

**Summary of ISO Capital Expenditure Forecast - Non-Incentive Projects**  
(\$000)

PIN	Project Title	C-WBS	Order #	High/ Low	OD	Project Total (ISO & non-ISO)				ISO Portion			
				Prior		2017	2018	Total	Prior	2017	2018	Total	
Non-Incentive Transmission Projects includes Direct Installation and Removal Expenditures													
Other Transmission													
07756	Whirlwind Sub (POS): Equip one (1) 220 kV position to terminate the Rattlesnake-Whirlwind 220kV Line	CET-ET-TP-RN-775602	901458993	High	Nov-16	36	1,200	1,000	2,236	36	1,200	1,000	2,236
07775	Whirlwind Substation (NU): Equip one (1) 220 kV position to terminate the Desert Flower-Whirlwind 220kV Lin	CET-ET-TP-RN-777500	901515853	High	Jun-18	1	50	150	201	1	50	150	201
Total Other Transmission						37	1,250	1,150	2,437	37	1,250	1,150	2,437
TSP Projects													
05383	Chino 220/66kV - Add a 4th 280MVA, 220/66kV Transformer Bank and Split the Chino 66kV System	CET-ET-LG-TS-538303	901191112	High	Dec-17	2,288	1,600	600	4,488	801	560	210	1,571
06824	La Fresa Sub (Phase 2): Install new MEER and cut over existing protection and upgrade CTs on existing banks. Upgrade SAS from 5.5 to 6X.	CET-ET-LG-TS-682400	900522611	High	Dec-17	22,398	1,600	600	24,598	8,287	592	222	9,101
07113	El Nido: Install 230 kV (63 kA) double breakers on No. 1 A bank at position 3 and No. 3A bank at position 6.	CET-ET-LG-TS-711300	901241164	High	Dec-17	4,217	3,618	-	7,835	4,217	3,618	-	7,835
Total TSP Projects						28,902	6,818	1,200	36,920	13,305	4,770	432	18,507
Transmission Project Reliability													
06468	Victor Sub: Upgrade protection and install 4 SEL-351 relays	CET-ET-TP-RL-646800	800063610	High	Dec-16	680	100	-	780	680	100	-	780
07112	Devers: Equip the 230 KV A-Bank positions (3 & 4) with circuit breakers	CET-ET-TP-RL-711200	900305114	High	Jun-17	3,202	1,450	-	4,652	3,202	1,450	-	4,652
06415	Devers Sub: PHASE 1 - Install relays, meters and logic controllers as necessary for IID's new SPS	CET-ET-TP-RL-641503	900566042	High	Dec-16	-	5	-	5	-	5	-	5
06415	Mirage Sub: PHASE 1 - Install relays, meters and logic controllers as necessary for IID's new SPS	CET-ET-TP-RL-641504	900566043	High	Dec-16	-	5	-	5	-	5	-	5
Total Path 42 and Devers-Mirage 230kV Upgrades						-	10	-	10	-	10	-	10
07680	Santiago Substation: 225 MVAR synchronous condenser system installation	CET-ET-TP-RL-768000	901333497	High	Dec-17	28,048	30,269	3,000	61,317	26,926	29,058	2,880	58,864
07451	Bailey Substation: Engineer and construct a new Mechanical Electrical Equipment Room (MEER)	CET-ET-TP-RL-745100	800477079	High	Feb-17	12,374	1,087	-	13,460	12,374	1,087	-	13,460
07451	Pastoria Substation: Replace relays due to work at Bailey Sub.	CET-ET-TP-RL-745101	901330664	High	Dec-16	239	64	-	303	239	64	-	303
Total Bailey Sub Upgrades to 66kV Switchrack						12,613	1,151	-	13,764	12,613	1,151	-	13,764
07518	Springville Sub: Redesign high side feed from bank on bus to double CB at 220kV position 4 equipped with two (2) new 3000A 220kV CB's and disconnects.	CET-ET-TP-RL-751800	901007168	High	Dec-17	4,373	2,907	1,200	8,480	3,498	2,325	960	6,784
07119	Walnut: Convert the Mesa 220 kV Line Position and 3A & 4A Bank High Side Positions to Double Breaker.	CET-ET-TP-RL-711900	900772538	High	Dec-18	2,708	4,212	5,694	12,613	2,708	4,212	5,694	12,613
