THE FERC'S VINTAGE AND ORIGINAL PURPOSE DOCTRINE FOR TRANSMISSION PRICING

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Abstract

The Federal Energy Regulatory Commission has sanctioned a new “doctrine” for ratemaking by approving PJM-RTO’s modified zonal transmission rates. Here, an interconnected transmission network owner recovers all the costs of its existing transmission facilities from customers physically located within its own zone – even though those from other zones within the RTO benefit from using these facilities – while the costs of new facilities are allocated to beneficiaries across all zones within RTO. The FERC’s decision was partly based on the faulty premise that existing-transmission-facility costs are sunk; the resulting subsidized transmission rates are discriminatory thwarting future RTO development and investment.

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1. **Introduction and Background**

   With the issuance of its Order 2000 in December 1999, the United States Federal Energy Regulatory Commission (“FERC”) set forth a framework to encourage the development and expansion of Regional Transmission Organizations (“RTOs”) with the stated goal of promoting efficiency and competition in wholesale electricity markets. A central goal of FERC’s RTO policy has been the elimination of “rate pancaking” or the application of separate transmission access charges for each utility service territory crossed by the transmission customer’s contract path.

   Elimination of rate pancaking has proved to be a vexing problem for the FERC because of the lack of consensus among the transmission-owner members within an RTO. This has been especially troubling in the FERC cases involving the Pennsylvania, New Jersey, Maryland Interconnection (PJM) RTO. In its opinion in this case, the FERC has seemingly developed a “vintage and original-use doctrine”¹ that precludes any broad, region-wide sharing of the costs associated with existing transmission facilities but mandates that a share of the costs associated with new transmission facilities be allocated to customers across the entire RTO region based on a beneficiary pays model. Under the “modified zonal” transmission pricing approved by the FERC in this case, 100% of the costs of existing transmission facilities are recovered solely from those customers (ultimately, the retail ratepayers) residing in the zones where the lines are located even though customers located in other zones within the RTO region benefit from the use of these existing facilities. For example, a New Jersey ratepayer would pay nothing for its electricity provider using an Ohio transmission line to import relatively inexpensive coal-fired

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¹ The use of the term “vintage and original-use doctrine” is, in part, accredited to Bruce W. Radford, “Vintage, Voltage or Votes” *Public Utilities Fortnightly*, December 2007. Radford’s piece provides a good summary of the public debate which ensued on this subject.
power from Indiana. However, ratepayers in Ohio and Indiana may be required to help pay for new transmission upgrades required to further increase the import capability of power into New Jersey.

The “vintage and original-purpose doctrine” results in an unduly discriminatory and preferential set of transmission prices based on vintage; i.e., new versus existing facilities. The “vintage and original-purpose doctrine” focuses on the original uses of transmission facilities outside the context of an RTO structure and then appeals to such original purpose for determining cost allocation within the context of an RTO structure. This logic works against the FERC’s own goal of regionalization of transmission operations because it leads to a subsidization of those who need competitive wholesale markets the most at the expense of those who need them the least.

FERC’s new “doctrine” is based, in part, on the following premises: (1) the costs of existing transmission facilities are sunk; (2) the original purpose of past investments in transmission located in a certain zone was to serve customers within that zone and, therefore, 100% of the costs of these existing facilities should be allocated to these zonal customers (despite the fact that others outside the zone may and do use those facilities); and, (3) the objective of national RTO pricing policy is the promotion of incentives for new transmission investment. Conventional wisdom among some economists appears to support the view that past utility investments are sunk. We examine this premise and find that with few exceptions, this view is mostly incorrect and those who expound it in utility ratemaking settings risk inefficient pricing.

In this analysis we first provide key background on FERC orders 888 and 2000 – orders that have attempted to provide for non-discriminatory equal access to the nation’s transmission
systems. In the case of a non-homogeneous RTO, we show that developing an RTO-wide transmission rate design (as per FERC Order 2000) – while moving away from FERC Order 888 “pancaked rates” – has proved to be an extremely troublesome problem for the FERC. We then show that the difficulties in developing consensus regarding a region-wide transmission rate design have been exacerbated by the FERC’s “vintage and original-purpose doctrine” applied to the PJM RTO. This doctrine is based on a flawed interpretation and use of the sunk-cost concept and violates standard utility rate-making principles.

1.1. Background: FERC Order 888 and Transaction-Specific Point-to-Point Service

For more than 15 years, FERC has devoted significant effort toward establishing competitive regional wholesale power markets. This effort has led the FERC to further develop rules and regulations aimed at preventing undue discrimination in the provision of unbundled wholesale electric transmission services. These rules and regulations underscore the FERC’s concern over the potential for vertical market power, which stems from the possibility that a transmission utility may give preferential treatment to affiliated electric generation over unaffiliated power producers in the provision of unbundled transmission services.

