California Independent
System Operator Corporation

October 12, 2007

VIA ELECTRONIC MAIL

Billie C. Blanchard, AICP, PURA V
Project Manager for Sunrise Powerlink Project
Energy Division, CEQA Unit
505 Van Ness Avenue
San Francisco, CA 94102-3298

Re: CAISO Response to Aspen/Energy Division's Second Set of Data Requests

Dear Billie:

Enclosed please find the CAISO response to the Second Set of Data Requests propounded by Aspen Environmental Group/Energy Division, CEQA Unit in the Sunrise Powerlink proceeding, CPUC Docket A.06-08-010

Please do not hesitate to contact me if you have any questions.

Sincerely,

Judi Sanders

Judith B. Sanders
Counsel
California Independent
System Operator

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

In the Matter of the Application of	)	Application No. 06-08-010
San Diego Gas & Electric Company	)	(Filed August 4, 2006)
(U-902-E) for a Certificate of Public	)	
Convenience and Necessity for the	)	
Sunrise Powerlink Transmission Project	)	

CAISO RESPONSE TO THE SECOND DATA REQUEST OF ASPEN ENVIRONMENTAL

GROUP/CPUC ENERGY DIVISION-CEQA

Request ISO-4: Please summarize the renewable energy mix assumed by CAISO in the Base Case and the Sunrise case, showing the resource type and location of the 10.3 TWh of Salton Sea/IID renewables that "Sunrise allows" according to page 34 of 88 of the CAISO March 1 testimony. To accomplish this, please expand Table 2.2 of the CAISO March 1 testimony to show the Salton Sea/IID resources that would occur in the Sunrise Case but not in the Base Case.

Response ISO-4:

The renewable energy mix assumed by CAISO in the Base Case and the Sunrise case are shown in Table 1 below. Sunrise allows 15.8 TWh of geothermal in the Salton Sea area, while the base case only has 7 TWh. This is a difference of 8.8 TWh. In addition, Sunrise allows 1.5 TWh of solar thermal (in the area identified in the table as East San Diego County). These total to the 10.3 TWh of generation referenced in the testimony and in Aspen's question.

Table 1: Renewable resources in the Sunrise and Base Cases

Resource Type	County (Location)	MW Added: Sunrise Case	GWh Added: Sunrise Case		MW Added: Base Case	GWh Added: Base Case
Geothermal	Imperial (Salton Sea Area)	1,785	15,768		785	7,008
Solar Thermal	San Diego (East San Diego Cnty.)	900	1,526		0	0
Wind	Kern (Tehachapi)	560	1,717		560	1,717
Wind	Alameda (Altamont)	298	914		298	914
Wind	Solano	200	613		200	613
Geothermal	Sonoma (Geysers)	200	1,594		200	1,594
Wind	Colusa	300	920		300	920
Geothermal	Modoc/Siskiyou (Medicine Lake)	0	0		300	2,391
Wind	Lassen	0	0		300	920
Wind	Shasta	0	0		200	613
Geothermal	Mono/Inyo	0	0		350	2,790
Geothermal	Washoe NV	0	0		500	3,986
Geothermal	Lake (Sulfur Bank)	0	0		40	319
Biomass	CA - Distributed	422	3,401		422	3,401
Total Added		**4,665**	**26,453**		**4,455**	**27,186**

Note that Table 2.2 only shows the renewable resources added to the Gridview model (i.e.: incremental to the renewable resources already in the CAISO/SSGWI database). This table shows the CAISO/SSGWI resources as well.

Request ISO-5: Please confirm that the additional renewable energy mix in the South Bay case is equal to that assumed for the Base Case, and that the additional renewable energy mix in the Green Path + LEAPS case is equal to that assumed for the Sunrise case. Please identify whether the errata and testimony filed on July 12, 2007 regarding CAISO's analysis of non-CAISO cases alter the level of renewable generation assumed by CAISO in its analysis of the CAISO Green Path + LEAPS case. Please tabulate the CAISO case assumptions for the South Bay case and Green Path + LEAPS case in a manner similar to those in Table 2.2 of the March 1 testimony.

Response ISO-5:

Yes, the additional renewable energy mix in the South Bay case is equal to that assumed for the Base Case.

Yes, the additional renewable energy mix in the Green Path + LEAPS case is equal to that assumed for the Sunrise case.

The errata and testimony filed on July 12, 2007 regarding CAISO's analysis of non-CAISO cases did NOT alter the level of renewable generation assumed by CAISO in its analysis of the CAISO Green Path + LEAPS case. The benefits provided by that generation, however, did change due to the adjustment for non-TAC customers and the change in the discount rate.

