FLORIDA PUBLIC SERVICE COMMISSION

Fletcher Building
101 East Gaines Street
Tallahassee, Florida 32399-0850

M E M O R A N D U M

May 30, 1991

TO : DIRECTOR, DIVISION OF RECORDS AND REPORTING

FROM : DIVISION OF APPEALS (MILLER) CW
DIVISION OF ELECTRIC AND GAS (FLOYD) RF JDJ
DIVISION OF RESEARCH (HOPPE, HEWITT) CBH DMH

RE : DOCKET NO.: 891324-EU - AMENDMENT OF RULE 25-17.008, F.A.C., PERTAINING TO CONSERVATION AND SELF-SERVICE WHEELING COST EFFECTIVENESS DATA REPORTING FORMAT

AGENDA : 6/11/91 - CONTROVERSIAL AGENDA - PARTIES MAY PARTICIPATE

CRITICAL DATES: NONE

BACKGROUND

The Commission proposed revisions to Rule 25-17.008, F.A.C., and incorporated a manual therein. A rulemaking hearing was held March 13-14, 1991. Staff issued a proposed version April 22, 1991. Comments were received and the staff is recommending the attached rule and manual. (Attachment A)

The major changes in the proposal since the rule hearing are:

(1) An alternate section on Self-Service Wheeling has been included. This alternate section provides that both the Rate Impact Test and the Total Resource Test may be applied when a self-service wheeling project is proposed. Staff now incorporates this alternate language in its primary recommendation (see below).

(2) A new section on allocation of lost revenues has been included. This section requires that lost revenues (as well as revenue gains) be allocated among the four categories: General & Administrative, Generation, Transmission and Distribution.

(3) Staff is now proposing that the calculation of capacity benefits be based on normal revenue requirements except when the life of the program is shorter than the life of the avoided generating unit. In that case, the value of deferral method as well as the normal revenue requirements method will be used to calculate these benefits.

(4) A statement has been added that the manual does not address interruptible and curtailable load. (See the next to last paragraph in the Introduction of the manual).

(5) A section entitled "Other Considerations" has been added to the alternate section on self-service wheeling. These other considerations include the fuel type used at the project, the fuel efficiency and the likelihood of a cogenerator building its own transmission line. The materiality of any lost revenues associated with the proposed project is also listed among these other considerations.

DISCUSSION OF ISSUES

ISSUE 1: How should lost revenues be treated in the rule and manual?

RECOMMENDATION: Lost revenues should be included as a cost in the Rate Impact Test, but should be omitted from the Total Resource Test. When lost revenues are included, they will be allocated among the following categories: General & Administrative, Generation, Transmission, and Distribution.

STAFF ANALYSIS: The treatment of lost revenues in the proposed rule depends on which of the three proposed tests is being considered. When viewed from the participants' point of view, lost revenues are termed bill reductions. These are calculated by multiplying the kwh saved or kw reduction in some period by the rate charged by the utility for each kwh or kw (excluding the customer charge portion of the rate). These bill reductions are benefits when calculating the benefit-cost ratio to participants.

When viewed from the total resource perspective, lost revenues are considered to be transfer payments from the utility to participants and don't affect net expenditures of the utility and

ratepayers as a whole. Therefore, lost revenues do not enter into the calculation of the benefit-cost ratio from a total resource perspective.

Finally, when looked at from a rate impact standpoint, lost revenues are considered to be a cost when calculating the benefit-cost ratio. If the bill reductions caused by the program are greater than the reduction in costs to the utility, rate levels must go up to make up the deficiency. The lost revenues for the Rate Impact Test should be adjusted to account for the "free rider" effect.

It should be noted that revenue gains from the program should be treated in a converse manner. That is, revenue gains (bill increases) are counted as costs in the participant test and benefits in the Rate Impact Test.

The use of the Rate Impact Test does not, in any way, predetermine whether lost revenues actually will be recovered.

ISSUE 2: How should environmental externalities be treated in the rule and manual?

RECOMMENDATION: If a particular conservation program would reduce certain external environmental costs that can be reasonably quantified, these avoided costs should be recorded as a benefit when calculating the benefit-cost ratio for the Total Resource Test only.

STAFF ANALYSIS: A generally accepted definition of externalities is: **Externalities are costs or benefits of market transactions not reflected in prices.** [Page 549, Modern Microeconomics Analysis and Applications, Times Mirror/Mosby College Publishing, 1986, by David N. Hyman, N.C. State.] We say that an externality has been internalized when prices have adjusted to reflect its true social cost.

It would not be appropriate to include externalities in the Rate Impact Test since the costs of such externalities are not paid for through electric rates. Thus the proposed rule would allow for these avoided costs only in the Total Resource Test, assuming that they could be reasonably quantified. As currently drafted, these

benefits would be listed under the column entitled Other Benefits, in the Total Resource Test form PSC FORM CE 2.3, page 45a.

ISSUE 3: What test or tests should be applied to Self-Service Wheeling?

PRIMARY RECOMMENDATION: Allowing the application of both the Ratepayer Impact Test and the Total Resource Cost Test properly sets forth a neutral reporting format. In addition, other considerations are required when determining the cost-effectiveness of self-service wheeling proposals.

PRIMARY STAFF ANALYSIS: The participants have all looked to principles of statutory construction to support their position on treatment of self-service wheeling. What the Commission is facing is two separate statutes which have somewhat overlapping and somewhat conflicting guidance. There is section 366.051 which requires public utilities to provide transmission or distribution service to enable a retail customer to transmit electrical power generated by the customer at one location to the customer's facilities at another location, "if the Commission finds that the provision of this service, and the charges, terms, and other conditions associated with the provision of this service are not likely to result in higher cost electric service to the utility's general body of retail and wholesale customers or adversely affect the adequacy or reliability of electric service to all customers." (Emphasis supplied).

The other applicable statutory provisions are in the Florida Energy Efficiency and Conservation Act (FEECA). Section 366.81, Florida Statutes, states the legislative intent that it is critical to use the most efficient and cost-effective energy conservation systems in order to protect the health, prosperity, and general welfare of the state and its citizens. The statute states:

> Since solutions to our energy problems are complex, the legislature intends that the use of solar energy, renewable energy sources, highly efficient systems, cogeneration and load control systems be encouraged. (Emphasis supplied).

This "encouragement" language is thus directed at cogeneration generally rather than self-service wheeling in specific. The statute also states that FEECA is to be liberally construed in order to meet the complex problems of reducing and controlling the growth rates of electric consumption and reducing the growth rates of weather-sensitive peak demand; increasing the overall efficiency and cost effectiveness of electricity and natural gas production and use; encouraging further development of cogeneration facilities; and conserving expensive resources, particularly petroleum fuels.

Counsel believes that FPL and other utilities have done an excellent job of arguing statutory construction principles to indicate that only the Ratepayer Impact Test applies and that the Legislature did not intend to accomplish greater encouragement of self-service wheeling. FPL has forwarded a transcript of the points of a compromise offered by Senator Jennings which was to represent "status quo" on self-service wheeling as found in the FPSC rule.

However, counsel also is unconvinced that the Legislature did not intend <u>some</u> encouragement -- however limited -- of self-service wheeling. The Senate bill analysis indicated such an intent to encourage it. Granted, the legislation did change to less encouraging verbiage after it reached the Senate floor.

Also, counsel is aware of another basic tenet of statutory construction: that where it is in any way possible, statutes should be read <u>in harmony</u>. In other words, rather than looking for one statute to pre-empt another statute, one should attempt to resolve disparities without preempting either statute. Counsel believes it is possible -- although, admittedly difficult -- to do this.

The way to do this is to leave the rule and a manual as a neutral reporting format only. It does not automatically bounce or reject a program -- conservation or cogeneration. Instead, it provides the analytical basis for the Commission to make a fair, rational judgment call.

In addition to the Rate Impact and Total Resource Tests, the manual states the following will be considered by the Commission in its determination of the cost-effectiveness of self-service wheeling proposals: the type of fuel used; the fuel efficiency; the likelihood of a cogenerator building its own transmission line; and the materiality of any lost revenues indicated by the Rate

Impact Test. These factors should help better assess the overall societal impact of self-service wheeling proposals, pursuant to the legislative intent in the Florida Energy Efficiency and Conservation Act (FEECA).

ALTERNATIVE RECOMMENDATION: The Ratepayer Impact Test most closely follows the statutory direction.

ALTERNATIVE STAFF ANALYSIS: The Ratepayer Impact Test most closely follows the statutory guidance in section 366.051, Florida Statutes. The statute states that the Commission should approve self-service wheeling if it is not likely to result in higher cost electric service to the utility's general body of wholesale and retail customers.

This could have the result that no self-service wheeling is approved, according to commenters at the rule hearing. See attached summary of arguments pro and con by utilities and cogenerators in this matter. (Attachment B)

ISSUE 4: Should an oral argument be scheduled for the legal issue of the statutory treatment of self-service wheeling?

RECOMMENDATION: If the Commission wishes to hear a legal debate on the self-service wheeling treatment, an oral argument could be scheduled.

STAFF ANALYSIS: While technical witnesses presented their views on the matter of treatment of self-service wheeling, it may prove helpful to have attorneys for utilities and cogenerators debate the statutory issues. A July 1, 1991, date is available.

ISSUE 5: Should Interruptible and Curtailable rates be addressed in this rule?

RECOMMENDATION: No.

STAFF ANALYSIS: The proposed rule and manual do not address interruptible and curtailable rates. There is currently another docket (Docket No. 900739-EI) that is considering the entire subject of non-firm electric service. However, the manual provides that nothing in the proposed rule and manual precludes the Commission from applying the methodologies therein described to such non-firm load after explicit consideration of the matter by the Commission in a proceeding.

ISSUE 6: Should avoided capacity costs be based on a normal revenue requirements or value of deferral method of calculation?

RECOMMENDATION: The normal revenue requirements method should be used except in the case where the life of the program is shorter than the life of the avoided unit. In that case, both methods will be used.

STAFF ANALYSIS: When the demand reduction achieved by a program cannot be reasonably projected to extend for the life of the avoided generating unit, the effect of the program is to defer the unit for a specified number of years rather than completely avoid the unit. In that case, the value of deferral method of calculating avoided capacity benefits shall be used in addition to the normal revenue requirements method.

ISSUE 7: Should the Commission take final agency action and adopt the rule and manual, and close this docket once they are filed with the Department of State?

RECOMMENDATION: Yes.

STAFF ANALYSIS: There is no need for this docket to remain open after the rule and manual become effective.

CBM:prl:0046
Attachments

(Substantial rewording of Rule 25-17.008. See Florida Administrative Code for present text.)

25-17.008 Conservation and Self-Service Wheeling Cost Effectiveness Data Reporting Format.

(1) This rule applies to all electric utilities, as addressed by section 366.82, F.S., whenever an evaluation of the cost effectiveness of an existing, new or modified demand side conservation program is required by the Commission and to all public utilities, as addressed by section 366.051, F.S., whenever an evaluation of the cost effectiveness of a self-service wheeling proposal is required by the Commission. For the purpose of this rule, self-service wheeling means transmission or distribution service provided by a public utility to enable a retail customer to transmit electrical power generated by the customer at one location to the customer's facilities at another location.

(2) The purpose of this rule is to establish minimum filing requirements for reporting cost effectiveness data for any demand side conservation program proposed by an electric utility pursuant to Rule 25-17.002 and for any self-service wheeling proposal made by a qualifying facility or public utility pursuant to Rule 25-17.0882.

(3) For the purpose of this rule, the Commission adopts and incorporates by reference the publication "Florida Public Service Commission Cost Effectiveness Manual For Demand Side Management Programs and Self-Service Wheeling Proposals" (/ /91).

CODING: Words underlined are additions; words in ~~struck through~~ type are deletions from existing law.

(4) Nothing in this rule shall be construed as prohibiting any party from providing additional data proposing additional formats for reporting cost effectiveness data.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.82(1)-(4), 366.051, F.S.

History: New 11/28/82, formerly 25-17.08, Amended _____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

COST EFFECTIVENESS MANUAL

FOR

DEMAND SIDE MANAGEMENT PROGRAMS

AND

SELF SERVICE WHEELING PROPOSALS

Florida Public Service Commission

Tallahassee, Florida

Revision 9, May 30, 1991

TABLE OF CONTENTS

SECTION I. INTRODUCTION

This manual describes the minimum data requirements for the cost-effectiveness analyses used by the Florida Public Service Commission (FPSC) to evaluate utility proposed conservation programs, direct load control programs, and self-service wheeling proposals. The use of this manual is authorized by FPSC Rule 25-17.008, F.A.C.

Chapter 366.82, Florida Statutes, requires the FPSC to review and approve cost effective utility conservation programs. In addition, Chapter 366.051, Florida Statutes, requires public utilities to provide wheeling for self-service customers if such wheeling is not likely to result in higher cost electric service to the utility's general body of retail and wholesale customers or adversely affect the adequacy or reliability of electric service to all customers. FPSC Rule 25-17.008 and this manual were adopted as part of the implementation of these Statutes.

There are three tests contained in this manual: the Total Resource Test, the Participants Test, and the Rate Impact Test. In evaluating conservation and direct load control programs, the Commission will review the results of all three tests to determine cost-effectiveness. However, because of the specific language in Chapter 366.051 F.S., only the Rate Impact Test will be reviewed to determine the cost-effectiveness of self-service wheeling proposals.

[Alternate to previous paragraph: There are three tests contained in this manual: the Total Resource Test, the Participants Test, and the Rate Impact Test. In evaluating conservation and direct load control programs, the Commission will review the results of all three tests to determine cost-effectiveness. The Rate Impact and Total Resource tests used for self-service wheeling projects are similar to those used for conservation and load control programs. A Participants Test is not specified for self-service wheeling since it is assumed that the proposal is cost-effective to the party requesting the wheeling. In addition to the Rate Impact and Total Resource tests, there are additional considerations listed for self-service wheeling projects.]

Figure 1 is a pictorial comparison of the three cost effectiveness analyses set forth in this manual. Only very broad categories of costs and benefits are depicted so that the conceptual differences may be seen at a glance. The detailed definitions and applicable formulas are found in the manual proper.

The calculation of demand-reduction benefits for cost-effectiveness analyses performed under FPSC Rule 25-17.008 shall be on a revenue requirements basis for all programs under consideration. However, when the demand reduction achieved by a program cannot be reasonably projected to extend for the life of the avoided generating unit, the demand-reduction benefits shall also be calculated on a value of deferral basis.

