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PUBLIC HEARING
before
ASSEMBLY ENERGY AND NATURAL RESOURCES COMMITTEE
SUB-COMMITTEE ON ENERGY CONSERVATION
on
ENERGY CONSERVATION IN THE CITIES

New Jersey State Library

Held:
March 30, 1981
Assembly Chamber
State House
Trenton, New Jersey

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Assemblyman Gerald R. Stockman, Chairman
Assemblyman Robert D. Franks

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ASSEMBLYMAN GERALD R. STOCKMAN (Chairman): Good morning. I would like to welcome you here this morning to the second in a series of hearings on energy conservation by the Assembly Energy and Natural Resources Subcommittee on Energy Conservation, a committee with which Senator Bill Bradley has associated himself and agreed to participate in a series of hearings, looking towards shedding some light on and perhaps developing some legislation in the area of energy conservation.

My name is Jerry Stockman. I am the Chairman of this Subcommittee. I want to thank you for being here. I think we have a very interesting list of witnesses. We are starting a few minutes late. Unfortunately, Senator Bradley, who had hoped to be here for at least an hour this morning, because of problems, is unable to be with us. He has, personally, given me his assurance that he and his staff will follow the testimony of these hearings and work with us hereafter so that, hopefully, some constructive things will result from our efforts. We will have at least two more hearings after this one. Those, of course, will be publicized.

I would like to get on with this hearing because we have a number of speakers. I have a prepared statement. It is a very good one. But I am going to forego it because I am more interested in hearing from you and getting ideas from you than speaking myself. The gist of the statement really is that energy is a major issue for the '80's, energy is a critical issue for the United States and a critical issue for the State of New Jersey, a very energy dependent state. I think, basically, that is all that needs to be said for a start. As I indicated, we have some very interesting and distinguished speakers.

The first one who has expressed a willingness and an interest to share with us some ideas and opinions on this subject is my good friend Commissioner Joel Jacobson of the Department of Energy. I would like to invite him to begin today's session.

J O E L J A C O B S O N: Thank you very much, Assemblyman. I am delighted for this opportunity to be here and, to demonstrate my appreciation, I am going to be particularly brief. There are two reasons for that. First, I have already appeared before your Committee and about exhausted the limits of my knowledge. Secondly, I think the subject of today's hearing has been primarily the purview of Assistant Commissioner Richman who has accompanied me here today. He has had the line responsibility for its implementation. I think all of us could benefit by listening to him.

However, if you don't mind, I would like to make one or two preliminary statements that are more background than specifics. In fact, I would like to make two general statements.

I would like to begin by outlining the assumptions under which our department has been operating because I believe they are vital to the success of what you are trying to do.

First, we regard conservation as a new source of energy.

The second is we accept the fundamental, conventional wisdom that is perfectly apparent to every citizen in this nation that energy costs are going to go up.

The third is that the government has a particularly vital role to play and the evidence is that the role we have played, particularly in this State, is one of a cost-effective investment. Chuck, I am sure, will be able to give you some of the details of that.

The fourth is that inefficiency and the profligate use of energy does occur and that there are significant savings to be generated by almost drilling for new resources in inefficient operations. I, frankly, am amused, although perhaps I

should be angered by the fact that some of the critics of our department have made statements as silly as, the New Jersey Department of Energy has not discovered one drop of oil. It would challenge the ingenuity of a Solomon to find any oil in New Jersey even if there were no Department of Energy in the State. Of course, that is just a cheap political shot for those who try to do that. We do not have any oil, or coal, or natural gas in our State. We have been able to produce, I think, significant quantities of these sources by the conservation work we have done.

Those are the basic assumptions, plus one final one. The common theory that the free market will generate significant savings, I believe is faulty for two reasons. The first is that it will not improve efficiency. It merely stratifies society along economic grounds with those best able to pay continuing their normal usage and, those not able to pay, decreasing theirs. The user and the payer is not always the same person. And, finally, the fact is that if we deprive departments of energy, such as ours, of the tools and personnel to do the job, we are defeating the entire purpose of the conservation program.

I set that forth with some - perhaps the word is even bitterness - because as we face the future, it becomes apparent that at least from federal funding we are being deprived of almost our total resources. I regard this to be a fundamental error both in judgment and in tactic.

Just one final point I would like to make: We have held throughout the State a series of seven seminars dealing with the problems of heating for low-income individuals. We have done this primarily because of our concern with eliminating the horror stories that we occasionally read about where people literally freeze to death or, sometimes more frequently, start fires by unfortunate means in trying to heat when their own regular sources have been turned off. I can tell you that these meetings which were held throughout the entire State produced a number of individuals with seething anger at the high cost of oil, gas and electricity bills. I know this is not generally within the scope of this Committee. But it is difficult to ignore this condition that does exist. And to deprive us of the funds to at least reach these groups with information concerning weatherization and insulation, how they can meet these problems, how there is relief to be provided by governmental agencies, again, in my judgment, is nothing less than sheer folly.

I believe the work of our department has been significant. I think the record that Chuck will probably set forth to you indicates the cost effectiveness of it. I feel that to deprive us of the opportunity to continue is folly. To depend upon the market to generate conservation is cruel.

Having said all these nice things, I would like to justify the continuation of our department by a delineation of these savings, which are a direct result of governmental - not interference, but contribution. We believe that the government has a proper role to play. It protects against fraud. It protects against faulty workmanship. It replaces an immoral, calloused, cruel marketplace mentality. Finally, it generates those types of savings which all of us believe is the necessary resolution of our problem, to extricate ourselves from these economic problems, and, more significantly, to relieve our dependence on foreign oil.

As I said, Chuck has been working with these programs within the State and I think it may be more appropriate for him to give you the specific details of them.

ASSEMBLYMAN STOCKMAN: Fine. Thank you.

C H A R L E S A. R I C H M A N: Mr. Chairman, dealing with energy conservation in the cities has probably been one of our agency's most frustrating activities. It

has been a combination of lack of funds on the part of many people whom we would like to aid, the potential and continued reduction of federal programs to assist the poor and the elderly, and our inability to develop within the State with the constraints of the budget sufficient funding to help some of the citizens.

Our programs have been aimed primarily at the government and the low- and moderate-income people when we deal specifically with city programs.

In the area of what we title Institutional Buildings Grant Program, which is a federally funded program and the one program that the U.S. Department of Energy at this point has scheduled to continue, we have aided some 18 counties and municipalities in performing audits of their buildings. Unfortunately, there are no funds available at the county or municipal levels directly from the state or federal government to implement any capital investments. But, at least at the audit level, over 900 buildings have been audited and savings of almost two million dollars in no-cost and low-cost, noncapital expenditures have occurred during the past year. That is a significant savings for communities faced with the problems of the cap law in New Jersey and their inability to pass and extend above that. Energy conservation can have a dramatic effect at the local level. In the State, as we have pointed out in the past, we have reduced energy consumption in State buildings through no-cost, low-cost maintenance changes by 11 1/2 percent. We believe that our municipalities and county governments can do equally, if not better, given in many cases a building mix which is very inefficient.

We have tried to tailor our programs for residents of the cities to interface with other State departments, specifically the Department of Community Affairs and the Weatherization Program, and the Department of Human Resources and the programs they have in direct aid to residents.

During the past year, in conjunction with those departments, we have conducted a series of meetings which attracted over 640 different organizations located in cities, with a group membership of over 50,000 persons. We have supplied these groups with informational booklets, not only addressing how weatherization and upgrading housing can take place and what low-cost, or again no-cost - and, unfortunately, that is primarily what we are dealing with - activities can take place, but also how to relate to utility cut-off policies and payment policies, how to relate to the fuel dealers, what local service organizations a person can go to if they are in need of help, and certainly how to go to the Department of Community Affairs in hopes of weatherizing their homes.

There is no doubt that the poor and the elderly are being hurt the most by what is happening with the high rise in the cost of energy.

We have some preliminary data from an Eagleton Study which is now in the field, which is distressing in that it shows a continued change in the mix of energy as it applies to those homeowners in the cities and those homeowners in suburban or rural areas. We are finding an increasing percentage of people in the cities and rural areas dependent on oil. We are finding an increasing percentage of the poor and the elderly in homes that are heated by oil. Oil costs, at least through the first half of this decade, will exceed the cost of natural gas, unless there is a speedup of deregulation of natural gas, a policy that the government in the State has opposed.

So what we are seeing is a stratification along the poor, the city, the rural, the elderly paying the higher up-front costs of what is a national energy policy, and the suburban areas at least dragging behind somewhat in costs because of the higher percentage of natural gas heated homes in those areas. We have

no funds directly to help the people in the cities to weatherize their homes. Unfortunately, the Congress has before it a proposal that would end the weatherization program in 1982. While this program has had significant difficulties in the past - and, indeed, in New Jersey we had a great number of problems administering the program, in part because of the relationship of the program to CETA - in this past year - and I assume Commissioner LeFante will report in more depth on that --- in the past year, the program has straightened out, more homes are being weatherized, and we face a cut-off in that program in 1982 which can have a devastating effect on the homeowners of this State.

Our survey shows that over 40 percent of the homes in the State do not have adequate ceiling insulation, let alone addressing such issues as storm windows and storm doors or caulking. The weatherization program was a program to help the needy directly with aid in weatherizing their homes. It has a benefit to all people in the State in that any reduction in the use of fuels has an effect on utilities and helps preserve everyone's costs.

I might point out to you that at least in one state, Maine, the government has been successful in passing bond issues that would be the equivalent of a \$140 million bond issue in New Jersey when you base it on a per capita basis to upgrade the homes of the poor and the elderly, for the residents of Maine as well as state and municipal buildings. We were very fortunate last year in passing the \$150 million bond issue. It may be worthwhile, especially in lieu of the cutbacks at the federal level, to look to some of these other programs.

Specifically, we have been conducting nearly a thousand audits in low- and moderate-income homes in Atlantic City this past year, in Bergen County, in the City of Camden, in various other communities in Camden County, in Elizabeth, in Jersey City and in New Brunswick, with the New Jersey Public Interest Research Group handling the program there. Also the Essex County Department of Planning and Economic Development has conducted 110 audits of multi-family dwellings. We have identified, as I pointed out, the low-cost, no-cost savings which generally can run in the 10 to 20 percent range. The problem is - and I assume you will hear this from others later - the capital to do the necessary other investments that we seek and have significant savings of energy. Some of the work done for us by Princeton University Center for Energy and Environmental Studies indicates a 50 to 75 percent savings in many of these buildings can occur if proper energy-efficient devices and schedules are maintained.

We, unfortunately, will be cutting our program in half in June because of reductions in the present year in federal funding. Next year, we probably will not have any outside - that is outside the State - Department of Energy funds as we have had this past year with grants to counties and cities actively pursuing the energy audit program at the local level. Precisely the time that we are seeing this increase in prices, unfortunately we are cutting back on these activities.

The only area we are expanding, and that is because of a joint program between our agency and the Department of Environmental Protection, is in the area of recycling. That, unfortunately, is a very long-term program which would not show immediate savings and certainly not have a direct immediate saving to the low- and moderate-income people that we are dealing with today.

I am sure the Commissioner and I will be happy to answer any questions.

ASSEMBLYMAN STOCKMAN: Chuck, let me ask you or the Commissioner a question in my mind. What do you see as the role of the public utilities in this struggle

over energy conservation in urban areas? Obviously, it is a big topic in itself; but can you comment on where you see the utilities may have a role to play in helping this problem?

Excuse me for a second. Bob Franks has arrived and I want to acknowledge Assemblyman Franks from Union County has been a faithful attendee at these sessions and a person very interested in energy issues in the General Assembly. He is to my far left. I guess I really should have deferred to him for questions first. But we are not that hung up on that sort of thing. Chuck, will you go ahead.

MR. RICHMAN: We do have the utilities participating in our energy conservation programs, at least at the identification level of what has to be done in buildings and for homeowners. Under our utility audit program which normally has a nominal \$15 fee to conduct an audit, there is a waiver of that fee when it involves any people who are on the Lifeline Program. The utility will come in and help identify what activities should be undertaken by a homeowner.

There is some evidence that homeowners have been reluctant in the past to go to a utility for direct financial assistance. I think it was three years ago - maybe four years ago - the Board of Public Utilities instituted a loan program for insulation, a maximum of \$500 the first 3 months or 90 days for free, and then a 1 percent a month program thereafter. It has had a minimal impact on the marketplace. Our surveys tend to indicate that people prefer, if they have the money, to take money out of savings and not borrow from either a bank or a utility. In fact, they tend to place banks ahead of utilities in the direction they want to go to borrow. Having said that, it may be possible when looking at the future demand and growth for a utility and what power plants may be needed in the future, to seek to offset that growth through a combination of conservation and renewable resource activities. And if that investment can aid the low- and moderate-income people and offset future construction costs, I think that is an ideal way of promoting conservation and financing it.

That would differ utility to utility. Some utilities will not need new power plants for years in the future. Others are short capacity today, in that their value, if you will, of conservation to that company is much higher value. I think that utility could spend more money ---

ASSEMBLYMAN STOCKMAN: Assemblyman Franks, do you have a question?

ASSEMBLYMAN FRANKS: I would like to ask Chuck, if I could, to give us a little further explanation of the weatherization program. You mentioned, for example, that last year there were some problems with it, sometimes in terms of its relationship with CETA.

MR. RICHMAN: For the first two or three years - I am not sure of the length of time - the way the federal regulations were written, the amount of money that could be spent on any individual home to weatherize it limited the program to the cost of materials plus almost free labor. The almost free labor, naturally, came out of the CETA Program. What that too often resulted in was a high turnover of people who were performing the work or, in fact, in many counties, the inability to have anyone do it. You could not at that time have substituted a contractor at a higher price to perform the work. In the past year, after these several years of admitted failure, the regulations were changed so that a contracting procedure could be used and, at least here in the State of New Jersey, the Department of Community Affairs signed contracts with several county governments, as opposed to the CETA sponsors. Essex County was one, for instance. That seemed to turn the program around well this past year. A significant number of homes were handled. I am sorry I don't have the exact number. But the increase was astonishing.

ASSEMBLYMAN FRANKS: The Reagan administration, if I am reading properly what you said, would curtail this program, beginning in 1982?

MR. RICHMAN: That's correct.

ASSEMBLYMAN FRANKS: I think there is no compelling reason why the State, if we felt this was a sufficiently high priority program, could not reinstate this program either through our own general revenues or through block-grant moneys that could flow from Washington; is there?

MR. RICHMAN: No. I believe with the increase in cost of energy that we are seeing that it is an important program for the State. You know, we have the program where we are helping people pay their utility and oil bills each year. But all we really do is recycle that money back to the oil companies or back to the government. Here is a program where when you insulate a home and put in the calking and storm windows, you are cutting the energy costs for a long period of time.

ASSEMBLYMAN FRANKS: I just think it is important to note - and this is why I asked for some historical background - some of the federal regulations that have burdened some of these programs in the energy field as well as others may have in some cases, not by their design but by their impact or field, complicated the institution of some of these goals that we are looking toward. If the State is left freer to design its own programs to meet New Jersey's own needs and we feel there is a sufficiently high priority for the public, we might end up with a better program than we had before anyway.

ASSEMBLYMAN STOCKMAN: Bob Franks and I are going to work on a broad-base tax to implement that kind of thing down the road.

COMM'R JACOBSON: I am going to make a major herculean effort to avoid responding to Assemblyman Franks' comments.

ASSEMBLYMAN STOCKMAN: We don't want to get into a debate on the Reagan administration.

COMM'R JACOBSON: Right. But just let it be known that there could be a difference of opinion.

I would just like to respond further to your question, Assemblyman Stockman, about the role of the utilities and tell a story that may be amusing, but sad. Several years ago, the Atlantic City Electric Company in a well motivated attempt to generate conservation for its customers recorded on its bills something to the effect "congratulations, you used so many fewer kilowatt hours than you did the preceding year in the same period." That was designed to pat the customer on the back and say, "Keep up the good work," except that the customers were able to note very easily that even though they were using less, they were paying more. And they started to ask this Catch-22 question, sometimes with a great deal of resentment. Of course, it was not difficult to explain because the reason was obvious, that as you generate conservation, the revenues of the utility in most cases will be eroded, their fixed cost remains constant or higher, and as a consequence it really led to a repeated application for rate increases. Nobody wanted to be told that this is not a solution and that if they didn't do that that the rates would be even higher. But I think it is important to point out, as Chuck has mentioned, that in the long run, this is the proper way to go because if we can reduce that growth rate and reduce the peak demand which the utility must provide for in its generating capacity, we will have generated savings and conservation.

ASSEMBLYMAN STOCKMAN: Thank you very much. Chuck, we appreciate your testimony.

Incidentally, we are going to have to move along pretty spiritedly because we have a list, I believe, of 14 witnesses to hear before the day is over. I am sure

everyone will keep that in mind.

The next witness that I will call is the President of the Board of Public Utilities George Barbour. George, welcome.

G E O R G E H. B A R B O U R: Good morning. I appreciate the opportunity to be here and share some of the information which we have been able to accumulate at the Board, particularly since I have been there. I am more familiar with that naturally. But I think a backdrop of what we are faced with in a very summary manner might be very important in connection with what we are talking about today.

I believe there probably were never truer words than those spoken by Jimmy Carter when he said, "The energy problem is the equivalent of war." We have a tremendous reliance on imported oil and I think the hostage situation has demonstrated very clearly and forcefully to us that this is a very volatile situation and one in which the OPEC countries have shown that they have a will and a determination to have their way. In fact, they have very recently announced a policy that they are going to be operating under. It is called "globability." It means very simply that they are going to retain the same stream of revenues or higher, regardless of how much less oil they send out. They are going to develop a pool of money which they say they will use to develop the countries that are not presently developed that have no source of energy or no gold mine or source of funds to assist in their development. Whether they actually use that money for that purpose remains to be seen. They have also said that they recognize that they do not have large markets for the products that they manufacture or produce in their own countries and that this factor will be a part of their energy-pricing policy, with this effect: If any country, particularly the United States, Japan and Western European countries, does not open the markets in their countries to the OPEC producers to the same extent as they are open for the manufacturers, industries, and commercial activities in those respective countries, that the price of oil to any country which persists in such a policy will be much greater than it would be to countries that open up their markets for the OPEC products.

I think, in addition, that the coming deregulation of natural gas is going to result in natural gas prices escalating. We have the "globality" policy with respect to oil. Since in the Northeast we use a tremendous amount of imported oil, we can look for nothing but higher and higher and higher energy prices. We have seen in the past decade that the law of supply and demand doesn't work in the energy area. We have seen many times during those ten years where the supply was relatively high and the price was relatively high. Very few times have we seen a situation where the supply being high, the price was low, or vice versa. It has been high in both situations. We know that something is out of kilter and something isn't working correctly when that situation exists.

When we look at the possibility of having a source of gas or a source of oil in New Jersey, we don't find any wells but we do find our buildings, our houses and our industrial and commercial facilities. They are perhaps the biggest source of in-state supply of natural gas and oil that we have in this State. One of the techniques that is used to extract, so to speak, that energy from those buildings in the industrial area is cogeneration. It is an old technology. It is almost as old as the electric utility technology, itself. It is now being updated to address new resources and economic concerns.

The longest continuing cogeneration project in New Jersey is the Atlantic City Electric cogeneration facility at the DuPont Chambers Works in Salem County. It is over 50 years old, having been started in 1928. Atlantic City

Electric runs two boilers at its Deep Water Station for the provision of steam and electricity to DuPont. The excess electricity, if any, is put into the grid for sale to other Atlantic Electric customers.

Public Service Electric and Gas has been selling steam from its Linden generation station to the Exxon Refinery at Bayway since 1957, offsetting the cost for generating the electricity.

Jersey Central sells by-product steam from a generating plant to the Riegel Products Paper Plant in Hunterdon County, a project it initiated in 1967.

The Board of Public Utilities is about to launch a program to give new life to this turn-of-the-century technology, bringing its regulatory framework up to date with current energy facilities. The Public Utility Regulatory Policies Act, commonly known as PURPA, enacted by Congress in 1978, requires that the State set standard rates for the electricity produced by qualified cogenerators up to 100 kilowatts in size, and to make ready to rule on applications for rates for larger facilities.

About 50 years ago, the falling cost of electricity provided by the electric utilities through the use of economies of scale made many of the small industrial cogenerating plants that were in use at that time obsolete and caused them to be abandoned. Today, with electricity costs back on the rise, the lack of markets for the excess electricity at satisfactory prices is continuing the inhibition. The Board will soon be ready to act on the PURPA cogeneration rates. It is in the process of reviewing the material submitted by its staff and the various parties to the proceeding. A final meeting of the parties to discuss continuing issues will be held in two weeks. The consensus among the parties appears to be that the Board should set standard rates for cogenerators up to 1,000 kilowatts, 1 megawatt in size, and that the rates for larger cogenerators should be negotiated directly with the host utility, using the same avoided-cost pricing principles used for setting the standard rates, but allowing for deviations where the uniqueness of the cogeneration facility warrants. From these standard rates and pricing principles, there should emerge in New Jersey three general types of new electricity sources, supplementing the electricity provided by the franchised utilities and allowing a lower overall cost:

One is the industrial cogenerator, similar in size to its early 20th century predecessor, but now larger in size because of the ability to sell excess electricity to the utilities. Hoffmann LaRoche, the Essex County pharmaceutical firm, is interested in this and may be the first entry for this group in New Jersey once the Board acts on the basic rules. Hoffmann LaRoche has been an active participant in our PURPA cogeneration proceedings.

The second is the small power-producer, using wind or waterfall energy, who will be able to use the same standard rates set in the PURPA proceedings as the cogenerator. Atlantic Electric already has three wind generators connected to its system and companies interested in selling wind machines in the Atlantic Electric and Jersey Central service territories have been parties to our PURPA proceedings. Paterson has a federal grant to help develop the hydroelectric generator on the Great Falls of the Passaic. The wind machines will be fairly small, perhaps 2 to 4 kilowatts generally, serving a single house or a group of houses. The Paterson hydroelectric plant will be larger, about 7 1/2 megawatts, and will generate electricity for downtown industrial plants.

The third type will be urban cogeneration, of which the Trenton integrated community energy systems, commonly known as ICES, is the only one now proposed for

New Jersey and has features which make it unique for the country. ICES has had a checkered reception since its proposal by the City of Trenton 5 years ago. Public Service Electric and Gas Company which originally considered building the cogeneration plant found it economically infeasible and pulled out. I might say here that the difference between the situation at that time and today is that Trenton has been able to develop some grants and attract low-interest loans. There is also a much faster write-off permitted in this situation. Those three factors make the Trenton project much more attractive than it was initially, back when the decisions were made some years ago.

