Regional White Paper

Presentation and Analysis of Southern Intertie Hourly Non-Firm Alternatives

November 17, 2015

Table of Contents [Placeholder]

I. Introduction

Customers have become increasingly concerned that long-term firm (LTF) transmission service on the Southern Intertie no longer has the value that it once had. Some customers are not renewing service and have removed requests from the queue. These customers have also expressed concerns that an equitable share of the economic benefits derived from markets served by the Southern Intertie should go to Northwest parties that purchase long-term service over the intertie. Bonneville Power Administration (BPA) wants to see what actions (if any) it should take to make sure long-term service on the Southern Intertie remains viable and its customers receive an equitable share of the economic benefits provided by the Southern Intertie.

II. Background

What Is the Definition and Description of the Southern Intertie?

The Southern Intertie segment is a system of transmission lines used primarily to transmit power between the Pacific Northwest and California. It is comprised of the California Oregon Intertie (COI) and the Pacific Direct Current Intertie (PDCI). The California Oregon Intertie, recognized as WECC regional transmission Path 66, transfers power between Oregon and Northern California. The PDCI is recognized as WECC regional transmission Path 65, and transfers power between Oregon and Southern California. BPA is the Path Operator on the northern segment of the COI and the PDCI. In addition to functioning as the Path Operator, BPA owns the majority of the northern segment of the COI and is the sole owner of the northern segment of the PDCI. These facilities are known as the Southern Intertie and their costs are recovered through the Southern Intertie rates.

See Appendix A for a complete list of Southern Intertie ownership rights.

The Value of BPA Transmission Rights on the Southern Intertie

For the northern portion of the Southern Intertie owned by BPA, the majority of costs are recovered through long-term firm transmission contracts. This service requires that customers agree to pay the long-term rate for the Southern Intertie segment for a term of one year or longer. In exchange for entering into long-term contracts, they receive the ability to schedule transmission in any hour of the year at BPA's highest transmission priority. Most Southern Intertie customers are not using transmission to serve their load, but instead use their transmission rights to ship power or sell capacity between a low priced region (usually the Pacific Northwest) and a historically high priced region (usually California).

Long-term firm transmission contracts are designed to have product advantages over non-firm transmission service. Traditionally, the primary advantage of firm transmission is that customers with firm rights have the ability to use the reservation in any hour (subject to de-rates), while non-firm transmission may be unavailable. Another traditional advantage of long-term firm rights is that it has the highest priority in the event of a curtailment, meaning it will be the last product to be curtailed. Finally, long-term firm transmission is designed to have~~s~~ a cost advantage. Under the current rate structure, long-term service on BPA's system is more economic than hourly service as long as the customer uses the reservation more than 80 hours per week.

Recently BPA has experienced some customers not rolling over their long-term Southern Intertie service. See Appendix B for long-term rights renewal history. Additionally, some customers have expressed reluctance to execute future rollovers. These customers have indicated their reason for removing requests and not rolling over transmission contracts is due to a perceived reduction in the value of long-term firm rights. They sta~~ci~~te that the California Independent System Operator (CAISO) does not recognize BPA transmission priority when granting power awards and issuing curtailments. They explain~~argue~~ that this, in conjunction with the pricing and availability of hourly non-firm (HNF), has made hourly non-firm a more attractive product choice for sales to the CAISO since HNF purchases can be largely concentrated to only hours with the highest forecasted price spreads.

The ability to bid into the CAISO Day Ahead Market (DAM) without transmission and procure hourly non-firm prior to the tagging deadline has the potential to devalue long-term rights in two ways. First, it increases the probability that a customer with long-term rights will not be able to fully utilize their transmission rights. Second, it has the potential to decrease the value of sales into the Southern Intertie Scheduling Points. The CAISO grants awards up to their capacity of the Southern Intertie. However, the bids into the CAISO DAM are not limited to the CAISO capacity. When the amount of bids into a Southern Intertie Scheduling Point exceed the scheduling limit, the marginal cost of congestion at the Scheduling Point increases. This congestion reduces the price that is paid to sellers at that scheduling point.

