Marginal (or Opportunity) Cost Pricing Under Regional Dialogue

The term "marginal cost" or "opportunity cost" has been used frequently in reference to certain pricing principles in connection with the proposed Regional Dialogue Policy and its implementation. The terms are generally interchangeable in their usage. This paper will delve into these concepts and present some of the varied thinking regarding the pricing principles that will be examined as BPA seeks to define how the Regional Dialogue Policy is implemented.

The key principle of marginal cost pricing under Regional Dialogue is that customers that choose additional services beyond raw system output pay the full cost of those services. The proposed Policy sets up an approach where the customers choose the additional services they want from BPA and that the costs of those additional services are rolled in with the costs for other customers choosing the same services. How those costs are distributed among customers choosing the services is left for future rate design discussions. The intent of this key principle is maintain the inherent value of the core system to all customers to the maximum extent possible.

Tiered Rates Overview

The fundamental pricing provision of the Regional Dialogue Policy is that BPA will tier its rates to its requirements customers.

> ***Policy Proposal:***
> BPA currently estimates the firm output of the FCRPS for FY 2012, net of all pre-existing firm system obligations, at approximately 7,100 aMW... This number, as well as BPA's regional net requirements load, is uncertain. This uncertainly is relevant to several issues, including the amount of ***lowest cost-based*** service that may be available to serve new publics and the anticipated time before existing customers are exposed to service at a ***marginal cost-based*** rate for their incremental power supply. (page 8)

The Policy defines two tiers of power, the output of the existing system priced at the lowest cost-based rate and incremental power at a marginal cost-based rate. The definition of these amounts of power and their corresponding rates is the subject of the implementation process that has commenced and will continue into late 2007. Initial thoughts on these definitions are presented later.

> ***Policy Proposal:***
> There is broad agreement among BPA, its customers, and other regional and national stakeholders that limiting BPA's open-ended obligation accomplishes our shared goals of promoting regional resource and infrastructure development, limiting BPA's costs, rates, and risk by not diluting the low-cost Federal system with high-cost power purchases, and helping ensure that the U.S.

taxpayers can continue to expect full and timely repayment of their investment. The cornerstone of the Regional Dialogue policy is to limit BPA's sales of firm power at the ***lowest-cost-based*** rate to public preference customers to meet their firm requirements loads to approximately the firm capability of the existing Federal system. … BPA proposes that each customer have a high water mark (HWM), which sets a ***lowest-cost-based*** rate ceiling for purchasing firm requirements power from the existing Federal system. … Under the long-term tiered rates structure, rates that reflect the low-cost existing Federal system (or Tier 1) would be distinguished through the HWM from rates that reflect the costs of power from incremental resources (or Tier 2). This tiered rates structure would send the appropriate ***marginal-cost-based*** price signal to customers for service for load growth beyond their HWM. (page 12)

Policy Proposal:

Experience has shown that BPA's open-ended supply obligation and current pricing structure create significant risks of cost increases and price hikes for BPA's power. BPA's proposal addresses these risks and proposes a much more certain and predictable construct, not by trying to change BPA's statutory power supply responsibilities, but by focusing on a more rational pricing structure. Clarity about the amount of power BPA would provide at what price in the future enables market participants—purchasers, marketers, and developers—to understand their economic choices and to better pursue rational economic investment alternatives. Thus, BPA developed the basic concept of limiting its sales of firm power at its ***lowest-cost-based rates*** to not exceed approximately the firm capability of the existing Federal system, and of providing additional retail load service at a higher rate that reflects the ***marginal cost*** of purchasing power to meet those additional loads. This is fundamentally designed to "encourage regional actions that ensure adequate, efficient and reliable power service." (page 80)

Tier 1 Pricing

The Policy commitment to Tier 1 pricing is that it will be at the lowest cost-based rate achievable consistent with BPA's statutory and financial obligations.

Policy Proposal:

Tier 1 Rates for PF Power: BPA is proposing to limit access to the **lowest-cost-based rate** by providing customers a HWM to define maximum amounts of power available to each customer at Tier 1 rates. Tier 1 rates would include the cost of the existing FBS and other costs such as the following: a. REP Costs… b.

> Public Benefits… c. Conservation… d. Renewables… e. Power Purchases… f. New Public Customers… g. GTA Costs… h. DSI Service… i. Other… (page 29-30)
>
> ***Policy Proposal:***
> As a cornerstone of this proposal, and to give customers long-term predictability and certainty, BPA proposes to establish a long-term tiered rates methodology that would limit the amount of power sold at our ***lowest cost-based*** rate to approximately the firm capability of the existing FBS under 20-year contracts. At the outset it is important to note that any rate proposal would require a Northwest Power Act section 7(i) rate setting proceeding and specific decisions on rates would be made in each rate case, consistent with the long-term methodology. This section describes the process and the key rate construct—a tiered PF Preference Rate—that BPA would put in place to meet the goal of minimizing the dilution of the low-cost service from the existing Federal system and the need to resolve the impact of the PF Exchange Rate on tiered rates. This pricing section concludes by discussing the rate construct for reshaping the FBS into the available power products. (page 28-29)

The Policy does not mention the design for Tier 1 rates, a topic that is usually reserved for individual rate cases. However, there has been some discussions with customer representatives regarding the desire to incorporate some rate design discussion into the tiered rates methodology. Some of this desire arises from the concern about what BPA will do to incorporate marginal cost pricing into its rate design. Another desire of the customers it to give some certainty to how they will be asked to pay for the Tier 1 power they are committing to for nearly 20 years.