Table 2: Renewable resources in the Green Path + LEAPS and South Bay Cases

Resource Type	County (Location)	MW Added: Green Path + LEAPS Case	GWh Added: Green Path + LEAPS Case		MW Added: South Bay Case	GWh Added: South Bay Case
Geothermal	Imperial (Salton Sea Area)	1,785	15,768		785	7,008
Solar Thermal	San Diego (East San Diego Cnty.)	900	1,526		0	0
Wind	Kern (Tehachapi)	560	1,717		560	1,717
Wind	Alameda (Altamont)	298	914		298	914
Wind	Solano	200	613		200	613
Geothermal	Sonoma (Geysers)	200	1,594		200	1,594
Wind	Colusa	300	920		300	920
Geothermal	Modoc/Siskiyou (Medicine Lake)	0	0		300	2,391
Wind	Lassen	0	0		300	920
Wind	Shasta	0	0		200	613
Geothermal	Mono/Inyo	0	0		350	2,790
Geothermal	Washoe NV	0	0		500	3,986
Geothermal	Lake (Sulfur Bank)	0	0		40	319
Biomass	CA - Distributed	422	3,401		422	3,401
Total Added	0	**4,665**	**26,453**		**4,455**	**27,186**

Note that Table 2.2 only shows the renewable resources added to the Gridview model (i.e.: incremental to the renewable resources already in the CAISO/SSGWI database). This table shows the CAISO/SSGWI resources as well.

Request ISO-6: Please describe the difference in generation and emissions by power plant between the Base Case and the three primary CAISO alternatives (i.e., Sunrise case, South Bay case, and Green Path + LEAPS case). Please identify which generators would provide the incremental power and which generators would be displaced, and provide an estimate of the change in annual emissions due to each of the three CAISO alternatives. Please tabulate the change in MWh output and emissions in a manner similar to that provided by CAISO in the April 18, 2007 response to our previous data requests.

Response ISO-6:
The tabulations of changes in output compared to the base case are shown in the tables that follow.

Table 3: Change in MWh output in 2015 (Sunrise case compared to base case)

Sum of Case1	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(34,562)	74,899		(1,637)	-	38,700
ARIZONA	(1,574,649)	(86,875)	7,853	-	-	(1,653,672)
B HILL	-	(1,988)	-		-	(1,988)
B.C.HYDR	503,064				145	503,208
BONZ		(2)				(2)
COL E	(71,747)	28,275	-		316	(43,156)
COL W	(240)	67,586			-	67,346
IDAHO	3,743	3,240			-	6,983
IMPERIAL	(44,758)		-	(38,333)	8,759,402	8,676,311
IPP		-				-
JB		(2,019)				(2,019)
KGB					-	-
LADWP	(17,309)				(13,061)	(30,370)
LRS	-	-			-	-
MEXICO-C	(1,880,358)		1,688		218	(1,878,453)
MONTANA	385	(3,644)		164	-	(3,095)
NEVADA	(831,171)	(71)	-			(831,242)
NEW MEXI	79,506	20,980		(1,274)	-	99,212
NW_EAST	2,432,208		-	7,546	(7,446,150)	(5,006,396)
NW_WEST	1,582,678	11,357	-	108	-	1,594,143
PG&E_BAY	546,416	300	-	-	-	546,716
PG&E_VLY	565,055	171	15,582	9,072	(2,837,487)	(2,247,608)
SANDIEGO	(1,131,872)		-		1,525,156	393,284
SIERRA	23,718	(5,625)		719	8,206	27,017
SOCALIF	(190,694)	2,587	-	(11,063)	(6,859)	(206,029)
SW WYO					-	-
UT N	32,262	5,084			-	37,346
UT S	1,858	1,731			-	3,589
WAPA L.C	(320,217)	-			-	(320,217)
WYO		1,843				1,843
YLW TL					-	-
Grand Total	(326,687)	117,829	25,122	(34,698)	(10,115)	(228,548)

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 4: Change in MWh output in 2015 (South Bay case compared to base case)

Sum of Case2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(10,862)	3,576		(111)	-	(7,397)
ARIZONA	(635,892)	(22,705)	439	-	-	(658,158)
B HILL	-	64	-		-	64
B.C.HYDR	(15,497)				46	(15,450)
BONZ		20				20
COL E	9,184	(3,323)	-		99	5,959
COL W	479	9,646			-	10,125
IDAHO	58	-			-	58
IMPERIAL	(768)		-	(1,383)	(36)	(2,187)
IPP		-				-
JB		(218)				(218)
KGB					-	-
LADWP	(28,573)				2,430	(26,143)
LRS	-	-			-	-
MEXICO-C	(694,039)		(743)		25	(694,758)
MONTANA	(6,095)	(527)		(98)	-	(6,719)
NEVADA	(175,647)	-	-			(175,647)
NEW MEXI	(2,534)	(3,172)		68	-	(5,638)
NW_EAST	(238,951)		-	23	334	(238,595)
NW_WEST	14,396	(3,142)	-	2,916	-	14,170
PG&E_BAY	(77,710)	-	-	-	-	(77,710)
PG&E_VLY	(86,764)	34	68	411	6,318	(79,933)
SANDIEGO	2,205,692		-		(2,064)	2,203,627
SIERRA	(7,560)	204		(13)	515	(6,854)
SOCALIF	(311,734)	(560)	-	(307)	808	(311,794)
SW WYO					-	-
UT N	(9,228)	(281)			-	(9,509)
UT S	4,973	(122)			-	4,851
WAPA L.C	(41,288)	-			-	(41,288)
WYO		-				-
YLW TL					-	-
Grand Total	(108,360)	(20,507)	(237)	1,505	8,474	(119,124)