The term "avoided generating unit" as used in this manual refers to a utility's proposed generating unit that is avoided in whole or in part by the demand-side management program. Avoided capacity charges shall be used in lieu of avoided generating unit costs, where appropriate, to determine cost effectiveness. Use of avoided capacity charges in lieu of avoided generating unit costs may be particularly appropriate by nongenerating utilities, wholesale power purchasers, or members of a power pool arrangement.

This manual does not address interruptible and curtailable load. However, nothing herein shall preclude the Commission from applying this methodology to such non-firm load after explicit consideration of the matter by the Commission in a proceeding.

The delineation of the various ways of expressing test results is not meant to discourage the continued development of additional variations for expressing cost-effectiveness.

cetest1.wk

COMPARISON OF COST EFFECTIVENESS TESTS

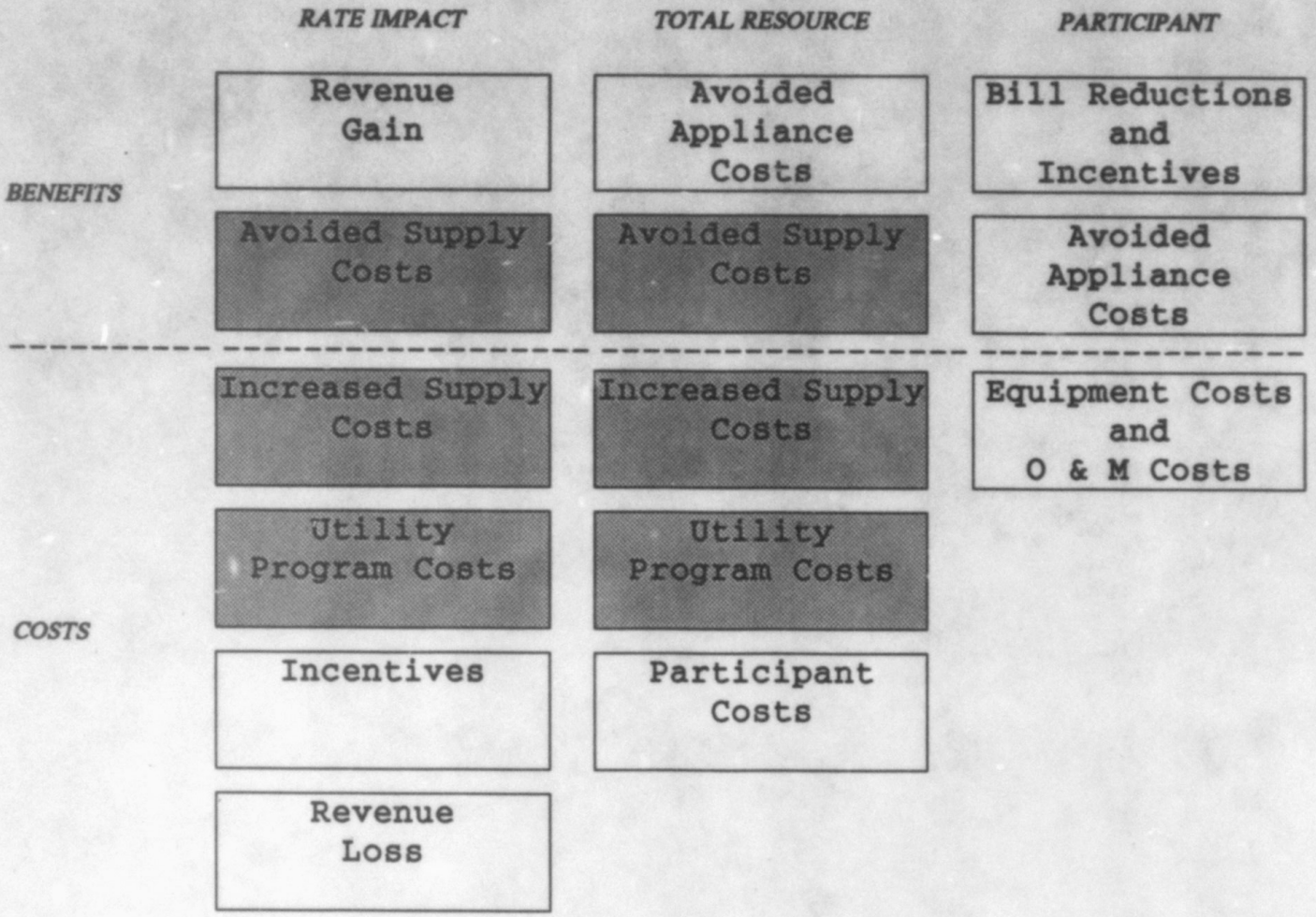

Figure 1

SECTION II. CONSERVATION AND DIRECT LOAD CONTROL

This Section describes the cost effectiveness tests that are required for conservation and direct load control programs. Three separate tests are defined. These are: the Total Resource Test, the Participants Test, and the Rate Impact Test.

The following information is provided for each test: (1) a definition; (2) the components of the benefits; (3) the components of the costs; (4) the formulas to be used to express the results in acceptable ways; and (5) the reporting format.

TOTAL RESOURCE COST TEST

DEFINITION:

The Total Resource Cost Test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs. This test may be turned into a Societal Test by excluding tax credit benefits, by including costs and benefits of externalities, and by using a societal discount rate, assuming that the costs and benefits of externalities are quantifiable.

GENERAL DESCRIPTION OF BENEFITS:

The benefits are the avoided supply costs, including avoided generation, transmission, and distribution costs. The avoided supply costs should be calculated using net savings, i.e., savings net of changes in energy use that would have happened in the absence of the program. Benefits include avoided supply costs for energy-using equipment not chosen by the participant.

GENERAL DESCRIPTION OF COSTS:

The costs are the program costs incurred by the utility and any increased supply costs. All equipment costs, installation, operation and maintenance, and administration costs, no matter who pays for them, are included in this test.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of program benefits
C_{npv} is the net present value of program costs
B_t are the total program benefits for year t
C_t are the total program costs for year t
D is 1 + the discount rate for the utility
n is the life of the program

B_t is further defined as follows:

$$B_t = AG_t + AT_t + AD_t + FS_t + TC_t + OB_t$$

where

AG_t are the avoided generation benefits
AT_t are the avoided transmission benefits
AD_t are the avoided distribution benefits
FS_t are the fuel savings from decreased sales
TC_t are any tax credits
OB_t are any other quantifiable benefits

AG_t is further defined as follows:

$$AG_t = AC_t + AO_t + AF_t - RF_t$$

where

AC_t are avoided unit capacity costs
AO_t are avoided unit O&M costs
AF_t are avoided unit fuel costs
RF_t are replacement fuel costs

AC_t may be calculated for either the Value of Deferral or Revenue Requirements Methodology.

For the purpose of the Revenue Requirements Methodology, AC_t is further defined as follows:

AC_t = 0 before the in-service year

$AC_t = CC * GPR_t * GKW\ Red_t$

where

CC is the avoided in-service year capacity costs including AFUDC

GPR_t is the revenue requirement in percent of capital cost
$GKW\ Red_t$ is the number of Kilowatts of plant avoided

where

GPR_t is the Annual Revenue Requirement factor which is calculated on PSC Form CE 1.1A, by taking annual total fixed charges (Column 10) divided by in-service cost.

GKW Red = Cumulative Total Participating Customers x KW Red

Cumulative Total Participating Customers is defined on PSC Form CE 1.2, Input Data -- Part 2, Col (3).

KW Red is defined in Section IV, PSC Cost Effectiveness Forms, PSC Form CE 1.1, Input Data -- Part 1.

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, and the Revenue Requirement factor for transmission and distribution plant may differ from that of the avoided generating unit.

For the purpose of applying the Value of Deferral Methodology, AC_t is defined as follows:

$AC_t = 0$ before the in-service year

$AC_t = K*CC*(1-R)/(1-R^N)$ for the in-service year

$AC_t = AC_{t-1}*(1+E_p)$ after the in-service year

where

N is the economic life of the avoided generating unit
K is the present value of carrying charges for one dollar of investment over N years
CC is the avoided in-service-year capacity costs including AFUDC
E_p is the plant cost escalation rate

$R = (1+E_p)/D$

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, K factor, and plant escalation rate for transmission and distribution plant may differ from that of the avoided generating unit.

C_t is further defined as follows:

$$C_t = IS_t + UC_t + PC_t + OC_t$$

where

IS_t are any increased supply costs
UC_t are utility program costs
PC_t are participant program costs
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the program is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 1.1, 1.1A, 1.1B, 1.2

Output: PSC Forms CE 2.1, 2.2, 2.3

PARTICIPANTS TEST

DEFINITION:

The Participants Test measures the impact of the program on the participating customers.

GENERAL DESCRIPTION OF BENEFITS:

The benefits include the reductions in the customers' bills, incentives paid by the utility or other third party, and any tax credits received. Savings estimates should be based on gross energy savings as opposed to net energy savings. (Net savings are gross savings minus savings that would have occurred even in the absence of the program.)

For fuel substitution programs, benefits include the avoided capital and operating costs of the equipment not chosen. For load building programs, benefits include any increases in productivity or services attributable to the load building program.

GENERAL DESCRIPTION OF COSTS:

The costs include increases in the customers' bills, equipment and materials purchased, ongoing operation and maintenance costs and any equipment removal costs.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of program benefits
C_{npv} is the net present value of program costs
B_t are the total program benefits for year t
C_t are the total program costs for year t
D is 1 + the discount rate for part. customers
n is the life of the program

B_t is further defined as follows:

$$B_t = BS_t + TC_t + UR_t + OB_t$$

where

BS_t are savings in customer bills
TC_t are any tax credits
UR_t are utility rebates or incentives
OB_t are any other quantifiable benefits

C_t is further defined as follows:

$$C_t = EC_t + CM_t + OC_t$$

where

EC_t are customer equipment costs
CM_t are customer O&M costs
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the program is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 1.1, 1.2

Output: PSC Forms CE 2.4

RATE IMPACT TEST

DEFINITION:

The Rate Impact Test is an indirect measure of the impact on customer rates caused by the program. Rates will go down more than they otherwise would have if the change in utility revenues minus the change in utility costs is positive. Rates will go up more than they otherwise would have if the change in utility revenues minus the change in utility costs is negative.

GENERAL DESCRIPTION OF BENEFITS:

The benefits are the avoided supply costs, including avoided generation, transmission, and distribution costs. The benefits also include any increased revenues generated by the program. Reductions in supply costs and revenue increases should be calculated using net energy savings. (Net savings are gross savings minus savings that would have occurred even in the absence of the program.)

GENERAL DESCRIPTION OF COSTS:

The costs include the program costs incurred by the utility, the incentives paid to participants, and increased supply costs. The costs also include any decrease in revenues caused by the program.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of program benefits
C_{npv} is the net present value of program costs
B_t are the total program benefits for year t
C_t are the total program costs for year t
D is 1 + the discount rate for the utility
n is the life of the program

B_t is further defined as follows:

$$B_t = AG_t + AT_t + AD_t + FS_t + IR_t + OB_t$$

where

AG_t are the avoided generation benefits
AT_t are the avoided transmission benefits
AD_t are the avoided distribution benefits
FS_t are the fuel savings from decreased sales
IR_t are any increased revenues
OB_t are any other quantifiable benefits

AG_t is further defined as follows:

$$AG_t = AC_t + AO_t + AF_t - RF_t$$

where

AC_t are avoided unit capacity costs
AO_t are avoided unit O&M costs
AF_t are avoided unit fuel costs
RF_t are replacement fuel costs

AC_t may be calculated for either the Value of Deferral or Revenue Requirements Methodology.

For the purpose of the Revenue Requirements Methodology, AC_t is further defined as follows:

AC_t = 0 before the in-service year

$AC_t = CC * GPR_t * GKW\ Red_t$

where

CC is the avoided in-service year capacity costs including AFUDC
GPR_t is the revenue requirement in percent of capital cost
$GKW\ Red_t$ is the number of Kilowatts of plant avoided

where

GPR_t is the Annual Revenue Requirement factor which is calculated on PSC Form CE 1.1A, by taking annual total fixed charges (Column 10) divided by in-service cost.

GKW Red = Cumulative Total Participating Customers x KW Red

Cumulative Total Participating Customers is defined on PSC Form CE 1.2, Input Data -- Part 2, Col (3).

KW Red is defined in Section IV, PSC Cost Effectiveness Forms, PSC Form CE 1.1, Input Data -- Part 1.

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, and the Revenue Requirement factor for transmission and distribution plant may differ from that of the avoided generating unit.

For the purpose of applying the Value of Deferral Methodology, AC_t is defined as follows:

$AC_t = 0$ before the in-service year

$AC_t = K*CC*(1-R)/(1-R^N)$ for the in-service year

$AC_t = AC_{t-1}*(1+E_p)$ after the in-service year

where

N is the economic life of the avoided generating unit
K is the present value of carrying charges for one dollar of investment over N years
CC is the avoided in-service-year capacity costs including AFUDC
E_p is the plant escalation rate
$R = (1+E_p)/D$

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, K factor, and plant escalation rate for transmission and distribution plant may differ from that of the avoided generating unit.

C_t is further defined as follows:

$C_t = IS_t + LR_t + UC_t + UR_t + OC_t$

where

IS_t are any increased supply costs
LR_t are lost revenues from reduced sales
UC_t are utility program costs
UR_t are utility rebates/incentives for participants.
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the program is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 1.1, 1.1A, 1.1B, 1.2

Output: PSC Forms CE 2.1, 2.2, 2.5, 2.5S

SECTION III. SELF-SERVICE WHEELING

This Section describes the prescribed cost effectiveness test for self-service wheeling proposals. A self-service wheeling proposal is one where a utility retail customer proposes to generate power at one of its locations and have it delivered to another of its locations through the utility's transmission or distribution system. Chapter 366.051, Florida Statutes, requires public utilities to provide wheeling for self-service customers if such wheeling is not likely to result in higher cost electric service to the utility's general body of retail and wholesale customers. Therefore, the test used here is similar to the Rate Impact Test used for conservation and load control programs. The reason for a separate section is that there are costs and benefits unique to cogeneration facilities, such as supplemental and standby purchases.

RATE IMPACT TEST FOR SELF-SERVICE WHEELING

DEFINITION:

The Rate Impact Test for Self-Service Wheeling is an indirect measure of the impact on customer rates caused by the wheeling proposal. Rates will go down more than they otherwise would have if the change in utility revenues minus the change in utility costs is positive. Rates will go up more than they otherwise would have if the change in utility revenues minus the change in utility costs is negative.

GENERAL DESCRIPTION OF BENEFITS:

The benefits include avoided generation, transmission, and distribution costs, and any increased revenues, such as wheeling revenues and increased standby revenues, generated by the proposed project.