While BPA is unlikely to commit to a certain rate design of the Regional Dialogue contracts, there may be some principles that could be codified in the Tiered Rates Methodology. There are at least five different methodological approaches to rate design that we will examine, both internally and with stakeholders. One method is BPA's current method of establishing the marginal cost-based price of each component of power sales (monthly energy, monthly demand, load variance) and scaling certain components downward by an equal percentage until revenues equal the allocated costs. Another method is similar to the first, but uses equal percentage scaling of all the rate components. A third method could develop demand charges through peak-crediting and energy charges based on some method of cost allocation. A fourth method would be comprised of cost-based assignment to the rate components. A final method would charge all customers based on a percentage of system costs, much as Slice does today. Within each of these methodologies they are various sub-components that allow certain cost to be assigned according to cost causation (*e.g.*, balancing purchases) and to allow for price signals.

In all methods outlined above, the costs recovered by the Tier 1 rates would be limited to the costs allocated to the Tier 1 power. There are certain costs, while labeled as Tier 1 cost, that would not be recovered through this Tier 1 rate, but under separate charges. These are discussed below in the section on Shaping Services. The current Load Variance charge best fits in that discussion.

The following table assesses the comparative level of the rate components to the marginal cost of providing each component.

Method	Description	Demand	Energy	Shaping
1	selective scaling	at marginal cost	considerably lower	at marginal cost
2	equal scaling	considerably lower	considerably lower	considerably lower
3	peak credit	near marginal cost	considerably lower	undefined, probably at cost
4	traditional allocated cost	somewhat higher	much lower	at actual cost
5	percentage basis	undefined	considerably lower	at actual cost

The importance of achieving certain objectives through Tier 1 rate design will be discussed. For example, one important factor in assessing the comparative merits of the different methods is that when the access to components is limited, marginal-cost rate design is less important and when there is no limit to a component, marginal-cost rate design is much more important. The Regional Dialogue Policy proposes to limit access to Tier 1 energy, meaning that the energy rate design is less important. The Policy does not propose to limit access to demand or shaping, increasing the need to price those components closer to marginal cost.

In addition to considering limits on the access to components is the ability of the customer to influence or control the amount of the component that they utilize. In the short-run, customers have little ability to control the amount of demand and shaping that they utilize (assuming that issues regarding how customers dispatch their own resources is addressed through other means). This means that how demand and shaping are priced is less important. But there is a long-term aspect to this consideration. If access to demand and shaping are not limited and they are not priced appropriately, then loads with unfavorable attributes may be attracted into our customers' service territories, with BPA, and by extension, all other customers, bearing the additional costs of these new loads.

Tier 2 Pricing

Tier 2 rates are expected to be at the marginal cost of power for amounts in excess of HWMs.

Policy Proposal:
Tier 2 Rates for PF Power: BPA proposes that power provided to meet a customer's net firm power requirements loads beyond its HWM would be provided at Tier 2 rates. BPA would set rates to fully recover the costs from those customers who request Tier 2 service. To the extent that FBS power is provided to serve load beyond a customer's HWM, it would be priced at BPA's ***marginal cost*** of power with the excess value above the average FBS cost being credited back to Tier 1 rates. Customers would have choices about the types of resources they choose for service at the Tier 2 rate. BPA proposes to establish notice periods associated with providing service subject to the Tier 2 rate. To help ensure Tier 2 costs stay separate from the Tier 1 rate, Tier 2 price options would include take-or-pay provisions that ensure the expected BPA revenue, but also provide the customer the market value of power they are not able to take and that BPA is able to remarket. While Tier 2 products and rates would be designed to assure full cost recovery to meet requirements of Section 7(a) and (g) of the Northwest Power Act, BPA must preserve the ability to reallocate costs to the Tier 1 rate in the unlikely event that Tier 2 costs cannot be recovered through the Tier 2 rate. (page 30)

Policy Proposal:
The rates that the customer pays would depend on the relationship between the customer's individual net requirement load placed on BPA and its individual HWM. A Tier 1 rate would apply for deliveries of Federal power to meet a customer's net requirement load below its HWM amount, reflecting the cost of the existing FBS. A Tier 2 rate would apply for power purchased to meet a customer's net requirement load above its HWM amount, reflecting the ***marginal cost*** of serving the load. (page 17)

Several different resource portfolios could be offered under Tier 2 pricing.

