

Optimal Module Solution for Achieving Lower LCOE of Utility Photovoltaic Power Station

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1. Background - Evolution of PV Silicon Wafer Size

Both aspects need to be considered for the evolution of PV silicon wafer size: the influence of silicon wafer size change on the manufacturing cost of the industrial chain, and, the influence of silicon wafer size on module size, electrical parameters and module application at the system side.

In early time, PV cells are similar to semiconductor chips, and the equipment and process costs are relatively high. Thus, increasing the size of silicon wafer can significantly reduce the manufacturing cost of cells. As the PV industry becomes more mature, situation is different now. Today, the solar cell manufacturing cost is about \$0.03/Watt, which is reduced by dozens of times; the silicon wafer / cell size has also evolved independently to include M1 (156.75- 205mm), M2 (156.75- 210mm), M4 (161.7- 211mm) and other specifications, while wafer thickness continues to be thinner.

In the industry, after the mainstream silicon wafer size maintained stably at 156.75mm for several years, G1 (158.75- 223mm) and M6 (166

case of 4L rack.

4L fixed rack, centralized inverter (cost unit: \$/Wp)		
Product	72c-182	55c-210
Power	540Wp	540Wp
DC capacity	3.96576MW	3.969MW
String length	27	35
Number of strings on a single rack	8	6
Pile spacing	3.5m	
Rack & foundation costs	0.068	0.070
Total cable cost	0.016	0.015

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