Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

PUBLIC AFFAIRS

March 23, 2009

In reply refer to: DK-7

Dustin T. Till
Marten Law Group, PLLC
1191 Second Avenue, Suite 2200
Seattle, WA 98101

RE: FOIA #09-028

Dear Mr. Till:

This is your final response to your request for information that you made to the Bonneville Power Administration (BPA), under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

You requested the following:
A copy of the study published by BPA between 1996 and 1998 regarding the variable rate charged to DSIs between 1986 and 1996 recovered, on average, the IP rate.

Response:
BPA has located and provided the responsive document in its entirety.

If you are dissatisfied with this determination, you may make an appeal within thirty (30) days of receipt of this letter to Director, Office of Hearings and Appeals, Department of Energy, 1000 Independence Avenue SW, Washington, DC 20585. The envelope and the letter must be clearly marked "Freedom of Information Act Appeal." There is no charge for this request.

I appreciate the opportunity to assist you with this matter. If you have any questions about this response, please contact my FOIA Specialist, Laura M. Atterbury, at (503) 230-7305.

Sincerely,

/s/ Christina J. Brannon

Christina J. Brannon
Freedom of Information Act/Privacy Act Officer

Enclosure: Responsive document

Bonneville Power Administration's Variable Industrial Power Rate Program for Pacific Northwest Aluminum Smelters

Final Program Summary from August 1986 to September 1996

Direct Service Industries
Market Segment Management

October 1996

Bonneville Power Administration
U.S. Department of Energy
P.O. Box 3621
Portland, Oregon 97208-3621 U.S.A.

Executive Summary

In August 1986 Bonneville Power Administration (BPA) adopted a 10-Year Variable Industrial (VI) rate program for the Pacific Northwest (PNW) aluminum smelters. The VI rate that the smelters paid was indexed to the monthly U.S. Transaction price of aluminum. This program worked well for both BPA and the aluminum smelters.

The PNW aluminum smelters represent 40 percent of U.S. production and use up to 3000 aMW of power, which is 30 percent of BPA sales. The early 1980's were trying times for both BPA and the aluminum smelters. BPA adopted dramatic rate increases, in part, to cover large PNW nuclear debt. A worldwide slowdown in metal consumption caused aluminum prices to fall. Since power represents 30 percent of a smelter's costs, the PNW smelters were caught with rising costs and declining prices for their products. As a result, large smelter loads began closing production. This had a dramatic effect on BPA sales and revenues, since BPA started developing large power surplus in the 1980's.

BPA's VI rate program intended to stabilize BPA's revenues by encouraging the continued operation of large aluminum smelter loads during periods of low metal prices. The program also demonstrated to the smelters that BPA intended to be a good business partner by helping their large and valuable high load factor loads remain competitive.

Since aluminum prices are cyclical, the VI rate was a risk-sharing venture between BPA and the smelters. During periods of low metal prices, BPA would discount the standard Industrial Power (IP) rates to the smelters. In return, during periods of high metal prices the smelters would pay BPA a premium over the IP rate. Over the 10-year period, the program was designed so that BPA was expected to collect as much aluminum smelter revenue with the VI rate as without the VI rate.

By the end of the VI rate program on September 30, 1996, BPA is expected to make out better than expected. During the first 5 years of the VI rate, the metal prices were higher than average, and the smelters paid premiums over the IP rate. During the last 5 years, metal prices were lower than average, and BPA gave the smelters a discount from the IP rates. In the end, however, the VI rate program is expected to collect $100 million more in nominal revenues (or $137 million in constant 1994 dollars) from the smelters than if there had been no VI rate. Part of this is due to the fact that without the VI rate, more smelters would have closed production during low metal prices, and BPA would have had to sell the unused power at a reduced price on the spot market.

When the original VI rate terminates, BPA will offer a follow-on VI rate with the new 5-Year DSI Block Sale Power Contract. The new VI rate will be similar to the old VI rate, but with one major difference. The primary risk of cyclical metal prices will be shared by the smelters and a third financial party, not BPA. If the new VI rate is selected by a DSI, the rate discount or rate premium from BPA's IP rate will be borne by both the smelters and the third financial party. Thus, BPA will achieve greater revenue stability by

passing off revenue volatility risks due to cyclical metal prices and fluctuating power rates.