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 5: Change in MWh output in 2015 (Green Path + LEAPS case compared to base case)

Sum of Case3	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(26,291)	74,182		(1,200)	-	46,692
ARIZONA	(2,333,772)	(69,462)	8,695	-	-	(2,394,539)
B HILL	-	(1,907)	-		-	(1,907)
B.C.HYDR	476,557				166	476,723
BONZ		(787)				(787)
COL E	(70,050)	25,432	-		(354)	(44,973)
COL W	197	71,789			-	71,985
IDAHO	3,665	3,240			-	6,905
IMPERIAL	(44,758)		-	(19,189)	8,757,975	8,694,027
IPP		-				-
JB		(2,290)				(2,290)
KGB					-	-
LADWP	(91,243)				(63,149)	(154,392)
LRS	-	-			-	-
MEXICO-C	(1,674,139)		3,366		223	(1,670,550)
MONTANA	4,116	(3,967)		36	-	185
NEVADA	(528,704)	(71)	29			(528,747)
NEW MEXI	(30,672)	23,198		(474)	-	(7,948)
NW_EAST	2,499,849		-	6,474	(7,446,304)	(4,939,980)
NW_WEST	1,472,156	12,138	-	10,704	-	1,494,998
PG&E_BAY	552,026	300	-	-	-	552,326
PG&E_VLY	622,618	137	14,682	10,398	(2,862,694)	(2,214,859)
SANDIEGO	(278,552)		-		1,524,470	1,245,918
SIERRA	16,807	(2,113)		728	7,926	23,348
SOCALIF	(344,665)	2,717	-	(11,864)	243,495	(110,317)
SW WYO					-	-
UT N	28,449	4,413			-	32,862
UT S	(2,267)	2,027			-	(239)
WAPA L.C	(440,756)	-			-	(440,756)
WYO		1,774				1,774
YLW TL					-	-
Grand Total	(189,427)	140,750	26,772	(4,389)	161,754	135,460

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 6: Change in CO2 emissions for Sunrise relative to base case in 2015 (lbs of CO2)

Sum of CO2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(37,198,685)	164,873,826		-	-	127,675,140
ARIZONA	(1,427,843,845)	(193,293,250)	17,472,329	-	-	(1,603,664,766)
B HILL	-	(4,668,975)	-		-	(4,668,975)
B.C.HYDR	460,709,603				-	460,709,603
BONZ		(5,371)				(5,371)
COL E	(65,529,896)	62,658,584	-		-	(2,871,312)
COL W	(221,499)	154,029,173			-	153,807,674
IDAHO	3,722,231	7,208,854			-	10,931,084
IMPERIAL	(41,850,041)		-	-	-	(41,850,041)
IPP		-				-
JB		(4,491,865)				(4,491,865)
KGB					-	-
LADWP	(8,958,836)				-	(8,958,836)
LRS	-	-			-	-
MEXICO-C	(1,703,600,991)		3,754,612		-	(1,699,846,379)
MONTANA	347,040	(8,128,483)		-	-	(7,781,442)
NEVADA	(750,084,086)	(158,595)	-			(750,242,681)
NEW MEXI	109,231,713	46,758,239		-	-	155,989,952
NW_EAST	2,185,283,495		-	-	-	2,185,283,495
NW_WEST	1,378,419,853	25,269,547	-	-	-	1,403,689,400
PG&E_BAY	493,725,487	699,423	-	-	-	494,424,910
PG&E_VLY	518,679,426	398,298	40,174,539	-	-	559,252,263
SANDIEGO	(1,036,262,608)		-		-	(1,036,262,608)
SIERRA	21,367,605	(12,516,223)		-	-	8,851,382
SOCALIF	(169,658,117)	5,756,560	-	-	-	(163,901,557)
SW WYO					-	-
UT N	29,422,479	12,928,693			-	42,351,172
UT S	819,270	4,402,691			-	5,221,961
WAPA L.C	(291,085,423)	-			-	(291,085,423)
WYO		4,146,024				4,146,024
YLW TL					-	-
Grand Total	(330,565,826)	265,867,151	61,401,480	-	-	(3,297,194)

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 7: Change in CO2 emissions for South Bay relative to base case in 2015 (lbs of CO2)

