file

24

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Amendment Of Chapter 4901:1-11 of the Ohio Administrative Code and Efforts to Reduce Reporting Requirements.	))))	Case No. 96-749-EL-ORD

COMMENTS OF THE INDUSTRIAL ENERGY USERS-OHIO

On August 8, 1996, the Commission issued an Entry requesting comments on a Commission Staff proposal for reducing the reporting requirements of all regulated electric utilities. As the Industrial Energy Users-Ohio ("IEU-OH") understand Staff's proposal, it includes elimination of the filing of many monthly ER forms, thereby reducing the amount of data required by the Commission on a monthly basis, and elimination of the existing efficiency incentive in the current EFC rules. The goal sought by Staff in its proposal is laudable, for reducing the need to file information which is either duplicative or unnecessary will reduce the electric companies' costs and should thereby eventually reduce customers' rates. Reducing electric companies' costs will help make them more competitive. However, the Commission should be certain when reviewing Staff's proposal to keep in mind the following matters.

First, the Commission is required by R.C. 4905.66 to adopt regulations for the filing by electric companies of certain information. Certain information must by statute be filed on a

monthly basis. R.C. 4905.66(A)(3). The information which is required to be filed by any revised rules must include this information, and it appears from IEU-OH's review that the revised filing requirements proposed by Staff would not incorporate, for example, the addresses of suppliers of fuel to the electric companies' generating plants. Moreover, the statute requires the identification of the supplier and the supplier's address for fuel delivered to and consumed at the electric company's plants. However, the only ER form which remains from those which are currently filed which could contain the appropriate information, ER 6-1, contains fuel deliveries subdivided only between Ohio fossil fuels and non-Ohio fossil fuels. Thus, the Commission should ensure itself that on a monthly basis the electric companies will file the information required by R.C. 4905.66.

Moreover, it is IEU-OH's understanding that the electric companies will still be required to file on a semiannual and annual basis information which will reveal by way of example, for each generating station, the identity of each supplier of fuel to that station, the cost on a dollar/ton basis as well as on a cents/mmBtu basis for the fuel delivered by each specific supplier, and the amount of fuel consumed to generate electricity for sale to EFC jurisdictional customers. This information is vitally important to those who review the cost of fuel consumed by electric companies to generate their electricity. The fuel component is a significant portion of industrial customers' bills,[1] by virtue of the huge amounts of electricity they consume, and they (not unlike OCC) are keenly interested in the costs incurred to serve them. It was through review of EFC forms since 1987 that industrial customers were able to observe the consistent pattern of

[1] In most cases, the fuel component of an industrial customer's bill represents approximately 50% of the cost of electricity.

purchases of high-cost affiliate coal by an electric company from its wholly-owned affiliates which resulted in EFC rates far in excess of rates that would have occurred from the purchase of coal from the open market.[2]

The second aspect of the Staff's proposal is elimination of the Measure of Cost Effectiveness, or MCE. The MCE consists of a series of formulas intended to create incentives for the efficient procurement and utilization of fuel by electric companies. Unfortunately, IEU-OH is unaware of **any** changes or steps taken by **any** electric company, in response to the vastly complicated EFC formulas, to restructure any aspect of their operations in order to achieve efficiencies which were then rewarded through the functioning of the MCE formulae. To the contrary, the accumulation of information, creation of accounting systems needed to track the information for input into the formulas, making the calculations necessary under the rule, and subsequently reporting the information to the Commission on a monthly basis has had little effect on the utilities other than to drive up their costs. Thus, IEU-OH is sympathetic to the suggestion that reform of the MCE formula should be undertaken.

The Staff is evaluating several proposals to replace the MCE. The first potential option suggested by Staff is the comparison of each utility's percent change in fuel cost as compared to a statewide average. Those utilities whose fuel cost changes are "more favorable" that the average will recover 100% of their unrecovered system losses. Those utilities whose fuel cost

---

[2] Ohio Power Company is currently operating under a comprehensive stipulation pursuant to which it is supposed to utilize its EFC to achieve certain goals with respect to recovery of costs associated with its Southern Ohio Coal Company, Central Ohio Coal Company, and Windsor Coal Company affiliates. The Commission should not lose sight of the need to require the retention of and filing of information to ensure the parties of their ability to review the Company's compliance with the terms of the Stipulation.

