Southern California Edison Unit Cost Guide dated March 31, 2022
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
1			
2	300kva & Sec. Cable	$39,140	
3	500kva & Sec. Cable	$50,470	
4	750kva & Sec. Cable	$58,710	
5	1000kva & Sec. Cable	$74,160	
6	1500kva, Sec. Cable & fuse cabinet	$101,970	
7	2500kva, Sec. Cable & fuse cabinet (Fuseing); Used with an External Fuse Cabinet	$193,640	

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'	$33,990	
2	Pri 350 Cable from New Pole 200'	$38,110	
3	Pri 1000 Cable from New Pole 200'	$44,290	

Category 3 - Overhead (OH) Service

#	Equipment	Unit Cost	Notes
1	OH Primary Service	$17,510	
2	New Conductor Extension from POI to PCC	$128/ft	

Category 4 - Underground to Underground - Cable with Terminators

#	Equipment	Unit Cost	Notes
1	Pri Low Ampacity Cable undg feed 400'	$18,540	1/O XLP
2	Pri High Ampacity Cable undg feed 400'	$38,110	350XLP
3	Pri High Ampacity Cable undg feed 400'	$40,170	1000XLP
4			
5			
6			
7	New underground cable and connections (ft)	$27/ft	1/O XLP
8	New underground cable and connections (ft)	$55/ft	350XLP - 1000XLP

Category 5 - Metering

#	Equipment	Unit Cost	Notes
1	Secondary Metering	$6,180	
2	12KV/16KV - 50/400 Amp Demand	$17,510	
3	33kV Pole Top Mtrg - Transformer rack configuration	$119,480	
4	Single Phase, self-contained meter (600 V)	$1,133	
5	Transformer-rated meter (600 V)	$6,386	3000/5 CT

	Southern California Edison Unit Cost Guide dated March 31, 2022 **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**		
6	Primary Transformer-rated meter (5 kV)	$12,772	4 kV Meter
7	Primary Transformer-rated meter (15 kV)	$13,802	Indoor type
8	Primary Transformer-rated meter (25 kV) - Existing single pole	$50,470	33 kV pole mounted
	Category 6 - Telemetry		
#	**Equipment**	**Unit Cost**	**Notes**
1	33kV Automatic Recloser	$147,290	Used for Interconnection switch and not used for telemetry
2	12/16kV-Gas switch with Automation	$62,830	Used for Interconnection switch and not used for telemetry
3	Distributed Remote Terminal Unit	$6,100	0.99 MVA-9.99 MVA
4	Dedicated Remote Terminal Unit	$144,000	Greater than 9.9 MVA
5	Bi-directional watt transducer	$53,500	
6	Data Point addition to existing RTU	$26,500	
7			
	Category 7 - System Equipment		
#	**Equipment**	**Unit Cost**	**Notes**
1	12 & 16kv Omni Pole Switch (switch itself and handle)	$14,832	
2	Padmounted Gas Switch (without SCADA)	$54,075	
3	12/16kV 1200 KVAR Capacitor Bank & Pole	$36,050	
4	12/16KV 1200 KVAR Capacitor Bank on Pad	$61,800	
5	12/16kV regulator 3-228s	$201,880	
6	33kV Regulator 3-690/722	$307,970	
7			
8	Pole Mounted 12kV Grd detector	$33,990	Average of Padmount and Overhead
9	Ground Bank	$66,950	Average of small and large
10	Reconductor (Per ft) - OH - Urban	$191/ft	
11	Reconductor (Per ft) - OH - Rural	$138/ft	
12	Reconductor (Per ft) - UG	$84/ft	

	Southern California Edison Unit Cost Guide dated March 31, 2022 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		
13			
14			
15	Overhead Fuse Replacement	$3,708	
16			
17	Relocate Capacitor Bank	$21,630	
18			
19	Relocate Voltage Regulator	$47,380	
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 under-build work, etc. A signed Interconnection Agreement is required before final design/engineering can start. Construction will not commence until all of the above conditions have been addressed.
Unit costs do not include the construction of UG ducts and structures (civil construction).

4
5
6
7
8

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
Interconnection Facilities				
500kva & Sec. Cable	EA	1	$50,470	(1)
Secondary metering (480V)	EA	1	$6,180	(5)
Pri 1/0 Cable from New Pole 200' (Riser)	EA	1	$33,990	(2)
		Total	$90,640	
Tax Component (if applied/see assumption 1)			$31,724	
Monthly Interconnection Facilities Charge			$344	
(see assumption 2/Replacement with Additional Cost)				

Supporting Comments

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.