07790	Eagle Mountain Substation: Install a 45 MVAR tertiary reactor (effective 34 MVAR @ 12 kV)	CET-ET-TP-RL-779000	901552346	High	Dec-18	126	3,817	703	4,646	126	3,817	703	4,646
07547	Eldorado: Engineer, remove and install equipment for changing the 500kV line pos for the Eldorado-Mohave & Eldorado-Moenkopi lines.	CET-ET-TP-RL-754700	901107340	High	Jun-18	271	4,230	1,929	6,430	271	4,230	1,929	6,430
07547	Eldorado-Mohave 500kV: Remove two (2) existing transmission structures. Install three (3) new.	CET-ET-TP-RL-754701	901107560	High	Jun-18	317	3,000	5,900	9,217	317	3,000	5,900	9,217
07547	Eldorado-Moenkopi 500 kV: Remove one (1) existing transmission structure. Install one (1) new.	CET-ET-TP-RL-754702	901107562	High	Jun-18	204	1,896	998	3,098	204	1,896	998	3,098
Total Eldorado-Mohave and Eldorado-Moenkopi 500kV Line Position Swap						792	9,126	8,827	18,745	792	9,126	8,827	18,745
07727	Inyokern Substation: Expand existing MEER at Inyokern Substation.	CET-ET-TP-RL-772700	901394462	High	Dec-18	5	129	717	851	2	48	265	315
07727	Control Substation: Install 12 (12) N60 relays, one (1) satellite clock, and two (2) ethernet switches	CET-ET-TP-RL-772701	901394533	High	Dec-18	39	154	221	414	34	132	190	356
07727	Kramer Substation Install six (6) N60 relays and one (1) satellite clock. Add points to existing RTU. Program and test RAS.	CET-ET-TP-RL-772704	901394536	High	Dec-18	8	90	176	274	6	70	137	214
Total Digial 395 Project: North-of-Kramer Area Telecom Network and RAS Upgrades						52	373	1,114	1,539	42	250	593	885
07763	Cima-Pisgah Optical Ground Wire (OPGW)	CIT-00-OP-NS-000475	801465575	High	Dec-18	27	1,260	456	1,743	27	1,260	456	1,743
07763	Lugo 500/220 kV (T) Install two (2) N60 relays Install one (1) ethernet switch Install one (1) satellite switch PSC- RTU Point additions at Lugo PSC-Modify Lugo-Victorville SPS program and test	CET-ET-TP-RN-776301	901484303	High	Dec-17	-	1	-	1	-	1	-	1
07763	Eldorado-Lugo 500 kV line: CA side - Install 85 miles of new OPGW between CA/NV border and Pisgah	CET-ET-TP-RN-776304	901665563	High	Dec-18	625	2,895	7,357	10,877	625	2,895	7,357	10,877
07763	Eldorado-Lugo 500 kV line: NV Side -Install 2 miles of new OPGW between CA/NV border and MI52-T2	CET-ET-TP-RN-776305	901665564	High	Dec-17	42	150	62	254	42	150	62	254
07763	Pisgah Sub: Install new telecommunication room.	CET-ET-TP-RL-776300	901671834	High	Dec-18	47	581	53	681	47	581	53	681
Total Lugo-Victorville 500 kV SPS						741	4,887	7,928	13,556	741	4,887	7,928	13,556
07645	Loop Kramer-Lugo 230 kV #1 & #2 lines into Victor substation	CET-ET-TP-RL-764500	901254013	High	Jun-17	8,699	811	-	9,510	8,699	811	-	9,510
07645	Lugo Sub: Perform Protection upgrade	CET-ET-TP-RL-764501	901254014	High	Jun-17	194	3	-	197	194	3	-	197
07645	Kramer Sub: Perform Protection upgrade	CET-ET-TP-RL-764502	901254015	High	Dec-16	226	44	-	269	226	44	-	269
07645	Kramer-Lugo lines: Loop into Victor Sub	CET-ET-TP-RL-764503	901254016	High	Jun-17	77	123	-	200	77	123	-	200
Total Victor Loop-In Project						9,196	981	-	10,177	9,196	981	-	10,177
07806	Kramer Substation: Install One (1) 220kV, 45MVAR Bus Shunt Reactor at Pos. 1x	CET-ET-TP-RL-780601	901580779	High	Dec-17	574	1,639	-	2,212	574	1,639	-	2,212
07120	Chino Sub: equip the No.1A 220kV A-Bank positions with circuit breakers	CET-ET-TP-RL-712000	900713964	High	Jun-18	22,344	11,044	10,973	44,361	14,524	7,179	7,132	28,835