Last year, Cogeneration Development Corporation of New York picked up the option, but ran into many basic differences with Public Service in the price at which it would be able to sell the electricity. Anthony Zarillo, our Executive Officer, and myself elected to attempt to mediate the differences at the request of the Governor's Office. And I might indicate here that you, Mr. Assemblyman, were also constantly calling our office with respect to the ICES program and I know that it is a project that is near and dear to you. The State of New Jersey was directly concerned with the outcome since it would be a purchaser of much of the hot water heat which the ICES plant would produce and, therefore, would save money on its fuel expenses.

I feel the mediation efforts that we have been involved in have been dramatically successful. We have been able to resolve the basic differences on a formula setting the cogeneration electricity rates. The project should now move forward. The parties are expected to announce a complete agreement on all terms in a few weeks. I will say that the horns of the dilemma, so to speak, that stood in the way of resolving that problem were the PJM running rate of 4.2 mils and the fact that there was supposed to be an 85 percent capacity factor and that the thermal energy would be at 7800 BTU's. The project developer is sufficiently sure of his facility and has agreed that he will take the risk of it having 85 percent capacity and a 7800 BTU equivalent. That assumption by the cogenerator is the reason for the optimism of this Board for this project.

Public Service has indicated that they would be able to pay in the area of 6 mils for the energy that is produced. We feel that some part of that will have to be written off as a research and development project. But under the circumstances, we feel that it is warranted.

The Trenton ICES project will be the first modern cogeneration district heating facility of a major size in the country. The dual fuel engines in the plant will run generators with a total capacity of 12 megawatts and produce enough hot water to heat the downtown Trenton Capitol Complex, Mercer Medical Center, Trenton State Prison, and several nearby apartments and office buildings. Its size makes it too large to be governed by the standard rates which the Board will set in the PURPA proceedings, but its uniqueness allowed Public Service to justify paying a higher rate for the electricity than the prospective standard rates, permitting the project to proceed. Public Service justifies the higher rates as a research contribution. I feel, however, that its assistance in the economic revival of an important downtown area such as Trenton imparts a special quality to the project, augmenting its research value.

Modern cogeneration is new to New Jersey and the Board has the responsibility to see that it is integrated within the State's energy network in a manner that is fair to all concerned. PURPA directs the State to set cogeneration rates that are just and reasonable to all electric consumers and to not discriminate amongst

qualifying cogenerators. Special reasons are necessary to justify an electric utility paying higher rates than its avoided costs for cogeneration of electricity. We are encouraging Public Service and the other electric utilities to seek out other cogeneration suppliers in New Jersey and investigate their prospects. If these projects are found to be economically feasible or if special reasons can be found to justify higher rates than the standard of what it costs, we will be urging them to go forward.

I would like to make a few comments with respect to one or two things that were touched on in Assistant Commissioner Richman's testimony. Under the Ford administration, there was a project headed by a Mr. Rosenberg from Michigan having to do with installing conservation facilities. In that project and in a number of other projects conducted in different states, it also developed that the financing by the utility didn't catch on, and that is not to be a true barometer of the success or failure of those projects because when you evaluate the number of houses where the owners took advantage of that, they were many, many times in excess of those financed by the utility. So, as Commissioner Richman indicated, the householders would rather deal with their banks or use their savings accounts in order to install those facilities than to deal with the utility company.

Also, the Princeton project at Twin Rivers shows that there can be very significant savings in using conservation measures in homes. But that project was developed and run in a laboratory type atmosphere and it included people who were interested and willing to put out a considerable effort to achieve a maximum result.

Jersey Central Power and Light and New Jersey Natural Gas are involved in a program to endeavor to implement that type of operation. They found that where you have to deal with customers across the board who are not all that dedicated to energy savings and to conservation, the results are spectacularly different and that the energy savings fall to less than half of that in a laboratory-controlled experiment like the Princeton one. So you can't expect those kinds of results. Even at a half of the Princeton experience, it is a way in which considerable energy can be garnered.

That concludes my prepared remarks, Mr. Chairman.

ASSEMBLYMAN STOCKMAN: Thank you very much. I think we have an interesting speaker to follow you who has a time problem. That is Professor Harvey Sacks. He may have some comments along the lines that you have talked about and may want to reply a bit. I know he has some interesting ideas.

I believe Mr. Franks may have a question or two for you.

ASSEMBLYMAN FRANKS: Just one, Commissioner. I think we are all looking to cogeneration, hoping it will give us some relief in the whole energy area. I am wondering if an advocate for cogeneration, working with the utilities and working with major corporations to try to develop more cogeneration relationships --- I know it is a State policy and we have read about the cogeneration policy in the Department of Energy. We are all enthusiastic about it. But I am just wondering who it is in State government who is going out there trying to put together these cogeneration relationships out in the field rather than just issuing a position paper. Is there a person or a group doing that?

COMM'R BARBOUR: We don't have anyone who is in place on any kind of a permanent basis to do it, other than the Advocate's Office which is involved in the matter when it comes before the Board. But they are not out in the field developing

situations. In addition to that, I think that in a way you could say that the Board is an advocate as well. We see the benefits to be gained from this. We are very acutely aware of the rising energy costs since we every month have to decide on a rate case or two. We know from our experience on the Board that there aren't any downs in that - it is all up. We see the results of cogeneration and conservation generally and are convinced that given all of the things that the Northeast part of this country has to deal with we must help to bring on things of this nature in order to help resolve our energy problem.

ASSEMBLYMAN FRANKS: I couldn't agree with you more.

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Barbour.

Professor Sacks, I may have misled you. But by a scheduling agreement and partly because, I believe, there is some intent to supplement some of the comments of Mr. Barbour, we have Mr. Rudy Stys, Vice President - System Planning, for Public Service. So I think I am going to ask you, Harvey, to follow Mr. Stys if that is no serious problem for you.

Incidentally, I do want to thank Mr. Barbour. He is right. I have been after him day in and day out on that ICES project. I am delighted to hear that there appears to be a compromise break-through because I think it has tremendous importance energy policywise, obviously for the City of Trenton, but I think for the State and for the Nation. So I hope that moves forward.

R U D Y D. S T Y S: Good morning, Assemblyman. I have given you copies of a rather comprehensive testimony that I submit for your consideration. What I would like to do this morning is to skim over that. Much of what Mr. Barbour and Mr. Jacobson mentioned is repeated in my testimony.

ASSEMBLYMAN STOCKMAN: That is fine and I assure you I, and I am sure Assemblymen Franks and other committee members, will read your testimony in full. I appreciate your summarizing or perhaps touching on the highlights and answering some questions if we have them.

MR. STYS: Fine.

As we have had indicated this morning, since the oil embargo, we have had a great deal of emphasis on our energy crisis and methods of conserving energy and ways to use energy more efficiently. One area that has gotten a great deal of attention is cogeneration. Perhaps for those in attendance we ought to define cogeneration so that we are all sure we are talking about the same technology. Fundamentally, in its simplest form, it is the simultaneous production of two forms of useful energy. Most of what we have been discussing this morning deals with electric power and thermal energy, normally in steam or water.

As Commissioner Barbour indicated, early in the century, many New Jersey utilities used cogeneration for a number of reasons. The cost of kilowatt hours were relatively high at that point. The cost of distribution lines extending to the industrial complexes were expensive. The cost of fuel was relatively low. It was mainly coal. And electrical requirements were not great. Drives by steam were more common. As the electric utility matured, on-site power production became less useful and was eliminated. Utilities became more efficient and expanded. Electric rates went down and the distribution of facilities became more widespread and reliable.

By 1950, cogeneration provided only 17 percent of the total electric energy produced in our country. Cogeneration is an energy concept which we at PSE&G have been involved in for many years. As Commissioner Barbour mentioned, the Linden Bayway facility is one of the more prominent. Currently, there are 23

industrial customers who generate electricity in parallel with PSE&G.

Maybe I can elaborate just a little bit on the Linden Generating Station Bayway Refinery facility. Here we cogenerate 459 megawatts of electrical energy and produce 1.4 million pounds of steam per hour. This steam is used not only by the refinery but also by our synthetic natural gas plant adjacent to the generating station.

Cogeneration has received a great deal of attention in New Jersey since 1976. As probably will be discussed in more detail, Princeton University presented a report to Governor Byrne's Cabinet Energy Committee. The Governor had a Cogeneration Panel late in 1976. The New Jersey Public Research Group surveyed industrial steam users in 1977 with their eye on cogeneration. The Public Utility Commission at that time received testimony from our company regarding an evaluation of cogeneration in 1977. The New Jersey Energy Research Institute formulated a panel that studied cogeneration in November of '77. The New Jersey Department of Energy had a hearing on cogeneration, at which I testified, in November of 1978. And this Committee heard testimony from our company in March of 1980.

All of these activities found that in varying degrees cogeneration has a benefit which can be made available to the people of New Jersey through more efficient energy use.

Our own investigation of cogeneration in more current times started in 1976. We contacted all industrial customers with steam capacity in excess of 500 boiler horsepower in our service territory. We found 18 industrial customers with 100,000 pounds per hour of steam demand, which we determined to be the minimum requirement to warrant consideration for cogeneration. Our economic analyses showed that of the 18 we identified, cogeneration installations would be economic at only 12 for a total capacity of 300 megawatts. We reviewed our findings with the 12 customers. Many of these customers indicated no desire to participate in cogeneration.

I would like to review for you the findings of several projects and system studies that we have delved in in these many years. The most prominent of these is the Trenton ICES project which started in 1976. We can discuss that in a little more detail later.

We investigated in 1978, with Hoffmann-LaRoche and Science Applications, Inc., a proposal for a cogeneration project at the Nutley Plant of Hoffmann-LaRoche. It would have consisted of a 30 megawatt combustion turbine capacity and waste heat boilers. We submitted our proposal from that study to the U. S. Department of Energy for funding. Our proposal was not accepted because it was based on burning light oil in combustion turbines. They awarded funds for other projects using more innovative technologies and renewable fuels.

The third area that we have looked into is district heating and cooling systems. We completed a Phase I study for the U. S. Department of Energy in May, 1979. Our Phase II study to refine the analysis done in Phase I is now being conducted. We are looking at retrofitting our Hudson and Essex Generating Stations to provide hot water to residential communities in Jersey City and Newark.

The fourth area that we have looked into in some detail is the dual energy use system with fuel cells. In 1979, as a contractor with Mathtech, Inc., we completed an analysis of the application of fuel cells in a dual energy use system for the Electric Power Research Institute. The results of the evaluation indicated that fuel cells could be technically feasible and economically attractive

if the units are dispatched on the electric system as opposed to being dispatched on a thermal system.

We looked into fuel cells for industrial cogeneration. As a subcontractor to Gilbert Associates, we completed a U.S. Department of Energy study to evaluate the application of 5 megawatt fuel cells at the Bergen County Utilities Authority sewage treatment plant in Little Ferry, New Jersey. That study indicated the economic attractiveness of the project. But, unfortunately, USDOE decided to investigate larger fuel cells rather than to continue with projects of this type.

Perhaps I should expand and elaborate on the Public Service cogeneration policy at this time. Our company encourages the use of cogeneration, provided it is economic and the electrical output is compatible with the PSE&G system. We will purchase energy from cogenerators at a price which is fair and reasonable and does not increase costs to our other customers. We will also sell energy to cogenerators at a rate which is fair and reasonable. We recognize that, given the right circumstances, cogeneration of electric energy and process heat could be beneficial to the company, our customers, and society.

We also recognize, however, that it is improper to assume that cogeneration is in the best interest of the involved parties in every case. Each potential cogeneration application must be analyzed on its own merits. We must look at the fuel that is to be used in the cogeneration facility, the type and quantity of the fuel that will be displaced by the cogenerated process heat, the quantity of electricity that will be produced, the profile of the electric production, the profile of the thermal energy demand, the reinforcement requirements on the electric transmission and distribution system, the investment opportunities, and the tax consequences.

We will participate under a given set of conditions, as we have in the past, in any cogeneration projects. We will participate as a supplier of process heat as we have done in the Linden-Bayway arrangement. We will participate as a purchaser of electricity, which we have offered many potential cogenerators. And we will participate as a co-owner of a cogeneration plant where the opportunity is proper for us.

I would like to discuss some of the details and history, as you have requested, on the Trenton ICES project. As I have indicated, we encourage cogeneration, provided: one, our cost to our customers is not increased; two, it is in compliance with national policies on conserving critical fuels; and, three, does not diminish the reliability of service to our customers.

As the Commissioner before me indicated, we began studying the Trenton ICES project in 1976. We completed the Phase I study, a preliminary evaluation, in July of 1977. However, as the Phase II study progressed, several questions were raised about the economics of the project. In order to confirm our findings, we had our economic analysis reviewed by Stone Webster Management Consultants, Inc. They confirmed our findings.

Concurrence among the Trenton ICES study team members on cost estimates and economic analysis could not be reached. Therefore, we submitted a separate draft Phase II report in March 1978 to the U.S. Department of Energy, indicating that it was not economically viable for PSE&G to be an owner-operator of an ICES system for the site specific project in Trenton.

In 1979, the City of Trenton requested PSE&G to review our position on the Trenton ICES, considering some of the things that Commissioner Barbour mentioned earlier: the HUD grant, a change in the thermal load of the community. Our findings were still that the project was uneconomic.

In September of 1980, Cogeneration Development Corporation was identified as a potential developer of the Trenton ICES. CDC made a proposal to sell to our company the electric output of a proposed 12 megawatt Trenton ICES plant. CDC sought financial guarantees and an unreasonable price for energy, such that PSE&G and its customers were exposed to an unacceptable level of risk at a price that was excessive. At the same time, CDC also asked for natural gas in a quantity greater than our tariff would permit. We agreed to review both the pricing proposal and the gas availability matter.

Just recently, on March 13th, as the Commissioner indicated, we met with the BPU and CDC in the BPU offices. CDC again repeated their demand for a guaranteed payment which we could not justify.

In a spirit of cooperation and for the potential research benefit of ICES, we responded with an offer to buy the electrical output at the price suggested by CDC with the payment based only on the energy delivered. That part of the price which is in excess of the value for energy delivered would be considered a research subsidy by PSE&G. The subsidy offer is in consideration of the fact that the project is a pioneering effort and a unique application of this technology. It is hoped that development of the project will enhance the City of Trenton. It is also agreed, as another form of subsidy, to deliver the full 1200 therms per hour of gas.

I would like to summarize then our position. As a result of our long experience and extensive study of cogeneration, we have made certain determinations. We recognize that cogeneration is thermally efficient and a potential contributor to our energy conservation efforts. However, all cogeneration is not always economic. The proper application of this technology requires considerable analysis, recognizing specifically the fuel, the thermal load and the site location. Cogeneration should not be subsidized by the other utility customers if a study shows that the proposed facility is uneconomic or that more oil or gas is burned over the life of the facility when compared to our other energy options.

Since PSE&G is in a financial position which requires strict capital rationing, it would be imprudent for us to invest or commit funds to major projects which result in potentially even higher costs to our customers for electricity and gas.

Nevertheless, since the Trenton ICES will aid in furthering the assessment of the benefits of cogeneration and district heating and the City of Trenton expects to benefit considerably by siting this demonstration project in our State capitol complex, we are willing to pay for any energy delivered at a price which is based on a formula of their costs, plus a research contribution. This price is higher than we would have to pay for an equivalent amount of energy if we were to purchase it from our power pool, but because of the relatively small amount of this purchase compared to our total electric sales, the penalty to our customers will be minimal. However, such an offer must not be considered a precedent.

I would like to add that I will be here most of the session and would be willing to respond to any questions that you have now or later as a result of comments made by other speakers. (Mr. Stys' written statement can be found on page 1X.)

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Stys. Time is a problem for us. I very much appreciate Public Service's comments on this, I think, vital subject. It is no secret that at a previous hearing I suggested to both Public Service and to the Board that I was most concerned and anxious about the progress of this project and whether or not we were losing a golden opportunity.

Apparently, much has happened since that time. And I am delighted that it looks as though the ICES project may survive. I very definitely would like to continue the dialogue with you and with Public Service. I think Assemblyman Franks is another person who has as much interest as I do in this concept of cogeneration, which I think holds some promise.

I had indicated from a variety of conversations I was concerned whether Public Service had really gotten religion, so to speak, on the subject of cogeneration and whether we were moving in the right direction. Obviously, all cogeneration projects and proposals aren't viable and don't make sense. But I think if one takes an objective look at the state of cogeneration in New Jersey, particularly in comparison with a state like California, we have to at least be questioning ourselves, more vigorously all the time, it seems to me, as to whether or not we truly have seen the potential of this use of energy and whether we couldn't by innovative approaches not penalize anyone, but really, I think, in the long run do much good. I think that is particularly appropriate at a time when utilities such as Public Service - and I don't say this critically - will be seeking a very, very substantial rate increase, well over \$300 million, from its rate payers in the coming year, in part on the basis of a need for completion of added sources of energy. So, we know that energy sources are essential. We know that these plants that you have are finite. We know that we are going to need more energy. And we know that cogeneration is an extremely efficient way of producing it. That is why I think we have to look more towards it. I am happy to hear that Public Service is looking that way, particularly on this ICES project. I would like to talk to you further about it in time. But, unfortunately, I think we really have to move forward with some further speakers, although certainly I don't want to cut Bob Franks off.

ASSEMBLYMAN FRANKS: Mr. Stys, I just want to follow up on the question I asked Mr. Barbour. I understand from the perception you are coming from, it is a balance test. Cogeneration is a good concept and a viable concept, but only if it meets certain criteria that are not deleterious to the other rate payers in the base. I understand all that. Do you, as a utility, go out and seek to put together cogeneration relationships which meet your own criteria or do you only get involved after an application is made for this process?

MR. STYS: No. As I indicated earlier, we have actively pursued potential cogenerators in our State. We have pursued industrials by and large who have high steam use and who have a requirement for steam that is more compatible with the requirements of delivering electric energy on an economic basis. It is very difficult in something like ICES, particularly as one looks out into the future, to say that it is a good thing to burn oil all winter long or all night long in order to provide heat to buildings when the electricity that could be provided to the system would be provided by coal or nuclear and there would be less oil burned. In the Trenton ICES project, for instance, over the life of the project, we would actually find that more oil and gas will be burned using the cogeneration concept than if we had used conventional central-plant electricity, individual-building heating systems. We will actually in the life of that facility use more gas and oil. This is even contrary to the national interest on vital fuel and this is very much in the forefront of our thinking. And, as we go to other customers, this is another situation that we run into often.

Also, in industrial facilities, you will find that their economic and their pay-back requirements on an investment are considerably different than ours. We are

looking for an arrangement with an industrial for 25 to 30 years. That is not in the same context in which they think of return on an investment. So that is a barrier that we have run into. But we are looking, as I have indicated, to retrofitting some of our generating facilities, including Mercer here in nearby Trenton.

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Stys. We appreciate it and perhaps later we could talk a little more about this if you do stay on.

Next is Professor Harvey Sacks from Princeton University.

H A R V E Y S A C K S: Good morning.

ASSEMBLYMAN STOCKMAN: I'm going to ask you, Harvey, if you would, to try to limit your remarks. We have to start tightening up or there are going to be some very unhappy people here in the audience. So, I would like you to limit your remarks to 15 minutes. That's no reflection on what you have to offer because, knowing you personally, I know you have some very interesting ideas and fascinating suggestions to offer the Committee, but we do have some time problems.

MR. SACKS: Assemblyman Stockman, Assemblyman Franks, thank you for the opportunity to come down. I will try to avoid rising to the debate offered by the previous speakers, Mr. Barbour and Mr. Stys.

I would like to talk to you today about several specific problems. One is to discuss the potential for energy savings in pre-World War II housing in New Jersey. I would like to pay particular attention to the challenge of rental housing and offer a couple of remarks on appropriate and inappropriate state roles, with respect to spending outside caps, with respect to what the Legislature might do to promote conservation. This falls into the categories of score keeping, quality control, financing, and research funding.

The first point to consider is that pre-war housing is a large fraction of New Jersey's single family housing stock. It lies between 40 and 50% of all of New Jersey's houses, all of New Jersey's single family houses. We would estimate several million units. Certainly, there are close to 8 million units in the Northeast standard census region.

Very few of these houses are considered to be completely modernized in terms of their thermal conformance, both in the mechanical system, the boiler, furnace, and their insulation. The present energy of these buildings is extremely high. Tales of 2,000 gallons of fuel oil or the equivalent of gas per year are far from uncommon in modest sized, single family housing. This works out to about 30 BTU's per square foot per degree day. That's just an index that allows us to compare houses of different sizes in different parts of the country. It is roughly two to three times as high as the New Jersey average, which indicates that modern housing is substantially more efficient than pre-war housing, and it is at least four times as high as we feel we can achieve with houses in this class. In one particular house, which we've worked on extensively--I happened to share that one with my banker--we have cut energy use by between 70 and 75%. This involved minor changes in one's lifestyle, closing off, roughly, 10% of the area of the house and using a setback thermostat. But, the major components for a thorough job involving approximately \$5,000 of capital expenditure in modernizing the domestic hot water system, modernizing the space heat system, the furnace, thoroughly insulating and removing, wholesale, the infiltration mechanisms. We have made the shell work better to keep the heat in and we've made the mechanical systems work better to provide heat. The result, as I say, is a saving of between 70 and 80% in this house. We feel that 50% will be routine.

I would like to make a point that the \$5,000 was borrowed money, that the payback on this investment, the \$5,000, was less than three years at today's fuel prices, regardless of inflation in the future.

We can extrapolate from this experience to a series of 200 houses which were studied by the Community Services Administration in a project supervised by one of my colleagues, Dick Grove of the National Bureau of Standards. He expected to see savings in the 35% range. It is my understanding that this almost exclusively

involved minor tuneups on the furnaces, minor tuneups on the hot water systems and large scale intervention with the building shell. In other words, insulation work was done, but we did not replace, in this study, obsolete coal fired boilers that had been converted to oil use. So, we see again that the likelihood of very large savings in pre-war housing, housing that is the backbone of our cities, is high. We can win with these houses. We can make them perform at least as well as post-war tract houses and, in many cases, much better.

Well, if it is such a good idea, why hasn't everyone done it? Why have we not seen people stacked up a year and a half deep at the doors of the insulation companies? Why do the plumbers not find themselves installing new boilers? We feel, in our group, that there are three major barriers to this type of investment, all of which are amenable to state intervention.