I. Background

BPA, a power marketing agency within the U.S. Department of Energy, supplies about half of the power used in the PNW states of Oregon, Washington, Idaho and Western Montana. BPA markets the power produced by the 30 Federal dams and generation projects in the PNW, and the power-intensive aluminum smelters consume about 30 percent of BPA's power.

There are 10 smelters in the PNW, 2 in Oregon, 7 in Washington State, and 1 in Montana. Of the 10 smelters, 6 are owned by major aluminum companies, and 4 are independently owned. The first smelter was built in Vancouver, Washington, in 1940, and the last was built in Goldendale, Washington, in 1971. The smelters were attracted to the abundant and low cost hydro-power available when the U.S. Government started building dams in the PNW. Half of the 10 PNW smelters were built in the 1940's, and were essential to U.S. World War II efforts to build war material. The 10 present PNW smelters produce 40 percent of the U.S. and about 10 percent of the Western world's aluminum. All 10 smelters use as much power as 3 cities the size of Seattle, Washington.

Starting from the 1890's, when aluminum was first produced commercially, to the 1970's, there were only a few large aluminum producers worldwide. With few large producers, metal prices tended to be stable and changed only slightly and infrequently. During the 1970's, aluminum trading on the London Metals Exchange was established, more metal market players emerged, and aluminum became a true commodity. Since then, there have been dramatic swings in aluminum prices, based on market supply and demand.

BPA's rates from its inception in the late 1930's to the late 1970's were also rather constant and changed infrequently. From the 1960's to late 1970's, BPA's low hydro-power rates were less than 10 mills per kWh, in constant 1994 dollars. In the early 1980's, BPA's rates rose 600 percent, in part, to cover the PNW region's nuclear debt.

The increased BPA power rates and low metal prices in the 1980's caused some smelters to reduce production, while others were put up for sale. This had a large sales and revenue impact on BPA, which had a power surplus. In order to retain the large smelter loads, BPA first offered a series of take-or-pay discounted incentive rates. Most smelters continued operating with the discounted rates. BPA then designed a 10-year variable industrial rate for the smelters, indexed to the price of aluminum. BPA believes that this 10-year VI rate stability prevented 3 smelters from permanently closing.

The VI rate program was designed by BPA for a 10-year period, which would be long enough to capture at least one complete aluminum price cycle. This increased the probability that the VI rate discounts given by BPA would closely equal the VI rate premiums collected. The VI rate was intended to "break-even," revenue-wise for BPA

over the 10-year period. BPA's VI rate program was approved by the Federal Energy Regulatory Commission initially for only 7 years (1986 to 1993), then later extended for another 3 years (until 1996), for a full 10 years. The program will end in September 1996.

II. General Concept of a Variable Rate

Variable industrial power rates have evolved in response to certain conditions existing between industries and utilities. Some general characteristics of industries and utilities who have adopted variable rates are as follows:

Industry Conditions

Cyclical and Elastic Product Prices -- Industries whose product prices fluctuate by large amounts may seek lower power rates when prices for their products are low.

Power Intensive -- Industries whose products consume large amounts of power have large power bills, thus may seek flexible power rates.

Rising Power Costs -- Industries may become economically marginalized when power costs go up; they are still viable when prices for their products are high, but higher power prices may make them uneconomical when prices for their products are low.

High Shutdown & Restart Costs -- Industries with high shutdown and restart costs may seek flexible power rates to continue operating when product prices are low.

High Fixed Costs -- Industries with high fixed costs have high fixed payments whether or not they operate, so they may seek flexible power rates to continue operating when prices for their products are low.

Utility Conditions

High Fixed Costs -- The higher a utility's fixed cost ratio, the greater its incentive to continue making power sales to help pay the high fixed costs.

Large Industrial Loads -- Loss of large industrial power sales could be hard to replace; these large industrial loads may also provide power system stability reserves.

