

Challenge

Special Issue on Energy



DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT

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HUD Challenge

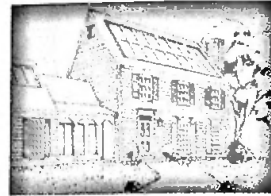
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PAGE 2: Selected residential units and solar energy systems selected for grant awards in the first cycle of HUD's Solar Heating and Cooling Demonstration Program are highlighted. HUD grants cover the cost of all or part of the expenses incurred as a result of including solar energy features.

PAGE 12: How do patterns of living arrangements among the elderly affect their safety or their perception of their safety? Fairly conclusive findings of a study conducted at the State University of New York at Albany to answer these questions appear in this issue of *HUD Challenge*.

PAGE 18: Over the years HUD's 701 Comprehensive Planning Assistance Program has become the key Federal grant program available to local officials for energy-related planning. The program's cooperative efforts with other agencies, namely the Federal Energy Administration, have led to innovative approaches to energy conservation on the State level.

PAGE 26: International conferences and bilateral agreements for the exchange of solar energy underscore the interest in harnessing solar energy as an international issue. Some examples of housing-related solar developments in other countries are described.

Cover by Wayne Eddins

NEXT MONTH:

The Bicentennial -- Some Highlights

Looking ahead

FmHA Housing Credit Extended

Home loan service to families of low- and moderate-income has been extended to 254 communities in the 10,000 to 20,000 population range by the Farmers Home Administration (FmHA), rural credit agency of the U.S. Department of Agriculture. The action was taken under a provision of the Housing and Community Development Act of 1974. The Act authorized FmHA to make housing loans in rural towns where populations exceed 10,000 but do not exceed 20,000, if the Secretaries of Agriculture and HUD determine such towns have a serious lack of mortgage credit. FmHA otherwise confines its home loan program to the rural countryside and rural towns of not more than 10,000 population.

\$10 Billion in Solar Sales by 1985

A New York City technological market research organization, Frost & Sullivan, Inc., has concluded a survey on solar energy which reveals that by 1980 the domestic solar heating and cooling industry's sales will reach \$1.25 billion. By 1985, this figure is expected to reach \$10 billion. Indications are that by 1980, about 250,000 houses will be equipped with solar energy and cooling systems; by 1985, this number will have grown 10 times. The survey notes that as of now, the solar industry is not prepared to meet the market demand. For example, no supplier offers a fully developed design or has complete manufacturing facilities for all of the components necessary to collect, store, pump, or otherwise utilize solar power for heating water, space heating and cooling. Solar heating and cooling systems for individual homes currently are only a supplement to conventional fuel systems and require an added expenditure of between \$3,000 and \$8,000. The survey found that a cost of \$2,500 or less would be "very acceptable" to potential customers. The manufacture of energy collectors for installation on roof tops has not even exceeded several thousand square feet, yet this is the most extensively produced of all components. The key, the survey suggests, will be to overcome the tendency to overdesign solar collectors which add thousands of dollars to a system.

People Movers—Alternatives for Subways

In an effort to encourage use of automated "people mover" transit systems for downtown travel instead of full-scale systems, the U.S. Department of Transportation's Urban Mass Transportation Administration will pay for 80 percent of the cost of up to three such systems in

city demonstration projects. "People mover," or "personal rapid transit" systems, are relatively low-volume lines that carry passengers in small automatically controlled vehicles along a fixed track. Morgantown, West Virginia, is the only city in the U.S. with such a system that might be identified with downtown-type application. Built at an estimated cost of \$112 million, the system serves to connect the University of West Virginia campuses. Robert Patricelli, administrator of the UMT Administration, indicated that using simpler versions of the Morgantown system might make more sense in some cities than building full-scale subway networks for downtown transportation. Whereas automated people movers have so far worked well in "benign" settings such as airports and sightseeing at the zoo, it's time to test them in "harsher" situations involving moving people around congested downtown areas. Cities showing interest in downtown people movers include Los Angeles, Atlanta, Miami, Denver, and Honolulu.

Modular Integrated Utilities System

St. Charles, a new town in Southern Maryland, is the test site for a new concept in conserving residential energy—Modular Integrated Utilities System (MIUS). A \$400,000 HUD research grant to the Interstate Land Development Corporation, developers of St. Charles, will pay for the planning and design phase of the experimental project now underway. The concept of MIUS is to package into one processing plant all the utilities needed to serve some 900 of the community's homes and shops—electricity, space heating and air conditioning, solid and liquid waste processing, and potable water. It is estimated that energy savings from the test project could be as high as 30 percent compared with a proposed alternative, all-electric system for the site. The savings result primarily from recovering waste heat normally discharged by conventional generating plants and using it to heat water and to heat and cool the buildings. Some additional energy savings are made possible by recycling solid waste for its energy content. Additionally, MIUS reduces pollution by processing solid and liquid waste on-site and by recapturing the waste heat, which would normally become thermal pollution. The Maryland firm will further develop the MIUS concept and design a plant for the specific utility needs of the community, and will also refine the environmental and cost comparisons between the proposed MIUS and conventional utilities. HUD will then decide whether to go forward with actual construction of the MIUS plant. St. Charles is located in Charles County, about 25 miles southeast of Washington, D.C.

HUD Grants for Solar Energy

by Toba Penny

The HUD Solar Heating and Cooling Demonstration Program is underway. The first 50 grants, involving \$1 million, were awarded in January to builders, public agencies and universities. These funds will provide for the incorporation of solar energy systems for heating, cooling and/or domestic hot water, in 97 single and 41 multi-family units located in 27 States and the Commonwealth of Puerto Rico. The grant awards pay for all or part of the additional cost of including solar energy in the unit.

These projects represent the first large scale test of solar energy systems in residential units and will provide HUD, the housing industry, and the general public a first hand look at the operation and appearance of these systems. The demonstration will also help alert the country to the potential energy savings that can be realized through the use of solar energy.

The grant awards are part of the first cycle of the HUD demonstration program, as described in *HUD Challenge*, June 1975. Similar grant awards will be made approximately once a year for the next 4 years.

In addition to the demonstration of solar energy systems, the HUD program includes the encouragement of a market for solar energy, including the study of potential barriers to the widespread use of solar, such as local building codes, zoning ordinances, tax assessment provisions, real

estate and banking practices, and the development of recommendations to remove these barriers.

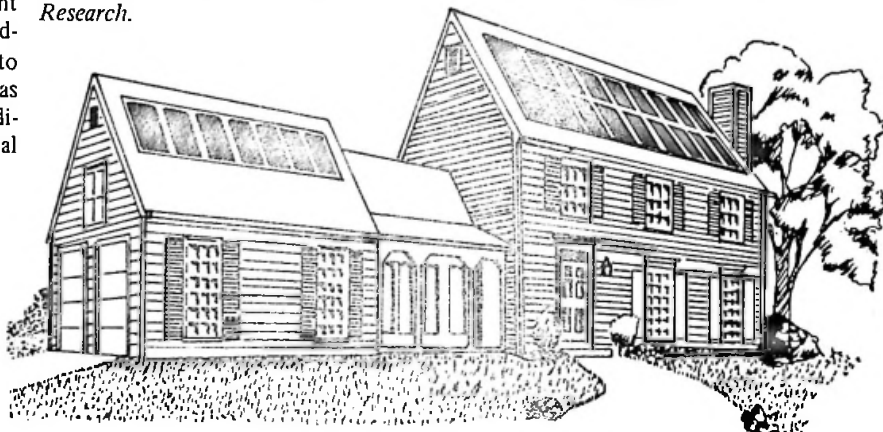
HUD's responsibility for demonstrating solar energy is spelled out in the Solar Heating and Cooling Demonstration Act of 1974. Grant funds administered by HUD for the residential solar energy demonstration have been transferred from the Energy Research and Development Administration (ERDA) pursuant to an interagency plan for solar heating and cooling, part of a comprehensive national program of energy research led by ERDA.

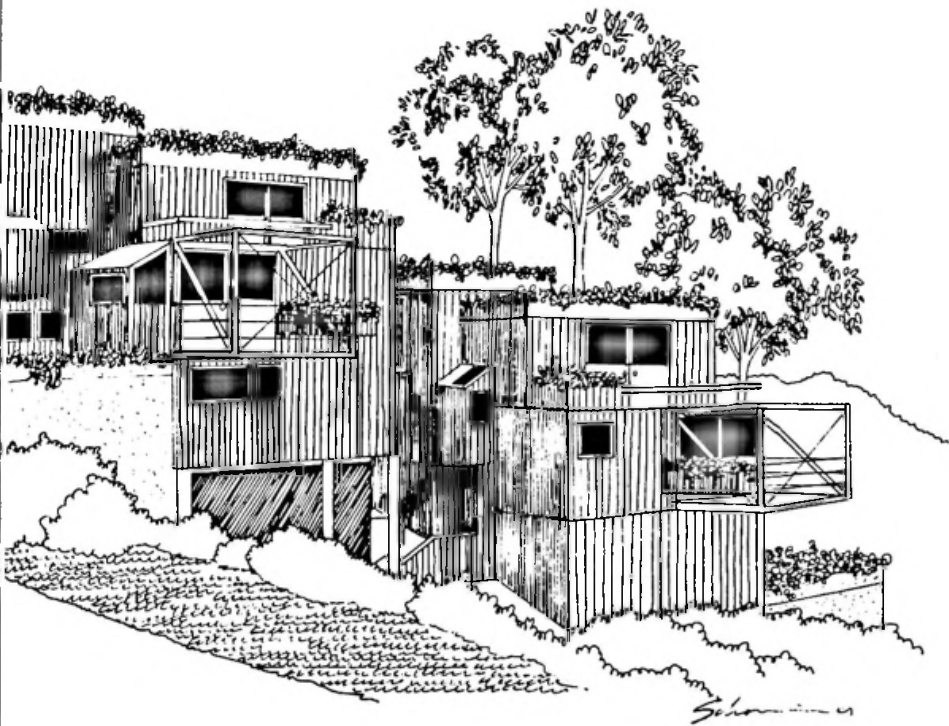
The designs noted here are examples of selected residential units and the solar energy systems selected for grant awards.

Ms. Penny is a consultant to HUD's Office of Policy Development and Research.

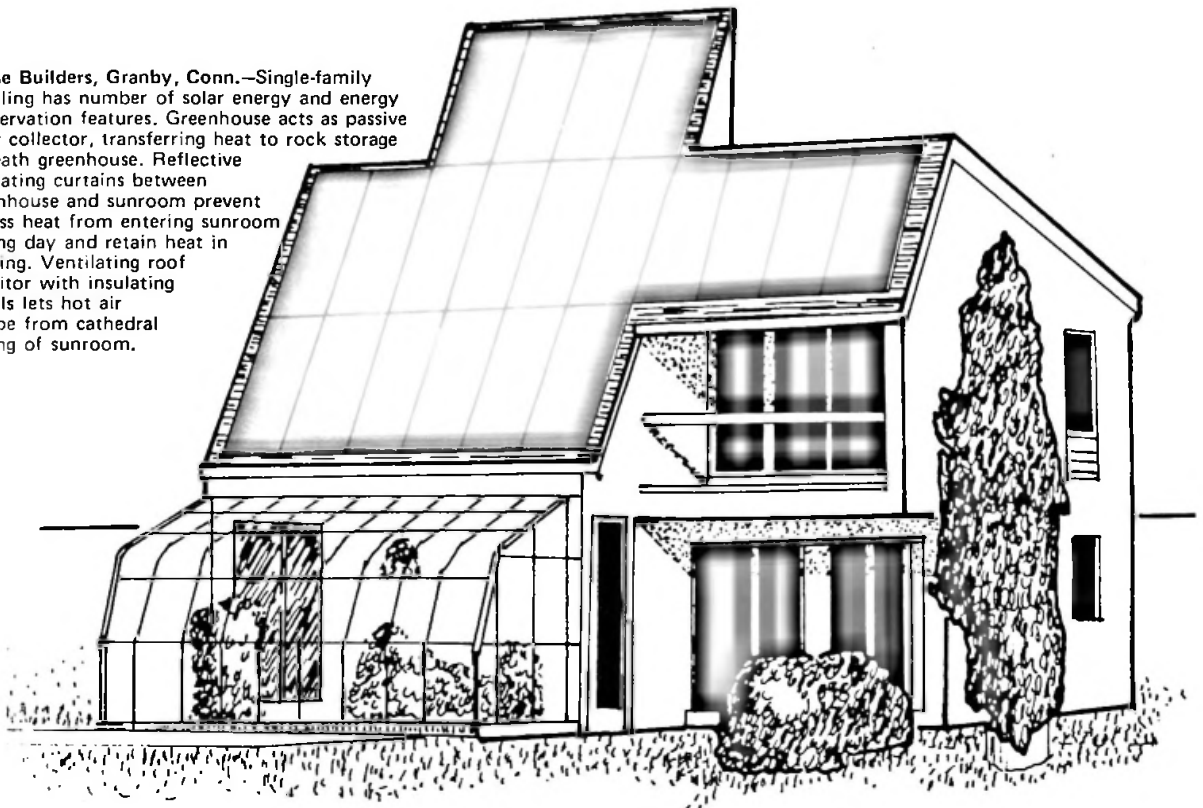
Grassy Brook Village, Brookline, Vt.—12,000 sq. ft. complex consists of 10 three-bedroom units with shared central solar collection and storage system located apart from buildings. Energy conservation features include: Common walls reducing by 18 percent vertical exterior wall area exposed to outside, double-glazed windows, extra insulation and sodded roof.