Sum of CO2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(7,893,859)	7,772,698		-	-	(121,161)
ARIZONA	(578,405,941)	(50,518,142)	977,086	-	-	(627,946,997)
B HILL	-	148,531	-		-	148,531
B.C.HYDR	(12,609,363)				-	(12,609,363)
BONZ		45,118				45,118
COL E	8,368,091	(7,649,121)	-		-	718,971
COL W	442,997	21,901,123			-	22,344,120
IDAHO	57,761	-			-	57,761
IMPERIAL	(697,083)		-	-	-	(697,083)
IPP		-				-
JB		(485,041)				(485,041)
KGB					-	-
LADWP	(23,678,452)				-	(23,678,452)
LRS	-	-			-	-
MEXICO-C	(631,576,337)		(1,653,942)		-	(633,230,278)
MONTANA	(5,490,941)	(1,176,870)		-	-	(6,667,811)
NEVADA	(157,447,733)	-	-			(157,447,733)
NEW MEXI	(411,683)	(7,057,499)		-	-	(7,469,182)
NW_EAST	(215,929,628)		-	-	-	(215,929,628)
NW_WEST	29,073,540	(6,989,714)	-	-	-	22,083,827
PG&E_BAY	(73,443,992)	-	-	-	-	(73,443,992)
PG&E_VLY	(79,669,582)	79,220	188,701	-	-	(79,401,661)
SANDIEGO	2,571,052,467		-		-	2,571,052,467
SIERRA	(6,810,717)	454,969		-	-	(6,355,748)
SOCALIF	(288,730,142)	(1,247,076)	-	-	-	(289,977,217)
SW WYO					-	-
UT N	(8,321,405)	(715,190)			-	(9,036,595)
UT S	4,679,727	(311,317)			-	4,368,410
WAPA L.C	(37,132,932)	-			-	(37,132,932)
WYO		-				-
YLW TL					-	-
Grand Total	485,424,793	(45,748,312)	(488,154)	-	-	439,188,327

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 8: Change in CO2 emissions for Green Path + LEAPS relative to base case in 2015 (lbs of CO2)

Sum of CO2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(29,943,701)	163,043,000		-	-	133,099,300
ARIZONA	(2,115,914,240)	(154,548,574)	19,345,199	-	-	(2,251,117,614)
B HILL	-	(4,482,978)	-		-	(4,482,978)
B.C.HYDR	438,172,418				-	438,172,418
BONZ		(1,751,223)				(1,751,223)
COL E	(63,763,436)	56,357,301	-		-	(7,406,135)
COL W	181,743	163,256,064			-	163,437,807
IDAHO	3,644,516	7,208,854			-	10,853,370
IMPERIAL	(41,850,041)		-	-	-	(41,850,041)
IPP		-				-
JB		(5,095,698)				(5,095,698)
KGB					-	-
LADWP	(76,896,770)				-	(76,896,770)
LRS	-	-			-	-
MEXICO-C	(1,506,020,801)		7,489,373		-	(1,498,531,427)
MONTANA	3,708,515	(8,857,992)		-	-	(5,149,477)
NEVADA	(468,779,662)	(158,595)	61,913			(468,876,344)
NEW MEXI	(17,114,171)	51,692,795		-	-	34,578,624
NW_EAST	2,272,529,201		-	-	-	2,272,529,201
NW_WEST	1,303,134,987	27,007,093	-	-	-	1,330,142,080
PG&E_BAY	501,661,025	699,423	-	-	-	502,360,448
PG&E_VLY	570,885,180	319,078	37,724,192	-	-	608,928,451
SANDIEGO	(247,212,317)		-		-	(247,212,317)
SIERRA	15,141,749	(4,700,423)		-	-	10,441,326
SOCALIF	(305,171,238)	6,046,101	-	-	-	(299,125,137)
SW WYO					-	-
UT N	26,377,402	11,221,489			-	37,598,891
UT S	(2,287,938)	5,155,222			-	2,867,284
WAPA L.C	(400,120,263)	-			-	(400,120,263)
WYO		3,977,511				3,977,511
YLW TL					-	-
Grand Total	(139,637,841)	316,388,449	64,620,678	-	-	241,371,286

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 9: Change in NOX emissions for Sunrise relative to base case in 2015 (lbs of CO2)