Large "At Risk" Industrial Loads -- If the utility has a large amount of "at risk" industrial loads, it may be in the utility's best interest to help these industries stay competitive to continue purchasing power, especially during low prices for their products.

Large High Load Factor Industries -- Industries that purchase power 24 hours a day are especially attractive so that the utility can better utilize generation resources, since a constantly used generation resource is more economical than one used periodically.

Large Power Surplus -- Utilities that have large power surpluses are eager to retain large power intensive industries in the absence of other potential large sales.

III. Variable Rate Design

General Economic Theory

The general theory is that if a firm cannot recover its variable cost of production, then the firm will close production. When the firm recovers its total (fixed plus variable) cost of production, then it will start making profit margins (i.e., unless a firm's margins are over their variable production costs, then the firm will be forced to restructure its fixed costs). Thus, to prevent the firm from shutting down during low commodity prices, rate discounts can be given when the prices are below the firm's variable production costs. When the commodity prices are above the firm's total costs, then the firm can start paying a rate premium to offset the rate discounts that were given during low commodity prices.

Plateau Rate

For the utility, the plateau rate is the standard industrial rate that would be charged if there were no variable rate. The advantage of a plateau rate is that the utility can plan on greater rate and revenue stability. This is because the rates will be stable on the plateau between set commodity price levels.

Rate Slopes

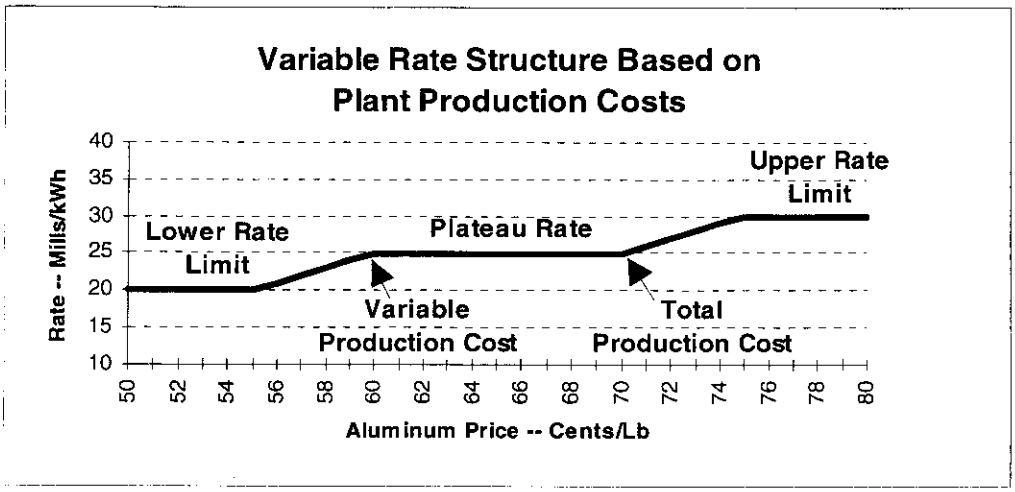
The slopes determine the magnitude of the rate discounts given. BPA's lower slope is 1.0, which is a ratio of 1 mill discount for every 1 cent drop in metal price. This reflects the fact that the typical PNW smelter uses 7.5 kWh to make a pound of metal, and typically also has alumina (supply) costs indexed at about 25 percent of metal price. Most other production costs, such as labor and other costs, are not necessarily tied to the metal price. Thus, when the aluminum price drops 1 cent, then the smelter will pay 1 mill less for BPA power. With a power efficiency of 7.5 kWh per pound of metal, its power cost will decline 0.75 cents. The 1 cent drop in aluminum price also drops the alumina cost by 0.25 cents. Therefore, the smelter's production cost will also drop by 1 cent for every 1 cent drop in metal price, and the smelter should "break-even."