changes are "less favorable" than the average would be entitled to recover only 50% of their unrecovered system losses. In terms of their total revenues recovered through the EFC, however, "penalizing" an electric company by limiting its recovery to only 50% of ***unrecovered*** system loss costs would hardly constitute a significant risk to any of the electric companies. It is IEU-OH's understanding that electric companies' system losses are set in rate cases, and that in subsequent fuel cases the utility would be subject to recovery or loss of some *fraction* of system losses not recovered through base rates. Thus, the utilities in fact face little or non-existent risk in terms of an economic outcome from fuel purchasing and utilization practices that were imprudent.[3]

Over thirteen years ago, the Office of the Consumers' Counsel ("OCC") presented evidence to the Commission that the use of system losses could potentially be "inequitable across utilities since system losses as a fraction of fuel costs vary dramatically across the different Ohio utilities" and that as a result "some Ohio utilities will have considerably more at risk than other utilities under the current clause." ***Proposed Amendments to Chapter 4901:1-11, O.A.C., with Comments***, submitted to OCC by Energy and Resource Consultants (January 18, 1983) at vi ("***Proposed Amendments***"). *See*, Attachment A to these IEU-OH Comments. In the ***Proposed Amendments***, OCC suggested changes to the fuel clause which proposed, in essence, a new rule which would have permitted a partial pass-through of changes in fuel costs. *Id.* at v. IEU-OH is not advocating adoption of the proposal offered by OCC in 1983. However, as the Commission

[3] The evidence that utilities have faced little risk through the functioning of the EFC is the Staff's statement that "For the past several years most electric companies have been in refund position, giving back the total amount of the calculated SLA to the ratepayers." Staff Proposal at 2. In other words, most electric companies have recovered more than 100% of their fuel costs plus system losses by virtue of the operation of the EFC, which they subsequently refunded to ratepayers.

can determine by reviewing the work performed by OCC's consultant, this issue is one which if worth undertaking is worth doing properly. The issue of development of alternative methods to create incentives for efficient electric utility purchasing and use of fuel is of heightened significance today, in light of the probability of sweeping changes occurring in the operation and regulation of electric companies.

Perhaps the most effective strategy to encourage efficient fuel procurement and utilization practices is freeing the electric companies to compete in an open market. If, instead of having a known bank for recovery of 40% to 60% of their costs, utilities were forced to compete for customers and had to succeed or fail in an economic sense, they would have the best incentive of all: Either purchase and use fuel that allows the utility to compete against other electric suppliers effectively, or lose customers to those who can do so. Moreover, unleashing utilities to compete would create significant opportunities for innovation and development of new services and service relationships, which electric companies would have to create or lose customer share.

Unleashing competition to achieve the goals of reduced prices and the availability of increased and innovative services has been recognized explicitly in Ohio in the telecommunications and natural gas industries through the enactment of R.C. 4927 and Am. Sub. H.B. 476. Similar efforts are underway at both the state and federal levels to introduce competitive choice in the electric industry. *See*, H.B. 653 and H.R. 3790, and FERC Orders 888 and 889. The Commission could take a first step in the direction of restructuring by requiring that fuel costs be shifted back into base rates, the component of rates through which electric companies once recovered their fuel costs, and developing a formula which addresses *changes* in

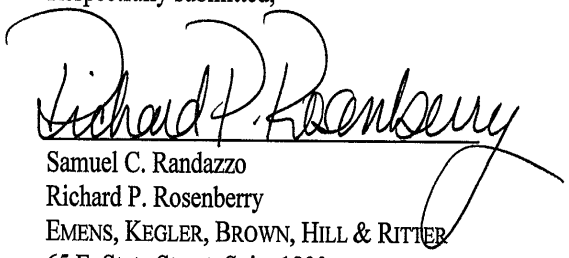
fuel costs as a measure of the efficiency of the utility's fuel procurement practices and a means to recognize the basic philosophical underpinning for fuel clauses.[4] With their fuel costs returned to base rates, utilities would have to pay keen attention to their fuel purchases because they would be required to undergo a rate case and support any increase in rates associated with fuel purchases. Eventually, however, IEU-OH believes that opening markets to competitive sourcing for electricity will mitigate the need for regulatory commissions to impose incentive provisions on electric companies' generation of electricity. Those regulatory incentives will be supplanted by the most effective incentive - competition and customer choice - for the services that electric companies offer.

