

PV Technology Based on Crystalline Silicon Wafers

From Solar Cells to Solar Modules

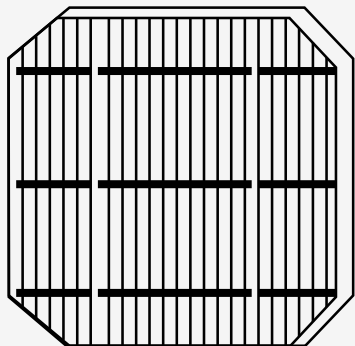
Week 4.5

Arno Smets

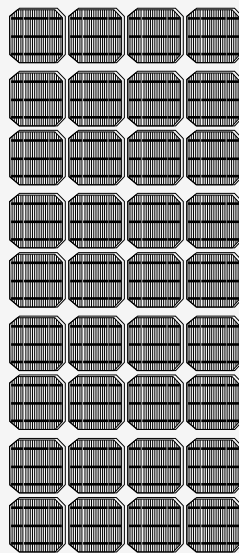


PV modules

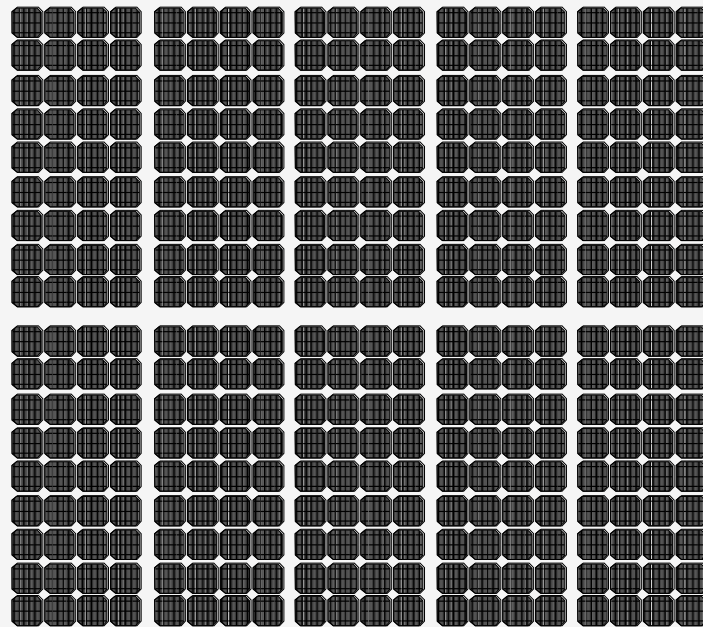
From a solar cell to
an array: modularity