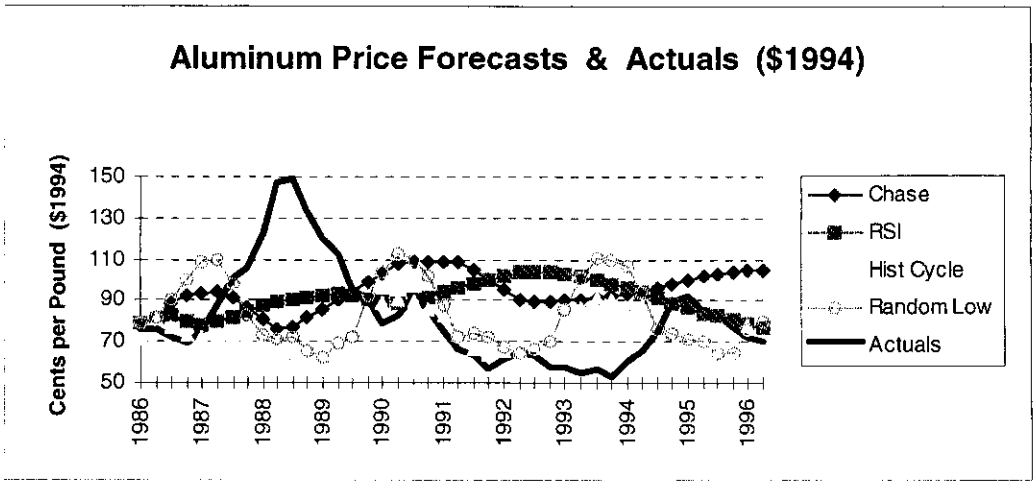
Rate Limits

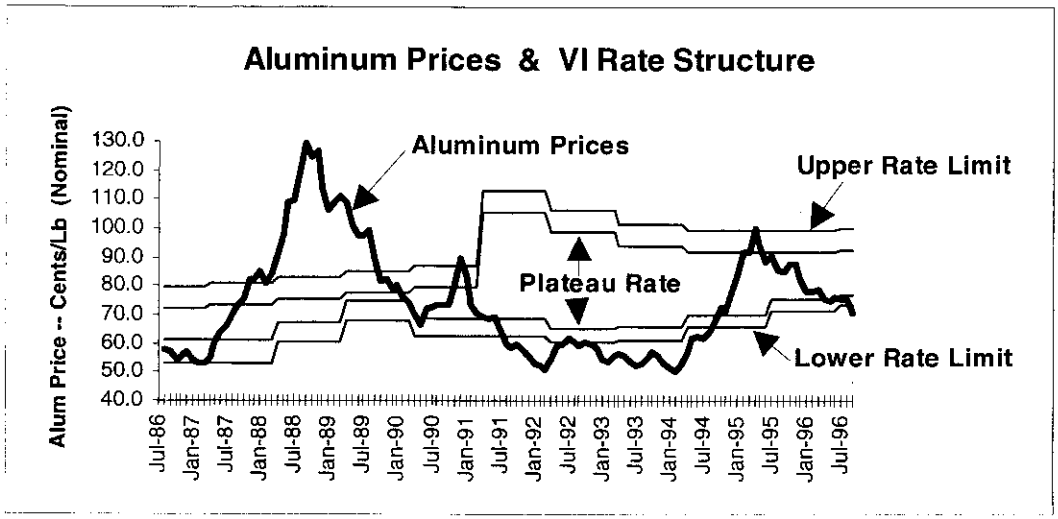
Rate discounts would be given when commodity prices are low, but the lower rate limit would be the opportunity cost of the utility's power. That is, if the smelter does not buy the power, the utility can always sell the power on the spot market. The price on the spot market is the opportunity cost of power to the utility. The upper rate limit would be calculated to offset the maximum discounts of the lower rate limit. Alternatively, the utility may have no rate limits, and have the possibility of giving deeper rate discounts, or collecting greater rate premiums based on the metal price. BPA's VI rate has rate limits.

Anticipated Aluminum Prices

The variable rate structure should also be designed with an anticipated metal price. Knowing that metal prices are cyclical, the VI rate parameters should anticipate as many metal prices on the lower slope and rate limit as there are on the upper slope and rate limit. In this way, there should be as much rate discounts given as premiums collected.







