Pacific Gas and Electric Company CHP RFO
Transmission Proxy Costs

Introduction

PG&E will consider the impacts on the electric transmission system in its evaluation of the Offer. One of the impacts relates to the capability of the transmission system to deliver the full output of the Offer from the first point of interconnection with the PG&E transmission system to serve load reliably. If there were insufficient capability, network upgrades would be needed. Network upgrades include transmission lines, transformer banks, substation breakers, voltage support devices and other equipment needed to transfer the generation output to the customer load. The specific network upgrades and their costs, if needed, are determined from the CAISO Generator Interconnection and Deliverability Allocation Procedures, or for distribution system interconnections, PG&E's Wholesale Distribution Tariff.

Existing generation already connected to the PG&E electric system, the evaluation of the Offer assumes no new transmission system expansion is required. For new, expanded or upgraded generation facilities, PG&E will use interconnection study cost estimates for evaluation, when available. These may include Feasibility Studies, System Impact Studies, Facilities Studies, Phase I Studies, Phase II Studies or deliverability studies. For projects that do not yet have completed interconnection studies, PG&E will use the preliminary results of the interconnection studies pending the availability of the completed studies, and if the preliminary results are not available, PG&E will use the transmission proxy costs for interim evaluation. This paper provides a description of the transmission proxy costs.

Method

The 2012 transmission proxy costs[1] are based on the method that was filed in compliance with CPUC Decision 04-06-013 and further addressed in D.05-07-040 for the development and consideration of transmission costs considered in the selection of resources to meet the Renewable Portfolio Standard ("RPS"). The method is summarized below:

- The assessment covers transmission network upgrades from the first delivery of power from the resource to PG&E's transmission system towards the load. Direct Assignment facilities or "gen-ties" are not covered.

[1] The 2012 transmission proxy costs were approved by the CPUC in a ruling dated April 5, 2012. This ruling accepted the draft proxy costs that were submitted by PG&E in its filing on June 27, 2012, which includes a detailed discussion of the methodology.

- The study assumed that energy from the resource would be delivered to the transmission bus at one of the substations listed in the next section.[2]

- The cost estimates are based on proxy facilities that could mitigate potential congestion due to the addition of the potential resource. In developing the proxy facilities, results from other studies previously published by PG&E would be used where appropriate.

Transmission Proxy Costs

PG&E has developed the transmission proxy costs at the transmission bus for twenty eight substations as shown in Table 1. The approximate locations[3] of these substations are shown in Figure 1.

The transmission proxy costs for the peak and off peak periods[4] are included in Table 1. The transmission proxy costs are based on potential transmission congestion, associated proxy network upgrades, and associated capital costs that may be needed to accommodate each substation representing the approximate location of renewable resources. For each substation, PG&E has identified several levels of possible additional transmission capacity and the related costs. Level 1 reflects the available transmission capacity after taking into account all approved reliability and economic transmission projects as well as upgrades planned for generation projects in the ISO interconnection queue based on their completed interconnection studies. Thus, Level 1 would have no network upgrade costs except those associated with reactive power support. The next and subsequent levels reflect the next most cost-effective proxy network upgrade(s). The number of levels depends on the number of proxy network upgrades needed to accommodate up to maximum expected amount of new generation in each substation.

Applications of Transmission Proxy Costs

It is important to note that the transmission proxy costs will be used solely for the purpose of ranking and evaluating Offers. The actual transmission network upgrade costs for a specific project, determined by the interconnection studies, may differ from the transmission proxy costs and PG&E is not responsible or liable for the deviation between estimated and actual costs.

Transmission Proxy Costs will not be applied to existing or utility pre-scheduled facilities.

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[2] Offers are not required to be delivered to one of these substations. The closest substation to the offer's Point of Delivery will be used to estimate the transmission cost, if any.
[3] PG&E has no prior knowledge where the new resources may be located and the substation selections are based on their locations (near gas transmission lines and spread out within NP15) and size (transmission level bus).
[4] Peak period is HE (hours ending) 7-22, Monday – Friday (except NERC holidays) for months Jun – Sep. Off peak period is the other hours.

