

RESIDENTIAL WEATHERIZATION THROUGH ZERO INTEREST FINANCING
THE PGandE EXPERIENCE

Earl R. Andrews
Pacific Gas and Electric Company

ABSTRACT

Since January 1981, Pacific Gas and Electric Company's Zero Interest Program (ZIP) has provided over \$168,000,000 to customers for financing retrofit weatherization of over 260,000 single and multi family dwelling units.

This paper explores the major factors contributing to the success of ZIP: the foundation provided by PGandE's management commitment to the program, the cost savings achieved through a Project Financing mechanism, the activities of a contractor advisory committee which help communication flow between the weatherization industry and PGandE, various consumer protection measures which help to maintain the legitimacy of ZIP in the public view, and promotion activities which encourage the participation of specific target customers.

The paper concludes that ZIP is a proven cost-effective and marketable mechanism for utility promotion of conservation. The success of ZIP in the long term ultimately may be measured in terms of the program's capacity to evolve with changing economic and market conditions. Future designs of ZIP will necessarily include the elements of versatility and dynamics that have characterized ZIP's success to date.

RESIDENTIAL WEATHERIZATION THROUGH ZERO INTEREST FINANCING
THE PGandE EXPERIENCE

Earl R. Andrews
Pacific Gas and Electric Company

PGandE AND THE ZERO INTEREST PROGRAM

The Pacific Gas and Electric Company (PGandE) serves primarily gas and electricity to residential, commercial, industrial, and agricultural customers in northern and central California. The utility operates in 48 counties and serves approximately 3.5 million residential customers with approximately 2.3×10^9 therms of natural gas and 22.1×10^9 kilowatt-hours electricity each year. The residential market is comprised of 2.44 million single-family and mobile homes and 1.06 million multifamily dwelling units.

In 1975, PGandE offered the Natural Gas Home as its first residential conservation program. This was the initiation of an evolutionary process that would substantially alter the scope of PGandE's services as a company. Since 1975, PGandE has become a gas, electric, and conservation service company. The flagship of PGandE's residential conservation programs is the Zero Interest Program (ZIP).

ZIP was first piloted in January 1981, and later became an incentive program designed to promote the retrofit installation of proven cost-effective residential weatherization and conservation measures and devices. ZIP has three components: zero-interest financing, cash rebates (proposed), and free "direct weatherization" of homes belonging to low-income customers.

Under the financing component, single-family customers may receive up to \$3,500 at zero interest for the installation of ceiling insulation, caulking, weatherstripping, heating/cooling duct insulation, water heater insulation, low-flow showerheads, wall insulation, floor insulation, storm or thermal windows and doors, clock (set-back) thermostats, intermittent ignition devices for central space-heating furnaces, and conversion of incandescent lighting fixtures. Loans for single-family applicants are repayable over 50 months. Multifamily dwelling owners and renters (both single- and multifamily) repay their loans over 100 months. Participants repay their loans through billing separate from PGandE's billing for gas and electric service.

The cash rebate portion of the program is designed to parallel the financing program. Approval of this program component is still pending before the California Public Utilities Commission (CPUC). Authorization to provide rebates is expected in mid-July 1984, with initiation of the program component in the Fall of this year. As proposed, cash rebates totaling \$1,275 will be available for the installation of the ZIP measures in single-family homes; \$815 per dwelling unit in multifamily dwellings.

Through the Direct Weatherization component, low-income customers in single-family dwellings can receive the installation of ceiling insulation, caulking, weatherstripping, duct insulation, water heater insulation, and low-flow showerheads at no cost to them. This portion of the program is conducted for PGandE by a consortium of local community-based low-income assistance groups distributed throughout the PGandE service area.