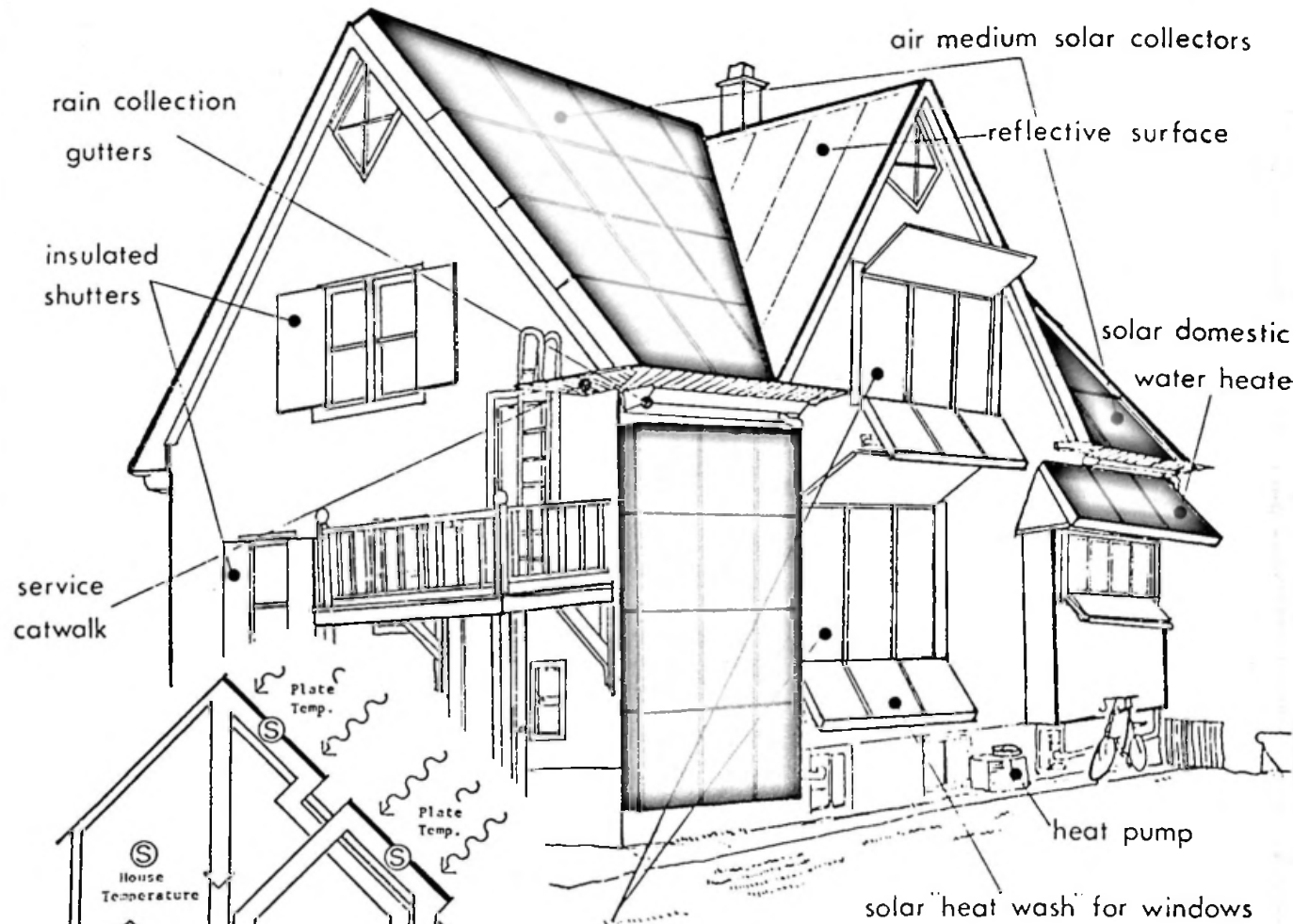
Hooker—Barnes, Atlanta, Ga.—Colonial styled single-family dwelling has solar heating and domestic water preheating system. Energy conservation features include: Foil-backed sheetrock, high grade and thickness of insulation in ceilings and walls, floor insulation where normally there is none, storm windows and double-paned glass. The solar collectors are mounted on the sloping south-facing roof of the dwelling and the garage.





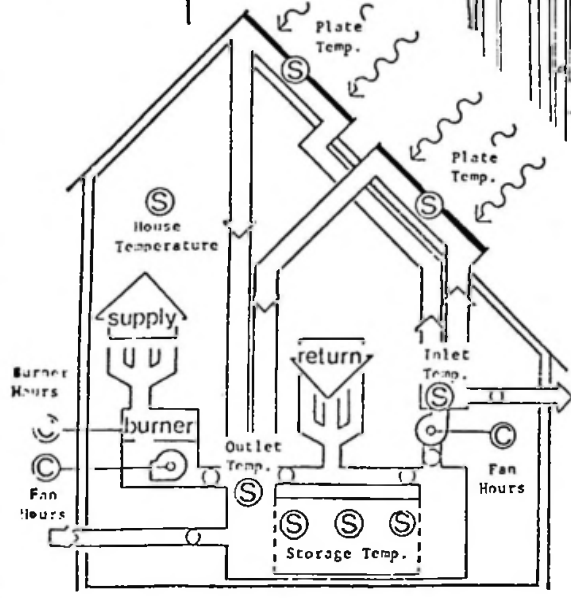
Crane Builders, Granby, Conn.—Single-family dwelling has number of solar energy and energy conservation features. Greenhouse acts as passive solar collector, transferring heat to rock storage beneath greenhouse. Reflective insulating curtains between greenhouse and sunroom prevent excess heat from entering sunroom during day and retain heat in evening. Ventilating roof monitor with insulating panels lets hot air escape from cathedral ceiling of sunroom.



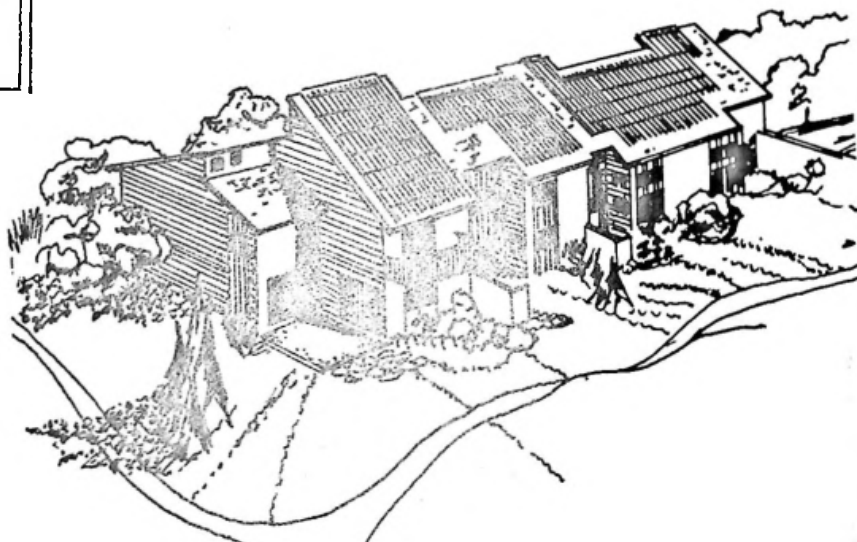


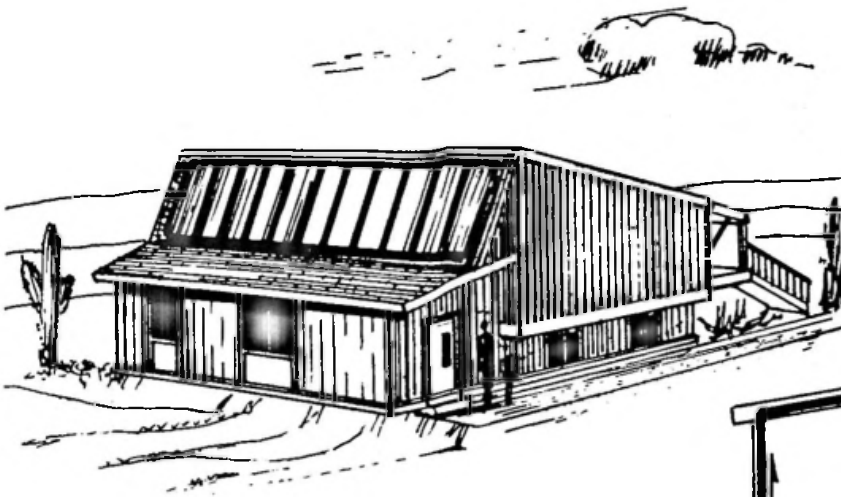
enlarged southern windows

University of Wisconsin, Milwaukee—Project involves rehab of single-family dwelling and its adaptation for solar heating and domestic water heating. Conservation features include additional wall and roof insulation, rain water collection system connected to a cistern for use in water closet flushing, enlarged south-facing windows to increase solar heat gain during winter, combined with insulated shutters and panels to reduce heat loss. Large overhangs shield south-facing windows from summer solar heat gain.

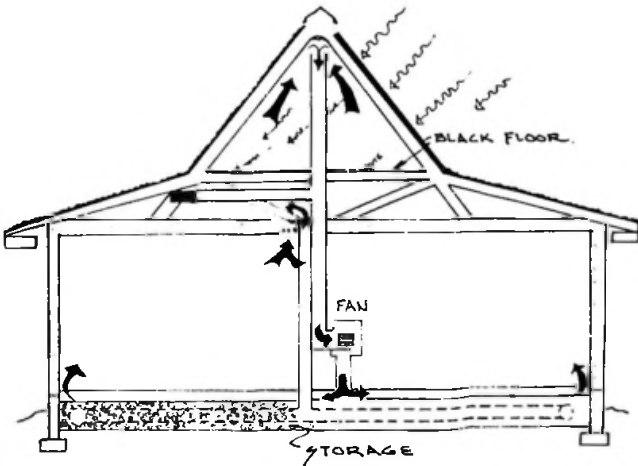
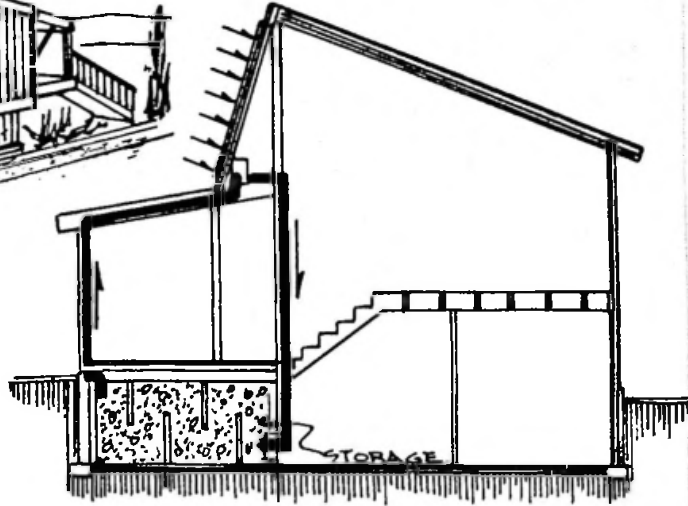


United Development Co., Vernon Hills, Ill.—Heating and domestic hot water preheating system in four, two-story single-family attached dwellings. Benefits of attached units are a reduction of heat losses and a decrease in solar system size.

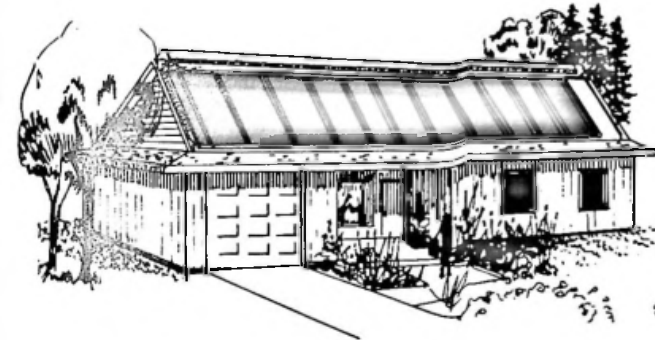
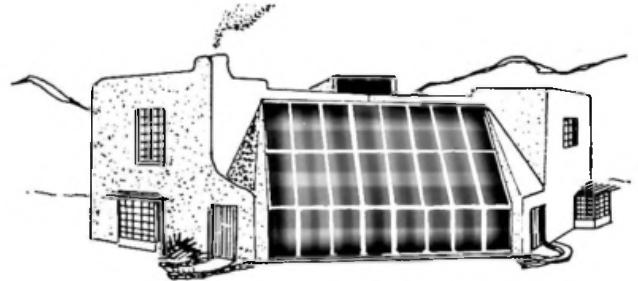




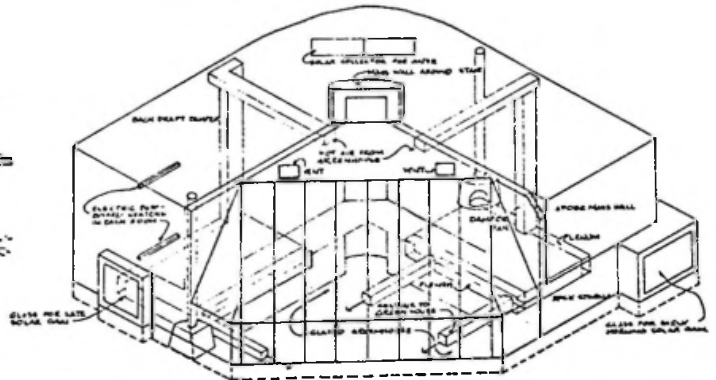
The Blackfeet Tribe, Blackfeet Indian Reservation, Montana—Part of larger HUD-sponsored program for self-help housing for Blackfeet Tribe. Five single-family detached dwellings are combined with solar heating and domestic hot water preheating system. The two-story homes total 1,226 sq. ft. of heated floor area. Collectors are mounted on steeply pitched south-facing roof.



