Southern California Edison Unit Cost Guide dated March 31, 2024

In accordance with Attachment A to Decision D16-06-052, the Unit Cost Guide represents facilities generally required for interconnection. Unit Cost Guide is not binding for actual facility costs and is provided only for additional cost transparency and developer reference. For reference, Ft = Per Foot

Category 1 - 12/16kV 480 volt transformer - includes 100' Sec. cable length

Item #	Equipment	Unit Cost	Notes
2	300 kVA & Sec. Cable	$61,000	
3	500 kVA & Sec. Cable	$77,000	
4	750 kVA & Sec. Cable	$91,000	
5	1000 kVA & Sec. Cable	$114,000	
6	1500 kVA, Sec. Cable & fuse cabinet	$156,000	
7	2500 kVA, Sec. Cable & fuse cabinet (Fusing); Used with an External Fuse Cabinet	$297,000	

Category 2 - Overhead to Underground (UG)- Set Pole and make up Cable

#	Equipment	Unit Cost	Notes
1	Pri 1/0 Cable from New Pole 200'	$52,000	
2	Pri 350 Cable from New Pole 200'	$58,000	
3	Pri 1000 Cable from New Pole 200'	$68,000	

Category 3 - Overhead (OH) Service

#	Equipment	Unit Cost	Notes
1	OH Primary Service	$27,000	
2	New Conductor Extension from POI to PCC	$196/ft	

Category 4 - Underground to Underground - Cable with Terminators

#	Equipment	Unit Cost	Notes
1	Pri Low Ampacity Cable undg feed 400'	$28,000	1/O XLP
2	Pri High Ampacity Cable undg feed 400'	$58,000	350XLP
3	Pri High Ampacity Cable undg feed 400'	$62,000	1000XLP
4			
5			
6			
7	New underground cable and connections (ft)	$42/ft	1/O XLP
8	New underground cable and connections (ft)	$85/ft	350XLP - 1000XLP

Category 5 - Metering

#	Equipment	Unit Cost	Notes
1	Secondary Metering	$7,000	
2	12/16 kV - 50/400 Amp Demand	$18,000	
3	33kV Pole Top Mtrg - Transformer rack configuration	$123,000	
4	Single Phase, self-contained meter (600 V)	$1,000	
5	Transformer-rated meter (600 V)	$7,000	3000/5 CT
6	Primary Transformer-rated meter (5 kV)	$13,000	4 kV Meter
7	Primary Transformer-rated meter (15 kV)	$14,000	Indoor type
8	Primary Transformer-rated meter (25 kV) - Existing single pole	$52,000	33 kV pole mounted

Category 6 - Telemetry

#	Equipment	Unit Cost	Notes
1	12/16 kV Remote Sectionalizing Recloser	$105,000	
2	33 kV Remote Sectionalizing Recloser	$226,000	Used for Interconnection switch and not used for telemetry
3	Automating Existing PME	$67,000	Used for Interconnection switch and not used for telemetry
4	12/16 kV-Gas switch with Automation	$122,000	Used for Interconnection switch and not used for telemetry
5	Distributed Remote Terminal Unit	$6,300	0.99 MVA-9.99 MVA

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6	Dedicated Remote Terminal Unit	$153,800	Greater than 9.9 MVA
7	Bi-directional watt transducer	$60,000	
8	Constraint Managment System: Programming	$28,900	
9	Constraint Managment System: Engineering Monitoring/Commissioning	$21,700	
10	Data Point addition to existing RTU	$46,600	
11	Replacement of Substation protection relays	$150,000	
12	Reprograming of existing Substation protection relays	$83,000	