Cell

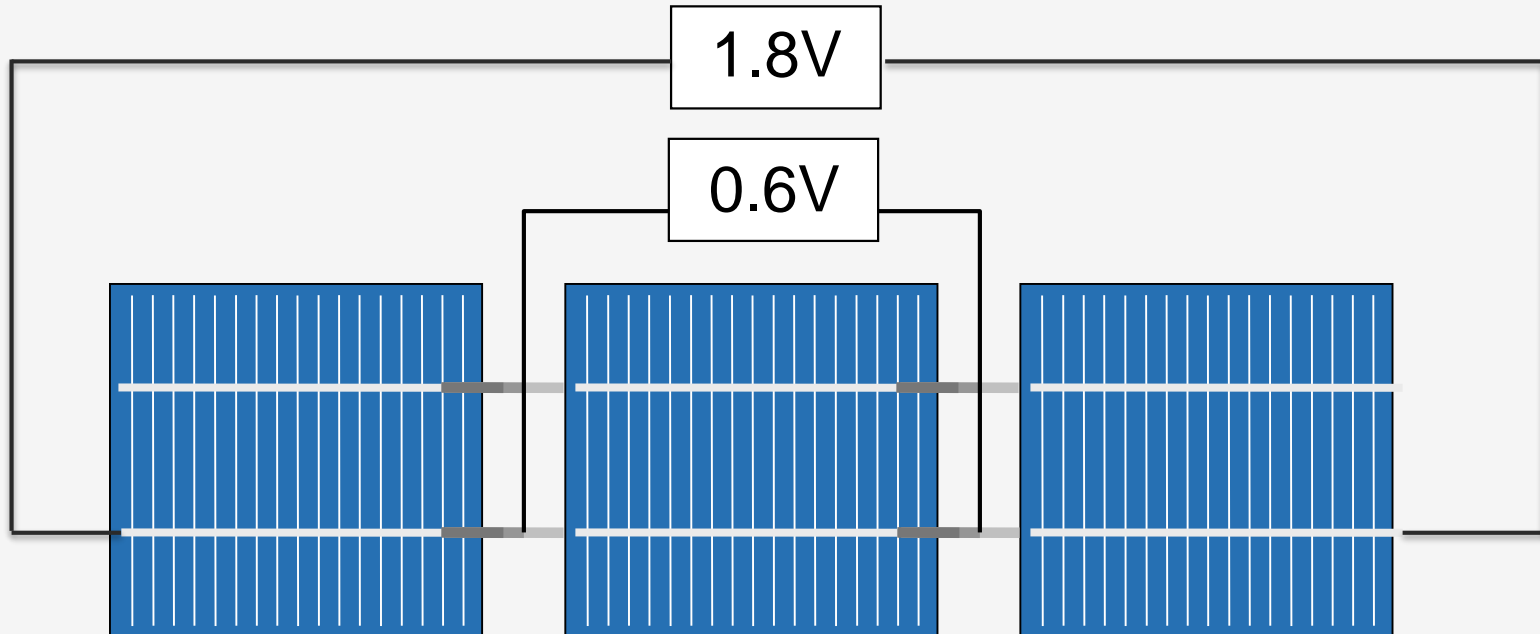


Module



Array

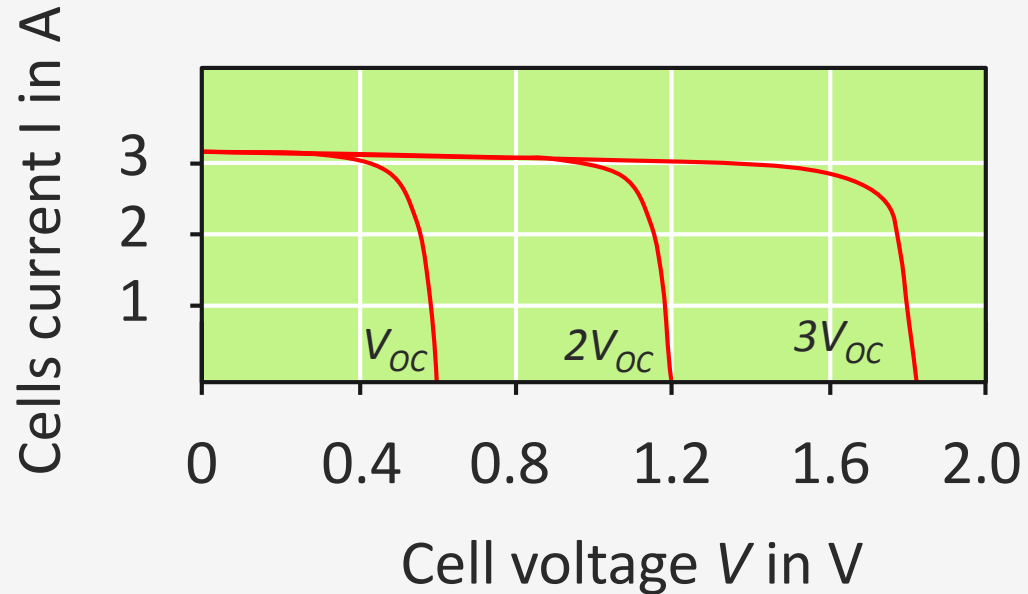
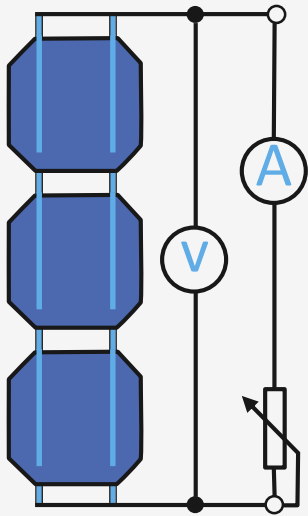
Series connection