FERC Order 888 (issued April 24, 1996) was the first in a series of orders that have attempted to create an environment wherein unaffiliated power producers can gain non-discriminatory equal access to transmission services with the goal that wholesale power markets increasingly become more open to competition. FERC Order 888 required its jurisdictional utilities that own and operate transmission lines to file Open Access Transmission Tariffs (OATTs), which provide for unbundled wholesale transmission and ancillary services to others in a nondiscriminatory fashion.
An individual utility’s OATT establishes unbundled prices for point-to-point transmission service and network integration transmission service as well as six unbundled ancillary services.² Point-to-point transmission service provides for the delivery of a transmission customer’s capacity and/or energy from a designated point-of-receipt (or “source point” on the transmission system) to a designated point-of-delivery (or “sink point” on the transmission system), which in turn provides power to a specific load. Point-to-point transmission service facilitates generation capacity and energy sales between a single seller and a single buyer of power. Under Order 888, such capacity and energy transactions require the scheduling of a contiguous transmission contract path between the points of receipt and delivery. Moreover, the transmission customer must acquire point-to-point transmission service from each utility whose transmission system the contract path crosses. When a contract path crosses multiple utilities’ transmission systems, the resulting payment of multiple point-to-point transmission service rates (under the FERC Order 888 OATTs) is referred to as “rate pancaking.”

The term “wheeling” refers to the unbundled transmission service provided by a transmission utility to a transmission customer, who requires the unbundled third-party transmission service to consummate its sale of generation capacity or energy to some wholesale buyer of power. During hours where the demand for transmission capacity exceeds available capacity on a particular transmission path, schedules are rationed on a “first-in-line” or “first-

² The six ancillary services are: (1) scheduling, system control and dispatch service; (2) reactive supply and voltage control from generation sources service; (3) regulation and frequency response service; (4) energy imbalance service; (5) spinning reserve service; and (6) supplemental reserve service. While the focus here is on point-to-point transmission service, integrated-network service allows the (network) transmission customer to integrate, economically dispatch and regulate its own (scattered) network resources to serve its network load in a manner comparable to that in which the transmission provider utilizes its transmission service to serve its native load.
come first-served” basis. In this queue, the native load served by the transmission provider itself, is at the front of the line.

When a contract path crosses multiple utilities’ transmission systems, the first transmission-providing utility (where the point-of-receipt resides) is compensated for “wheeling-out services.” The last transmission-providing utility (where the point-of-delivery resides) is compensated for “wheeling-in services” and any in-between transmission-providing utility is compensated for “wheeling-through” services. Also, under the FERC Order 888 pro forma OATT the price paid for point-to-point transmission service does not vary by distance; and that price is multiplied by the amount of reserved transmission capacity measured in kilowatts (“kW”). Therefore, under the FERC Order 888 regime (for a given amount of scheduled capacity) the amount paid by the transmission customer to a particular transmission-providing utility for point-to-point transmission service does not depend upon whether the service provided is of the “wheeling-out,” “wheeling-through” or “wheeling-in” variety.

1.2. Background: FERC Order 2000 and the Movement to Eliminate Rate Pancaking

As utilities in the United States began offering transmission service under FERC Order 888, the FERC started to perceive potential problems under these regimes. Primarily, the FERC perceived that: (1) transmission providers still had opportunities to unduly discriminate in favor of affiliated power-market participants; (2) rate pancaking was also inhibiting the development of region-wide competitive wholesale markets for power; and (3) the first-in-line rationing device under FERC Order 888 favored the transmission owner’s affiliated interests. As a result, the FERC issued FERC Order 2000 on December 20, 1999.

As part of the FERC’s policy goal of establishing competitive regional wholesale power markets, wherein load-serving entities are able to access lower-cost generating resources located
anywhere in the region, FERC Order 2000 encouraged individual transmission owners to voluntarily join independently-managed Regional Transmission Organizations (RTOs). RTOs are regulated entities responsible for administering a single transmission tariff for service within a region. The RTO region is comprised of the individual members’ zones. The primary characteristics of an RTO are that: (1) it is independent of all market participants; (2) it is of appropriate geographical scope and regional configuration; (3) it has operational authority for all transmission facilities under its control; and (4) it has exclusive short-term reliability authority. Currently, there are four FERC-approved operational RTOs; they are: (1) the Pennsylvania, New Jersey, Maryland Interconnection (PJM) RTO; (2) the Midwest Independent System Operator (MISO) RTO; (3) the New England RTO; and, (4) the Southwest Power Pool (SPP) RTO. In each of these RTOs, the member utilities still own the transmission facilities within their zone, but they have relinquished operational control of this transmission to the independent region-wide RTO operator.

It is important to note that RTOs have been developed, for the most part, by utilities within the states that have also authorized retail choice, where end-use customers are allowed to choose alternative suppliers of power. Most of the retail choice states have also dismantled their traditional vertically-integrated utilities. In these states, for the most part, traditional utilities have sold off their generation resources and have relinquished operational control over their transmission resources to the RTO of which they are a member. Because the vast majority of retail customers in these states have not actively chosen an alternative supplier of power, the

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3 A member’s “zone” is that member’s individual transmission network and control area. Under FERC Order 888 each individual member had its own separate OATT and operated its own control area; while under FERC Order 2000 the RTO has one region-wide OATT and operational control is the responsibility of the RTO.

