

Table 21.5 Total capital requirements for central station plants [4] 3rd Quarter 1990\$, Carrisa Plains Site

	Fresnel lens		Central receiver		CIS flat plate	
	[\$(10 ⁶)]	[\$/Watt]	[\$(10 ⁶)]	[\$/Watt]	[\$(10 ⁶)]	[\$/Watt]
Buildings, site improvement	1.20	0.02	1.9	0.04	1.23	0.02
Array structure	37.92	0.76			13.38	0.27
PV modules	80.80	1.62			66.91	1.38
Heliostat system			53.30	1.07		
Receiver system			18.80	0.38		
Receiver tower			6.30	0.13		
Power conditioning unit	5.92	0.12	4.30	0.09	5.85	0.12
Balance of plant	3.09	0.06	16.40	0.33	7.06	0.14
Master control system	0.12	0.00	0.80	0.02	0.08	0.00
Total field cost	129.10	2.58	101.80	2.04	94.50	1.91
Engineering, & const. Management	5.20	0.10	6.10	0.12	2.80	0.06
Owner's costs	5.40	0.11	5.40	0.11	2.90	0.06
Contingencies	14.20	0.29	19.70	0.39	9.80	0.20
Total plant cost	153.90	3.08	133.00	2.66	110.00	2.22
Escalation (mixed year dollars)	(2.90)	(0.06)	(2.50)	(0.05)	(2.10)	(0.04)
Total cash expended (mixed year dollars)	151.00	3.02	130.50	2.61	107.90	2.18
Allowance for funds during const. (mixed year dollars)	6.80	0.14	5.80	0.12	4.80	0.10
Total plant investment	157.80	3.16	136.30	2.73	112.70	2.27
Preproduction costs	3.20	0.06	2.90	0.06	2.30	0.05
Inventory capital	0.80	0.02	0.70	0.01	0.60	0.01
Land	0.20	0.00	0.30	0.01	0.20	0.00
Total capital requirement	162.00	3.24	140.00	2.80	116.00	2.34

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associated with engineering, construction management, cost of money, contingencies, and so on. The contingency item accounts for uncertainties in system performance and unaccounted costs in the design. Later systems of the same design may avoid some of the contingency cost. The total system cost in Table 21.5 is equivalent to the present worth of capital expenditures during the construction of the systems. The central receiver plant and the CIS flat plate plant both turn out to have less-expensive collector costs than the Fresnel lens plant, and the resultant total capital requirements are also less by 14% and 28%, respectively. The central receiver plant has a forced convection, water-cooling system that adds significantly to the system cost relative to the other two plants.

The remaining steps in computing LEC (see equation (21.14)) are summarized in Table 21.6. The typical energy output was calculated from solar-insolation data and the performance parameters of the systems using computer codes. The energy outputs for