The first is simply the capital expenditure. Although there are some mechanisms for raising that kind of money, the secondary mortgages through the Federal Housing Administration in some cases, the sheer amount of capital required to get you past the low cost-no cost renovations and into the 35%, 50%, 75% savings is large. It is a staggering burden and unless we develop mechanisms to deliver this type of capital, we will continue to have a hemorrhage of oil through our houses. I would suggest to you, particularly with the way the federal DOE is going, New Jersey should have an energy loan bank or, at minimum, a reinsurance program to handle loans to buy back loans in those cases where the marketplace is too sluggish. I would suggest that this is particularly important because this will give the state leverage to carry out a quality control program.

The second major barrier, after the capital requirements, is clearly ignorance. We find people with Ph.D's who simply do not understand how a thermostat can save them money. We find people who are well educated, people who are caring and shivering because they do not know what investments in their houses will save them money and increase their comfort. We need an effective energy extension service and an effective program of house doctoring, something that will get information out into the field. I'm afraid that pamphlets don't do it. We need and we are now doing research on mechanisms to effectively deal with the individual home owners to urge the home owner to implement cost effective conservation strategies.

The third major area which we find inhibiting investment and conservation is, again, one in which the state has leverage. I find more frequently than either ignorance or capital problems in the people that I deal with--I'm not suggesting that this is generally the case--but, many of the people that I deal with, the fear of ripoffs is an overwhelming barrier to major investment. No home owner feels that he has the technical competence to choose wisely among systems, among proposals for insulation, among boilers and in this fear of being ripped off, particularly given the capital amount required, most people opt to do nothing and year after year accept the steady increase in the financial hemorrhage, even though they're shivering. They pay the bills because they do not want to be taken for a ride.

Here we close the loop that if the state is to provide a house doctoring service or a loan or reinsurance program, it is certainly in the state's interest and the state's right to provide a quality control program, perhaps an extension of the energy extension service, that will give us post-retrofit quality control on all investments which are made. Only with such a mechanism can we reward the many conscientious contractors that I have met and help home owners discriminate between those who are conscientious and those who are not.

This is particularly important as feedback to the contractors who want to do a good job and who want to be known for doing a good job. They don't want to do shoddy work, yet most of them are simply unable to finance the kinds of quality control which, in some cases, involve infra-red scanning, which we find necessary.

I would like to turn my attention to another question. I may be racing, but I'm on my schedule and I hope on yours. That is, how should we finance quality control by the state? How should we finance this type of activity by the state as an impartial person between the homeowner and his contract. I would like to suggest two alternatives.

One is that the reinsurance or state financing program insured by the state certainly can include a small percentage increment which would be a surcharge to cover the inspection and quality control services. I think that this is a reasonable insurance for the state to avoid defaults in state funded work. As an alternative, an alternative which I'm sure will make each of you blanch, it bothers me as well, but an alternative which really, again, closes the loop and puts the solution on the back of the problem. Should we consider, particularly given the almost certain failure of Federal Department of Energy funding, should we consider a state tax on energy, a modest tax, the equivalent of two to three cents per gallon of oil, a cent or two per therm of gas, to finance this type of quality control and conservation extension service. This immediately penalizes and gives incentives to those who are the most profligate wasters or those who are trapped in the most unfortunate situations. So, although it is 1981, I wonder if an earmarked tax might make sense as a mechanism for implementing the large scale savings of energy which past and later speakers on this program will be able to document for you.

As another mechanism to finance quality control, we certainly can think about the Oregon experience in terms of utility rate basing or power short utilities. Again, it is a small surcharge on the rate basing which will allow us a great deal of leverage for quality control. If the utility is doing rate based investments in people's houses, they certainly will have the incentive, as we have seen in Oregon and I believe in California, to provide the quality control services.

Now, the key that I must emphasize at this point is that we have leverage. In most old houses, given conscientious, large scale capital investments in conservation improvements, the combined cost of a reasonable loan, plus the post retrofit utility bills will be less than the cost of the unretro-fitted houses' utility bills. I emphasize that point, savings of \$1,000 per year for loans, plus utility bills relative to prior use of energy alone. That is attainable in a large fraction of these houses. We have leverage.

I want to turn my attention, for a minute or two, to two market failures in the rental sector and I cite two cases, the case of the house rented to the tenant who pays his own bills. In this case, at present, the landlord has no incentive to invest. I can spot these houses in my own town. The day after a snowfall, I drive down the street. The rental houses are the ones with no snow left on the roof. There is no attic insulation and the snow melts. The owner-occupied houses are well insulated.

Let's assume, as a metaphor, that the tenant has a fixed housing budget to be allocated to both rent and utilities. What we need is a mechanism to allow landlords to capture the returns in conservation investments by raising rents and to allow tenants to select housing knowing what their budgets will be. There are two approaches that can be implemented.

One is a regulatory approach, simply not issuing a certificate of occupancy until each dwelling has been brought to a recognizable, attainable standard of energy efficiency. This can be based on inspections or it can be based on consideration of the billing data for the unit in question.

Another much more modest proposal, which I offer to you very seriously, is the adoption of the "miles per gallon sticker" approach. We've seen that the widespread, mandatory use of miles per gallon stickers on new cars has led to incredible changes in the market for automobiles. People look at the stickers and they try to buy energy efficient cars. Why don't we require that each housing unit in the rental sector be provided with an annual letter from the provider of space heat, whether it is the oil delivery firm or the utility, that states, "this is how much energy was used; this is a projection of its cost for next year; and this is how it compares with other units of its type?" Here, immediately, we have the feedback which rewards the landlord who is willing to make the investment, conservation investments, and allows the tenant to choose knowingly, being able to estimate what his budget for both utilities and the housing unit will be. I personally feel that this would make a tremendous difference in the attitudes of landlords and tenants in our state and would implement a great deal of conservation.

For those houses which are landlord bill paid, we have a different kind of market failure. The tenants have no incentive to conserve. The landlords have a great deal of difficulty with these, because of their cash flow problems. I would like to suggest that there might be an appropriate legislative function, one to which many of my friends are very much attuned in using an energy bank or re-insurance scheme to provide capital and quality control for investments in renovation of the heating control and installation schemes of these units or, indeed, to provide enabling legislation which would allow a third party, a conservation contractor to go into such houses, provide a new heating system, and be confident that he could sell comfort rather than thermal units to the landlord and could make his money by decreasing the amount of energy required to adequately heat that house. I think that enabling legislation that would remove the contracts from the lawyer holiday type thing to the lawyers--well, from the multi-page to the single page would be a tremendous contribution to enabling this new sector to develop.

Now, I would like to offer a thirty second gripe and just ask how come the Legislature was so avid in moving to remove local utility bills, local, governmental utility bills from caps. All of a sudden we've provided a major disincentive for conservation. If any capital expenditure has to either be done on a bond or, for more modest scale things, within the caps, but my utility bills can be put outside the caps so that I don't have to go to my townspeople, I'm certainly going to elect, as a member of the town's governing body, to buy more fuel, to pass on that cost automatically instead of going through the hassle of conservation. We can provide all the audits in the world, but as long as we discriminate between conservation investments and utility bills by the decision within or without the cap, I predict that nobody is going to bother. Where is the incentive to local government, now that utility bills are outside the caps? So, here's a gripe that says that we just need to think.

So, to summarize, I'm pleading for programs. We need state action for quality control, for diagnostic services. We would probably benefit greatly from a re-insurance or loan program. All of this, plus a modest investment in research, would have tremendous effects in greatly reducing New Jersey's energy consumption and in tremendously increasing the number of jobs.

I estimate job generation at the rate of approximately 30,000 man years per million houses, retrofit. I think that's a target to keep here instead of in Libya. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much, Professor. Are there any questions? There are a lot of things we can talk about, but I think you understand our time problem. We can explore those further as time goes on. Our next speaker is Phyllis Salowe-Day.

PHYLLIS SALOWE - DAY: My name is Phyllis Salowe-Day and I am President of the New Jersey Tenants Organization. I am also a member of a group of planners, attorneys and community organizers that publish a national housing magazine called, "Shelter Force." I've been a tenant organizer in the state for 11 years and have traveled throughout the state speaking with thousands of tenants. The NJTO is the oldest and largest statewide tenant organization in the country with over 70,000 dues paying members. We are reaching well over 500,000 tenants yearly.

The New Jersey Tenants Organization is in support of state legislation that has been drafted by the Department of the Public Advocate which would establish minimum standards for energy conservation that landlords must comply with. The American Society of Heating and Air Conditioning Engineers which prompted the BOCA construction code has competed a national model standard for minimum energy conservation in existing apartments. We believe that the New Jersey DOE could use this to promulgate minimum standards for New Jersey apartments. The standards would cover such areas as caulking, weather stripping of windows and doors, minimum furnace efficiencies, and insulations. The Department could be given direction to require only those measures which have a payback period of five to seven years. This would mean that the landlord could expect to recoup his or her investment in the form of energy savings within that period of time.

As energy prices skyrocket, the payback period would become even less. This limitation would preclude the Department from imposing prohibitively expensive energy conservation methods.

There are many different types of apartments in New Jersey ranging from luxury high rise to suburban garden apartments to old tenements. The regulations would, of necessity, establish somewhat different conservation standards for these different types of apartment.

Standards are of little value unless they are enforced. We propose that the conservation standards be enforced in several ways. One is on a day to day basis through the implied warranty of habitability and, at the time of sale, through a complete energy audit. The Department of Community Affairs could also enforce these regulations through enforcement of their regular hotel-motel, multiple dwelling law.

The warranty of habitability: The New Jersey Supreme Court in *Marini Vs. Ireland* held that all residential landlords must be held to an implied covenant that the premises are habitable and fit for living. If this covenant is breached, the tenant is entitled to a rent abatement. In this era of energy crisis, legislation should be enacted stating that energy conservation is one element of the warrant of habitability. If the energy conservation requirements are not complied with, the tenant could be entitled to a rent abatement just as he is for any other habitability breach. A landlord could establish compliance with the conservation warranty in one of two ways, by demonstrating either reduction in energy conservation or substantial

compliance with the New Jersey DOE regulations.

This energy savings must come from conservation measures, not through reduction of temperatures in the apartment. The dangers of hyperthermia are so serious that a landlord showing energy reduction must show that he or she has maintained the required temperatures for his tenants.

Some landlords have already fully complied with energy conservation methods so that further savings are not feasible. Such a landlord could have an energy audit to prove that he is in substantial compliance with the energy regulations.

Finally, in special circumstances, a landlord would not be required to comply with particular conservation regulations if he or she could prove that in his case they were economically prohibitive. A landlord would be required to post in a conspicuous place proof that he or she was complying with the conservation warranty requirement, either through reductions in energy usage or through an energy audit. If this were not done, a tenant or a group of tenants could seek rent abatement in small claims court or as a defense to a summary dispossession action. This legislation could mandate a minimum of 10% abatement in such cases and could compel the court to enter into an order compelling the landlord to comply with the standards.

The Federal Housing Administration will not insure a mortgage for the resale of a house until it makes an inspection to catch defects in houses and sees that the defects are corrected. Likewise, the State of Minnesota has just implemented a program which requires that an energy audit be made before any home can be sold or resold. Similarly, a New Jersey landlord should be required, at the time of sale of an apartment or conversion of it to a condominium or cooperative, to first have an energy audit and establish compliance with the energy regulations. In cases where complete compliance with the regulations would be prohibitively expensive, the DOE could grant the waiver. Combining a time sale requirement with the warrant of habitability could provide two methods of enforcement. The conservation warranty would allow the tenant to monitor and enforce compliance from the very first year. The time of sale would give the state one opportunity to monitor compliance regardless of the tenants' enforcement of lack of enforcement. Furthermore, the state's involvement would come at a time when the landlord has the best financial ability to weatherize his building, at a time when he is receiving cash for the sale of his building.

The hotel-motel-multiple dwelling inspection: The Department of Community Affairs inspects multiple dwellings at least every five years. A multiple dwelling is defined as a building with three to four units. The department of inspectors now has sufficient expertise to do an inspection to insure compliance with most energy standards. The Department could incorporate these standards into their regulations and into their periodic inspections. Enactment of the conservation regulation and the time of sale requirement and the community inspections would produce major energy savings for our state.

On a local level, energy calculations and efficiency assessments could be included on all local certificates of compliance or habitability before an apartment is allowed to be rerented. More than 110 communities in New Jersey have rent control. Over the past two years, landlords, hit by rising energy costs, have lobbied municipal officials in a statewide effort to water down rent control and raise rents through fuel passalongs or fuel surcharges and in many communities, landlords have won substantial rent increases using this method. Unfortunately, this additional income provides the landlord with absolutely no incentive to conserve fuel. Only one municipality, Metuchen, to our knowledge, has written in any type of energy conservation standards

into fuel surcharge passalongs. Thousands of apartments lack storm windows. Landlords don't caulk windows or insulate their buildings. In most instances, heat is regulated by a master thermostat. Tenants complain of days when they have absolutely no heat followed by days of too much heat, causing them to have to open windows in the middle of the winter. Vacant apartments are often heated throughout the winter and many hallways and vestibules are unbearably hot. These fuel surcharges are automatic. Landlords are required to do nothing but collect their money. This practice is blatantly anti-conservative.

While the NJTO does not believe that rent control is the cure-all, we do believe that it is necessary to protect tenants from rent gouging. Furthermore, rent boards can be used to monitor fuel conservation. The boards are made up of both tenants and landlords. They will be able to rule on the validity of increase, passalongs, and hardship increases based on the information presented to them. The New Jersey Tenants Organization proposes that no fuel surcharge or passalong be allowed unless the landlord has shown all efforts have been made to conserve fuel. We propose that there is a prohibition of hardship increases that involve the cost of fuel and the calculation unless the landlord has shown that he has attempted to conserve fuel. Finally, we propose that all annual increases be prohibited unless the landlord has taken all possible steps to conserve energy. Tenants, of course, should be encouraged to do their part to conserve energy. Unfortunately, many times the regulation of heat in our apartments are beyond our control. Money, tax deductions, and materials should be made available to tenants and tenant associations who institute energy conservation programs. Educational programs on conservation funded by the Department of Energy of the State of New Jersey and channelled through local tenant associations could reach thousands of apartment dwellers, if implemented. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much for your testimony. Kathleen Rae, I believe, is our next scheduled witness.

K A T H L E E N R A E: Assemblyman Stockman, I want to thank you for inviting me to address your committee today. I am Kathleen W. Rae, Director of the New Jersey Committee of the Regional Plan Association, the oldest private, non-profit, planning organization in the nation. Since 1922, Regional Plan has carried out research and planning for the entire New York metropolitan area, a region that encompasses the City of New York, suburban New York and Connecticut and all of northern New Jersey. Two decades ago--in the early 1960's--Regional Plan established a New Jersey office and for eight years, the New Jersey Committee of Regional Plan played an active research and advocacy role in the arena of public policy decision making and planning in our state. The development of the state's Green Acres Program, the creation of the Hackensack Meadowlands Development Commission and the New Jersey Commission on Capital Planning and Budgeting were some of the major areas in which the first New Jersey Committee played an active and important part.

The first New Jersey Committee was closed in 1968, not because of the state and regional issues that it was involved in were resolved, but because of funding limitations. Over the last several years, it has become increasingly apparent that such major New Jersey concerns as water supply, housing, energy, economic development, transportation, and the revival of New Jersey cities required a reactivated New Jersey Committee and a full-time staff effort. Through a grant from the Geraldine R. Dodge Foundation and with the leadership of Robert V. VanFossan, Chairman of the Board of Mutual Benefit Life Insurance Company, as its Chairman, the New Jersey Committee of Regional Plan Association has been re-established.

We just opened up our new offices in Newark, at 60 Park Place and we're having an open house on Thursday, April 2 and I would invite you to be there if your schedule permits.

Today, you are here to consider the problem of energy conservation, particularly in cities. The painful fact, as others before me have indicated, is that New Jersey has no proven coal, oil, or natural gas reserves. We are only one of two states in the country that has no intra-state production of fossil fuels.

We are forced to import all of the coal, all of the oil, and all of the natural gas that we consume. For New Jersey, in particular, energy conservation is not an option, it is a necessity. The economic future of our state and of the entire tri-state metropolitan, of which we are a part, depends upon our ability to remain competitive with our sister states and regions in the country. Every therm of gas, every gallon of oil, every ton of coal that we don't need to use is productive conservation. Increased energy efficiency is the only way that we in New Jersey, as an energy importer state, can hold the line on energy costs and be economically competitive with the energy producer regions of the country.

The picture, however, is not as bleak as many may suspect. What is on our side is the fact that our tri-state metropolitan area already demands less energy than other areas of the country. According to a pioneering Regional Plan study published in 1974, the New York region, including Northern New Jersey, with 9.7% of the nation's population and 12% of its income, consumed only 6.4% of the nation's energy. This low consumption level is primarily because we are proportionately a more service-related industry area and have less energy intensive manufacturing here, but it is also because our population is concentrated in cities and in relatively high density urban counties.

Urban residents can conserve energy because they are more likely to reside in energy efficient, multi-family dwellings; because they generally travel shorter distances to and from work and for recreation; and because in doing their travelling, they are more likely to use energy efficient public transportation of their feet. An automobile, after all requires three times as much energy per passenger mile as a buss and nearly twice as much energy per passenger as a train. A 1977 Regional Plan study on public transportation showed that only a handful of major cities across the country ranked ahead of the entire State of New Jersey in the use of public transportation for trips to work. That's an incredible statistic that we really, in comparison with other major cities in the country, perform more like a metropolitan city than our sister states.

Public transportation makes sense, however, only when jobs are centralized in downtown areas. That is the most important condition associated with people choosing to get out of their cars and ride a bus or train. The second most important condition is population ranged around the downtown with the highest density close in, tapering off to lower densities. Then, even neighborhoods with one-family homes on a quarter acre can support bus service to the downtown. New Jersey remains the most densely populated state in the nation. However, as population and employment opportunities in New Jersey have become more broadly dispersed over the last twenty years, our transit advantage has declined. In 1960, when gasoline cost 30¢ per gallon, nearly 25% of New Jersey's work force used mass transit. By 1970, however, we experienced a 12% decline in population density in our state over the decade from 1960 to 1970 and a 30% decline in the percentage of the work force using mass transit. Today, despite the fact that gasoline now costs nearly \$1.40 per gallon, stepped up population dispersal in the 1970's has contributed to further erosion in public transit usage.

If we are to sustain and even improve the cost advantages of existing public transportation in New Jersey, than we must more actively office jobs and services to locate in downtowns and in higher density development areas along transit lines. The availability and use of public transportation produces an economic benefit for users and non-users alike. The cost to maintain and operate an energy-efficient public transportation system, whether those costs are covered by reasonable fare increases, by a dedicated gasline tax or as a share of our federal taxes returned to New Jersey as operating subsidies, represents an investment in our state's future economic vitality. New Jersey dollars spent for increased dollar consumption are ultimately dollars exported out of our state with no guarantee that they will be reinvested to promote and sustain the economical well-being of New Jersey.

The relationship between population density and heating costs is more complex than the relationship between transportation. Generally speaking, however, the greater the population density, the lower the residential, industrial and commercial heating costs.

A 1974 Regional Plan study on "Regional Energy Consumption," while taking into account the variables in per capita income, in industrial and commercial usages, and in the age and condition of structures within the tri-state region, suggests that energy consumption declines as population density increases. Hudson and Essex Counties, for example, with the greatest population concentrations in New Jersey, show the lowest per capita energy usage while Warren and Sussex Counties, the least urbanized areas in Northern New Jersey, show the highest per capita energy consumption. Later studies by others have confirmed the general truth that the higher the density, the lower the per capita energy usage.

Our cities, in particular, have the advantage of multi-family and attached residential structures, which, if properly maintained, are far more economical to heat than single family detached homes.

These multi-family structures are a special resource. They constitute 75% of the housing stock of Newark and a substantial percentage of the housing in other urban areas. We are squandering this resource at a rapid rate. Over the last decade, Newark lost almost 7,000 dwelling units which was 5.2% of its housing stock. Jersey City lost 4.4% of its housing, most of which was multi-family.

There are many reasons for the loss of this housing, but one of the most significant factors contributing to this decline, neglect and eventual abandonment, is the difficulty in financing improvements in this state for structures of more than four dwelling units. The New Jersey Mortgage Finance Agency carries out a very useful program of providing low interest rehabilitation mortgage financing for structures of one to four family units, but the Agency has been very reluctant to finance larger multi-family buildings for fixing up the boiler, for fixing up the roof, an electrical or heating system. How long will it take them before these structures decline, they're vandalized, they're abandoned, or they're eventually torched?

Banks hesitate to make loans for anything other than owner-occupied structures in cities, and for good reason. A loan to an owner-occupied structure is a prudent investment. A loan for multi-family rehabilitation can be risky.

We must, however, take risks if we are to preserve our cities. A forceful and meaningful state program to provide new sources of financing for larger, multi-family structures is essential. Without such financial support, these structures can hardly remain liveable, much less energy efficient. Those rehabilitation monies can be used not only to make them liveable, but to install energy efficient improvements,

including the upgrading of their heating systems, more insulation, improved roofing and storm windows. Metering of individual units in new construction and wherever feasible in existing structures will also encourage energy conservation.

In my testimony, I say something about the subject of co-generation and the use of district heating systems, which has already been gone into in great detail by some of the previous speakers. So, I will skip on to something else, but I would say that the use of district heating, through the co-generation process, similar to the ICES project in Trenton, has been very successfully utilized in European cities for decades and the fact that we have the densities in our state to theoretically support district heating grids, especially in such areas as Newark and Jersey City and soe of the most densely populated urban areas is potentially a great plus in this state.

In conclusion, I would like to say, if you wish to conserve energy, conserve our cities. If they remain viable, if they grow and prosper, then we can sustain public transportation and exploit the full potential of high density living and working patterns. If our urban centers continue to decline, the very direct results will be unnecessarily wasteful energy consumption from dispersed development, decling mass transit use and the erosion of our state's economic vitality.

I would like to commend this Committee for meeting today to consider this compelling and timely subject. The meeting is particularly appropriate in the light of the news from Washington that, in the future, priorities for action will be determined more at the state leve. If New Jersey is going to provide jobs for its residents and compete economically with the rest of the nation and the world, then energy conservation should be given a top priority. Once upon a time, it was quickly subordinated to other interests. It was expendable. It was nich to have in local states, federal budget and we can't afford to think like that any longer. Energy conservation must be fundamental to our state's economic development strategies.

In approaching the task ahead, we should recall that we have significant strengths in terms of our demography, in terms of the existence of our cities and our existing transportation network and our existing high density development. If we play to those strengths, then we can prosper. If we need a model, consider that Japan, with no domestic sources of fossil fuels, but with extraordinary population densities, has done rather well of late, thanks in part to significant individual conservation efforts, but, even more importantly, the fact that they have a comprehensive public policy that effectively promotes energy conservation.