Through May 1984, over 302,000 single- and multifamily dwellings units have been weatherized through ZIP; 260,000 through financing and 42,000 through Direct Weatherization. This represents over 721,000 installations of various weatherization measures, and a loan volume of over \$168,000,000. Most significantly, this weatherization will produce 38.0 million therms and 65.7 million kilowatt-hours of energy savings per year and 654.6 million therms and 1,036.3 million kilowatt-hours over the life of the measures.

The administrative expense for the ZIP program in 1984, exclusive of debt-service costs for the loan program, will be over \$53 million dollars. Administration expenses, carrying costs for the loan principal, and bad-debt losses are covered through additions made to the rates charged to PGandE customers for gas and electricity service.

Tables I and II summarize the achievements of ZIP to date.

TABLE I. Energy Savings Through ZIP, 1981 - May 1984.

YEAR	1ST YEAR		LIFE-CYCLE	
	ELECTRIC (kWh x 10 ⁶)	GAS (therms x 10 ⁶)	ELECTRIC (kWh x 10 ⁶)	GAS (therms x 10 ⁶)
1981	3.1	1.8	39.0	26.0
1982	15.4	8.4	252.7	143.0
1983	42.1	22.6	672.5	402.7
1984 (based on installations through May)	5.1	5.2	72.1	82.9
TOTALS	65.7	38.0	1,036.3	654.6

TABLE II Weatherization Measures Installed Through ZIP, 1981 - May 1984.

	SINGLE-FAMILY		MULTIFAMILY	
	<u>LOANS</u>	<u>D.W.</u>	<u>LOANS</u>	<u>TOTAL</u>
	(All Figures are in Dwelling Units Served)			
Ceiling Insulation	\$171,218	30,871	6,482	208,571
Caulking	30,564	37,267	1,835	69,666
Weatherstripping	89,423	41,097	94,292	224,812
Duct Insulation	22,680	1,864	930	25,474
Water Heater				
Insulation	56,636	23,184	3,589	83,409
Low-Floor Showerheads	43,034	30,592	3,394	77,020
Wall Insulation	13,560	N/A	367	13,927
Floor Insulation	8,094	N/A	201	8,295
Storm/Thermal				
Windows and Doors	7,458	N/A	147	7,605
Clock Thermostats	1,134	N/A	28	1,162
Intermittent Ignition				
Devices	163	N/A	4	167
Lighting Conversions	<u>881</u>	<u>N/A</u>	<u>214</u>	<u>1,095</u>
 TOTAL	 <u>\$444,845</u>	 <u>\$164,875</u>	 <u>\$111,483</u>	 <u>\$721,203</u>

The achievements of the ZIP program are clearly substantial and significant. It has proven to be a highly functional and cost-effective means of providing necessary motivation through incentives for residential conservation; conservation which PGandE has determined to be its favored resource among new electricity generation options. The purpose of this paper is to explore the fundamental factors contributing to the success of ZIP.

FACTORS FOR SUCCESS

Corporate Commitment

The foundation for ZIP lies in the support provided to it by PGandE's upper level management. This support is evident in a variety of key administrative actions and corporate policies.

ZIP and all other conservation programs at PGandE fall under the rubric of Customer Service. PGandE's officers declared in 1982 that in order for PGandE to survive in the energy economics of the post oil-embargo era, service to customers would have to be placed at the center of all PGandE decisions and activities. This was expressed as "Corporate Goal One":

To provide the highest level of reliable, safe, and efficient energy and conservation services to the customers permitted by rates authorized by the CPUC (California Public Utilities Commission) with special emphasis on providing courteous service at all times.

The direct benefit of conservation activities was recognized as helping customers cope with ever increasing utility bills. Conservation was in fact becoming PGandE's most effective way of protecting its customers from the circumstances of rising energy prices.

After the issuance of Goal One, Frederick W. Mielke, Chairman of PGandE's Board of Directors declared:

With our renewed emphasis on serving our customers reliably and well through new activities, such as conservation and load management, alternative energy resources and smaller-scale projects, it is imperative that we evaluate the full implications of these new activities and then make whatever changes in our management practices to carry them out well.

