CLAIMS

1. A regeneration device for a laminate stack of solar cells having a chamber including an upper chamber and a lower chamber with an upper face comprising

a heated platen with temperature adjustment control mounted directly beneath the upper chamber, being used to provide a target temperature to the laminate stack;

a cooling member connected to the chamber at the upper chamber for maintaining temperature of the regeneration device, regulating the temperature of the heated platen;

a conveyor apparatus for loading of the laminate stack of solar cells into the chamber; wherein the illumination source is solely tailored for the optimal regeneration process for the individual solar cells within the solar panel;

an illumination source for a regeneration process of the regeneration device being mounted at the upper face of the lower chamber, wherein the illumination source is configured as an array spanning the solar panel laminator, allowing the array spanning of the entire solar module, or single row solar cell coverage combined with a scanning technique to regenerate the entire solar module, which allows the regeneration period, the illumination intensity and target temperature per individual solar cell to be adjusted and optimized, independent of the optimal settings for the lamination process; and the illumination source is configured in single row solar cell coverage combined with a scanning device to regenerate the stack of solar cells and is solely function to perform light based regeneration of the individual solar cells within the solar panels in the most optimal intensity and regeneration period, and wherein the scanning device allows adjusting and optimizing of settings of the regeneration and lamination process with respect to a regeneration period, illumination intensity and a target temperature per individual solar cell or row/column of solar cells; and

a vacuum pump being connected to the chamber to provide vacuum to the chamber, wherein the stack of solar cells is being regenerated simultaneously with the lamination process implemented to the laminate stack of solar cells via a plurality steps of vacuuming, heating and pressing.

2. The regeneration device as set forth in Claim 1, wherein the regeneration process is taking place simultaneously while the lamination process is ongoing.

3. The regeneration device as set forth in Claim 2, wherein no additional equipment footprint except the solar panel laminator is required when the regeneration process is taking place.

4. The regeneration device as set forth in Claim 1, wherein the laminator is effective on regeneration process for P-Mono, P-Multi, N-Cast Mono, N-Multi, N-Mono silicon solar modules.

5. The regeneration device as set forth in Claim 1, wherein the illumination source has adjustable intensity of less than one sun intensity up to 100 suns intensity.

6. The regeneration device as set forth in Claim 1, wherein the regeneration device has a regeneration period of at least 5 seconds and up to 30 minutes per solar cell.

7. The regeneration device as set forth in Claim 1, wherein the cooling member is functioned to maintain a temperature within the stack of solar cells, and regulates the temperature of the illumination source.

8. The regeneration device as set forth in Claim 1, wherein completed laminated and regenerated solar modules are unloaded onto a conveyor system.

9. The regeneration device as set forth in Claim 1, wherein the lamination source includes laser, light emitting diodes, halogen incandescent lamps, fluorescent light, metal halide light xenon strobe lamps, infrared lamps and light and sunlight concentrators.

10. The regeneration device as set forth in claim 1, wherein a mobile cart is used to accommodate the regeneration device automatically by scanning the solar panels on site.

11. The regeneration device as set forth in Claim 10, wherein the mobile cart is equipped with a computer/monitor.