In conclusion, the Commission's effort to reduce utilities' costs and regulatory burdens by reforming the EFC is appropriate. However, this effort should be undertaken carefully in order to ensure that during the interim transition to competitive electricity sourcing the Commission and interested parties have available to them sufficient and adequate information through which they can observe utilities companies' fuel procurement practices and be prepared to address those practices in hearings held pursuant to R.C. 4905.66. IEU-OH is willing to work with the Commission to make this effort at reform succeed. However, it would be appropriate for the Commission to issue a specific proposed rule for comment after interested parties have

[4] OCC's report noted that "the principal objective of a fuel clause is to mitigate the effect on utility revenues of rapidly changing fuel prices. By allowing for the automatic pass-through of all, or a portion of, fuel costs the Commission is transferring part of the risks of doing business from the utility stockholders to the ratepayers. A 100 percent automatic pass-through of fuel costs effectively transfers all of the risks (and opportunity) resulting from volatile fuel prices from the utility stockholders to the ratepayer. The ratepayer can be further penalized since once the financial risks to the utility of escalating fuel prices have been reduced, the utility may not work as hard to keep fuel costs at a minimum." ***Proposed Amendments*** at iv.

had a more effective opportunity to evaluate a proposed rule and discuss alternatives.[5] Staff's proposal is extremely general and there remain questions about the underlying need for a fuel clause today. This warrants additional consideration by both the Commission and interested parties to ensure that one ineffective measure is not supplanted by another.

Respectfully submitted,



Samuel C. Randazzo
Richard P. Rosenberry
EMENS, KEGLER, BROWN, HILL & RITTER
65 E. State Street, Suite 1800
Columbus, OH 43215-4294

[5] The Commission gave interested parties three weeks to respond to Staff's proposal, a proposal which suggests significant changes in the regulation of fuel procurement practices which have been in place for decades. IEU-OH is not suggesting that lengthy meetings are necessary, or appropriate, given the experience of the electricity roundtable process over the last two years. However, the issue raised by Staff's proposal does merit responsible consideration by all affected parties.

Energy and Resource Consultants, Inc.

ATTACHMENT A

Proposed Amendments to Chapter 4901:1-11, O.A.C. with Comments

Submitted to:

Ohio Office of Consumers' Counsel
137 East State Street
Columbus, Ohio 43215

by:

Energy and Resource Consultants, Inc.
P.O. Drawer O
Boulder, Colorado 80306
(303) 449-5515

January 18, 1983

Our Reference: OHMAN-PA (REVISED)

TABLE OF CONTENTS

PREFACE TO THE PROPOSED REVISIONS

The report entitled "A Critique of the Ohio Fuel Clause with Suggestions for Improvement," and submitted to the Ohio Office of Consumers' Counsel on November 30, 1982, contained a suggested revised fuel clause. It was recognized that some structural problems would still exist even if the revisions were adopted. In proposing the changes, the major deficiencies in the clause were targeted while still maintaining a close correspondence between the present clause and the suggested revised clause.

The purpose of this set of proposed revisions is to present a generic alternative to the present clause that we feel is superior to the existing clause. By not constraining the suggested revisions to stay within the basic structure of the existing clause, a much better alternative clause can be designed. The suggested alternative is the partial pass-through of fuel price increases. This suggested clause has the following advantages:

1. The structure of the clause is simple.
2. The incentives for efficient use of fuel are straightforward and easily identified.

Conceptual Background to the Proposed Partial Pass-Through Fuel Clause

There is a general consensus in the regulatory literature regarding the reasons for having fuel cost adjustment clauses. The recognized purpose of fuel clauses is to mitigate the effect of volatile fuel costs on utility revenues. Special treatment for fuel costs may be needed since, under fixed rate of return regulation and rate cases subject to regulatory lag, a utility can suffer severe financial consequences if fuel prices escalate rapidly. Also, if fuel prices are increasing rapidly, the utility has an incentive to file frequently for rate relief resulting in increased administrative costs for both the utility and the Commission. The use of automatic adjustment clauses can reduce these administrative costs by reducing the frequency of rate hearings. Other benefits are also claimed for fuel clauses in the literature. By adjusting electricity prices rapidly, consumers are charged prices that more accurately reflect the current costs of production. This can encourage customer conservation and promote an economically efficient level of consumption.

These benefits are obtained at a cost in terms of reduced and, occasionally, distorted efficiency incentives for the utility. Singling out one set of a utility's costs (e.g., fuel costs) for special treatment will always result in some distortion of efficiency incentives. In an inflationary environment the utility will always benefit by trading off non-fuel expenses (i.e. expenses subject to regulatory lag) for increased fuel expenses if an automatic pass-through type fuel clause is in use. This distortion can manifest itself in a bias in the choice of fuel mix, selection of environmental controls, implementation of energy conservation measures, and the scheduling of equipment maintenance.* Also, since the financial risks associated with fuel procurement and use are reduced when a conventional fuel clause is in place, the utility has a smaller incentive to try to minimize these costs.