In order to facilitate the emphasis on customer service and residential conservation programs, PGandE made significant administrative commitments. In January 1982, PGandE created a separate Residential Conservation Service Department to plan and implement ZIP and all other residential conservation programs. A significant staff allocation to this new department was made: 89 management employees with 13 clerical support positions. Additional support department and field personnel have brought ZIP support labor to 240 employees.

PGandE's commitment to customer service and conservation has permeated the conventional area of electric generation planning. Incorporation into the load forecast expanded conservation and ZIP beyond being solely a good customer service tool to becoming a more formidable, and necessary portion of PGandE's energy supply options during the 1980's and beyond. In this way, PGandE has not only committed itself to a policy of promoting conservation, but has committed itself to become reliant on conservation in its fundamental business area of electricity and gas sales.

Project Financing Mechanism

Consistent with PGandE's commitment to facilitating achievement of customer service through conservation, the Company created a subsidiary corporation to carry out a novel method of raising the capital necessary to fund the financing offered through ZIP. The creation of Pacific Conservation Services Company (PCSC) and the use of project financing for ZIP have helped keep the rate impact of the program on PGandE customers low and maintain the program as cost-effective. The creation of PCSC marked PGandE's diversification into the finance industry. This is a significant point. Rather than employ the services of a bank for loan processing, PGandE chose to become a lending institution itself.

The fundamental motivating factor for the use of project financing is that carrying costs for a project can be lower if capital is borrowed via a project financing agreement rather than having the utility use its direct-borrowing ability to generate capital. In essence, project financing amounts to a special loan "deal" that affords PGandE a discount on carrying costs charged on the capital loaned through ZIP.

The current ZIP Project Financing agreement covers a maximum initial amount of \$150,000,000 for loan proceeds. A consortium of 11 banks agreed to provide this capital. The credit facility is structured as a two-year revolving credit followed by a conversion to a ten-year term loan. The revolving credit allows PCSC to use the capital returned to it via payments from active loan recipients to fund new loans. Insofar as capital demand for new loans exceeds the incoming capital through repayments, PCSC will seek additional funds through the Project Financing agreement, up to its \$150,000,000 ceiling. Once the \$150,000,000 is paid out in ZIP loans or two years after the initiation of the Project Financing Agreement, whichever occurs first, the Revolving Credit Agreement is terminated and the debt is converted to a ten-year loan at an interest rate that would be negotiated at that time. The termination of the Revolving Credit Agreement has not yet occurred with the initial Project Financing Agreement.

Once the Revolving Credit facility is converted to a long-term note, the funding of new ZIP loans will require the establishment of a new and separate Project Financing Agreement.

PCSC's ability to borrow through the Revolving Credit Agreement is actually limited to 80 percent of the capital it requires for ZIP Loans. The remaining 20 percent is contributed by PGandE through an equity subscription in the subsidiary. Because this is an equity contribution, PGandE can earn its authorized rate of return on these funds. In this way, PGandE profits directly from the provision of the ZIP loan program. Given PGandE's authorized rate of return of 12.57 percent (net) and an equity contribution of \$24 million (out of \$121 million in total loan debt) in 1983, PGandE earned \$2.2 million through ZIP. This stands as another significant cause for PGandE's commitment to provision of the ZIP program.