07120	Mira Loma Sub: Upgrade protection as needed	CET-ET-TP-RL-712002	N/A	High	Jun-18	-	24	73	97	-	24	73	97
Total Chino 220/66 kV Bank on Circuit Breaker Project						22,344	11,068	11,046	44,458	14,524	7,203	7,206	28,932
07884	Tap the remainig Lighthipe 220kV line to Harborgen substation	CET-ET-TP-RL-788402	901822249	High	Dec-17	153	100	400	653	153	100	400	653
Total Transmission Project Reliability						85,602	72,089	39,911	197,602	75,775	66,309	35,189	177,273

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PIN		Project Title	C-WBS	Order #	High/ Low Voltage	OD	Project Total (ISO & non-ISO)				ISO Portion			
							Prior	2017	2018	Total	Prior	2017	2018	Total
Infrastructure Replacement														
04211	Replace Bulk Power Circuit Breakers	CET-ET-IR-CB-421100			High	Blanket Specifics	-	2,559	6,021	8,580	-	2,559	6,021	8,580
04329	Non-Bulk Circuit Breaker Replacement Program (115kV and Below)	CET-ET-IR-CB-432911			Low	Blanket Specifics	-	508	-	508	-	508	-	508
03138	LADWP DC electrode replacement	CET-OT-OT-ME-31380	Various		High	Nov-17	12,450	24,163	5,000	41,612	12,450	24,163	5,000	41,612
03138	LADWP/Sylmar Miscellaneous Equipment	CET-OT-OT-ME-313800			High	Blanket Specifics	-	3,317	-	3,317	-	3,317	-	3,317
06197	On-line Dissolved Gas Analysis of Bulk Power Transformer Banks	CET-ET-IR-ME-619700			High	Blanket Specifics	-	1,026	2,129	3,156	-	1,026	2,129	3,156
04343	Non-Bulk Relay Replacement Program ("SRRP")	CET-ET-IR-RP-434301			Low	Blanket Specifics	-	2,043	1,210	3,252	-	2,043	1,210	3,252
05089	Bulk Power 500kV & 220kV Line Relay Replacement	CET-ET-IR-RP-508900			High	Blanket Specifics	-	9,122	17,248	26,370	-	9,122	17,248	26,370
04756	Substation Miscellaneous Equipment Additions & Betterment	CET-ET-IR-ME-475600			High	Blanket Specifics	-	8,657	11,253	19,910	-	8,657	11,253	19,910
05210	Substation Transformer Bank Replacement Program (AA-Bank & A-Bank)	CET-ET-IR-TB-521001			High	Blanket Specifics	-	17,486	16,325	33,811	-	17,486	16,325	33,811
07924	Antelope: Substation Maintenance and Test Building Improvements program	COS-00-RE-AD-SR0001	N/A		High	Dec-17	-	5,803	304	6,107	-	5,803	304	6,107
07956	Pardee: Substation Maintenance and Test Building Improvements program	COS-00-RE-AD-SR0002	N/A		High	Dec-17	-	5,596	304	5,900	-	4,986	271	5,257
07957	Devers: Substation Maintenance and Test Building Improvements program	COS-00-RE-AD-SR0003	N/A		High	Dec-17	-	6,114	304	6,418	-	5,139	256	5,395
07958	Santa Clara: Substation Maintenance and Test Building Improvements program	COS-00-RE-AD-SR0005	N/A		High	Dec-17	-	5,751	355	6,106	-	1,504	93	1,597
07959	Rector: Substation Maintenance and Test Building Improvements program	COS-00-RE-AD-SR0006	N/A		High	Dec-17	-	6,787	912	7,700	-	3,925	528	4,453
Total Substation Maintenance and Test Building Improvements Program							-	30,051	2,179	32,230	-	21,357	1,451	22,808
07637	Substation Capital Maintenance	COS-00-RE-MA-NE7637			High	Blanket Specifics	-	13,300	15,635	28,935	-	1,333	1,567	2,899
07392	Seismic assessment and preliminary engineering	COS-00-SP-BR-000000			High	Blanket Specifics	-	446	-	446	-	446	-	446
07392	Seismic Mitigations for Transmission Substation Assets	COS-00-SP-TD-000000			High	Blanket Specifics	-	-	13,117	13,117	-	-	13,117	13,117