The principal objective of a fuel clause is to mitigate the effect on utility revenues of rapidly changing fuel prices. By allowing for the automatic pass-through of all, or a portion of fuel costs, the Commission is transferring part of the risks of doing business from the utility stockholders to the ratepayers. A 100 percent automatic pass-through of fuel costs effectively transfers all of the risks (and opportunity) resulting from volatile fuel prices from the utility stockholders to the ratepayer. The ratepayer can be further penalized since once the financial risks to the utility of escalating fuel prices have been reduced, the utility may not work as hard to keep fuel costs at a minimum.

The 100 percent pass-through of fuel costs in a fuel clause would be unequivocably beneficial under the following circumstances:

(1) The utility has no control at all over the prices paid for fuel; and

(2) The quantity of fuel required to meet electric generation requirements cannot be influenced in any way by the utility.

---

* M. Schmidt, Automatic Adjustment Clauses: Theory and Application, published by Michigan State University Public Utilities Studies (1980) contains several numeric examples of how a utility can increase its rate of return through uneconomic (i.e., inefficient) decisions regarding generation mix, plant maintenance, conservation equipment, and environmental control equipment when an automatic fuel adjustment clause is present.

Under these circumstances, all fuel costs are truly outside the control of the utility. Then, any fuel cost increases are entirely unavoidable and must eventually be borne by the ratepayers. A 100 percent pass-through of fuel costs would then reduce costs to the ratepayers by avoiding increased regulatory costs and reducing the costs to the utility of raising needed capital.

These conditions never hold. The utility is always able to exercise some control over the prices paid for fuel and the quantity of fuel used. Since these costs are at least partially controllable by the utilities, a more appropriate fuel clause would be a compromise between keeping all fuel costs in base rates where the utility incurs high risks and a 100 percent automatic pass-through of all fuel costs where all the risks of volatile fuel prices are transferred to the ratepayers. The goal is to balance the risks of volatile fuel prices between the stockholders and ratepayers. This can be done by allowing only a percentage of fuel cost changes to be automatically passed-through. Insight into the appropriate fraction of fuel costs to be accorded automatic pass-through can be gained from an examination of the financial risks to the utility under different forecasts of price changes. Allowing any fraction of fuel cost increases to be collected by the utility in between general rate cases will make the utility better off financially than it would be without the fuel clause. In summary, the purpose of an automatic fuel clause is to reduce the risks to the utility of volatile fuel costs, while still providing the utility management with an incentive to control fuel costs. A simple partial pass-through of changes in fuel costs accomplishes these objectives.

Discussion of the Proposed Rule

Under the proposed rule, fuel costs would be divided into two components -- a fuel component and a fuel rate adjustment. The fuel component would be based on fuel costs for the previous base period. The fuel rate adjustment would be based on the change in fuel prices from this historical base period. The revised clause is designed to allow the utility to automatically recover 50 percent of any increase in fuel costs through the fuel rate adjustment. The remaining 50 percent of fuel price increases would be eligible for recovery in the next general rate order. If the utility managed to reduce its fuel costs, then it would be able to retain 50 percent of the cost savings until the next general rate order and it would refund 50 percent of the savings to rate payers through the fuel rate adjustment. This structure is a compromise between fixed rate of return regulation

without a fuel clause (this can be viewed as having a zero percentage pass-through of changes in fuel costs) and a 100 percent automatic pass-through of all changes in fuel costs.

This structure has several advantages. The utility recovers 100 percent of all fuel costs as long as the utility manages to maintain fuel costs at prior levels. The only fuel costs not subject to automatic recovery are the incremental increases in costs above the test year fuel costs. The partial pass-through of fuel cost increases serves to provide the utility with a direct incentive to use fuel efficiently and to negotiate hard on contracts. It also limits the utilities' financial risk to foregone earnings on a portion of the increase in fuel costs. By tying the fuel clause incentives to increases in fuel costs, this fuel clause structure directly focuses on fuel cost minimization, while also reducing the risks to the utility of volatile fuel prices. This new clause is simple, the incentives are clear, and it minimizes any distortions in management's incentives to operate efficiently. The costs of administering this clause would be lower than the costs of administering the present clause since its simplicity would reduce the staff requirements for implementation at both the utility and the Commission.