The central feature of the Project Financing Agreement, however, is the absence of a specific guarantee from PGandE to the lending banks as security for the repayment of funds borrowed by PCSC. Instead, as a virtually unprecedented financial structure, this security is provided through the rates charged to PGandE's customers for the provision of the ZIP program. The specific portion of rates charged for ZIP that cover the security for PCSC's borrowing is referred to as the Debt Service Rate and includes a provision for doubtful accounts or "bad debts" (i.e., loans that are not repaid). The Project Financing concept is predicated on the existence of a viable flow of cash back from the ZIP loan recipient through PCSC and eventually to the consortium of banks. Without the protection of the Debt Service Rate, if a ZIP borrower were to fail to uphold his responsibilities under the ZIP financing agreement through nonpayment, he inherently would threaten the security of the funds borrowed by PCSC through Project Financing. Accordingly, the lending banks are guaranteed a return of their capital through the inclusion in the Debt Service Rate of the cost for bad loans that are written off. The Debt Service Rate includes also the cost of interest paid by PCSC to the lending banks as the cost of the capital borrowed through Project Financing.

As mentioned above, the main justification for the Project Financing mechanism is the ability of PGandE to offer ZIP without having to supply all the capital for loans through its equity or through its borrowing in the commercial lending market, both of which can be very costly. The project financing agreement facilitates a reduction of the cost of financing passed on to PGandE's ratepayers in the debt service rate. At the current rates, the cost of the capital borrowed through the banks is 10.137 percent per year. PGandE has estimated the average cost of the debt over the life of this initial agreement will be approximately 13 percent per year. In contrast, PGandE's cost of equity capital, as authorized in its 1984 general rate case, will be 20.32 percent in 1984. This difference of over 7 percent per year clearly demonstrates the cost savings afforded PGandE's ratepayers via Project Financing. A total savings of \$27.8 million is estimated to result from this first financing agreement.

Industry Liaison

The third factor contributing to the success of ZIP has the weatherization industry as its focus. PGandE has instituted a Contractor Advisory Committee (CAC) to be one of the main communication links between PGandE and the manufacturer and installer of weatherization materials.

The CAC is composed of contractors and PGandE personnel representing the 13 PGandE operating divisions as well as additional at-large contractor members. Each area-representative contractor is selected by and from among the contractors in each local division. The CAC serves four functions: as a mechanism for disseminating program requirements and changes from PGandE to the field; as a forum for contractors to voice their concerns and suggestions about the ZIP program; as a vehicle for conducting weatherization marketing jointly between PGandE and the industry; and as a mechanism for achieving the acceptance and implementation of specific consumer protection measures.

Weatherization contractors perform approximately 98 percent of the installations financed through ZIP. The remaining 2 percent are performed by the ZIP applicants themselves. The CAC serves to channel program rules to the field and channel feedback on the appropriateness and impact of those rules back to PGandE. Much of the success of ZIP is due to the weatherization contractors' loyalty to participating in the program. This loyalty is maintained, in part, due to the opportunity afforded contractors to participate in reviewing and critiquing of the program and their knowledge that their views are used in program design and evaluation.

Another area of joint contractor-PGandE activity that contributes to the success of ZIP is joint marketing and advertising. Through cooperative advertising, PGandE and contractors share in the cost of developing and running ZIP ads. Such campaigns are usually developed for a specific local area and usually make generic rather than specific references to contractors. Clearly, such promotion techniques can be of significance to all contractors since the cost of the joint ads may exceed the advertising budgets of any individual contractor. PGandE benefits by this cost sharing in exactly the same way; costs are reduced without a loss in market coverage.

The most significant function of the CAC has been a mechanism for implementing consumer protection, however. PGandE's belief has been that it is ultimately responsible for the customer's satisfaction with the weatherization performed through ZIP. This has evolved into a policy that customers interested in ZIP are referred to a specific list of ZIP qualified contractors. To be on this list, and in fact to qualify jobs for ZIP, the contractor and his sales people must sign a Letter of Agreement with PGandE. The Letter of Agreement states the contractor's agreement to comply with all federal, state, and PGandE standards for weatherization work and contractor behavior, including an obligation to participate in ZIP in an honest and good faith manner.