Category 7 - System Equipment

#	Equipment	Unit Cost	Notes
1	12 & 16 kV Omni Pole Switch (switch itself and handle)	$22,000	
2	Padmounted Gas Switch	$83,000	
3	12/16 kV 1200 kVAR Capacitor Bank & Pole	$56,000	
4	12/16 kV 1200 kVAR Capacitor Bank on Pad	$95,000	
5	12/16 kV regulator 3-228s	$309,000	
6	33 kV Regulator 3-690/722	$472,000	
7			
8	Pole Mounted 12 kV Ground Detector	$52,000	Average of Padmount and Overhead
9	Ground Bank	$102,000	Average of small and large
10	Reconductor (Per ft) - OH - Urban	$293/ft	
11	Reconductor (Per ft) - OH - Rural	$211/ft	
12	Reconductor (Per ft) - UG	$129/ft	
13			
14			
15	Overhead Fuse Replacement	$6,000	
16			
17	Relocate Capacitor Bank	$33,000	
18			
19	Relocate Voltage Regulator	$73,000	
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

Note: For overall IOU line consistency, facilities not commonly used for SCE interconnection have been placed in gray.

Southern California Edison Unit Cost Table - Acronym Table

Acronym	Description	IOU (if used)
ITCC	Income Tax Component of Contribution	All
CICA	Contributions is Aid of Construction	All
IF	Interconnection Facilities	All
PCC	Point of Common Coupling	All
POI	Point of Interconnection	All
ESR	Electrical Service Requirements	SCE
UG	Under Ground	All
OH, OVH	Over Head	All
DER	Distributed Energy Resource	All
DG	Distributed Generation	All
IC	Interconnection Customer	All
SLD	Single Line Diagram	All
ROW	Right of Way	All
BLM	Bureau of Land Management	All
AFUDC	Allowance of Funds Used During Construction	SDGE
CNF	Cleveland National Forest	SDGE
SCADA	Supervisory Control and Data Acquisition	All
RTU	Remote Terminal Unit	All
GS	Gas Switch	All
PME	Pad Mount Equipment	All
COO	Cost of Ownership	PGE

Southern California Edison Cost Table Assumptions - Unit Cost Table

General labor overtime: based on 6-10 work schedule.
General contingency factor: 35% - SCE Standard Contingency Policy used for preliminary project estimating based on AACE guidelines.
Unit costs include costs to procure materials, installation, engineering, project management costs, home office costs, and contingency.
Unit costs exclude allocated corporate overhead, including P&B, A&G, payroll tax, and AFUDC (these will be added to total cost estimates, if required).
Unit cost guide assumes facilities are constructed under an Engineering, Procurement and Construction (EPC) agreement. All facilities are owned by SCE.
Unit costs exclude generator's responsibility for Income Tax Component of Contribution (ITCC), (these will be added to total cost estimates, if required) along with O&M Replacement (both discussed under example assumptions)
Unit costs exclude environmental monitoring, licensing and mitigations.
Unit cost are given w/out the benefit of any preliminary & final engineering. Unforeseen conflicts and/or scope will increase costs. These unit costs do not include: right-of-way & easements requirements, environmental engineering/mitigation, GO 131-D engineering /permitting, other permitting, associated SCE/3rd Party
Unit costs do not include the construction of UG ducts and structures (civil construction).

Southern California Edison Unit Cost Guide Per Ruling Dated September 21, 2016 - Variability Illustrative Discussion

The impacts identified below are only examples of items based upon historic experience. While effort has been made to include numerous examples, this list is not meant to be viewed as all inclusive and is for illustrative purposes only. Impacts are not always know in advance and final estimates are driven by project specific conditions as reviewed during the system review process.