This simple formulation provides the utility with incentives for the efficient use, procurement, and management of fuel. Automatic fuel adjustment clauses using more complicated provisions have been found to have hidden, unexpected implications that can alter the incentives of the utility in complicated ways. The partial pass-through of fuel cost increases guarantees that the utility will benefit by keeping fuel costs low. Also, it allows the utility to use the complete range of management options at its disposal to seek these costs reductions.

Selected Comments on the Proposed Rule

In the proposed clause, the fuel rate adjustments are no longer based on system loss costs. There is no theoretic or practical reason for basing a fuel clause incentive on the fraction of a utility's fuel costs which show up as system losses. In fact, this can be argued to be inequitable across utilities since system losses as a fraction of fuel costs vary dramatically across the different Ohio utilities. As a result, some Ohio utilities will have considerably more at risk than other utilities under the current clause.

The MCE that serves as a measure of electric utility efficiency in the current clause is no longer explicitly tied to fuel cost recovery. Instead, a measure of electric utility efficiency will be used in the fuel cost reasonableness hearings that are called for by both the current clause and the proposed clause. These hearings form the basis of the annual report on utility performance as required by the Ohio Revised Code Section 4905.69.

An important consideration is whether Section 4905.69 requires the formula that measures the efficiency of fuel procurement and utilization to be explicitly contained in the fuel clause in a manner similar to the current clause. OCC's view is that the law does not require this explicit use of MCE or another such formula. It is analytically appealing to have the incentive structure of the clause tied directly to the formula that measures fuel use efficiency; however, it is very difficult to develop formulae that reasonably measure efficiency. All measures of efficiency are necessarily simplistic and, at best, can serve as approximate measures of efficiency.

Many of the procedures for incorporating the correct incentives for efficient fuel use and management make implicit rather than explicit use of efficiency measures. In fact, these implicit incentive measures are the most frequently used in fuel clauses and are based on conventional, proven regulatory practices.

The use of an explicit efficiency formula to determine the recovery of fuel costs can be viewed as a form of shadow management of the utility by the Commission. No perfect formula or formulae for measuring efficiency has been devised.* Rather than rewarding the utility for simply reducing fuel costs (or minimizing their increase), the use of an explicit efficiency formula provides the utility with an incentive to maximize its efficiency measure. Rarely does this coincide with overall cost minimization (i.e., efficient use and procurement of fuel). All measures of efficiency are necessarily simplistic when compared to the diverse operating decisions that are made and the complexity of utility operations. At best, explicit formulae for measuring efficiency can serve only as approximate measures of efficiency. Also, the use of explicit efficiency measures invariably reduces management options. It is difficult for the analyst devising the efficiency meas-

* For example, B. W. Tenenbaum in his 1980 Ph.D. dissertation on this topic (University of California, Berkeley) concluded that efficiency measures of this type provide useful information to regulators, but they have not progressed to a point where they should be directly incorporated into rates.

ure to anticipate all the options a utility may have to reduce costs. An efficiency measure will generally only incorporate a few of these options.

Even though the efficiency measure would not be explicitly linked to the fraction of incremental fuel costs recovered by the utility, it would still serve an important regulatory function. The preferential treatment accorded fuel costs makes regulatory oversight even more important. Regardless of the fraction used to determine the amount of the automatic pass-through, the financial risks to the utility have been reduced through this clause when compared to the conventional fuel cost recovery through base rates. This may reduce the utility's incentive to minimize these costs. Additionally, whenever one set of a utility's costs are singled out for special treatment some distortion in incentives results. As discussed in Section 5.1 of ERC's report, the utility will have an incentive to trade off non-fuel expenses (such as plant maintenance) for the preferentially treated, automatically passed through fuel costs.

The use of approximate efficiency measures such as the MCE can provide information very useful in reviewing the prudence of certain fuel expenditures, without being tied directly to rates. For example, the way the MCE is currently constructed it is unlikely that any of the factors (i.e., j, k, d, p and u) would be less than one under normal operating conditions. The fact that one of these factors is close to one, or even less than one, does not necessarily mean that the utility is inefficient; however, it can be used as a "red flag" to show aspects of the utility's operation that warrant further examination.