Seams Issues & Scope of this White Paper

Seams occur at boundary points between transmission providers due to differences in market designs, transmission scheduling practices, operating rules, etc. Customers identified three distinct seams that they believe are affecting the value of long-term service on the Southern Intertie. These identified seams on the Southern Intertie are between BPA and the California ISO and BPA and other OATT transmission providers.

1) BPA does not limit use of firm reservations during de-rates

   When the path is de-rated, long-term firm customers can still schedule up to their full scheduling rights.

   This can lead to some long-term customers displacing other long-term customers and preventing them from utilizing their pro-rata share of available capacity during outages or de-rates. Additionally, this has the potential to increase the financial congestion at the Southern Intertie Scheduling Points.

2) BPA's hourly non-firm product has the same priority in the CAISO Day Ahead Market as the long-term firm product.

   The CAISO does not consider whether a customer has firm transmission capacity when awarding bids for the DAM. Because BPA sells unused long-term capacity as hourly non-firm at relatively low costs, customers without long-term capacity are able to bid into the CAISO DAM and purchase HNF transmission if they are awarded.

   The current scheduling structure allows customers to bid into the CAISO using HNF with little risk. This can lead to some hourly non-firm schedules displacing long-term schedules, preventing long-term customers from fully utilizing their transmission rights. Additionally, this has the potential to increase the financial congestion at the Southern Intertie Scheduling Points.

3) OATT transmission providers do not recognize the curtailment priority of neighboring OATT transmission providers.

   California OATT providers perform the curtailments on the majority of tags moving N-S across the Southern Intertie; therefore, the transmission priority of the product used on their systems determines the order of curtailment. When the southern party is curtailing, the transmission priority of the product used on BPA's system is irrelevant and BPA firm transmission may be curtailed ahead of BPA non-firm transmission.

For the purposes of this White Paper, the scope of the problem to be addressed is limited to seam number two (# 2), the use of BPA hourly non-firm transmission in the CAISO DAM. BPA believes the other two seams must be addressed, but they will be better addressed in a separate process. Several customers indicated interest in BPA working collaboratively with its neighboring Balancing Authorities to solve the identified seams. BPA will be pursuing collaborative solutions in ongoing discussions outside of this process and will keep customers apprised periodically as to the status of those discussions.

Current HNF Product Attributes

Rate Calculations

Currently, the rates for all of BPA's hourly transmission products (Network PTP, Intertie PTP, and Scheduling System Control, and Dispatch) are based on the same ratio between long-term and hourly products. The hourly rate for both firm and non-firm products is developed by first dividing the annual rate by hours per year to yield a rate per hour cost. Then, this rate per hour cost is divided by 1,000 to convert to mills and then multiplied by 24/16 (24 hours a day over 16 heavy load hours based on traditional industry definitions). Next, that result is multiplied by a factor of 7/5 (seven days in a week divided by five weekdays). BPA has previously explained this methodology as follows: Multiplying by these factors ensures that if a customer were to "cherry pick" their purchases, and purchase only during all heavy load hours Monday through Friday (80 hours a week), ~~;~~ they would be paying as much as a long-term customer.

In addition, the BP-16 transmission rate schedule contains a provision for "Interruption of Non-Firm PTP Transmission Service." This provision states that non-firm PTP customers will not be charged for transmission in hours where their transmission is curtailed because of conditions on the Federal Columbia River Transmission System (FCRTS).

Inventory and Release

On the Southern Intertie, BPA Transmission (BPAT) sells any unscheduled long-term capacity as hourly non-firm. At the opening of the real time window at 10:00 p.m. on the preschedule day, any long-term capacity that is not scheduled is released for sale as HNF. BPA continues to update the amount of HNF available for sale between the opening of the real time window and the hour for which HNF capacity is being sold. To the extent that customers purchase HNF and do not schedule the entire capacity, BPAT will resell the unused HNF capacity. For example, if a customer purchases 100 MW of HNF, but only schedules 75 MW, the remaining 25 MW is returned to the HNF inventory to be sold.