The Letter of Agreement can be used as leverage with contractors whose work may not consistently meet all minimum ZIP requirements. It is for this reason that the power of the Letter of Agreement is supported by the participation of contractors in the design and implementation of ZIP through the CAC. Having the Letter of Agreement without the CAC would amount to having PGandE police contractors rather than have the contractors participate in their own self-regulation. The Letter of Agreement in the context of the CAC thus becomes a very effective and legitimate tool for maintaining consumer protection.

Consumer Protection

Consumer protection is itself the fourth factor contributing to the success of ZIP. The prevention of situations in which the ZIP participant is not completely satisfied with his weatherization work and the speedy rectifying of those cases in which problems do arise is critical to maintaining the legitimacy of ZIP in the eyes of PGandE customers. In addition to the prevention provided through the Letter of Agreement, consumer protection is provided through a bid monitoring procedure, an on-site inspection of the weatherization work, and warranty requirements for the weatherization work and products.

To apply for ZIP, the customer first receives a bid from a contractor. When PGandE receives the ZIP application, the bid is reviewed and compared with weatherization price guidelines established in conjunction with the California Residential Conservation Services audit program. PGandE will recommend the customer receive additional bids if the first bid proposes costs greater than the price guidelines. PGandE encourages customers to shop around for their weatherization work in order to protect those customers who might be misled by a contractor and his prices. To avoid price fixing conditions and to afford customers flexibility in their choice of contractor and weatherization products, customer may use any of the bids they receive, not necessarily the lowest one.

Once the weatherization is installed, PGandE may conduct an inspection of the work to insure it has been performed in accordance with all installation requirements and safety standards. If a deficiency is detected, PGandE contacts the installer for the latter to amend the problem.

Warranty coverage extends consumer protection past the stages of choosing a contractor and getting the work performed. Materials installed through ZIP must be covered by a one-year workmanship and three-year material warranty. A second purpose of this requirement is to ensure the proper function of the conservation product or device for the minimum period necessary to justify the ratepayer subsidy of the installation. In this manner, participants and ratepayers are protected against faulty conservation installations.

Target Group Promotion

The final significant factor contributing to ZIP's success is the emphasis directed to specific customer groups in program promotional efforts. PGandE sets a yearly goal for ZIP participation among customers who are low-income, elderly, non-English speaking, or renters. These "target group customers" are the groups which historically have been least likely to participate in utility-sponsored conservation programs. Yet, it is these very groups which suffer the most from rising gas and electricity prices. The purpose of putting special emphasis on achieving target group participation is to ensure that the ratepayer-supported benefits of ZIP are enjoyed by a wide spectrum of participants, not simply the home-owning middle and upper-income customers. Target group participation is promoted through two mechanisms: the direct weatherization component of ZIP and Community Services marketing.

The Direct Weatherization component involves the weatherization of single-family homes owned by customers who meet federal low-income guidelines. This weatherization is performed at no cost to the homeowners. Although PGandE and its ratepayer sponsor Direct Weatherization, the implementation of the component is performed by a consortium of community-based low-income assistance groups distributed throughout the PGandE service area. The sub-contracting of Direct Weatherization involves the performing of customer-participant selection and arranging for installation of the basic weatherization measures.

The use of outside community groups to carry out Direct Weatherization fulfills two important functions for PGandE, each of which helps in maintaining the viability of the ZIP program. First, by having an outside agency select the customer to receive Direct Weatherization assistance, PGandE avoids becoming involved in conflicts arising over the choice of recipients. The local community groups legitimize the allocation process by its very performance of it. Second, again due to the recognized low-income constituency of the local groups, their implementation of Direct Weatherization lends credence to ZIP and PGandE in general. This relationship is mutually beneficial since the local groups gain legitimacy through the delivery of the tangibles of Direct Weatherization.

Community Services marketing also utilizes the local community group infrastructure in developing ZIP loan participation by target group customers. There are two aspects to this function: cooperative marketing events and Outreach Contracting.