Alternative Measures of Utility Efficiency

This section will discuss several alternative measures of efficiency that may not suffer from some of the drawbacks present with the MCE. Section 2.2 of the November 30, 1982 report delivered to the Ohio Office of Consumers' Counsel critiqued the MCE as a measure of efficiency. It was pointed out that the MCE employs an inaccurate underlying concept. The MCE uses as its basis a ratio between two cost components where efficiency is a measure of the success of a firm in producing a given output at the minimum cost. As a result, an efficiency measure should relate costs of production to output. The examples of structural distortions presented in Section 2.2.2 of the report all stem from the use of a ratio of two cost components rather than a relationship between cost and output.

There are possible alternatives to the MCE. The role of MCE in the actual calculation of the financial gain or loss to the utility has been eliminated in these proposed rule revisions, but it may still be desirable to employ a better efficiency measure.

The past ten years have seen a tremendous growth in the published literature on productivity and efficiency measures for regulated industries.* Four approaches to assessing electric utility efficiency are commonly referred to in the literature: management audits, operating ratios, factor productivity indices, and statistical cost functions. Of these four measures, factor productivity indices and statistical cost functions seem the most promising for incorporation in fuel clauses.

Management audits have been the most widely applied technique but, due to the qualitative nature of the efficiency evaluation, they are difficult to incorporate as an explicit measure for use in computing rates. The operating ratio approach is based on the use of performance indicators or ratios. An example of this approach is contained in a 1976 NARUC study entitled "The Measurement of Utility Cost Performance" by Edward Smith. The approach used performance statistics encompassing financial, production and service categories. These statistics are compiled for a number of utilities that are classified as "comparable." If a performance variable for a utility were well below the norm, then this indicates the need for further investigation; however, a high or low variable does not necessarily indicate efficient or inefficient operation.

The two remaining approaches -- factor productivity indices and statistical cost functions--have the most promise for use in fuel clauses and are discussed below.

Total Factor Productivity Measures

Factor productivity ratios are ratios of outputs to inputs. A productivity ratio can be partial or total. A partial productivity factor index relates output to one input. One example of a partial productivity factor index would be the ratio of output in kWh to,

---

* Two excellent references outlining this recent research are: T. G. Cowing and R. E. Stevenson (eds.), Productivity Measurement in Regulated Industries, Academic Press, New York, 1981; and B. W. Tenenbaum, Measurement of Relative Productive Efficiency Among Privately Owned Electric Utilities, Ph.D. Dissertation, University of California; Berkeley, CA 1980.

say, labor input. A more useful measure is a total factor productivity (TFP) index. A TFP index is a ratio of output to a weighted measure of all inputs:

$$TFP = \frac{\Sigma_i \ kWh_i \cdot W_i}{\Sigma_f \ Q_f \cdot w_f}$$

where kWh_i = output for the i^{th} customer (or service) class

W_i = weighting factor for combining customer classes

Q_f = quantity of input factor f

w_f = weighting factor (or price) for input factor f.*

A TFP index of this general form measures the combined productivity of all inputs. The principal use of TFP indices has been to measure dynamic efficiency, i.e., the rate of change in a TFP index over time. The rationale behind this measure is that if a utility can produce the same output (i.e., kWh) with fewer inputs, then the utility can be said to be operating more efficiently. Efficiency is simply a measure of the firm's success at combining different levels of inputs to produce a given output at minimum cost.

Versions of the TFP efficiency measure have been introduced as evidence in hearings before commissions in several states including New York and Utah. Although promising and useful, TFP measures still have certain drawbacks. There are several alternative methods of aggregating inputs in the construction of a TFP index. These include the use of a Laspeyres input index, Divisia indices, exact index numbers, and non-parametric measures.** The rank ordering of TFP measures across utilities has been found to be

* If the weighting factor is the price of the input, then the TFP measure is expressed in terms of kWh per dollar of inputs.

** A complete explanation of these approaches can be found in W. E. Diewart, "Theory of Factor Productivity Measurement" in Productivity Measurement in Regulated Industries, T. G. Cowing and R. E. Stevenson eds., Academic Press, 1981, p. 17.

sensitive to the input aggregation technique.* Additionally, some of the computations are complex. For example, the non-parametric measures requires the solution to "f" linear programs.

A version of a TFP efficiency measure could be useful in providing incentives for increased efficiency in a fuel adjustment clause. Tying fuel cost recovery to a TFP measure would provide the utility with incentives in the correct direction and reduce the perversities present in the current MCE. Additionally, TFP measures can be formulated from publicly available data contained in FERC publications.