4 There are three other operational “RTOs” that have yet to receive FERC approval. They are the New York Independent System Operator, the California Independent System Operator and the Electric Reliability Council of Texas (ERCOT) Independent System Operator. The California and New York ISOs have not gained FERC approval because the FERC does not view them as “regional in scope.” The ERCOT ISO has not received FERC approval because it is not under FERC jurisdiction.
dismantled utility is obligated to procure wholesale market power on behalf of these customers – as well as pass on the cost of these market purchases to these customers. As a result, these states have become extremely dependent on wholesale markets and tend to be strong proponents of the FERC’s efforts in establishing competitive regional wholesale power markets.

However, approximately three-quarters of states have not opted into retail choice, have maintained the traditional vertically-integrated utilities, and therefore have not become as dependent on wholesale power markets. Across these traditional states, RTO development has been slow to develop and, therefore (at the wholesale level), utilities in these states operate under the FERC Order 888 world. There has been some degree of tension between these “Traditional States” and the FERC regarding the need for RTOs. These states argue that they have carefully planned to ensure adequate resources through reasonable investments by state-regulated vertically-integrated utilities; andt their retail customers have provided, and continue to provide, the “collateral” backing for financing transmission investments by state-regulated utilities. Typically, the overwhelming share of transmission cost recovery comes from state-regulated retail rates. These states go on to say that this low-risk business allows the utility to maintain relatively low financing costs and, hence, lower retail rates and that these state-regulated utilities should not be forced to compete for transmission capacity originally financed to serve their retail customers or “native load.”

Under FERC Order 2000 a key objective of the RTO tariffs is the elimination of transaction-specific charges for point-to-point transmission service across each member system within an RTO. The FERC held that pancaked rates would serve as “toll gates” that could block customers’ access to the most efficient generating resources within the region. In conjunction with its decision to eliminate these charges, FERC required RTOs and participating transmission
owners and their customers to develop a regional transmission rate that would replace pancaked rates. In the world of RTOs, the regional transmission rates have developed across two competing lines: (1) the zonal, or so-called license plate, rate design; and, (2) the postage-stamp rate design.

Under the postage-stamp regime, all customers throughout the entire RTO region pay the same rates designed to recover the full cost of the entire region-wide transmission system. All customers throughout the entire RTO are allowed to use the entire transmission system and the postage-stamp rate is calculated based on the sum of all these customers’ demands. The name “postage-stamp” refers to the fact that all transmission customers pay the same price per kilowatt demand but can “mail” their power anywhere within the region. The postage-stamp regime is very similar to the rate design for integrated network service at the individual transmission operator level under FERC Order 888, but expanded to the RTO (regional) level.

The zonal or “license plate’ rates are designed to recover the cost in each zone solely from the load (customers) physically located within that zone. However, transmission customers are free to use the entire RTO transmission system comprised of all zonal/member transmission networks within the entire RTO. The name “license-plate” rate refers to the fact that this regime is analogous to the situation wherein individual states collect license plate fees from those people with vehicles registered within that state, but these people are free to drive their vehicles on roads in any state.

Developing an RTO regional rate – and a movement away from FERC Order 888 pancaked transmission rates – has proven to be quite a vexing problem for the FERC. A major reason for such difficulties is that not all individual member transmission systems are used as extensively as all other members’ systems; that is, RTO members tend not to be homogeneous in
that there is asymmetric usage of each others’ systems. On the one side are utilities who historically have provided substantial third-party transmission service and used the revenues from that service as an offset to the cost-of-service charged to their native retail and wholesale customers that reside in their “zone.”

The utilities in this first camp own transmission systems that are heavily used by others to facilitate regional power transfers. Absent a regional rate design that allocates some of their costs to users other than the native retail and wholesale customers who reside in their “zone,” these utilities argue that the elimination of “wheeling-through” and “wheeling-out” point-to-point transmission service rates will lead to substantial revenue shortfalls. Such shortfalls occur when there is a movement away from FERC Order 888 through and out rates to a zonal, or license plate, RTO pricing structure. These shortfalls will have to be passed on to their native zonal customers through higher rates. Utilities and states that historically have provided substantial third-party transmission service believe some compensation for these lost revenues is justified; or as an alternative, the regional rate should be of the postage-stamp variety.

A movement from FERC Order 888 point-to-point transmission service to an RTO zonal pricing regime would eliminate revenues paid to a transmission-providing utility from wheeling-through and wheeling-out point-to-point transactions. In each of these two types of services, the transmission customer is serving a load that resides in a zone other than that of the transmission-providing utility.

On the other side of the debate regarding an appropriate regional transmission rate are utilities who believe that a movement away from zonal pricing to postage-stamp rate will substantially shifts costs to them, which must be passed along to their customers in the form of higher rates. These utilities own transmission systems that have not been heavily used to
facilitate regional power transfers; but these utilities tend to have zonal load that depend significantly on other members’ systems to access power sources throughout the region. The utilities in this camp would tend to favor zonal rate designs. This camp was also a major opponent of 888 pancaked rates because – being extensive users of others’ transmission systems – they paid significant wheeling through and out fees.