Sum of NOX	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(4,681)	116,711		-	-	112,030
ARIZONA	(152,771)	(136,829)	12,368	-	-	(277,231)
B HILL	-	(3,305)	-		-	(3,305)
B.C.HYDR	49,911				-	49,911
BONZ		(4)				(4)
COL E	(7,075)	44,355	-		-	37,279
COL W	(24)	109,034			-	109,010
IDAHO	443	5,103			-	5,546
IMPERIAL	(4,650)		-	-	-	(4,650)
IPP		-				-
JB		(3,180)				(3,180)
KGB					-	-
LADWP	(43)				-	(43)
LRS	-	-			-	-
MEXICO-C	(182,078)		2,658		-	(179,420)
MONTANA	37	(5,754)		-	-	(5,717)
NEVADA	(79,766)	(112)	-			(79,878)
NEW MEXI	16,735	33,099		-	-	49,834
NW_EAST	231,071		-	-	-	231,071
NW_WEST	139,776	17,888	-	-	-	157,664
PG&E_BAY	52,588	495	-	-	-	53,083
PG&E_VLY	56,353	282	28,439	-	-	85,073
SANDIEGO	(112,222)		-		-	(112,222)
SIERRA	2,267	(8,860)		-	-	(6,593)
SOCALIF	(17,710)	4,075	-	-	-	(13,635)
SW WYO					-	-
UT N	3,171	9,152			-	12,323
UT S	(30)	3,117			-	3,087
WAPA L.C	(31,243)	-			-	(31,243)
WYO		2,935				2,935
YLW TL					-	-
Grand Total	(39,940)	188,202	43,465	-	-	191,727

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 10: Change in NOX emissions for South Bay relative to base case in 2015 (lbs of CO2)

Sum of NOX	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(598)	5,502		-	-	4,904
ARIZONA	(62,130)	(35,761)	692	-	-	(97,200)
B HILL	-	105	-		-	105
B.C.HYDR	(1,153)				-	(1,153)
BONZ		32				32
COL E	901	(5,415)	-		-	(4,514)
COL W	49	15,503			-	15,552
IDAHO	7	-			-	7
IMPERIAL	(75)		-	-	-	(75)
IPP		-				-
JB		(343)				(343)
KGB					-	-
LADWP	(2,230)				-	(2,230)
LRS	-	-			-	-
MEXICO-C	(67,880)		(1,171)		-	(69,051)
MONTANA	(583)	(833)		-	-	(1,416)
NEVADA	(16,598)	-	-			(16,598)
NEW MEXI	212	(4,996)		-	-	(4,784)
NW_EAST	(23,002)		-	-	-	(23,002)
NW_WEST	5,288	(4,948)	-	-	-	340
PG&E_BAY	(8,263)	-	-	-	-	(8,263)
PG&E_VLY	(8,659)	56	134	-	-	(8,470)
SANDIEGO	352,693		-		-	352,693
SIERRA	(723)	322		-	-	(401)
SOCALIF	(31,716)	(883)	-	-	-	(32,599)
SW WYO					-	-
UT N	(884)	(506)			-	(1,390)
UT S	524	(220)			-	303
WAPA L.C	(3,931)	-			-	(3,931)
WYO		-				-
YLW TL					-	-
Grand Total	131,248	(32,384)	(346)	-	-	98,518

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 11: Change in NOX emissions for Green Path + LEAPS relative to base case in 2015 (lbs of CO2)

Sum of NOX	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(3,943)	115,415		-	-	111,473
ARIZONA	(226,352)	(109,402)	13,694	-	-	(322,060)
B HILL	-	(3,173)	-		-	(3,173)
B.C.HYDR	47,703				-	47,703
BONZ		(1,240)				(1,240)
COL E	(6,855)	39,894	-		-	33,039
COL W	20	115,566			-	115,586
IDAHO	434	5,103			-	5,537
IMPERIAL	(4,650)		-	-	-	(4,650)
IPP		-				-
JB		(3,607)				(3,607)
KGB					-	-
LADWP	(7,434)				-	(7,434)
LRS	-	-			-	-
MEXICO-C	(159,499)		5,302		-	(154,198)
MONTANA	394	(6,270)		-	-	(5,877)
NEVADA	(48,711)	(112)	44			(48,780)
NEW MEXI	(377)	36,592		-	-	36,215
NW_EAST	243,928		-	-	-	243,928
NW_WEST	135,110	19,118	-	-	-	154,227
PG&E_BAY	53,824	495	-	-	-	54,320
PG&E_VLY	61,939	226	26,704	-	-	88,870
SANDIEGO	(25,720)		-		-	(25,720)
SIERRA	1,607	(3,327)		-	-	(1,721)
SOCALIF	(31,651)	4,280	-	-	-	(27,371)
SW WYO					-	-
UT N	2,901	7,943			-	10,845
UT S	(276)	3,649			-	3,373
WAPA L.C	(42,873)	-			-	(42,873)
WYO		2,816				2,816
YLW TL					-	-
Grand Total	(10,483)	223,965	45,744	-	-	259,226

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Request ISO-7: Please describe the difference in generation and emissions by power plant between the Base Case and the CAISO Sunrise case assuming that the additional renewable energy mix is equal to that of the Base Case (i.e., Sunrise adds no generation resources beyond those in Base Case). Please tabulate the change in output and emissions as in request ISO-6.

Response ISO-7:
The tabulations of changes in output compared to the base case are shown in the tables that follow.