Communicco, Santa Fe, N.M.—Two-story single-family house contains a solar heating, cooling and domestic hot water pre-heating system. Energy-saving features include thick adobe walls, south-facing greenhouse, airlock entry and extra insulation to improve thermal characteristics of structure.



Helio Tharmic, Greenville, S.C.—Low-cost, one-story single-family dwelling uses attic space as solar collector. Wood framehouse is well insulated; air space separates solar heated first floor ceiling. black painted, plywood floor of attic from summer. Continuous operable ridge ventilates attic in summer.



Local Government Innovations in Energy Conservation

by Richard Burk

As the cost of energy increases, government decisions affecting energy consumption gain in importance. While extensive work has been done at the Federal and State government levels, it is in local government where decisions, ranging from establishing building construction specifications to determining land use patterns affecting the viability of mass transit systems, may have the greatest impact on energy consumption.

What then can local governments do to reduce energy use in their communities?

- **Indio, California** is demonstrating how an energy conservation performance code can be developed and implemented at the small city (population 20,000 and less) level of government.

- **Helena, Montana** is showing how municipal government, working with private enterprise, can engage in solar energy projects in the public sector.

- **The State of Massachusetts** is assisting local governments to integrate energy conservation principles into their on-going planning and design processes.

These projects, along with projects in Davis and Anaheim, California, represent a HUD effort to identify and demonstrate innovative ways for State and local governments to address energy conservation problems.

They are part of the Innovative Projects Program authorized by Title I of the Housing and Community Development Act of 1974 and administered by HUD's Office of Policy

Development and Research. The Innovative Projects Program is designed to strengthen the capability of local governments by developing innovative approaches to the solution of long-standing or widespread urban problems through individual demonstration projects. Projects are selected from an annual competition held in the spring.

A basic principle of the Program is that State and local governments, because they are nearer than the Federal Government to community development problems, can design and successfully engineer innovative techniques to solve many of the Nation's urban problems, and that the Federal Government can encourage such innovation with the infusion of limited research and demonstration funds.

The five energy projects perhaps best illustrate this proposition by the range and practicality of the energy conservation techniques they are demonstrating.

A premise common to the energy projects is that local government can and should play a larger role in the Nation's energy conservation effort. To assume this expanded role, the winning proposals identified a number of needs:

- more complete and accurate information regarding community energy use;

- identification of the key local government decision points for effectively controlling energy consumption;

- improved measures to reduce energy consumption, e.g., an energy conservation building code; and

- activities local government can undertake to encourage private sector development of alternative energy

Anaheim, California

To improve its capacity to deal with energy problems, Anaheim proposed to assemble information and develop a model for municipal management of energy conservation activities. Specifically, the city is developing the three basic elements for use in addressing energy management decisions: (1) A survey of cities in the California Innovation Group (of which Anaheim is a member) to catalog recent accomplishments in energy conservation and assess the results, (2) an audit procedure to assess the city's energy status and (3) a model energy management plan for the city, identifying the key control points for city officials.

State of Massachusetts

The Massachusetts Executive Office of Communities and Development, realizing the impact local government decisions have on energy consumption, is assisting municipal officials to integrate energy conservation principles into their planning and design processes.

The State is preparing and testing a manual and a training course on practical ways local government can control development that will be

sources in the public interest.

Each project addresses the energy conservation problem from a different viewpoint, but each meets one or more of these needs in an innovative yet practical demonstration.



Mr. Burk is Director of HUD's Innovative Projects Program.

energy conserving. In addition, it is developing alternative courses of action of State government to facilitate local energy conservation activities.

Indio, California

This small city in California's Imperial Valley, where temperatures exceed 110 degrees for long periods in the summer, needed to develop building codes directed at the more economical use of energy in new and rehabilitated buildings.

The city is developing an energy conservation performance code for new and rehabilitated buildings which is more comprehensive than standards promulgated by the State of California or HUD/FHA. In addition, it is initiating an energy monitoring program on existing buildings.

Davis, California

Davis had recently developed an energy conservation code but realized that implementation and daily use of the code would require a major effort, to avoid alienating the local building industry. The city is now developing a process for introducing the housing code by presenting seminars for local builders, architects and

engineers; by developing a workable program for on-site inspection by building officials and by initiating a citizen review process on proposed construction projects.

Davis intends transferring the program to other nearby jurisdictions.

Helena, Montana

Recognizing the need for local government to participate in the development of alternate sources of energy, the City of Helena proposed to install and demonstrate a solar energy collector for heating and cooling a 32-unit elderly housing project. The city is demonstrating a technique in which private enterprise could join with public efforts in community development in an energy project which would mean profit to the private investor and overall improvement to the community.

Most of the projects are approaching the mid-way point in their schedules; reports, manuals and handbooks are being prepared for use by other States and local officials interested in replicating the projects. Anaheim, Davis and the State of Massachusetts have integrated dissemination and transfer plans into their projects for nearby jurisdictions and HUD is

presently developing a plan to make the important materials generated from all of the projects available to the public.

This is the real payoff for the Innovative Projects Program and the acceptance of these materials by local officials will measure its usefulness. ☺

Recycling energy through modular integrated utility systems

by Jerome Rothenberg

For decades we Americans have consumed fuel and allowed much of its energy to be dissipated into the air or water as unused heat. Recently we have been forced to recognize that the sources of conventional energy, both domestic and foreign, are limited. With that recognition has come a growing realization that there are limits also on how much we dare pollute our air and water by heat and other emissions. It is plain that our wasteful practices of the past must be stopped. It is equally plain that decent housing and a suitable living environment require energy for heating homes and water, power for lights and appliances, and cooling systems for relief from summer heat.

HUD's Office of Policy Development and Research has been working on the user side of the energy problem for several years, specifically on residential energy consumption. One of its important research efforts is the development and demonstration of the Modular Integrated Utility System (MIUS), which provides improved means for furnishing essential utility services for residential communities through integration of these services. One significant advantage of MIUS is the conservation of fuel through recovery of energy that normally is wasted when essential utility services are supplied from separate sources. MIUS "recycles" energy by "packaging" into one processing plan all of the five utility services necessary for community development, namely: electricity, space heating and air conditioning, solid waste processing, liquid waste processing, and potable water.

Conventional methods of generating electricity waste about 65 percent

of the energy input in the form of excess heat. MIUS recovers better than half of this waste energy and uses it for space heating, air conditioning, water heating, water treatment, and liquid waste treatment. An additional 5-10 percent fuel savings is made by recycling solid waste for its energy content. This is referred to as a "total energy system" by engineers.

MIUS is an extension of a total energy system which, in addition to performing energy/heat recovery functions, also processes solid wastes and liquid wastes and purifies water.

In addition to saving energy, MIUS minimizes the adverse environmental impact of utility systems by reducing thermal pollution from the generation of electricity, air pollution from fuel combustion, water pollution from sewage, and land pollution from solid waste disposal.

Goals of MIUS

The goals of the MIUS program are to:

- provide options in utility services needed for urban/suburban development that reduce the time span from planning to operation, reduce risk, reduce plant operating cost, add capacity in phase with actual demand, develop financing methods and make possible more flexible and economic urban/suburban growth patterns through a self-contained utility system that is independent of the existing infrastructure;
- provide more efficient utilization of energy and other resources by improving utility systems fuel usage efficiency by recovering energy from power generation, by using solid wastes for its energy content, by using recovered energy to provide heating and cooling services and to enhance liquid waste treatment processes, and by improving the efficiency of domestic water usage;
- reduce total cost of providing utility services;

- improve the quality and environment of life by reducing thermal pollution, air pollution, solid waste pollution, and water pollution.

Early Stages of Program

The MIUS program was initiated more than 2 years ago. Its initial phase included evaluation of available technology, development of component and system performance specifications, and completion of detailed technical, economic and institutional feasibility studies of the

Utility Systems Board to independently assess the state-of-the-art and the applicability of MIUS.

A second phase of the MIUS Program is the construction and evaluation of a demonstration project in an actual private sector residential development to be initiated after completion of the design study later this year. The project would provide utility services for a community with an equivalent of 900 dwelling units including some commercial and

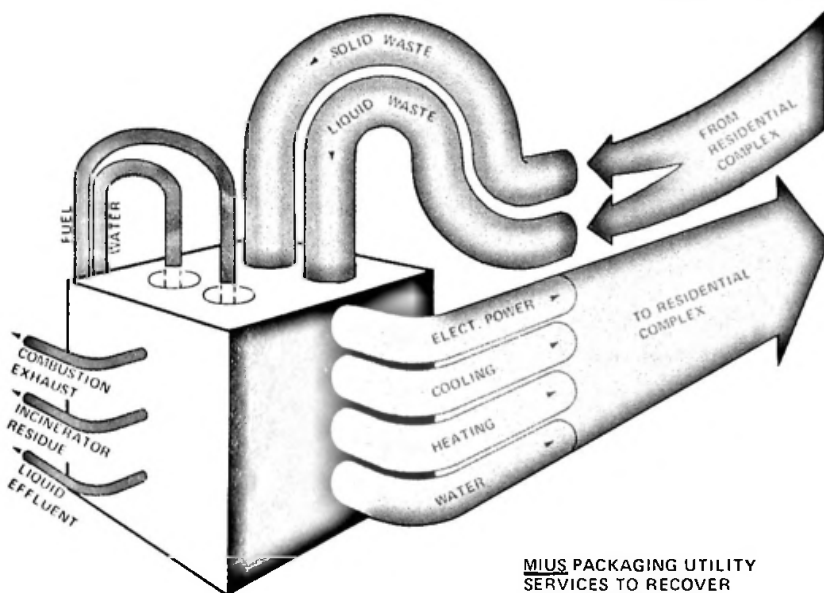
Development and Research is conducting a demonstration of a total energy system coupled with an "automatic" pneumatic trash collection system.

The facility, now in a long-term "real life," monitored operation, is located in a HUD-insured development in Jersey City, New Jersey. The site includes 486 dwelling units in six structures, as well as a grade school, swimming pool, and 50,000 square feet of commercial area on 6.5 acres. Installed electric capacity consists of five 600 KW diesel engine generator units. Reject heat from the generating system is used to supply hot and chilled water to all of the structures for space conditioning. The plant has the capability for the evaluation of generating systems. Future plans call for the installation of advanced incineration/waste heat recovery systems to the automatic trash collection system to recycle the energy and integrate it automatically into the total energy system.

A MIUS Integration and System Test (MIST) facility is in operation at the NASA Johnson Space Center in Houston, Texas. This facility is used by NASA and HUD for developing and verifying MIUS control systems as well as other urban utilities research.

A coal-fueled MIUS is being developed by HUD and the Energy Research and Development Administration. This will enable the use of coal as a substitute for oil in residential energy systems, in accordance with national policy. A pilot unit is scheduled for test and evaluation in late 1976; its successful development could lead to a coal-fueled MIUS demonstration in 1977 or 1978. ☞

Mr. Rothenberg is Program Manager, Modular Integrated Utility System, HUD Office of Policy Development and Research.



MIUS PACKAGING UTILITY SERVICES TO RECOVER WASTE ENERGY AND REDUCE POLLUTION

MIUS concept. Various governmental agencies have been involved with HUD in this phase—the National Aeronautics and Space Administration, the Atomic Energy Commission, the National Bureau of Standards, the Environmental Protection Agency, and the Departments of Defense, Health, Education, and Welfare and the Energy Research and Development Administration through the Office of Fossil Energy. In addition, HUD awarded a contract to the National Academy of Engineering for the establishment of an Integrated

shopping areas. The demonstration would be carried out by a private sector developer on a cost-sharing basis, with the residential development built on the developer's site in accordance with a performance specification. HUD would then gather data and evaluate the results. Should the demonstration verify the advantages of the MIUS concept, the role of HUD will be to address the institutional and regulatory barriers to MIUS which may impede future private sector development.

At present, the Office of Policy

'Locking in' Energy Conservation

The Energy Research and Development Administration

by Robert Griffin

As every homeowner knows, it's possible to save energy—and make a real difference in utility bills—by lowering furnace thermostat settings in winter and raising them on air conditioners in summer, by turning off unneeded lights, and by using major appliances sparingly, or not at all. But, according to Austin N. Heller, Assistant Administrator for Conservation, Energy Research and Development Administration (ERDA), there's another way to save energy—and in the long run, perhaps, a much better way.

Heller notes that if buildings and appliances were made more energy efficient we could conserve without forgoing our accustomed level of comfort, or without giving up the many products and conveniences that we've come to expect. "For example," he said, "a building designed to minimize heat losses and heat gains can save a great deal of energy, yet allows indoor temperatures to be maintained in the most comfortable range. A lamp that uses less electricity input per lumen, in effect, saves energy without the need to reduce lighting levels." Heller refers to this approach as "locking" energy conservation into buildings, products and systems. For the consumer it means that conscious effort to conserve need be applied only once—by selection of the most energy-efficient product at the time of purchase.