If Regional Plan Association can be of assistance to you in the future, please let us know and don't hesitate to contact us again. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much for your very thoughtful remarks. I assure you that we will reread your testimony as you have submitted it and I just apologize again for the fact that you've had to move rather rapidly through them. I don't want you to think that we take them lightly. Thank you very much for coming to join us. Our next speaker is Ed Lloyd from the New Jersey Public Interest Research Group.

E D W A R D L L O Y D: Good morning. My name is Ed Lloyd. I am the Executive Director of the New Jersey Public Interest Research Group. PIRG is a private, non-profit, non-partisan, public interest, advocacy corporation, funded and directed by over 25,000 New Jersey college and graduate students. PIRG operates six offices throughout the state and employs over 20 full-time professional staff persons.

PIRG works primarily in the areas of environmental and consumer protection, governmental and corporate accountability, and sex and race discrimination. We have done extensive work on energy issues over the last nine years, some of which I will touch upon later in my testimony.

I am sure that this committee has heard time and time again the litany of benefits from the immediate implementation of a strong conservation strategy. I will simply summarize some of its many benefits below:

1. It is far more economic than any of the alternatives which create new energy sources;
2. It creates far more jobs for the local economy than its more expensive alternatives. The jobs are low skilled and concentrated in urban areas where unemployment problems are the greatest;
3. It is the most environmentally benign of the alternatives to meet our future energy needs;
4. Its return on investment is faster than that of the alternatives; that is, the money invested is returned to the state's economy in far larger amounts and far quicker than investments in alternatives, e.g. petro-dollars to the Mideast or even America's West for a synfuel program;
5. It increases national security and helps stabilize the state's economy. We become less dependant on foreign sources and ship fewer of our hard earned dollars and jobs out of the State. Keeping these dollars within the state's economy through local investment creates New Jersey jobs and stabilizes the New Jersey economy.

This room could be filled with studies documenting these facts. It is my hope that we can start with these facts as givens.

But, there is another perspective on our failure to vigorously pursue these energy conservation strategies which I believe that this Committee should be aware of. According to New Jersey's State Energy Conservation Plan, our energy use in 1980 was approximately 1900 trillion Btu's. This is the equivalent of about 13.5 billion gallons of #2 fuel oil. If you use the cost of that oil at \$1.25 per gallon, New Jersey spent nearly \$17 billion for energy last year. If we then make the very conservative assumption that our energy use for 1981 will not grow at all and that the price of our energy in 1981 will increase at the modest rate of 10%, we in this state will be paying an additional \$1.7 billion for energy in 1981 over 1980. It is also important to recognize that every penny of that \$1.7 billion will leave the state, as New Jersey has no inherent energy sources. This means that our dollars are leaving the state as are our energy related jobs. That \$1.7 billion loss to the state in 1981 is equivalent to over 100,000 jobs where that money could be invested at home instead of in energy sources from outside the state and sometimes outside the country. To carry this thought just a few years down the road, assume that we are able to achieve zero energy growth in the next ten years, again, very conservative and optimistic, and that energy prices are to rise only 10% a year for that same period. If that scenario is achieved for the 80's--and it is an ambitious one by past standards--New Jersey will still be shipping out over \$44 billion in the year 1990. This is over 2.5 times the cost of 1980's energy, assuming no growth in the energy use throughout the decade. Put another way, each New Jersey household paid approximately \$3500 for his energy use in 1980. If we make the same assumptions on the cost of energy for the 80's and, again, no growth in energy use by the family, each household will have to pay over \$9000 per year for energy in 1990. This would mean that the average family income would have to exceed \$50,000 per year just to

keep up with energy bills. These bills simply cannot be paid. Neither the homeowner nor the state can afford these increased shipments of cash out of the state. What we're talking about here is individual bankruptcy--and bankruptcy on every level, local, State and regional--if we do not conserve immediately. If you think that this cannot happen, just consider that one of this state's major utilities faces bankruptcy regularly because, at least in part, of our failure to vigorously pursue an energy conservation strategy.

There is an alternative if we are willing to embrace it. The County Renewable Energy Plan is a tool by which we can implement that conservation alternative. County Renewable Energy Plans, based on "The County Energy Plan Guidebook" by James Benson, are plans that:

- 1) document the amount of energy each county is now using by sector (transportation, industry, commerce and residences) and how much costing; and
- 2) estimate how much that energy will cost, in money and in jobs, in the year 2000, what percentage of the county's energy demand could be met through renewables--conservation, solar, biomass, wind, etc., by then, and how to set and reach reasonable goals for those renewables.

PIRG has organized groups of citizens, local officials, and others to do county plans in Mercer, Camden, Essex and Hunterdon Counties and they are currently underway. Salem County has also begun work on their plan, and several other counties are beginning to show interest, including Somerset, Hudson, and Middlesex. Each county's community action agency or OEO agency has received Energy Crisis Intervention (ECIP) funds, part of which is to be devoted to energy planning. We are encouraging ECIP coordinators to do county plans with these funds and just set a timetable with the freeholders and mayors for trying to meet each plan's goals. These plans should be done at every level of government in the state--at the municipal, county, and state level. They can show us how many of our dollars are being transferred out of the local economy and how they might be returned or retained through more efficient energy use.

This brings us to the need for a strong, capable agency on the state level to provide the technical assistance and the financing for the implementation of a conservation strategy, whether that strategy includes county renewable energy plans or any of the other techniques that can and have proved successful in promoting the conservation of energy. Fortunately, we now have such an agency in NJDOE, but NJDOE faces virtual extinction unless the state government restores funding which has been cut back or eliminated in Washington. The need for a conservation program is there and NJDOE's unsurpassed track record has earned it the right to such continued funding. In an analysis of the cost effectiveness of NJDOE's programs done with methodologies developed by the accounting firm of Price, Waterhouse and approved by UNDOE, NJDOE was credited with saving the state's consumers over \$625 million in 1980 alone, \$130 in fuel costs for every dollar spent by the Department. I challenge this committee to find any dollar in the state budget which can boast of a better return. Of there is one mission that the committee is to undertake, and only one mission, it should be to make every conceivable effort to restore the NJDOE budget to full funding. NJDOE's track record warrants it and New Jersey needs it.

The next priority to get the state on the road to a balanced energy budget is financing the conservation investments. Every sector of our economy can reap significant benefits from immediate conservation investments if only they could

find the money to make those investments. Government has an important role to play in assuring that the money is available for these expenditures because the alternative to not spending that money is continued exports of dollars from the state's economy-- \$1.7 billion additional dollars in 1981 alone, with the concomitant loss of the economic equivalent of 100,000 jobs. This is a high price to pay and an unnecessary one.

Some of the financing methods which have been successfully employed in other states are described below. New Jersey should adopt some or all of these mechanisms as soon as possible. Since 1978, Pacific Power and Light has offered zero interest loans for conservation investments in electrically heated homes:

"...The utility audits a potential customer's home and authorizes loans that are competitive with the cost of power on the utility grid. The cost of the loan is treated as part of the utility's rate base until such time as the construction investment is repaid, at no interest, usually on the sale of the property.

"The plan has benefits for all participants and even for non-participants. Homeowners get lower electric bills and a zero interest home improvement loan. PP&L gets a rate of return on its investment (at the margin, higher than their cost of money), cash flow is improved because funds turn over in seven years or so, rather than the 30 or 40 years required for a power plant to repay its costs. This, in turn, makes it easier for the utility to earn its authorized return on traditional investments. The utility is saved the risk and the trouble of raising large sums to finance uncertain and probably unnecessary power plants. Even landlords and tenants whose incentives are normally at cross-purposes share the benefits. The former gets a free loan and and, possibly, higher occupancy rates, and the latter gets reduced utility bills. Non-participants save because the cost of saved energy is less than the average cost of electricity in the system, which is three to four cents per kilowatt hour. Costs as high as 6.5 to 10 cents per kilowatt hour, the marginal costs, might be justified, but PP&L has not yet gone this far.

"...zero interest loans have not been offered to commercial and industrial customers. Nevertheless, the commercial and industrial sectors may yield more results per dollar than residences when it comes to saving electricity...

"In examining alternatives to the proposed Sundesert Nuclear Plant, the California Energy Commission found over 5000 megawatts of very cheap efficiency improvements available in Southern California by 1985. The cost of the Sundesert project was 6.5¢ per kWh, plus \$1.00 or 2¢ per kWh for transmission and distribution. Its size was 1900 megawatts; its capital cost, over \$3 billion. The conservation improvements available by expanding existing utility audit programs cost an average of .5¢ per kWh for nearly three times the total megawattage and a program capital cost about a third of that at a nuclear plant. Nearly 50% of the peak power savings was in the commercial sector. 25% was in residences and the remainder was in industrial cogeneration and voltage reductions to all customer classes. In energy terms, commercial programs saved five times the electricity of the residential program (112 TWh at \$308 million vs. 24 TWh at \$703 million). Thus the commercial sector energy was saved at about one tenth of the cost (.3¢ per kWh) of the residential sector electricity."

The Tennessee Valley Authority or TVA has had similar success with conservation programs. According to David Morris, writing in "Energy Economics and Energy Financing," TVA:

"...provides zero interest loans for attic insulation, storm windows and wood stoves. The building is first audited by TVA. After insulation, TVA returns to inspect the work and if it is properly done, TVA pays the contractor. The customer repays TVA at \$5.00 per month until the loan is repayed.

"In Memphis, TVA established a financial mechanism which spread out monthly payments to customers. They paid for solar, domestic hot water systems through energy savings. It is estimated that the average Memphis resident paid \$14.00 per month for electricity for hot water. Assuming that the solar system would displace 75% of this load, this customer is billed at \$12.00 per month in loan payments for

twenty years. This is in effect a 20 year loan by TVA at 3.7% interest. TVA borrows money at 9%. Over the life of the loan, TVA is, in effect, subsidizing the solar technology by \$880 (the difference between the rate at which TVA borrows the money and what it lends to the customer). Since new capacity coming on line costs \$2000 per kilowatt, TVA actually saves money. The solar systems have an oversized hot water tank equipped with a clock timer which stops the customers from using peak electricity. Thus the utility is assured that solar energy is directly replacing peak capacity."

Another method of realizing energy conservation goals is to provide technical assistance to builders and architects in the state. Builders could submit their plans for housing that they are now building to NJDOE, where architects and engineers would review and revise the plans to make the homes energy conserving. This would be done at little or no cost to the builder. The plans would then be returned to the builder, and explained, with estimates for how much the changes would cost above the current cost of the house, if that cost was higher at all. The appearance of the house would be changed as little as possible from the builder's original plans. The builders who built these homes could then receive--or the homes could receive--the NJDOE certification, a guide to show consumers where they could buy the most conserving homes. Builders should be able to get the extra financing necessary from a state bond issue or tax incentives. The Solar Energy Research Institute or SERI in Colorado carried out just such a program very successfully. They issued a call for housing plans from Denver area builders and 130 builders responded. There is now a buyer's waiting list for the conservation homes.

Existing housing should also be required to come up to a standard conservation code upon the sale of the house, such as adequate ceiling and wall insulation, water restrictors and toilet dams, weatherstripping and caulking, storm windows and doors, and heater insulation jackets.

The energy amendments to the Municipal Land Use Act need to be strengthened and municipalities given a deadline and more guidelines for meeting energy conservation goals.

Cities should institute curbside collection of paper, bottles, and cans, as well as other garbage to help solve both the energy and garbage/landfill problems.

Congress must amend the conservation and solar tax credits so that "double dipping" is allowed. That is, a consumer cannot now get tax credits if he or she has received a low interest loan or financing for the conservation investment. This has knocked the bottom out of the financing programs that we had in New Jersey, notably the Mortgage Finance Agency program. These financing programs significantly increased the number of solar and conservation investments made. Tax credits do not provide the incentive that front-end financing does. The federal Solar and Conservation Bank, slated for elimination, was an excellent step in the right direction. States should create their own solar and conservation banks if the federal bank does not materialize.

Additionally, rent control ordinances should reflect tenants' and landlords' energy problems. Landlords should not be able to raise rents due to higher energy costs unless they can show that they have made significant, bona fide conservation improvements. Likewise, tenants should be eligible for zero interest conservation loans.

Finally, it is important to recognize that even in the absence of financing programs, but with the considerable efforts of NJDOE and others around the state and country, efficiency improvements have supplied 72% of our energy supply increment from 1973 to 1978. Energy efficiency improvements are by far the fastest growing component of our energy supply. According to Amory Lovins, "...If you put it in a different way in that same five year period we already got from efficiency improvements twice as much energy 'supplying' capacity twice as fast as the synthetic fuels people say they can do at ten times the cost. Just in industry alone, we had saved by 1978 the equivalent of twice the '78 output of the Alaska pipeline, except that we left that much oil in the ground. The past year, we did considerably better than that--about 97% of our economic growth was fueled by energy savings and by now the total savings since the oil embargo have probably added up to the equivalent of 6 million barrels of oil a day compared with net imports last year of only about 7.8 barrels a day..."

In short, we have the knowledge, the technology and the resources to move to an energy efficient society. We must begin to use all of them to prevent the further drain of literally billions of dollars and hundreds of thousands of jobs from this state. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much, Ed, for your testimony. We appreciate it. Linda Stansfield is our next scheduled speaker. Linda?

L I N D A S T A N S F I E L D: I am Linda Stansfield, the Energy Director of the League of Women Voters of New Jersey. We are here because we think we have a crisis. I find the word, crisis, very interesting. The Chinese don't have a word for crisis. They use two characters. Separately, these are "danger" and "opportunity."

For those of us in this room today, the danger or dangers are obvious. The very balance of our world power and economic survival will be determined by how each nation, region, state, and city makes the transition to a life no longer dependant on fossil fuels. Unfortunately, the general public is not being fully alerted to the scope of the world struggle before us.

The opportunities are equally great. Energy conservation can lead to great improvements in environmental quality. Energy efficiency is itself a desirable trait in all technology. Many believe that renewable resources, especially solar, can lead to an egalitarian society.

Last Sunday, the League of Women Voters held an energy forum in South Orange. We had speakers of every persuasion. If there was one thing that each and every panelist agreed upon, it was the need for and the value of conservation. Conservation is the top priority not only for the League, but for all of us in the United States. But, the message does not seem to be getting into the public's hands, how important this is for them.

Conservation is so important that we cannot assume that New Jersey utilities will take care of it, that they will promote and publicize it. New Jersey utilities, realistically, have no true incentive to do so. They have reserve capacity. To maximize their capital investment, they need to promote their product. Therefore, the thrust towards conservation must come from government.

Conservation can make the crucial difference now, during these decision making years, while we decide how to produce energy for the 90's and beyond.

Conservation has impacts that many people do not think about. I heard Dr. Walter Anderson talk last week. He is the head of the U.S. Department of Education, Office of Energy. He pointed out that school boards had to pay more money than they

budgeted this year for energy bills. Taking the incremental difference, just the difference between what they budgeted, which had already allotted for inflation, and what they had to pay, Dr. Anderson pointed out that this amount would have paid 120,000 teachers \$18,500 per year. That's just the difference between what they expected to pay and what they had to pay. The results of such energy costs will mean that school budgets will be eaten up by heating and lighting demands, while teaching and education diminishes or even disappears. This is just one example of how conservation affects an area where many do not see it.

But, for urban conservation, the topic here today, there are special pitfalls. It is not easy to accomplish residential retrofit. It is much harder for a tenant to see clearly the relationship between his action and his rent. It is also difficult for a landlord to see how he will benefit from capital expenses he must lay out. There must be a mechanism developed by this Legislature to allow both the landlord and the tenant to understand and benefit more directly.

We suggest getting rid of master metering. We think that utilities should be required to provide a meter for every living unit. As an incentive to the landlord, we think that buildings whose landlords provide some sort of conservation technique, be it storm windows, day-night thermostat, or attic insulation, should have first priority in having individual meters installed and we think that such measures could begin to bring home to tenants exactly what their actions mean.

There are a lot of barriers to residential energy conservation. I went, last year, to a conference in Princeton, which has subsequently been called The First National Annual Retrofit Conference, and they put out this wonderful book called, "Home Remedies--How To Help Your Home." One problem that I've already addressed is that people don't recognize how much energy can be saved cost effectively. That is a process that needs more education. They do not know how to save energy, particularly if they don't have a meter that tells them how much they're wasting. Other speakers have spoken to the fact that they don't know who can do the job.

Another factor is that they don't intend to live in the house for a very long period of time. On this point, the League very much supports legislation requiring conservation standards for every residence at the time of sale. This would speed up installation as the homeowner would recognize that he might as well benefit now from something that he would have to do at the time of sale.

The League has always supported the requirement that the utilities should provide financing for home conservation measures payable through their utility bills.

I also find that we are dealing with public myths. Now, I have heard one myth mentioned by our Commissioner of DOE, the Government, and the President of our largest utility and that is that solar doesn't have much potential in New Jersey. I assume that they meant that it doesn't have much potential for electricity because I knew it had potential for space heating. However, a recent study done by the Solar Energy Research Institute of Colorado, the solar braintrust, shows the potential for photovoltaics on homes in the U.S. measured by utility service areas. Now, this study took into account a number of factors, including the electric utility rates in that area and the availability of sunshine. Surprisingly, its potential cost effectiveness is not consistently rated in the West or in the Southwest, where we might guess. Because the heavy dependence on petroleum for generating electricity was so important a factor, more than half of the top 33 utility service areas ranked for photovoltaic potential are in the Northeast. In fact, New York City has the

second highest ranking and our New Jersey utilities ranked seventh, twelfth, and twentieth. We are a leading candidate for photovoltaic power, eliminating the Sunbelt myth. This same potential, mathematically, would hold true for those residences currently heating hot water with electricity.

We are very interested in Senator Bradley's Residential Energy Efficiency Plan. We would like to know how it is faring and how the model communities that have been picked are progressing along the road to having conservation measures installed through government action.

We endorse New Jersey's Home Energy Savings Plan and we think it is a good idea as far as it goes, but we would like to see it financed by the utilities as part of the League's energy position requiring utilities to provide conservation financing for homes, payable through utility bills.

Marketing in New Jersey is very difficult because of our diverse media. We suggest that the State should follow a program of saturation marketing; choose a municipality or urban area to flood with the information that we have on renewable resources and conservation information; allow all personnel from DOE and the utilities in that area to focus their concern in one small area for that period of time; pick our urban areas by just drawing them out of a hat and do the best we can on a step by step basis.

Finally, we would like to pass on to you what Daniel Yergin said in the Harvard Energy Future Study: "If the United States were to make a serious commitment to conservation, it might well consume 30 to 40% less energy than it now does, and still enjoy or an even higher standard of living. That saving would not hinge on a major technological breakthrough and would require only modest adjustments in the way people live. Moreover, the cost of conservation energy is very competitive with other energy sources, and the possible energy savings would be the equivalent of the elimination of all imported oil--and than some."

Thank you for the opportunity to speak on this issue.

ASSEMBLYMAN STOCKMAN: Thank you. We now have Mr. Alvin Zach, Director of the Department of Engineering in Newark.

A L V I N Z A C H: My name is Alvin Zach, City of Newark, and I am here today representing Mayor Gibson, who unfortunately could not be with you. I must commend the many individuals who have worked so hard to make today's hearing on Energy Conservation in the Cities a reality. It is through hearings such as this one that we can inform one another of our successes and failures. In this way we can proliferate the usual ideas and improve on the best of these by learning of one another's failures.

Today's topic concerns one of the most pressing problems faced by the cities of our state and nation. What I am about to discuss today may shock many of you, but the facts speak for themselves.

For years, corporate energy interests and some agencies of the government have vigorously urged a rapid expansion of energy production. The energy systems that they have promoted are often large in scale technologically complex, costly, wasteful, and environmentally destructive and dangerous to its employees and the public. They are supply oriented and do not take into account the tremendous potential for energy conservation. An increasing number of Americans are becoming convinced that systems such as nuclear fission and conversion of coal and shale to gas and oil are too destructive to the public's health and environment to be acceptable.

The alternative proposed by these citizens and accepted by me is to marshal our resources to reduce the incredible waste of energy in our nation; to conserve energy and to develop solar and other soft energy technology, many of which are now ready for widescale utilization. Those proponents of large scale, complex energy systems concede that they expose the public to a variety of risks, but they contend that there is no other way to meet the nation's energy needs, to provide for a healthy economy and to create a large number of new jobs.

I disagree. There is another way. Increased energy efficiency, energy conservation, and the implementation of alternative energy technologies such as solar can provide for sufficient energy and for a prosperous economy. In fact, such a solution to our energy problems would lead to a more stable economy and to more jobs than does the present, large scale, capital intensive system. It does this with less pollution, less disease, less social disruption, while, at the same time, providing more jobs and greater self-reliance. Today, our national unemployment rate is approximately 7%. In Newark, the unemployment rate is over 12%. Women, minorities and young people are out of work in even higher percentages. The problem is staggering. In the last several years, millions of Americans, especially in our nation's largest cities, have been experiencing severe financial crises and, over the years, have cut back in a wide range of vital human services. Industry has been operating at less than full capacity and inflation has cut deeply into wage increases. Yet, this high unemployment, particularly in our cities, has been taking place while energy use has generally been increasing.

Historically, industry has sought to substitute energy for human labor. The amount that each working person could produce has, therefore, steadily increased, but after the substitution of energy for labor, the total number of workers needed in that process decreased. The five largest manufacturing industries, primary metal, stone, clay, glass, food, chemical, and paper account for only 7% of our nation's jobs. From 1959 to 1969, employment declined from 450,000 persons to 100,000 as production increased 45% and energy use increased.

In the agricultural sector, the use of energy for fertilizers, chemicals, and automated equipment increased the output per worker. But, this increase in productivity led to a steep decline in the number of people employed. In 1970, agriculture employment was less than half of what it had been in 1920. That year, about 27 billion person hours of labor was needed, compared with only 2 billion person hours 50 years later.

Energy input increased more than four times over the same period. This situation has not been reversed and the situation is getting worse. From 1961 to 1973, electric utilities increased their kilowatt output about 130%; the revenues about 250%; the construction costs about 340%. But, employment and electric utilities increased only 21%. So, where are all the new jobs? Since World War II, the new jobs have been created overwhelmingly in the merchandising and service sectors of the economy. Between 1947 and 1970, employment in these areas increased 95%. These jobs required relatively low amounts of energy, capital, and resources. A numbers study has shown that Americans use as much as twice the energy per person as the West Germans, Swedes and the Swiss. Yet, the standards of living in West Germany, Sweden, and Switzerland are comparable to or higher than this country's and their unemployment is much lower than the United States.

Energy is an essential input into all sectors, but it does not necessarily follow that increasing the production of energy will increase the number of jobs

in these sectors. In general, it can be stated that increased energy use will not necessarily result in increased employment. Energy has been wasted primarily because public and private policies have long promoted energy abundance in the mistaken belief that this was the best way to bolster our economy.