GENERAL DESCRIPTION OF COSTS:

The costs include any decrease in revenues caused by the program and any increased supply costs. When marginal fuel cost is less than average fuel cost, the decrease in sales will cause an increase in average fuel cost that must be borne by the remaining customers. Costs also include loss of fixed plant costs collected through demand or non-fuel energy charges.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of benefits
C_{npv} is the net present value of costs
B_t are the total benefits for year t
C_t are the total costs for year t
D is 1 + the discount rate for the utility
n is the life of the program

B_t is further defined as follows:

$$B_t = AG_t + AT_t + AD_t + IR_t + FS_t + OB_t$$

where

AG_t are the avoided generation benefits
AT_t are the avoided transmission benefits
AD_t are the avoided distribution benefits
IR_t are the increased revenues
FS_t are the net fuel savings
OB_t are any other quantifiable benefits

AG_t is further defined as follows:

$$AG_t = AC_t + AO_t + AF_t - RF_t$$

where

AC_t are avoided unit capacity costs
AO_t are avoided unit O&M costs
AF_t are avoided unit fuel costs
RF_t are replacement fuel costs

AC_t may be calculated for either the Value of Deferral or Revenue Requirements Methodology.

For the purpose of the Revenue Requirements Methodology, AC_t is further defined as follows:

AC_t = 0 before the in-service year

$AC_t = CC * GPR_t * GKW\ Red_t$

where

CC is the avoided in-service year capacity costs including AFUDC
GPR_t is the revenue requirement in percent of capital cost
$GKW\ Red_t$ is the number of Kilowatts of plant avoided

where

GPR_t is the Annual Revenue Requirement factor which is calculated on PSC Form CE 1.1A, by taking annual total fixed charges (Column 10) divided by in-service cost.

GKW Red = Cumulative Total Participating Customers x KW Red

Cumulative Total Participating Customers is defined on PSC Form CE 1.2, Input Data -- Part 2, Col (3).

KW Red is defined in Section IV, PSC Cost Effectiveness Forms, PSC Form CE 1.1, Input Data -- Part 1.

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, and the Revenue Requirement factor for transmission and distribution plant may differ from that of the avoided generating unit.

For the purpose of applying the Value of Deferral Methodology, AC_t is defined as follows:

$AC_t = 0$ before the in-service year

$AC_t = K*CC*(1-R)/(1-R^N)$ for the in-service year

$AC_t = AC_{t-1}*(1+E_p)$ after the in-service year

where

N is the tax life of the avoided generating unit
K is the present value of carrying charges for one dollar of investment over N years
CC is the avoided in-service-year capacity costs including AFUDC
E_p is the plant escalation rate
$R = (1+E_p)/D$

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, K factor, and plant escalation rate for transmission and distribution plant may differ from that of the avoided generating unit.

C_t is further defined as follows:

$$C_t = FC_t + LR_t + OC_t$$

where

FC_t are net increase in fuel costs
LR_t are lost revenues from reduced sales
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the program is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 3.1, 1.1A, 1.1B, 3.2

Output: PSC Forms CE 2.1, 2.2, 3.3, 3.3S

ALTERNATE SECTION III. SELF-SERVICE WHEELING

This Section describes the prescribed cost effectiveness tests for self-service wheeling proposals. The reason for a separate section is that there are costs and benefits unique to cogeneration facilities, such as supplemental and standby purchases.

A self-service wheeling proposal is one where a utility retail customer proposes to generate power at one of its locations and have it delivered to another of its locations through the utility's transmission or distribution system. Chapter 366.051, Florida Statutes, requires public utilities to provide wheeling for self-service customers if such wheeling is not likely to result in higher cost electric service to the utility's general body of retail and wholesale customers.

The Rate Impact and Total Resource tests used here are similar to those used for conservation and load control programs. No Participants Test is specified since it is assumed that the proposal is cost-effective to the party requesting the wheeling. In addition to the Rate Impact and Total Resource tests, there are additional considerations listed for self-service wheeling projects.

RATE IMPACT TEST FOR SELF-SERVICE WHEELING

DEFINITION:

The Rate Impact Test for Self-Service Wheeling is an indirect measure of the impact on customer rates caused by the wheeling proposal. Rates will go down more than they otherwise would have if the change in utility revenues minus the change in utility costs is positive. Rates will go up more than they otherwise would have if the change in utility revenues minus the change in utility costs is negative.

GENERAL DESCRIPTION OF BENEFITS:

The benefits include avoided generation, transmission, and distribution costs, and any increased revenues, such as wheeling revenues and increased standby revenues, generated by the proposed project.

GENERAL DESCRIPTION OF COSTS:

The costs include any decrease in revenues caused by the program and any increased supply costs. When marginal fuel cost is less than average fuel cost, the decrease in sales will cause an increase in average fuel cost that must be borne by the remaining customers. Costs also include loss of fixed plant costs collected through demand or non-fuel energy charges.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of benefits
C_{npv} is the net present value of costs
B_t are the total benefits for year t
C_t are the total costs for year t
D is 1 + the discount rate for the utility
n is the life of the program

B_t is further defined as follows:

$$B_t = AG_t + AT_t + AD_t + IR_t + FS_t + OB_t$$

where

AG_t are the avoided generation benefits
AT_t are the avoided transmission benefits
AD_t are the avoided distribution benefits
IR_t are the increased revenues
FS_t are the net fuel savings
OB_t are any other quantifiable benefits

AG_t is further defined as follows:

$$AG_t = AC_t + AO_t + AF_t - RF_t$$

where

AC_t are avoided unit capacity costs
AO_t are avoided unit O&M costs
AF_t are avoided unit fuel costs
RF_t are replacement fuel costs

AC_t may be calculated for either the Value of Deferral or Revenue Requirements Methodology.

For the purpose of the Revenue Requirements Methodology, AC_t is further defined as follows:

AC_t = 0 before the in-service year

AC_t = CC * GPR_t * GKW Red_t

where

CC is the avoided in-service year capacity costs including AFUDC
GPR_t is the revenue requirement in percent of capital cost
GKW Red_t is the number of Kilowatts of plant avoided

where

GPR_t is the Annual Revenue Requirement factor which is calculated on PSC Form CE 1.1A, by taking annual total fixed charges (Column 10) divided by in-service cost.

GKW Red = Cumulative Total Participating Customers x KW Red

Cumulative Total Participating Customers is defined on PSC Form CE 1.2, Input Data -- Part 2, Col (3).

KW Red is defined in Section IV, PSC Cost Effectiveness Forms, PSC Form CE 1.1, Input Data -- Part 1.

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, and the Revenue Requirement factor for transmission and distribution plant may differ from that of the avoided generating unit.

For the purpose of applying the Value of Deferral Methodology, AC_t is defined as follows:

AC_t = 0 before the in-service year

$AC_t = K*CC*(1-R)/(1-R^N)$ for the in-service year

$AC_t = AC_{t-1}*(1+E_p)$ after the in-service year

where

N is the tax life of the avoided generating unit
K is the present value of carrying charges for one dollar of investment over N years
CC is the avoided in-service-year capacity costs including AFUDC
E_p is the plant escalation rate
$R = (1+E_p)/D$

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, K factor, and plant escalation rate for transmission and distribution plant may differ from that of the avoided generating unit.

C_t is further defined as follows:

$$C_t = FC_t + LR_t + OC_t$$

where

FC_t are net increase in fuel costs
LR_t are lost revenues from reduced sales
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the program is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 3.1, 1.1A, 1.1B, 3.2

Output: PSC Forms CE 2.1, 2.2, 3.3, 3.3S

TOTAL RESOURCE TEST FOR SELF-SERVICE WHEELING

DEFINITION:

The Total Resource Cost Test measures the net costs of a self-service wheeling project as a resource option based on the total costs of the project, including both the participants' and the utility's costs. This test may be turned into a Societal Test by excluding tax credit benefits, by including costs and benefits of externalities, and by using a societal discount rate, assuming that the costs and benefits of externalities are quantifiable.

GENERAL DESCRIPTION OF BENEFITS:

The benefits are the avoided supply costs, including avoided generation, transmission, and distribution costs.

GENERAL DESCRIPTION OF COSTS:

The costs are the project costs incurred by the utility and any increased supply costs. All equipment costs, installation, operation and maintenance, and administration costs, no matter who pays for them, are included in this test.

FORMULAS:

B_{npv} = Sum of (B_t / D^{t-1}) for t = 1 to n

C_{npv} = Sum of (C_t / D^{t-1}) for t = 1 to n

where

B_{npv} is the net present value of project benefits
C_{npv} is the net present value of project costs
B_t are the total project benefits for year t
C_t are the total project costs for year t
D is 1 + the discount rate for the utility
n is the life of the project

B_t is further defined as follows:

$$B_t = AG_t + AT_t + AD_t + FS_t + TC_t + OB_t$$

where

AG_t are the avoided generation benefits

AT_t are the avoided transmission benefits
AD_t are the avoided distribution benefits
FS_t are the fuel savings from decreased sales
TC_t are any tax credits
OB_t are any other quantifiable benefits

AG_t is further defined as follows:

$$AG_t = AC_t + AO_t + AF_t - RF_t$$

where

AC_t are avoided unit capacity costs
AO_t are avoided unit O&M costs
AF_t are avoided unit fuel costs
RF_t are replacement fuel costs

AC_t may be calculated for either the Value of Deferral or Revenue Requirements Methodology.

For the purpose of the Revenue Requirements Methodology, AC_t is further defined as follows:

AC_t = 0 before the in-service year

$AC_t = CC * GPR_t * GKW\ Red_t$

where

CC is the avoided in-service year capacity costs including AFUDC
GPR_t is the revenue requirement in percent of capital cost
$GKW\ Red_t$ is the number of Kilowatts of plant avoided

where

GPR_t is the Annual Revenue Requirement factor which is calculated on PSC Form CE 1.1A, by taking annual total fixed charges (Column 10) divided by in-service cost.

GKW Red = Cumulative Total Participating Customers x KW Red

Cumulative Total Participating Customers is defined on PSC Form CE 1.2, Input Data -- Part 2, Col (3).

KW Red is defined in Section IV, PSC Cost Effectiveness Forms, PSC Form CE 1.1,

Input Data -- Part 1.

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, and the Revenue Requirement factor for transmission and distribution plant may differ from that of the avoided generating unit.

For the purpose of applying the Value of Deferral Methodology, AC_t is defined as follows:

$AC_t = 0$ before the in-service year

$AC_t = K*CC*(1-R)/(1-R^N)$ for the in-service year

$AC_t = AC_{t-1}*(1+E_p)$ after the in-service year

where

N is the economic life of the avoided generating unit
K is the present value of carrying charges for one dollar of investment over N years
CC is the avoided in-service-year capacity costs including AFUDC
E_p is the plant cost escalation rate

$R = (1+E_p)/D$

AT_t and AD_t, avoided transmission plant and avoided distribution plant, are defined similarly to AC_t. The in-service year, the economic life, K factor, and plant escalation rate for transmission and distribution plant may differ from that of the avoided generating unit.

C_t is further defined as follows:

$C_t = IS_t + UC_t + PC_t + OC_t$

where

IS_t are any increased supply costs
UC_t are utility program costs
PC_t are participant program costs
OC_t are other quantifiable costs

If $B_{npv} > C_{npv}$ the project is cost effective.

REPORTING FORMAT:

Input: PSC Forms CE 1.1, 1.1A, 1.1B, 1.2

Output: PSC Forms CE 2.1, 2.2, 2.3

OTHER CONSIDERATIONS

In addition to the Rate Impact and Total Resource tests, the following will be considered by the Commission in its determination of the cost-effectiveness of self-service projects:

(1) The type of fuel used at the cogeneration project.

(2) The fuel efficiency of the project.

(3) The likelihood of a cogenerator building its own transmission line to its other location.

(4) The materiality of any lost revenues indicated by the Rate Impact test.

SECTION IV. FPSC COST EFFECTIVENESS FORMS

This Section contains the forms to be used in conjunction with the tests discussed in the previous sections of this manual. The following list contains the FPSC Form designation, the name of the FPSC Form, and a brief description of each form. This is followed by sample forms to be used, showing column headings and other pertinent information.

PSC FORM CE 1.1 Input Data -- Part 1

This form, along with PSC FORM CE 1.2, specifies the input data to be used in the cost-effectiveness test for conservation and direct load control programs. Each element on the form is defined below:

I.(1) Customer KW Reduction at Meter

This is the maximum load reduction in kilowatts at the customer's meter.

I.(2) Generator KW Reduction Per Customer

This input is developed by taking into account such factors as reliability, line losses and customer diversity. A crude, but acceptable, method of calculating the KW reduction is to use the following formula:

$$\text{KW Red} = [DS_w(\text{WLOLP}) + DS_s(\text{SLOLP})] \,/\, [(\text{ALOLP})(1\text{-FOR})(1\text{-DL})]$$

where

DS_w is the demand saving at winter peak
DS_s is the demand saving at summer peak
WLOLP is the winter seasonal LOLP
SLOLP is the summer seasonal LOLP
ALOLP is the annual LOLP
FOR is the forced outage rate
DL is the kw line loss factor

and

$$(\text{WLOLP} + \text{SLOLP}) \,/\, \text{ALOLP} = 1$$

I.(3) KW Line Loss Percentage

This is the percentage reduction in KW from the generator to the customer.

I.(4) Generation KWH Reduction Per Customer

This is the annual KWH reduction given by the following formula:

$KWH\ Red = KWH_m / (1 - EL)$

where

KWH_m is the KWH reduction at the customer's meter
EL is the energy line loss factor to account for losses from the generator to the customer location

I.(5) KWH Line Loss Percentage

This is the percentage reduction in KWH from the generator to the customer.

I.(6) Group Line Loss Multiplier

This is a factor used to take into account the fact that various groups of customers receive service at different voltage levels. It is used to adjust the fuel cost calculation for participating customers.

I.(7) Customer KWH Increase at Meter

For conservation programs, this input would normally be zero. But, for other programs such as thermal storage, there may be an increase in KWH during off-peak periods.

II.(1) Study Period for the Conservation Program

This is the economic life of the conservation program, and will generally be less than or equal to the life of the unit to be avoided.

II.(2) Generator Economic Life

This is the economic life of the avoided generating unit.

II.(3) Transmission and Distribution Economic Life

This is the economic life of the avoided transmission and distribution facilities.

II.(4) K Factor for Generation

This is the present value of carrying charges for a $1 investment over the life of the generating unit. PSC FORM CE 1.1A must be filed showing in detail the calculation of this factor.