Dr. Maxine Savitz, Director of ERDA's Division of Buildings and Industry, Office of Conservation, is especially enthusiastic about the po-

tential for saving energy by introducing new and improved technology in the buildings sector. Savitz points out that currently 32 percent of all energy consumed in the United States is used in buildings—an equivalent of 10.8 million barrels of oil per day. "Without a vigorous end-use energy conservation program, consumption in the buildings sector will reach an equivalent of 13.9 million barrels of oil per day by 1985 and 16.6 million barrels per day by the year 2000," Savitz said. "The goal of ERDA's buildings program is to significantly reduce these consumption figures, without adversely affecting our standard of living. To this end, our efforts are generally directed toward increasing efficiency of energy use in the built environment, as contrasted to regulating or curtailing the use of energy."

Architectural and Engineering Systems

Improvement in architectural and engineering systems presents an obvious challenge for new technology to yield large energy savings. ERDA is actively pursuing research to develop better materials, methods and processes for retrofitting buildings, as well as for use in new construction. Special effort is being made to involve private industry and other Federal agencies in this program in order to encourage the rapid introduction of research results into the marketplace.

ERDA officials point out that the present inventory of residential space includes 70 million dwelling units. They believe under present economic conditions 30 percent of the dwelling units which will be in place in 1985 will have been built in the decade immediately preceding 1985; thus, ERDA's architectural and engineering research program can have significant impact on existing homes as well as on residential space as yet to be constructed.

Similarly, the present inventory of commercial space is 24 billion square feet and in the year 1985 40 percent of the inventory then in place will have been built in the 1976-1985

time period. Again, this suggests great opportunities for the results of ERDA buildings research to "pay off" in the near term.

Dr. Savitz cites a number of institutional barriers that may now impede the adoption of new energy conservation technology in buildings. These include:

- The present fragmentation of the building industry;
- the effect of certain building codes, taxes, regulation and construction practices; and,
- the lack of market incentive for builders to include energy-saving features that may have higher first cost. This is important because operating costs are typically borne by the building renter, and are always paid by the building buyer.

Such institutional barriers are the object of careful study by ERDA in order to establish a data base that may guide future change.

Community Systems

Other researchers in ERDA's buildings program are seeking to apply the "systems approach" to saving energy on a community-wide basis. The intent is to help develop technologies and planning methods that can help make the most efficient use of energy supplies that are available to a community, and to minimize the consumption of nonrenewable energy resources. Specific areas of effort include:

- **Integrated Systems RD&D**—To increase the energy efficiency of certain energy-consuming services required by a community. These are generally known as utility type services, including: Heating, cooling, solid waste removal, sewage disposal, transportation and communications services, and various other services requiring the use of electricity.

- **Community Design RD&R**—To develop basic concepts and ways to achieve the best "match" between integrated (utility type) community systems, and a given community. This will vary from one community to another, based on various attributes of the community as, for example, its

physical characteristics (size, density, climate, etc.), and technical and institutional constraints that may be present.

● **Commercialization**—Efforts to assist in “marketing” the results of research in integrated systems and community design to municipalities, developers and others.

Technology and Appliances

The work ERDA is sponsoring in the area of improved appliance efficiency is perhaps of most direct interest to consumers. Researchers are looking for technological opportunities to use energy more efficiently in building components, advanced lighting systems, insulating materials, window control systems and space heating and cooling equipment. A related effort will be directed toward

acquainting consumers with the advantages of buying more selectively, with energy conservation in mind.

The agency is also engaged in research to develop reliable, low-cost measurement techniques to assist local governing bodies in evaluating and enforcing energy efficiency building standards.

Building Information Dissemination and Technology Transfer

In order to assure the most rapid possible transfer of new technology into the marketplace, ERDA publishes numerous fact sheets, how-to manuals, design guides and case histories. Seminars are conducted for the benefit of design professionals, and others who must be instrumental in bringing the benefits of new and

existing conservation technology into widespread use. In addition, studies have been undertaken to examine the feasibility of establishing consumer-oriented energy conservation information centers in all 50 States.

Ultimately, the real test of effectiveness for ERDA’s conservation program—the “bottom line”—will be measured in Btu’s saved. Undoubtedly, it will be several years before real savings will begin to accrue from some areas of research. For others, however, including many projects in the buildings area, ERDA researchers are confident that resultant energy savings will not only be very large—but they will also be evident very soon! ☞

Mr. Griffin is a Public Information Officer with the Energy Research and Development Administration.

NEW LIGHT BULB SAVES ENERGY

If Thomas Edison had foreseen today’s energy crisis, perhaps he would have dreamed of a light bulb that could last a decade and use 70 percent less energy than conventional bulbs.

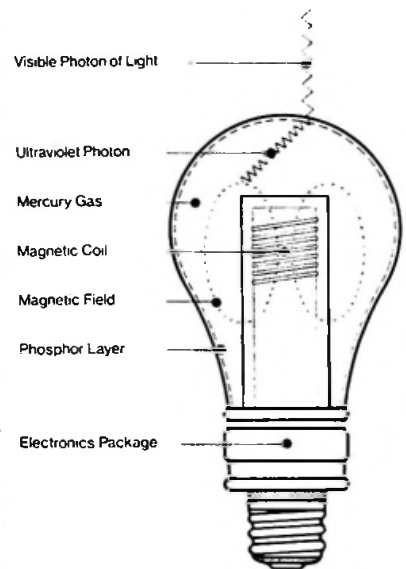
That light bulb has been invented, and will be developed over the next year under an Energy Research and Development Administration (ERDA) contract with the Lighting Technology Corporation, a small company in Fullerton, California.

The fluorescent “Litek” bulb resembles a 100 watt incandescent bulb, fits standard sockets, and produces a warm white light similar to the familiar incandescent bulb. Because it contains no wire filaments that can burn out, it can last at least several years and possibly a decade or more.

According to ERDA Assistant Administrator Austin N. Heller, preliminary studies show that full nationwide use of this new electrodeless fluorescent lamp could save more than the equivalent of 500,000 barrels of oil per day. He pointed out that incandescent lighting costs Americans more than \$6 billion

annually. The Litek bulb would reduce energy consumption by 70 percent compared to the conventional incandescent bulb.

The light bulb’s inventor is Donald D. Hollister of Placentia, California, President of the Lighting Technology Corporation. According to *The Wall Street Journal*, Mr. Hollister hopes his bulb will replace the incandescent lamp invented by Edison. Under its one year \$310,000 contract with ERDA, Hollister’s corporation intends to refine, test and evaluate its new product. The contract also calls for developing approaches to mass production and marketing.



According to *The Journal*, Hollister first developed the theory for the better bulb in 1956 and 3 years later presented it to the world in a paper given at a scientific symposium. “The reaction was no particular reaction at all,” he says, probably since there wasn’t much interest then in saving energy.



Living Arrangements and Security Among the Elderly: A Study

by Edmund Sherman, Evelyn Newman,
and Anne Nelson

Professional gerontologists have long held that age-integrated neighborhoods are better for elderly people than age-segregated neighborhoods. They assume that different age groups in normal neighborhoods will develop needed social intercourse and mutual support.

Many criminal justice experts advocate age-segregated housing for the elderly. They maintain that crimes against the aged in public housing can be nearly eliminated if buildings are exclusively designed and reserved for the elderly. In addition, social welfare experts have noted that services delivery to the elderly is considerably enhanced where client groups are concentrated as in age-segregated housing situations.

The Institute of Gerontology, a part of The School of Social Welfare of the State University of New York, conducted a survey among elderly residents in different types of public housing in the Albany-Troy area to

determine the effects of different living arrangements on the numbers and kinds of crimes involving elderly victims. The survey was also aimed at identifying their fears and attitudes as far as personal safety was concerned and to assess attempts to ensure their safety.

Two projects in the City of Albany were selected to represent an age-integrated pattern of housing. Four residents were interviewed from the John Boyd Thacher Homes and 60 from the Lincoln Park Homes which consist of 275 units with 110 of those allocated to the elderly who live side by side with families of different ages. The results of this study are based on their responses.

Kennedy Towers, a single high-rise building in Troy, New York, was selected as the site for the age-segregated setting of the study. The

266-unit building is occupied entirely by the elderly. Finally, the mixed housing pattern was represented by the Ida Yarbrough Homes in Albany which consist of two high-rise buildings of 112 units each for the elderly. These buildings are situated in the midst of low-rise buildings which house younger adults and their families.

Interviews

The goal was to interview a minimum of 50 respondents in each type of setting in order to calculate percentages and make comparisons among the types of settings.

A total of 169 interviews was obtained: 64 in age-integrated housing, 55 from the age-segregated setting, and 50 from the mixed setting. The interviews were conducted either by the research project or by paid graduate students from the School of Social Welfare at the State University of New York, at Albany. The

majority of the questions in the 14-page interview were structured, with a few open-ended ones for more exploratory items. Even though the residents had been notified regarding the interviews and the interviewers carried identification, there were some who were so fearful that they would not admit any strangers to their apartments. Initially, there were 15 refusals of in-person interviews in the age-integrated setting. We attempted to compensate for this by obtaining some interviews by telephone rather than face-to-face.* Eleven interviews were obtained in this manner, thereby leaving only four outright refusals in that setting. There were three refusals among the age-segregated.

A second major facet of the study was a survey of project managers, public housing officials, security personnel, and police officials concerning security practices and problems in the study settings. The interview consisted of general open-ended questions of an exploratory and descriptive nature. It was conducted with 15 officials on various aspects of public housing security and measures designed to protect the elderly. In addition, demographic data based on census tracts and data on crime frequency were obtained.

Findings of the Survey

The survey showed there were markedly more respondents in age-integrated housing who had been victims of crime. Of the 25 victims in the age-integrated setting, four had been victims of robbery, five of larceny (purse snatching), two of assault and eight of burglary. Five respondents had been victims of unclassified crimes (vandalism and harassment) and one respondent reported a crime but refused to elaborate.

Of the seven victims from the mixed setting, two had been victims

*One respondent reported keeping a can of bug spray next to her door for protection against unwanted visitors. She insisted that she trusts no one. The interviewer was unable to gain access to the apartment and the interview was conducted over the telephone.

of robbery, two of larceny, and three of burglary. Of the eight victims in the age-segregated setting, five had been victims of larceny, one of assault, and two of unclassified offenses. Three residents in the age-integrated and two in the age-segregated settings were victims of a crime more than once while living in their respective projects. Also, a higher percentage of respondents in the age-integrated housing were aware of other residents in their buildings having been victimized than was true in the other two types of housing. Further, the majority of the crimes in the age-integrated setting occurred in the building: 11 inside the apartments, five in the elevator, and five elsewhere in the building. In the age-segregated building, on the other hand, only two of the eight crimes reported occurred in the apartments, whereas four occurred on the grounds, one on the neighborhood streets and one elsewhere.

Sixty percent of the crimes reported happened in the daytime. In the age-integrated setting most crimes occurred in the apartments, elevators or somewhere else in the building. In the age-segregated setting most crimes occurred in apartments or on the grounds.

The differences between the types of housing in terms of fear of crime is even more dramatic than the differences in the actual incidence of crime. Thus, the evidence is quite clear with respect to incidence and fear of crime that age-integrated buildings are the least preferred. It should be noted that the "mixed" type of housing in this study is in fact age-segregated by building, so that it can be said that segregated buildings show more positive results from the standpoint of security and morale.

Other Findings and Recommendations

Another interesting finding that has implications for public housing policy is the discrepancy between feelings of safety in the building by type of housing and feelings of safety in the neighborhood. Residents of the age-

segregated project showed a somewhat higher degree of fear of crime in their neighborhood than did residents of the other two types of project. However, despite their fear not one of the residents nor one from the mixed setting, indicated that he or she wanted to move from current housing because of fears of crime, whereas 42 percent of the respondents from the age-integrated setting said they wished to move. This was further evidence of the more secure feelings of residents of age-segregated buildings.

Recommendations for Change

The respondents' primary recommendation for better security in all types of settings was to hire more and better guards. This recommendation was far greater in frequency than any other safety measure suggested, including locking doors and greater care in the selection of residents. When respondents were asked what they thought of having residents patrol the building most did not like the idea.*

This finding tended to dovetail with findings from the security survey. Most of the security staff in the study settings were also residents, and they felt a role conflict which made for poor morale on their part and little confidence in them on the part of the tenants.

Other findings of interest from the security survey indicated that security practices and staffing tended to follow the age patterns of the buildings. In the age-integrated housing the paid security staff were more numerous, more formally organized and more active with regard to patrolling of the premises. In the age-segregated and mixed housing, on the other hand, security tended to be more passive or less patrol-oriented, with more informal security activities on the part of the tenants themselves and a major reliance on monitoring the main entrance. One other safety feature of the age-segregated and mixed settings that differed from the age-integrated

* A major reason for the dislike of having residents act as patrol is that they are not able to keep each other's children under control without causing hard feelings.

was that each room was equipped with an emergency alarm button which simultaneously rings an alarm and lights up a panel in the front office identifying the apartment.

Implications of the Findings

Findings of this study tend to support the concept of age-segregated housing for the aged as a means of reducing the incidence and fear of crime among the aged. Residents of age-segregated buildings feel more secure in their buildings even while feeling anxious in the neighborhood. Most public housing developments are built in urban areas with low land values, high crime rates and in undesirable locations from a commercial standpoint. If this is truly dictated by economic necessity, then the implications for public policy become apparent. It is necessary to plan for more secure age-segregated buildings.