Cooperative marketing involves joint PGandE-community group sponsorship of informational workshops or seminars for acquainting target groups customers with the various aspects and benefits of ZIP. The cost of such promotion is often born by PGandE with the community group providing facilities and sponsorship.

Outreach Contracting is an arrangement by which community groups are paid for each customer name submitted as a ZIP program lead. Additional fees are paid when such customers actually become ZIP participants. Here again, with the community groups having target group customers as their constituency, they naturally focus on these customers in their outreach activities. These activities generate a revenue stream for the community group and a participant stream for the ZIP program.

CHANGING FOR THE FUTURE

ZIP has been highly successful, to date. This paper has explored some of the more prominent causes and conditions contributing thereto: the foundation provided by PGandE's management commitment to the program, the cost-savings achieved through the Project Financing mechanism, the activities of the Contractor Advisory Committee which help communication flow between the weatherization industry and PGandE, various consumer protection measures which maintain ZIP legitimacy in the public view, and the promotion activities conducted through ZIP Community Outreach efforts which encourage the participation of specific target customers.

The success of ZIP in the long term ultimately may be measured in terms of the program's capacity to evolve with changing economic and market conditions. It is PGandE's firm belief that a static ZIP will necessarily fail.

One immediate concern is the mix of weatherization measures now offered through ZIP. Since ZIP is currently offered to those homes constructed prior to January 1981, there is a finite number of installations possible for each measure promoted through ZIP. Over time as the number of measure installations achieved increases, the market potential for the measure decreases. Economic theory dictates that the cost of encouraging the installation of measures should increase with the decreasing market potential, with a corresponding decrease in the cost-effectiveness of such encouragement. This condition is fast approaching with a few of the measures promoted through ZIP, particularly ceiling insulation.

A reverse situation occurs with measures not currently included in ZIP. As the cost of encouraging conservation increases, and as the market for traditional weatherization measures are saturated, new measures become good candidates for promotion through the program.

In this context, the mix of ZIP-promoted measures becomes a variable which can be adjusted, some measures being retired from and others initiated into the program over time. PGandE is now preparing proposals for consideration by the CPUC to do just this. The Company envisions continuing to approach the CPUC with proposals to change the ZIP measure mix on an as-needed basis. Thus, ZIP has evolved into a mechanism for distributing incentives for the installation of various conservation products, regardless of what those products may be at any one time.

A second issue confronting the long-term viability of ZIP is the general condition of energy economics. ZIP's worthiness as a generation alternative is partially based on its benefits exceeding costs as predicted in econometric-based cost-effectiveness modeling. Such modeling attempts to measure the economic value of conservation in context with assessments of current and future economic conditions. The energy economy has clearly stabilized, if perhaps for only the short term. Yet such stabilization tends to precipitate corresponding changes in the basic economic assumptions used in cost-effectiveness modeling.

Such changes tend to represent improving economic conditions for conventional generation and supply: lower capital costs, greater conventional resource availability, and lower costs at the margins for those resources. In the past, conservation programs such as ZIP were cost-effective alternatives to conventional supply by wide margins. This conditional was achieved because conventional energy economics were so poor. But as a result of improving economics for conventional energy, the cost effectiveness of conservation programs, though still positive, is dropping.

Changing energy economics requires programs like ZIP to "tighten their belts" in order to maximize their energy savings results and reduce the corresponding cost of conserved energy. Conservation planners understand the ephemeral nature of the currently improved economics of conventional energy, that the current condition is only a short-term phenomena. Nevertheless, there is no reason to ignore the opportunities inherent in the present situation to improve the efficiency of conservation programs.

ZIP planning for 1985 and beyond has efficiency as its first agenda item. The incorporation of new conservation measures, improvement in administrative productivity, and the streamlining of program marketing techniques are only a few of a number of options which will be incorporated into ZIP to achieve a bigger "bang-for-the-buck." But, throughout the design of ZIP there will continue to be the essential elements of versatility and dynamics that have characterized its success to date.