II.(5) K Factor for Transmission and Distribution

This is the present value of carrying charges for a $1 investment over the life of the avoided transmission and distribution facilities. PSC FORM CE 1.1A must be filed showing in detail the calculation of this factor.

III.(1) Utility Nonrecurring Cost per Customer

This represents nonrecurring costs in the base year that would be incurred by the utility, such as a one-time customer rebate.

III.(2) Utility Recurring Cost per Customer

This represents recurring costs in the base year that would be incurred by the utility, such as O&M costs associated with the installed equipment.

III.(3) Utility Cost Escalation Rate

This rate is used to escalate the costs identified in III.(2). Normally, this rate would be close to the rate at which the Consumer Price Index is projected to increase.

NOTE: As an alternative, annual program costs may be specified for each year on the appropriate FORM, but detailed documentation must be attached to show how these costs were computed.

III.(4) Customer Equipment Cost

This is the base year cost for equipment incurred by each customer when the program is selected.

III.(5) Customer Equipment Cost Escalation Rate

This rate is used to escalate the costs identified in III.(4). Normally, this rate would be close to the rate at which the Consumer Price Index is projected to increase.

NOTE: As an alternative, annual customer equipment costs may be specified for each year on the appropriate FORM, but detailed documentation must be attached to show how these costs were computed.

III.(6) Customer O&M Cost

This is the base year cost for O&M incurred by each participating customer.

III.(7) Customer O&M Cost Escalation Rate

This rate is used to escalate the costs identified in III(6). Normally, this rate would be close to the rate at which the Consumer Price Index is projected to increase.

NOTE: As an alternative, annual O&M costs may be specified for each year on the appropriate FORM, but detailed documentation must be attached to show how these costs were computed.

IV.(1) Base Year

This is the reference year for the present worth analyses and the first year for recording costs and benefits of the program.

IV.(2) In-Service Year for Avoided Generator Unit

This is the in-service year of the generating unit to be avoided or deferred by the conservation program.

IV.(3) In-Service Year for Avoided T&D

This is the in-service year of the transmission and distribution facilities to be avoided or deferred by the conservation program.

IV.(4) Base Year Avoided Generating Unit Cost

This is the base year cost in dollars per kilowatt of the generating unit to be avoided or deferred by the conservation program. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the unit in the in-service year, including AFUDC.

IV.(5) Base Year Avoided Transmission Cost

This is the base year cost in dollars per kilowatt of the transmission facilities to be avoided or deferred by the conservation program. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the facilities in the

in-service year, including AFUDC.

IV.(6) Base Year Avoided Distribution Cost

This is the base year cost in dollars per kilowatt of the distribution facilities to be avoided or deferred by the conservation program. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the facilities in the in-service year, including AFUDC.

IV.(7) Gen, Tran, and Dist Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in IV.(4) through IV.(6).

IV.(8) Generator Fixed O&M Costs

This is the annual fixed O&M costs for the generating unit to be avoided or deferred, stated in $/KW/Year.

IV.(9) Generator Fixed O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in IV.(8).

IV.(10) Transmission Fixed O&M Costs

This is the annual fixed O&M costs for the transmission facilities to be avoided or deferred, stated in $/KW/Year.

IV.(11) Distribution Fixed O&M Costs

This is the annual fixed O&M costs for the distribution facilities to be avoided or deferred, stated in $/KW/Year.

IV.(12) Trans and Distr Fixed O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in IV.(10) and IV.(11).

IV.(13) Avoided Generating Unit Variable O&M Costs

This is the base year variable O&M costs for the generating unit to be avoided or deferred, stated in cents/KWH.

IV.(14) Generator Variable O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in IV.(13).

IV.(15) Generator Capacity Factor

This is the projected capacity factor of the generating unit to be avoided or deferred.

IV.(16) Avoided Generating Unit Fuel Cost

This is the base year fuel costs for the generating unit to be avoided or deferred, stated in cents/KWH.

IV.(17) Avoided Generating Unit Fuel Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in IV.(16).

V.(1) Non Fuel Cost in Customer Bill

This is the base year non fuel charge in the participating customer's bill in cents per KWH.

V.(2) Non Fuel Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in V.(1).

V.(3) Demand Charge in Customer Bill

This is the base year demand charge in the participating customer's bill in $/KW/Month. This would be zero for residential customers.

V.(4) Demand Charge Escalation Rate

This is the escalation rate to be used in escalating the costs in V.(3).

FORM1_1.WK1

INPUT DATA -- PART 1
PROGRAM: LOAD MGMT.

PSC FORM CE 1.1
PAGE 1 OF 1
11/28/89

I. PROGRAM DEMAND SAVINGS AND LINE LOSSES

(1) CUSTOMER KW REDUCTION AT METER	1.5 KW
(2) GENERATOR KW REDUCTION PER CUSTOMER	1.69 KW
(3) KW LINE LOSS PERCENTAGE	8 %
(4) GENERATION KWH REDUCTION PER CUSTOMER	250 KWH
(5) KWH LINE LOSS PERCENTAGE	6 %
(6) GROUP LINE LOSS MULTIPLIER	0.98000
(7) CUSTOMER KWH INCREASE AT METER	0 KWH

II. ECONOMIC LIFE AND K FACTORS

(1) STUDY PERIOD FOR CONSERVATION PROGRAM	15 YRS
(2) GENERATOR ECONOMIC LIFE	30 YRS
(3) T & D ECONOMIC LIFE	40 YRS
(4) K FACTOR FOR GENERATION	1.54281
(5) K FACTOR FOR T & D	1.70712

III. UTILITY AND CUSTOMER COSTS

(1) UTILITY NONRECURRING COST PER CUSTOMER	$1,159
(2) UTILITY RECURRING COST PER CUSTOMER	$0
(3) UTILITY COST ESCALATION RATE	5.0 %
(4) CUSTOMER EQUIPMENT COST	$0
(5) CUSTOMER EQUIPMENT COST ESCALATION RATE	5.2 %
(6) CUSTOMER O&M COST	$0
(7) CUSTOMER O&M COST ESCALATION RATE	5.1 %

IV. AVOIDED GENERATOR AND T&D COSTS

(1) BASE YEAR	1990
(2) IN-SERVICE YEAR FOR AVOIDED GENERATING UNIT	1995
(3) IN-SERVICE YEAR FOR AVOIDED T&D	1995
(4) BASE YEAR AVOIDED GENERATING UNIT COST	400 $/KW
(5) BASE YEAR AVOIDED TRANSMISSION COST	133 $/KW
(6) BASE YEAR AVOIDED DISTRIBUTION COST	136 $/KW
(7) GEN, TRANS and DIST COST ESCALATION RATE	5.2 %
(8) GENERATOR FIXED O&M COSTS	2.45 $/KW/YR
(9) GENERATOR FIXED O&M COST ESCALATION RATE	6.1 %
(10) TRANSMISSION FIXED O&M COSTS	1.34 $/KW/YR
(11) DISTRIBUTION FIXED O&M COSTS	1.94 $/KW/YR
(12) T&D FIXED O&M COST ESCALATION RATE	6.0 %
(13) AVOIDED GEN UNIT VARIABLE O&M COSTS	0.8450 Cents/KWH
(14) GENERATOR VARIABLE O&M COST ESCALATION RATE	6.0 %
(15) GENERATOR CAPACITY FACTOR	20 %
(16) AVOIDED GENERATING UNIT FUEL COST	5.044 Cents/KWH
(17) AVOIDED GEN UNIT FUEL COST ESCALATION RATE	5.2 %

IV. NON-FUEL ENERGY AND DEMAND CHARGES

(1) NON-FUEL COST IN CUSTOMER BILL	1.0371 Cents/KWH
(2) NON-FUEL COST ESCALATION RATE	4.0 %
(3) DEMAND CHARGE IN CUSTOMER BILL	5.45 $/KW/MNTH
(4) DEMAND CHARGE ESCALATION RATE	4.0 %

PSC FORM CE 1.1A Calculation of K Factor

This form specifies the data to be used when calculating the K Factor for the avoided generating unit and also for avoided transmission and distribution plant, if applicable. Each element on the form is defined below:

Col (1) Year

The years begin with the in-service year of the avoided unit (or avoided transmission and distribution plant) and extend through the life of the unit (or other avoided plant).

Col (2) Mid-Year Rate Base

This column contains, for each year, the value of the avoided investment at mid year. This is calculated by averaging the beginning-of-year and end-of-year rate bases. The end-of-year rate base is calculated by subtracting straight-line depreciation (Column 9) and deferred taxes (Column 7) from beginning-of-year rate base. See PSC Form CE 1.1A, Page 2 of 2 for this calculation. The beginning-of-year rate base is the in-service cost of the plant calculated on PSC FORM CE 1.1B.

Col (3) Debt

This column contains, for each year, the cost of debt associated with the investment given in Column (2).

Col (4) Preferred Stock

This column contains, for each year, the after-tax cost of preferred stock associated with the investment given in Column (2).

Col (5) Common Equity

This column contains, for each year, the after-tax cost of common equity associated with the investment given in Column (2).

Col (6) Taxes

This column contains, for each year, the taxes associated with the before-tax cost of preferred and common stock.

Col (7) Other Taxes & Insurance

This column contains all taxes and insurance not contained in Column (6).

Col (8) Depreciation

This column contains, for each year, the depreciation costs associated with the in-service cost of the avoided plant.

Col (9) Deferred Taxes

This column contains the deferred taxes for each year. The tax depreciation schedule is given as Page 2 of 2 of PSC FORM CE 1.1A.

Col (10) Total Fixed Charges

This column contains, for each year, the sum of column (3) through column (8).

Col (11) Present Worth Fixed Charges

This column is the present value of the corresponding numbers in the previous column, using the in-service year as the reference year.

Col (12) Cumulative Present Worth Fixed Charges

This column is the year by year accumulation of the numbers in the previous column.

As indicated in the example, this form must also contain the in-service cost of the plant, the book life of the plant, the capital structure, the effective tax rate, and the discount rate used to calculate present worth dollars.

FORM1_1A.WK1
a1..w51

CALCULATION OF K FACTOR
1995 COAL UNIT

PSC FORM CE 1.1A
Page 1 of 2
05/27/91

(1) CALENDAR YEAR	(2) MID-YEAR RATE-BASE ($000)	(3) DEBT ($000)	(4) PREFERRED STOCK ($000)	(5) COMMON EQUITY ($000)	(6) INCOME TAXES ($000)	(7) OTHER TAXES & INSURANCE ($000)	(8) DEPREC. ($000)	(9) DEFERRED TAXES ($000)	(10) TOTAL FIXED CHARGES ($000)	(11) PRESENT WORTH FIXED CHARGES ($000)	(12) CUMULATIVE PW FIXED CHARGES ($000)
1995	787,297	34,295	6,235	52,544	35,464	12,019	26,709	1,257	167,267	167,267	167,267
1996	754,100	32,849	5,972	50,329	33,968	12,019	26,709	11,721	161,847	146,893	314,160
1997	716,486	31,210	5,675	47,818	32,274	12,019	26,709	10,092	155,706	128,262	442,422
1998	680,439	29,640	5,389	45,413	30,650	12,019	26,709	8,585	149,820	112,012	554,433
1999	645,855	28,133	5,115	43,104	29,093	12,019	26,709	7,167	144,174	97,831	652,264
2000	612,628	26,686	4,852	40,887	27,596	12,019	26,709	5,871	138,749	85,451	737,715
2001	580,637	25,293	4,599	38,752	26,155	12,019	26,709	4,694	133,526	74,636	812,351
2002	549,792	23,949	4,354	36,693	24,765	12,019	26,709	3,579	128,490	65,185	877,537
2003	519,595	22,634	4,115	34,678	23,405	12,019	26,709	3,398	123,560	56,893	934,430
2004	489,488	21,322	3,877	32,668	22,049	12,019	26,709	3,398	118,645	49,582	984,012
2005	459,382	20,011	3,638	30,659	20,693	12,019	26,709	3,398	113,730	43,137	1,027,148
2006	429,275	18,699	3,400	28,650	19,337	12,019	26,709	3,398	108,814	37,459	1,064,607
2007	399,169	17,388	3,161	26,641	17,981	12,019	26,709	3,398	103,899	32,462	1,097,069
2008	369,062	16,076	2,923	24,631	16,624	12,019	26,709	3,398	98,984	28,069	1,125,138
2009	338,956	14,765	2,685	22,622	15,268	12,019	26,709	3,398	94,068	24,211	1,149,349
2010	308,849	13,453	2,446	20,613	13,912	12,019	26,709	3,398	89,153	20,825	1,170,174
2011	278,743	12,142	2,208	18,603	12,556	12,019	26,709	3,398	84,238	17,859	1,188,033
2012	248,637	10,831	1,969	16,594	11,200	12,019	26,709	3,398	79,322	15,263	1,203,297
2013	218,530	9,519	1,731	14,585	9,844	12,019	26,709	3,398	74,407	12,995	1,216,291
2014	188,424	8,208	1,492	12,575	8,488	12,019	26,709	3,398	69,492	11,015	1,227,306
2015	161,649	7,041	1,280	10,788	7,281	12,019	26,709	(3,267)	65,120	9,368	1,236,674
2016	141,598	6,168	1,121	9,450	6,378	12,019	26,709	(10,052)	61,847	8,075	1,244,750
2017	124,940	5,442	990	8,338	5,628	12,019	26,709	(10,052)	59,127	7,007	1,251,756
2018	108,281	4,717	858	7,227	4,878	12,019	26,709	(10,052)	56,407	6,067	1,257,823
2019	91,622	3,991	726	6,115	4,127	12,019	26,709	(10,052)	53,687	5,241	1,263,064
2020	74,964	3,265	594	5,003	3,377	12,019	26,709	(10,052)	50,967	4,516	1,267,580
2021	58,305	2,540	462	3,891	2,626	12,019	26,709	(10,052)	48,248	3,880	1,271,460
2022	41,647	1,814	330	2,779	1,876	12,019	26,709	(10,052)	45,528	3,323	1,274,782
2023	24,988	1,088	198	1,668	1,126	12,019	26,709	(10,052)	42,808	2,836	1,277,618
2024	8,329	363	66	556	375	12,019	26,709	(10,052)	40,088	2,410	1,280,028

IN-SERVICE COST ($000)	801280
IN-SERVICE YEAR	1995
BOOK LIFE (YRS)	30
EFF. TAX RATE	0.3763
DISCOUNT RATE	0.1018
OTAX & INS RATE	0.015