Scenario 2

Interconnection Facilities				
750kva & Sec. Cable	EA	1	$58,710	(1)
Pole Mounted 12kV Grd detector	EA	1	$33,990	(7)
Pri Low Ampacity Cable undg feed 400' (1/0 XLP)	EA	1	$18,540	(4)
Secondary metering (480V)	EA	1	$6,180	(5)
		Total	$117,420	
Tax Component (if applied/see assumption 1)			$41,097	
Monthly Interconnection Facilities Charge			$470	
(see assumption 2/20 Year Replacement and No Additional Cost)				

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.

Scenarios ≥ 1MW:

Scenario 3

Interconnection Facilities				
12/16kV Gas switch with Automation	EA	1	$62,830	(6)
1500kva, Sec. Cable & fuse cabinet	EA	1	$101,970	(1)
Secondary metering (480V)	EA	1	$6,180	(5)
Pri 1/0 Cable from New Pole 200' (Riser)	EA	1	$33,990	(2)
Distributed RTU	EA	1	$6,100	(6)
		Total	$211,070	
Distribution Upgrades				
12/16kV regulator 3-228s	EA	1	$201,880	(7)
		Total	$201,880	

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.

Scenario 4

	Unit	Quantity	Cost ($)	
Interconnection Facilities				
12/16kV Gas switch with Automation	EA	1	$62,830	(6)
Pri High Ampacity Cable undg feed 400' (1000 XLP)	EA	1	$40,170	(2)
12 kV meter	EA	1	$17,510	(5)
Distributed RTU	EA	1	$6,100	(6)
		Total	$126,610	
Distribution Upgrades				
Reconductor of OH to 336 ACSR	FT	1500	$207,000	(7)
		Total	$207,000	

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.

Scenario 5

Interconnection Facilities				
12/16kV Gas switch with Automation	EA	1	$62,830	(6)
New underground cable and connections (1/0 XLP)	FT	250	$6,750	(4)
16 kV meter	EA	1	$17,510	(5)
Distributed RTU	EA	1	$6,100	(6)
		Total	$93,190	
Distribution Upgrades				
Bi-directional Watt transducer	EA	1	$53,500	(6)
Data Point addition to existing RTU	EA	1	$26,500	(6)
		Total	$80,000	

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.

Scenario 6

Interconnection Facilities				
12/16kV Gas switch with Automation	EA	1	$62,830	(6)
Ground Bank	EA	1	$66,950	(7)
Pri 1000 Cable from New Pole 200' (Riser)	EA	1	$44,290	(2)
16 kV meter	EA	1	$17,510	(5)
Distributed RTU	EA	1	$6,100	(6)
		Total	$197,680	

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.

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

Scenario 7

Interconnection Facilities				
33kV Automatic Recloser	EA	1	$147,290	(6)
Reconductor OH (336 ACSR)	FT	9000	$1,242,000	(7)
33kV Pole Top Mtrg Transformer rack configuration	EA	1	$119,480	(5)
Dedicated RTU	EA	1	$144,000	(6)
		Total	$1,652,770	
Distribution Upgrades				
Reconductor - UG (4/0 to 750 XLP)	FT	1000	$84,000	(7)
		Total	$84,000	

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.

Scenario 8

Interconnection Facilities				
12/16kV Gas switch with Automation	EA	1	$62,830	(6)
New underground cable and connections (1/0 XLP)	FT	250	$6,750	(4)
Secondary metering (480V)	EA	1	$6,180	(5)
Distributed RTU	EA	1	$6,100	(6)
		Total	$81,860	

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.

EXAMPLE DEVELOPMENT ASSUMPTIONS:

ESCALATION OVERVIEW :

Current SCE Unit Cost Guide as posted on the CAISO website is in 2022 Constant Dollars.

SCE's cost estimating is done in 2022 constant dollars and then escalated over the years during which the project will be constructed, arriving at project costs in 2022 Constant Dollars Escalated to OD Year.

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

► Q3 2021 IHS Global Insight Forecast of Transmission Capital escalation for the Pacific region (JUEPT@PCF)

2021 - 2031 Q3 2021 IHS GI Forecast

2032 3-year average escalation rate (2029-2031)

DEFINITIONS :

Project Cost in 2022 Constant Dollars represents the cost of the Project if all costs were paid for in 2022.

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 :

Proposed Escalation Rate - Effective 1/1/2022											
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Escalation Rate		2.36%	1.55%	0.94%	1.31%	1.70%	1.85%	2.06%	2.10%	1.96%	1.96%
Escalation Factors	1.0000	1.0236	1.0395	1.0492	1.0630	1.0811	1.1011	1.1237	1.1473	1.1698	1.1927