President Carter once stated that our energy waste on transportation is 85%; in generating electricity, 65%. Overall, 50% of our energy is wasted. We continue to await President Reagan's proposal to deal with this major problem.

Energy production must not be a goal in and of itself. Energy must be used to serve people, to provide the freedom for all people to lead decent lives. In the energy field, we must overcome the myth that more is better. This approach is not anti-technology, but is technology on which we must rely on alternatives to the previous noted scenario of incredible waste. A unit of energy saved is cheaper than a unit of energy produced. According to several authorities, saving energy by conservation costs 1/6th of what it costs to deliver an equivalent amount of energy from new power plants. The American Institute of Architects has calculated that by 1990 12.5 million barrels of petroleum today, equal to 1/3rd of the current national energy use, could be saved just by employing energy efficient systems in old and new buildings. This would be larger than the contribution of supply of the conversion of shale to oil or the Alaskan North Shore Slope oil.

In order to supply the energy equivalent of 12.5 million barrels of oil today in 1990, with centralized systems, a capital investment of \$415 billion would be required. Customers would also have to pay between \$892 billion and \$1.2 trillion for this unneeded energy. Investing money in labor intensive energy, efficient buildings, improvements would result in both energy and dollar savings. This proposal by the American Institute of Architects, for example, would create between .5 million and 1 million direct jobs in energy through 1990.

In order to begin to initiate energy conservation in New Jersey and throughout the nation, we need economic incentives. One specific example, which the City of Newark has worked on with success, was our effort before the New Jersey Board of Public Utilities to restructure the Public Service Electric and Gas rate schedule dealing with street lighting. It is well known that energy use could be cut on an average of approximately 40% through the conversion of street lamps from inefficient incandescent, fluorescent and mercury vapor lights to high pressure sodium vapor type lamps. The rate schedule discussed dissuaded municipalities from converting to more efficient high pressure sodium vapor type lamps by penalizing such conversions. This was a consequence of Public Service's rate schedule which charged more for the high pressure sodium vapor units and less for the less efficient, more energy consuming, incandescent, fluorescent or mercury vapor type units. In essence, the less electricity used, the more per unit of electricity paid. Archaic regulations such as these which penalize those who conserve must be eliminated.

Through Newark's efforts, we have prompted Public Service Electric and Gas to offer more sizes of the efficient, high pressure sodium type units previously unavailable. This simple readjustment to the rate schedule has resulted in a savings of more than \$100,000 for the City of Newark. These savings did not include additional savings which allow for the installation of more efficient units and smaller sized units, previously prohibited by the rate schedule. These savings are only based on approximately 1,000 high pressure sodium type units. We still have 15,000 other street lighting units which need to be converted into high pressure sodium lamps. Ultimately, with today's dollars, this would lead to a saving of approximately \$1.5 million for Newark.

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This rate schedule restructuring has provided the City with enough incentive to take the necessary steps to invest an initial \$75,000 to convert 375 inefficient units to the new lamp type and this will begin in mid-1981. It is estimated that the payback on our investment will be less than two years at today's prices. Obviously, our efforts will lead to further conversions as quickly as we can finance the replacement program.

While we have been partially successful in our quest to modify the antiquated electric rate structure, additional changes are now necessary to provide further incentives to encourage utilization of such new technologies. Specifically, we need further revisions to provide an even greater payback on investment in order to achieve a radical reduction in the amount of energy utilized to light our streets. In order to accomplish this, we have already placed the wheels in motion to intervene in an upcoming BPU Public Service rate case and we urge everyone here to apply the same type of pressure to ensure equitable, conservation-minded rate schedule policies.

Other inefficient utility policies exist which can easily be rectified. For example, the City of Newark received, in 1980, 5400 separate billings for 450 signalized intersections. We see no reason for such a practice. Combined billings would easily solve this expensive paperwork barrage. One way would be to have combined monthly or quarterly billings which would result in either 12 or 4 billings respectively, rather than the 5400 we received in 1980.

Another major area of energy conservation can accrue to society by repairing major water leaks in our cities. Such an effort is initially expensive, but it is less expensive than constructing massive new water projects such as dams, pipelines, and pumping systems, which would only divert more water to leaking systems. Our large urban areas do not have the kind of upfront capital necessary to make these repairs. Conservation is the cheapest means through which water can be provided to our citizens in the least expensive and most energy efficient manner. We need your help to make financing for such an undertaking a top priority over massive new water supply projects, particularly in light of our present water emergency.

With respect to vehicular travel, it is obvious that a great need exists for efficient mass transit and new, more energy efficient vehicles. While it is well known that Newark is a major center for mass transit in New Jersey, it is less well known that we are experimenting with new, more energy efficient and cleaner vehicles. Recently, the City converted a vehicle to a propane car. This automobile was converted from gasoline to propane in 1980. In addition to favorable economics, the exhausts from the vehicle are cleaner and less maintenance is needed. The retail cost of propane is only 75¢ per gallon, as compared to more than \$1.50 per gallon for gasoline. In addition to being more efficient, it also provides an alternative energy source, thereby reducing our reliance on imported oil. This is particularly important should gasoline shortages develop again. We will soon purchase more of these propane converted units and, possibly, electric vehicles to replace the large, inefficient gasoline powered vehicles. We invite you to inspect and evaluate this vehicle at your convenience. Further, we urge the State of New Jersey to follow our lead and begin to diversify its belief for these, clean, safe, and energy efficient vehicles.

Another need is to reduce energy consumption in the home. Utilities should be required to convert and conduct energy audits and make repairs whenever a payback of less than six years exists. Such repairs could be paid for, initially, by the utility which would then, in turn, amortize and bill the homeowner in long-term installments. While you may think that this is a radical and unprecedented

step, let me say that, yes, it is radical, but, no, it is not unprecedented. Public Service Electric and Gas has already recommended and is awaiting to receive approvals from the United States Department of Energy to allow the utility to install solar units on individual rooms. The utility would provide the initial capital investment and then bill the user on an installment plan. It is our belief that such a plan is feasible and you could fund energy supply systems and that plan could easily be expanded to provide for the principle of wholesale conversion. The benefit to the utility is obvious because it can reduce huge capital investment in the new energy producing facilities, if the quantity of energy is reduced.

With respect to energy conservation in the home, Newark has begun a new adventure in providing low cost, well insulated solar housing on an experimental basis to the poor. Such a concept is providing deprived urban dwellers with low cost, well insulated housing and is the direction that this nation must go.

We must promote the proliferation of both conservation and generation of safe, clean, and low cost energy. Additionally, such an action will make us independent of an economy based on imported energy and will provide us with a larger employment base. In 1979, the Newark Housing Authority outfitted six dwelling units on Urban Turner Blvd. with rooftop solar panels. This system was designed to save \$3000 in fuel costs in the first year of operation. Four families received solar hot water, while two families, most of their heating needs for water and space were directly from the energy of the sun. The dwelling units are three and four bedroom, two story apartments, but this is just the beginning; the beginning of a new era. We are awaiting the results of these prototypes in order to determine the most desirable manner in which to proceed.

While the systems have worked, active solar systems need frequent monitoring and occasional repair. Hence, we are now trying to identify a source of funding in order to solicit a grant of funds to develop detailed plans and specifications for an affordable, low income, passive, solar house. Our plans call for the Housing Authority and the scientific community to develop such plans and to make such a program a reality for our urban poor. We hope that you might be interested in providing funds to assist in the development of such a project. It is this type of conservation minded concept that might create more jobs than can be created through the development of new supplies. Most energy supply systems such as power stations are highly automated. They employ skilled workers whose skills are already in high demand such as engineers. These jobs are usually located in mining areas far from our cities where unemployment is highest.

Energy conservation, on the other hand, requires the use of many semi-professional as well as professional skills; skills possessed by many who are now out of work in our cities. The insulation of existing buildings and the construction of well insulated houses and small scale, self-reliant energy units in this housing will give a major boost to the economy where it is most needed: in our cities.

The energy industry contends that they want to expand for the sake of the poor and disadvantaged. If the energy industry is truly concerned with these people, they would be spending much more to develop inexpensive, energy efficient, and long lasting appliances. Yet, the industry spends 8 times as much money on advertising as it does on the research and development of energy efficient consumer goods.

Additionally, utilities would use those affordable lifeline utility rates and would not be charging higher rates to smaller users. They could not oppose clean air and water regulations, since polluted air and water affect the poor more

than those who can afford to escape to the suburbs. They would not be constantly downplaying the dangers of nuclear fission and syn-fuel dangers, which threaten the poor first and most. And, they would not be misleading us about where the jobs are. So, why don't we have a stampede for energy conservation and alternative technologies? I think it is time that we did. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much for presenting Mayor Gibson's ideas in this area and we appreciate it. That concludes the testimony for this morning. The hearing will continue at 1:30. Thank you.

(at which time a luncheon recess was taken)

AFTERNOON SESSION:

ASSEMBLYMAN STOCKMAN: We are ready to continue the public hearing which we started this morning. Our first speaker this afternoon is the Mayor of the capital city of the State of New Jersey, my good friend, Arthur Holland. I am happy to have him lead off and have him talk to us this morning, I'm sure, about cogeneration, among other things.

A R T H U R H O L L A N D: Mr. Chairman, I appreciate this opportunity to testify on what is probably the most important matter, not only for our community and state, but for our nation and, I suppose, the world, the need for energy.

New Jersey, as we know, has no energy resources of its own and is totally dependant upon imported resources. We get coal from Pennsylvania or oil from the Middle East or natural gas from Texas. In order for our state to succeed economically and reverse the loss of jobs and population to other regions of the country, energy conservation is a necessity.

Typically, energy conservation efforts have focused on technological answers, whether they are new technologies for heating and cooling of buildings or financial incentives for insulation or lower thermostats. The agenda for conservation, however, must include the issue of rational land use. Thus far the efforts of both government and private industry have focused energy conservation efforts on individual objects, more fuel efficient automobiles or energy conserving buildings. Market forces have influenced the characteristics and configuration of consumer objects such as buildings, cars, or appliances, but no one has sought to optimize energy consumption caused by land use patterns formed by a complex web of governmental regulations and market forces. I would urge a policy that goes beyond the parochial interest of home rule and which seeks to minimize energy consumption on a regional basis. Each time a productive farm is converted to a tract of single family suburban homes, the potential is lost for energy efficient public transit, while our population becomes more dependant on private automobiles.

Substantial energy is expended in the production of new, usually imported--by that I mean from outside our region--building materials while housing units are abandoned in our central cities. Further, local agricultural production is displaced from our state and another vital product, our food, must be imported from elsewhere. That elsewhere is often California, Arizona or Florida and when that elsewhere is California or Arizona, that food is fertilized with energy intensive petroleum products and irrigated at great energy and capital costs from gigantic water projects financed by federal tax dollars from New Jersey. There is no insurance

that water for irrigation will always be available in that semi-arid region or that the soil will remain fertile for the long term when subjected to this forced fertilization-irrigation. Finally, that food, when harvested, must be transported over 1,000 miles by trucks fueled by imported oil.

Popular opinion holds that technology has the power to transform our lives and, to an extent, that is true. Many of our existing energy programs attempt to develop new technologies which will conserve energy, but we must examine the underlying assumptions and goals before we jump to conclusions about the future of our society. One proposed panacea for our energy woes is solar energy. Will the solar house that we see in the magazines solve our energy problems? Let us examine the energy economics of a hypothetical, 2,000 square foot house in suburban New Jersey.

The construction of such house will require the expenditure of 10,000 to 15,000 gallons of fuel oil. This is the energy necessary to harvest the wood grown in Georgia, transform it into dimension lumber and plywood, and to transport it to New Jersey, as well as the cement from California, the asphalt shingles from North Carolina, the copper from Utah and the power for tools to assemble the components into a new home.

Because this house is energy efficient, we shall assume that 60% of its heat and 85% of its hot water will be provided by the sun and the balance by oil. It will thus consume 350 gallons of oil per year. This is a total oil consumption of 17,000 to 22,000 gallons of oil in the first 20 years of life.

By contrast, a substantial row house of 2,000 square feet, such as you see across the street from the State House, and which can be found in urban neighborhoods throughout New Jersey, has its major construction energy imbedded in the existing bricks and mortar, foundation and wood framing. While the financial cost of completely rehabilitating such a structure is comparable to or less than constructing a new house, the money goes largely toward a local resource, labor, not imported building materials. It requires an energy input of only 1700 to 2500 gallons of oil to complete rehabilitation. This row house will consume 730 gallons per year compared to 350 gallons for the solar house. In 20 years, however, the town house will consume a total of 16,000 to 20,000 gallons of oil, about 5% less than the single family solar house. Solar components can also be added to the urban house, making it even more energy efficient.

This calculation of energy use does not even touch on the energy expended on commutation nor on displaced agricultural production. This analysis is not intended to imply that solar energy technologies should not be pursued nor that single family houses should be prohibited. It is an example, however, of a systematic look at how and why we expend energy which will often yield a surprising result. In Trenton alone we have 1000 unoccupied residential properties, which represents an embedded energy reserve of 10 million gallons of oil. Together with the other cities in New Jersey, our existing housing stock is an undiscovered oil reserve. I am convinced that the redevelopment of our central cities is one key element in a rational approach to solving our energy problems in New Jersey.

If this redevelopment is desirable, how can it be achieved? There are, of course, no easy answers; 30 years of various forms of urban renewal teaches us that. I believe the following six point program will help achieve this end:

1. We should enact an effective farmland preservation program to prevent New Jersey from becoming totally dependant on extra-regional resources for its vital food supplies. Farmland is New Jersey's primary natural resource and we should no more prevent its use than Texans should abandon their oil fields.

2. We should continue to increase State support for public transportation, with a view toward improving service and subsequently increasing ridership.
3. We should continue the excellent programs of the New Jersey Mortgage Finance Agency, since they encourage revitalization of urban housing.
4. We should fulfill the State's obligation to provide a thorough and efficient education to all New Jerseyans, including urban dwellers, to improve urban living, which, by its nature, saves energy.
5. We should implement a statewide property tax to replace the inequitable municipal property tax, which holds back efforts to revive cities.
6. We should encourage the development of innovative urban energy technologies such as cogeneration and district heating, which have tremendous potential for energy conservation.

Cogeneration is the simultaneous production of heat and electricity. It is not a new technology. In fact, in the early 20th century, a substantial portion of our electricity was cogenerated in this country. Early steam turbines were very inefficient and primitive electrical distribution technologies forced electric generating stations to locate close to their customers, which were thus a market for the waste heat. New technologies eliminated the gross waste of heat. Fuel costs declined as oil was discovered, removing some of the incentive for district heating. Because of the design and construction of larger and larger central generating stations, sites were selected in increasingly remote locations, such as a nuclear plant in Salem, New Jersey to serve customers in Jersey City, and a proposed coal-fired plant for the 4 corners of New Mexico, Arizona, Colorado, and Utah to serve customers in Los Angeles.

Europe continued to develop these systems in the post-war era, while America was abandoning hers, barely maintaining antiquated steam systems and permitting smaller and smaller percentages of the heat output to be cogenerated.

In 1977, in response to initiatives from the U.S. Department of Energy, the City of Trenton began studying the feasibility of constructing a cogeneration/district heating system in downtown Trenton, known as ICES or the Integrated Community Energy System.

ICES construction will begin in early summer and when completed will provide hot water to heat and cool various buildings in downtown Trenton, including State office buildings, the Mercer Medical Center, the Trenton State Prison, and several apartment complexes.

The plant will consist of two 8400 horsepower diesel engines which can operate on either natural gas or heavy oil.

ICES will produce 89 million kilowatt hours of electricity and as a bi-product, over 400,000 million BTU's of hot water at 320° F. The water will be distributed under the City streets in preinsulated pipes. When the system is in full operation, over 5 million gallons of oil will be saved every year.

This project is being constructed, owned and operated Cogeneration Development Corporation, a private developer and entrepreneur in the energy conservation/cogeneration field. The City has assisted in conceptualizing the project, leading the early feasibility studies, selecting a developer, and putting together an innovative financing package which includes a \$4 million Urban Development Action grant.

As I said, the technologies of cogeneration are not new. No technical innovation is required to construct them in New Jersey. What is required is a hospitable financial and institutional climate to encourage the development of markets for both

heat and cogenerated electricity. In the first instance, the financial climate will be affected by the success or failure of the first projects to come on line.

The second area is one where State government can be helpful, by effectively and rigorously implementing the mandate of the federal Public Utility Regulation Policy Act by the Board of Public Utilities.

Toward this end, I recommend three essential steps:

1. The establishment of fair and reasonable "avoided costs" as the basis of the sale of electricity to utility companies. These avoided costs must include a capacity component on the presumption that the aggregate of cogenerators will defer investment by the public utilities in additional plants.
2. The allocation of natural gas on a priority basis to cogenerators, since this is the most efficient use of the gas.
3. The determination of fair, reasonable, and predictable grid connection costs, so that cogenerators can accurately plan their capital costs.

I am pleased to report that the New Jersey Board of Public Utilities and Department of Energy have taken the lead in mediating negotiations in these critical areas on the Trenton ICES project and that these negotiations with PSE&G are proceeding. When the system is fully operating and the Trenton ICES project proves to be the technological, financial, and energy conservation success which we anticipate, we strongly recommend that the institutional arrangements necessary for the implementation of additional projects be established by the Board of Public Utilities, thereby creating the markets and climate to replicate this system in other areas of New Jersey.

Mr. Chairman and members of the Committee, thank you for this opportunity to present these views and I would welcome any questions that you might have.

ASSEMBLYMAN STOCKMAN: Thank you, Mayor. I don't have any questions at this time. We heard a presentation on ICES from Public Service and I believe there is a copy of their testimony which you may or your assistant may go over and take with you.

MAYOR HOLLAND: I want to note that Mr. Greenberg, who accompanies me, has been the leader in developing this project and in working with cogeneration and Public Service and others involved.

ASSEMBLYMAN STOCKMAN: I might suggest to you that I've stolen a little of his time and certainly a little of his thoughts from time to time to educate me on the concept and he's been very helpful and I appreciate that. Okay, thank you very much.

Robert Furgeson, New Jersey Association of Realtors?

ROBERT FURGESON: Good afternoon. My name is Robert F. Furgeson, Jr. and I am the Executive Vice-President of the New Jersey Association of Realtors.

I appear here today on behalf of the 17,000 member association to make, as part of the record, the Realtor's Guide to Residential Energy Efficiency. This is a study program that has been prepared by our national Association of Realtors in cooperation with the Department of Energy.

We here in the State of New Jersey have made a commitment to train over 1,000 of our members in 1981 in the use of this guide and to become, we hope, disciples of energy conservation. Across the nation, our commitment to the federal government is over 100,000 trained real estate licensees dealing with the public in the area of energy conservation.

The New Jersey Association of Realtors also has made, as part of its overall graduate Realtor Institute program, a requirement that the 90 hour course include a section on energy conservation in the residential real estate field. Basically, as realtors, we are attempting to educate our members so that they in turn can be effective in communicating to the buyers and sellers of real estate the fact that energy must be conserved, that there are things that can be accomplished in the residential field for relatively few dollars in investment and the returns will be great. So, at this point, I would like to make available to you, Assemblyman, this realtor's guide.

ASSEMBLYMAN STOCKMAN: Thank you very much. I wonder, Mr. Furgeson, if you could help me with a few questions. Feel free if I get beyond a point where you feel comfortable in commenting. I appreciate your appearing before us and submitting this material to us and I certainly will look it over. But, this morning, interestingly enough, there were some suggestions made about, perhaps, the feasibility of legislation whereby the state would insist that certain minimum standards be met in terms of energy efficiency in various dwellings and I suppose such legislation, if it were to be seriously thought about or pursued, could be limited to single family homes, could be more expansive or go in various directions, and the committee was advised that, I believe, the State of Minnesota has just recently passed such legislation. Does your group or the organization that you speak for or you personally have any position on that sort of legislation and, if so, could you share it with us?

MR. FURGESON: Speaking for the organization, we would probably be opposed to any time of transfer energy audit similar to what has been enacted in the State of Minnesota. What I would think would be a prudent course, at this point, is to monitor what the actual outcome of the legislation will be in Minnesota. We personally feel that a voluntary approach, at this time, in New Jersey is our best bet for the simple reason that we'll have an impact in the urban areas that I don't think will do us much good. From my conversations with realtors throughout the state and at seminars, the public today is becoming very energy conscious. That is one of the first items that they talk about. It used to be transportation, schools, churches. Now, in addition to mortgage carrying costs, the second point is what are the energy costs for the unit and part of our program is to develop the rapport between the broker and the client as to what can be done voluntarily to upgrade the property so that it becomes energy efficient and related to some savings on down the line. But, for now, we would support this voluntary program that that we've entered into with the Department of Energy.

ASSEMBLYMAN STOCKMAN: All right, thank you very much. I don't have any further questions at this point.

MR. FURGESON: Thank you.

ASSEMBLYMAN STOCKMAN: Carol Allen? Would you come forward, please?

C A R O L A L L E N: Okay, there are two of us, two Carols, Carol with one r and one l and this is Carroll, with two r's and two l's, Thomas. My position is energy analyst for community action programs, Executive Directors' Association of New Jersey. Our organization is responsible for addressing the concerns of 60,000 poor people in this state. 23 community action agencies in New Jersey have been engaged for at least 7 years in energy programs for low income people, including weatherization of residences, energy conservation information, fuel bill assistance, and survival information. These programs had been originally developed by the U.S. Community

Services Administration, which is the federal anti-poverty agency. It is well known that low income people pay a disproportionate share of their incomes for energy, but they also have some special problems in instituting energy conservation modifications.

Four general problem areas for poor people are, lack of information, lack of capital, renter status, and inadequacy of public transportation. My colleague, Carroll Thomas, who is Coordinator of Urban Energy Extension Service Projects, is going to discuss some attempts to solve the lack of information problem. The lack of capital problem could be partially offset by the U.S. Department of Energy's low income weatherization program and the proposed solar and conservation bank. These programs, at this point in time, desperately need federal, congressional support if they are to flourish.

Since energy prices are the fastest rising price category, it really seems counterproductive to cut energy conservation measures as part of an anti-inflationary measure.

The problem of the low income person's typical urban renter status takes the form of an understandable lack of incentive to implement energy conservation modifications on dwellings owned by someone else. The landlord who pays the fuel bill may not even have sufficient incentives to make major modifications to conserve energy. Some landlords are really slumlords who intend to let the building deteriorate while they collect rents and then ultimately abandon the building or write it off as a loss for tax purposes. If Mr. Furgeson is still here, I'm sure it is not likely to be the people who are in the Realtors Association. Probably, the typical slumlord is not up front. They are even hard to find when the building is deteriorating. All you can find is a post office box number. They don't join trade associations to do good things. So, we're really talking about a different kind of person and "slumlord" is really a different term that is different from landlord.