Captital Structure

Source	Weight	Cost
DEBT	0.44	0.099
P/S	0.09	0.088
C/S	0.47	0.142

K-FACTOR = CPWFC / IN-SVC COST = 1280028 / 801280 = 1.59748

YEAR	TAX DEPRECIATION SCHEDULE	TAX DEPRECIATION ($000)	DEFERRED TAX ($000)	END OF YEAR NET PLANT IN SERVICE ($000)	BEGINNING YEAR RATE BASE ($000)	ENDING OF YEAR RATE BASE ($000)	MID-YEAR RATE-BASE ($000)
1	0.0375	30,048	1,256	774,571	801,280	773,314	787,297
2	0.0722	57,852	11,719	747,861	773,314	734,886	754,100
3	0.0668	53,526	10,091	721,152	734,886	698,086	716,486
4	0.0618	49,519	8,583	694,443	698,086	662,793	680,439
5	0.0571	45,753	7,166	667,733	662,793	628,917	645,855
6	0.0528	42,308	5,870	641,024	628,917	596,338	612,628
7	0.0489	39,183	4,694	614,315	596,338	564,935	580,637
8	0.0452	36,218	3,578	587,605	564,935	534,648	549,792
9	0.0446	35,737	3,397	560,896	534,648	504,542	519,595
10	0.0446	35,737	3,397	534,187	504,542	474,435	489,488
11	0.0446	35,737	3,397	507,477	474,435	444,329	459,382
12	0.0446	35,737	3,397	480,768	444,329	414,222	429,275
13	0.0446	35,737	3,397	454,059	414,222	384,116	399,169
14	0.0446	35,737	3,397	427,349	384,116	354,009	369,062
15	0.0446	35,737	3,397	400,640	354,009	323,903	338,956
16	0.0446	35,737	3,397	373,931	323,903	293,796	308,849
17	0.0446	35,737	3,397	347,221	293,796	263,690	278,743
18	0.0446	35,737	3,397	320,512	263,690	233,583	248,637
19	0.0446	35,737	3,397	293,803	233,583	203,477	218,530
20	0.0446	35,737	3,397	267,093	203,477	173,370	188,424
21	0.0225	18,029	(3,266)	240,384	173,370	149,928	161,649
22	0	0	(10,051)	213,675	149,928	133,269	141,598
23	0	0	(10,051)	186,965	133,269	116,610	124,940
24	0	0	(10,051)	160,256	116,610	99,952	108,281
25	0	0	(10,051)	133,547	99,952	83,293	91,622
26	0	0	(10,051)	106,837	83,293	66,634	74,964
27	0	0	(10,051)	80,128	66,634	49,976	58,305
28	0	0	(10,051)	53,419	49,976	33,317	41,647
29	0	0	(10,051)	26,709	33,317	16,659	24,988
30	0	0	(10,051)	(0)	16,659	(0)	8,329

PSC FORM CE 1.1B Calculation of AFUDC and In-Service Cost of Plant

This form specifies the data to be used when calculating AFUDC and the in-service cost of plant (generating unit or transmission and distribution plant). Each element on the form is defined below:

Col (1) Year

The years begin with the first year of construction for the avoided unit (or avoided transmission and distribution plant) and extend to the in-service year.

Col (2) Years Prior to In-Service Year

This column contains the number of years prior to the in-service year of the plant corresponding to each year in Column (1).

Col (3) Plant Escalation Rate

This column contains the plant escalation rate corresponding to each year in Column (1).

Col (4) Cumulative Escalation Rate

This column contains the cumulative escalation rate corresponding to each year in Column (3).

Col (5) Percent Expenditure

This column contains, for each year of construction, the percentage of the plant to be constructed. The sum of the percentages in this column should equal 100.

Col (6) Annual Spending

This column contains the year-end spending, in dollars per kilowatt, for each year of construction.

Col (7) Cumulative Average Spending

This column contains the cumulative average spending for each year of construction.

Col (8) Cumulative Spending with AFUDC

This column contains, for each year, the cumulative average spending for that year

(from Column 7) plus the AFUDC that has accumulated through the previous year.

Col (9) Yearly AFUDC

This column contains the AFUDC applicable for each year.

Col (10) Incremental Year-End Book Value

This column contains the incremental value added to the plant each year.

Col (11) Cumulative Year-End Book Value

This column contains, for each year, the cumulative year-end book value for the plant. The final figure in this column represents the in-service year cost.

As indicated in the example, this form must also contain the in-service cost of the plant (in dollars per kilowatt), the base year construction cost ($/KW), and the AFUDC rate.

FORM1_1B.WK1

CALCULATION OF AFUDC AND IN-SERVICE COST OF PLANT
PLANT: 1995 COAL UNIT (1989 APH)

PSC FORM CE 1.1B
PAGE 1 OF 1
05/27/91

(1) YEAR	(2) NO. YEARS BEFORE IN-SERVICE	(3) PLANT ESCALATION RATE	(4) CUMULATIVE ESCALATION FACTOR	(5) YEARLY EXPENDITURE (%)	(6) ANNUAL SPENDING ($/KW)	(7) CUMULATIVE AVERAGE SPENDING ($/KW)	(8) CUMULATIVE SPENDING WITH AFUDC ($/KW)	(9) YEARLY TOTAL AFUDC ($/KW)	(10) INCREMENTAL YEAR-END BOOK VALUE ($/KW)	(11) CUMULATIVE YEAR-END BOOK VALUE ($/KW)
1986	-9	0.000	1.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00
1987	-8	0.000	1.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00
1988	-7	0.000	1.000	0.01	10.23	5.12	5.12	0.605	10.83	10.83
1989	-6	0.040	1.040	0.01	10.64	15.55	16.15	1.909	12.55	23.38
1990	-5	0.044	1.086	0.02	22.21	31.98	34.49	4.077	26.29	49.67
1991	-4	0.048	1.138	0.20	232.81	159.49	166.08	19.631	252.44	302.11
1992	-3	0.051	1.196	0.35	428.19	489.99	516.21	61.016	489.21	791.33
1993	-2	0.055	1.262	0.25	322.68	865.43	952.66	112.605	435.28	1,226.61
1994	-1	0.056	1.332	0.16	218.08	1,135.80	1,335.64	157.873	375.95	1,602.56
1995	0			0.00	0.00			0.000	0.00	
				1.00	1,244.84			357.72	1,602.56	

IN-SERVICE YEAR = 1995

PLANT COST (1988 $) = 1023
AFUDC RATE = 0.1182

PSC FORM CE 1.2 Input Data -- Part 2

This form, along with PSC FORM CE 1.1 specifies the input data to be used in the cost-effectiveness test for conservation and direct load control programs. Each element on the form is defined below:

Col (1) Year

The years begin with the Base Year and extend through the life of the conservation program.

Col (2) Cumulative Total Participating Customers

This column contains, for each year, the cumulative total participating customers without regard as to whether they would have adopted the conservation measure in the absence of a utility sponsored program.

Col (3) Adjusted Cumulative Total Participating Customers

This column contains, for each year, the cumulative total participating customers adjusted for the fact that some customers would have adopted the conservation measure in the absence of a utility sponsored program.

Col (4) Utility Average System Fuel Cost

This column contains, for each year, the annual average system fuel cost, including costs of purchases and sales.

Col (5) Avoided Marginal Fuel Cost

This column contains, for each year, the annual average avoided fuel costs in cents per KWH. These costs should reflect the fact that conservation programs have different impacts on the system, depending on the hour of the day. If the program reduces consumption on peak, the marginal fuel costs may be significantly higher than the average fuel costs, resulting in savings to all customers.

Col (6) Increased Marginal Fuel Cost

This column contains, for each year, the annual average increased fuel costs in cents per KWH. These costs reflect the fact that some conservation programs increase energy use during certain hours.

Col (7) Replacement Fuel Cost of Avoided Generating Unit

This column contains, for each year, the annual average replacement fuel costs in cents per KWH. This is the system fuel cost if the utility had built the unit to be avoided. If the avoided unit would have lowered system fuel costs, then these costs act as an offset to the savings gained by not building the unit. On the other hand, if the avoided unit would have raised system fuel costs, there are additional savings to be achieved by avoiding the unit.

Col (8) Program KW Effectiveness Factor

This column contains, for each year, a factor that represents the degradation or improvement of the demand savings over time. Complete documentation must be supplied if a factor other than 1 is used.

Col (9) Program KWH Effectiveness Factor

This column contains, for each year, a factor that represents the degradation or improvement of the energy savings over time. Complete documentation must be supplied if a factor other than 1 is used.

FORM1_2.WK1

INPUT DATA -- PART 2
PROGRAM: LOAD MGMT.

PSC FORM CE 1.2
PAGE 1 OF 1
03/29/90

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
YEAR	CUMULATIVE TOTAL PARTICIPATING CUSTOMERS	ADJUSTED CUMULATIVE PARTICIPATING CUSTOMERS	UTILITY AVERAGE SYSTEM FUEL COST (C/KWH)	AVOIDED MARGINAL FUEL COST (C/KWH)	INCREASED MARGINAL FUEL COST (C/KWH)	REPLACEMENT FUEL COST (C/KWH)	PROGRAM KW EFFECTIVENESS FACTOR	PROGRAM KWH EFFECTIVENESS FACTOR
1990	500	400	2.27	3.60	2.38	5.04	1.00	1.00
1991	1,000	800	2.25	3.51	2.36	5.13	1.00	1.00
1992	1,500	800	2.47	3.49	2.59	5.30	1.00	1.00
1993	1,500	800	2.72	3.50	2.86	6.22	1.00	1.00
1994	1,500	800	3.11	3.93	3.27	6.56	1.00	1.00
1995	1,500	800	3.11	3.90	3.27	6.98	1.00	1.00
1996	1,500	800	3.43	4.32	3.60	7.40	1.00	1.00
1997	1,500	800	3.56	4.57	3.74	7.82	1.00	1.00
1998	1,500	800	3.89	4.94	4.08	8.32	1.00	1.00
1999	1,500	800	4.04	5.16	4.24	8.58	1.00	1.00
2000	1,500	800	4.38	5.45	4.60	9.03	1.00	1.00
2001	1,500	800	4.55	5.81	4.78	9.50	1.00	1.00
2002	1,500	800	4.94	6.09	5.19	10.01	1.00	1.00
2003	1,500	800	5.13	6.45	5.39	10.53	1.00	1.00
2004	1,500	800	5.56	6.73	5.84	11.11	1.00	1.00
2005	1,500	800	5.77	7.09	6.06	11.67	1.00	1.00
2006	1,500	800	6.24	7.45	6.55	12.30	1.00	1.00
2007	1,500	800	6.47	7.83	6.79	12.95	1.00	1.00
2008	1,500	800	6.83	7.68	7.17	11.52	1.00	1.00
2009	1,500	800	7.21	7.94	7.57	11.91	1.00	1.00
2010	1,500	800	7.20	8.19	7.56	12.29	1.00	1.00

PSC FORM CE 2.1 Avoided Generating Unit Benefits

This form is used to report the avoided generating unit benefits of a conservation program or self-service wheeling project. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program. Normally, benefits on this form will be zero until the in-service year of the avoided unit. Also, benefits will only accrue for the life of the conservation program.

Col (2) Avoided Generating Unit Capacity Cost

This column contains the avoided generating unit benefits as previously defined in Section II. These are value of deferral benefits that extend from the in-service year of the avoided unit through the life of the conservation program or the life of the avoided unit, whichever comes first.

Col (3) Avoided Generating Unit Fixed O&M

This column contains the avoided generating unit fixed O&M costs. This may be calculated by taking the dollars per kilowatt per year as reported on PSC FORM CE 1.1 times the kilowatts saved, with costs escalated appropriately.

Col (4) Avoided Generating Unit Variable O&M

This column contains the avoided generating unit variable O&M costs. This may be calculated by taking the dollars per kilowatt-hour reported on PSC FORM CE 1.1 times the kilowatts saved times the capacity factor times 8760, with costs escalated appropriately.

Col (5) Avoided Generating Unit Fuel Costs

This column contains the annual fuel costs for the avoided generating unit. This may be calculated by taking the fuel cost reported on PSC FORM CE 1.1 times the kilowatts saved times the capacity factor times 8760, with fuel costs escalated appropriately.

Col (6) Replacement Fuel Costs

This column contains the replacement fuel costs that occur because the avoided generating unit was not built. These costs may be calculated by multiplying the annual kwh generation of the avoided unit by the replacement fuel costs shown on

PSC FORM CE 1.2. (The net fuel savings of the avoided plant would be calculated by subtracting this column from column 5). For a base loaded avoided unit, the net fuel savings might be large. At the other extreme, the net fuel savings for a peaker might be very small or slightly negative.

Col (7) Avoided Generating Unit Benefits

This column is the sum of columns (2) through (5) minus column (6).

This form also contains totals for each column and the cumulative net present value for each column.

FORM2_1.WK1
a13..n49

AVOIDED GENERATING UNIT BENEFITS

PSC FORM CE 2.1
PAGE 1 OF 1
05/27/91

(1) Year	(2) Avoided Gen Unit Capacity Cost $(000)	(3) Avoided Gen Unit Fixed O&M $(000)	(4) Avoided Gen Unit Variable O&M $(000)	(5) Avoided Gen Unit Fuel Cost $(000)	(6) Replacement Fuel Cost $(000)	(7) Avoided Gen Unit Benefits $(000)
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	0	0	0	0	0	0
1991	0	0	0	0	0	0
1992	0	0	0	0	0	0
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	353	87	109	318	356	510
1996	369	92	115	335	368	543
1997	387	98	122	352	380	579
1998	406	104	129	370	393	616
1999	425	110	137	390	406	656
2000	446	116	145	410	419	698
2001	467	123	154	431	433	742
2002	489	131	163	454	448	790
2003	513	139	173	477	463	839
2004	538	147	183	502	478	892
2005	563	156	194	528	494	948
2006	590	165	206	556	510	1,007
2007	619	175	218	585	527	1,070
2008	648	186	232	615	544	1,136
2009	680	197	245	647	562	1,206
2010	712	208	260	681	581	1,280
Nominal:	8,206	2,233	2,787	7,651	7,363	13,514
NPV:	2,011	535	667	1,861	1,858	3,216

PSC FORM CE 2.2 Avoided T&D, Program Fuel Savings, and Other Benefits

This form is used to report the avoided transmission benefits, avoided distribution benefits, program fuel savings, and other benefits of a conservation program or self-service wheeling project. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program.

Col (2) Avoided Transmission Capacity Cost

This column contains the avoided transmission capacity benefits as previously defined in Section II. These are value of deferral benefits that extend from the in-service year of the avoided transmission plant through the life of the conservation program or the life of the avoided generating unit, whichever comes first.