IV. Variable Rate Impact on BPA

Advantages of Large Aluminum Smelter Loads

BPA's variable rate was designed to keep the aluminum smelters competitive on the world market and continuously purchasing BPA power, even during low metal prices.

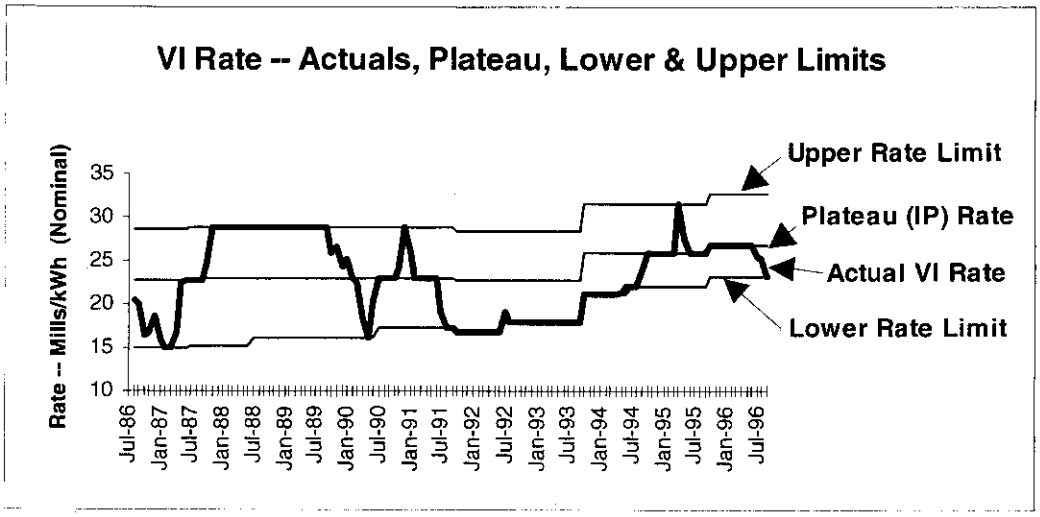
Smelters have high load factors, averaging 98.5 percent. This means that they take nearly a constant amount of power, day and night, throughout the year. This enables BPA to continuously and fully utilize generation resources with very few slack periods. A constantly operating generation resource is more economical than one used periodically.

Smelters have large loads that provide power system reserves. Because the aluminum smelters comprise about 30 percent of BPA's loads, their loads can easily be interrupted within seconds for short periods of time to provide power system stability.

These system benefits make these large industrial loads attractive. Should BPA lose these loads, the additional costs of future system stability and lesser utilization of generating resources will have to be borne by higher rates for other customers.

Variable Rate Actuals in Variable Rate Structure

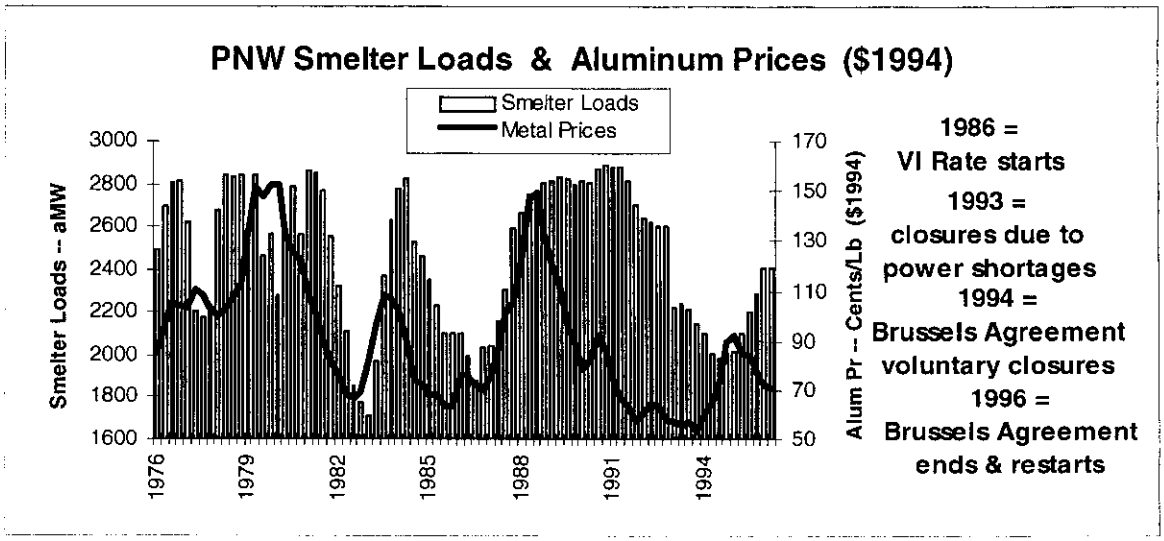
The following graph shows how the actual VI rate (based on cyclical aluminum prices) fit into the VI rate structure over the 10-year period.