HNF Use in the CAISO

Shortly after the CAISO implemented the Market Redesign and Technology Upgrade (MRTU) in 2009, the CAISO removed the day-ahead tagging requirement for day-ahead power awards. This allows customers without long-term firm to bid into the CAISO DAM using hourly non-firm because 1) customers are not required to have acquired transmission to submit a bid, and 2) the CAISO grants awards economically without consideration to the OATT priority of the transmission which will deliver the energy. This allows customers without firm service to bid into the CAISO DAM by 10:00 a.m. and later procure hourly non-firm (HNF) if they are awarded in the CAISO DAM (see timeline below). BPA releases hourly non-firm service on the intertie based on unscheduled firm reservations at the opening of the "Real Time Window" (10:00 p.m.). Figure 1 illustrates the relationship between the timelines for the CAISO DAM and BPAT's release of hourly non-firm.

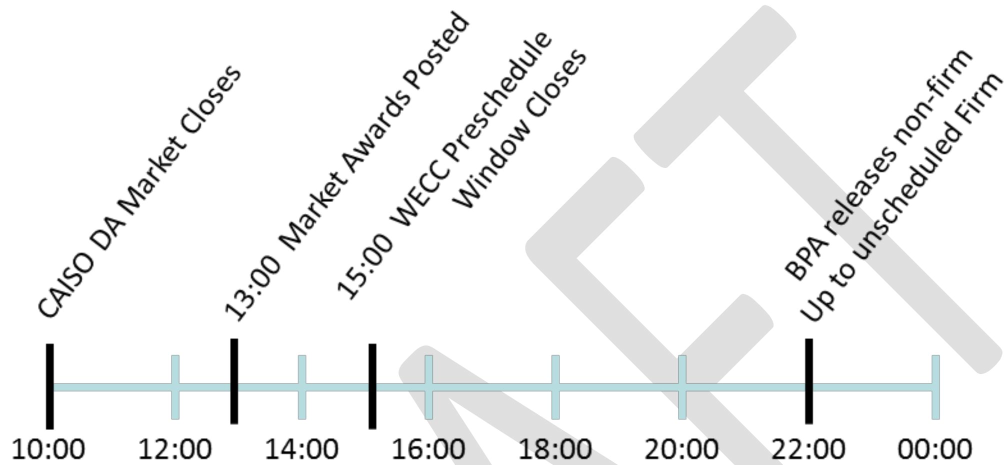


Figure 1. CAISO Day Ahead Market and BPAT Scheduling Timeline (Day Prior to Flow)

There is some risk to being able to purchase HNF since BPA only releases LT capacity that is not scheduled in the WECC pre-schedule. However, if a customer with long-term firm does not receive an award in the DAM, the probability of BPA being able to offer that customer's capacity as HNF increases. This makes it less risky for a customer that has an award in the DAM (but no transmission rights) to obtain HNF and meet its obligation to CAISO. Therefore HNF customers are largely insulated from any additional risk of relying on a short term non-firm product.

Positions in BP-16

In the BP-16 rate case, Joint Party 6 (Public Power Council and Powerex) proposed an alternative rate design for the Southern Intertie HNF product that would allocate costs between long-term and hourly non-firm products based on a proposed measure of per customer historical use of hourly non-firm service on the Southern Intertie. The proposed methodology was designed so that a customer using an average number of hourly non-firm services would pay the same per MW as a customer using long-term firm. The proposal would have increased hourly non-firm rates by about 300%.

BPA staff filed rebuttal testimony that highlighted several concerns with the proposed methodology:

- Volume of purchases was ignored.
- Methodology ignored if the customer made multiple requests during the same hour, even if those requests were on different paths.
- Hourly non-firm transmission is not always available, and the methodology did not take into account hours where a customer would like to purchase hourly non-firm but couldn't.
- High possibility of instability rate period to rate period.

The administrator decided to retain the initial proposal hourly non-firm rate methodology, but acknowledged that there are seams issues with California and committed to holding regional workshops and potentially an expedited 7(i) process to pursue a rate solution prior to BP-18.

