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NEEMIS OVERVIEW

New England Energy Management Information System

Energy Laboratory in Association with the
Alfred P. Sloan School of Management
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NEEMIS

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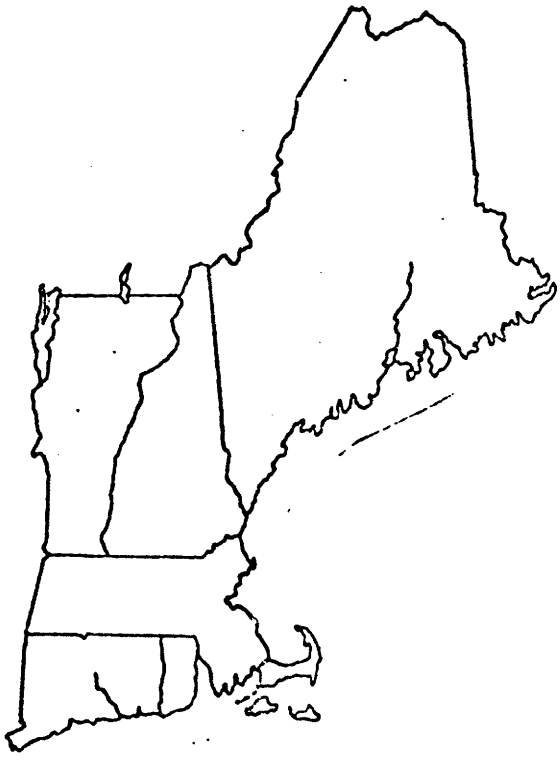

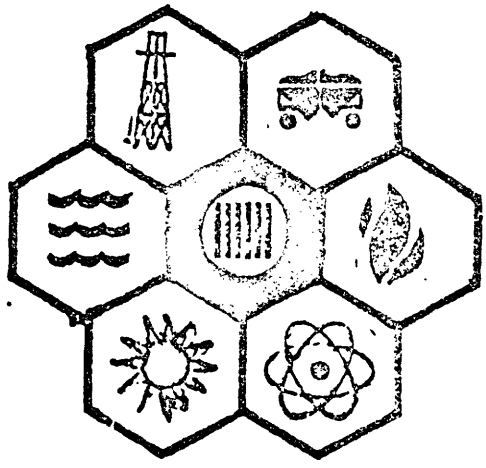

New England Regional Commission

PURPOSE OF NEEMIS

Public policymakers are regularly faced with complex and serious problems and must make decisions without the capacity to manage and analyze the pertinent information. The NEEMIS Project objective is to develop tools to assist public policymakers in the area of New England energy policy analysis and decisions and to support these tools with the necessary data and computational facilities.

HISTORY

The Project's scope and purpose broadened from its original conception in December 1973 when there was a growing fear of impending shortages of gasoline and heating fuel oil and other petroleum products. The New England area, being more dependent on foreign imported fuel than the rest of the nation, was particularly concerned about lack of information to manage, forecast, and predict energy shortages.

The New England Regional Commision (NERCOM) recognized the need for the implementation of an information system to monitor fuel in New England, to project local shortages, and to aid in policy decisions to handle these shortages. Thus, NERCOM initiated the development of the NEEMIS Project and sponsored an effort through MIT to develop an energy management information system.

As the needs for energy information in New England evolved, it became clear that a more general facility was needed to assist in policymaking in non-crisis situations, such as:

1) economic impact studies of energy prices,
2) effects of fuel switching,
3) the production of leading indicators,
4) studies on location of facilities (e.g., refineries, terminals,
5) conservation monitoring and testing and environmental studies.

Since a system to support the objective of such a facility was not commercially available, a major part of the NEEMIS effort went into software development, applying many of the new techniques available and developing others.

Hence, NEEMIS is:

> A facility (for storing and validating data, retrieving data, interpreting and analyzing data, and constructing and applying models using those data), which will facilitate New England energy policy analysis and decisions.

NEEMIS FACILITY

The major characteristics of NEEMIS's data management capability are: the ability to store large quantities of data, easily add new data series, modify existing data, and add new relations between data, select and retrieve data in virtually any conceivable way or by any criteria, ability to validate data, and flexible protection mechanisms.

The major characteristics of NEEMIS's analytical and modeling facility are: an interactive capability, multi-user access to the same data base, statistical packages (e.g., regression, analysis of variance, etc.), plotting and reporting capabilities, ability to construct and execute mathematical models, multiple and different modeling languages, e.g., TSP, GPSIE, TROLL, EPLAN, FORTRAN, APL, PL/I, etc., all capable of accessing data stored in the data management system.

NEEMIS DATA SERIES

NEEMIS Facility is capable of easily storing any data series, some of the major data series that are available in NEEMIS are:

* Static Terminal Data which consists of the following informa- for terminals of over 50,000 gallons; capacity, fuel type, location and owner.
* Petroleum Fuel Flow which consists of inventories and transactions of oil within New England, at the county level.
* Regional Demand Data which consists of:

  - Socio - economic (population, households, employment by industry, vehicles registered for the years 1962-1972).
  - consumption (by state, fuel type, consumer class for the years 1962-1972).
  - electricity generated by state and by type of electric power generation for the years 1962, 1966 and 1975.

* Historical Import which consists of information on imports. (County, importer, country of origin, fuel type, date, amount, % of sulphur, viscosity for years 1971-1974.)
* Census Data which consists of data on population, characteristics by county e.g., number of oil burners and size of house.

* Weather which consists of historical data on county level.
* Home Heating Demand which consists of a sample of 2,000 homes (size of house, characteristics of household and owner, K factor and supply).
* Consumption of Government-owned facilities which consists of data on consumption of all city owned buildings in Boston and the State owned buildings in Connecticut.

NEEMIS ENERGY APPLICATIONS

NEEMIS is a facility which can be used to implement applications that answer specific questions. Examples of applications which are operational are the following:

* Economic Impact Program which allows a user to input OPEC price, amount of tariffs, Federal policy concerning decontrol. -- The program computes the future effect on prices of fuels, the effect on the home owners and on industrial sectors.
* Regional Demand Model which allows a user to input growth, consumption patterns, changes in efficiency of fuel utilization and outputs demand by state and by consumer class.
* Consumption Monitoring is a study to observe the consumption of government owned facilities, two of the studies are state owned buildings in Connecticut and city owned buildings in Boston.
* Specific State Questions - The NEEMIS office has been responsive to specific requests from the states. Examples of such special studies are: Dependency of foreign oil and self-sufficiency study.
* Conservation - Several studies on conservation are underway. E.g., working in conjunction with Massachusetts Public Housing who spend some $20,000,000/year in heat and utilities, a study of occupant behavior, administrative policy and building characteristics is underway to determine the effects of these variables on conservation.
* Home Heating Demand Model which forecasts demand of homes in a county by month, taking into account the weather, owner characteristics, consumption and home characteristics.

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