Congestion Revenue Rights (CRRs): Overview and Introduction to Current Issues

Part 2: Congestion Rights in Other RTOs and Recent CAISO Reforms

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Organized markets utilize different methods to allocate congestion rents through financial transmission rights

	Allocation methods	Source of Entitlement
CAISO	Congestion Revenue Rights	Contracts and Load
MISO	Auction Revenue Rights	Transmission Service and upgrades
PJM	Auction Revenue Rights	Transmission Service and upgrades
ISO-NE	Auction Revenue Rights	Contracts and upgrades
NYISO	Transmission Congestion Contracts	Contracts
SPP	Auction Revenue Rights	Transmission Service and upgrades
ERCOT	Congestion Revenue Rights	Captive Load

Financial Transmission Rights auctions support allocated FTRs

- Direct allocations can be sold into the auction
  - Provides opportunity to monetize congestion value up-front prior to flow date
    - Possibly up to one-year in advance

- Auction Revenue Right holders have the option to receive the value of congestion determined in the auction or “self- schedule” in the auction and accept the day-ahead market settlement of the path

- Financial transmission right products are offered as obligations in all RTOs/ISOs and PJM and ERCOT offer options as well

- Most RTOs and ISOs auction three time-of-use strips (e.g., OnPeak; Weekend OnPeak; OffPeak)

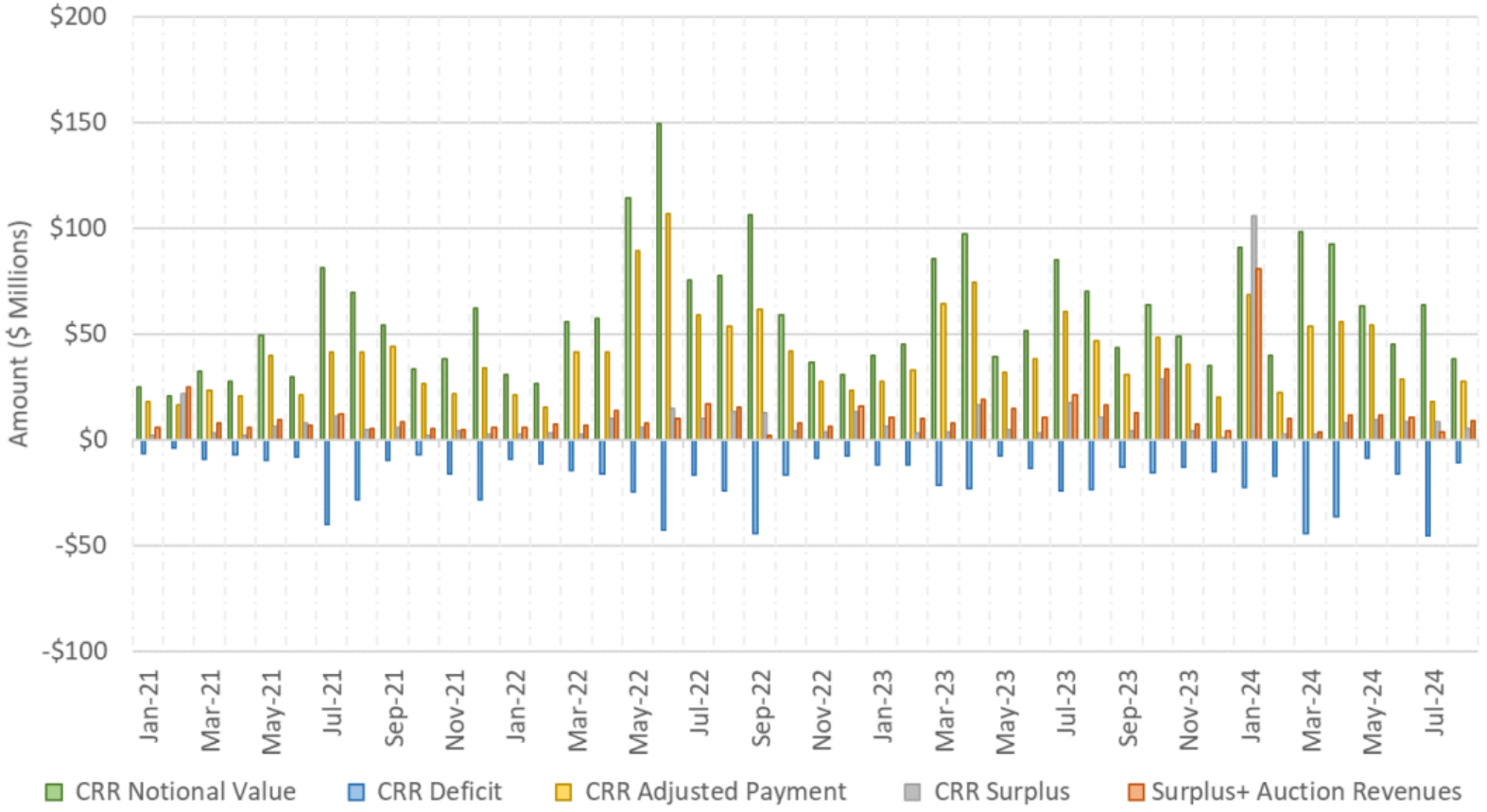
Financial transmission rights or "Congestion Revenue Rights" provide opportunities to provide nodal hedges

