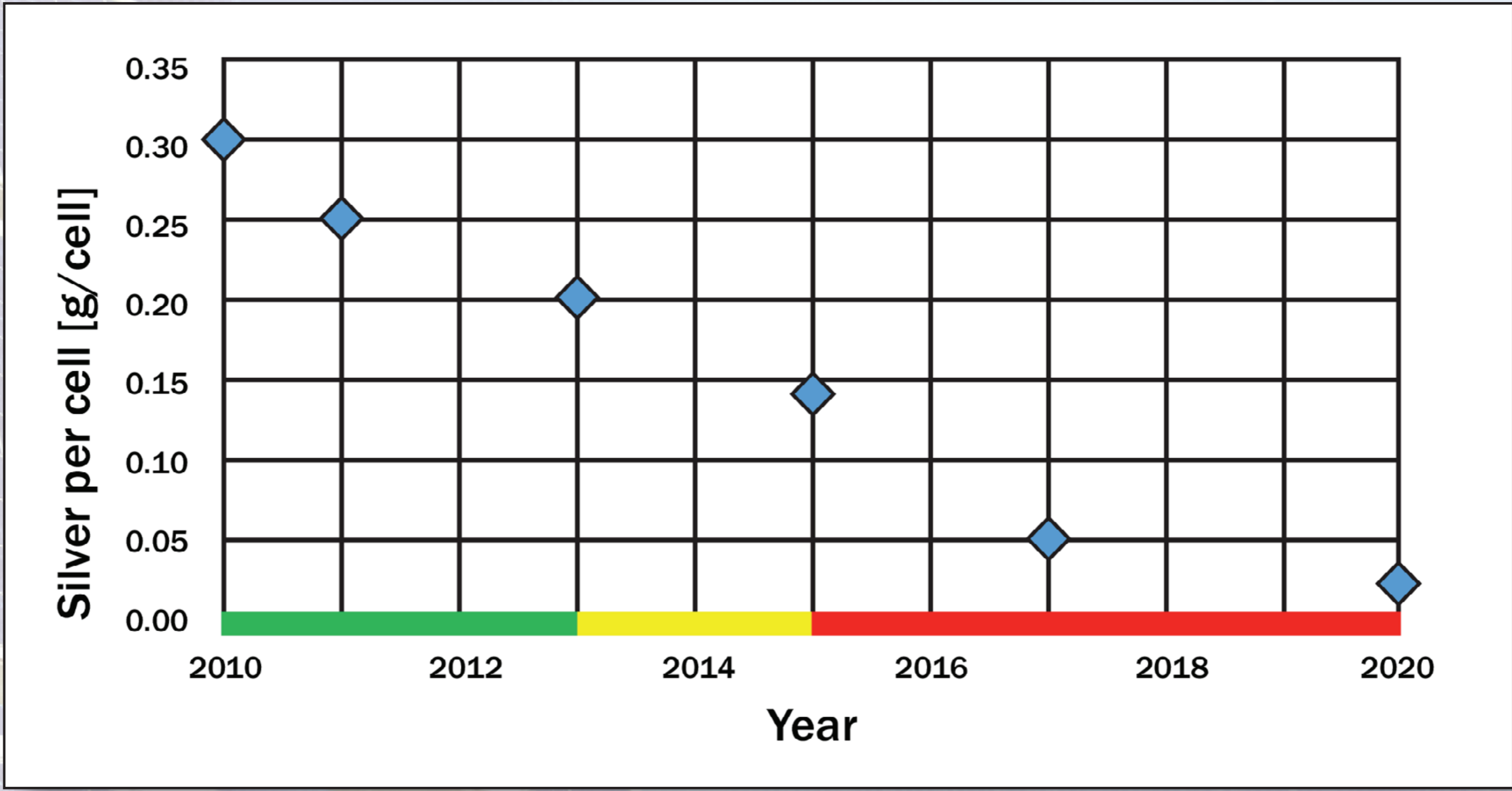


IMPORTANCE OF ANNEAL FOR PLATING OF SOLAR CELLS

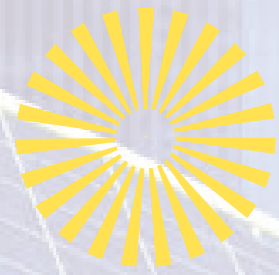
One method to achieve low-cost, high efficiency cells is to replace screen printing with plating. Plating promises to replace high cost silver with that of a lower cost metal, such as copper or nickel. An important part of the plating process is the post plating anneal which enables the formation of nickel-silicide at the interface between silicon and nickel. This anneal step is crucial for the plated cell in order for it to perform at its highest efficiency level.