Policy Proposal:
If customers want to purchase power priced at the ***marginal cost*** of BPA acquiring or purchasing such power for their load above their HWM, BPA proposes to offer several service alternatives that reflect the full underlying costs of the new resources or market purchases used to provide them priced at a Tier 2 rate. BPA will not subsidize Tier 2 rates to create a financial advantage for a customer to make a choice to buy from BPA instead of the market. The costs of power acquired to serve load subject to a Tier 2 rate would be kept as low as possible and would not be melded with costs of the existing Federal system… (page 13)

There are a number of considerations for Tier 2 rate design. Tier 2 prices could be set each rate period to reflect the expected market cost of procuring power, or the Tier 2 prices could be determined to recover the actual cost of power procurements. The first option introduces risk into the Tier 2 cost pool because the expected market value of power may be higher or lower than the costs actually incurred in obtaining the power. Risk of this type will be harder to deal with in Tier 2, creating either financial surpluses or deficits that may ultimately impact Tier 1 costs.

The second option of basing Tier 2 rates on BPA's actual costs introduces other issues. For instance, there has been discussing establishing different vintages of rate pools depending on when a customer enters the pool and how long they commit to the pool. This issue can be illustrated by the following: assume that a group of customers committed to BPA for Tier 2 beginning in FY2012, and their loads are now 100 aMW. The cost of their Tier 2 power for FY2017 is about $60/MWh because BPA made long-term commitments to procure this power. A large customer who had been self-supplying is now facing a market price of $100/MWh for 100 aMW of Tier 2 and decides to turn to BPA for service. Are the existing Tier 2 customers now melded with the new customer and all are charged $80/MWh, or do the existing customers get to keep their $60/MWh power with the new customer consigned to pay the $100/MWh that it costs BPA to provide the new 100 aMW?

> ***Policy Proposal:***
> Purchases at Tier 2 rates would also be take-or-pay, subject to specific yet-to-be developed terms for those products. BPA would design those terms so that the benefits as well as the costs of those purchases are retained by the customer or customer group making the commitment, mimicking the cost and benefits of a comparable purchase from the market. A fundamental principle for Tier 2 rates would be that, to the extent possible, the customers retain all risks, costs and benefits for these ***marginal cost based*** purchases. (page 19)

Shaping Services

Shaping services are designed to convert the output of the Federal system into power that can be used to serve customers' loads. The services are comprised of balancing purchases and sales which moves power among the months and diurnal periods, and load variance, which moves the power from monthly diurnal blocks into hourly amounts that serve the customer's load. Different customers use differing amounts of each. For example, a flat annual block uses some shaping, while a winter-peaking full requirements customers uses greater amounts of both services.

> ***Policy Proposal:***
> BPA proposes that charging reasonable ***opportunity-cost-of-service-based*** adjustments for shaping services is an important element of the overall proposal to equitably provide access to

> BPA's ***lowest cost-based*** rates. It is also the approach discussed in earlier versions of the PPC Proposal. Charging less than BPA's projected ***opportunity cost of service*** would allow a customer's use of system flexibility to reduce the value from the existing Federal system to the remaining customers. BPA's proposal is designed to ensure that a customer's use of FBS flexibility is provided equitably to all customers. By charging the ***opportunity cost*** for buying and selling energy to shape amounts of FBS power to what a customer actually purchases that customer's use of these services does not erode the value of BPA's secondary energy, which maintains the rate-reduction benefits of the credits for this secondary revenue. Any Slice product would not be affected by this reshaping because a Slice purchaser does not buy load shaping or load following from BPA and can use the flexibility within contractually established limits directly to manage the Federal power with its other non-Federal resources for its own loads. (page 31)

Pricing shaping services at marginal costs is designed to minimize the inter-customer cost shifts that arise from using differing amounts of shaping services. A Slice customer uses none of the shaping services from BPA, so they should bear none of the cost. A flat annual block customers uses fewer services than a winter-heavy shaped block customer, so the flat annual block customer should pay relatively fewer shaping costs. The block customers use no load variance service from BPA, so they should not bear any cost of this service.

The goal of pricing shaping services according to marginal cost is to arrive at rates and billing determinants that appropriately distribute the costs of these services to those who use the services in rough proportion to their comparative usage.

BPA currently forecasts the value of balancing purchases and sales based on monthly market prices of diurnal energy because that best tracks the value of the power being moved between periods. Whether or not an actual purchase made, depending on the availability of secondary energy, failing to value the energy needed in a deficit period would result in one customer losing the value of the Federal system to another customer who gains due to shaping of the energy to their load. Since this process begins with BPA being in annual load-resource balance, the process accounts for only the difference in value among the monthly diurnal periods in a year.

Shaping services are different than Tier 2 energy. Shaping services are generally dealing with determining the value of flexibilities of the Federal system in addition to the actual cost of balancing purchases, whereas Tier 2 energy is generally dealing with actual purchases of energy. Therefore, it is more appropriate to measure the value of the system flexibility based on market prices than actual costs. This will result in a more appropriate cost assignment to those using more shaping services and will better preserve the value of the Federal for those using fewer shaping services.