Policy Alternatives

Based on the implications of our findings, and with the primary objective of reducing crime and fear of crime among the elderly, we are recommending that: Priority in future planning for assisted housing for the elderly be given to age-segregated projects; where age-segregated projects are not feasible, economically or otherwise, certain buildings be set aside for the aged within projects; better trained and paid security personnel be provided for in future budgetary considerations; periodic instruction in safety and security for assisted housing residents be developed by police, housing agency or HUD staffs—respondents in this study who received such instruction attested to its helpfulness; and where appropriate, increased use of electronic safety devices, not only as an adjunct to the security forces, but to enhance the natural surveillance capacity of the residents themselves. @

Dr. Sherman is project director; Ms. Newman is project coordinator; and, Mr. Nelson is research assistant for the study, which was conducted under a grant from the Institute of Public Policy Alternatives, State University of New York.



HUD Standards and the National Fuel Conservation Program

by Duane E. Keplinger

The Minimum Property Standards of HUD and FHA and their predecessor, the Minimum Property Requirements of FHA, have contained standards for thermal insulation of residential construction for the past 36 years.

The concern of the initial Minimum Property Requirements was to enhance the comfort of the occupants and to maintain reasonable costs of operation for the heating equipment in the home. Requirements were minimal and were in the form of limitation of the thermal transmission value of walls and ceilings. The requirements would have provided approximately two inches of insulation in the ceiling of a home in any area of the country. One inch of insulation in the exterior walls would have been acceptable in the coldest regions and no wall insulation would have been required in warmer climates. In addition a restriction was placed on the allowable heat loss, permitting no more than 60 Btuh* per square foot of floor area of the home. While this limitation would have required additional insulation for certain designs of homes, it was not considered unduly restrictive.

When the first Minimum Property Standards, FHA No. 300, were issued in 1958, the maximum allowable heat loss of residences was reduced to 50 Btuh per square foot of floor area of the home. Included in this overall limit was a requirement that re-

stricted the heat loss through all vertical wall surfaces to no more than 30 Btuh per square foot of floor area. Thus for the first time, a degree of consideration was shown for the heat lost through doors and windows. During the 15 years these standards were in effect, and as the shortage of fossil fuels became increasingly evident, they were amended several times. Each time the requirements became more stringent and recognized other sources of energy consumption by extending the coverage of the standards to such items as air infiltration through windows and doors and to summer air conditioning.

At the time the present Minimum Property Standards, HUD 4900.1, were in preparation, information from the Federal Energy Administration (FEA) indicated that residential use accounted for approximately 20 percent of the national energy consumption, with about 13 percent being used for heating and cooling. HUD's desire to play an active part in the national fuel conservation program indicated a need for further improvement in appropriate standards areas. The conservation of energy became a prime concern and the comfort of the occupants was now a secondary factor, although comfort would also benefit. The new standards were intended to provide the maximum practical application of in-

insulation without drastically revising presently accepted construction materials and techniques.

New Standards

The new standards divided the country into four climatic areas, based upon the number of Winter Degree Days. This division made it possible to not only consider the severity of climate in a specific area but to also take into consideration the length of the heating season. The amount of insulation required in ceilings now ranges from three and one-half inches in the southern part of the Nation to approximately nine inches in the northern areas. If mechanical cooling is proposed, ceiling insulation must be increased to approximately six inches in thickness in the warmer areas. Storm sashes and doors or insulated doors and windows are required when the number of Winter Degree Days exceeds 4500. This is roughly over the northern half of the Nation. Since it would be more expensive and in many cases very difficult for the homeowner to add insulation to exterior walls at a later date, the new standards require that walls be insulated to the maximum degree practicable for various common construction methods in all climatic zones of the country. Insulation for floors varies depending upon the area in which the home is located

and upon whether the home is located over a basement, crawl-space or slab-on-grade.

The new requirements increased the initial cost of construction of new homes. However, a study of 28 cities across the country indicated that the increased monthly mortgage payments due to these requirements was offset by a reduction in the cost of operating heating or cooling equipment in the majority of the cases, when using the fuel costs of 1973. A slight projected increase in fuel costs, which has since proven very conservative, added the rest of the homes in the study to the group in which the monthly total payment by the homeowner was equal to or less than that for homes insulated to previous requirements.

The present standards are again being studied to see if further refinements are possible. HUD is also working with the National Bureau of Standards to prepare standards for the use of solar energy for domestic water heating and home heating. The standards are expected to be completed around the middle of this year.

Local Initiative Encouraged

It should be understood that the previously described standards are the *minimum* level of protection acceptable to HUD. Field offices are en-

couraged to cooperate with industry groups within their jurisdiction in an attempt to further energy conservation measures on a voluntary basis. The efforts of the Little Rock Area Office are outstanding in this field. In cooperation with a local utility company and a builder, the office designed a home intended to reduce the cost of heating and cooling to less than \$100 a year. Several homes have been built and metered to measure the energy consumed. Reports to date indicate that the goal will be attained. The results achieved in these homes have generated national interest by the news media and have been the subject of reports by several industry associations.

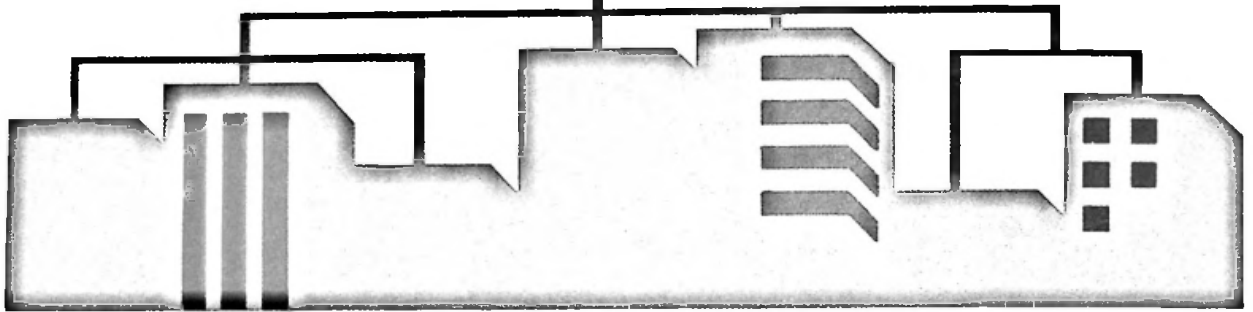
The efforts described here have been directed at reducing energy consumption in new homes. For existing homes submitted for mortgage insurance, the recommendations for thermal protection of ceilings, windows and doors and floors over unheated spaces are the same as for new homes. The installation is voluntary rather than mandatory, but credit for such improvements is reflected in the value of the property as an incentive to the seller and purchaser. ©

Mr. Keplinger is Deputy Director, Architecture and Engineering Division, Office of Underwriting Standards, Housing Production and Mortgage Credit.

Public Housing Management and the Future

Certification of an Important Profession

by Gail Gebran



Management of public housing has been in existence in various forms since the low rent public housing program began in 1937. Despite its relatively long history, the field has never been professionalized. Nevertheless, there have been many managers who have done an excellent job of managing their housing projects, often under adverse conditions. However, there are still those managers who lack the formal education, skills, experience, and competence that enable them to effectively carry out their responsibility for maintaining, improving, and operating the Nation's housing stock. In the past 4 or 5 years, the number of low income housing units has doubled. This sharp rise necessitates an increase in management manpower unlike that of the past. The quality of management also needs to be strengthened and improved to make the best use of available resources. In order to accomplish this and also meet the challenges that go with managing a housing project, the skills of the housing manager must be upgraded and professionalized.

Special Needs to be Met

Residents of public housing projects have social and economic problems that can be alleviated effectively only by a "professional" manager with

special training. These residents cannot afford to seek housing by conventional means. Unfortunately, they are often left with no other choice than to settle in a dwelling that can be very degrading as well as demoralizing. A housing manager coming from a middle class background into a situation such as this will eventually run into hardships unless he can communicate with his residents. This requires a good deal of training in human relations.

To add to his problems, the housing manager is the liaison between the residents and the local housing agency. He must balance the conflicting needs and interests of both to create a smooth operation and suitable living environment. Consequently, the job of housing manager is not an easy one. So, how can capable men and women be attracted to this important field and be encouraged to remain in it when there are no significant financial rewards and few incentives for upward mobility along a career ladder?

HUD is concerned about this dilemma facing the field of public and private housing management. For the past 2 years the Department has been developing a certification process that will help combat the problem by setting up performance standards for job qualification. This article will

deal only with the public housing management version of the certification process. There are many professions, such as that of public accountant, which certify their participants. The public housing manager should also be included in the professional sector of the working world. If he is formally recognized as a competent professional in operating the housing project, his residents should come to respect his knowledge and feel more secure in their environment, resulting in a healthier resident-landlord relationship. The entire concept of housing management depends upon his ability to hold the trust of both the residents and the local agency.

HUD is not alone in its efforts to create the profession of housing management. Since April 1974, the Department has been working closely with the National Association of Housing and Redevelopment Officials (NAHRO) in devising a workable certification program for public housing management. Recently, NAHRO completed a set of job related performance standards that are soon to be tested in the field. These standards are one important basis for the current program. As it now stands, an individual wishing to become a certified public housing manager or assistant housing manager will apply to a professional organization or as-

sociation approved by HUD. This approval will be based on past performance in housing management, experience in and capacity to deal with low income housing, the existence of a nondiscrimination policy, and a suitable certification program. Once these organizations or associations are approved, their names will be entered into the Federal Register.

NAHRO Stands Alone

Presently, NAHRO is the only association that has developed standards for certification, but others are expected to apply to HUD in the future. In the case of NAHRO, the current manager requesting certification must submit a resumé to the Board of Credentialing Trustees for evaluation. He will be certified by a process called "grandparenting" if he has at least 4 years of on-the-job experience as a housing manager or assistant housing manager, submits a satisfactory Candidate Self-Profile and three references detailing his professional history, adheres to the NAHRO Code of Professional Responsibility, and agrees to the provisions for certification maintenance. This last requirement is important for keeping the quality of management at a continuing high level. If the applicant meets the above requirements, as well as receives an acceptable rating from his personal interview, he should have no problems in obtaining a certificate to continue his public service.

The requirements are slightly more extensive for the newcomers in the field and for those managers with less than 4 years of experience. In these cases, the individual must supply the Board of Credentialing Trustees with a resumé of his educational background and personal references; adhere to the NAHRO Code of Professional Responsibility; and agree to the requirement for periodic renewal of his certificate. If he currently holds a manager's position, he will be reviewed on the job several times a year by a group of his peers. For this current manager and for the newcomer in the field, a passing mark on

a standardized objective examination will also be required. This examination, stressing the knowledge and performance standards necessary to become a competent manager, will be composed by a group of men and women selected from the field of housing management and will be independently administered by a national testing organization.

Grants Awarded

Where will the manager be able to receive the education and training that will give him sufficient background knowledge to successfully complete the examination? Early in 1975, HUD awarded \$660,000 in grants to five universities for the development of housing management curricula. Less than a year later, the curriculum of each university has been assessed and partially tested and refined. The objective is a broad dissemination of these materials to other schools so that there will be eventual courses of study in housing incorporated under majors or minors in housing management.

Since the field of housing management is so diversified, an individual will have the choice of taking special courses, based on whether he operates a project composed of elderly or handicapped residents or families. The individual need not take the university route, however, since a Bachelor's Degree in housing management is not a stipulation of the certification process. He may prefer to take part in relevant training courses, seminars, or workshops offered around the country. One such NAHRO training program is broken down into four categories covering (1) management principles, (2) housing administration, (3) maintenance and related physical concerns, and (4) human relations and social/community environment. These training courses are not free, but public housing authorities (PHA) are now being informed that costs of training related to certification are eligible budget expenditures.

The certification process will be implemented on January 1, 1978, for those managers and assistant man-

agers of projects containing 50 or more units. January 1, 1980, is the required date for certification of those persons managing projects with less than 50 units. Three months prior to the effective dates in each case, HUD is asking all public housing authorities to submit a list of names of those persons they feel will require certification. This will give HUD ample time to review the lists and make sure they are realistic. The salaries of those not certified by the above dates will not be considered as eligible operating expenditures for PHA budgets. However, if a person is appointed to the position of manager or assistant manager within a year of these dates, he is allowed 1 year to become certified.

If the individual chooses to apply to NAHRO and is denied certification, he may appeal to the NAHRO Board of Governors for additional review. If he is denied once again, he has the right of appeal to the Secretary of HUD or a designee. He may request an informal hearing which can include presentation of oral testimony, cross-examination, and preparation of a hearing record. The Secretary's decision will be rendered within 90 days of the filing date of the petition. PHA budgets will be allowed to consider as operating expenditures those salaries of housing managers and assistant housing managers involved in the appeal process.

Poor management is held responsible for many of the difficulties public housing projects encounter. Something needs to be done and done quickly to keep from wasting efforts in trying to house low income families. While certification of housing managers is not a panacea for today's housing problems, it is one big step in the right direction. Reflecting upon the failures and accomplishments of the past 200 years, our Bicentennial is an appropriate time for taking the necessary action toward the betterment of this sector of American life. ☞

Ms. Gebran is a HUD Co-op Student from the University of Maryland.

Planning for Energy Needs

701 Helps Meet the New Challenge

by Melvin W. Wachs



Last year, Secretary Hills and Federal Energy Administration Chief Frank Zarb signed an agreement pledging cooperation on vital matters affecting State, areawide and local energy planning needs. Over the past year, HUD's 701 Comprehensive Planning Assistance Program has moved into a central position as the Federal grant program available for energy related planning. This has resulted from a series of cooperative efforts launched by both agencies.