Statistical Cost Functions

Statistical cost functions use econometric techniques to estimate production and cost functions.** Typically, cost functions are easier to estimate than production formulations. Regression techniques are used on a set of observations from a number of utilities to estimate the coefficients for an "average" cost function. A specific utility can be viewed as more efficient or less efficient than average, depending on whether its actual cost per kWh is above or below the predicted average cost using the estimated cost function.

Statistical cost functions can be useful if the commission wants to base the incentives on overall productive efficiency. These estimated cost functions are not as useful in identifying where specific inefficiencies lie. These statistical cost functions are best used to show whether total costs for a utility are above or below estimated average costs. As a result, they are as useful in determining whether costs in a specific area (e.g. fuel related costs) are too high. Other problems with this approach include the potential for

---

* T. G. Cowing, J. Small and R. E. Stevenson, "Comparative Measures of Total Factor Productivity in the Regulated Sector: The Electric Utility Industry," in Productivity Measurement in Regulated Industries, T. G. Cowing and R. E. Stevenson, (eds.), Academic Press, New York, 1981.

** A good example is found in: B. W. Tenenbaum, The Measurement of Relative Productive Efficiency Among Privately Owned Electric Utilities, Ph.D. Dissertation, University of California, Berkeley, 1980.

misspecification of the estimated cost function or other errors (such a omitted relevant variables) in the formulation of the cost function. This can introduce biases into the utility cost and efficiency estimates.

Efficiency Measure Overview

Both the Total Factor Productivity (TFP) indices and statistical cost functions could result in improvements over the current MCE measure. Of these two, the TFP approach would seem to be preferred. With a TFP measure, the incentives for the utility are clear. To the extent that the utility can produce the same kWh output with lower cost inputs, the utility's TFP will be higher and the utility would recover a larger portion of its incremental fuel costs.

No matter which efficiency measure is used, some problems will remain. There is no perfect efficiency measure. B. W. Tenenbaum, in his 1980 Ph.D. dissertation on this issue, concluded that statistical cost functions were not likely to produce efficiency assessments of sufficient accuracy and reliability to be used in regulatory proceedings. The Massachusetts Department of Public Utilities in the 1979 Boston Edison case expressed a strong interest in using a TFP efficiency measure. After five years of consideration and four rate cases, the Department decided that acceptable estimates of productivity were not available. Still, the New York Commission has used TFP measures in rate cases; however, reasonable judgment was found to be preferable to a mechanical reliance on TFP estimates.

Explicit formulae for measuring efficiency provide useful, needed information to regulators. However, these efficiency measures should be the beginning of the analysis, not the end. When a particular efficiency measure has a low value, or a decline in efficiency is shown, this indicates the need for further study to determine the underlying reasons. It may be the result of a perfectly rational and efficient management strategy. For example, an efficient strategy for a utility may result in an increase in production costs for several years with the goal of reducing long run costs. Thus, the values and rankings obtained from explicit efficiency measures may be the first step in a more involved analysis.

In conclusion, a fuel cost recovery clause that gives utility management the greatest amount of flexibility to minimize operating costs is generally preferred to an explicit measure of efficiency. The use of a simple partial pass-through of incremental fuel costs provides the utility with this type of general incentive. The maximization of a specific efficiency measure by a utility will rarely result in overall generation cost minimization. In addition, complex efficiency measures have often been found to contain expected implications for utility incentives. The MCE being used in the current fuel clause is no exception. Better efficiency measures can likely be constructed; however, the estimation and calibration of these alternative efficiency measures would take time.

PROPOSED REVISIONS TO CHAPTER 4901:1-11, O.A.C., WITH COMMENTS

Rule 01 shall be amended to read as follows:

(K) Strike the entire subsection.

Rule 03 shall be amended to read as follows:

(B) Replace the words "SYSTEM LOSS ADJUSTMENT" with the words "FUEL RATE ADJUSTMENT".

Comment:

Fuel rate adjustments are no longer based on system loss costs. Instead, fuel rate adjustments are based on the change in fuel costs over previous period fuel costs. Thus, the term "system loss adjustment" is no longer appropriate and is replaced with a term which is more descriptive of the rate to which it applies.

Rule 04 shall be amended to read as follows:

(A) SCOPE

Replace the words "EXCEPT FOR SYSTEM LOSS COSTS" with the words "EXCEPT FOR THE INCREMENT OR DECREMENT OVER THE PREVIOUS BASE PERIOD FUEL COSTS".

Comment:

The fuel rate adjustment is now based on the change in fuel costs over the previous base period rather than on system loss costs. Therefore, all previous period fuel costs are now recoverable through the fuel component.