Examples of Potential Factors Effecting Rule 21 Estimated or Actual Costs

1	**3rd Party or Multi-Party Easements** Example: Roof top solar project on leased building. Significant added coordination to obtain easements. Leasing tenant and/or developer failed to engage building owner of need for interconnection facilities in advance of proceeding with project. This issue is compounded when the site plans and drawings provided do not include surveyed property lines. Even with approval, 3rd party easements require additional document preparation, review and processing.
2	**City Restrictions** Example: Traffic control in a school area limited work to 9:00 AM to 2:00, doubled project duration (days) of project, impacted efficiency and doubled traffic control and number of resource mobilizations (Road moratorium, customer research)
3	**Local Jurisdiction Improvements** Example: Long term city plan for road widening. Required existing pole to be set back to get jurisdictional permits. Critical that customer communicate plans with city well in advance to determine required upgrades or improvements.
4	**Outage Coordination** Utilities make best efforts to balance impacts to all customer when taking outages. Multiple customer needs must be considered. While there is obligation to get service connected impact to existing customer(s) must be considered.
5	**Pole Height Restrictions** Deteriorated pole condition requires a replacement. Under build requires pole change and taller pole is restricted by view or other issues. Local airport restrictions on pole height.
6	**Underground Impairments & Structure Limits** Errors in customer base map for underground. Mapping can not forecast underground structure volume available for new facilities. Overcrowded structures can be an issue.
7	**Undisturbed Grounds** Customer environmental survey work does not take into account potential utility work.
8	**Customer Base Map Quality** Low quality customer base maps requiring field visits, surveying and multiple back and forth communication to get correct details. Often causes months of delay to project construction.
9	**Neighboring Customer Impacts** Customer on circuit with seasonal operation would be excessively impacted by outage. Circuit with high level of critical care customers. Generator required to support outage. Construction anticipated in winter months or during storm season.
10	**Topology** What appeared to be "drainage channel" was classified as waterway and required long span crossing
11	**Customer Civil Work** A high number or projects see delays in start and completion of customer civil work that extends project duration and can result in added crew trips to site for re-starts. Heavily impacts crew scheduling.
12	**Requested Project Timing** Construction anticipated in winter months or during storm season.

Project Examples - Southern California Edison Unit Cost Table; examples provided below are for illustrative purposes only and are not binding for actual facility costs

Scenarios < 1MW:

Scenario 1	**Unit**	**Quantity**	**Cost ($)**	**Category**	***Supporting Comments***
Interconnection Facilities					
500kva & Sec. Cable	EA	1	$77,000	(1)	
Secondary metering (480V)	EA	1	$7,000	(5)	This is a 0.380 MW, 480V solar generator interconnecting to an OH service located on a low DG penetration 12 kV circuit. Based on the size of the project, standard Interconnection Facilities are required: new riser pole, primary cable, new padmount transformer secondary metering cable. The main feeder did not require any Distribution Upgrades.
Pri 1/0 Cable from New Pole 200' (Riser)	EA	1	$52,000	(2)	
		Total	$136,000		
Tax Component (if applied/see assumption 1)			$47,600		
Monthly Interconnection Facilities Charge			$517		
(see assumption 2/Replacement with Additional Cost)					

Scenario 2					
Interconnection Facilities					
750kva & Sec. Cable	EA	1	$91,000	(1)	
Pole Mounted 12kV Grd detector	EA	1	$52,000	(7)	This is a 0.675 MW, 480V induction generator interconnecting to an existing underground service located on a low DG penetration 12 kV circuit. Based on the size of the project, standard Interconnection Facilities are required: primary cable, new padmount transformer, padmount ground detector and secondary metering and cable. The main feeder did not require any Distribution Upgrades.
Pri Low Ampacity Cable undg feed 400' (1/0 XLP)	EA	1	$28,000	(4)	
Secondary metering (480V)	EA	1	$7,000	(5)	
		Total	$178,000		
Tax Component (if applied/see assumption 1)			$62,300		
Monthly Interconnection Facilities Charge			$712		
(see assumption 2/20 Year Replacement and No Additional Cost)					

Scenarios ≥ 1MW:

