

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			
				Voltage		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 Line	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 remaing 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

Infrastructure Replacement

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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
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-313802	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-SR0003	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-SR0004	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
	<b>Total Substation Maintenance and Test Building Improvements Program</b>					-	<b>30,051</b>	<b>2,179</b>	<b>32,230</b>	-	<b>21,357</b>	<b>1,451</b>	<b>22,808</b>
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	<b>Seismic Assessment and Mitigation Program for Transmission Substation Assets</b>					-	<b>446</b>	<b>13,117</b>	<b>13,563</b>	-	<b>446</b>	<b>13,117</b>	<b>13,563</b>
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	8,121	12,121	57	3,746	4,317	8,121
	<b>Total Substation Physical Security Enhancements Project</b>					<b>18,044</b>	<b>28,450</b>	<b>44,992</b>	<b>91,486</b>	<b>15,945</b>	<b>25,922</b>	<b>41,273</b>	<b>83,140</b>
	<b>Total Infrastructure Replacement</b>					<b>30,494</b>	<b>141,127</b>	<b>135,109</b>	<b>306,730</b>	<b>28,395</b>	<b>117,937</b>	<b>116,593</b>	<b>262,925</b>
<b>Grid Applications</b>													
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 6th 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	<b>Total CRAS Program - Phase 1: Colorado River Corridor RAS</b>					<b>70</b>	<b>6,404</b>	<b>-</b>	<b>6,474</b>	<b>70</b>	<b>6,404</b>	<b>-</b>	<b>6,474</b>
06446	Phasor Measurement System Installations	CET-ET-GA-EM-644600		High	Blanket Specifics	-	10,194	5,828	16,021	-	1,535	878	2,413
	<b>Total Grid Apps</b>					<b>70</b>	<b>16,597</b>	<b>18,486</b>	<b>35,153</b>	<b>70</b>	<b>7,939</b>	<b>13,536</b>	<b>21,545</b>
<b>PWRD Blankets</b>													
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	<b>Substation Equipment Additions &amp; Replacements</b>					-	<b>27,615</b>	<b>28,296</b>	<b>55,912</b>	-	<b>3,070</b>	<b>3,146</b>	<b>6,215</b>
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	4,571	6,828	-	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
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
03364	<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

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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>