Table 12: Change in MWh output in 2015 (Sunrise with base case renewables compared to base case)

Sum of Case1	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(50,557)	36,377		598	-	(13,581)
ARIZONA	387,706	18,454	(1,368)	-	-	404,792
B HILL	-	15	-		-	15
B.C.HYDR	22,010				24	22,033
BONZ		39				39
COL E	(1,165)	11,947	-		66	10,848
COL W	(608)	7,856			-	7,247
IDAHO	95	-		-	-	95
IMPERIAL	4,290		-	4,726	43	9,059
IPP		-				-
JB		(149)				(149)
KGB					-	-
LADWP	10,622				(3,896)	6,726
LRS	-	-			-	-
MEXICO-C	(142,945)		(3,134)		(288)	(146,367)
MONTANA	(2,795)	(364)		167	-	(2,991)
NEVADA	(132,609)	-	-			(132,609)
NEW MEXI	909	(340)		339	-	908
NW_EAST	(194,735)		-	135	427	(194,173)
NW_WEST	(24,580)	(2,090)	-	1,884	-	(24,786)
PG&E_BAY	(52,788)	14	-	-	-	(52,774)
PG&E_VLY	(66,835)	-	246	3,280	(1,366)	(64,675)
SANDIEGO	(86,487)		-		(2,416)	(88,903)
SIERRA	(7,741)	6,390		(16)	364	(1,003)
SOCALIF	69,665	(315)	-	498	795	70,643
SW WYO					-	-
UT N	(9,383)	(102)			-	(9,484)
UT S	(235)	(274)			-	(509)
WAPA L.C	31,000	-			-	31,000
WYO		-				-
YLW TL					-	-
Grand Total	(247,168)	77,460	(4,256)	11,610	(6,246)	(168,599)

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 13: Change in CO2 emissions in 2015 (Sunrise with base case renewables compared to base case) (lbs of CO2)

Sum of CO2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(43,428,845)	80,823,874		-	-	37,395,028
ARIZONA	351,947,631	41,059,692	(3,043,088)	-	-	389,964,235
B HILL	-	35,698	-		-	35,698
B.C.HYDR	22,920,950				-	22,920,950
BONZ		87,777				87,777
COL E	(1,097,913)	26,714,611	-		-	25,616,698
COL W	(562,266)	17,786,732			-	17,224,466
IDAHO	94,517	-		-	-	94,517
IMPERIAL	4,138,002		-	-	-	4,138,002
IPP		-				-
JB		(331,691)				(331,691)
KGB					-	-
LADWP	12,478,611				-	12,478,611
LRS	-	-			-	-
MEXICO-C	(140,776,443)		(6,973,207)		-	(147,749,650)
MONTANA	(2,518,224)	(806,993)		-	-	(3,325,217)
NEVADA	(120,186,353)	-	-			(120,186,353)
NEW MEXI	1,384,094	(755,388)		-	-	628,705
NW_EAST	(175,555,095)		-	-	-	(175,555,095)
NW_WEST	(6,614,102)	(4,649,640)	-	-	-	(11,263,743)
PG&E_BAY	(47,210,116)	31,752	-	-	-	(47,178,365)
PG&E_VLY	(57,449,421)	-	618,674	-	-	(56,830,747)
SANDIEGO	(86,391,929)		-		-	(86,391,929)
SIERRA	(6,973,992)	14,217,039		-	-	7,243,047
SOCALIF	64,630,121	(701,305)	-	-	-	63,928,816
SW WYO					-	-
UT N	(8,490,896)	(258,414)			-	(8,749,310)
UT S	(202,688)	(695,807)			-	(898,496)
WAPA L.C	27,818,467	-			-	27,818,467
WYO		-				-
YLW TL					-	-
Grand Total	(212,045,891)	172,557,934	(9,397,621)	-	-	(48,885,579)

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 14: Change in NOX emissions in 2015 (Sunrise with base case renewables compared to base case) (lbs of NOX)

Sum of NOX	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(4,344)	57,214		-	-	52,869
ARIZONA	37,709	29,065	(2,154)	-	-	64,620
B HILL	-	25	-		-	25
B.C.HYDR	2,855				-	2,855
BONZ		62				62
COL E	(123)	18,911	-		-	18,788
COL W	(62)	12,591			-	12,529
IDAHO	11	-		-	-	11
IMPERIAL	476		-	-	-	476
IPP		-				-
JB		(235)				(235)
KGB					-	-
LADWP	1,722				-	1,722
LRS	-	-			-	-
MEXICO-C	(16,579)		(4,936)		-	(21,515)
MONTANA	(267)	(571)		-	-	(838)
NEVADA	(12,851)	-	-			(12,851)
NEW MEXI	224	(535)		-	-	(311)
NW_EAST	(18,644)		-	-	-	(18,644)
NW_WEST	1,423	(3,291)	-	-	-	(1,869)
PG&E_BAY	(4,962)	22	-	-	-	(4,939)
PG&E_VLY	(5,718)	-	438	-	-	(5,280)
SANDIEGO	(10,326)		-		-	(10,326)
SIERRA	(740)	10,064		-	-	9,324
SOCALIF	7,113	(496)	-	-	-	6,617
SW WYO					-	-
UT N	(906)	(183)			-	(1,089)
UT S	(20)	(493)			-	(513)
WAPA L.C	2,937	-			-	2,937
WYO		-				-
YLW TL					-	-
Grand Total	(21,072)	122,150	(6,652)	-	-	94,426