- Nodal markets come with nodal settlement and risk
  - Generation settles at its node and load at aggregation points
- CRRs provide the opportunity to hedge basis risk
  - CRR are used to hedge settlement risk between hubs and generation and load points
  - Hubs are liquid trading points where entities contract forward (E.g., SP15)
    - Standardized contracts at a basket of nodes leads to increased market liquidity, which in turn lowers risk premiums
    - Bi-lateral markets do not provide sufficient liquidity at all nodal settlement locations (CAISO alone ~1100+ settlement points)

CAISO introduced three changes to its auction structure in January 2019

- Elimination of non-delivery paths for bidding in CRR auctions
  - Designed to reflect the need for basis hedges between generation and load points to aggregation points
- Pro-rata adjustments of CRR's settlement based on their contribution to revenue deficiency
  - CRRs no longer "fully funded"
  - Unique approach compared to other organized market regions
- Reduction of transmission capacity released in the annual process from 75% to 65%
  - Designed to improve the quality of the CRR hedge by decreasing the amount of CRRs that are likely to be infeasible in the day-ahead market

The magnitude of the overall CRR settlements saw an increase in the last 2 months



Source: https://www.caiso.com/documents/presentation-market-performance-and-planning-forum-sep-18-2024.pdf

2024 Allocation of Revenue Inadequacy By Constraint Type and Month

2024 Underfunding By Constraint Type (August through 8/26/24)

Constraint Type	Revenue	Underfunding	% Underfunding
High Voltage	$ 298,000,153	$ (109,464,548)	-37%
Interface	$ 53,940,468	$ (6,808,993)	-13%
LowVoltage	$ 87,913,543	$ (52,317,870)	-60%
Nodal Group	$ 9,830,185	$ (1,593,803)	-16%
Nomogram	$ 63,640,199	$ (30,934,857)	-49%

2024 Underfunding By Month (August through 8/26/24)

Month	Revenue	Underfunding	% Underfunding
Jan	$ 89,252,356	$ (21,878,639)	-25%
Feb	$ 37,350,847	$ (15,999,317)	-43%
Mar	$ 98,137,497	$ (45,153,219)	-46%
Apr	$ 90,845,926	$ (36,936,477)	-41%
May	$ 60,117,335	$ (10,388,500)	-17%
Jun	$ 43,692,407	$ (16,138,585)	-37%
Jul	$ 61,097,194	$ (44,012,293)	-72%
Aug	$ 32,830,987	$ (10,613,040)	-32%