2. The PJM Case

The PJM case illustrates the difficulties in developing a RTO regional rate – and a movement away from FERC Order 888 pancaked transmission rates – created by a non-homogeneous RTO. Moreover, this case has produced some troubling results. Specifically, in its Opinion No. 494\(^5\), the FERC repeatedly refers to the costs of existing transmission facilities as sunk and, therefore, should only be paid for by those customers for which these investments were originally intended. In this conclusion the FERC, as discussed below, has relied on a faulty application and interpretation of the concept of sunk costs. This flawed use of sunk costs has led the FERC to continue the use of its modified zonal rate design, which is arguably unjust, unreasonable, unduly discriminatory and preferential. The results of this case are quite surprising when one considers all the effort that the FERC has gone through over the last 15 years to establish non-discriminatory wholesale access to the transmission systems.

The lack of consensus towards a region-wide transmission tariff has caused some members within PJM to recommend that FERC permanently adopt its (interim) “modified zonal rate design.” As mentioned above, under “modified zonal” transmission pricing, 100% of the

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\(^5\) FERC Opinion No. 494 (PJM Interconnection, L.L.C., 119 FERC ¶ 61,063) was issued on April 19, 2007 in Docket Nos. EL05-121-000 and EL05-121-002. Opinion No. 494 reverses the Initial Opinion by the Presiding Administrative Law Judge issued on July 13, 2006 (PJM Interconnection, L.L.C., 116 FERC ¶63,007). In the Initial Opinion, the Judge ruled that the existing PJM license-plate pricing was unjust and unreasonable under sections 205 and 206 of the Federal Power Act.
costs of existing transmission facilities are recovered solely from those native customers (ultimately, the retail ratepayers) residing in the zones where the lines are located even though customers located in other zones within the RTO region benefit from using these existing facilities.

American Electric Power (AEP), a PJM member, argued that the zonal rate design might be appropriate in regions where each member’s transmission systems are of comparable size and where there is symmetric usage of each others’ systems within the region. In the PJM region, however, that isn’t the case. AEP contends that large power transfers across the regional transmission grid are made by possible by AEP’s existing “backbone” network of extra-high voltage transmission facilities (those greater than 345 kV) and that other PJM’s members have not made comparable investment in such existing facilities. AEP further contends that the region is made up of zones that historically have been either (i) significant net importers (i.e., those who primarily used the transmission system—and incurred third-party charges for those uses—to access lower-cost power in other zones), or (ii) significant net exporters (i.e., those who provided substantial transmission service—and earned third-party revenues for those uses—to permit importers to access lower-cost power in other zones).6

Pancaked rate charges served as a method to allocate the costs of the exporters’ systems to users within the importers’ systems via wheeling through and out fees. AEP argues that, the zonal rate design fails to fairly allocate these costs and thereby (i) unduly discriminates against customers in the zones of AEP and other net exporters by causing them to shoulder the costs of the backbone, and (ii) unduly prefers customers in net import zones by shielding them from paying a fair share of the costs of the backbone system that they use and benefit from.

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6 AEP’s argument in the PJM case at the FERC is summarized in its Request for Rehearing (March 3, 2008) in Docket No. EL07-101-001. The rehearing was denied by the FERC.
Absent wheeling through and out fees, AEP advocated a rate design that would allocate the total costs of all regional backbone facilities – new and existing – to customers throughout the entire PJM region, where the allocation is based on each zone’s contribution to the system peak. AEP further argued that the cost of existing and new lower voltage (non-backbone) facilities should be allocated under the zonal methodology; i.e., to customers of the zone within which the facilities are located because these facilities are primarily used by native load within a zone.

AEP lost. In its Opinion No. 494 the FERC found that there was insufficient evidence to find that the existing modified zonal rate design is unjust and unreasonable and that this interim rate design would be made permanent. In this decision, standard rate-making principles gave way to majority rule. The FERC, in its determination that a zero price for others’ use of AEP’s existing transmission facilities is just and reasonable, has given excessive weight to the fact that such a rate design is palatable to a majority of the PJM stakeholders – the eastern block.