The actual VI rate averaged 23.0 mills, which was slightly lower than the average IP rate of 23.9 mills for the 10-year program. However, the low VI rate during low metal prices also helped PNW smelters remain competitive and continue to buy BPA power instead of closing production.

BPA Load Impact

The following graph shows aluminum prices and smelter loads from 1976 to 1996. From 1976 to early 1986, smelters generally operated at full capacity during high metal prices and closed production (and bought less power) during low metal prices.



This metal price versus smelter load relationship changed with the adoption of BPA's variable rate in August 1986. The smelters continued to operate and maintain

high load levels even when metal prices started dropping after the metal price peak in 1988.

However, smelters reduced loads in 1993 due to the PNW drought, when BPA cut off one quarter of their power. Smelter loads were further reduced in 1994 due to poor metal prices and the signing of the "Brussels Agreement." Due to the continuing low metal prices, the aluminum producing nations met in Brussels, Belgium, in early 1994 and signed a 2-year "Memorandum of Understanding," by which the major metal companies voluntarily agreed to cut production due to poor market conditions. Metal prices started recovering during 1994, in response to the reduced metal production. The "Brussels Agreement" expired in early 1996, and many companies restarted idled production.

Goals for BPA's VI Rate Program

The *1986 Variable Industrial Power Rate Executive Summary of Administrator's Record of Decision* (DOE/BP-707, August 1986) stated three goals for BPA's VI rate program, which were all fulfilled:

1. Discourage aluminum plant closure during the short run, one to three years
2. Encourage smelters to operate and stabilize their consumption of power during BPA's surplus of firm power
3. Increase BPA's total revenues over those that would be expected from the Standard IP rate with the Incentive rate option

V. Break-Even Analysis

BPA's VI rate analysis shows that BPA collected $100 million ($137 million $1994) more in revenues over the 10-year period with a VI rate than without a VI rate.

BPA's Break-Even Analysis

BPA's analysis assumes that if there was not a VI rate program, that three smelters would have permanently closed. In addition, other smelters would swing operations in response to cyclical metal prices, depending on their production costs both with and without the VI rate.

BPA's methodology assumes that the VI rate discounts given during low aluminum prices kept some of the high-cost smelters operating, whereas they would have closed with the higher IP rate during the low metal prices. BPA also assumed that if a smelter is closed, that the unsold BPA power would be either sold on the spot market or else used to offset other power purchases.

For several years in the early 1990's the aluminum prices were in the low 50 cents per pound range, which is one-third below the average long-term price of 80 cents. Many PNW smelters had a difficult time recovering their operating costs with metal prices in the 50 cents per pound range. BPA's VI rate during the low aluminum prices gave the

PNW smelters a power rate discount up to 6 mills, which would reduced their average power costs about 4.5 cents for every pound of metal produced.

The DeFazio Alternative Break-Even Analysis

A report from Congressman Peter DeFazio (D-Oregon) titled *"BPA at a Crossroads"* (May 1994), concluded that BPA's VI rate was losing revenues for BPA. The DeFazio report took the 10-year averages of the VI and IP rates and multiplied both rates by the same smelter loads. Since the average 10-year VI rate (23.0 mills) turned out lower than the average IP rate (23.9 mills), the report concluded that the 10-year VI rate program would lose revenues for BPA.