Col (3) Avoided Transmission Fixed O&M Cost

This column contains the avoided generating unit fixed O&M costs. This may be calculated by taking the dollars per kilowatt per year as reported on PSC FORM CE 1.1 times the kilowatts saved, with costs escalated appropriately.

Col (4) Total Avoided Transmission Cost

This is the sum of columns (2) and (3).

Col (5) Avoided Distribution Capacity Cost

This column is analogous to Column (2).

Col (6) Avoided Distribution Fixed O&M Cost

This column is analogous to Column (3).

Col (7) Total Avoided Distribution Costs

This is the sum of columns (5) and (6).

Col (8) Program Fuel Savings

This column contains the fuel savings generated by the conservation program. This

is the product of the kwh saved per customer, the number of participating customers, and the appropriate marginal fuel cost.

FORM2_2.WK1
a13..o49

AVOIDED T&D AND PROGRAM FUEL SAVINGS

PSC FORM CE 2.2
PAGE 1 OF 1
05/27/91

(1) Year	(2) Avoided Transmission Capacity Cost $(000)	(3) Avoided Transmission O&M Cost $(000)	(4) Total Avoided Transmission Cost $(000)	(5) Avoided Distribution Capacity Cost $(000)	(6) Avoided Distribution O&M Cost $(000)	(7) Total Avoided Distribution Cost $(000)	(8) Program Fuel Savings $(000)
1988	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	1
1991	0	0	0	0	0	0	3
1992	0	0	0	0	0	0	4
1993	0	0	0	0	0	0	6
1994	0	0	0	0	0	0	8
1995	31	4	35	32	6	37	10
1996	33	4	37	34	6	40	11
1997	34	4	38	36	6	42	12
1998	36	5	40	38	7	45	12
1999	37	5	42	40	7	47	13
2000	39	5	44	42	8	50	14
2001	41	6	47	45	8	53	15
2002	43	6	49	48	9	56	15
2003	45	6	51	51	9	60	16
2004	47	7	54	54	10	63	17
2005	50	7	57	57	10	67	18
2006	52	7	59	60	11	71	20
2007	54	8	62	64	11	75	21
2008	57	8	65	68	12	80	22
2009	60	9	69	72	13	85	23
2010	63	9	72	76	14	90	25
Nominal:	722	101	823	815	146	960	286
NPV:	177	24	201	195	35	230	77

PSC FORM CE 2.3 Total Resource Cost Test

This form is used for the Total Resources Cost Test. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program.

Col (2) Increased Supply Costs

This column contains any increased supply costs associated with the program. This includes both energy and capacity supply costs as well as costs for alternate fuels.

Col (3) Utility Program Costs

This column contains the costs of the program incurred by the utility, including equipment costs, administrative costs.

Col (4) Participant Program Costs

This column is the same as column (10), PSC FORM CE 2.4.

Col (5) Other Costs

This column contains other quantifiable costs attributable to the program, including environmental and other external costs.

Col (6) Total Costs

This column is the sum of the costs in columns (2) through (5).

Col (7) Avoided Generating Unit Benefits

This column is the same as column (7) on PSC FORM 2.1.

Col (8) Avoided Transmission and Distribution Plant Benefits

This column is the sum of columns (4) and (7) on PSC FORM CE 2.2.

Col (9) Program Fuel Savings

This column is the same as column (8) on PSC FORM CE 2.2.

Col (10) Other Benefits

This column contains any other quantifiable benefits. Complete documentation must be provided to support the figures in this column.

Col (11) Total Benefits

This column is the total of columns (7) through (11).

Col (12) Net Benefits

This is total costs minus total benefits.

Col (13) Cumulative Discounted Net Benefits

The figures in this column are obtained by discounting the figures in column (12) to the first year in column (1) and then accumulating these discounted figures year by year.

FORM2_3.WK1
a13..y54

TOTAL RESOURCE COST TEST

PSC FORM CE 2.3
PAGE 1 OF 1
05/27/91

(1) Year	(2) Increased Supply Costs $(000)	(3) Utility Program Costs $(000)	(4) Participant Program Costs $(000)	(5) Other Costs $(000)	(6) Total Costs $(000)	(7) Avoided Gen Unit Benefits $(000)	(8) Avoided T&D Benefits $(000)	(9) Program Fuel Savings $(000)	(10) Other Benefits $(000)	(11) Total Benefits $(000)	(12) Net Benefits $(000)	(13) Cumulative Discounted Net Benefits $(000)
1988	0	2576	1380	225	4,181	345	0	0	0	345	(3,836)	(3,836)
1989	0	2737	1490	225	4,452	733	0	0	0	733	(3,719)	(7,210)
1990	0	2907	1609	225	4,741	1,171	0	1	0	1172	(3,569)	(10,149)
1991	0	3,087	1,736	225	5,048	1,661	0	3	0	1664	(3,384)	(12,677)
1992	0	3,276	1,872	225	5,373	2,210	0	4	0	2214	(3,159)	(14,818)
1993	0	3,475	2,019	225	5,719	2,700	0	6	0	2706	(3,013)	(16,671)
1994	0	3,550	2,250	225	6,025	3,250	0	8	0	3258	(2,767)	(18,215)
1995	0	0	0	225	225	17,694	72	10	0	17776	17,551	(9,328)
1996	0	0	0	225	225	17,809	77	11	0	17897	17,672	(1,209)
1997	0	0	0	225	225	17,968	80	12	0	18060	17,835	6,226
1998	0	0	0	225	225	18,175	85	12	0	18272	18,047	13,053
1999	0	0	0	225	225	18,431	89	13	0	18533	18,308	19,336
2000	0	0	0	225	225	18,742	94	14	0	18850	18,625	25,136
2001	0	0	0	225	225	19,112	100	15	0	19227	19,002	30,506
2002	0	0	0	225	225	19,544	105	15	0	19664	19,439	35,490
2003	0	0	0	225	225	20,043	111	16	0	20170	19,945	40,130
2004	0	0	0	225	225	20,500	117	17	0	20634	20,409	44,438
2005	0	0	0	225	225	20,900	124	189	0	21213	20,988	48,458
2006	0	0	0	225	225	21,300	130	20	0	21450	21,225	52,146
2007	0	0	0	225	225	21,700	137	21	0	21858	21,633	55,558
2008	0	0	0	225	225	22,100	145	22	0	22267	22,042	58,712
2009	0	0	0	225	225	22,400	154	23	0	22577	22,352	61,613
2010	0	0	0	225	225	22,800	162	25	0	22987	22,762	64,295
Nominal:	0	21,608	12,356	5,175	39,139	331,288	1,782	457	0	333,527	294,388	
NPV:	0	16,098	9,120	2,169	27,387	91,141	431	110	0	91,681	64,295	

Discount Rate: 10.21%

Benefit/Cost Ratio: Col (11) / Col (6): 3.35

PSC FORM CE 2.4 Participant Costs and Benefits

This form is used to report the costs and benefits for the participating customers. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program.

Col (2) Savings in Participants' Bills

This column contains the savings in customer bills brought about by the reduction in kwh usage.

Col (3) Tax Credits

This column contains any tax credits received by the participant.

Col (4) Utility Rebates

This column contains any utility rebates to participating customers.

Col (5) Other Benefits

This column contains other quantifiable benefits to the participant attributable to the program. Complete documentation must be provided to support the figures in this column.

Col (6) Total Benefits

This column is the sum of the costs in columns (2) through (5).

Col (7) Customer Equipment Costs

This column contains equipment costs borne by the participating customer.

Col (8) Customer O&M Costs

This column contains O&M costs borne by the participant.

Col (9) Other Costs

This column contains other quantifiable costs borne by the participant. Complete

documentation must be provided to support the figures in this column.

Col (10) Total Costs

This column is the total of columns (7) through (9).

Col (11) Net Benefits

The numbers in this column are calculated by subtracting column (9) from column (6).

Col (12) Cumulative Discounted Net Benefits

This column contains the cumulative discounted net benefits of the program. The figures in this column are obtained by discounting the figures in column (11) and accumulating them year by year.

This form also contains the in-service year of the avoided generating unit and the appropriate customer discount rate.

FORM2_4.WK1
a13..w54

PARTICIPANT COSTS AND BENEFITS

PSC FORM CE 2.4
PAGE 1 OF 1
05/27/91

(1) Year	(2) Savings in Participants' Bills $(000)	(3) Tax Credits $(000)	(4) Utility Rebates $(000)	(5) Other Benefits $(000)	(6) Total Benefits $(000)	(7) Customer Equipment Costs $(000)	(8) Customer O&M Costs $(000)	(9) Other Costs $(000)	(10) Total Costs $(000)	(11) Net Benefits $(000)	(12) Cumulative Discounted Net Benefits $(000)
1988	673	0	1955	0	2,628	1,380	0	0	1,380	1,248	1,248
1989	1,456	0	1998	0	3,454	1,490	0	0	1,490	1,964	3,030
1990	2,362	0	2040	0	4,402	1,609	0	0	1,609	2,793	5,330
1991	3,405	0	2,083	0	5,488	1,736	0	0	1,736	3,752	8,132
1992	4,602	0	2,125	0	6,727	1,872	0	0	1,872	4,855	11,423
1993	5,971	0	2,168	0	8,139	2,019	0	0	2,019	6,120	15,187
1994	6,389	0	2,220	0	8,609	2,170	0	0	2,170	6,439	18,780
1995	6,836	0	0	0	6,836	0	0	0	0	6,836	22,242
1996	7,315	0	0	0	7,315	0	0	0	0	7,315	25,603
1997	7,827	0	0	0	7,827	0	0	0	0	7,827	28,866
1998	8,375	0	0	0	8,375	0	0	0	0	8,375	32,034
1999	8,961	0	0	0	8,961	0	0	0	0	8,961	35,109
2000	9,588	0	0	0	9,588	0	0	0	0	9,588	38,095
2001	10,260	0	0	0	10,260	0	0	0	0	10,260	40,994
2002	10,978	0	0	0	10,978	0	0	0	0	10,978	43,809
2003	11,746	0	0	0	11,746	0	0	0	0	11,746	46,541
2004	12,400	0	0	0	12,400	0	0	0	0	12,400	49,159
2005	13,100	0	0	0	13,100	0	0	0	0	13,100	51,668
2006	13,900	0	0	0	13,900	0	0	0	0	13,900	54,084
2007	14,700	0	0	0	14,700	0	0	0	0	14,700	56,402
2008	15,400	0	0	0	15,400	0	0	0	0	15,400	58,605
2009	16,100	0	0	0	16,100	0	0	0	0	16,100	60,695
2010	16,800	0	0	0	16,800	0	0	0	0	16,800	62,674
Nominal:	209,144	0	14,589	0	223,733	12,276	0	0	12,276	211,457	
NPV:	60,733	0	11,016	0	71,749	9,075	0	0	9,075	62,674	

In Service Year of Gen Unit: 1995

Discount Rate: 10.21%

PSC FORM CE 2.5 Rate Impact Test

This form is used to report the costs and benefits from the standpoint of the impact on customer rates. If costs exceed benefits, rates would be higher than they otherwise would be if the program is implemented. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program.

Col (2) Increased Supply Costs

This column is identical to column (2), PSC FORM CE 2.3.

Col (3) Utility Program Costs

This column is identical to column (3), PSC FORM CE 2.3.

Col (4) Incentives

This column contains any utility incentives paid to the participating customers.

Col (5) Revenue Losses

This column contains any revenue losses for periods where the load has been decreased.

Col (6) Other Costs

This column contains any other quantifiable costs attributable to the program. Complete documentation must be provided to support the figures in this column.

Col (7) Total Costs

This column is the sum of columns (2) through (6).

Col (8) Avoided Gen Unit & Fuel Benefits

This column is the sum of columns (4) and (5), PSC FORM CE 2.1.

Col (9) Avoided T&D Benefits

This column is identical to column (8), PSC FORM CE 2.3.

Col (10) Revenue Gains

This column contains any revenue losses for periods where the load has been increased.

Col (11) Other Benefits

This column contains other quantifiable benefits. Complete documentation must be provided for the numbers in this column.

Col (12) Total Benefits

This column is the sum of columns (8) through (11).

Col (13) Net Benefits

This column is calculated by subtracting column (7) from column (12).

Col (14) Cumulative Discounted Net Benefits

This column is the accumulation of the figures in column (13), discounted by the appropriate discount rate.

This form also contains the discount rate and the benefit/cost ratio.

FORM2_5.WK1
a13..aa54

RATE IMPACT TEST

PSC FORM CE 2.5
PAGE 1 OF 1
05/27/91

(1) Year	(2) Increased Supply Costs $(000)	(3) Utility Program Costs $(000)	(4) Incentives $(000)	(5) Revenue Losses $(000)	(6) Other Costs $(000)	(7) Total Costs $(000)	(8) Avoided Gen Unit & Fuel Benefits $(000)	(9) Avoided T&D Benefits $(000)	(10) Revenue Gains $(000)	(11) Other Benefits $(000)	(12) Total Benefits $(000)	(13) Net Benefits $(000)	(14) Cumulative Discounted Net Benefits $(000)
1988	0	2576	1380	673	0	4,629	345	0	0	0	345	(4,284)	(4,284)
1989	0	2737	1490	1456	0	5,683	733	0	0	0	733	(4,950)	(8,775)
1990	0	2907	1609	2362	0	6,878	1173	0	0	0	1173	(5,705)	(13,472)
1991	0	3,087	1,736	3405	0	8,228	1667	0	0	0	1667	(6,561)	(18,374)
1992	0	3,276	1,872	4602	0	9,750	2218	0	0	0	2218	(7,532)	(23,479)
1993	0	3,475	2,019	5971	0	11,465	2712	0	0	0	2712	(8,753)	(28,862)
1994	0	3,550	2,250	6389	0	12,189	3266	0	0	0	3266	(8,923)	(33,842)
1995	0	0	0	6836	0	6,836	17714	72	72	0	17858	11,022	(28,261)
1996	0	0	0	7315	0	7,315	17831	77	77	0	17985	10,670	(23,359)
1997	0	0	0	7827	0	7,827	17992	80	80	0	18152	10,325	(19,054)
1998	0	0	0	8375	0	8,375	18199	85	85	0	18369	9,994	(15,274)
1999	0	0	0	8961	0	8,961	18457	89	89	0	18635	9,674	(11,954)
2000	0	0	0	9588	0	9,588	18770	94	94	0	18958	9,370	(9,036)
2001	0	0	0	10260	0	10,260	19142	100	100	0	19342	9,082	(6,469)
2002	0	0	0	10978	0	10,978	19574	105	105	0	19784	8,806	(4,212)
2003	0	0	0	11746	0	11,746	20075	111	111	0	20297	8,551	(2,222)
2004	0	0	0	12400	0	12,400	20534	117	117	0	20768	8,368	(456)
2005	0	0	0	13100	0	13,100	21278	124	124	0	21526	8,426	1,158
2006	0	0	0	13900	0	13,900	21340	130	130	0	21600	7,700	2,496
2007	0	0	0	14700	0	14,700	21742	137	137	0	22016	7,316	3,650
2008	0	0	0	15400	0	15,400	22144	145	145	0	22434	7,034	4,656
2009	0	0	0	16100	0	16,100	22446	154	154	0	22754	6,654	5,520
2010	0	0	0	16800	0	16,800	22850	162	162	0	23174	6,374	6,271
Nominal:	0	21,608	12,356	209,144	0	243,108	332,202	1,782	1,782	0	335,766	92,658	
NPV:	0	16,098	9,120	60,733	0	85,951	91,361	431	431	0	92,222	6,271	

Discount Rate: 10.21%

Benefit/Cost Ratio: Col (12) / Col (7): 1.07

PSC FORM CE 2.5S Supplementary Form on Revenue Gains and Losses

A supplementary form will be filed containing, for each year, an allocation of the revenue gains and losses reported in columns (5) and (10) to general and administrative, generation, transmission and distribution.