Industry Scan

[Forthcoming]

BPA's Rate Principles

BPA developed principles for the Southern Intertie hourly non-firm analysis which will be used to evaluate each of the rate proposals. These principles were shared with customers.

1. Set rates and policies consistent with statutory requirements

a. Full and timely cost recovery
b. BPA's rates are based on total system costs
c. Equitable cost allocation between Federal and non-Federal uses of the transmission system
d. Encourages the widest possible diversified use of electric power at the lowest possible rates to consumers consistent with sound business principles

2. Set rates consistent with ratemaking principles

a. Cost causation
b. Simplicity, understandability, public acceptance and feasibility of application
c. Avoidance of rate shock
d. Rate stability from rate period to rate period

3. Effectiveness in addressing seams issues with CAISO

a. Preserve the value of BPA transmission services and ensure their long-term viability

b. Minimize adverse impacts on BPA transmission customers of seams issues with other transmission providers and path operators on the COI and PDCI
c. Takes in account the effect of NW Market development

BPA's Non-Rate Principles

BPA developed principles for the Southern Intertie hourly non-firm analysis which will be used to evaluate each of the non-rate proposals. These principles were shared with customers.

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
   a. Options provided herein will have implications for the ability to implement both from a technical standpoint, but also from a customer process and communication standpoint.
4. ***Supportability***
   a. Options provided herein will have implications for the ongoing cost of maintenance and upgrade for the systems automation that implements this decision.
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
   a. Options presented here may have significantly different implementation costs associated with them.
8. ***Considers revenue impact***

III. Proposed Alternatives

Alternative #0 – Status Quo

Description

BPA would make no changes to its rates or scheduling practices on the Southern Intertie.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Rate Alternatives

Alternative #1a – Recalculate the Southern Intertie HNF rate using the methodology proposed by Joint Party 06 in BP-16.

Description

BPA would review historic use of the HNF product on the Southern Intertie and develop a measure to determine how many hours a week, on average, per customer the product was used. BPA would then calculate the Southern Intertie HNF rate similar to the current methodology, but use a ratio of 168/23 instead of 168/80 (total hours in a week over heavy load hours in a week). At this rate, a customer purchasing hourly non-firm 23 hours per week would pay the same amount as a long-term firm customer.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Alternative #1b – Recalculate the Southern Intertie HNF rate based on a different measure of Southern Intertie usage.

Description

The current Southern Intertie HNF rate is calculated such that a customer reserving 80 hours per week pays the same as a customer with long-term. This alternative would create a measurement of HNF reservations to replace the 80 hours per week in the current rate calculation.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Alternative #2 – Calculate the Southern Intertie HNF rate based on a different assumption of "high value" hours

Description

The current Southern Intertie HNF rate is calculated such that a customer reserving 80 hours per week pays the same as a customer with long-term. This alternative would change the assumed 80 hours per week based on a different assumption of "high value" hours.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Alternative #3 – Set the Southern Intertie HNF rate based on the cost of expansion

Description

BPA would develop an estimate of the build cost to expand the Southern Intertie and then divide the total costs by number of hours the new build would be in service to determine the hourly non-firm rate.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Alternative #4 – Set the Southern Intertie HNF rate based on market indicator

Description

This alternative would tie the Southern Intertie HNF rate to some market based estimate of transmission value. Possible market based rates could be CRR auction prices, after the fact congestion charges, or market price spreads.

Justification

BPA staff recommends against exploring this rate structure because of concerns that it is inconsistent with the principle of cost based rates.

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with CAISO***

Alternative #5 – Eliminate the HNF interruption credit

Description

Bonneville would no longer refund customers when HNF service is curtailed due to conditions on the FCRTS.

Justification

Evaluation based on BPA Principles

1. ***Consistent with Statutory Requirements***
2. ***Consistent with Ratemaking Principles***
3. ***Effectiveness in addressing seams issues with California***

Non-Rate Alternatives

Alternative #6 – Sell HNF inventory once

Description

Once an HNF reservation has been scheduled on the Southern Intertie, BPA would not post the unscheduled portion of the reservation back to the market.

