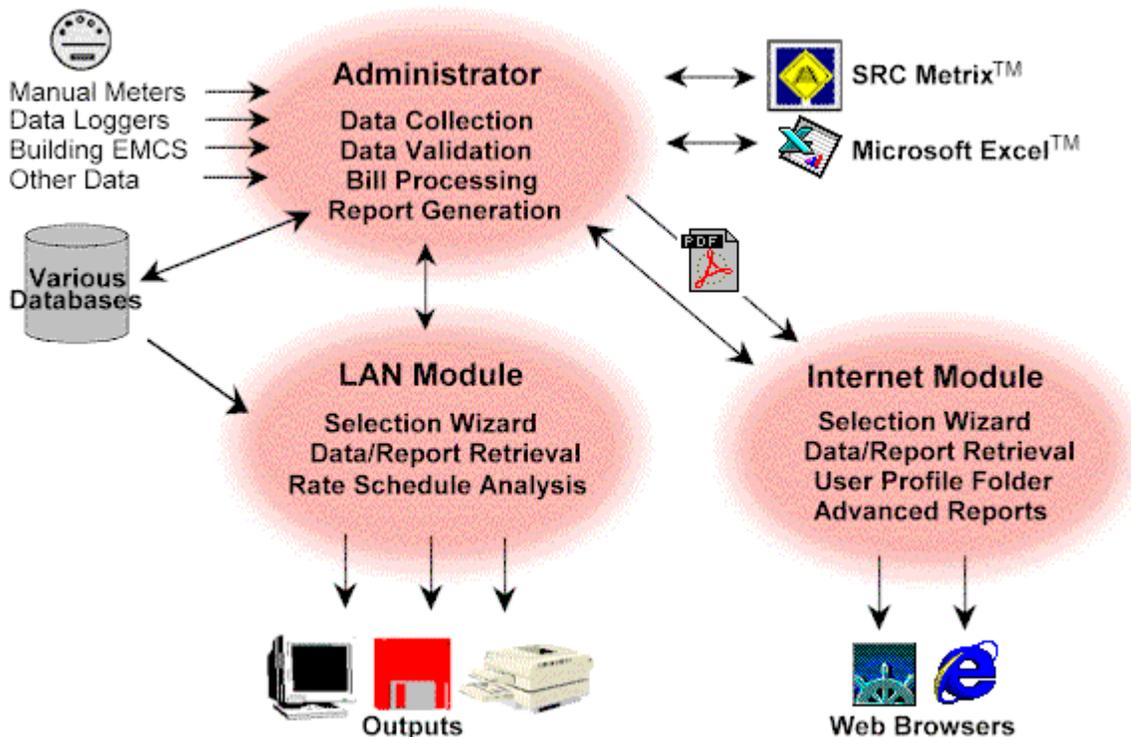
Data and Analysis

A variety of data and types of analysis are available to the user, including:

- **Building Characteristics** – Provides information about the building, its use, and its occupants.
- **Monthly Summaries** – Provides the monthly

demand and consumption for a particular meter and allows users to view their utility bill on-line.

- **Time-Series Data** – Time-series or raw data displays every data point collected in the specified time period with no data aggregation.
- **24 Hour Folds** - Displays a typical day profile by averaging every reading at a particular time each day in the specified time period.
- **Daily statistics** - Displays daily statistics (minimum, maximum, median, and average) for all days in the period.
- **Rate Analysis** – FRED's LAN Module allows users to enter custom electric rates to determine what affect new rates will have on their bill. (Current implementation does not allow for Time-Of-Use Rates, but will be added later.)
- **Metrix™ Output** – FRED can interface with utility-management software packages, like SRC's Metrix™. This allows users to take advantage of the advanced analysis features of other software from within the FRED environment. (additional licensing costs may apply)



For More Information, contact:

Project Management
Commercializing Opportunities
Technical Development

Steven A. Weakley
John C. Hail
William D. Chvala, Jr.

(509) 372-4275
(509) 376-5988
(509) 372-4558

sa_weakley@pnl.gov
jc_hail@pnl.gov
wd_chvala@pnl.gov