PSC FORM CE 3.1 Input Data, Self-Service Wheeling -- Part 1

This form, along with PSC FORM CE 3.2, specifies the input data to be used for self-service wheeling proposals. Each element on the form is defined below:

I.(1) Generator KW Reduction

This input is calculated by taking into account such factors as reliability, line losses and customer diversity.

I.(2) KW Line Loss Percentage

This is the percentage reduction in KW from the generator to the customer.

I.(3) KWH Line Loss Percentage

This is the percentage reduction in KWH from the generator to the customer.

I.(4) Group Line Loss Multiplier

This is a factor used to take into account the fact that various groups of customers receive service at different voltage levels.

II.(1) Study Period for the Proposal

This is the number of years in the analysis and will generally be less than or equal to the life of the avoided unit.

II.(2) Generator Economic Life

This is the economic life of the avoided generating unit.

II.(3) T&D Economic Life

This is the economic life of the avoided transmission and distribution facilities.

II.(4) K Factor for Generation

This is the present value of carrying charges for a $1 investment over the life of the avoided generating unit. PSC FORM CE 1.1A must be filed showing in detail the calculation of this factor.

II.(5) K Factor for T&D

This is the present value of carrying charges for a $1 investment over the life of the avoided transmission and distribution facilities. PSC FORM CE 1.1A must be filed showing in detail the calculation of this factor.

III.(1) Supplemental Billing KW Reduction

The reduction in billing demand for supplemental purchases because the QF will serve load with its own generation.

III.(2) Supplemental MWH Reduction at Meter

The reduction in energy for supplemental purchases as a result of self-service wheeling.

III.(3) Self-Service Wheeling Charge

The charge for self-service wheeling.

III.(4) Wheeling Escalation Rate

The annual rate of escalation that applies to III.(6).

III.(5) Standby Billing KW Increase

The increase in billing demand for standby purchases as a result of self-service wheeling.

III.(6) Standby MWH Increase at Meter

The increase in billing energy for standby purchases as a result of self-service wheeling.

IV.(1) Utility Non-Recurring Cost

This represents non-recurring costs in the base year of the analysis.

IV.(2) Utility Recurring Costs

These are the recurring administrative costs of the utility as a result of the self-service wheeling proposal.

IV.(3) Utility Cost Escalation Rate

This rate is used to escalate the costs in IV.(2).

V.(1) Base Year

This is the reference year for the present worth analyses and the first year for recording costs and benefits of the proposal.

V.(2) In-Service Year of Avoided Gen Unit

This is the in-service year of the generating unit to be avoided by the self-service wheeling project.

V.(3) In-Service Year for Avoided T&D

This is the in-service year of the transmission and distribution facilities to be avoided by the self-service wheeling project.

V.(4) Base Year Avoided Gen Unit Cost

This is the base year cost in dollars per kilowatt of the generating unit to be avoided or deferred by the project. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the unit in the in-service year, including AFUDC.

V.(5) Base Year Avoided Transmission Cost

This is the base year cost in dollars per kilowatt of the transmission facilities to be avoided or deferred by the project. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the unit in the in-service year, including AFUDC.

V.(6) Base Year Avoided Distribution Cost

This is the base year cost in dollars per kilowatt of the distribution facilities to be avoided or deferred by the project. PSC FORM CE 1.1B must be filed showing in detail the calculation of the installed cost of the unit in the in-service year, including AFUDC.

V.(7) Gen. Trans. Dist Cost Escalation Rate

This rate is used to escalate the costs in V.(4), V.(5) and V.(6).

V.(8) Generator Fixed O&M Costs

This is the annual fixed O&M costs for the generating unit to be avoided or deferred, stated in $/KW/Year.

V.(9) Generator Fixed O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in V.(8).

V.(10) Transmission Fixed O&M Costs

This is the annual fixed O&M costs for the transmission facilities to be avoided or deferred, stated in $/KW/Year.

V.(11) Distribution Fixed O&M Costs

This is the annual fixed O&M costs for the distribution facilities to be avoided or deferred, stated in $/KW/Year.

V.(12) Trans and Distr Fixed O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in V.(10) and V.(11).

V.(13) Avoided Generating Unit Variable O&M Costs

This is the base year variable O&M costs for the generating unit to be avoided or deferred, stated in cents/KWH.

V.(14) Generator Variable O&M Cost Escalation Rate

This is the escalation rate to be used in escalating the costs in V.(13).

V.(15) Generator Capacity Factor

This is the projected capacity factor of the generating unit to be avoided or deferred.

V.(16) Avoided Generating Unit Fuel Cost

This is the base year fuel costs for the generating unit to be avoided or deferred, stated in cents/KWH.

V.(17) Avoided Generating Unit Fuel Cost Escalation Rate

The rate of escalation that the cost in V.(16) would be escalated each year.

VI.(1) Supplemental Service Rate, Non-Fuel

The non-fuel energy charge in the QF's bill for supplemental service.

VI.(2) Supplemental Service Rate, Demand

The demand charge in the QF's bill for supplemental service.

VI.(3) Supplemental Service Escalation Rate

The annual rate of escalation that applies to items VI.(1) and VI.(2).

VI.(4) Standby Rate, Non-Fuel

The non-fuel energy charge in the QF's bill for standby service.

VI.(5) Standby Rate, Demand

The demand charge in the QF's bill for standby service.

VI.(6) Standby Escalation Rate

The annual rate of escalation that applies to items VI.(4) and VI.(5).

FORM3_1.WK1
a1..h37

INPUT DATA -- PART 1
SELF-SERVICE WHEELING

PSC FORM CE 3.1
PAGE 1 OF 1
11/28/89

I. PROGRAM DEMAND SAVINGS AND LINE LOSSES

(1)	GENERATOR KW REDUCTION	938.00 KW
(2)	KW LINE LOSS PERCENTAGE	8 %
(3)	KWH LINE LOSS PERCENTAGE	6 %
(4)	GROUP LINE LOSS MULTIPLIER	0.98000

II. ECONOMIC LIFE AND K FACTORS

(1)	STUDY PERIOD FOR PROPOSAL	15 YRS
(2)	GENERATOR ECONOMIC LIFE	30 YRS
(3)	T & D ECONOMIC LIFE	40 YRS
(4)	K FACTOR FOR GENERATION	1.54281
(5)	K FACTOR FOR T & D	1.70712

III. UTILITY AND QF PURCHASES

(1)	SUPPLEMENTAL BILLING KW REDUCTION	0.00 KW
(2)	SUPPLEMENTAL MWH REDUCTION AT METER	0.00 MWH/YR
(3)	SELF-SERVICE WHEELING CHARGE	0 $/YR
(4)	WHEELING ESCALATION RATE	5.40 %
(5)	STANDBY BILLING KW INCREASE	0.00 KW
(6)	STANDBY MWH INCREASE AT METER	0.00 MWH/YR

IV. UTILITY AND CUSTOMER COSTS

(1)	UTILITY NONRECURRING COST PER CUSTOMER	$1,159
(2)	UTILITY RECURRING COST PER CUSTOMER	$0
(3)	UTILITY COST ESCALATION RATE	5.0 %

V. AVOIDED GENERATOR AND T&D COSTS

(1)	BASE YEAR	1990
(2)	IN-SERVICE YEAR FOR AVOIDED GENERATING UNIT	1995
(3)	IN-SERVICE YEAR FOR AVOIDED T&D	1995
(4)	BASE YEAR AVOIDED GENERATING UNIT COST	400 $/KW
(5)	BASE YEAR AVOIDED TRANSMISSION COST	133 $/KW
(6)	BASE YEAR AVOIDED DISTRIBUTION COST	136 $/KW
(7)	GEN, TRANS and DIST COST ESCALATION RATE	5.2 %
(8)	GENERATOR FIXED O&M COSTS	2.45 $/KW/YR
(9)	GENERATOR FIXED O&M COST ESCALATION RATE	6.1 %
(10)	TRANSMISSION FIXED O&M COSTS	1.34 $/KW/YR
(11)	DISTRIBUTION FIXED O&M COSTS	1.94 $/KW/YR
(12)	T&D FIXED O&M COST ESCALATION RATE	6.0 %
(13)	AVOIDED GEN UNIT VARIABLE O&M COSTS	0.8450 Cents/KWH
(14)	GENERATOR VARIABLE O&M COST ESCALATION RATE	6.0 %
(15)	GENERATOR CAPACITY FACTOR	20 %
(16)	AVOIDED GENERATING UNIT FUEL COST	5.044 Cents/KWH
(17)	AVOIDED GEN UNIT FUEL COST ESCALATION RATE	5.2 %

VI. UTILITY RATE DATA

(1)	SUPPLEMENTAL SERVICE RATE, NON-FUEL	0.869 Cents/KWH
(2)	SUPPLEMENTAL SERVICE RATE, DEMAND	1.09 $/KW/MNTH
(3)	SUPPLEMENTAL SERVICE ESCALATION RATE	4.60 %
(4)	STANDBY RATE, NON-FUEL	0.56 Cents/KWH
(5)	STANDBY RATE, DEMAND	2.31 $/KW/MNTH
(6)	STANDBY ESCALATION RATE	4.60 %

PSC FORM CE 3.2 Input Data, Self-Service Wheeling -- Part 2

This form, along with PSC FORM CE 3.1, specifies the input data to be used for self-service wheeling proposals. Each element on the form is defined below:

Col (1) Year

The years begin with the base year and extend through the life of the proposal.

Col (2) Utility Average System Fuel Cost

This is the utility's annual system fuel cost approved by the FPSC that includes fuel, purchases and sales.

Col (3) Utility Purchase Marginal Fuel Cost

This is the marginal fuel cost reduction caused by purchases of QF energy by the utility.

Col (4) QF Supplemental Marginal Fuel Cost

This is the marginal fuel cost reduction caused by the reduction in supplemental purchases by a QF that serves its own load.

Col (5) QF Standby Marginal Fuel Cost

This is the marginal fuel cost increase caused by the increase in standby purchases by the QF.

Col (6) Replacement Fuel Cost

This column contains, for each year, the annual average replacement fuel costs in cents per kwh. This is the system fuel cost if the utility had built the unit to be avoided. If the avoided unit would have lowered system fuel costs, then these costs act as an offset to the savings gained by not building the unit. On the other hand, if the avoided unit would have raised system fuel costs, there are additional savings to be achieved by avoiding the unit.

Col (7) QF Effectiveness Factor -- KW

This is a factor that is normally 1.00, but may be reduced or increased to simulate degradation or improvement on KW.

Col (8) QF Effectiveness Factor -- KWH

This is a factor that is normally 1.00, but may be reduced or increased to simulate degradation or improvement on KWH.

FORM3_2.WK1
a1..o33

INPUT DATA -- PART 2
SELF-SERVICE WHEELING

PSC FORM CE 3.2
PAGE 1 OF 1
03/29/90

(1) YEAR	(2) Utility Avg System Fuel Adj Cost (c/KWH)	(3) Utility Purchase Marginal Fuel Cost (c/KWH)	(4) QF Supplemental Marginal Fuel Cost (c/KWH)	(5) QF Standby Purch Marginal Fuel Cost (c/KWH)	(6) Replacement Fuel Cost (c/KWH)	(7) QF Effectiveness Factor -- KW --	(8) QF Effectiveness Factor -- KWH --
1990	2.27	2.98	2.98	2.98	5.04	1.00	1.00
1991	2.25	3.38	3.38	3.38	4.58	1.00	1.00
1992	2.47	3.69	3.69	3.69	4.77	1.00	1.00
1993	2.72	3.66	3.66	3.66	5.31	1.00	1.00
1994	3.11	4.33	4.33	4.33	5.56	1.00	1.00
1995	3.11	4.51	4.51	4.51	5.76	1.00	1.00
1996	3.43	5.20	5.20	5.20	6.14	1.00	1.00
1997	3.56	5.20	5.20	5.20	6.59	1.00	1.00
1998	3.89	5.65	5.65	5.65	6.98	1.00	1.00
1999	4.04	5.77	5.77	5.77	7.34	1.00	1.00
2000	4.38	6.28	6.28	6.28	7.88	1.00	1.00
2001	4.55	6.60	6.60	6.60	8.31	1.00	1.00
2002	4.94	7.07	7.07	7.07	8.69	1.00	1.00
2003	5.13	7.41	7.41	7.41	9.18	1.00	1.00
2004	5.56	7.95	7.95	7.95	9.69	1.00	1.00
2005	5.77	8.41	8.41	8.41	10.04	1.00	1.00
2006	6.24	9.03	9.03	9.03	10.56	1.00	1.00
2007	6.47	9.47	9.47	9.47	10.95	1.00	1.00
2008	6.83	9.43	9.43	9.43	9.56	1.00	1.00
2009	7.21	9.79	9.79	9.79	10.09	1.00	1.00
2010	7.20	10.16	10.16	10.16	10.08	1.00	1.00

PSC FORM CE 3.3 Self Service Wheeling Rate Impact Test

This form is used to report the costs and benefits from the standpoint of the impact on customer rates of a self-service wheeling proposal. Each item to be reported is listed below:

Col (1) Year

The years begin with the base year of analysis and extend through the life of the program.

Col (2) Increased Fuel Costs

This column is used to report any increases in fuel costs attributable to the self-service wheeling proposal.

Col (3) Revenue Losses

This column is used to report any revenue losses resulting from the proposal.