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #7 – Do not sell HNF on the Southern Intertie

Description

BPA would stop selling HNF on the Southern Intertie or stop selling HNF when schedules reach a certain percent of the System Operating Limit (SOL).

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #8 – Implement duration based competition on the Southern Intertie

Description

BPA would award HNF capacity on the Southern Intertie to requests with the longest duration.

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #9 – Change the HNF release time on the Southern Intertie

Description

BPA could release HNF on the Southern Intertie earlier in the preschedule day, after the CAISO DAM bid submittal deadline and before the CAISO DAM awards are posted. Alternatively, BPA could move the HNF release time to the day of schedule, possibly close to T-20 (the scheduling deadline).

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #10 – Limit HNF sales on the Southern Intertie to the amount calculated after the close of the Day Ahead preschedule window

Description

Instead of continuously updating the HNF inventory through the real time window, BPA would lock in available HNF capacity on the Southern Intertie when the Day Ahead preschedule window closes and eliminate "post-backs" subsequent to the HNF release.

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #11 – Limit availability of HNF service on the Southern Intertie (tie to posted secondary transmission market)

<u>Description</u>

BPA would only offer HNF on the Southern Intertie when secondary transmission is not posted on OASIS for resale.

<u>Justification</u>

<u>Evaluation based on BPA Principles</u>

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

Alternative #12 – BPA limits LTF schedules to their pro-rata share during path de-rates

<u>Description</u>

BPA has determined this alternative is out of scope in this process because it would likely only address seams issue #1. It will be addressed in a different process.

Alternative #13 – BPA proactively manages curtailments on the Southern Intertie prior to the interval

Description

BPA would actively issue N>S curtailments on the Southern Intertie to enforce BPA OATT priority.

Justification

Evaluation based on BPA Principles

1. ***Consistent with statutory obligations and minimize compliance risk***
2. ***Consistent with desired future state of BPA business and policy***
3. ***Ability to implement***
4. ***Supportability***
5. ***Considers impacts to different customers***
6. ***Considers impacts to reliable operations***
7. ***Considers cost of implementation***
8. ***Considers revenue impact***

IV. Other Analyses of Alternatives

Alternative #0 – Status Quo

Alternative #1a – Recalculate the Southern Intertie HNF rate using the methodology proposed by Joint Party 06 in BP-16.

Alternative #1b – Recalculate the Southern Intertie HNF rate based on a different measure of Southern Intertie usage.

Alternative #2 – Calculate the Southern Intertie HNF rate based on a different assumption of "high use" hours

Alternative #3 – Set the Southern Intertie HNF rate based on the cost of expansion

Alternative #4 – Set the Southern Intertie HNF rate based on market indicator

Alternative #5 – Eliminate the HNF interruption credit

Alternative #6 – Sell HNF inventory once

Alternative #7 – Do not sell HNF on the Southern Intertie

Alternative #8 – Implement duration based competition on the Southern Intertie

Alternative #9 – Change the HNF release time on the Southern Intertie

Alternative #10 – Limit HNF sales on the Southern Intertie to the amount calculated after the close of the Day Ahead preschedule window

Alternative #11 – Limit availability of HNF service on the Southern Intertie (tie to posted secondary transmission market)

Alternative #12 – BPA limits LTF schedules to their pro-rata share during path de-rates

BPA has determined this alternative is out of scope in this process because it would likely only address seams issue #1. It will be addressed in a different process.