Considering how crucial AEP’s existing EHV transmission facilities are to the PJM RTO, and considering that most of the parties had a history of purchasing more Through & Out Services than they sold, it is not surprising that these parties would vote for non-payment for AEP’s existing EHV transmission facilities. Clearly, however, the Federal Power Act does not state that a majority approval of a rate implies that the rate is just and reasonable.\(^7\)

3. **The PJM Case: The Role of Sunk Costs**

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\(^7\) AEP appealed the FERC’s Opinion No. 494 to the Seventh Circuit of the U.S. Court of Appeals. On a 2-1 vote the Court affirmed FERC’s zonal rate design for existing facilities but rejected FERC’s rate design of new facilities greater than 500 kV. The case was remanded back to the FERC and a new final order is pending.
PJM’s FERC-approved modified zonal transmission tariff uses different allocation methods for new versus existing transmission facilities and uses different allocation methods for new high-voltage transmission facilities versus new low-voltage transmission facilities. The former is most troubling. The rate design admits to the fact that there are regional benefits for new high-voltage transmission facilities but fails to recognize the existence of regional benefits from the interrelated existing high-voltage transmission facilities. The FERC justifies this inconsistency based on the concept of sunk costs. In their testimony in this case before the FERC, Evans and Schmalensee state that:

> It has been well known in economics for at least a century that the allocation of sunk costs cannot affect the efficient use of resources. There is, therefore, no reason based on economic efficiency to require network transmission customers to bear a greater share of the existing sunk costs of network transmission facilities than they now bear...

The FERC, in part, relied on this sunk cost notion propounded by Evans and Schmalensee in its justification for approving the modified zonal approach,

> That is, the existing facilities represent sunk costs that were built primarily by individual utilities to serve their own internal needs and were financed by those utilities. This fact supports continued reliance on a zonal or license plate rate design to recover the costs of these existing transmission facilities.

Such logic seemingly provides the basis for FERC’s “vintage and original-purpose doctrine. Because this doctrine has not heretofore been analyzed in the academic literature, we initiate such review and look forward to others weighing in on the subject. Should this doctrine for existing facilities set forth a precedent to influence future utility ratemaking? We begin by questioning whether the costs associated with existing utility facilities are sunk costs. We then question whether the original purpose behind utility investments should forever guide regulatory

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9 FERC, Opinion No. 494, Docket Nos. EL05-121-000 and EL05-121-002, April 19, 2007, ¶50.
allocation of costs and effectively substitute the long-standing matching principle and beneficiary pays doctrine.

4. **Are Existing Transmission Costs “Sunk Costs”?**

   In the PJM case, the FERC appears to have relied on a very narrow view of sunk costs. The sunk cost concept is not simply black or white, and the view that costs are either eternally sunk or not at all sunk is no longer consistent with contemporary economic thought. The sunk cost concept is one of degree with a dynamic time dimension. This sunk cost time dimension will nicely match the time dimension associated with traditional ratemaking principles discussed in the next section below. As Professor Jean Tirole (1988) clearly articulates:

   *We will define fixed costs as costs that are independent of the scale of production and are locked in (committed, sunk) for some short length of time... The distinction between ‘fixed costs’ and ‘sunk costs’ is one of degree, not one of nature. Fixed costs are sunk only in the short run. ... Sunk costs are those investment costs that produce a stream of benefits over a long horizon but can never be recouped. A machine will be labeled a fixed cost if the firm rents it for a month (or can sell it without capital loss a month after its purchase) and a sunk cost if the firm is stuck with it....there is clearly a continuum of degrees of commitment between these two polar cases of short and eternal commitment.*

   Therefore, costs related to utility investments would be considered “eternally” sunk if such investments can never be recouped upon exit from the service market. However, this does not appear to be the case. If a transmission owner in the United States desired to exit the transmission business, clearly it could recoup most, if not all, of its existing transmission investments through sale of those assets to other companies; therefore, those costs are not sunk from the point of view of the current owner.
Bonbright, Danielson, and Kamershen (1988) characterize sunk costs as: “The essential characteristics of a sunk investment is that the productive capital facilities are so specialized as to location or purpose that they cannot easily be converted to alternative productive uses.”

Transmission capacity, however, does have alternative uses, which may differ from what the facilities were originally intended; that is, the transmission assets are fungible to some degree (only costs of non-fungible assets are sunk). Ironically in its Opinion No. 494 ¶ 51, the FERC actually recognized this as a fact “...[in] that the transmission system is used today in ways that differ from when the facilities were first constructed....” This fact serves to show that the transmission facilities in question do have alternative uses and can serve markets other than the zone within which they are physically located; thereby demonstrating that they are not eternally sunk.

The classic example of an eternally sunk cost is a firm’s purchase of a non-transferable business license. Such investments are required for a firm to provide service, are only valuable for the specific service the license originally was intended to cover, and cannot be resold should the firm desire to exit the industry. This example illustrates an investment that cannot be applied to alternative uses other than that which it was originally intended and whose costs cannot be recouped upon exiting the industry. Therefore, the fact that this upfront investment was required to enter the industry will never influence future decision-making.

An electric utility example is illustrated by dedicated line extensions. For example, there are mining companies operating in the western United States that have mines in very remote areas. These mining operations are usually very high-demand electric utility customers, and the electric utility constructs high-capacity, dedicated connection facilities to provide access to the grid. Because of the remote location and large capacity of these connection facilities, it is highly
doubtful that they could serve an alternative use other than service to the mine. Therefore, if the mine were to suddenly shut down, it would be difficult for the utility to keep these facilities in service and recover its costs. It is for this reason that such a customer would either be required to pay for the connection facilities in advance (as is common under most line extension rules) or at a minimum enter into a long-term contract with substantial termination penalties. This would be an example of investment costs that are probably eternally sunk, which are very different than the “highway” transmission facilities that clearly can serve multiple markets as well as customers other than those for whom the facilities were originally intended.