(B) (3) THE DENOMINATOR OF THE FUEL COMPONENT SHALL EQUAL THE CORRESPONDING NUMBER OF INCLUDABLE KILOWATT-HOURS SOLD AS SET FORTH IN PARAGRAPH (H) OF THIS RULE.

Comment:

Because system loss costs are no longer excluded from rate recovery through the fuel clause, it is no longer necessary to use kilowatt-hours generated rather than kilowatt-hours sold.

(H) INCLUDABLE KILOWATT-HOURS SOLD

(1) THE INCLUDABLE ENERGY IS THE NUMBER OF KILOWATT-HOURS SOLD BY THE ELECTRIC UTILITY IN THE BASE PERIOD.

(2) EXCLUDABLE ENERGY
Strike the words "PLUS THE NUMBER OF KILOWATT-HOURS OF SYSTEM LOSSES ASSOCIATED WITH ALL EXCLUDABLE ENERGY."

Comment:

The definitions of the terms "includable energy" and "excludable energy" have been changed because system loss costs are no longer to be excluded from recovery through the FC rate.

Rule 05 shall be amended to read as follows:

(B) (3) Replace the words "GENERATED AND PURCHASED" with the word "SOLD".

(D) (3) (a)
Strike the words "MULTIPLIED BY THE RATIO OF METERED LEVEL KILOWATT-HOURS TO GENERATION LEVEL KILOWATT-HOURS FOR THE BASE PERIOD."

(D) (3) (c)
Strike the words "THE DIFFERENCE SHALL BE MULTIPLIED BY THE RATIO OF GENERATION LEVEL KILOWATT-HOURS TO METERED LEVEL KILOWATT-HOURS FOR THE BASE PERIOD." Replace the words "THE PRODUCT" whenever they appear with "THE DIFFERENCE".

Comment:

The stricken multiplications are no longer necessary because kilowatt-hours for rate recovery are now measured on an as-sold basis rather than on an as-generated-and-purchased basis.

Rule 06 shall be amended to read as follows:

(A) SCOPE

(1) EACH ELECTRIC UTILITY SHALL RECOVER A PORTION OF THE DIFFERENCE BETWEEN FUEL COSTS IN THE PREVIOUS PERIOD AND FUEL COSTS FOR THE BASE PERIOD.

(2) Strike the entire paragraph.

(3) THE RECOVERY OF A PORTION OF THE DIFFERENCE BETWEEN FUEL COSTS IN THE BASE PERIOD AND FUEL COSTS FOR THE CURRENT PERIOD SHALL BE MADE THROUGH THE FUEL RATE ADJUSTMENT. THE FUEL RATE ADJUSTMENT SHALL BE DETERMINED ON THE BASIS OF KNOWN AND FORECAST DATA FOR EACH MONTH OF THE BASE PERIOD AND SHALL ENCOMPASS ONLY THOSE MONTHS INCLUDED IN THE SAME BASE PERIOD. THE AMOUNT OF THE FUEL RATE ADJUSTMENT SHALL BE CALCULATED PURSUANT TO PARAGRAPH (C) OF THIS RULE. THE FUEL RATE ADJUSTMENT SHALL BE EXPRESSED ON A CENTS PER KILOWATT-HOUR BASIS.

(B) Strike the entire section.

(C) CALCULATION OF THE FUEL RATE ADJUSTMENT
THE FUEL RATE ADJUSTMENT SHALL BE CALCULATED BY EACH ELECTRIC UTILITY AS FOLLOWS:

(1) THE FUEL COSTS RECOVERABLE THROUGH THE FUEL RATE ADJUSTMENT FOR THE BASE PERIOD SHALL BE CALCULATED AS THE DIFFERENCE BETWEEN INCLUDABLE FUEL COSTS INCURRED IN THE PREVIOUS PERIOD AND INCLUDABLE FUEL COSTS INCURRED IN THE BASE PERIOD MULTIPLIED BY THE RECOVERY FRACTION Fcrf. Fcrf SHALL BE EQUAL TO .5 UNLESS OTHERWISE SET BY THE COMMISSION IN A RATE ORDER.

(2) THE FUEL RATE ADJUSTMENT SHALL EQUAL THE FUEL COSTS RECOVERABLE THROUGH THE FUEL RATE ADJUSTMENT FOR THE BASE PERIOD DIVIDED BY THE KILOWATT-HOURS SOLD AS DEFINED IN RULE 04, SECTION H.