## Base Resource Scheduling Flexibility Enhancements Benefits Report

TABLE 1. Summary of Benefits, All Enhancements, All Customers, January 1, 2020 - December 31, 2020

NHANCEMENT			l I	RESCHEDULING	RESIDUAL_LVH	RESIDUAL_POTENTIAL	RESIDUAL_LVH_MWH	NESIDOAL_CAFFED
LIVITAIVELIVILIVI	LVH_MWH	LVH_AVE_LMP	HVH_AVE_LMP	_BENEFITS, \$	_MWH	_BENEFITS, \$	_CAPPED	_BENEFITS, \$
0	0	21.6981	41.5936	0	0	0	0	0
1	7,302	22.8250	40.7313	132,363	2,580	46,158	2,579	46,135
2	211	26.3815	48.9993	4,761	62	1,393	62	1,393
0	0	17.3394	39.8150	0	0	0	0	0
1	5,742	15.2783	38.1071	130,475	5,102	113,406	5,078	112,884
2	1,873	12.1962	36.9749	47,020	2,846	71,069	2,796	69,980
1	356	25.0890	42.6739	6,257	306	5,373	299	5,253
2	8,244	17.5499	36.9351	163,600	13,681	266,883	13,327	260,563
1	356	13.9759	31.7753	6,188	1,848	33,351	1,768	31,836
2	5,005	15.7678	30.7810	75,727	17,535	271,667	16,927	261,031
1	7,925	7.4920	31.7526	188,664	24,691	586,249	23,403	556,266
0	90	12.8297	39.1146	2,396	5,928	153,941	5,330	138,294
1	1,448	19.6699	55.1861	47,517	2,094	69,248	2,003	65,997
2	10,030	11.2625	33.8919	225,541	16,741	386,239	13,900	321,005
2	10,869	16.4768	39.1267	242,842	20,091	444,674	17,717	391,579
2	9,984	24.6701	104.3977	676,636	17,018	1,033,506	13,598	789,894
2	5,867	26.0840	71.1480	208,002	10,526	358,853	9,774	337,724
2	10,438	28.8299	67.7808	407,972	7,887	261,313	7,719	256,590
2	5,308	28.1312	53.4942	140,543	4,191	110,992	4,140	109,755
2	4,868	27.9817	55.0497	131,848	4,016	109,775	3,939	107,723
	95,916			2,838,351	157,143	4,324,091	144,358	3,863,902
	1 2 0 1 2 1 2 1 0 1 2 2 2 2 2 2 2 2 2	1 7,302 2 211 0 0 1 5,742 2 1,873 1 356 2 8,244 1 356 2 5,005 1 7,925 0 90 1 1,448 2 10,030 2 10,869 2 9,984 2 5,867 2 10,438 2 5,308 2 4,868	1       7,302       22.8250         2       211       26.3815         0       0       17.3394         1       5,742       15.2783         2       1,873       12.1962         1       356       25.0890         2       8,244       17.5499         1       356       13.9759         2       5,005       15.7678         1       7,925       7.4920         0       90       12.8297         1       1,448       19.6699         2       10,030       11.2625         2       10,869       16.4768         2       9,984       24.6701         2       5,867       26.0840         2       10,438       28.8299         2       5,308       28.1312         2       4,868       27.9817	1       7,302       22.8250       40.7313         2       211       26.3815       48.9993         0       0       17.3394       39.8150         1       5,742       15.2783       38.1071         2       1,873       12.1962       36.9749         1       356       25.0890       42.6739         2       8,244       17.5499       36.9351         1       356       13.9759       31.7753         2       5,005       15.7678       30.7810         1       7,925       7.4920       31.7526         0       90       12.8297       39.1146         1       1,448       19.6699       55.1861         2       10,030       11.2625       33.8919         2       10,869       16.4768       39.1267         2       9,984       24.6701       104.3977         2       5,867       26.0840       71.1480         2       10,438       28.8299       67.7808         2       5,308       28.1312       53.4942         2       4,868       27.9817       55.0497	1       7,302       22.8250       40.7313       132,363         2       211       26.3815       48.9993       4,761         0       0       17.3394       39.8150       0         1       5,742       15.2783       38.1071       130,475         2       1,873       12.1962       36.9749       47,020         1       356       25.0890       42.6739       6,257         2       8,244       17.5499       36.9351       163,600         1       356       13.9759       31.7753       6,188         2       5,005       15.7678       30.7810       75,727         1       7,925       7.4920       31.7526       188,664         0       90       12.8297       39.1146       2,396         1       1,448       19.6699       55.1861       47,517         2       10,030       11.2625       33.8919       225,541         2       10,869       16.4768       39.1267       242,842         2       9,984       24.6701       104.3977       676,636         2       5,867       26.0840       71.1480       208,002         2       10,438 <td>1       7,302       22.8250       40.7313       132,363       2,580         2       211       26.3815       48.9993       4,761       62         0       0       17.3394       39.8150       0       0         1       5,742       15.2783       38.1071       130,475       5,102         2       1,873       12.1962       36.9749       47,020       2,846         1       356       25.0890       42.6739       6,257       306         2       8,244       17.5499       36.9351       163,600       13,681         1       356       13.9759       31.7753       6,188       1,848         2       5,005       15.7678       30.7810       75,727       17,535         1       7,925       7.4920       31.7526       188,664       24,691         0       90       12.8297       39.1146       2,396       5,928         1       1,448       19.6699       55.1861       47,517       2,094         2       10,030       11.2625       33.8919       225,541       16,741         2       