If one agreed with this methodology, then one would assume that all the PNW smelters operated identically over the last 10 years with the IP rate as they did with the VI rate. That is, one would have assumed that the VI rate discounts given during low metal prices had no impact in increasing the chances of the smelters' continued operations due to lower power prices. Using the DeFazio break-even VI rate methodology, the total 10-year revenues using the same smelter loads both with the IP rate and a VI rate would have resulted in a total BPA revenue loss of $116 million ($91 million loss in $1994).

BPA's Disagreement with the DeFazio Analysis

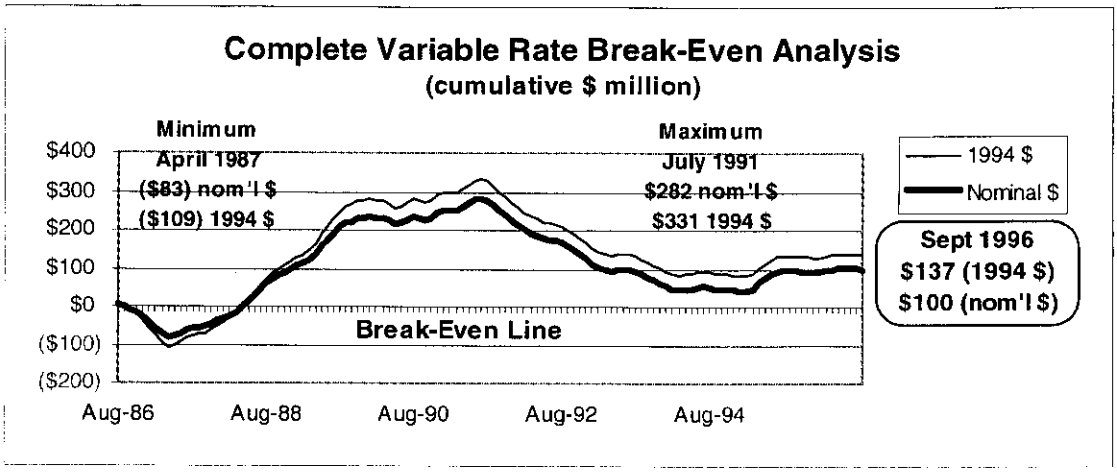
BPA disagreed with the DeFazio report's analysis and conclusion, since it is not reasonable to assume the same smelter loads for 10 years both with and without a VI rate. BPA also disagreed with the report's assumption that the power not sold to the smelters would not be resold or used to offset power purchases. BPA's disagreement was noted in a footnote in the DeFazio report.

BPA thinks it is not a reasonable economic assumption that there would be the same amount of smelter operations in the last 10 years both with the IP rate and VI rate, as assumed in the DeFazio report's analysis. Some additional smelter capacity would have shut down at the higher BPA IP power rates when the low aluminum prices would not cover the variable operating costs of the marginal smelters.

In addition, BPA's methodology to evaluate the VI rate is the same methodology used to adopt the VI rate, as documented in the *1986 Final Variable Rate Proposal, Variable Industrial Power Rate Design Study* (VI-86-FS-BPA-02, June 1986). BPA's VI rate methodology was also publicly reviewed in BPA rate cases, and also approved by the Federal Energy Regulatory Commission for the VI rate program.

Considering the Time Value of Money

The nominal $100 million BPA benefit from the VI rate program also does not consider the time value of money. Due to the time value of money, VI rate premiums collected 10 years ago are really worth more in spending power than the same discounts given recently. If this is factored into the VI rate analysis, it would show that BPA's VI rate program benefit would actually be worth $137 million in constant $1994.



VI. The Subsidy Question

Black's Law Dictionary (6th Edition, 1990) defines the term "subsidy" as, *"A grant of money made by government in aid of the promoters of any enterprise, work, or improvement in which the government desires to participate, or which is considered a proper subject for government aid, because such purpose is likely to be of benefit to the public."*

There have been statements that BPA's VI rate program was a "subsidy" to the aluminum smelters. BPA does not agree that the VI rate program was a "subsidy" to the smelters for the following reasons.