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Request ISO-8: Please describe the difference in generation and emissions by power plant between the Base Case and the CAISO South Bay case assuming that the additional renewable energy mix is equal to that of the Base Case. Please tabulate the change in output and emissions as in request ISO-6.

Response ISO-8:
The CAISO assumes that the renewable energy mix in South Bay case is the same as the base case. Accordingly, the results are already presented in response number 6 above for South Bay.

Request ISO-9: Please describe the difference in generation and emissions by power plant between the Base Case and the CAISO Green Path + LEAPS case assuming that the additional renewable energy mix is equal to that of the Base Case. Please tabulate the change in output and emissions as in request ISO-6.

Response ISO-9:
The tabulations of changes in output compared to the base case are shown in the tables that follow.

Table 15: Change in MWh output in 2015 (LEAPS + GPN with base case renewables compared to base case)

Sum of Case3	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(12,982)	14,614		970	-	2,603
ARIZONA	(347,315)	(7,880)	1,913	-	-	(353,282)
B HILL	-	(69)	-		-	(69)
B.C.HYDR	46,875				76	46,951
BONZ		143				143
COL E	7,810	938	-		(407)	8,341
COL W	29	3,184			-	3,213
IDAHO	914	-		-	-	914
IMPERIAL	842		-	5,514	(22)	6,334
IPP		-				-
JB		142				142
KGB					-	-
LADWP	(26,274)				(32,729)	(59,002)
LRS	-	-			-	-
MEXICO-C	61,289		(187)		3	61,104
MONTANA	825	(332)		119	-	611
NEVADA	369,134	-	-			369,134
NEW MEXI	57,381	9,211		874	-	67,466
NW_EAST	(221,299)		-	782	392	(220,124)
NW_WEST	132,975	842	722	3,547	-	138,087
PG&E_BAY	11,226	-	-	-	-	11,226
PG&E_VLY	68,223	(1)	1,975	2,155	(21,282)	51,070
SANDIEGO	(214,496)		50		(5,332)	(219,779)
SIERRA	2,042	6,568		(9)	(226)	8,374
SOCALIF	33,852	692	-	966	239,597	275,106
SW WYO					-	-
UT N	(362)	442			-	80
UT S	8,127	582			-	8,709
WAPA L.C	(15,963)	-			-	(15,963)
WYO		-				-
YLW TL					-	-
Grand Total	(37,147)	29,076	4,474	14,918	180,070	191,390

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 16: Change in CO2 emissions in 2015 (LEAPS + GPN with base case renewables compared to base case) (lbs of CO2)

Sum of CO2	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(10,756,044)	32,534,294		-	-	21,778,250
ARIZONA	(312,510,375)	(17,533,027)	4,257,004	-	-	(325,786,398)
B HILL	-	(160,410)	-		-	(160,410)
B.C.HYDR	38,095,439				-	38,095,439
BONZ		318,660				318,660
COL E	6,903,502	1,616,730	-		-	8,520,231
COL W	26,977	6,753,599			-	6,780,576
IDAHO	909,312	-		-	-	909,312
IMPERIAL	819,234		-	-	-	819,234
IPP		-				-
JB		315,767				315,767
KGB					-	-
LADWP	(25,938,309)				-	(25,938,309)
LRS	-	-			-	-
MEXICO-C	55,733,421		(416,111)		-	55,317,309
MONTANA	742,841	(740,574)		-	-	2,267
NEVADA	332,673,288	-	-			332,673,288
NEW MEXI	71,994,519	20,494,609		-	-	92,489,127
NW_EAST	(200,395,527)		-	-	-	(200,395,527)
NW_WEST	130,058,886	1,874,405	1,605,702	-	-	133,538,993
PG&E_BAY	11,064,087	-	-	-	-	11,064,087
PG&E_VLY	66,385,187	(2,199)	4,919,881	-	-	71,302,869
SANDIEGO	(192,307,216)		111,603		-	(192,195,612)
SIERRA	1,839,316	14,612,924		-	-	16,452,240
SOCALIF	35,407,244	1,538,606	-	-	-	36,945,850
SW WYO					-	-
UT N	(192,871)	1,125,057			-	932,185
UT S	7,571,158	1,479,440			-	9,050,598
WAPA L.C	(14,555,525)	-			-	(14,555,525)
WYO		-				-
YLW TL					-	-
Grand Total	3,568,543	64,227,880	10,478,079	-	-	78,274,502