10,869       16.4768       39.1267       242,842       20,091</td> <td>1       7,302       22.8250       40.7313       132,363       2,580       46,158         2       211       26.3815       48.9993       4,761       62       1,393         0       0       17.3394       39.8150       0       0       0       0         1       5,742       15.2783       38.1071       130,475       5,102       113,406         2       1,873       12.1962       36.9749       47,020       2,846       71,069         1       356       25.0890       42.6739       6,257       306       5,373         2       8,244       17.5499       36.9351       163,600       13,681       266,883         1       356       13.9759       31.7753       6,188       1,848       33,351         2       5,005       15.7678       30.7810       75,727       17,535       271,667         1       7,925       7.4920       31.7526       188,664       24,691       586,249         0       90       12.8297       39.1146       2,396       5,928       153,941         1       1,448       19.6699       55.1861       47,517       2,094       69,248         2</td> <td>1       7,302       22.8250       40.7313       132,363       2,580       46,158       2,579         2       211       26.3815       48.9993       4,761       62       1,393       62         0       0       17.3394       39.8150       0       0       0       0       0         1       5,742       15.2783       38.1071       130,475       5,102       113,406       5,078         2       1,873       12.1962       36.9749       47,020       2,846       71,069       2,796         1       356       25.0890       42.6739       6,257       306       5,373       299         2       8,244       17.5499       36.9351       163,600       13,681       266,883       13,327         1       356       13.9759       31.7753       6,188       1,848       33,351       1,768         2       5,005       15.7678       30.7810       75,727       17,535       271,667       16,927         1       7,925       7.4920       31.7526       188,664       24,691       586,249       23,403         0       90       12.8297       39.1146       2,396       5,928       153,941</td>	1       7,302       22.8250       40.7313       132,363       2,580         2       211       26.3815       48.9993       4,761       62         0       0       17.3394       39.8150       0       0         1       5,742       15.2783       38.1071       130,475       5,102         2       1,873       12.1962       36.9749       47,020       2,846         1       356       25.0890       42.6739       6,257       306         2       8,244       17.5499       36.9351       163,600       13,681         1       356       13.9759       31.7753       6,188       1,848         2       5,005       15.7678       30.7810       75,727       17,535         1       7,925       7.4920       31.7526       188,664       24,691         0       90       12.8297       39.1146       2,396       5,928         1       1,448       19.6699       55.1861       47,517       2,094         2       10,030       11.2625       33.8919       225,541       16,741         2       10,869       16.4768       39.1267       242,842       20,091	1       7,302       22.8250       40.7313       132,363       2,580       46,158         2       211       26.3815       48.9993       4,761       62       1,393         0       0       17.3394       39.8150       0       0       0       0         1       5,742       15.2783       38.1071       130,475       5,102       113,406         2       1,873       12.1962       36.9749       47,020       2,846       71,069         1       356       25.0890       42.6739       6,257       306       5,373         2       8,244       17.5499       36.9351       163,600       13,681       266,883         1       356       13.9759       31.7753       6,188       1,848       33,351         2       5,005       15.7678       30.7810       75,727       17,535       271,667         1       7,925       7.4920       31.7526       188,664       24,691       586,249         0       90       12.8297       39.1146       2,396       5,928       153,941         1       1,448       19.6699       55.1861       47,517       2,094       69,248         2	1       7,302       22.8250       40.7313       132,363       2,580       46,158       2,579         2       211       26.3815       48.9993       4,761       62       1,393       62         0       0       17.3394       39.8150       0       0       0       0       0         1       5,742       15.2783       38.1071       130,475       5,102       113,406       5,078         2       1,873       12.1962       36.9749       47,020       2,846       71,069       2,796         1       356       25.0890       42.6739       6,257       306       5,373       299         2       8,244       17.5499       36.9351       163,600       13,681       266,883       13,327         1       356       13.9759       31.7753       6,188       1,848       33,351       1,768         2       5,005       15.7678       30.7810       75,727       17,535       271,667       16,927         1       7,925       7.4920       31.7526       188,664       24,691       586,249       23,403         0       90       12.8297       39.1146       2,396       5,928       153,941