Source: Appian Way Energy Partners

2024 Allocation of Revenue Inadequacy By Constraint

CAISO Binding Constraints Sorted by Underfunding Percentage -- 2024 through 8/26/24 (Excluding Constraints with under $250K Revenue)				
Constraint		Revenue	Underfunding	% Underfunding
30440_TULUCAY_230_30460_VACA-DIX_230_BR_1_1	$	800,721	$ (2,106,350)	-263%
35621_IBM-HRJ_115_35642_METCALF_115_BR_1_1	$	982,697	$ (2,202,784)	-224%
36851_NORTHERN_115_36852_SCOTT_115_BR_2_1	$	413,078	$ (767,420)	-186%
34724_KRNOLJ_115_34736_MAGUNDEN_115_BR_1_1	$	650,019	$ (936,434)	-144%
7820_TL 50002_IV-NG-OUT_TDM	$	4,458,683	$ (4,790,360)	-107%
32214_RIO OSO_115_30330_RIO OSO_230_XF_1	$	24,031,633	$ (24,696,459)	-103%
34366 SANGER 115 34370 MCCALL 115 BR 3 1	$	2,640,816	$ (2,473,482)	-94%
33020_MORAGA _115_32790_STATN X_115_BR_3_1	$	389,508	$ (354,676)	-91%
30733_VASONA _230_30735_METCALF_230_BR_1_1	$	2,784,689	$ (2,491,119)	-89%
34418 KINGSBRG 115 34428 CONTADNA 115 BR 1 1	$	291,226	$ (259,295)	-89%
31338_KONOCTI6_60.0_31344_EGLE ROK_60.0_BR_1_1	$	4,365,501	$ (3,783,517)	-87%
OMS 151503&4 CNTRL-INYOK_EXP_NG	$	310,554	$ (256,256)	-83%
7820 TL23040 IV SPS NG	$	4,364,163	$ (3,583,662)	-82%
OMS_14830999_IV-SX Outage_NG	$	3,083,327	$ (2,460,012)	-80%
OMS IV-SX OUTAGE_NG	$	1,526,480	$ (1,187,358)	-78%
6410_CP10_NG	$	1,442,755	$ (1,112,253)	-77%
OMS_14831000_IV-SX Outage_NG	$	2,065,680	$ (1,589,539)	-77%
OMS_14973100_IV-SX Outage_NG	$	954,909	$ (702,313)	-74%
OMS 50004 IV-ML OUTAGE_NG	$	891,903	$ (581,973)	-65%
OMS 14513059 LOSBNS_BUS_OUTAGE	$	2,276,202	$ (1,488,623)	-65%
OMS_15570615_IV-SX Outage_NG	$	1,128,362	$ (648,505)	-57%
31334_CLEARLAKE_60.0_31338_KONOCTI6_60.0_BR_1_1	$	1,018,776	$ (570,372)	-56%
MIGUEL_BKs MXFLW NG	$	12,858,375	$ (7,179,915)	-56%
22357_IVPFC1 _230_22358_IV PFC _230_PS_1	$	536,026	$ (297,411)	-55%
24801_DEVERS _500_24804_DEVERS _230_XF_1_P	$	9,545,808	$ (4,695,937)	-49%
OMS 15079029_50001_OOS NG	$	329,858	$ (160,705)	-49%
30055_GATES1 _500_30060_MIDWAY _500_BR_1_1	$	54,446,076	$ (26,285,388)	-48%
24801_DEVERS _500_24804_DEVERS _230_XF_2_P	$	15,554,584	$ (7,496,153)	-48%
7820_TL 230S_TL50001OUT_NG	$	868,892	$ (396,977)	-46%
7820 TL 230S OVERLOAD NG	$	1,844,632	$ (811,129)	-44%
30055_GATES1 _500_30057_DIABLO _500_BR_1_1	$	295,975	$ (128,124)	-43%
OMS_15080878_Suncrest_BK81	$	312,230	$ (132,846)	-43%
34454 RVERROC 70.0 34464 COPPRMNE 70.0 BR 1 1	$	556,284	$ (232,740)	-42%
PALOVRDE_ITC	$	3,358,380	$ (1,388,380)	-41%
30790_PANOCHE _230_30900_GATES _230_BR_2_1	$	8,706,450	$ (3,539,613)	-41%
30040 TESLA 500 30050 LOSBANOS 500 BR 1 1	$	53,189,882	$ (21,152,929)	-40%
OMS_15334647_50004 OUTAGE_NG	$	255,967	$ (98,582)	-39%
Remaining Constraints	$	279,280,886	$ (54,861,112)	-20%

Source: Appian Way Energy Partners