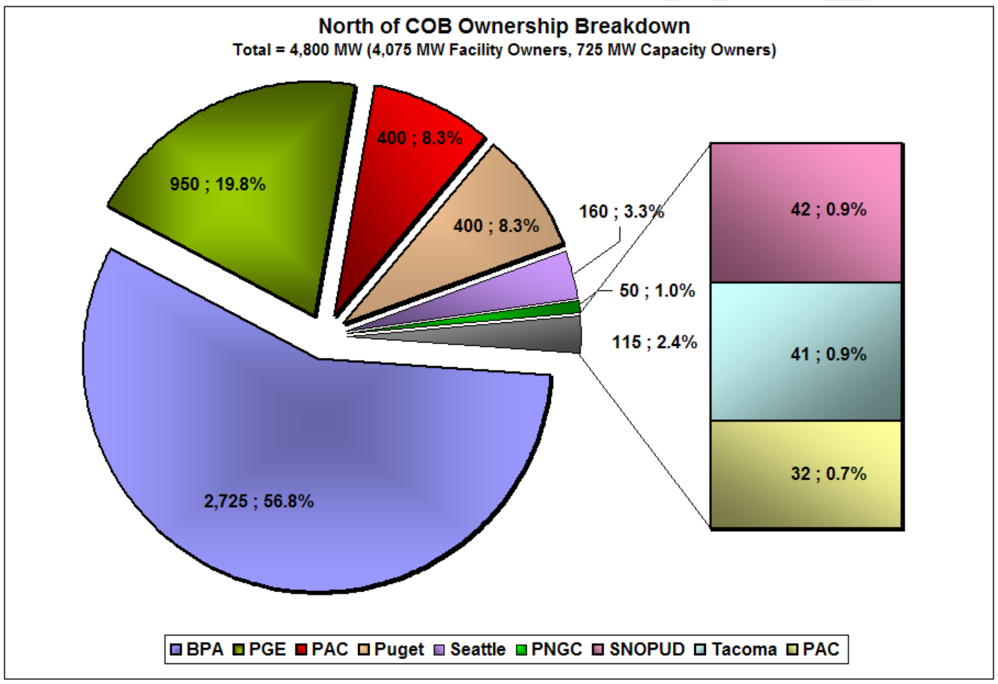
Alternative #13 – BPA proactively manages curtailments on the Southern Intertie prior to the interval

Appendix A: Southern Intertie Ownership

California Oregon Intertie Ownership

<u>Ownership North of COB</u>

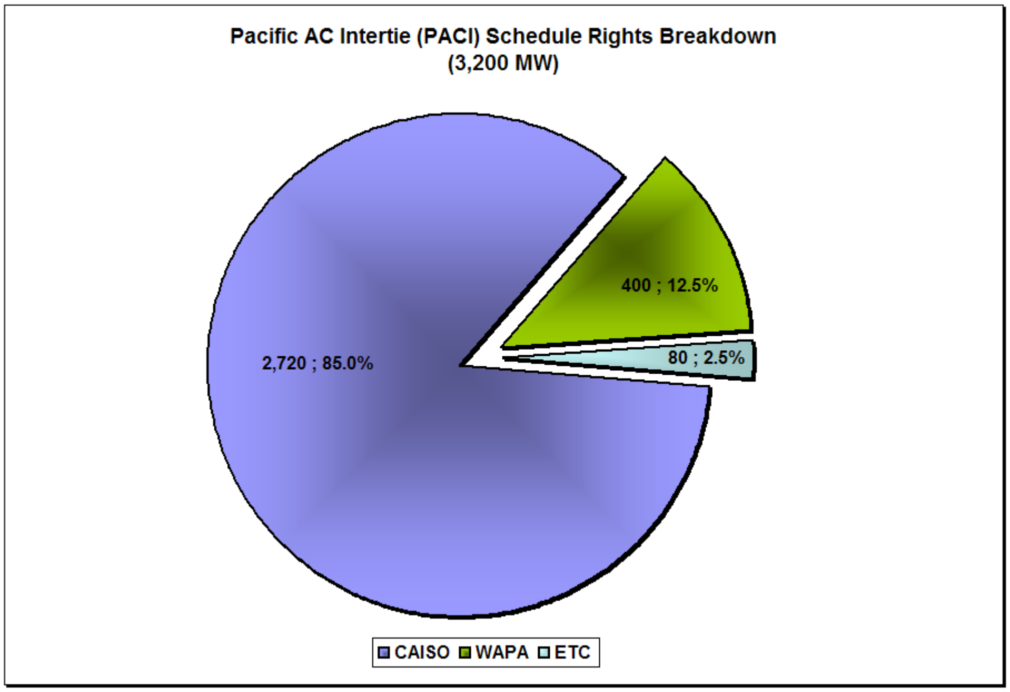
The California Oregon Intertie north of the California Oregon Border is shared by Facility and Capacity Owners. The Facility Owners include BPA, Pacificorp and Portland General Electric. Capacity Owners include Puget Sound Energy, Seattle City Light, Pacific Northwest Generating Cooperative, Snohomish County PUD, Tacoma Power, and Pacificorp.