LVH MWH

= Total Initial BR Min MW less Total Scheduled BR MW by ALL Customers for the 6 lowest-priced hours in the day

LVH\_AVE\_LMP HVH\_AVE\_LMP = Average Day Ahead MEEA LMP for the 6 lowest-priced hours in the day
= Average Day Ahead MEEA LMP for the 6 highest-priced hours in the day

RESCHEDULING\_BENEFITS, \$

= LVH\_MWH \* (HVH\_AVE\_LMP - LVH\_AVE\_LMP)

RESIDUAL LVH MWH

= Total Scheduled BR MW by ALL Customers less Total Actual BR Min MW for the 6 lowest-priced hours in the day

RESIDUAL\_POTENTIAL\_BENEFITS, \$

= RESIDUAL\_LVH\_MWH \* (HVH\_AVE\_LMP - LVH\_AVE\_LMP)

RESIDUAL\_LVH\_MWH\_CAPPED

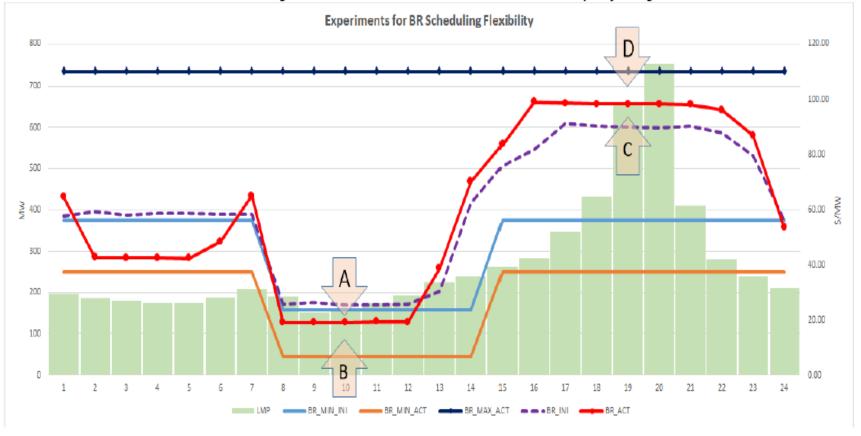
= min(RESIDUAL\_LVH\_MWH, Total Actual BR Max MW less Total Scheduled BR MW by Customer for the 6 highest-priced hours in the day), calculated for each customer