07392 Seismic Assessment and Mitigation Program for Transmission Substation Assets							-	446	13,117	13,563	-	446	13,117	13,563
07681	Devers: NERC CIP-14 Physical Security Enhancements	CET-ET-IR-ME-768101	Various		High	Apr-17	17,277	1,976	-	19,254	15,241	1,743	-	16,984
07820	NERC CIP-14 Physical Security Enhancements	COS-00-CS-CS-782000	Various		High	Dec-17	0	16,494	-	16,494	0	14,680	-	14,680
07820	Mira Loma: NERC CIP-14 Physical Security Enhancements	CET-ET-IR-ME-782001	901656354		High	Dec-18	268	2,248	16,988	19,504	228	1,911	14,445	16,584
07820	Pardee: NERC CIP-14 Physical Security Enhancements	CET-ET-IR-ME-782002	901656355		High	Dec-18	208	1,328	10,787	12,323	185	1,184	9,611	10,980
07820	Vincent: NERC CIP-14 Physical Security Enhancements	CET-ET-IR-ME-782005	901656358		High	Dec-18	234	2,658	12,899	15,791	234	2,658	12,899	15,791
07820	Eldorado: NERC CIP-14 Physical Security Enhancements	CET-ET-IR-ME-782008	901657121		High	Dec-18	57	3,746	4,317	8,121	57	3,746	4,317	8,121
Total Substation Physical Security Enhancements Project							18,044	28,450	44,992	91,486	15,945	25,922	41,273	83,140
Total Infrastructure Replacement							30,494	141,127	135,109	306,730	28,395	117,937	116,593	262,925
Grid Applications														
06428	Generation Interconnection Remedial Action Scheme (RAS)	CET-OT-OT-BP-642800			High	Blanket Specifics	-	-	12,658	12,658	-	-	12,658	12,658
07666	Colorado River: install Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Colorado River-Red Bluff No. 1 500 kV transmission line; Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Colorado River-Red Bluff No. 2 500 kV transmission line; One (1) SEL-2407 Satellite Synchronized Clock; and Two (2) GE D400S Gateways (one for CRAS-A and one for CRAS-B)	CET-ET-GA-CR-766600	901292691		High	Dec-17	30	3,692	-	3,722	30	3,692	-	3,722
07666	Devers: install Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Devers-Red Bluff No. 1 500 kV line; Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Devers-Red Bluff No. 2 500 kV line; One (1) SEL-2407 Satellite Synchronized Clock; and Two (2) GE D400S Gateways (one for CRAS-A and one for CRAS-B).	CET-ET-GA-CR-766601	901292692		High	Dec-17	22	645	-	668	22	645	-	668
07666	Red Bluff: install Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Colorado River – Red Bluff No. 1 500 kV line; and Two (2) GE N60 relays (one for CRAS-A and one for CRAS-B) to monitor the status of the Colorado River – Red Bluff No. 2 500 kV line.	CET-ET-GA-CR-766602	901292693		High	Dec-17	17	2,066	-	2,084	17	2,066	-	2,084
07666	Total CRAS Program - Phase 1: Colorado River Corridor RAS						70	6,404	-	6,474	70	6,404	-	6,474
06446	Phasor Measurement System Installations	CET-ET-GA-EM-644600			High	Blanket Specifics	-	10,194	5,828	16,021	-	1,535	878	2,413
Total Grid Apps							70	16,597	18,486	35,153	70	7,939	13,536	21,545
PWRD Blankets														
03363	Substation Planned Maintenance Replacements	CET-PD-IR-SP-SUBSNW			High	Blanket Specifics	-	18,223	18,673	36,896	-	2,198	2,252	4,450
03363	Substation Unplanned Maintenance Replacements	CET-PD-BM-SU-SUBSNW			High	Blanket Specifics	-	8,283	8,487	16,769	-	784	803	1,586
03363	Substation - Storm	CET-PD-ST-SS-SUBSNW			High	Blanket Specifics	-	1,109	1,137	2,246	-	88	90	179
03363 Substation Equipment Additions & Replacements							-	27,615	28,296	55,912	-	3,070	3,146	6,215