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Table 17: Change in NOX emissions in 2015 (LEAPS + GPN with base case renewables compared to base case) (lbs of NOX)

Sum of NOX	GenType					
Load Area	1	2	3	4	5	Grand Total
ALBERTA	(978)	23,030		-	-	22,053
ARIZONA	(33,107)	(12,411)	3,013	-	-	(42,505)
B HILL	-	(114)	-		-	(114)
B.C.HYDR	3,477				-	3,477
BONZ		226				226
COL E	714	1,144	-		-	1,859
COL W	3	4,781			-	4,784
IDAHO	108	-		-	-	108
IMPERIAL	95		-	-	-	95
IPP		-				-
JB		224				224
KGB					-	-
LADWP	(3,063)				-	(3,063)
LRS	-	-			-	-
MEXICO-C	5,985		(295)		-	5,690
MONTANA	79	(524)		-	-	(445)
NEVADA	35,316	-	-			35,316
NEW MEXI	10,416	14,508		-	-	24,924
NW_EAST	(21,404)		-	-	-	(21,404)
NW_WEST	15,204	1,327	1,137	-	-	17,668
PG&E_BAY	1,304	-	-	-	-	1,304
PG&E_VLY	7,718	(2)	3,483	-	-	11,199
SANDIEGO	(20,278)		79		-	(20,199)
SIERRA	195	10,344		-	-	10,539
SOCALIF	4,429	1,089	-	-	-	5,518
SW WYO					-	-
UT N	(2)	796			-	794
UT S	837	1,047			-	1,885
WAPA L.C	(1,568)	-			-	(1,568)
WYO		-				-
YLW TL					-	-
Grand Total	5,480	45,466	7,417	-	-	58,363

1 = Gas-fired, 2 = Coal-fired, 3= Fuel Oil, 4=Other (nuclear, wood, biomass), 5=renewable (hydro, wind, solar)

Request ISO-10: Please confirm there was a typographical error in the April 18 CAISO response to request ISO-3, where the quantity of CO2 emissions should be "pounds" rather than "tons."

Response ISO-10:
Yes, there was a typographical error in the April 18 CAISO response to request ISO-3. The quantity of CO2 emissions is shown in "pounds" rather than "tons."

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

In the Matter of the Application of	)	Application No. 06-08-010
San Diego Gas & Electric Company	)	(Filed August 4, 2006)
(U-902-E) for a Certificate of Public	)	
Convenience and Necessity for the	)	
Sunrise Powerlink Transmission Project	)	

SUPPLEMENTAL CAISO RESPONSE TO THE SECOND DATA REQUEST OF ASPEN ENVIRONMENTAL GROUP/CPUC ENERGY DIVISION-CEQA (November 14, 2007)

Supplemental ISO-1: Why are there CO2 increases caused by LEAPS (comparing Table 13 vs 16)?

Response to Supplemental ISO-1: First of all the total difference in CO2 between these two cases is approximately 0.04%. Although the localized differences may be somewhat larger, CO2 is a global phenomenon. With that in mind, the CAISO offers the following observations with respect to the CO2 increases caused by LEAPS:

- LEAPS pumping/generation cycle causes 20 % inefficiency losses, and this results in the need to convert more fossil fuel into electric energy (MWH).

- LEAPS units pump during off-peak load hours and generate during peak day time hours. During a significant portion of off-peak hours, coal units were marginal, and therefore more coal was burned due to LEAPS pumping. LEAPS then generates during peak hours and displaces mostly gas units (marginal units). Gas units have a lower CO2 emission rate than coal. As a result, LEAPS tends to increase coal units output and reduce gas units output, and increases CO2 emissions.

- Green Path North causes congestion on the Northern portion of Path 49 (East of River) between Arizona and California. This requires generation redispatch which presumably results in increased transmission MWH losses.

- For the same generation dispatch, Sunrise reduces more MWH losses than Green Path North and LEAPS.

Supplemental ISO-2: Why do Mexican generators operate more with LEAPS than SRPL (Table 6 vs 8)?

Response to Supplemental ISO-2: The internal CFE area constraint, discussed during the conference call on November 12, 2007, does not appear to be a dominant factor in the total CFE area generation for all hours of the year.

Instead, it appears that the Arizona to California constraint discussed above dominates the generation dispatch differences, on average, over the course of the year. In other words, in these cases with no additional Imperial area renewable development, Sunrise slightly relieves the Arizona to California path and results in a 0.5% increase in Arizona Generation compared to the Green Path North/LEAPS case. Since Mexico is the next cheapest source area adjacent to San Diego, after Arizona, generation output in Mexico replaces generation that is constrained off in Arizona.