Table 1. Transmission Proxy Costs

Substation Associated With Cluster Of Potential Generation	Level	Peak and Shoulder Year Round			Off Peak Year Round		
		Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars) Proxy Voltage Support Devices*	Other Proxy Transmission upgrades	Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars) Proxy Voltage Support Devices*	Other Proxy Transmission upgrades
Bellota 230 kV	1	1000	70	0	1000	70	0
Caribou 230 kV	1	100	7	0	100	7	0
	2	500	35	131	500	35	131
	3	400	28	654	400	28	46
Carrizo Plains 115 kV	1	0	0	0	0	0	0
	2	500	35	173	200	14	173
	3				300	21	356
Contra Costa Sub 230 kV	1	0	0	0	650	46	0
	2	100	7	189	350	25	42
	3	550	39	78			
	4	350	25	236			
Cortina 230 kV	1	0	0	0	450	32	0
	2	600	42	169	550	39	139
	3	400	28	220			
Cottonwood 230 kV	1	0	0	0	0	0	0
	2	500	35	703	1000	70	46
	3	500	35	220			
Delta Metering Station 115 kV	1	0	0	0	0	0	0
	2	500	35	1049	500	35	346
Fulton 230 kV	1	900	63	0	300	21	0
	2	100	7	151	300	21	82
	3				400	28	151
Gates 230 kV	1	0	0	0	200	14	0
	2	1000	70	15	100	7	59
	3				450	32	189
	4				750	53	620
	5						
Gregg 230 kV	1	0	0	0	200	14	0
	2	400	28	15	300	21	59
	3	300	21	42	250	18	189
	4	200	14	18	750	53	620
	5	100	7	137			
Helm 230 kV	1	0	0	0	150	11	0
	2	1000	70	15	400	28	59
	3				200	14	189
	4				750	53	620
	5						

Combined Heat and Power Request for Offers

Substation Associated With Cluster Of Potential Generation	Level	Peak and Shoulder Year Round			Off Peak Year Round		
		Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars)		Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars)	
			Proxy Voltage Support Devices*	Other Proxy Transmission upgrades		Proxy Voltage Support Devices*	Other Proxy Transmission upgrades
Humboldt 115 kV	1	0	0	0	0	0	0
	2	100	7	369	500	35	369
	3	400	28	703			
Los Banos 230 kV	1	0	0	0	100	7	0
	2	1000	70	15	650	46	59
	3				750	53	324
	4						
Metcalf 230 kV	1	1000	70	0	1000	70	0
Midway 230 kV	1	0	0	0	0	0	0
	2	1400	98	15	300	21	59
	3	1100	77	46	450	32	297
	4	500	35	88	750	53	1403
	5				1000	70	765
Morro 230 kV	1	0	0	0	0	0	0
	2	600	42	15	250	18	59
	3	200	14	218	200	14	189
	4	700	49	330	550	39	218
	5				500	35	845
Moss Landing 230 kV	1	1000	70	0	350	25	0
	2				650	46	88
Newark 230 kV	1	1000	70	0	1000	70	0
Panoche 230 kV	1	0	0	0	100	7	0
	2	1000	70	15	250	18	59
	3				400	28	40
	4				750	53	809
	5						
Pitl 230 kV	1	0	0	0	50	4	0
	2	150	11	693	250	18	72
	3	450	32	62	350	25	46
	4	400	28	220	350	25	82
Rio Oso 230 kV	1	0	0	0	1000	70	0
	2	375	26	6			
	3	225	16	134			
	4	400	28	635			
Round Mt 230 kV	1	0	0	0	400	28	0
	2	500	35	693	600	42	46
	2	500	35	220			
Stagg 230 kV	1	0	0	0	1000	70	0
	2	750	53	32			
	3	250	18	21			

Combined Heat and Power Request for Offers

Substation Associated With Cluster Of Potential Generation	Level	Peak and Shoulder Year Round			Off Peak Year Round		
		Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars)		Maximum MW of Potential Generation In each Level	Cost of Proxy Network Upgrades to accommodate MW Level of Potential Generation ($ millions in 2012 dollars)	
			Proxy Voltage Support Devices*	Other Proxy Transmission upgrades		Proxy Voltage Support Devices*	Other Proxy Transmission upgrades
Summit 115 kV	1	0	0	0	0	0	0
	2	400	28	263	500	35	263
	3	100	7	134			
Table Mt 230 kV	1	100	7	0	500	35	0
	2	200	14	435	500	35	46
	3	700	49	220			
Tesla 230 kV	1	1000	70	0	1000	70	0
Vaca Dixon 230 kV	1	0	0	0	1000	70	0
	2	100	7	95			
	3	900	63	220			
Wilson	1	750	53	0	0	0	0
	2	250	18	64	350	25	59
	3				350	25	112
	4				300	21	189

Notes: * Static Var Compensator (SVC) is used as a proxy for voltage support devices required. The size of the SVC at each level assumes the capacity in each level will be fully utilized. However, since addition of voltage support devices is less "lumpy" than other transmission facilities, it is separately listed so that the size, and hence, cost can be prorated based on the size of the resource bid.

Figure 1 PG&E Substations Associated with the CHP RFO