One of the first was a series of cooperatively funded demonstration projects. Secretary Hills and Admini-

strator Zarb notified each governor that the new HUD-FEA cooperative agreement would make available funds and assistance for urgently needed impact and energy resources planning projects. Several projects were quickly funded. They included such unique and vital approaches as:

- An ad hoc Middle Atlantic Governors Coordinating Resources Council (MAGCRC), which with HUD-FEA aid, would seek to assess the impact of oil facility construction on the Outer Continental Shelf on urban areas along the Coast. The first of three MAGCRC reports has just been issued.
- A similar study launched by the California State Office of Planning and Research, evaluating the impact of offshore oil facility siting derived from the Department of Interior's

sale to oil companies of leasehold 35. The National Oceanic and Atmospheric Administration's Office of Coastal Zone Management joined HUD and FEA in support of the project.

- A project undertaken by the State of Connecticut to create a combined State planning and energy agency, which would systematically plan for energy needs throughout the State and link these to the State's land use plan.

- A Washington Metropolitan Area Council of Governments program to improve dissemination of energy related information to its membership, set up an areawide energy information system, implement energy related training and help area governments set up energy management centers. It would also plan for an energy emergency situation, such as the gasoline shortage of 1974.

- A Utah program to set up statutory bases for energy development, plan for impact analysis, and take other steps to mitigate energy facility development. This is being done in response to massive strip mining planned on federally owned lands.

A second round of cooperative demonstration projects is about to be announced. It will underscore innovations in energy management and planning.

The 701 Program has funded energy-related planning for many years. Analysis of past grants shows that 701 has been used by States, areawide and local agencies to plan for such diverse energy needs as statewide assessments of energy requirements (Kansas and North Carolina, among others), strip mining (Wyoming, Utah, Pennsylvania), energy information systems (Washington Metropolitan Council of Governments, Oregon, Kansas) and energy facility site studies in many areas. The agreement added a sense of urgency and provided for new initiatives, such as the jointly funded projects and joint information and

briefing sessions made available to many 701 grantees and new State energy offices through HUD and FEA Regional Offices.

One of these was the development of a program guide written expressly for laymen—that is, nontechnical in approach and language, and intended for State and local officials who were not energy specialists or planners. This publication, entitled *Rapid Growth From Energy Projects: Ideas for State and Local Action*, is unusual, not only as a "first" in its field but because it was designed to help local officials and citizens respond to problems caused by the development of energy producing or extractive facilities to be located in their area.

The Guide emphasizes a "how to do it" approach, naming Federal program managers who are prepared to assist State and local governments, and telling citizens and officials alike what other governments have done. The Guide has proved to be a prepublication "sellout." Almost 20,000 copies were distributed by such organizations as the American Institute of Planners, the American Society of Planning Officials, the National Association of Counties, Federal agencies such as the Department of Agriculture's Rural Development Service, FEA, NOAA's Office of Coastal Zone Management, the Energy Research and Development Administration, other Federal agencies and HUD. Thousands of copies went to regional commissions, libraries, universities, planning and energy agencies, private developers, power companies, mines, unions and energy-related industrial firms.

Other Joint Efforts

Another 701-FEA cooperative project will create a technical sequel to the *Rapid Growth* handbook, offering insight into energy conservation planning and the latest available techniques, technology and pitfalls to professional staff. This Guide will also be a potential sourcebook for university level training programs for

planning and public administration students. A training package to orient local officials toward the needs for energy impact planning is also underway, centering on the *Rapid Growth* Guide as a text.

701 staff recently assisted the American Institute of Planners in designing an energy conservation workshop at Vail, Colorado, and participated as resource persons in the workshop with ERDA, FEA and other Federal agency staff. Similar workshops are planned by HUD and FEA, including a workshop this summer at the HUD Training Center in Columbia, Md., intended to encourage exchange of information, techniques and technology among demonstration project grantees. HUD and FEA staff will also undergo joint training in energy planning needs at this workshop.

HUD and FEA are also circulating information derived from the demonstration projects and their other cooperative efforts to local and State officials. They are also making available the results of other research and demonstrations sponsored by both agencies and by ERDA, in fields such as housing energy conservation, recycling waste products toward energy goals, energy planning and information systems and management of scarce energy resources.

Although still in its infancy, HUD's 701-FEA cooperative agreement appears to have gotten off to a good start and expectations are that, through this cooperative effort, national energy needs may be more effectively met without undue environmental or community sacrifices.

☞

Dr. Wachs coordinates energy projects for the 701 Program and is Program Officer in HUD's Office of Planning and Management Assistance, Office of Community Planning and Development. He is also a visiting professor at two universities, teaching graduate seminars in urban planning policies and energy planning.

Editor's Note: *Rapid Growth from Energy Projects: Ideas for State and Local Action*. This program guide is designed to help State and local officials whose localities may suffer from the development of large scale energy facilities. Following is a reprint of the introduction to the guide.

Hundreds of new energy projects—from coal mines to nuclear plants to offshore oil and gas—are proposed to meet national energy needs and goals. One or more of these projects may be proposed for your community. Long-term positive contributions to the local economy are easy to document: Improved energy supply, increased employment, in-migration of skilled labor, and diversification and expansion of the economic base. The energy produced will be of great benefit to the economy of the region and the Nation as a whole.

But at what price are these benefits purchased? There may be overcrowded schools, higher prices and taxes, traffic congestion, and pressures put on housing supply and medical services. Loss of the relaxed pace of life and friendly lifestyle may very well emerge. These impacts will face citizens and elected officials of many communities across America. How are they to predict and plan for impacts?

In the past few years, a number of States and communities have felt the impact of energy projects. They demonstrate what often happens to population and housing, to services and the quality of life. Their experience in overcoming three problems—information, management and money—can help guide future planning and action programs of other States and communities.

The purposes of this publication are simple:

- To show what the community impacts of energy projects are likely to be;
- to share ideas for action among communities, based on actual experiences; and
- to point out sources of help: for information, planning and financial assistance.

APPROACH OF THIS PUBLICATION

To be of value to you in planning for and responding to energy project impacts, the emphasis of this publication is:

- *On ideas for action*. There have been many studies of the impacts, actual and projected. What is needed now are ideas on what to *do* to prepare for the impacts.
- *On the construction phase*. It is immediate, rapid, massive, yet temporary. Conventional planning, management and financing are not geared to this pattern.
- *On smaller communities*. The rate of growth in these communities is much higher than it would be in

larger ones. And the smaller communities generally have more limited resources at the start.

— *On generally transferrable information*. Responses to one type of project may be used for others. There is a concentration on Western coal projects in this book. That is where the largest number of cases are presently available.

— *On brevity*. To keep down the size, only selected examples have been included. Some problems have few ready solutions (for example, the inflation of housing prices and changes in life style). In presenting sources of assistance at the Federal level, only those which were available at the time of publication are included.

ENERGY PROJECTS

The national policies and programs being developed to resolve our energy problems include the conservation of energy, research and development on new energy sources and the construction of many new energy projects. While many alternative energy futures have been considered, all recognize a need to accelerate production of domestic resources. Conservation is important, but cannot do the whole job.

The energy projects which are proposed, and discussed in this publication, are: Coal export mines, electric generating plants (coal-fired), substitute gasification plants (from coal), oil shale processing facilities, nuclear power plants, support facilities for offshore oil and gas, platform fabrication facilities, deepwater ports, liquid natural gas (LNG) conversion plants, and oil refineries. Many parts of the Nation would be affected, with the most prominent being:

- *Rocky Mountains and Northern Great Plains*—coal and oil shale
- *Appalachia*—coal and nuclear plants
- *Coastal zones*—offshore oil and gas, and nuclear power plants
- *Nationwide*—nuclear power plants

THE IMPACT UPON COMMUNITIES

Construction and operation of an energy project can provide many benefits to the region in which it is located. The economic base may be expanded and diversified, providing new employment opportunities—especially for young workers who might otherwise have to leave the region for work. The energy supply may be maintained or improved, and the tax base of the region strengthened. Comparative case studies show that in Tullahoma, Tennessee (with the Arnold Engineering Development Center) and in Idaho Falls, Idaho (with the National Reactor

Testing Station—both Atomic Energy Commission facilities) the "quality of life appears to have been enhanced." The reason for this was a moderate growth rate, followed by stable permanent population. The impact was gradual enough to allow public services to keep up with demands.

All too often, however, while benefits are long-range and regional, the negative impacts are immediate and local. The severity of the impacts on communities depends on several factors: Original population size, rate of growth, level of unemployment, condition of local services and facilities, and quality of planning. Impacts also vary by the type of energy project. Of all these indicators, the rate of growth appears to predict severity of impacts best. In its studies of energy impacts, the Denver Research Institute concluded:

"An annual growth rate of ten per cent strains local service capabilities. Above fifteen per cent seems to cause breakdowns in local and regional institutions."

Employment and Population

What happens when an energy project comes in? If it's a nuclear power plant, for example, there could be a surge of construction workers up to 2,500 at its peak. Five to 10 years will be required to build the power plant. The population will increase as workers' families come in. The number of workers needed to run the energy project after it is built is generally less than the construction force. Providing housing and services is difficult with a temporary build-up and decline.

Land Use and Housing

In most cases, the first local impact is on housing. The few vacant houses are quickly snapped up, by either temporary or permanent residents. The most visible sign of the energy boom is the mobile home. When all available standard housing has been taken up and little new housing is being built, workers and their families turn to mobile homes. If there are not enough spaces within the existing community, the units will scatter across the landscape creating "aluminum ghettos." It is not the mobile home itself which is the problem, but inadequate planning, lack of control over siting, and few amenities.

Community Life

Life in the community changes as a fast rate of growth produces symptoms of urbanization, such as a speeded up pace of life, congestion, inflation of prices and scarcity of amenities. Particularly significant are possible tensions between long-time residents and newcomers, and the lack of activities for wives of project workers. A major problem in human services is likely to be medical care, getting enough doctors for increased population. Traffic is often

a problem, and added housing puts large demands on the water and sewer systems.

Fiscal Impacts

Revenues from energy developments are generally sufficient—in the long-run and at the regional level—to offset induced costs. However, for the individual community, there are problems of timing and geographic distribution of revenues:

— *Revenues may appear too late.* The taxes imposed on the energy project come in after the project is completed. Where is the city or county to get money to solve problems which are there now?

— *Revenues may be distributed without regard to need.* The taxes on the plant usually go to the county (and the State), while the major impacts are in the cities where the people live. The cities may get no tax money at all from the energy project. Or the project may be in one county, while the community where workers live is across the county (or even State) line. How can tax revenues line up with needed expenditures?

CONSTRAINTS ON ACTION

If we know what the problems are, what keeps us from solving them? Well, we know a lot more about the problems than the solutions. There are many constraints that limit the ability of the local community and State to respond. In general they involve the inability to predict, lack of growth management tools and experience, and lack of money. It is difficult to plan a meaningful response when the details of the future are unclear.

Most communities which will bear the impacts of energy projects are small and remote, often without experienced and professional help. In the six States of the Denver Federal Region, one-half of the 131 communities to be impacted have less than 1,500 population and are more than 100 miles from a metropolitan area. The fiscal constraints place limitations by restricting tax rates, debts, grants and allocations available to local and State governments.

These constraints can be overcome with foresight, planning and cooperative efforts among local communities, areawide districts and States.

The Guide is available free of charge from The Program Information Center, HUD, Wash., D.C. 20410, or from the U.S. Departments of Agriculture, Interior, and Commerce, the Energy Research and Development Administration, regional councils, and through professional associations such as the American Society of Planning Officials, the American Institute of Planners, and the National Association of Counties.

More Comfort with Less Energy?

by Conrad C. Arnolts

Since the onset of the energy crisis with its long gas station lines and turned back thermostats, we have all experienced more inconvenience, higher heating bills, and less comfort. The problems of energy conservation quickly became a national concern not only to individuals but also to industry and government. HUD is particularly affected because of the large amount of energy used in public housing. The Office of Policy Development and Research, Division of Energy, Building Technology and Standards, working with the Department's Housing Management Maintenance Engineering Branch, analyzed methods of conserving energy in public housing while maintaining comfort. Many public housing units have a disproportionate share of the elderly and the very young to whom healthful temperatures are very important.

New Approaches

An unusual approach which shows promise is to provide a supplemental radiant heating system by combining electric heating elements with a seamless flooring system. Neither radiant heating systems nor seamless flooring is a new development. Electric radiant heating has been used for many years, primarily in foreign countries. Seamless flooring was

developed 15 years ago but its marketing potential was adversely affected by the failure of some systems due to installation problems. Recent improvements in both materials and installation methods have corrected the earlier problems and the present product is a thin, seamless, tough, and attractive surface requiring minimum maintenance. Integrating radiant heating with seamless flooring has not previously been attempted; so this HUD research is both an effort to solve a problem and to advance the state of the art in materials technology.

Radiant Heating and Seamless Flooring

The idea behind the radiant heat in seamless flooring is not based on technology as much as physiology. Research studies conducted in both the U.S. and England indicate that the temperature under foot is a critically important factor in comfort.