The fact that transmission facilities are physically tied to a geographic location does not create sunk costs. In our earlier example of a mining operation located in a remote area, location of transmission facilities contributed to our conclusion that those costs are probably eternally sunk. However, the high-voltage transmission facilities in question do interconnect with multiple markets, have value for alternative uses and, therefore, are not sunk. Additionally, through time – as regional load grows and characteristics of demand changes – the number of alternative uses of the highway increases and, therefore, the degree to which the costs may be deemed “sunk” decreases.

The degree to which costs are sunk is time-dependent (i.e., the time period necessary to alter the current use of available transmission capacity.) The mix of transmission use is constantly varying hour to hour, day to day; and, therefore, transmission investments do not exhibit the characteristics of “sunk” costs. Most importantly, labeling transmission based on vintage and a very narrow view of sunk cost in an attempt to justify disparate pricing between new and existing transmission services results in a highly discriminatory pricing regime.

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10 One possible alternative, however, could be the siting of a generation plant adjacent to the mine. The power plant possibly could use the same connection facilities to access the grid.
Finally, as argued above by Evans and Schmalensee, the allocation of sunk costs does not affect the efficient use of resources. This is not the case with AEP’s existing high-voltage transmission facilities. The fact that utilities from eastern PJM zones can benefit from using AEP’s existing transmission facilities to import Midwest power – while paying a zero pricing for such use – could definitely lead to decreased investment in additional eastern power plants even if such investment made economic sense.

5. **Original-Purpose Doctrine Substitutes Sound Utility Ratemaking Principles**

The PJM rate design admits to the fact that there are regional benefits for new high-voltage transmission facilities but fails to recognize the existence of regional benefits from the interrelated existing high-voltage transmission facilities. This inconsistency is unjust, unreasonable, unduly discriminatory and unduly preferential and is in clear violation of standard utility rate-making principles.

The current rate regime leaves AEP and its customers, *for the first time in decades*, with no compensation for others’ use of AEP’s backbone transmission system. This means that others are allowed to use, and benefit from, AEP’s backbone transmission while paying a price of zero. Non-AEP customers clearly benefit from AEP’s backbone transmission services and their lack of payment for these services has in turn led to a sharp increase in what AEP customers pay for transmission services. At the same time, the current rate design in PJM requires AEP and its customers to share in the cost of new extra high voltage (EHV) transmission facilities being built to alleviate congestion on the eastern part of PJM. In other words, while transmission customers in eastern PJM may, at no cost, use the AEP system to access resources located to the west, AEP’s customers will bear a significant share of the cost of new facilities designed to increase
transmission access for the customers in eastern PJM. In this pricing regime, non-AEP customers are clearly granted preferential treatment over AEP customers.

If a particular new facility is installed that is dedicated to, and renders benefits exclusively to, only a select and distinct group of customers, then cost causation would suggest that only these customers pay for the said facility. For example, if a radial line extension is constructed to deliver power to another utility, then the customers of that utility generally will be required to pay the full cost of this dedicated facility. If a primary reason for expanding RTOs is to also expand the market for wholesale power, then clearly non-AEP customers benefit in this respect from the access provided by AEP’s existing EHV facilities. The vintage of AEP’s existing facilities simply does not detract from this fact; therefore, using different allocation factors based on vintage is not consistent with standard utility rate-making procedures.

Facilities with different vintages are distinguished in the rate base by their depreciated-book value. Standard rate-making procedures set a facility’s stock value at original cost minus accumulated depreciation and amortization (i.e., net book value), where depreciation is accumulated via a straight-line depreciation schedule. Utility rates include a reasonable return on the depreciated-book value and a return of the value through an annual depreciation expense, based on a straight-line depreciation schedule.

Whereas the customer composition typically changes through time, the benefits received from a particular facility tend to be distributed uniformly throughout the facility’s expected life. While maintenance expenditures may increase as the facility ages, the annual benefits received from the initial capital outlay are approximately the same through time. In order to match intergenerational benefits with the intergenerational allocation of capital costs, it follows that the annual depreciation expense should be constant through time. Finally, while the installed costs
of a facility are incurred in the past, the manner in which the revenue is collected through time – for the purpose of replacing the facility – is a dynamic concept, which should be matched with the benefits received through time. Depreciation expense is, in general, an allowance in recognition that all property used in providing service wears out and eventually must be replaced. Because consumers receive the benefit of the property through time, they should pay for its economic consumption through time. The costs associated with the economic consumption of transmission assets include annual depreciation expense and maintenance expenses. These are on-going costs, which need to be allocated to those who consume (i.e., use) the existing facilities. The identities and mix of beneficiaries will tend to change through time and the use of straight-line depreciation properly assigns costs as those benefits are received through time. This tends to conform to the time dimension found in the modern definition of sunk cost.