03364	Transmission Maintenance Planned - Eastern	CET-PD-IR-TP-TREAST			High	Blanket Specifics	-	16,693	-	16,693	-	2,279	-	2,279
03364	Transmission Maintenance Planned - Metro West	CET-PD-IR-TP-TRMETE			High	Blanket Specifics	-	3,000	-	3,000	-	2,190	-	2,190
03364	Transmission Maintenance Planned - Orange	CET-PD-IR-TP-TRORAN			High	Blanket Specifics	-	3,251	-	3,251	-	65	-	65
03364	Transmission Maintenance Planned - Highland	CET-PD-IR-TP-HIGH			High	Blanket Specifics	-	-	33,585	33,585	-	-	8,304	8,304
03364	Transmission Breakdown Maintenance Unplanned	CET-PD-BM-TU-TREAST			High	Blanket Specifics	-	2,257	2,313	4,571	-	563	577	1,141
03364	Transmission Deteriorated Pole Repl & Restoration - Eastern	CET-PD-IR-TR-TREAST			High	Blanket Specifics	-	80,938	-	80,938	-	6,469	-	6,469

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PIN	Project Title	C-WBS	Order #	High/ Low	OD	Project Total (ISO & non-ISO)				ISO Portion			
				Voltage		Prior	2017	2018	Total	Prior	2017	2018	Total
03364	Transmission Deteriorated Pole Repl & Restoration - Metro West	CET-PD-IR-TR-TRMETW		High	Blanket Specifics	-	-	64,362	64,362	-	-	726	726
03364	Pole Loading Transmission Pole Replacements - Eastern	CET-PD-IR-PT-TREAST		High	Blanket Specifics	-	14,655	-	14,655	-	1,171	-	1,171
03364	Pole Loading Transmission Pole Replacements - Metro West	CET-PD-IR-PT-TRMETW		High	Blanket Specifics	-	-	24,628	24,628	-	-	278	278
<b>03364</b>	<b>Transmission Equipment Additions &amp; Replacements</b>					-	<b>120,794</b>	<b>124,889</b>	<b>245,682</b>	-	<b>12,737</b>	<b>9,885</b>	<b>22,622</b>
07298	Transmission Line Rating Remediation - Metro West, Highland & Eastern Grids	CET-PD-OT-PJ-729800		High	Blanket Specifics	-	54,455	-	54,455	-	47,430	-	47,430
07298	Transmission Line Rating Remediation	CET-PD-OT-PJ-TRSJAC		High	Blanket Specifics	-	55,545	146,418	201,963	-	48,380	127,530	175,910
<b>07298</b>	<b>Transmission Line Rating Remediation (TLRR)</b>					-	<b>110,000</b>	<b>146,418</b>	<b>256,418</b>	-	<b>95,810</b>	<b>127,530</b>	<b>223,340</b>
<b>03362</b>	<b>Critical Infrastructure Spare - FERC Spare Transformer Equipment Program (STEP)/Emergency</b>	CET-PD-CI-CI-CRINSP		High	Blanket Specifics	-	10,793	-	10,793	-	10,793	-	10,793
03367	Substation Claim	CET-PD-CL-SC-SUBSNW		High	Blanket Specifics	-	909	931	1,840	-	66	67	133
03367	Transmission Claim	CET-PD-CL-TC-TREAST		High	Blanket Specifics	-	2,815	2,884	5,699	-	177	181	358
03367	Transmission Storm	CET-PD-ST-TS-TREAST		High	Blanket Specifics	-	4,796	4,915	9,711	-	906	928	1,834
<b>03367</b>	<b>Transmission Storm &amp; Claims</b>					-	<b>8,520</b>	<b>8,730</b>	<b>17,250</b>	-	<b>1,148</b>	<b>1,177</b>	<b>2,325</b>
	<b>Total PWRD Blankets</b>					-	<b>277,722</b>	<b>308,333</b>	<b>586,055</b>	-	<b>123,558</b>	<b>141,737</b>	<b>265,295</b>
<b>Total Non-Incentive Transmission Projects</b>						<b>145,105</b>	<b>515,603</b>	<b>504,190</b>	<b>1,164,898</b>	<b>117,581</b>	<b>321,763</b>	<b>308,638</b>	<b>747,981</b>
<b>Total Forecast Expenditures (Closing by December 2018)</b>						<b>145,105</b>	<b>169,224</b>	<b>94,432</b>	<b>408,762</b>	<b>117,581</b>	<b>150,174</b>	<b>84,495</b>	<b>352,249</b>
<b>Total Forecast Blanket Expenditures (Closing by December 2018)</b>						-	<b>346,379</b>	<b>409,758</b>	<b>756,136</b>	-	<b>171,589</b>	<b>224,143</b>	<b>395,732</b>