RESIDUAL\_CAPPED\_BENEFITS, \$

= RESIDUAL\_LVH\_MWH\_CAPPED \* (HVH\_AVE\_LMP - LVH\_AVE\_LMP)



CHART 1. Illustration of BR made available for Higher-Value Hours: MWh Rescheduled and Available Capacity at Higher-Value Hours



LVH\_MWH = "A"

RESCHEDULING\_BENEFITS, \$

RESIDUAL LVH MWH = "B"

RESIDUAL\_LVH\_MWH\_CAPPED

= Total Initial BR Min MW less Total Scheduled BR MW by ALL Customers for the 6 lowest-priced hours in the day

= LVH\_MWH \* (HVH\_AVE\_LMP - LVH\_AVE\_LMP), benefits realized by rescheduling "A" into higher value hours in "C"

= Total Scheduled BR MW by ALL Customers less Total Actual BR Min MW for the 6 lowest-priced hours in the day

= min(RESIDUAL\_LVH\_MWH, Total Actual BR Max MW less Total Scheduled BR MW by Customer for the 6 highest-priced hours in the day), calculated for each customer

= min("B", "D"), calculated for each customer



## Impact of BR Scheduling Flexibility Enhancements to the Max Peaking Program

TABLE 2. Estimate of Impact of BR Rescheduling to the Max Peaking Program

					AVERAGE_MAXPK_BENEFIT,	BR_RESCHEDULING_IMPACT,
YEAR_MO	ENHANCEMENT	MAXPK_MWH	LVH_AVE_LMP	HVH_AVE_LMP	\$/MWH	s
2020_01	0	0	20.6835	46.5091	10.9401	0
	1	3,937	21.2438	43.0268	10.9401	-43,074
	2	122	25.3586	52.1288	10.9401	-1,336
2020_02	0	0	15.5276	42.2105	11.3506	0
	1	2,968	12.7944	40.4558	11.3506	-33,691
	2	1,045	10.6295	40.2665	11.3506	-11,859
2020_03	1	204	24.4672	45.5831	8.3467	-1,704
	2	4,439	15.9227	39.9461	8.3467	-37,049
2020_04	1	180	12.9470	38.1482	5.6507	-1,018
	2	2,808	14.8632	34.2890	5.6507	-15,868
2020_05	1	4,246	6.5251	37.2267	15.7039	-66,671
2020_06	0	42	11.7477	47.0523	27.6489	-1,172
	1	971	18.0965	69.5662	27.6489	-26,837
	2	5,459	9.9151	38.9074	27.6489	-150,936
2020_07	2	6,733	14.5251	47.0823	21.8691	-147,247
2020_08	2	5,441	22.5947	152.2437	84.0846	-457,528
2020_09	2	3,083	24.1864	95.1035	45.4373	-140,078
2020_10	2	5,798	27.3743	87.8169	63.2435	-366,696
2020_11	2	2,784	26.9498	60.2339	28.6223	-79,689
2020_12	2	2,663	26.5181	59.5798	26.3783	-70,235
	·	52,923				-1,652,688

MAXPK\_MWH

= Total Initial BR Min MW less Total Scheduled BR MW by ALL Customers for the 3 lowest-priced hours in the day

LVH\_AVE\_LMP

= Average Day Ahead MEEA LMP for the 3 lowest-priced hours in the day

HVH\_AVE\_LMP

= Average Day Ahead MEEA LMP for the 3 highest-priced hours in the day

AVERAGE\_MAXPK\_BENEFIT, \$/MWH

= Max Peaking Monthly Average Difference of Sale Price and Purchase Price

BR\_RESCHEDULING\_IMPACT, \$

= MAXPK MWH \* (AVERAGE MAXPK BENEFIT, \$/MWH) \* -1