Scenario 3					
Interconnection Facilities					
12/16kV Gas switch with Automation	EA	1	$122,000	(6)	
1500kva, Sec. Cable & fuse cabinet	EA	1	$156,000	(1)	This is a 1.5 MW, 480V solar generator interconnecting downstream of an existing Automatic Recloser on a 12 kV circuit. Based on the size of the project, standard Interconnection Facilities are required: riser pole, primary cable, padmount gas switch, padmount PME switch, padmount transformer, secondary metering and cable. Since this project is ≥ 1 MW but <10MW telemetry is required. In addition, the solar project triggers a high voltage condition on the circuit. As a result, a Voltage Regulator is install to mitigate the high voltage condition.
Secondary metering (480V)	EA	1	$7,000	(5)	
Pri 1/0 Cable from New Pole 200' (Riser)	EA	1	$52,000	(2)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$343,300		
Distribution Upgrades					
12/16kV regulator 3-228s	EA	1	$309,000	(7)	
		Total	$309,000		

Scenario 4	Unit	Quantity	Cost ($)		
Interconnection Facilities					
12/16kV Gas switch with Automation	EA	1	$122,000	(6)	
Pri High Ampacity Cable undg feed 400' (1000 XLP)	EA	1	$62,000	(2)	This is a 2.0 MW, 12 kV solar project interconnecting to an existing underground service located on a high penetration DG, 12 kV circuit. Based on the size of the project, standard Interconnection Facilities are required. Primary cable, padmount gas switch, Remote Control Switch for automation, and primary metering. The addition of the generator triggered a thermal overload on the feeder. Thus, a line reconductoring is necessary to alleviate the thermal overload.
12 kV meter	EA	1	$18,000	(5)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$208,300		
Distribution Upgrades					
Reconductor of OH to 336 ACSR	FT	1500	$207,000	(7)	
		Total	$207,000		

Scenario 5					
Interconnection Facilities					
12/16kV Gas switch with Automation	EA	1	$122,000	(6)	
New underground cable and connections (1/0 XLP)	FT	250	$6,750	(4)	This is a 3.0 MW, 16 kV solar generator interconnecting at the end of the line on an existing overhead service. Base on the size of the project new Interconnection Facilities are triggered: riser pole, primary cable, padmount gas switch, Remote Control Switch for automation, primary metering and associated wiring and telemetry. It also triggers reverse power flow back (MW/MVAR) at the SCE substation. As a result, a transducer and data point addition to an existing RTU is required to monitor watts and reactive power.
16 kV meter	EA	1	$18,000	(5)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$153,050		
Distribution Upgrades					
Bi-directional Watt transducer	EA	1	$60,000	(6)	
Data Point addition to existing RTU	EA	1	$46,600	(6)	
		Total	$106,600		

Scenario 6					
Interconnection Facilities					
12/16kV Gas switch with Automation	EA	1	$122,000	(6)	This is a >1 MW, 16 kV synchronous generator interconnecting to an existing overhead service. Based on the size of the project, standard Interconnection Facilities are required: riser pole, padmount gas switch, Remote Control Switch for automation, ground detector and primary metering. The ground bank would be dependent on the grounding configuration of the Generating Facility. If the step transformer is connected Delta/Y-grounded (Delta on the gen side), then the ground bank would not be required.
Ground Bank	EA	1	$102,000	(7)	
Pri 1000 Cable from New Pole 200' (Riser)	EA	1	$68,000	(2)	
16 kV meter	EA	1	$18,000	(5)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$316,300		

Scenario 7					
Interconnection Facilities					
33kV Automatic Recloser	EA	1	$226,000	(6)	This is >10 MW, 33 kV solar generator interconnecting to an existing overhead service. Based on the size of the project, new Interconnection Facilities are required: pole line extension, Automatic Recloser and 33 kV poletop metering and a Dedicated Remote Terminal Unit. The main feeder experience a high voltage condition and a line recoductor is required to mitigate the voltage.
Reconductor OH (336 ACSR)	FT	9000	$1,242,000	(7)	
33kV Pole Top Mtrg Transformer rack configuration	EA	1	$123,000	(5)	
Dedicated RTU	EA	1	$153,800	(6)	
		Total	$1,744,800		
Distribution Upgrades					
Reconductor - UG (4/0 to 750 XLP)	FT	1000	$84,000	(7)	
		Total	$84,000		