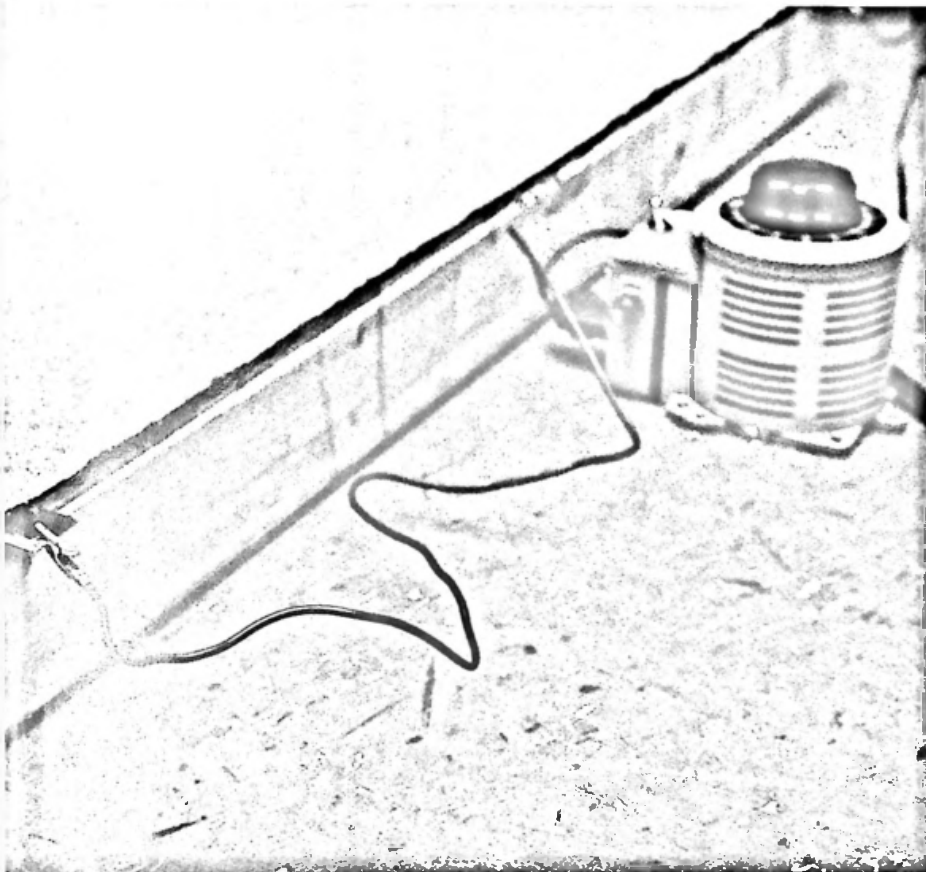
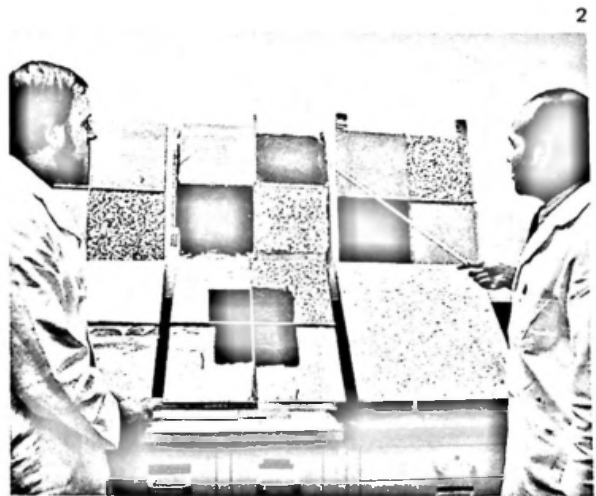
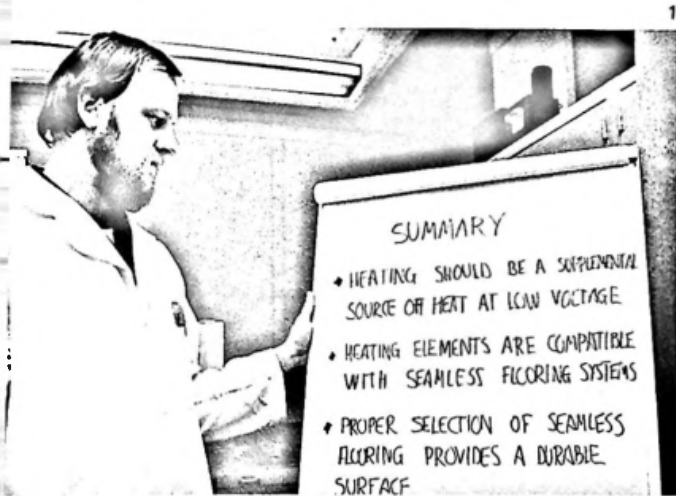
"The radiant heating system will maintain the temperature of the seamless flooring at 80 degrees and at 40 volts."

Simply explained, although a room may be warm, if tenants' feet are cold they are inclined to raise the thermostat. This wastes energy. For both energy conservation and comfort, floors must be maintained near room temperature. The radiant heating system will maintain the temperature of the seamless flooring at 80 degrees and at 40 volts. Very low electrical energy consumption is expected. This is intended to be only a supplemental heat source which will permit the reduction of room temperatures without causing discomfort to

the tenants. The potential for energy savings is significant since a thermostat turned back 5 degrees can reduce a heating bill 20 percent in the Washington, D.C., area. This system has the added advantage of conveniently being introduced as a quick response, supplemental heating-flooring system in a retrofitting process for existing housing units.

New ideas always raise questions and problems which must be solved. Will the flooring discolor or warp when the heat is applied? Is it safe? Can it be cost effective? What are the effects of carpets or furniture on the floor? The National Bureau of Standards is working with the HUD Office of Policy Development and Research to answer these questions, based on a small scale laboratory study. Twenty different seamless flooring systems were examined including polyurethane, epoxy, and acrylic systems. Tests, including abrasion, slip, impact, stain, and flame spread were performed on each. Eight radiant heating systems constructed of conductive non-woven fabric, conductive paints, heating cables, plastic encased heating elements, and a foil element in a fiberglass polyester fabric were tested to determine their performance characteristics. Further tests will be performed on a larger scale on the best heating-flooring combinations. If the system seems to be feasible, a full scale field test will be the next step. The final results should indicate the possibility of using the system as a means of providing more comfort with less energy. *AC*

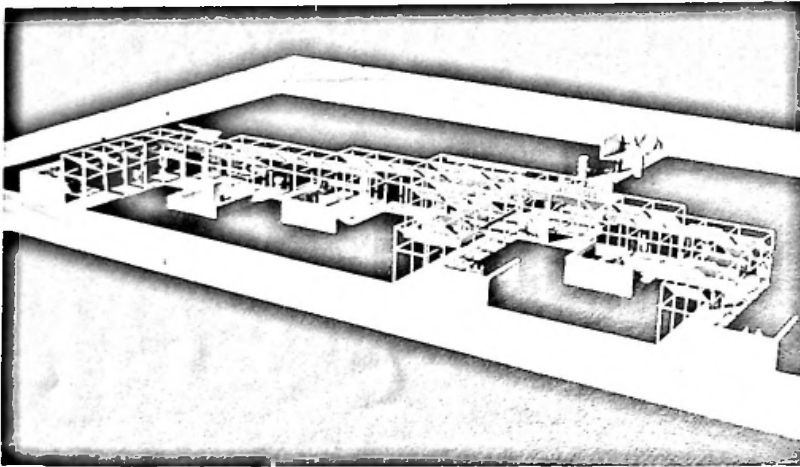
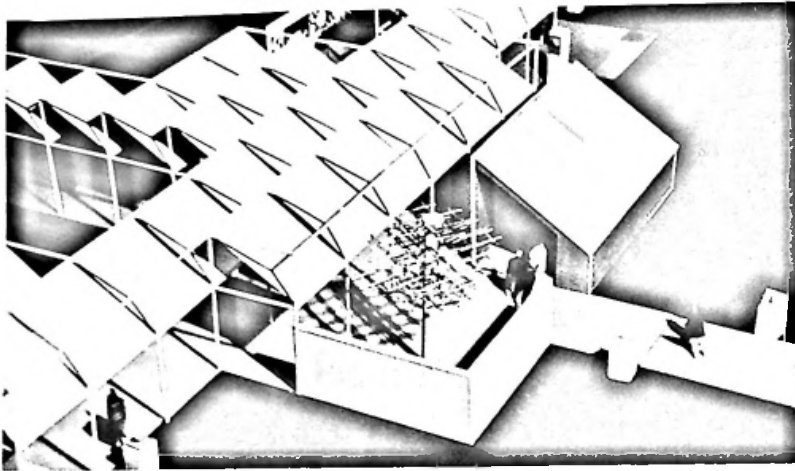
Mr. Arnolts is an architect in the Division of Energy, Building Technology and Standards, HUD Office of Policy Development & Research.



1. & 2. Recent improvements in both materials and installation methods have corrected earlier problems. HUD research is designed to make advancements in materials technology.

3. Electric heating elements are combined with a seamless flooring system. Electric radiant heating has been used for many years in other countries.

SOLAR EXHIBIT on THE MALL



May 24th marked the official opening of the solar exhibit on The Mall located in the Nation's Capital. Designed to highlight the use of energy conservation techniques and solar energy for heating and cooling, the exhibit is located directly on The Mall between the new Air and Space Museum and the Botanical Gardens.

The exhibit consists of a series of covered walkways connecting separate displays. A major focus of the exhibit is a portion of a house designed to show how a solar heating and hot water system can be integrated into a residential structure. The house display also emphasizes correct weatherstripping, insulation, storm windows and other energy conservation improvements which a homeowner can do himself.

Other parts of the exhibit:

- describe the history of solar energy usage;
- list existing solar energy structures around the country;
- demonstrate an actual solar domestic hot water system, including a place for the visitor to feel the hot water;
- indicate current energy use by country and the number of years each energy source will still be available;
- demonstrate a solar electric generator by a rotating reflecting sculpture powered by sunlight falling on an array of photovoltaic cells which generate electricity to run a small motor;
- provide a small area for visitors to rest and relax while being cooled from air piped in from the solar cooling exhibit;
- describe promising new technologies; and
- document important weather and solar collector information from the Climate Data Bank.

The solar exhibit is a combined effort of Concern, Inc., a nonprofit national environmental organization, Energy Research and Development Administration, HUD and the Federal Energy Administration. The exhibit will remain open until October 1976.

"The Department has undertaken a vigorous campaign to inform the public of its rights under Civil Rights Law. Under Title VIII, we publish advisory guidelines to aid those subject to the jurisdiction of the law in understanding their responsibilities. We undertake studies of housing practices and collect racial data in all of our housing programs in order to determine areas of non-compliance. We conduct continuing community education programs to inform individuals of their rights under law. We encourage national, State and local private organizations in undertaking programs designed to expand housing options for minority groups and low-income individuals. We work closely with State and local agencies having Fair Housing Laws which provide rights and remedies substantially equivalent to those provided by Title VIII and refer complaints to these Agencies.

"Our public information efforts include a number of administrative meetings held to exchange information concerning particular areas of Title VIII enforcement. The six administrative meetings that have been conducted as of this date dealt with (1) off-base housing for minority servicemen and their families; (2) discrimination in the financing of housing (the role of lending institutions with regard to granting of mortgage credit); (3) the Fair Housing enforcement efforts of the State of Maryland Commission on Human Relations and (4) three meetings relating to housing discrimination against Spanish-speaking Americans.

"We have sponsored regional seminars to provide information to the public, leaders of citizens groups and public officials on the Fair Housing Law, its implementation, and have also been involved in the production and distribution of radio and television public service announcements that are broadcast across the country at frequent intervals as part of the general commitment to public service by the electronic communications media."

*—John B. Rhineland, HUD Under Secretary,
Before the Subcommittee on Civil and
Constitutional Rights, House Committee on the
Judiciary, March 10, 1976*

"The Block Grant affords unusual latitude for creative thinking and innovative planning. It also affords unparalleled opportunities for direct communication with and input from those groups which will be affected by the Block Grant and the changes it brings to the community. Now, more than at any time in the past, you and the communities you represent and serve have the ability to specify the goals of that construction and the impact it will have on the community.

"This is no time for selfish concerns to prevail. This

is no time to be influenced by the kind of tunnel vision that too often displaced human beings to make way for football stadiums and convention centers. This is a time for all elements of the community to share equitably in creative efforts to eliminate one of the final barriers to full individual freedom and dignity."

*—James H. Blair, HUD Assistant Secretary for Fair
Housing & Equal Opportunity, before the
National Association of Housing and Redevelopment
Officials, National Workshop on Equal Opportunity,
New Orleans, La., February 16, 1976*

"In general, the outlook for 1976 production is for a continuation of the hopeful trends of late 1975. Further recovery in housing can be expected along with recovery in the economy, especially if the favorable trends in savings and more economical design continue.

"The industry has entered 1976 with an annual rate of starts at the 1.2 to 1.4 million level. Additional growth can be expected as the economy progresses during the year, so that we project total private starts in 1976 to be between 1.4 and 1.6 million units. Economic forecasts are always a risky business, but present indicators suggest that the higher figure is more likely than the lower. Single-family starts would represent 1.0 to 1.2 million units, and multifamily starts between 0.3 and 0.5 million units, with some substitution possible between the two sectors.

"Mobile home shipments, which experienced seasonally adjusted annual rates between 185,000 and 235,000 units in 1975, are expected to approach or even surpass 300,000 units in 1975; most of these will be used as primary residences.

"These housing production developments are reported in greater detail in the Eighth Annual Report on the National Housing Goals."

*—Carla A. Hills, HUD Secretary
speaking before the Senate Committee on
Banking, Housing and Urban Affairs,
February 20, 1976*

"Public confidence in Government and industry is in direct proportion to the bread winner's confidence in his or her chance to make it, multiplied by all the bread-winners in the Nation.