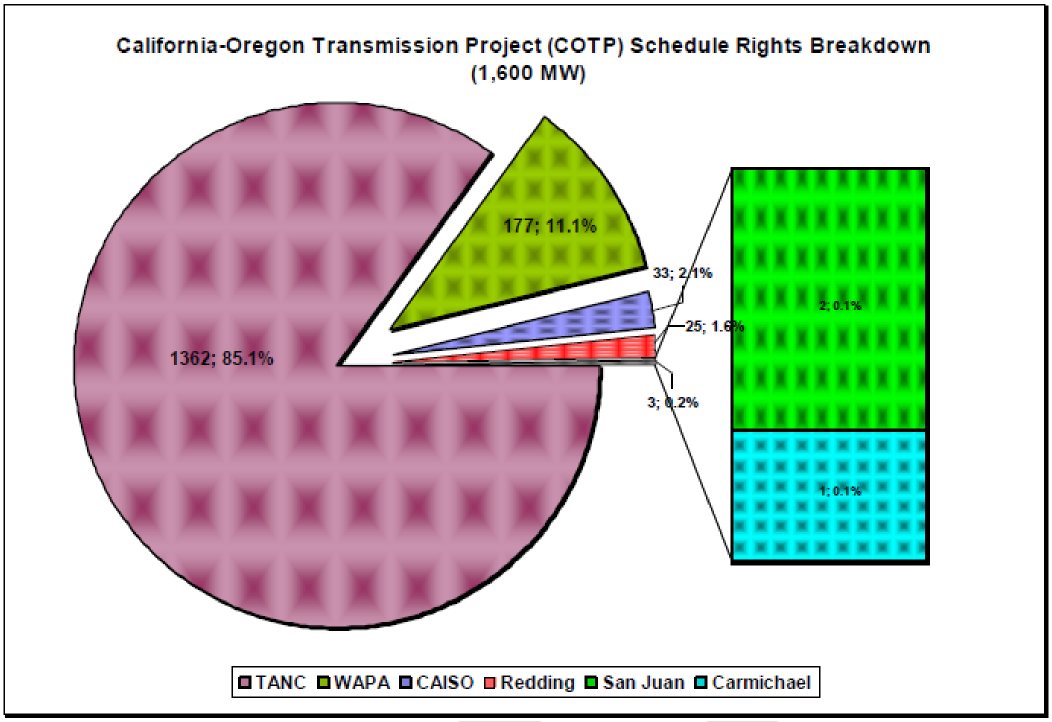
Source: Transmission Utilization Group: COI Utilization Report May 04, 2011

Ownership South of COB

Ownership of the 3,200 MW PACI lines is shared between WAPA, PG&E and Pacificorp. Through agreements, 2,720 MW of this capacity has been turned over to the CAISO. The 1,600 MW COTP line is owned by TANC, WAPA Redding, San Juan and Carmichael. 33 MWs of the COTP line has been turned over to the CAISO.