Rates are set in response to what the utility’s environment – including customer composition – is expected to look like moving forward, and not in response to what the utility’s environment may have been like years in the past. Straight-line depreciation recognizes this phenomenon by allocating to new customers, like PJM customers who now benefit from use of the regional EHV grid, the depreciated costs of the grid. PJM customers would be getting quite a bargain if they paid a share of the embedded cost of the AEP EHV network, as compared to what they would pay if that network were replicated at today’s costs.

The degree of confusion regarding this observation is extremely alarming given that such confusion seems to be guiding public policy in this case. AEP’s existing facilities clearly can be used for purposes other than what they were originally intended; that is, they are, to a certain degree, fungible assets. The costs of fungible assets are not eternally sunk. It goes without
saying that AEP’s existing facilities can be used for purposes other than what they were originally intended given the fact that RTOs didn’t exist at the time when most of these facilities were built. In other words, the facilities still accomplish their original objective of transmitting large amounts of power, but now they provide this valuable service to customers through PJM. From an economic and ratemaking standpoint, one could argue that the costs of facilities are truly 100% sunk \textit{only} if they have no value outside the purpose in which they were originally intended and, in turn, could be retired without repercussion. In that case, the facilities should be paid for only by those customers for whom they were originally intended to serve. This is clearly not the case here.

In its Opinion 494, the FERC also argued that existing transmission facilities were not part of the current PJM RTP planning process and, therefore, the costs of these facilities should only be allocated to those for whom these investments were originally intended. Institutional rules regarding capital planning change all the time, but standard rate-making principles guiding the allocation of capital costs – be they existing or new – still apply. For example, state integrated resource planning (“IRP”) processes were in vogue during the 1980s, went out of fashion during the deregulation phase in the 1990s, and have lately come back into fashion. New state statutes regarding IRP are beneficial in helping utilities and commissions determine the least-cost mix of new investment. However, such a process does not, and should not, lead to a situation wherein facilities built prior to IRP are used by certain customers for free. New planning processes will always build on what came before them; in fact, what came before them will also guide what direction the planning process moves going forward.

Indeed, FERC has applied these same principles for years in approving rates for coordination sales and third-party transmission service. For example, while expressly
recognizing that a utility’s fleet of power plants was built to serve native load customers, FERC has allowed the utility’s rates for off-system power sales to include a fully allocated share of the fixed costs of the fleet in addition to the applicable energy costs. Likewise, third-party transmission customers pay a fully allocated share of the fixed costs of existing grid through FERC-approved point-to-point charges.

The important fact central to this discussion is that just because AEP’s existing transmission facilities were built prior to the RTO planning process does not mean that customers throughout the region do not currently benefit from such facilities. While cost causation principles look to assign costs to those for whom facilities were built (based on their current and projected usage of the facilities) – and certainly AEP zonal customers will be allocated a significant share of the costs of the AEP system. These principles, however, also look to see who else currently benefits from the facilities as well as who will benefit from these facilities moving forward. Those who would focus solely on the fact that the AEP system was not developed under the same planning regime as exists today place too much emphasis on that aspect and thus incorrectly apply cost-causation principles.

Utility facilities are in service during a period of time that typically includes many different rate cases and an ever-changing mix of customers and customer demand. During a particular rate case a test-year period is chosen for analysis, which typically includes the utility’s costs, revenues and customer demand and usage characteristics over the most previous calendar year. Then, these data are adjusted for any known and measurable changes so that a “picture” is developed, which most likely represents what the world facing the utility will look like moving forward into the rate-affected period. The key point being made here is that rates are set in
response to what the utility’s environment is expected to look like moving forward and not in response to what the utility’s environment was like in the past.

6. **Substitution of the New Doctrine for Traditional Ratemaking Principles results in Highly Discriminatory Rates**

In economics, price discrimination exists when customers or users of an identical service pay different prices for that service and the price differential cannot be explained by cost differences. The existing zonal rate design is clearly unduly discriminatory. The fact that some users of existing transmission capacity physically located outside the users’ zone pay nothing for the use of that transmission capacity is indicative of price discrimination. The cost of high-voltage transmission capacity is the same whether the user of that capacity is within the zone where the transmission is located or the user is located outside the zone. Therefore, the price differential between these two types of users of the same capacity is not cost-justified, thereby satisfying the economist definition of price discrimination. The price discrimination inherent in the PJM modified zonal rate design, however, not only satisfies the economics definition, is by far an extreme form of price discrimination.

Legal forms of price discrimination do exist in a variety of businesses. One example would be a restaurant that offers student discounts or senior discounts for the exact same meals for which others pay full price. Similarly, motels may offer a senior discount for the exact same room non-senior customers would pay full. These discounts that discriminate based on student status or age are not cost-justified and are clear examples of price discrimination from an economist’s point of view. However, unlike this case, one could make the argument that in these

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11 In the power industry economic development rates generally have survived discrimination challenges if there is a sufficient record to justify the overall benefits to the ratepayers as a whole.
illustrative examples the discount is required in order to entice the customer to take the service; that is, absent the discounts, demand would drastically decrease. Furthermore, as long as the discounted price yields some fixed-cost recovery, the customers who do not receive the discount are made better off in that, absent the additional fixed-cost recovery, these customers would have to pay a higher price.

