

| Crystalline Silicon Solar Panel | CPV Solar Panel (Elceram) |
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| <p>Low efficiency: 1. Cell 15-20 %, in laboratory 28 %, theoretical limit 40 % 2. Panel 14-16 %, world champion 2011 (Sanyo 21,6 %).</p> | <p>High efficiency: 1. Multijunction cell 35-39 %, in laboratory 42 %, theoretical limit 86 % 2. Panel 29 %, Elceram 29 % too, (Concentrix technology 27,5 %).</p> |
| <p>Performance of the cell falls considerably with higher temperatures: Thermal coefficient around $-0,47 \% / ^\circ\text{C}$ (BOSCH). When is the cell applied in the solar panel, the efficiency falls more rapidly.</p> | <p>Thermal coefficient is $-0,17 \% / ^\circ\text{C}$ only (three times lower than on silicon cell).</p> |
| <p>Unusable in warm regions. In real hot conditions much lower power than rated is measured because of overheating.</p> | <p>CPV excellently works in warm regions (deserts, etc.).</p> |
| <p>Large size planar dimensions. Need twice the area to achieve the same performance as CPV panel.</p> | <p>For the same performance the half of Si panel area is sufficient.</p> |
| <p>The small immunity against to radioactive rays.</p> | <p>The high immunity against to radioactive rays (space technology for satellites).</p> |
| <p>Flat, compact construction, mechanically resistant, waterproof due to its hermetic construction.</p> | <p>Not flat, but always volume construction (depending on the focal length of lenses), dust-proof and watertight.</p> |
| <p>Small thickness design (about 20 mm).</p> | <p>Always greater depth of panel than silicon one (Elceram panel depth about 175 mm).</p> |
| <p>Low weight (constituted primarily by glass).</p> | <p>Higher weight than silicone panel.</p> |
| <p>Fixed position on the ground is sufficient. No need of the solar tracking. However if used, the daily electricity production increases about 30-40 %.</p> | <p>2-axis tracking mechanism is necessary. The CPV panel must permanently follow position of the Sun with high precision (acceptance angle $\pm 0,5^\circ$).</p> |
| <p>Use not only direct Sun irradiation, but either diffused light. Therefore it works also if the sky is cloudy, at the rain, snow, however with limited performance.</p> | <p>Direct sun irradiation is necessary. Does not work if is overcast, when the Sun is just behind the cloud, at rain and snowfall. There shall by no obstacle between Sun and panel.</p> |
| <p>Insensitive to deflection caused by windy blasts.</p> | <p>At higher deflections caused by windy blasts the generated electric power fluctuates.</p> |
| <p>Works (at least in limited mode) if the panel is moving.</p> | <p>Stationary placement only. The CPV panel is not suitable for use at movement.</p> |
| <p>Large consumption of semiconductor material. Shortage of raw material (silane) in the world production.</p> | <p>Large semiconductor material savings (1000 times less need than for silicon cell).</p> |
| <p>Small output voltage of silicone cell, output voltage of one cell is about 0,6 V. For output voltage 24 V at least 40 cells are needed.</p> | <p>CPV GaAs cell gives approx. 4 times higher voltage. Output voltage of one cell is about 3 V. For output voltage 24 V only 8 cells are needed. Smaller number of the cells needed to reaching of necessary voltage is projected to higher reliability of the CPV panel.</p> |

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| Simple carrying construction. | Necessity of tracker with the sun navigation increases the cost. |
| The Silicon panel is not repairable, any kind of its damage leads to its exchange. | Repair of defective CPV panel is possible in manufacturing factory. If covering lens array is damaged, the replacing by new one is simple. |
| Difficult and expensive recycling. | Easy disassembling and recycling. |
| Additional Estimations | |
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| Cost 2-3 EUR / Wpp at 2011. | Cost Prototype: 6 - 10 EUR / Wpp at 2011. |
| | Forecast for mass-production: cca 2 – 5 EUR/Wpp, (depends on the production quantity). |
| The estimated lifetime is 20 years. After 20 years the 80% of initial power is guaranteed. However, the first bigger installations are 10 years old only. | The estimated lifetime is also 20 years, but the first installations are 5 years old only. Elceram use the double protection of cells against humidity. We use our own encapsulated solar cells ELC 38. The inner space of the panels is protected well. It assumes long lifetime of the panels, too. |