"The challenge of our decade is to make our system of free enterprise work, hampered not so much by a harsh economic climate as by sagging public confidence.

"That should be challenge enough for us to forge and cultivate a solid partnership."

*—Carla A. Hills, HUD Secretary
speaking before the Business Council,
Washington, D.C., February 18, 1976*

Many nations throughout the world share the United States' interest in harnessing solar energy. Those who must import all of their oil and coal feel an even greater sense of urgency than we do to become less dependent on fossil fuels as the primary source of energy. Others, with hot climates, would like to put their abundance of sunshine to work.

Interest in solar energy can be traced back to the days of the ancient Greeks, who used convex mirrors to concentrate the sun's rays for the purpose of lighting their sacred temple fires. During the 17th and 18th centuries, a number of experiments with large solar mirrors were carried out in Italy and France, and in 1882 a Parisian demonstrated that he could print a newspaper on a press powered by a solar boiler. In this century, solar energy has been used to run irrigation pumps in Egypt and to heat water for homes in Israel, Japan, Australia, and the USSR.

The energy crisis has given new stimulus to a venerable topic. Solar societies have been meeting seriously for at least 15 years. Conferences on the subject have been sponsored by international governmental organizations such as the United Nations (1961) and the Organization for Economic Cooperation and Development (1974). A number of bilateral agreements for the exchange of solar information have been signed. From this wide-ranging activity have come a multitude of possible uses for solar energy, ranging from an enormous French solar furnace used for high-temperature materials research to solar stoves in Haiti and a solar-powered educational television service in Niger. A representative sampling of housing-related solar developments in other countries is given below.

International Interest in Solar Energy

By Ann R. Weeks

Canada

It is unusual, particularly in a country with a cold climate, to build a solar-heated house that has no supplementary source of heat. A noteworthy exception is the four-bedroom demonstration home being constructed north of Toronto by the Ministry of State for Urban Affairs in cooperation with Ontario's Energy and Housing Ministries. The building—called Provident House because it will provide for future needs—will have a large (65,000 gallon) storage tank underneath it for water that has passed through a heat collector. The temperature of the water is expected to range between 175 degrees Fahrenheit in October and 105 degrees in March. Part of the landscaping will be a ridge of raised soil called an earth berm which will provide additional insulation for the storage tank and shield the house from north winds.

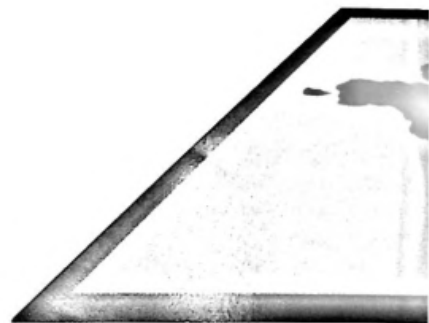
Provident House will be one of Canada's urban demonstration projects for Habitat, the U.N. Conference on Human Settlements in Vancouver (May 31-June 11). Later, it will be sold with the stipulation that the new owner allow access to the house for several years so that the heating system can be monitored.

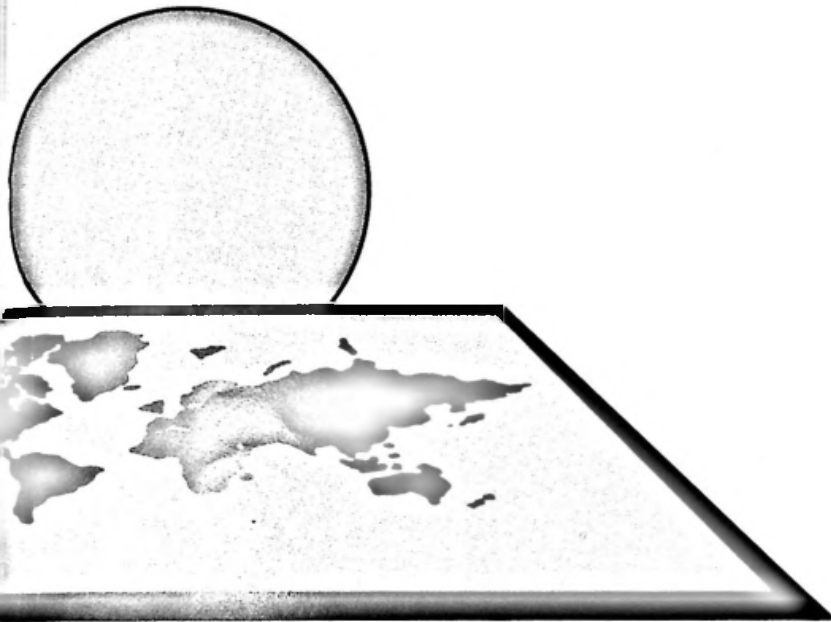
The Ontario Housing Ministry will also contribute funds for the design of a 20- or 30-unit residence for senior citizens that will be partly

heated by solar energy. It will be the first multiple-unit dwelling of its size to be constructed in latitudes as far north as Canada, and is probably the largest solar-heated project in the country.

France

The French have done more experimenting than most countries with homes heated by direct transfer of solar energy through the walls of the building, rather than the more generally used combination of rooftop heat collectors and circulating water. One such model, built in southern France by the National Center for Scientific Research, absorbs heat through a blackened, south-facing concrete wall 13-15 inches thick that is faced with glass. A 4-inch air space





between glass and wall, plus slots at the wall's top and bottom, allows air to circulate up between glass and concrete and down into the rooms. This system provides two-thirds of the heat needed in the winter for the Mediterranean climate where the house is located.

West Germany

The Ministry of Research and Technology is the joint sponsor, with an electrical conglomerate, of a project in Aachen known as the "powerhouse." In this house, fully equipped for a family of four, electric appliances and other equipment are operated daily by remote control governed by a computer in the attic. Since the house is heavily insulated and its ventilation is controlled, it

consumes only one-sixth of the power normally used by a house of its size. What energy it does use is solar energy, collected in 18 roof-top boxes and stored in a 10,000-gallon water tank in the basement. During an average year, solar energy equivalent to 10,000 to 12,000 kilowatt hours is collected in this manner, more than enough to meet the building's heating requirements.

Additional heat is obtained from the ground below the house by means of plastic tubing embedded in the basement floor. Water flowing through the tubes is brought up to soil temperature (about 45 degrees Fahrenheit) and further warmed by a heat-exchange circuit. The result is a tank of 120-degree water, which should be sufficient in itself to heat

the entire house. In the powerhouse, even surplus heat from hot water leaving the bathtub, washing machine, and dishwasher is recycled, as is hot air, reducing the per-annum hot water energy consumption from 3,980 kilowatts to 980.

South Africa

This sunny country is well suited to the use of solar water heaters, and they are being produced for both the domestic and industrial markets. Those manufactured by one South African company utilize roof-top heat collectors made of stainless steel and insulated with polyurethane foam. They are covered by acrylic rather than the more easily broken glass. Water flows into the collector from a storage tank located nearby, is heated by the sun, and then returns to the tank. When hot water is drawn from a tap in the house, the tank is topped up with cold water regulated by a ball cock.

Brazil

Brazil, another country with an abundance of sunshine, foresees an extensive use of solar energy at some point in its future. For the present, the major project is a nationwide system of monitoring stations that will measure solar radiation levels. The data obtained will be used to prepare a map showing solar energy distribution and potential for development. Short-range projects using solar power in agriculture and sea-water desalinization are under consideration, and solar cookers and water heaters are already on the market. ☞

Ms. Weeks is an Information Specialist in HUD's Office of International Affairs.

HUD has issued a *Spanish Speaking Program Handbook* detailing policies and procedures for promoting equal opportunity in employment and housing for Spanish surnamed citizens. Spanish speaking individuals, or Hispanics as they are commonly called, are those of Mexican, Puerto Rican, Cuban, or other ancestry from Spanish Speaking countries of the Western Hemisphere and Spain. Copies of the Handbook are available at all HUD offices.

HUD's pavillion in the U.S. Bicentennial Exposition on Science and Technology, to be entitled, "America: A Nation of Communities," will focus on HUD's role in helping American communities achieve a better life style through science and technology. The exposition is scheduled to open at the Kennedy Space Center in Cape Canaveral, Florida, on May 30 and will run through September 7, 1976. The exhibit—one of 16 to be presented by various Federal agencies—was planned by the Association of Science-Technology Centers of Washington, D.C. with the collaboration of a national steering committee composed of urban planners, museum representatives and HUD officials. Its special design permits audience participation in the process that has built America's cities, suburbs, and towns, and provides visitors an opportunity to learn the intricacies of community development.

HUD Secretary Carla A. Hills recently announced the appointment of Ronald D. Stegall as Assistant to the Secretary for International Affairs. A native of Richmond, Indiana, Stegall lives in Wash., D.C.

On behalf of senior citizens in public housing, Community Services Advisor David Courtney, HUD Birmingham Area Office, works closely with the Alabama Commission on Aging and its county counterparts. Following the formal HUD-HEW Agreement on provision of public housing facilities for a hot balanced meal a day for the elderly of the community, Alabama was the first to initiate such a joint agreement with HUD on the State level. In April '76 the first of a series of four half-hour panel-studio audience programs on positive concerns of older adults was broadcast each Thursday at 7 p.m. statewide on educational TV. Topics were Consumer Protection; Housing for the Elderly, with CSA David Courtney, and John Springer, Social Services Supervisor, Birmingham District Housing Authority; Health: Key to

Happiness, with panelist Frank Clayton, Supervisor of Recreation and Community Activities, of the Housing Authority; and Adjusting to Retirement.

Residential construction activity in New York State during 1975 dropped to the lowest level recorded in the 17 years the State Division of Housing and Community Renewal has maintained the statistical series. A report on the year's construction activity released recently indicates that building permits were issued authorizing the construction of 32,623 new housing units in the State during 1975, a decline of 37 percent from 1974 when 51,637 units were authorized, and a decline of 59 percent from the 79,470 units authorized in 1973. In New York City, the decrease in construction was even more severe as new housing unit authorizations fell by 76 percent, from 15,743 in 1974 to 3,810 in 1975.

Oak Park, Ill., was named an all America City for the Nation's Bicentennial year in a competition sponsored by the National Municipal League. The city, which has been the home of such noted Americans as Ernest Hemingway, Edgar Rice Burroughs, and Frank Lloyd Wright during its 75-year history, was cited for "significant citizen achievement and involvement."

Thirteen States have passed laws favoring, to some degree, the installation of solar heating systems. In Indiana, Arizona, Colorado, Illinois, Maryland, Montana, Massachusetts, New Hampshire, Oregon, and North and South Dakota, solar systems have been wholly or partially exempted from property taxes. In addition, Arizona permits a homeowner to deduct the cost of solar installation from his taxable income over 60 months, and New Mexico grants a credit of 25 percent of a solar system's cost from State income tax liability, up to a maximum of \$1,000. In Texas, solar systems are exempt from sales taxes. Similar measures are being considered in several other States.

Secretary Hills recently announced the appointment of David M. deWilde as President of HUD's Government National Mortgage Association. He succeeds Daniel P. Kearney who has been appointed Associate Director for Economics and Government Programs of the Office of Management and Budget. Since November 1974, deWilde has been Deputy Assistant Secretary for Housing Production and Mortgage Credit (HPMC) and Deputy Commissioner of the Federal Housing Administration.

lines&numbers

Trends in HUD/FHA New Single-Family Home Sales, 1969-1974

The typical new single-family home purchased with mortgage insurance under HUD/FHA's Section 203 program sold for \$26,864 in 1974. This represented a 31 percent increase over the 1969 sale price. The average home buyer assumed a debt of \$24,609, about 27 percent higher than the average mortgage amount in 1969. Closing costs increased by nearly 30 percent over the same period. Construction costs increased by more than one-third while land costs were up 27 percent.

Although the floor area of the average home was virtually unchanged, the average lot size decreased by one-fourth, reflecting the continuing rise in land costs. The trend toward such amenities as multiple bathrooms, central air conditioning, and individual garages or carports continued. In addition to providing a smaller home, builders are increasingly building homes without basements. In 1960, one-third of all homes purchased under the Section 203 program had basements, compared to one-fifth in 1969 and one-seventh in 1974.

The median annual family income of Section 203 purchasers was \$14,357 in 1974 compared to \$12,836 for all U.S. families in the 1974 Current Population Survey. The severe impact of inflation on the home buyer persisted as evidenced by the 41 percent increase in prospective monthly housing expenses while effective monthly income rose 30 percent.

HUD/FHA New One-Family Home Transactions, Section 203

Financial	1974	1969	Percent Change
Sale Price	\$26,864	\$20,563	+31
Mortgage Amount	24,609	19,324	+27
Closing Cost	584	458	+28
Market Price of Site	5,482	4,300	+27
Construction Cost (sq. ft.)	18.10	13.39	+35
Physical			
Floor area (sq. ft.)	1,238	1,271	-3
Lot Size (sq. ft.)	6,986	9,299	-25
No. of Rooms	5.8	5.9	-.1
With One Story	78.8	85.6	-6.8
With Basement (%)	13.9	20.3	-6.4
With Garage (%)	56.4	56.7	-.3
With More than 1 bath (%)	79.8	71.9	+7.9
With Central Air Conditioning (%)	44.3	28.3	+16.0
Family Income and Expenditure			
Median Annual Income	\$14,357	\$11,479	+25
Effective Monthly Income	1,055	814	+30
Prospective Monthly Housing Expense	295	209	+41

Compiled by
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