Incentives for landlords to do conservation must be found to the extent that rent control laws permit energy costs to be passed along to the tenant at a higher percentage than is otherwise allowed for rent increases. The landlord doesn't have incentives to curtail energy consumption. The rental income on which the landlord is taxed is also net of operating expenses such as heating oil and utilities. Nevertheless, there have been some ways of motivating landlords to make fuel conservation modifications. In New York City, one rent control board proposed to allow the landlord to collect the same energy surcharge if the amount of oil used was 220 gallons per room per season or 200 gallons per room per season; thus permitting the landlord to benefit directly from adding insulation, weatherproofing windows and doors, or fuel burner efficiency modifications.

The issue of adequate heat to meet public health standards is always a problem. Unhealthy low temperatures are not to be encouraged any more than overheating rental dwellings, which is a way of saying that while you want to get landlords to add insulation or to do weatherproofing or to modify the burners for greater efficiency, you don't just want to say to landlords, "Cut the use of oil by lowering the temperature," because you better believe that they will do it and then you will have the other age old problem of people freezing. One kind of modification that is very important is simply good thermostat devices so that it is able to be ascertained in all parts of the building what the temperature really is. So, it is not just thermostats, but just plain thermometers in individual apartments because, chances are, in a multi-family dwelling, the heat is not evenly distributed in all parts of the building and that is something that has to be known in order to address this problem rationally.

Other methods of impacting upon urban landlords could include help with financing such as subsidized loans, via banks and utility companies. I would like to ask, when are the oil companies with their billions going to get into investing in the conservation sector. Maybe a tax incentive could be offered to them to finance energy conservation modifications in multiple family urban residential buildings.

Incentives should include the setting of standards for what is a feasible conservation investment. Standard setting is a by-product of mandatory conservation requirements. For example, in Seattle, Washington, free scriptive standards are used, i.e., measures are specified which must be taken for each residential building. Another approach to setting standards used by Portland, Oregon and the State of Minnesota is to determine cost effective measures through an energy audit of each structure. Then, those modifications with payback periods of say five to ten years are selected as adoptable.

The solutions suggested above and other solutions could result from combined, cooperative action on the part of all the players in this game, including urban landlords, government, the financial sector, oil and utility companies, and the makers and venders of insulation, storm windows, improved thermostats and efficient fuel burners.

Perhaps, the most important energy need of urban poor is for efficient transportation. The Mercer Metro in Trenton is fairly good and so is the PATH system in Hudson County. But, many areas in this state, including middle sized cities, do not have transportation suitable for getting people to work. It is difficult to get to Camden from anywhere except Philadelphia, for example. To go to Warren County from anywhere else in New Jersey, it is necessary to go to the Port Authority in New York City. A program at the Middlesex County Economic Opportunities Corporation provides transportation to job interviews and for ten weeks or so of the new job. Such flexible transportation programs should be considered in many New Jersey cities. Public transit in cities is a basic, economic and energy saving need, especially for low income people.

Ways should be found to overcome the barriers of lack of information, lack of capital, landlords' lack of incentives and inadequate public transportation. The result could be a reduction in urban energy consumption, while also improving living standards. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you. Carroll Thomas?

C A R R O L L T H O M A S: Good afternoon. I'm Carroll Thomas and I am Energy Extension Coordinator. The Energy Extension Service is made possible by a grant from the Department of Energy. EES aims to encourage conservation on the part of everyday living in selected cities, selected communities, in the Cities of Paterson and Trenton.

The pilot project is administrated by the Community Action Program, Executive Directors Association of New Jersey. The Association provides a communication network among community action agencies on behalf of the constituency, the poverty populations throughout the state.

The purpose of this project is to identify conservation problems for citizens living on the North Side of Paterson and the South Side of Trenton and to assist them in solving them. This has been implemented in the following ways: by targeting urban schools, churches, and community action agencies for outreach and providing information for low income persons; and by providing an opportunity

for low income persons to understand the importance of conservation.

Because I've been exposed to the project's goals and objectives, I feel a special kinship to this targeted population. I am pleased to share with you the following information, which would dramatically reflect why energy conservation is a must for urban persons on fixed incomes and struggling for self-sufficiency.

The majority of the state's poor happen to live in urban areas and according to the Community Service Administration, CSA, an advocate on behalf of low income persons, fuel costs have risen 291% from 1972 to 1979. In a local study conducted by the Energy Extension Project in the cities of Paterson and Trenton, we have found that oil costs have risen 27%. That study was undertaken in December of this year. CSA estimates that the low income persons spend 23% of their total annual income on household energy needs. During the five coldest months a New Jersey poor person could spend up to 45% of their household monthly income on energy needs. These inflationary spending patterns suggest that a person on fixed income can spend, on the average--a person on a fixed income of \$200 to \$300 a month can spend an estimated \$2000 on energy related goods.

As a former manager of a local outreach center, I have found a direct correlation between the rising costs of energy prices and the number of clients seeking assistance for food. Therefore, poor people are struggling to meet their basic, daily needs. This is seriously compounded because a great deal of the energy is being wasted. The majority of our poor people live in old housing stock in our cities, which is in need of conservation measures such as caulking, weatherstripping, which can save between \$60 and \$85 a year, insulating of attics, which can save \$60 to \$95 a year. People must be educated in conservation measures. By adding insulation around the hot water heaters, by turning off the T.V.'s, by turning off lights, and by buying energy efficient appliances, this all adds to the energy conservation effort.

In recent months, there appears to be a trend from conservation to exploration. This is evident by the recent efforts on the part of our new administration. I don't mean to argue against exploration, but I do believe that waste in any form is wrong and it could have a dramatic effect on our poor. We must educate people to become self-sufficient, to employ good conservation habits in order to meet their energy needs. We must educate them as well support them in order to encourage conservation. For those people who are hardest hit with the rising costs of energy, conservation is a must from a national, moral, and social perspective. We need time to develop safe alternatives to our present dependency on foreign oil. We can no longer, as a nation, ignore the high energy waste. We have a social and moral responsibility to those people who are affected by the rising costs of energy. I encourage you to support energy conservation measures and would like to thank you, Assemblyman Stockman, for supporting our efforts and Kathy Kirby in your office. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Thomas, for your testimony and, Miss Allen, for yours as well. We appreciate you taking the time to come and join us.

I see that the distinguished Commissioner of the Department of Community Affairs has arrived and I know that he has a lot of interest in this subject and we're delighted that he personally was willing to come down and appear before us. I have to apologize to him. We've lost some of our membership during the course of the day and you are down to me, Commissioner, but I assure you that your remarks will be circulated among all the membership and Senator Bradley has personally promised me that he is going to review this transcript with his staff.

J O S E P H L E F A N T E: Thank you, Assemblyman. First of all, I would like to apologize for being a little late. And, I'm quite aware, from previous experience, what 2 o'clock in the afternoon means. I also appreciate the fact that Senator Bradley has, on a joint venture with you and your committee, displayed such a sincere and genuine interest. I know, in my previous discussions with the Senator, he will be watching this transcript very closely. He's indicated to me that he is anticipating some very fruitful expression as a result of these hearings and I'm sure that, under your leadership, you'll get it to him just as soon as possible.

I welcome this opportunity to come before you today to present a unique perspective on energy conservation in the cities and my Department, more than any other state department or agency, has a mandate to improve the quality of life in our urban areas. We witness firsthand the economic problems encountered by our municipal officials, the distressed neighborhoods where our financially disadvantaged are forced to live and the growing inability of many of our constituencies to meet the ever increasing inflationary demands on their meager incomes.

With our experience, we have no doubt that these problems faced by our elderly, the handicapped, and the low income are exacerbated by the spiraling cost of energy in our society today. The majority of these people reside in our urban areas. They are bearing the greater share of the energy burden because of the notoriously energy inefficient older housing stock of the cities and these people are the ones who can least afford the higher rents due to fuel costs passed through by the landlords or their own exorbitant heating bills.

My Department recognizes the complexity of the energy issue and has been working and will continue to work on the development of long range solutions to ensure energy conservation and efficiency in our cities and the rest of the state.

Well, in January, 1978, we adopted the Energy Subcode of the Uniform Construction Code. The provisions of the sub-code must be met prior to our approval of any new construction. These provisions include minimum insulation levels; limits of water use; and efficiency levels for heating, cooling, and lighting. Present indications are that this sub-code has resulted in average energy savings of 20%.

In our Neighborhood Preservation Program, weatherization is an eligible and desirable expenditure and has become widely accepted with the aid of our technical assistance unit. We also administer the Housing Demonstration Program, which includes energy conservation services as part of its rehabilitation package. These services, to date, have included weatherization, insulation, thermostat control, and boiler upgrading. Unfortunately, funds for this program are extremely limited.

One alarming trend which we have all seen of late is the choice of landlords to abandon or convert their properties, rather than to maintain and repair them. This choice is usually made in recognition of two factors: First, the up-front cost of the repairs; and second, the never-ending increases in operating costs, such as heating bills. One housing expert recently predicted that the "wolf is at the door" right now; that heating costs this year are going to be the straw that is going to break the backs of low and moderate income housing.

As you know, and I know, and everyone else knows, the state cannot, for the sake of our renting population, afford to have any more multiple dwellings taken out of circulation. As it is, we are losing about 25,000 units a year because landlords are abandoning their buildings. But, there are still some landlords who are attempting to meet their high energy costs by passing their heating costs through to the tenants in the form of higher rents. Other landlords are converting their

heating systems from one large unit to individual ones for each apartment in the building. This way, the tenants receive their heating bills directly and are able to control their own energy consumption.

As you know, A-2187 is moving through the Legislature to establish the "Tenants Lifeline Assistance Program."

This bill would extend utility cost assistance to an estimated 150,000 households which are occupied by senior or disabled citizens otherwise qualified for the current lifeline credit program except that they do not receive individual electric or gas utility bills.

The program would make available to eligible senior or disabled citizen tenants an annual payment of \$150.00 beginning in October of 1981. This is a much needed program for our elderly to meet their high fuel bills.

Many landlords facing the problem of rising operating costs for their multi-family dwellings in an inflationary economy are choosing to convert their apartment buildings to condos or cooperatives.

Since October 1, 1980/ more than 13,000 rental units have been permanently eliminated from the rental market through conversion to condominiums and/or cooperatives, and for those who purchase the converted units, there is no assurance that the unit is energy efficient. In most cases, the landlord has merely transferred the burden of paying the fuel bill to the new homeowner.

One of the problems in conversions is the future cost of energy consumption now taken on by the condo owners, which creates a problem. In many cases, within a short period of time after conversion, tenants face substantial assessments to restore a deteriorating energy inefficient building. This problem can be dealt with by amending the Planned Real Estate Development Full Disclosure Act of 1978 to require the correction of all defects noted in the engineering report and the abatement of all local and state building code and energy subcode violations. As an alternative, consideration would be given to require the establishment of a reserve account by the conversion developer which would be funded in an amount sufficient to meet these costs.

Energy conservation is without a doubt the most cost effective means of ensuring decreased heating bills for landlords and tenants. However, the greatest barrier to the landlord is the unavailability of the upfront financing costs for the needed improvements. In answer to this problem, we have developed recommendations providing for below market rate financing to preserve the stock of small multi-family structures. Our conclusion is that neither the availability nor the cost of market financing is sufficient to meet the need, particularly when viewed with the objective of minimizing rent increases and displacement brought on by abandonment or conversion. Below market rate loans for refinancing with improvements included in the cost are considered necessary to retain levels affordable by the moderate income households which comprise the majority of the tenant population in small urban apartment houses. The inclusion of energy conservation measures would be prerequisite to rehabilitation financing. Besides the obvious advantages of conserving energy to the general welfare, conservation measures benefit the owner with a near-immediate payback in the form of reduced energy costs. These savings would reduce the operating costs of structures which would enable the owner to maintain rent levels, improve the marketability of the structures, and protect the viability of state loans for rehabilitation.

Our proposal had requested authorization for \$70 million in general obligation bonding authority to be used for direct loan program to finance building code related repairs, to finance capital improvements, and energy conservation improvements for small multi-family buildings, rooming houses, and boarding houses.

The objective of the proposed program was to improve the marketability, energy consumption, and investment climate for small apartment buildings and boarding houses. The program was designed to accomplish this by developing a subsidy mechanism to finance improvements. The subsidy was geared to balancing the operating costs of the building (including debt services and taxes) with available market rent levels and allowing a reasonable rate of return on cash equity.

While we assumed that all the improvement loans would entail energy conservation measures, many property owners could address only energy conservation needs and since reducing the utility costs of the structure would improve the cash flow, the availability of these loans meets the objective of improving the marketability of the structure. Energy conservation improvements would also have the effect of limiting increases in rent.

The energy conservation loans were expected to average \$1,000 per dwelling unit and would be issued at no interest, but with a relatively short payback period. That's very important. That's the consideration that's being given, that they be issued with no interest, with a relatively short payback period. For the projections, the average term of energy conservation loans was calculated to be three years. However, the actual term will be calculated to reflect the time in which the improvements pay for themselves in energy cost savings. Given the relatively short payback period, the program would be to project significant investment income on loan repayments. We, just as a guesstimate, think that it should be somewhere between three to five years, overall; three year minimum and five year maximum.

However, the progress of this proposal has been temporarily halted due to the enactment of the Federal Mortgage Revenue Bond Act. The New Jersey bond underwriters are concerned with the tax exempt status of all future housing bond issues due to the restrictive nature of the legislation. We are awaiting the regulations from the federal Department of the Treasury to clarify the intent before proceeding with our proposals.

The Mortgage Finance Agency recently instituted a pilot project, providing low interest loans for financing the purchase and installation of solar hot water systems.

The program allowed a loan of up to \$3,000 for the purchase and installation of the solar system. An additional sum of up to \$1,500 could be borrowed for other energy saving improvements for a total loan limit of \$4,500. No maximum income limits were imposed for this statewide pilot program, but borrowers had to meet standard credit criteria. Loans were available through 75 participating lending institutions throughout the state on a first come, first served basis.

Incidentally, we do have, which was just completed Friday, a report of that pilot program project, which I think would be very interesting to you and your Committee, Assemblyman. Some of the figures are startling in here, but it is a very strong indication of what direction we should be going in and up until the time this program was established and put into effect, it was all guess and supposition. Here it is detailed in great detail and it is finalized and I would like to leave a copy of the report for you and staff to review.

But, just a couple of those highlights. The public response was very strong. It didn't get a very high degree of publicity, the program itself. It was done through a press release and the response was extremely strong. 96% of the funds were committed to individual borrowers within 11 weeks. 52% of the borrowers took advantage of a provision permitting the homeowners to borrow up to an additional

\$1,500 for other energy conservation improvements, spending an average of \$1,445 on these improvements and the average cost of the solar system was \$3,362.

Again, this demonstrates that if up-front costs were available at low interest rates, the incentive would be present for landlords to upgrade their buildings, making them more energy efficient.

The Department administers, in addition to what we're involved with now, the federally funded low-income weatherization program. We have maintained this responsibility since the program's inception in 1977.

The program provides funding for weatherization of homes of low income, elderly, and handicapped persons. Weatherization funds are allocated to community action agencies, community based organizations, and units of local government to provide services which decrease energy costs by reducing energy consumption and promoting a more healthful environment. Typical weatherization activities include weather-stripping, caulking, insulating homes, storm windows, storm doors and things of that nature, in general.

In 1980, \$7.2 million was expended to weatherize 5,721 single and multi-family homes in New Jersey through this program. The great majority of these homes are located in urban areas. Except for the bumpy beginning that this program had, we probably could have serviced a few more homes and until we got the wrinkles ironed out of it and got it running as efficiently as it is running now, we were satisfied that we did service 5,720 units.

It has been documented that the weatherization can produce an annual utility savings ranging from a most conservative estimate of 14% to as high as 67%. This program has proven to be a cost effective, long-range energy conservation measure.

But, President Reagan's budget proposal seeks to eliminate the weatherization program by folding it into the Community Development Block Grant program, administered by units of local government within the state. No additional funds will be added to the Community Development Block Grant program for this purpose. So, for all intents and purposes, if you're going to plan and if Senator Bradley is going to generate the very sincere interest he has up until now and match it with effort and energy, he has his work cut out for him to try and get those funds built back into the budget process at the federal level.

Since communities currently do not receive sufficient funding to carry out their established objectives, they will most likely not include weatherization activities in their list of priority projects. Consequently, the low income population in New Jersey will be unable to continue to have their homes weatherized, with the end result being an increase in the need for available fuel to continue heating homes in the future.

As a result of our direct involvement in weatherization activities, we are also developing a proposal for a casino funded, weatherization utility relief program for New Jersey's senior and disabled citizens. Hopefully, this program can extend the long-term energy conservation benefits of weatherization to the elderly and the disabled out of casino revenues. That is another area that the Administration is doing some research on and, hopefully, the results from that research will be positive, as our Department's was.

You know, as we reminisce a little bit and begin to think about what this is all about and we apply what we've experienced to what lies ahead of us, one must remember that one of the most important components in energy conservation is planning for the future. The New Jersey Legislature recently recognized this by

amending the Municipal Land Use Law requiring that master plans contain "an energy conservation plan element which systematically analyzes the impact of each other component and element of the master plan on the present and future use of energy in the municipality, details specific measures contained in the other plan elements designed to reduce energy consumption and proposes other measures that the municipality may take to reduce energy consumption and to provide for the maximum utilization of renewable energy sources."

Our Division of Planning is working closely with local planning boards providing technical assistance in the drafting of such plans to comply with the law.

The Legislature has also given cap relief to municipalities for their rising utility costs. We have also funded energy saving projects through the "clean" portion of the Safe and Clean Program. One such project provided funds to repair damaged street lights and replace all existing lamps with brighter, but more energy efficient ones. This not only preserved energy, but prevented crime. And, don't forget those 800 walking patrolmen funded through the Safe and Clean Program. And, if one thinks about energy conservation, think about the energy being conserved by the patrolmen walking rather than riding in cars. If you combine the two, energy conservation and crime prevention, I think you've got a home run going for yourselves, particularly in those urban centers.

In conclusion, what we are recommending to the Sub-Committee are four cost effective programs to help promote efforts toward energy conservation in the cities:

1. The establishment of a low interest loan program for owners of multiple dwellings to be used for rehabilitation and energy conservation in their buildings;

2. A casino funded, weatherization/utility relief program for senior citizens and the disabled. This would utilize casino funds to weatherize residences and would have a very strong impact on urban housing stock;

3. Amendments to the Planned Real Estate Development Full Disclosure Act of 1978 to require, prior to conversion, the correction of all local and state building code and energy sub-code violations to ensure an energy efficient and safe converted apartment unit;

4. The enactment of A-2187 into law to ensure temporary financial relief to our elderly tenants.

President Reagan's recommended budget cuts will sharply curtail the amount of funding available to municipalities through many grant programs and to our citizens. An example of one of the many cuts is the energy conservation bank.

The 96th Congress had approved and former President Carter had signed into law on July 4, 1980, the Energy Conservation Bank as part of the Energy Security Act. The Bank would have provided subsidies of 20% of the cost of energy conservation improvements up \$400 per unit for multi-family buildings over four units. President Reagan rescinded the appropriation to fund the bank for fiscal '81 and did not propose any funding for it at all in '82. Therefore, we believe less available funds will mean less emphasis on energy conservation, unless cities are given special incentives to make energy conservation a priority and it will most likely take a back seat to other eligible activities. There would have been great things done with those funds if they were left in there. They could be an incentive. They could be put out there as an incentive and could, perhaps, be used as a match. They could be used as seed money to start things off, to generate some private sector dollars. There are many

things that could have been done with it. But, unfortunately, they are just not in there and I think the die is cast in the U.S. Senate with regard to how these votes are going to go on the budget, but there is still a little spark of hope left at the House level.

Gentlemen, we're available to assist you in any way, not only to implement these recommendations, but to explore others with you and, if need be, even to try some of them out on a pilot project, if you so desire. So, feel free to call on us. We make ourselves available to you and we're at your service.

ASSEMBLYMAN STOCKMAN: Commissioner, I have a couple of questions that, perhaps, you could help me with, although, feel free, if you feel that you would rather not. One interesting suggestion that was made--and I don't think it is new by any means--but, someone, I think, from the League of Women Voters suggested that we ought to have legislation that would require some sort of an energy audit on any residential home that is being sold in compliance with some minimum standards of energy efficiency as a condition precedent to transfer of title. Has your Department given any thought to that kind of idea or are you in a position to make any comment on that?

COMMISSIONER LE FANTE: Well, that's a very strong recommendation of my Department at the condominium or cooperative level. Yes, it could be extended and I could support something like that, yes. Perhaps you will hear pros and cons on that two ways.

ASSEMBLYMAN STOCKMAN: I'm sure we will.

COMMISSIONER LE FANTE: For example, who would be responsible for making it energy efficient? The answer would be, the seller. Then, the buyer would say, "Who's kidding who? In the end, I'm going to pay for it because the seller is going to put it on the price of the sale." But, in the long range, regardless of who pays for it, someone is going to save. If it is going to reduce the fuel bill, whoever is occupying the dwelling unit is going to save and if it doesn't reduce the fuel bill, then ultimately, the new owner is going to be paying more money for heating the apartment and wasting energy. Yes, we could support something like that.

ASSEMBLYMAN STOCKMAN: Another interesting question that's on my mind; as you may know, we recently passed a law relaxing the cap laws to a very limited extent in, among other things, the consideration of energy costs. There were some complaints registered to this committee this morning about the wisdom of that in terms of energy conservation policy and I wondered whether it would be feasible--and frankly, I voted for that piece of legislation, although I had some misgivings about it--whether it would be feasible to modify or amend that law to require that in order to qualify for that waiver that the unit of government in question would have to establish or show some evidence of compliance with the conservation efforts. Now, just how that could be done, I'm not sure, but I think you would agree with me that the idea of just saying to anyone, including a unit of government, that we're not going to restrict them in their energy costs because they're going up, when you and I know that they do have some control over that. I wonder what you would think about something like that.

COMMISSIONER LE FANTE: Assemblyman, I think one of the wisest considerations that you, as a legislator, can give to that type of suggestion is, if you're going to make conservation one of the qualifications for consideration for cap relief, it is a very wise move and I could support an amendment like that myself, if I were still here in the Legislature. Unfortunately, I am not, but I advise you

wholeheartedly, as a legislator, to take that one on as a personal responsibility at this point. It just seems to make very good sense that if you want relief outside the caps, there should be some indication of conservation. Now, they may be at full efficiency, but you don't know unless you look into it.