1. The VI rate was a risk-sharing program between BPA and the smelters. If the metal prices were higher than forecasted for the program period, then BPA would collect more revenues than from the standard IP rate. If the metal prices were lower than forecasted, then BPA would collect less revenues than from the IP rate. This does not appear to fit the above definition of a "subsidy," since the VI rate program was not a one-way grant of money from BPA to the smelters.

2. Even if BPA's VI rate program had "lost" money (rather than "making" $100 million nominal or $137 million in constant 1994 dollars), BPA would still not consider

the VI rate program a "subsidy." This is because the program would still have been a two-way risk sharing deal, and not an outright grant.

3. The Congressional report "*BPA at a Crossroads*" concluded that the VI rate was "losing money" for BPA, which some consider as proof of a BPA "subsidy." BPA does not agree with the report. The report was also done during a period of power shortages and low aluminum prices, and the low VI rates paid by the smelters caused concerns. However, there are not equivalent concerns during periods of normal or high metal prices.

4. The Direct Service Industries, Inc. (DSI, Inc.), the trade group for aluminum smelters served by BPA, has claimed that the rate premiums paid by the smelters during high aluminum prices allowed BPA to cancel one of its regularly scheduled rate increases. Thus, some may state that the higher rate premiums paid by the smelters during high metal prices have "subsidized" the low rates paid by other BPA customers.

VII. The "New" BPA Variable Industrial Rate

BPA will offer a "new" VI rate starting October 1996, when the original "old" VI rate expires. The new VI rate is more fully described in the BPA Rate Case's *1996 Initial Rate Proposal Direct Testimony* document WP-96-E-BPA-35 (July 1995).

BPA's old VI rate program was one of the first of its kind 10 years ago. Because variable power rates are designed to mitigate the risk of cyclical metal prices and stabilize revenues for both the smelters and their power suppliers, the popularity of the variable rate has increased. Today, about one-third of all Western world smelters have variable power rates with their power suppliers. In 5 years, this proportion is expected to rise to one-half.
To stay competitive in such a market, it is anticipated that the PNW smelters will continue to need some sort of program to mitigate their low metal price risks.

The major difference between the old and new BPA VI rate is who will share the primary risk of the cyclical metal prices. Under the old VI rate, both BPA and the smelters shared the risk. Thus, BPA had the risk of under-recovering revenues and the smelters had the risk of paying higher than average power rates. Under the new VI rate, BPA will pass off the primary risk of cyclical VI rates tied to metal prices to the smelters and a third party financial institution.

Ten years ago, there was not the volume of aluminum trading on the commodities exchange as there is today. Thus, ten years ago the financial institutions could not easily mitigate very large risks in cyclical metal prices, such as to cover the large PNW aluminum industry. However, the increased volume in metal trading today has made it easier to mitigate the large risk necessary for the large PNW aluminum industry.

BPA's new VI rate takes advantage of this new metal price risk mitigation opportunity. If a smelter customer wants a new VI rate, BPA will recruit a third party financial institution that will trade on the commodity exchange and mitigate the primary metal price risks for the smelter. In this way, if metal prices are low, the smelter will get a power rate discount, and the third party financial institution will pay BPA the difference between BPA's standard IP rate and the discounted smelter power rate. Conversely, if the metal prices are high, the smelter will pay a power rate premium over BPA's standard IP rate, which will be passed on to the third party financial institution mitigating the risk.

Because of this new metal price risk mitigation scheme, the smelters themselves could also manage their own variable power rate risk. However, some smelters may prefer that their power supplier handle all the details of their power supply, so they can concentrate on producing and selling metal.

Thus, under BPA's new VI rate, a smelter can remain competitive with a variable power rate during low metal prices and continue to buy BPA power. BPA will also achieve greater revenue stability by passing off revenue volatility risks due to cyclical metal prices and fluctuating variable power rates.