The late Professor Alfred Kahn, former Chairman of the New York Public Service Commission, and former Chairman of the old Civil Aeronautics Board, notes that discriminatory rate reductions are only justified if the following possibilities exist: (1) the cost of taking on the incremental business is less than the average cost of the total company operation without it; (2) the lower rates are required to elicit the additional business; and (3) the elasticity of the incremental demand is sufficiently in excess of unity so that selective rate reductions yield incremental revenues in excess of incremental costs. In other words, discriminatory rate reductions are only justified if the customers who do not get the discount are not harmed and, in fact, are may be benefited because the incremental business yields some contribution to fixed costs.

In this case it is clear that: (1) the discount is not required to elicit demand by customers outside AEP’s zone; and (2) the zero price does not generate revenues in excess of incremental cost, and therefore it does not yield a contribution to fixed cost recovery. As a result AEP’s customers are, in fact, harmed by the discounted price of zero applied to non-AEP customers. For this reason, in our opinion, allocation of 100% of the cost of transmission to the users within

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13 It is our understanding that by and large, the AEP system was nearly fully subscribed over high value paths when the usage rates were in effect, suggesting, from economists’ point of view, that no discount was necessary to attract incremental business.
the zone where the transmission is located and a 0% allocation to users of that same transmission capacity who happen to be located outside that zone is an extreme form of price discrimination; that is, one that anyone would be hard-pressed to justify based on cost or other differences between these two types of users of the same transmission capacity.

7. **RTO Policy Implications and Concluding Remarks**

   The PJM modified zonal pricing scheme will give a disincentive for utilities to join RTOs. Why would a utility that has made substantial investments in transmission facilities voluntarily join an RTO if it knew that its facilities would be used by other RTO members’ loads, but that it would no longer receive compensation for such usage once it joined an RTO? This is especially pronounced if the members of the RTO are not homogeneous and, therefore, there is not symmetric usage of and benefits received from each others’ systems.

   For example, utilities and many state regulators in the (non-California) western United States – which is comprised of traditional vertically-integrated utilities – have been skeptical about the benefits of, or have been slow in forming, an expansive RTO. Presently, California could be a major beneficiary of a western-wide RTO, as it is in desperate need of greater access to cheap generation sources across the non-California west. One needs to ask oneself whether the policy precedent set forth by FERC Opinion No. 494 will increase or decrease non-California utilities’ reluctance to join a western-wide RTO. Suppose, for example, non-California utilities were presented with the following deal: Please let California use your existing EHV transmission facilities for free – while you (and your customers) also help pay for the transmission upgrades required to move more power to the California border – so that California can import more cheaper power. We doubt that the rest of the western states would think it fair
that they have to pay for the fact that California has been lacking in needed generation and transmission investments. Similarly, it is unfair that AEP customers are being asked to contribute to the cost of transmission upgrades that eliminate congestion into eastern PJM (with no benefits to AEP’s zonal load customers) while the customers in eastern PJM make no contribution to the costs of AEP’s existing EHV network from which they benefit. Finally, if California was to join a western-wide RTO and pay a zero price to access non-California cheap power, this would clearly affect California’s investment decisions (or lack thereof) in generation facilities located within California. Thus, the allocation of existing transmission facility costs would affect future investment decisions and, as argued by Evans and Schmalensee, cannot be deemed sunk.

For more than 15 years, the FERC has devoted significant effort at establishing competitive regional wholesale power markets. This effort has led the FERC to develop rules and regulations aimed at preventing undue discrimination in the provision of unbundled wholesale electric transmission services. More recently, the FERC effort has focused on the development of independent Regional Transmission Organizations, in which typically traditional utility transmission owners are members. In the PJM case examined here, the FERC’s flawed use of sunk costs leads to a transmission rate design – the so-called modified zonal rate – that is unjust, unreasonable, unduly discriminatory and preferential and that is in clear violation of standard utility rate-making principles. The results of this case are quite surprising when one considers all the effort that the FERC has gone through over the last decade to establish non-discriminatory wholesale access to the nation’s transmission systems.

This analysis shows that RTO tariff development is extremely difficult in situations where there was historically been asymmetric use of members’ transmission systems. In
additional, the “original-purpose doctrine” developed by the FERC in the PJM transmission rate case will only further inhibited the development of RTOs. This is expected to be especially pronounced in the areas of the country that have maintained the traditional vertically-integrated utilities, and have not become as dependent on wholesale power markets. Across these states, RTO development has been slow to develop – if not non-existent – and, therefore (at the wholesale level) utilities in these states operate under the FERC Order 888-889 world. There has been much tension between these “Traditional States” and the FERC regarding the need for RTOs and the disincentives for RTO membership created by the PJM/MISO case will only serve to exacerbate these tensions.

References