ASSEMBLYMAN STOCKMAN: With the help of staff, maybe I'll do just that.

COMMISSIONER LE FANTE: I think you ought to consider it very seriously.

ASSEMBLYMAN STOCKMAN: I have no further questions, but I do want to thank you for your thoughtful presentation. I think your presence here has been very helpful to the committee.

COMMISSIONER LE FANTE: Thank you. I appreciate it.

ASSEMBLYMAN STOCKMAN: Steve Miller, representing Mayor Thomas F.X. Smith of Jersey City.

S T E V E N M I L L E R: I'm a little nervous at these hearings. The Mayor was supposed to be coming.

ASSEMBLYMAN STOCKMAN: Well, if there's any committee you shouldn't be nervous in front of, it's my one man operation. It's a very relaxed setting and you can be assured that we won't have anything critical to say about you or about your mayor.

MR. MILLER: Well, let me begin by introducing Carey Quinn, who is our Grants Coordinator for the City, as well as Deputy Director of the Human Resources Department, and make some comments about the Mayor's interest in energy conservation. I don't know, Assemblyman Stockman, if you're familiar with it or not, but a few years back, when he took office, we learned there was an energy crisis and immediately the Mayor started one of the first citywide energy offices in the State of New Jersey, naming me to be the coordinator of it and setting up some functions for it. He also began to establish a voluntary Mayor's Energy Advisory Committee composed of citizens and community leaders, as well as business people and city officials. That committee meets quite often to consider energy policy and advise the Mayor.

Despite a conspicuous lack of funding from the federal government sources, which you've probably been hearing about all day long, the Jersey City Energy Office has been able to effect a number of energy conservation projects which have proven both economically and humanistically beneficial to the community. Some these are as follows:

1. The development of an Energy Consumption Audit and Monitoring Plan, one of the primary objectives of this office has been somewhat successful. Through careful planning, the office, working in connection with the Mayor's Advisory Sub-committee on Conservation in Public Buildings and the Facilities Maintenance Division of the Department of Public Works has been able to monitor and control energy consumption within the Department of Public Works and the Jersey City Free Public Library system. Due to energy conservation techniques implemented at Public Works, savings are indicated at four primary areas: Electric, natural gas, fuel oil and gasoline/diesel fuel for the city's vehicle fleet. Savings in these areas in 1979 as compared to 1978 are as follows: in the electrical consumption, the Department consumed 135,000 kilowatt hours less electrical energy in 1979 than in 1978. This represents an overall savings of 6.5%, an amount of energy which would be sufficient to supply the electrical needs of 28 average homes in the City for one year.

In natural gas, the Department consumed 1565 therms less in 1979 than in 1978, which would be enough natural gas to supply cooking energy needs for

five average homes for one year. This represents an overall saving of 17.6%.

In fuel oil, the Department consumed 11,486 gallons of fuel oil less in 1979 than in 1978 for an overall savings of 18%; enough fuel oil to supply the heating needs of 14 average homes for one heating season.

In gasoline and diesel fuel, it consumed 44,215 gallons less in 1979 than in 1978, which represents a 15% reduction in vehicle fuel consumption, or an average savings of 850 gallons per week.

Similar dramatic savings are again seen reflected in the monitoring of the Jersey City Free Public Library system. Through the cooperation of the Library Director and his staff, the Public Libraries overall were able to use 22% less oil and gas in 1979 than in 1978.

It is clear that the monitoring plan does work. It is hoped that this plan can now be expanded to include most of the other 100+ city owned buildings. Although consumption figures for 1980 have not yet been fully considered, preliminary analysis indicates savings on the same level that we have been going on. For some reason, the libraries seem to be the easiest to monitor than all the different public buildings.

Another program that we tried to start about two years ago was called the Energy Watcher Program, which, in June of 1979, the Energy Office initiated. The objective of the program was to involve City employees in energy conservation. One employee in each city owned building was designated as an "energy watcher" for that particular building. The function of the energy watcher was to report energy consumption and energy abuses monthly on a very simplified audit form to the Energy Office, as well as carry out daily checks on heating, lighting, use of equipment, and windows. The Energy Watcher Program, originally designed to cover all City departments, is more clearly focused on the two areas I just mentioned, Public Works and the Free Public Library, but we hope to get the other departments more involved, especially the Board of Education.

In an effort to expand and increase the scope of the City's Energy Conservation Program, the Jersey City Energy Office has continually sought to procure additional program material and financial assistance. In addition to assembling a library of ideas and materials from various cities involved in energy conservation, the Office has submitted a number of grant applications. To go through a few of them very briefly, we had submitted a request for funds to expand the activities of the Energy Office to the state and federal departments of energy, just as an unsolicited proposal. Both applications were rejected because there was a lack of funding available at the time.

Another grant application made about a year and a half ago was for the Small Appropriate Technology Program to demonstrate the use of infra-red technology to photograph heat loss from structures in the City. This grant also was rejected because they said there was a large volume of applications submitted at the time and very limited funding.

The third program, the Energy Extension Service Grant, which we submitted through the state Department of Energy to the federal Department of Energy, was funded and we now have one full-time staff person and three student interns working in my office to develop community workshops and meetings for block associations and classes of students and senior citizens to demonstrate weatherization techniques and things that they could do on their own to conserve energy. This grant was funded through the D.O.E. and is now up for reconsideration for refunding for the second year.

As you probably know, that program is in not too good of shape at the federal level. So, it is rather difficult to work with programs that start one year and then are on shaky ground to be refunded.

Finally, we've applied through the local Community Development Block Grant Program for an energy rehab program. This most recent grant application which is being approved for the CDBG program is a request for \$200,000 to provide \$500 individual energy efficiency grants which would be piggybacked onto the existing Home Improvement Program to provide additional funding to individual homeowners to do specific energy conservation, weatherization techniques in addition to whatever home improvements they had already planned. One aspect of this grant would be to have the planning division assign a staff member to compile statistics comparing before and after energy costs correlated with the various improvement methods that are used in the buildings to see if the energy conservation is really producing anything. Up until now, there has been very little monitoring of CDBG programs to determine whether or not they really have any effect, other than for cosmetic purposes.

Another area that the Energy Office got involved with is dealing with students in trying to utilize their efforts in energy conservation. Last year, through the efforts of Dr. Charles Lawrence of the New Jersey Energy Research Institute, who has been assisting us a great deal on a voluntary basis developing our energy program in Jersey City, we had several students involved in the Student Exposition for Energy Resources program which was run statewide and held a competition in Morristown last year. This was the first time that Jersey City school students were involved in an energy competition of any sort at the statewide level. One of our students came in fourth place and went on to the national competition. Two of the other students received corporate awards through the American Telephone and Telegraph Company.

Another area that the Energy Office got involved in was street lighting. Up until Mayor Smith came into office, street lighting had been handled as part of the Division of Engineering with a full time engineer coordinating the request for street lighting. That was taken away and streamlined under the Energy Office, saving the cost of an engineer and allowing him to do other work and setting up a form system of making street lighting requests for additional lighting and lighting changes. The budget for street lighting, which we manage more or less, was \$1.6 million in 1980's annual budget for the city. In 1981, the figure is now up to over \$2 million because of increases granted by the PUC to Public Service. There's not a whole lot of choice in the matter. You simply can't make the City go dark. So, we have to find some way of coming up with the extra money in the City budget for street lighting.

The Jersey City Energy Office has also presented energy conservation films to the community. These films are supplied through the State Department of Energy and were shown at the Five Corners Branch of the Public Library. The films were followed by question and answer periods during which staff members of the Energy Office answered viewer questions on conservation. Conservation literature was also distributed at these showings.

The Jersey City Energy Office consistently maintains a library of energy conservation literature, distributes that literature freely to the public upon request and also to other cities.

We also have held a couple of exhibits dealing with energy. Once a year we have a City Spirit Day in Jersey City where the Energy Office has participated the last two or three years and we also held an exhibit at the Hudson Shopping Mall. The exhibits supplied through the State Department of Energy and the federal D.O.E.

were very helpful.

Other comments that I wanted to add were primarily for the benefit of Senator Bradley, who I assume will get the transcript and you will be talking to him somewhat. Basically, as you can tell from what I've been saying, we're most interested in funding and the need for more grants and more assistance financially for the energy programs. There's not too much you can do without money coming from somewhere and the City budget is extremely tight to provide this kind of funding.

Some more points that I want to mention briefly: Decontrol at the federal level which was accelerated by President Reagan has only produced bigger profits for the oil companies. These same companies are using revenues to purchase other companies producing other resources and not using revenues to drill more wells or find other sources of energy. One of the examples that Commissioner Jacobson uses quite often is the company that bought the circus or a Montgomery Ward Department Store with the money they were supposed to be investing in finding new sources of energy and helping us conserve. So, the consumer has certainly been dealt an inflationary blow by these companies gaining larger profits.

New Jersey is the most densely populated state in the Union. The urban areas, in particular, are energy efficient. Regretably, within our poor neighborhoods, home owners experience difficulties obtaining loans which would improve the energy efficiency of their dwelling. We need this type of assistance for our people because low interest loans for homeowners would help to make energy conserving improvements. I certainly would endorse everything that Commissioner LeFante said just previous to me and I hope that he would give some of the money to Jersey City when he gets it.

The State Department of Energy should be providing more technical assistance for homeowners, industrialists, farmers, etc., and to the local governments to demonstrate and advise regarding measures that will improve energy efficiency. The state should continue to provide consultation by the telephone hotline that they're using.

The State should increase its effort to provide an auditing service, perhaps charging a nominal fee to the homeowner who would be made aware of specific steps which would reduce energy consumption and should be provided with data as to the approximate cost savings and payback periods. One thing that Commissioner LeFante mentioned, the Housing Demonstration Grant, which is somewhat related to energy, that started in Jersey City last year through a grant that Cary put together to provide for the first housing port in the State and that's been working quite well in dealing with multi-family building owners.

The Energy Extension Service, which I mentioned before, should definitely be continued and money should be found somewhere along the way to expand this program as well.

The function of the Department of Energy to provide assistance to local areas on a wide variety of energy matters, especially education, and to senior citizens, should also be extended.

One area that the Reagan Administration proposes that funding be cut back in is the energy conservation field, which I feel and the Mayor feels would be very bad for New Jersey and for Jersey City in particular. Whether you have a state department of energy or federal department of energy or abolish both of them doesn't really make too much difference to the City. We can deal directly with the State and with the federal government on a one-to-one basis, without going through any other

levels. What we need is money available at that level to go and deal for. One bill that was in the Senate and House last year--and I'm not too sure whether it is being revised again now--is the Songus-Williams Community Education Act legislation which we pushed very strongly for last year. It provides for an energy block grant program to the cities directly from the federal government. At that time it was through D.O.E. Now, it may be coming through HUD and this would provide for entitlement grants to cities similar to CDBG for housing, but these grants would be for energy conservation and alternate technology uses by the cities and that kind of legislation would help a city like Jersey City a great deal.

One thing I noticed very recently, we got the newsletter from the federal Department of Energy last week and it had an outline of the Department's projected budget. It shows the breakdown in the last three fiscal years, of where the money is going and, to my surprise, I found \$5 billion for 1982 for defense spending in the Department of Energy budget, which I thought should have, at least, been in the Department of Defense budget. That particular category went from \$3 billion two years ago to \$4.5 billion and now \$5 billion in their projected request, whereas the category for energy conservation grants and funding that would be available to cities like Jersey City started out at \$800 million three years back, went down to about \$500 million and is now down to about \$120 million in their projections. So, it seems that their priorities are a little out of whack in terms of helping cities confront the energy crisis.

I guess that's about all the comments that I can make other than to hope that you would pass on the word that we need the money and we need some direct funding either from the State or the federal government and that we're very willing to assist in any way that we can to develop programs to spend that money. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Miller, for your testimony. We will pass that on.

Cameron Boehme, Essex County Energy Office?

C A M E R O N B O E H M E: Good afternoon, Assemblyman. I am Cameron Boehme, the Energy Coordinator for the County of Essex. We thank you for the opportunity to come today and speak before your committee and we thank you for taking the effort to put energy in its best perspective.

The impact of rising energy costs on urban areas is of grave concern to Essex County. From the county seat in Newark, we can see the progressive abandoning of buildings, the boarding up of businesses, the continuing unemployment. All of these symptoms of decay of an economy are severely aggravated by the rising costs of energy. Responsible landlords have told me that they would have to abandon buildings though they have reliable tenants. Families who have struggled for decades, even generations, to own a home are now faced with fuel costs approaching mortgage costs. Senior citizens are being forced to eat or heat.

The full extent of the distress that this frigid winter brought has not been documented. Some aid has gone to the very poor but those people barely edging by and many senior citizens living on social security are ineligible. You can imagine what a doubling of heating costs does to these people. Much of the story is hidden in old buildings with inefficient heating systems where the boiler may even be functioning but is burning fuel so poorly that little heat reaches the radiators, or the heat is unevenly distributed so some windows must be opened while people in other rooms shiver, or the windows and doors are in such poor repair that the cold air flowing in undoes any efforts to warm the rooms. Business with huge energy costs have placed

refrigerators next to stoves, industries which could have installed controls to manage costs have instead moved away.

The fact is most energy costs can be brought down to reasonable levels if the buildings and equipment are properly managed. Most solid buildings can be kept warm reasonably well, most businesses could lower their costs, most industry could install controls to use energy efficiently. It is not a question of technical limitations. The need is for managerial skills and determination. Much can be accomplished without capital investment. In all this lies a tremendous opportunity for those of us living in urban areas.

In New England and the northern states where long cold winters are the norm, people have found ways to keep warm by using fuel efficiently. This has been possible even in older housing. In fact, solidly built older housing is particularly suitable. This can be done in New Jersey just as well.

The goal is to keep people warm in their homes and workplaces and to keep machinery working. With proper planning, this goal can be met in present plants and buildings using perhaps half of the fuel we now use. In properly designed new housing, only 10% of the fuel need be used to keep a building at 70° all winter rather than at a drafty 65°. Thousands of homes were built in the last year, when the direction of energy costs was absolutely unmistakable, which if turned around by 90° would reduce energy costs to their residents by 25%. In a well oriented building, large windows would take in warmth from the low winter sun while attached east and west walls would be protected from the heat of the summer sun. Proper orientation of housing in planning stage costs nothing but would make that housing maintainable in spite of rising energy costs. The opportunities are there for keeping energy costs under control. What is required is understanding and an innovative spirit.

In the Essex County Energy Office, we have made an appraisal of energy use in the county and found the following: Essex County uses nearly 200 trillion B.T.U.'s of energy annually for:

Residential, heating, cooling, appliances, and lighting--39 trillion B.T.U.

Commercial, 13.7% of state employment--48 trillion B.T.U.

Industrial, 10.2% of state employment--34 trillion B.T.U.

Transportation, 14% of state vehicles--76 trillion B.T.U.

Transportation takes over one third of the energy and this is in a county with extensive mass transportation.

We have calculated that the 200 trillion B.T.U. cost Essex County about \$1.5 billion a year (at \$7.50 per million B.T.U.). The price is already higher and still climbing. That means \$1.5 billion which is earned by county residents and businesses is spent for energy when it could be spent for other things. More importantly, most that \$1.5 billion is paid for fuel oil imported from overseas or for gas from the southeast. In either case, all the money which goes to pay for the fuel and for services outside the county is drained from the local economy. The multiplier effect of the money as it is passed through the economy is lost as well.

A conservative calculation indicates that about one billion dollars is drained from the Essex County economy every year for energy costs. With the loss of the threefold multiplier effect, the loss is equivalent to \$4 billion. Every properly functioning furnace and every caulked window not only brings warmth and comfort to county residents, but returns money to the county's economy.

Every sunporch, every device which really increases efficiency of fuel use can add hundreds of dollars to local development. There is a slogan about

the OPEC countries having us over a barrel. The Atomic Industrial Forum uses this as an argument for investment in nuclear energy. There is a much cheaper, quicker and human scale solution which is right at our fingertips. That is efficient use of energy.

Over the long term, there is no necessity for Essex County or any part of New Jersey to be dependent on any sort of imported energy. There is no need for massive investment in inefficient or insecure sources. We have now in Essex County reaching us in the depths of January when the sun is low and often covered by clouds and snow, three times as many B.T.U.'s in solar energy reaching us as are used in the County.

We could provide suggestions from our work about institutional changes which would encourage energy efficiency and we will gladly do so at another time.

Finally, the most important source of energy available in the county and in the state is our own ingenuity and our willingness to face up to the challenge of becoming energy independent. Thank you.

ASSEMBLYMAN STOCKMAN: Thank you very much for your testimony.

Michael Weiser?

M I C H A E L W E I S E R: Good afternoon, Assemblyman. My name is Michael Weiser and I am the Vice-President of Cogeneration Development Company and we are the sponsors of the Trenton ICES project.

In considering the options for conserving energy in the United States cities, the Department of Housing and Urban Development has stated that if district heating systems were in wide use today, the value of oil imports could be reduced by as much as \$30 billion annually.

In addition to reducing the U.S. dependence on foreign oil, H.U.D. favors district heating for the following four reasons:

1. The first is to reduce heating costs. Through the use of currently discarded heat and increased equipment efficiency, district heating systems can offer thermal energy at lower prices than can conventional heating systems. This translates into reduced housing costs for low and moderate income people.
2. Improved urban economic development opportunities--District heating systems can provide high temperature hot water or steam for industrial or commercial applications at prices lower than conventional heating systems. This offers communities an opportunity to enhance economic development and commercial revitalization projects.
3. Improved air quality--District heating systems offer potential for improvements for air quality by replacing the large number of uncontrolled sources of emissions with single or small numbers of heat sources whose emissions can be controlled by using a combination of more efficient equipment, better maintained equipment, and increased application of pollution control equipment. In Scandinavia, where co-generation and district heating are the norms rather than the exception, substantial reductions in SO₂ concentrations have been recorded.
4. Reduced requirements for sanitary landfills--By recovering and using the heat produced in a mass burn or RDF fired boiler in a district heating network, the volume of solid waste requiring disposal can be greatly reduced. Scarcity of land available for landfill operations has been the primary impetus behind the integration of community solid waste incineration to district heating systems in Europe.

There is rather widespread agreement as to the national and local advantages of cogeneration and district heating. An interesting question is why aren't

systems being built in the United States today. The technology certainly exists. Over one third of the people in Sweden live or work in buildings connected to district heating systems.

The United States Conference of Mayors sponsored a four day Critical Issues Panel on district heating earlier this month. The purpose was to bring together experts from all over the country to determine what are the barriers that are inhibiting the construction of district heating systems and to develop a plan so that the mayors can work to overcome these barriers.

One of the basic conclusions was that due to the institutional inertia and the high fixed costs associated with starting a district heating system in an urban area, it is essential that these systems include cogeneration in their early stages.

The Trenton ICES is the cogeneration/district heating project that is farthest along in its development and closest to being built.

The Trenton project consists of the construction and operation of a grid connected, thermally controlled, Integrated Community Energy System (ICES) on an urban renewal site in downtown Trenton. This cogeneration/district heating system will utilize dual fueled, medium speed diesel generator sets generating electricity and waste heat recovery boilers producing high temperature hot water.

The construction of the project incorporates the final phases of a continuing program sponsored by the U.S. Department of Energy, originally begun in 1977.

ICES offers an alternative method of supplying both electric power and thermal energy which is not only lower in cost, but which saves energy. Implementation of ICES in Trenton will produce fuel savings of about 40%; a substantial portion of these savings will be imported foreign oil, since all of the oil currently burned in the heat customers' boilers will be replaced with thermal energy produced in the cogeneration process.

The high temperature hot water will be sold to various customers, initially including the State of New Jersey, to heat several existing downtown office buildings, including the State House, Trenton State Prison, Mercer Medical Center, and several low and moderate income housing complexes and a privately owned office building.

Calculations to evaluate the economic attractiveness of thermal energy supplied by the Trenton ICES were independently performed by the two major thermal users, the State of New Jersey and Mercer Medical Center.

In the case of the State of New Jersey, the evaluation was performed by the Division of Purchase and Property. The evaluation for Mercer Medical Center was conducted by an outside consultant, Fuel Energy Consultants.

Additional thermal customers for whom ICES is attractive will be added to the system during development and operation.

Malmo, a community of 250,000 people in Southern Sweden, began district heating with three miles of main pipe in 1953. That's approximately the same size as the initial Trenton system. Today, Malmo has approximately 250 miles of main pipe with a corresponding increase of subscribers.

The city is clean, since nearly all of its thermal needs are met by in 4 cogeneration/district heating stations that have large, efficient, low pollution boilers using oil and solid wastes as fuels.

Once the Trenton hot water distribution network is in place, it is expected that the pattern regarding solid waste disposal that has emerged in Europe

will apply in Trenton also. Specifically, we will continue to coordinate the ICES thermal network with the Mercer County personnel planning the solid waste disposal strategies. The ICES network will be positioned to make use of the low temperature thermal energy produced in the future solid waste disposal facility. This will enable the area's refuse to be burned in clean, relatively conventional boilers. This is, by far, the most promising approach to solid waste disposal.

The electrical energy will be fed into the existing utility grid under terms of a contract to be negotiated with PSE&G. A meeting was held between our company and representatives of PSE&G at the office of the Board of Public Utilities on March 13th. A framework for the sale of the electricity was worked out and PSE&G was to prepare a letter of intent which would be converted into a contract. Our counsel contacted the person who represented PSE&G last week asking whether that letter of intent was forthcoming and we were told it was in the mail. It had not arrived this morning, but we anticipate that it will be coming. But, I want to emphasize at this point that the implementation of the project is such that we really must move along on a schedule that doesn't allow for two weeks for a letter to be sent from Newark to New York.

The ICES plant itself will consist of 12 megawatts capacity of medium-speed diesel engine, plus supplementary and conventionally fired boilers. The diesel engine will have dual fuel capacity, that is they can burn both oil and natural gas. This dual fuel feature will allow ICES to use an interruptable fuel supply and curtail natural gas during the coldest weather. This feature will also allow ICES to use synthetic fuels that become available in the future.

The amount of gas available to the project is very important both to the users, because of the impact on the cost of their thermal energy, and to the developers since it impacts on the equipment selection process. At our March 13th meeting, PSE&G orally committed to the full requirements of gas to the project.

In the system, the diesel engines are cooled with jacket water, just as an automobile engine is cooled; however, instead of dissipating the heat to the atmosphere, the heat is extracted from the cooling water and used. In addition the hot exhaust gases, which conventionally are exhausted to the atmosphere, are utilized in heat recovery units which in turn produce high temperature hot water.