Source: Transmission Utilization Group: COI Utilization Report May 04, 2011



Source: Transmission Utilization Group: COI Utilization Report May 04, 2011

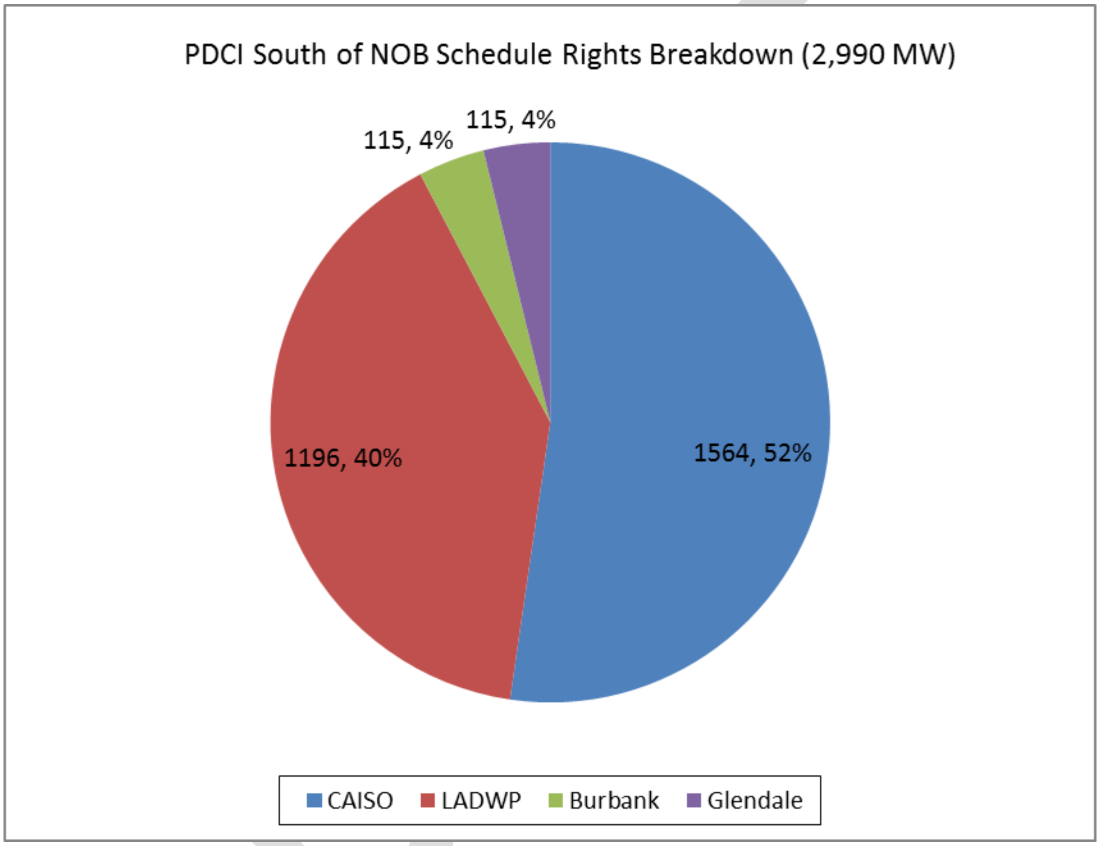
Pacific Direct Current Intertie Ownership

<u>Ownership North of NOB</u>

The Pacific Direct Current Intertie north of the Nevada Oregon Border is owned by BPA.

<u>Ownership South of NOB</u>

The Pacific Direct Current Intertie South of the Nevada Oregon Border is jointly owned by Southern California Edison, Los Angeles Department of Water and Power, Burbank, Glendale and Pasadena. 1564 MW of capacity has been turned over the CAISO.



Appendix B: Long-Term Rights Renewal History

COI N>S Renewal History

Fiscal Year	TSR MWs Ending	MW Eligible for Renewal	MW Electing to Renew	MW Not Eligible for Renewal	New Offers Accepted	MWs at Risk of Non-Renewal
2011-2016	1617	1417	1309	200	474	
2017	1058	358		700	700	358
2018						0
2019	1142	1142				1142
2020	200	200				200

COI S>N Renewal History

Fiscal Year	TSR MWs Ending	MW Eligible for Renewal	MW Electing to Renew	MW Not Eligible for Renewal	New Offers Accepted	MWs at Risk of Non-Renewal
2016	71	71	0			

PDCI N>S Renewal History

Fiscal Year	TSR MWs Ending	MW Eligible for Renewal	MW Electing to Renew	MW Not Eligible for Renewal	New Offers Accepted	MWs at Risk of Non-Renewal
2011-2016	2324	2249	2199	75	394	
2017	761	461	103*	300	300	358
2018	357	357				357
2019	795	795				795
2020	440	440				440

* As of 10/07/2015 103 MWs have submitted requests for rollover