The importance of the anneal step is outlined in the test results below. After plating, the efficiencies are low and show a wide spread. However, after anneal the distribution becomes very narrow with a standard deviation of just 0.2 compared to 2 before anneal. The efficiency average increases by 12% (relative)

The required profile flexibility can be achieved via the use of infrared lamps. Low cost of ownership is possible while maintaining low oxygen levels (<100ppm) by using small amounts of nitrogen.

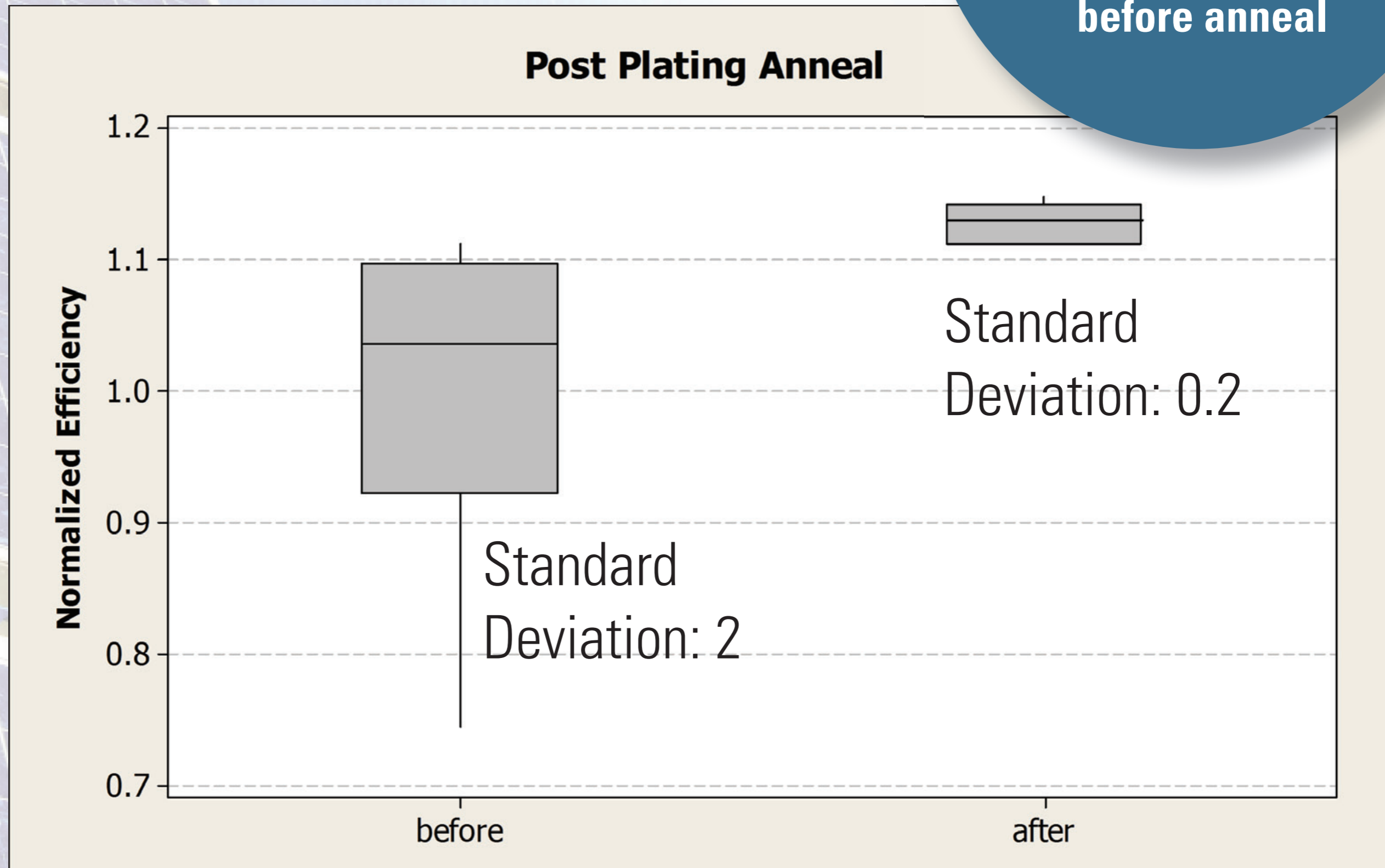


Source: ITRPV 2012

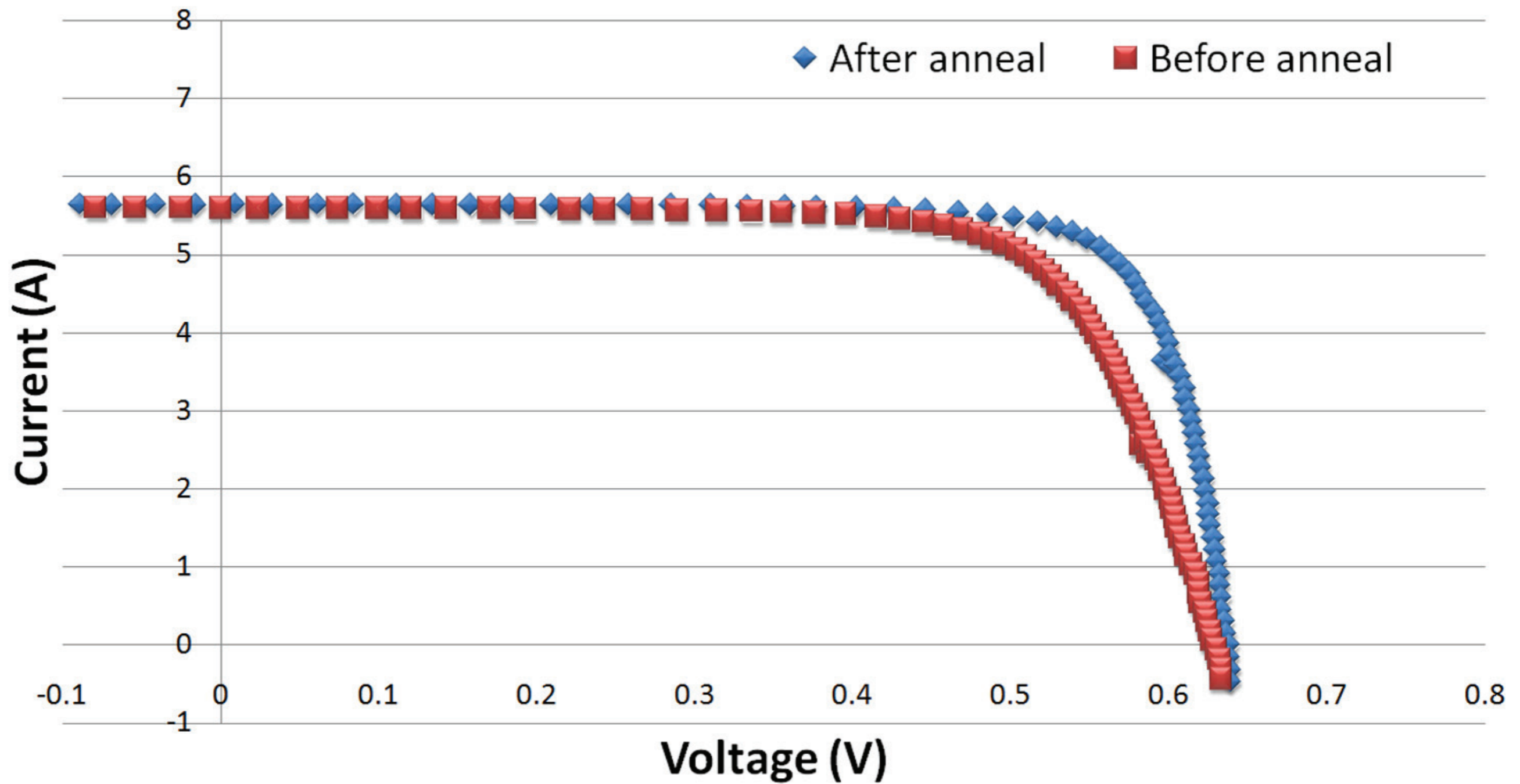


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After anneal the distribution becomes very narrow with standard deviation of just 0.2 compared to 2 before anneal



Mono Cell



Condition	Voc (V)	Isc (A)	Rser (ohm)	Rshunt (ohm)	FF (%)	Eta (%)
Before Anneal	0.629	5.598	0.0134	154.7	72.47	16.51
After Anneal	0.637	5.645	0.003	103.7	79.17	18.43