This is the technology which will be incorporated into the ICES and will combine to produce both 26,000 volt electric power and 350° superheated water. The high temperature hot water will flow through underground, highly insulated pipes where it will be distributed to customer buildings.

The high temperature hot water will arrive at the customer's building where it will be converted to a variety of forms, depending on the end use equipment and requirements particular to the building. In most cases, in the Trenton system, the water will be either flashed to steam or used directly as hot water. This thermal energy will heat buildings, operate absorption air conditioning systems, sterilize hospital and laboratory equipment and run a laundry.

While the construction of an ICES is feasible and advantageous in an existing urban area, it becomes far more attractive when implemented in the context of a potential new development. With the district heating system, new builders do not need to purchase and amortize expensive heating plants, nor do they have to devote portions of valuable buildings to the areas which these plants occupy. Thus, the implementation of an ICES creates a development incentive for all abutting the thermal distribution system. In fact, this is a primary motivation for the City of Trenton's

involvement in the ICES project

ASSEMBLYMAN STOCKMAN: Thank you very much, Mr. Weiser. I don't believe there are any other witnesses and I think it is very opportune because Mr. Stys is still here and I would very much like to just chat with both of you after this hearing about the progress which I'm delighted we're making on this subject. I appreciate you coming and I appreciate them coming, and I just want to note that they've stayed for the full hearing, which is a real commitment in itself and real evidence of good will. So, unless there is anyone else who I've overlooked, I think everyone who was scheduled to testify has testified. So, I will call this hearing to a conclusion and thank you for your cooperation.

(Hearing Concluded)

Testimony Before The
Energy Conservation Subcommittee
of the New Jersey Assembly Committee
on Energy and Natural Resources

by

R. D. Stys, Vice President - System Planning
Public Service Electric and Gas Company

1. Introduction

2. Since the OPEC oil embargo of 1973 and the energy crisis
3. generated by that embargo, there has been much concern
4. expressed about methods to conserve energy and use energy
5. more efficiently. One area of specific investigation is
6. cogeneration. It is estimated by some that as much as
7. 30,000 MW of electrical energy could be cogenerated in the
8. United States, saving upwards of 900 trillion BTU's by 1985
9. (420 thousand barrels per day oil equivalent). It is
10. appropriate to take a closer look at cogeneration and its
11. possible effect on New Jersey's energy supply. Cogeneration
12. is a fairly new term for an old concept. The current
13. definition, according to the Federal Government, is "the
14. simultaneous production of two forms of useful energy, such
15. as electric power and steam."

16. History of Cogeneration

17. Early in this century, at the time electricity first
18. became widely used, many large industrial or commercial
19. enterprises maintained large steam boiler plants for space
20. heating and/or process energy. It was a relatively easy

1. matter to boost the boiler steam pressure somewhat beyond
2. the process requirement, insert a turbine which was
3. connected to an electric generator, and then use the steam
4. for its original requirement after the added energy was
5. extracted to generate electricity. This first cogeneration
6. concept was practical for several reasons:

7. 1) The cost of purchased kilowatthours was relatively high.
8. 2) The cost of running electric distribution lines,
9. which the customer had to bear, was high.
10. 3) The cost of boiler fuel was low (most of it was coal and
11. the resulting emissions did not have to comply with any
12. official air quality standards).
13. 4) The electrical requirements were not great.

14. As the electric utility industry matured, many of the above
15. advantages of on-site power production were eliminated, and many
16. private generation facilities were shut down. As electric
17. utilities became more efficient and expanded, electric rates
18. went down and distribution facilities became more widespread and
19. reliable. By 1950, cogeneration provided only 17% of the total
20. electric energy produced in the country. By the mid to
21. late fifties, the majority of these original private plants
22. were abandoned because of economic and operational
23. obsolescence.

24. Cogeneration is an energy concept with which PSE&G has
25. been involved for years. Currently, there are 23 customers
26. who generate electricity in parallel with PSE&G. PSE&G

1. supplies these customers with auxiliary and backup service.
2. In our last rate proceeding, we examined our standby and
3. cogeneration rate and determined that this price should be
4. reduced so as to encourage future cogeneration potential.

5. The most successful large scale cogeneration arrange-
6. ments involving electric utilities have been with the
7. chemical and petroleum industries - large users of process
8. steam and electricity. PSE&G has been directly involved in
9. such a cogeneration operation with Exxon's Bayway refinery.

10. Since 1957, PSE&G has been cogenerating process steam
11. and electricity at the Linden Generating Station in coopera-
12. tion with Exxon. This cogeneration potential was increased
13. in 1972. Today, the Linden Station has the potential to
14. cogenerate 459 megawatts of electrical energy and 1.4
15. million pounds of steam per hour. The steam is then used by
16. the refinery as well as by our synthetic natural gas plant
17. which is located adjacent to the generating station.

18. In response to renewed interest in cogeneration,
19. several groups in the State embarked on investigation of
20. cogeneration and its potential. These groups include:

- 21. . Princeton University - Report to Governor Byrne's
- 22. Cabinet Energy Committee (June 1976)
- 23. . Governor's Cogeneration Panel - Richard McGlynn,
- 24. Commissioner of BPU, chaired a special panel to
- 25. investigate the potential for cogeneration (Late 1976)

1. . New Jersey Public Interest Research Group (PIRG) -
2. Survey of Industrial Steam Users (June 1977)
3. . PUC Generic Hearings (Docket 762-194) - R. F. Dittrich of
4. PSE&G testified on PSE&G's Cogeneration Evaluation (June 1977)
5. . New Jersey Energy Research Institute (NJERI) - Formulated
6. general guidelines for cogeneration at the request of
7. Commissioner of the New Jersey Department of Energy (NJDOE),
8. Joel Jacobson (November 1977)
9. . NJDOE Cogeneration Hearing - I personally testified at this
10. hearing held in compliance with the Department of Energy
11. Act (November 1978)
12. . Assembly Committee on Energy and Natural Resources -
13. Testimony by S. A. Mallard on Cogeneration (March 1980)
14. All of these activities found that in varying degrees
15. cogeneration has the potential to benefit the people of New
16. Jersey through more efficient energy use.
17. In addition to the concern about cogeneration in New
18. Jersey, the Federal Government introduced legislation that
19. impacted on cogeneration. This legislative package, the
20. National Energy Act, included:
21. . Public Utilities Regulatory Policies Act (PURPA)
22. . Natural Gas Policy Act (NGPA)
23. . Power Plant and Industrial Fuel Use Act (FUA)

1. PSE&G Cogeneration Activities

2. PSE&G also embarked on its own investigation of cogenera-
3. tion potential starting in 1976. As a result of the newly
4. developing interest in cogeneration, PSE&G marketing forces
5. contacted all industrial customers with steam capacity in
6. excess of 500 boiler horsepower (bhp). This survey found
7. 430 MW as the potential capacity available from cogenera-
8. tion. We found 18 industrial customers with 100,000
9. pounds per hour steam demand which we determined to be the
10. minimum requirement to warrant consideration for cogenera-
11. tion. Our economic analyses showed that of the 18 customers
12. PSE&G had identified, cogeneration installations would be
13. economic at only 12 for a total capacity of 300 MW. Our
14. findings were reviewed with the 12 customers, many of whom
15. indicated no desire to participate in cogeneration.

16. In addition to our participation with Exxon and our
17. cogeneration evaluation, along with associated customer
18. discussions, PSE&G has been involved in other cogeneration
19. related activities. I would now like to review briefly, in
20. a chronological fashion, our findings in several project and
21. system studies.

22. 1. Trenton Integrated Community Energy System (ICES) Study

23. PSE&G began participation with the City of Trenton and
24. other consultants on a U.S. Department of Energy (USDOE)
25. funded project in 1976. This was a feasibility study of
26. applying a grid-connected ICES concept to supply electric

1. and thermal energy to a group of office and apartment
2. buildings in downtown Trenton. The project, as PSE&G
3. envisioned it, would have consisted of four 2.5 MW
4. combustion turbines and waste heat boilers with a total
5. steam capacity of 68,000 pounds per hour and two 30,000 pounds
6. per hour oil-fired boilers for peaking and standby reserve
7. of thermal load. The Phase II Report, which described preliminary
8. design and economic evaluation, was prepared and submitted to
9. the USDOE in 1978.

10. The Phase II study indicated that the economic
11. viability of the ICES plan could not be established at the
12. time of report submission. However, if tax-exempt financing
13. and government financial assistance could be obtained and
14. the steam profile of the community improved so that a
15. revised evaluation would show the project to be economic,
16. and if all the usual criteria PSE&G employs before
17. committing to a capital expenditure were met, then PSE&G
18. would be willing to proceed with construction of the
19. project.

20. I will present more detailed information on Trenton
21. ICES later.

22. 2. PSE&G/Hoffmann-LaRoche Industrial Cogeneration Project
23. Proposal

24. In September, 1978, PSE&G, Hoffman-LaRoche, New Jersey Department
25. of Energy (NJDOE) and Science Applications, Inc. (SAI) submitted a
26. proposal for a cogeneration project to the U.S. Department

1. of Energy (USDOE). This proposal was in response to the
2. USDOE's Program Opportunity Notice (PON) EM-78-N-01-4135
3. "Industrial Cogeneration System Evaluation and Demonstration
4. Project."

5. The cogeneration facility proposed for the
6. Hoffmann-LaRoche plant in Nutley, New Jersey, would have
7. consisted of 30 MW of combustion turbine capacity and waste
8. heat boilers. Under the proposal, PSE&G would have owned and
9. operated the plant which would have been thermally controlled
10. to provide steam to Hoffmann-LaRoche at a maximum rate of
11. 150,000 pounds per hour. The electric energy produced would
12. have been fed into the PSE&G grid. Unfortunately, the USDOE
13. did not accept our proposal because it was based on burning
14. light oil in combustion turbines. They awarded the funds
15. for other projects using more innovative technologies and
16. renewable fuels.

17. 3. District Heating and Cooling Systems

18. PSE&G, along with its subcontractors, has been
19. participating in a USDOE sponsored project to assess the
20. technical-economic feasibility and environmental
21. acceptability of a district heating and cooling system.
22. Phase I of the study was completed and a final report
23. submitted to the USDOE in May 1979. Phase II is now being
24. conducted and will focus on the feasibility of retrofitting
25. PSE&G's Hudson and Essex Generating Stations to provide hot
26. water to residential communities in Jersey City and Newark.

1. 4. Dual Energy Use System (DEUS) Fuel Cell Study

2. In February 1979, PSE&G, as a subcontractor to
3. Mathtech, Inc., completed an analysis of the application of
4. fuel cells in a dual energy use system (DEUS) for the
5. Electric Power Research Institute (EPRI). This study was
6. begun in early 1978. The application of a DEUS fuel cell
7. was evaluated for residential and commercial building
8. systems, industrial plants and utility generating stations
9. to provide electricity and useful thermal energy. The
10. results of the evaluation in all three sectors indicated
11. that DEUS fuel cells would be technically feasible and
12. economically attractive if the units were electrically
13. dispatched. On the other hand, if the units were thermally
14. dispatched, greater savings would accrue, but some coal
15. produced electric energy would probably be displaced.

16. 5. Feasibility Study for Industrial Cogeneration Fuel Cell
17. Applications

18. In 1979, PSE&G, as a subcontractor to Gilbert Associates,
19. Inc. completed a USDOE funded study to evaluate the
20. application of a 5 MW fuel cell at the Bergen County
21. Utilities Authority (BCUA) sewage treatment plant in Little
22. Ferry, New Jersey. The proposed fuel cell would use methane
23. gas, which is a by-product of the sewage plant anaerobic
24. digestive tanks, to produce electricity and useful thermal
25. energy. The electricity would be fed into the PSE&G grid
26. and the thermal energy would be used to sustain the

1. anaerobic digestive process and for building heat. The
2. results of the study indicated the economic attractiveness
3. of the project, but unfortunately the USDOE decided to
4. investigate larger fuel cells rather than continue with this
5. project.

6. PSE&G Cogeneration Policy

7. The policy of PSE&G toward cogeneration is straight-
8. forward. The Company encourages the use of cogeneration
9. provided it is economic and the electrical output is
10. compatible with the PSE&G system. We will purchase
11. energy from cogenerators at a price which is fair
12. and reasonable and does not increase costs to our other
13. customers. PSE&G will also sell energy to cogenerators at a
14. rate which is fair, reasonable and nondiscriminatory.
15. PSE&G recognizes that, given the right circumstances,
16. cogeneration of electric energy and process heat could be
17. beneficial to the Company, the customers, and society. Such
18. circumstances exist with the Linden-Bayway steam sale
19. arrangement. There may be other similar situations
20. throughout the State which would make the same economic
21. sense.

22. PSE&G also recognizes, however, that it is not proper
23. to assume that cogeneration is in the best interest of the
24. involved parties in every case. Each potential cogeneration
25. application must be analyzed on its own merits. Some of the
26. areas that must be considered are:

1. 1. Type and quantity of fuel that will be used in the
2. cogeneration facility.
3. 2. Type and quantity of fuel that will be displaced by the
4. cogenerated process heat.
5. 3. Quantity of electricity that will be produced.
6. 4. Profile of electricity production.
7. 5. Profile of the thermal energy demand.
8. 6. Required reinforcement of the electric transmission and
9. distribution system.
10. 7. Investment required.
11. 8. Tax benefits available.

12. PSE&G Participation in Cogeneration

13. Given the proper set of conditions, PSE&G has in the
14. past and will in the future, participate in cogeneration
15. projects.

16. 1. As a Supplier of Process Heat

17. The Linden-Bayway steam sale represents the optimum
18. technical scenario for cogeneration. Under this scenario,
19. our steam customers would benefit because they would be
20. assured of a dependable supply of steam without having to
21. maintain a large boiler plant. Our electric customers would
22. benefit through the lower cost of electric energy resulting
23. from the steam-fuel swap and the higher efficiency of
24. operation of the generating plant. The PSE&G stockholders
25. would benefit through a good return on the investment made
26. and society would benefit through more efficient use
27. of fuel and improved environmental conditions.

1. It is with similar expectations that PSE&G is
2. considering participation with other industrial customers as
3. cogeneration partners. As a result of the 1976 cogeneration
4. survey, there appear to be several industrial customers who
5. would benefit from base load steam supply provided by
6. cogeneration plants to be constructed on their property.
7. Some of these cogeneration plants could be owned and
8. operated by PSE&G. While the steam produced in these
9. stations would be for specific customers, the electricity
10. produced would be fed into the utility transmission and
11. distribution system for the use of all customers.

12. An optional approach for installation up to 30 MW would
13. be for PSE&G to supply turbine exhaust heat directly to the
14. customer from a combustion turbine that PSE&G would own and
15. operate to produce electricity. The customer could then use
16. the available energy as heated air directly, to heat water,
17. or to generate steam.

18. 2. As a Purchaser of Electricity

19. PSE&G has received several preliminary proposals
20. whereby garbage would be burned in a boiler and steam and
21. electricity produced. The steam would be used by the
22. garbage burning facility or sold to a third party while the
23. electricity would be sold to PSE&G. PSE&G would consider
24. participating in such an undertaking and would evaluate
25. payment for the electricity based on our avoided cost
26. (the price paid for electricity from the power pool

1. if we are a net energy purchaser or the maximum cost for
2. energy produced by PSE&G if we are a net energy seller).

3. 3. As A Co-owner of a Cogeneration Plant

4. PSE&G has considered co-ownership of a cogeneration
5. facility. There are other utilities throughout the country
6. that are considerably closer to participating in
7. co-ownership. In many instances, the co-owned facility is
8. not considered as a part of the utility system, but rather
9. it supplies an isolated industry (or cluster of industries)
10. with the electric utility supplying only stand-by power."

11. The advantages claimed for the co-ownership form of
12. cogeneration are:

13. 1. A reliable and economic source of energy for the industry
14. (or industries).
15. 2. A reduced financial requirement by the industrial participant(
16. 3. Additional investment upon which a return can be generated
17. outside the utilities' rate base.

18. Analyzing closely the claimed advantages to the
19. co-ownership of cogeneration, while private industry would
20. benefit from such a cooperative effort, there appears to be
21. nothing in this arrangement that would benefit PSE&G under
22. our present financial constraints. While our contribution
23. to such an enterprise would likely be outside of our rate
24. base, any profits made would be subject to the maximum
25. limitation established in hearings before the Board of
26. Public Utilities (BPU).

1. Trenton ICES

2. I know you are very interested in the Trenton ICES, but
3. I felt it necessary to review both our recent activities in
4. cogeneration and our Company policy toward cogeneration to
5. develop the proper perspective. As I have indicated before,
6. PSE&G encourages cogeneration, provided 1) costs to our customers
7. are not increased, 2) it is in compliance with National policies
8. on conserving critical fuels, and 3) does not diminish the
9. reliability of service to our customers.

10. As I mentioned before, PSE&G has been involved with the
11. Trenton ICES project since 1976. I feel that it is appropriate
12. to discuss, in a chronological fashion, the course of events
13. leading to the present status.

14. PSE&G participated as a subcontractor to the City of
15. Trenton on the U.S. Energy Research and Development
16. Administration (now USDOE) funded project to investigate the
17. feasibility of implementing a grid connected integrated
18. community energy system (ICES) in Trenton. The purpose of
19. this study was to evaluate the economic, financial,
20. institutional and environmental aspects of implementing an
21. ICES cogeneration system to provide thermal energy to a
22. group of downtown Trenton office and apartment buildings
23. with the electric energy to be fed into the PSE&G grid.

24. Phase I of the study, a preliminary feasibility
25. evaluation, was completed in July of 1977. On the basis of
26. the Phase I findings, the City of Trenton and its

1. subcontractors decided to proceed with the Phase II of the
2. analysis which was intended to be a more extensive
3. evaluation.

4. As the Phase II Study progressed, several questions were
5. raised about the Phase I economic analysis. Detailed estimates
6. prepared by PSE&G were higher than earlier estimates prepared
7. by Turner Construction Company due to escalation and design
8. philosophy. In addition, because of rapidly rising oil prices,
9. fuel costs for the ICES system were increased substantially.
10. It became evident that further examination of these areas
11. was necessary. In order to confirm our findings, PSE&G had
12. its estimates and economic analysis reviewed by Stone and
13. Webster Management Consultants, Inc., a well known utility
14. consultant with extensive large and small power plant
15. experience. They confirmed the PSE&G findings.

16. Concurrence among the Trenton ICES study team members
17. on cost estimates and economic analysis could not be reached.
18. Therefore, PSE&G submitted a separate draft Phase II report in
19. March 1978 to the USDOE with the PSE&G evaluation results
20. indicating that it was not economically viable for PSE&G to be
21. the Owner/Operator of an ICES system for the site specific
22. project in Trenton. Since that time, the City of Trenton
23. has pursued other concepts of implementing some form of
24. Trenton ICES.

1. In December 1979, the City of Trenton requested that PSE&G
2. reevaluate its position on the Trenton ICES project considering
3. the possibility of receiving a Housing and Urban Development
4. (HUD) grant for a portion of the capital required. PSE&G's
5. re-evaluation, with a HUD grant included, still indicated that
6. the ICES project would result in a financial loss and therefore
7. would not justify PSE&G's participation. This re-evaluation
8. considered the constraints imposed at the outset of the study
9. such as a very defined community, or load, and a specific
10. geographic location. It also took into account the modification
11. made at the end of the Phase II Study, which included several
12. modified communities with improved load factors. In spite of
13. all of these improvements, the project was still found to be
14. uneconomic. The City of Trenton was notified that due to these
15. results, PSE&G was not interested in pursuing the project
16. further.

17. In September of 1980, Cogeneration Development Corporation
18. (CDC) contacted PSE&G, through the BPU. CDC was identified as a
19. potential developer of ICES. At the request of the BPU, a
20. meeting was arranged for October 27, 1980. CDC made an
21. offer to sell PSE&G the electrical output of a proposed 12
22. megawatt (versus 10 MW in the previous study) Trenton ICES
23. plant. CDC sought financial guarantees and an unreasonable
24. price for energy such that PSE&G and its customers were
25. exposed to an unacceptable level of risk at a price that was
26. excessive.

1. In addition to discussing a price for electricity, CDC
2. also asked for natural gas in a quantity that was greater
3. than our tariff would permit. PSE&G agreed to review both
4. the pricing proposal and the gas availability matter.

5. On March 13, 1981, PSE&G and CDC met at the BPU offices
6. to discuss our respective positions. CDC again repeated their
7. demand for a guaranteed payment which PSE&G could not justify.

8. In a spirit of cooperation and for the potential
9. research benefit of ICES, PSE&G responded with an offer to
10. buy the electrical output at the price suggested by CDC with
11. the payment based only on energy delivered. That part of
12. the price which is in excess of the value for energy delivered
13. would be considered a research subsidy by PSE&G. The subsidy
14. offer is in consideration of the fact that the project is a
15. pioneering effort and a unique application of this
16. technology. It is hoped that development of the project
17. will enhance the City of Trenton. In return for the
18. subsidy, PSE&G requested the right to install data
19. monitoring equipment to measure the performance of the ICES
20. so that the project operation will contribute to our
21. research of energy options. In addition to the proposed
22. energy purchase agreement and the research subsidy, PSE&G
23. also agreed, as another form of subsidy, to deliver the full
24. 1200 therms per hour of gas for the ICES to assist the research
25. aspects of the project.

1. Summary Remarks

2. As a result of our long experience and extensive study
3. of cogeneration, PSE&G has made certain determinations.
4. We recognize that cogeneration is thermally efficient and
5. a potential contributor to our energy conservation efforts.
6. However, all cogeneration is not always economic. The proper
7. application of this technology requires considerable analysis
8. recognizing specifically, the fuel, the thermal load
9. cycle, and the site location. Cogeneration should not be
10. subsidized by the other utility customers if a study shows
11. that the proposed facility is uneconomic or that more oil
12. or gas is burned over the life of the facility when compared
13. to other energy options.

14. Since PSE&G is in a financial position which requires
15. strict capital rationing, it would be imprudent for
16. us to invest or commit funds to major projects which result
17. in potentially even higher costs to our customers for electricity
18. and gas.

19. Nevertheless, since the Trenton ICES will aid in furthering
20. the assessment of the benefits of cogeneration and district
21. heating and the City of Trenton expects to benefit consider-
22. ably by siting this demonstration project in our State
23. capitol complex, PSE&G is willing to pay for any energy
24. delivered at a price which is based on the cost of

1. production plus a research contribution. This price is higher
2. than the company would have to pay for an equivalent amount
3. of energy from the PJM interconnection, but because of the
4. relatively small amount of this purchase compared to our
5. total electric energy sales, the penalty to our customers
6. will be minimal. However, such an offer must not be considered
7. a precedent.