Scenario 8					
Interconnection Facilities					
12/16kV Gas switch with Automation	EA	1	$122,000	(6)	This is a 1 MW, 480V solar and 0.5 MW Battery Energy Storage System generators interconnecting to an existing UG service located on a low DG penetration 12 kV circuit. Based on the size of the project, standard Interconnection Facilities are required: primary cable, pad , 480 V NGOM and Distributed RTU. The main feeder did not require any Distribution Upgrades.
New underground cable and connections (1/0 XLP)	FT	250	$6,750	(4)	
Secondary metering (480V)	EA	1	$7,000	(5)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$142,050		

Scenario 9					
Interconnection Facilities					
Automating Existing PME	EA	1	$67,000	(6)	This is a 1.6 MW, 480V solar interconnecting to an existing UG service located on 16 kV circuit. Since the project is located on the rooftop of an existing service the only Interconnection Facilities required were installing an RCS-G on an existing structure and PT for automation, bi-directional metering, and telemetry. The main feeder did not require any Distribution Upgrades.
Secondary metering (480V)	EA	1	$7,000	(5)	
Distributed RTU	EA	1	$6,300	(6)	
		Total	$80,300		

EXAMPLE DEVELOPMENT ASSUMPTIONS:

1. ITCC (Income Tax Component of the Contribution): For purposes of the example assumptions, the ITCC rate is assumed to be at 35% (based upon standard depreciation)
2. The Interconnection Facilities Charge (O&M) is determined in accordance with GRC Authorization Provided in Rule 2.H (2015 Southern California Edison General Rate Case, 15-11-021 authorized rate from January 1, 2016). Please note that the rate is subject to change based on future filings. For the Interconnection Facilities Charge Replacement Options, Interconnection Applicant would pay the following as provided in Examples 1 and 2: Customer Financed with Replacement at Additional Cost = 0.38%, With Replacement for 20 yrs at No Additional Cost = 0.40%
3. Removal Costs are case dependent and determined based upon actual costs and are not prepared utilizing a proxy percentage.
4. ITCC and Interconnection Facilities Charge are reflected in examples 1 and 2; same methodology can be utilized in other shown examples.

ESCALATION OVERVIEW :

SCE's cost estimating is done in 2024 constant dollars and then escalated over the years during which the project will be constructed, arriving at project costs in 2024 Constant Dollars Escalated to OD Year.

Current escalation rates used to arrive at escalated dollars are derived as follows:

Pacific, Cost Index, Distribution Plant - Distribution Plant - Electric Utility Construction - Total - Pacific, Units: (1973=100)

► Q4 2023 IHS Global Insight Forecast of Distribution Capital escalation for the Pacific region (JUEPD@PCF)

2024 - 20 Q4 2023 IHS Global Insight Forecast of Distribution Capital escalation for the Pacific region (JUEPD@PCF)

2030 3-year average escalation rate (2027-2030)

DEFINITIONS :

Project Cost in 2024 Constant Dollars represents the cost of the Project if all costs were paid for in 2024.

Project Cost Escalated to OD Year represents the cost of the Project if all costs were paid for in the OD Year.

Mathematical formula: Constant Dollars Escalated to OD Year = Cost in Constant Dollars x Escalation Factor to OD year

CURRENT SCE ESCALATION RATES - DISTRIBUTION CAPITAL:

Proposed Escalation Rate - Effective 1/1/2024										
	2024	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Escalation Rate		**3.77%**	**2.49%**	**2.52%**	**2.58%**	**2.53%**	**2.43%**	**2.49%**	**2.64%**	**2.48%**
Escalation Factors	**1.000**	**1.038**	**1.064**	**1.090**	**1.118**	**1.147**	**1.175**	**1.204**	**1.236**	**1.266**