Col (4) Other Costs

This column contains any other quantifiable costs. Complete documentation must be provided to support the numbers in this column.

Col (5) Total Costs

This column is the sum of columns (2) through (4).

Col (6) Avoided Gen Unit and Fuel Benefits

This column is the sum of columns (4) and (5), PSC FORM CE 2.1.

Col (7) Avoided T&D Benefits

This column is the sum of columns (4) and (7), PSC FORM CE 2.2.

Col (8) Revenue Gains

This column contains any revenue gains, such as wheeling revenues, resulting from the proposal.

Col (9) Other Benefits

This column contains other quantifiable benefits. Complete documentation must be provided for the numbers in this column.

Col (10) Total Benefits

This column is the sum of columns (7) through (10).

Col (11) Net Benefits

This column is calculated by subtracting column (6) from column (11).

Col (12) Cumulative Discounted Net Benefits

This column is the accumulation of the figures in column (12), discounted by the appropriate discount rate.

This form also contains the discount rate and the benefit/cost ratio.

FORM3_3.WK1
a13..w54

SELF SERVICE WHEELING RATE IMPACT TEST

PSC FORM CE 3.3
PAGE 1 OF 1
05/27/91

(1) Year	(2) Increased Fuel Costs $(000)	(3) Revenue Losses $(000)	(4) Other Costs $(000)	(5) Total Costs $(000)	(6) Avoided Gen Unit & Fuel Benefits $(000)	(7) Avoided T&D Benefits $(000)	(8) Revenue Gains $(000)	(9) Other Benefits $(000)	(10) Total Benefits $(000)	(11) Net Benefits $(000)	(12) Cumulative Discounted Net Benefits $(000)
1988	0	673	0	673	345	0	0	0	345	(328)	(328)
1989	0	1456	0	1,456	733	0	0	0	733	(723)	(984)
1990	0	2362	0	2,362	1173	0	0	0	1173	(1,189)	(1,963)
1991	0	3405	0	3,405	1667	0	0	0	1667	(1,738)	(3,261)
1992	0	4602	0	4,602	2218	0	0	0	2218	(2,384)	(4,877)
1993	0	5971	0	5,971	2712	0	0	0	2712	(3,259)	(6,882)
1994	0	6389	0	6,389	3266	0	0	0	3266	(3,123)	(8,624)
1995	0	6836	0	6,836	17714	72	72	0	17858	11,022	(3,043)
1996	0	7315	0	7,315	17831	77	77	0	17985	10,670	1,859
1997	0	7827	0	7,827	17992	80	80	0	18152	10,325	6,163
1998	0	8375	0	8,375	18199	85	85	0	18369	9,994	9,944
1999	0	8961	0	8,961	18457	89	89	0	18635	9,674	13,264
2000	0	9588	0	9,588	18770	94	94	0	18958	9,370	16,182
2001	0	10260	0	10,260	19142	100	100	0	19342	9,082	18,748
2002	0	10978	0	10,978	19574	105	105	0	19784	8,806	21,006
2003	0	11746	0	11,746	20075	111	111	0	20297	8,551	22,995
2004	0	12400	0	12,400	20534	117	117	0	20768	8,368	24,762
2005	0	13100	0	13,100	21278	124	124	0	21526	8,426	26,375
2006	0	13900	0	13,900	21340	130	130	0	21600	7,700	27,714
2007	0	14700	0	14,700	21742	137	137	0	22016	7,316	28,867
2008	0	15400	0	15,400	22144	145	145	0	22434	7,034	29,874
2009	0	16100	0	16,100	22446	154	154	0	22754	6,654	30,738
2010	0	16800	0	16,800	22850	162	162	0	23174	6,374	31,488
Nominal:	0	209,144	0	209,144	332,202	1,782	1,782	0	335,766	126,622	
NPV:	0	60,733	0	60,733	91,361	431	431	0	92,222	31,488	

Discount Rate: 10.21%

Benefit/Cost Ratio: 1.52

PSC FORM CE 3.3S Supplementary Form on Revenue Gains and Losses

A supplementary form will be filed containing, for each year, an allocation of the revenue gains and losses reported in columns (3) and (8) to general and administrative, generation, transmission and distribution.

Comments of Participants

The Hearing

The section 120.54 rule hearing took place March 13-14. Representatives of utilities, cogenerators, solar industry, environmental groups, and staff participated. The issues addressed included: treatment of self-service wheeling, treatment of environmental externalities, and lost revenues.

--Self-Service Wheeling

The treatment of self-service wheeling raised particularly difficult issues. The utilities maintained that only the Ratepayer Impact test should apply to self-service wheeling and that only that test would comply with the statutory requirement in section 366.051, Florida Statutes. Cogenerators suggested that the Ratepayer Impact test doesn't truly recognize rate impact timing, in that the test assumes instantaneous rate relief.

A Commissioner questioned whether the denial of self-service wheeling resulting in the company building its own transmission line would actually lead to a higher cost to customers where self-service wheeling was not allowed. He questioned whether the FPSC should consider that rates could be even higher if the customer builds its own transmission.

Several commenters and Commissioners discussed the point that the benefits of self-service wheeling occur only when such wheeling induces expanded cogeneration. Just by adding self-service wheeling in itself does not defer plant capacity -- only if there's an expansion by the QF. In other words, the ability to self-service wheel must induce someone to expand generation.

FPL stated that self-service wheeling is almost never economically justified.

Several commenters stated that if only the Ratepayer Impact test is adopted, very little self-service wheeling will occur.

FICA said the statutory language about "higher cost of electric service" is not equivalent to price. They urged that the statutory language should not be used to prohibit use of the Total Resource Cost test.

The FPL witness said he is not recommending that the FPSC disallow every program that doesn't pass the rate impact test.

--Lost Revenues

Issues such as the impact of growth of the customer base offsetting lost revenues were addressed.

FPL acknowledged that some costs go down when there's reduction in usage -- such as transmission and generation. Yet the transformer cost didn't go down and the administrative cost didn't go down. Thus, a shortfall is created.

FPL suggested that "unrecovered revenue requirements" is better terminology than lost revenues or revenue losses.

The distinction between "market-driven" or individual conservation versus "utility-driven" conservation was discussed.

A Commissioner put matters into perspective when he stated, "the use of the lost revenues analysis is only as to this cost effectiveness review; in no way are we making a decision on the recovery of dollars. That occurs later when the rate impact is reviewed in a rate case."

FPL agreed, "We tend to mix 'cost effectiveness' with 'cost recovery' and 'rate recovery.'"

TECO said that the tests do not have precision, but are instead a theoretical framework. "No one is saying you have to give us lost revenue."

--Environmental Externalities

The difficulty of assessing or quantifying environmental externalities was addressed. The various agency jurisdictional demarcations were mentioned. Some of the Commissioners expressed concern that the FPSC not intrude on other agencies or the legislative role in this area.

The American Planning Association urged that choosing some number to plug in the equation for environmental externalities, no matter how conservative, was better than none.

The Florida Solar Energy Industries Association participnt expressed concern that there is, in essence, a default number that is zero, when no number is specified for environmental externalities.

The FPL participant described the wide variation of numbers assessed as externalities by the different states.

--Miscellaneous

There were many points made about the rule being a mere reporting format -- the servant, not the master. In other words, the rule and manual would still allow for judgment call.

Value of deferral versus full revenue requirements methodology was discussed.

Treatment of nonfirm was discussed.

One Commissioner suggested that the most logical approach might be "looking at the tests in a series -- First, the TRC, then a stage as to whether the program would have a substantially adverse effect on rates." (TR 299-300).

Post-Hearing Comments and Responses to Staff's Proposed Final Version

--Utilities

Florida Power urged that only the Ratepayer Impact test apply to self-service wheeling or there would be a violation of section 366.051, Florida Statutes. Citing principles of statutory construction that the narrow or more specific provision -- i.e., section 366.051, controls over the more general FEECA statute.

TECO stated that the proposed rule is silent as to how a conservation program is actually approved. That is, there are no criteria to determine which program can expect approval or which cannot. Rather than referring to minimum filing requirements, TECO urges that the rule would be more useful if it defined how a program is to be approved (i.e., state the criteria for approval) or at least state to process for approval.

TECO said the Total Resource test should not treat incentives rebates as transfer payment because when supply cost's comparisons are made, none of the supply costs (some of which might be classified as transfer payments) are evaluated in the same manner. The demand versus supply evaluations will be tilted in favor of demand side measures, said TECO.

Gulf Power also cited to section 366.051 to state that it is appropriate to place limits on what sort of action will be taken to encourage cogeneration. "It is not a perverse result of the statute if self service wheeling will not occur due to a failure of any such proposals to pass the Rate Impact test. Rather, it could be a perverse result it self service wheeling were to be encouraged at the expense of higher costs to the general body of customers. Such a subsidy was not intended by the Legislature, and should not be countenanced by this Commission through adoption of its rules."

Gulf Power also noted that the legislation was changed after the time of the Senate bill analysis (which indicated a legislative intent to encourage self-service wheeling) to a more objective and difficult standard for such wheeling to occur.

FPL emphasized also that the final version of the bill, Chapter 89-292, which passed was different from the earlier Senate version. The language changed from "impose undue risks or undue costs upon the electric consumers in the state," to the phrase "self-service wheeling is not to be provided if it is likely to result in higher cost electric service to the utility's general body of ratepayers." Senator Jennings on the Senate floor stated that the compromise language was to maintain status quo.

FPL also addressed the statutory construction principle that the narrower provision, section 366.051, should govern over the broader FEECA language. FPL added that this is appropriate in that "if self-service wheeling has the effect of compensating cogenerators at a rate less than full avoided cost, it will pass the Rate Impact test and should be not only permitted, but encouraged."

FPL decried the staff's significant revision this late in the proceeding regarding self-service wheeling. FPL addressed each of the factors set out by staff on self-service wheeling. Regarding cogenerator's fuel type, FPL stated that if there are important environmental or other social benefits, than those benefits should be reflected in avoided cost. The second consideration, the fuel efficiency of cogenerator projects, again should be reflected in avoided cost. The factor of whether the cogenerator is likely to build its own line should only be taken into account in limited circumstances according to FPL. "FPL remains concerned that cogenerators' intentions in this regard must be carefully and critically scrutinized in order to minimize the potential for abuse. Finally, FPL said the materiality of lost revenues should not be a factor in that any increase of cost for the general body of ratepayers is improper pursuant to section 366.051, Florida Statutes.

FPL criticized staff's draft form, Form CE 2.56 which would require the utility to allocate revenue gains and losses to general and administrative, generation, transmission, and distribution functions. FPL is concerned that the form asks for information that will be impossible to obtain with any accuracy. FPL said the cost of service allocation should not be used to impute an allocation of the lost revenues in that it may be out of date at the time revenue losses are being determined and allocated. Second, rate design is an act, not a mechanistic application of the unit costs developed in the cost of service study.

As to the need for flexibility to approve programs that are not cost-effective, FPL recommends that the existing language in the current role be retained. It states, "This rule does not bind the Commission to approve or disapprove a program shown to be cost-effective under it, nor does it preclude the Commission from approving a program shown not be cost-effective under this rule."

--<u>Cogenerators</u>

Florida Industrial Cogeneration Association (FICA) filed comments stating that:

1. The rate impact test is not legally mandated for self-service wheeling. (The rate impact test assumes that ratemaking is instantaneous).

2. FPSC should use the Total Resource Cost test in cojunction with the Rate Impact test. The TRC test

measures whether a proposal tends to increase or decrease the cost of electric service to the utility and its ratepayers as a whole. The ratepayer Impact test is a practical measure that considers the effect of lost revenues in the rates of a utility. It provides the FPSC with a practical check to determine whether any potentially negative effect should outweigh the positive effect of the proposal.

3. A substantial revision would conflict with Rule 25-17.0773.

4. There has been no showing of why utilities should be absolved of the burden of demonstrating that revenue growth does not offset lost revenues.

5. Because the Rate Impact test includes a non-cost element in the form of lost revenues, it is not a true measure of cost effectiveness.

FICA endorses the Alternative Version on self-service wheeling in that it applies the same tests to self-service wheeling and conservation.

FICA stated that the Rate Impact test is not a true measure of cost effectiveness because it "includes a non-cost element in the form of lost revenues." FICA said that the Rate Impact test is actually a practical measure that considers the potential effect of lost revenues on the rates of a utility. It provides the Commission with a practical "check" by which to weigh any potentially negative effect on rates against the positive impact the program or proposal has on total energy costs.

The statutory provision in section 366.051 does not mandate a "lost revenues" test, according to FICA. Lost revenues as a form of "cost" is a contrived concept that is simply foreign to the Legislature's use of the term, argued FICA. Instead the term "cost" refers to the utility's cost of generating and distributing electricity. This type of cost, says FICA, is fully and accurately measured in the Total Resource Cost test.

FICA stated that the principle policy rationale used to argue in favor of the Rate Impact test during the rule hearings was that self-service wheeling involves a QF receiving payments in excess of full avoided cost. This rationale is a pure fabrication, says FICA. The QF is not getting paid anything.

The Rate Impact test should be revised slightly to deal with the growth/no-growth issue, according to FICA. FICA criticized the deletion from the current rule which requires that the utility bear the burden demonstrating that growth will not offset lost revenues. There has been no showing of why utilities should be absolved of the burden of demonstrating that revenue growth does not offset "lost revenues" in the Rate Impact test. That test simply assumes

that every dollar of "lost revenue" results in a dollar of "cost." The theoretical argument that growth has already been accounted for in the planning process has not been illustrated on the record, according to FICA.

--Solar Industry

Solar Industries, a manufacturer of solar swimming pool heating systems, criticized the utilities' distinction between on-peak and off-peak conservation. He said:

> I believe that while reducing KW demand at peak is as important as ever, saving KWH off-peak can have corresponding benefits for both participants and non-participants as well. It all has to do with how you define costs and benefits.

Solar Industries said the key is in the Total Resource test. In that test, he urged that the description of benefits and costs be expanded to describe specific examples of costs related to externalities and those benefits achieved by reducing the externalities through conservation. The creation of greenhouse gases such as CO_2, NO_2, and SO_2 through the burning of fossil fuel to produce electricity exacts a cost on the environment and on society. He said this is a true cost that could be avoided by using less fossil fuel when less KWH are purchased because conservation programs are working, either during peak or off-peak hours. There should be a dollar value associated with this avoided cost. He urged that the calculated avoided cost should include the avoided cost of using environmentally damaging fossil fuels regardless of whether they were avoided on or off-peak. If the utilities had to account for this higher level of avoided costs, then technologies such as solar domestic water heating and solar swimming pool heating would look much more cost effective, said Gorran.

0047