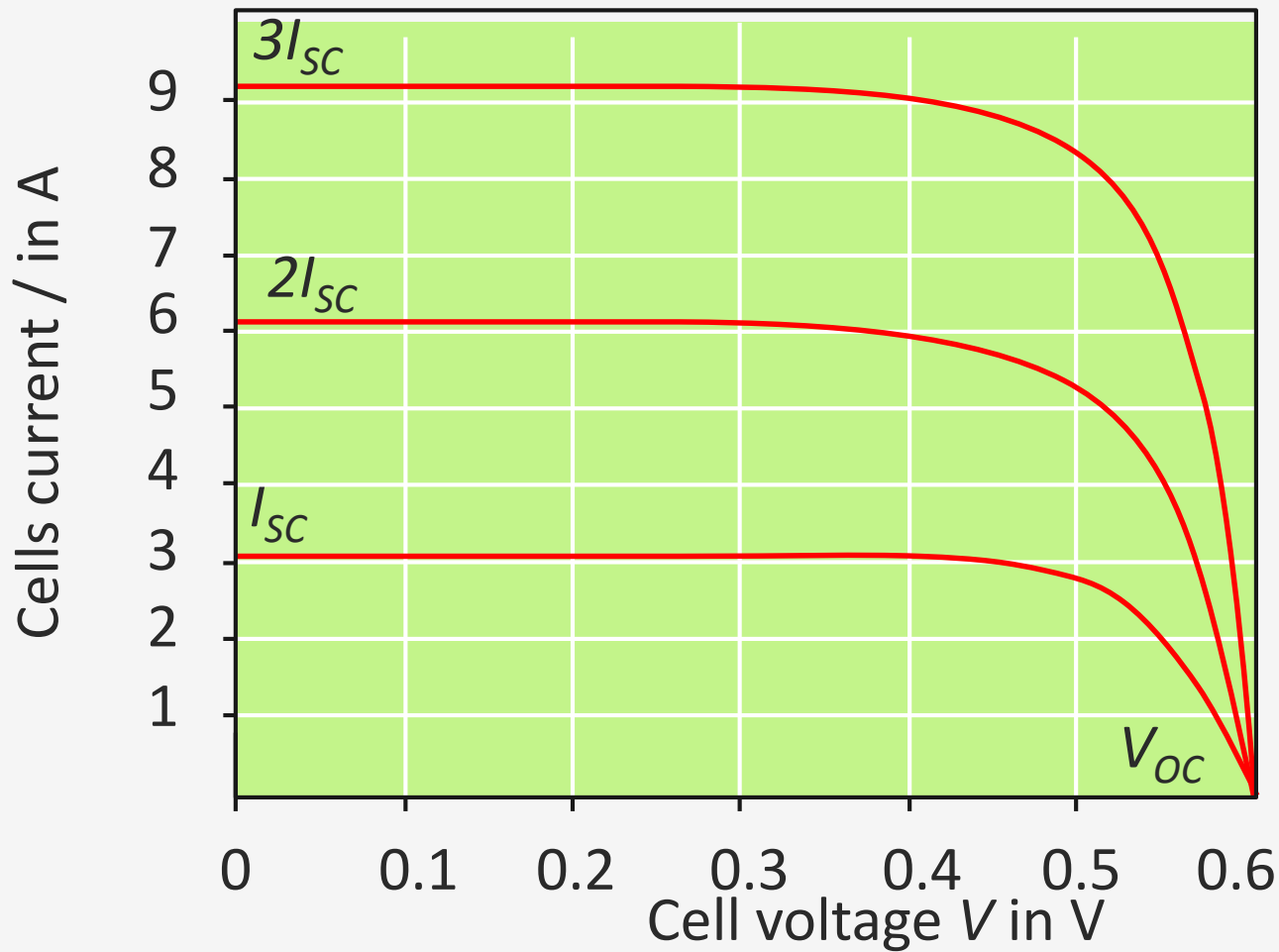
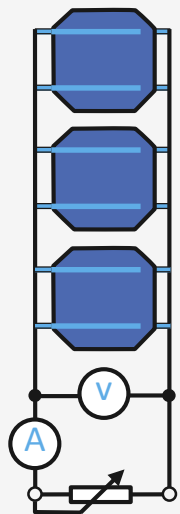


Series connection



Series connection





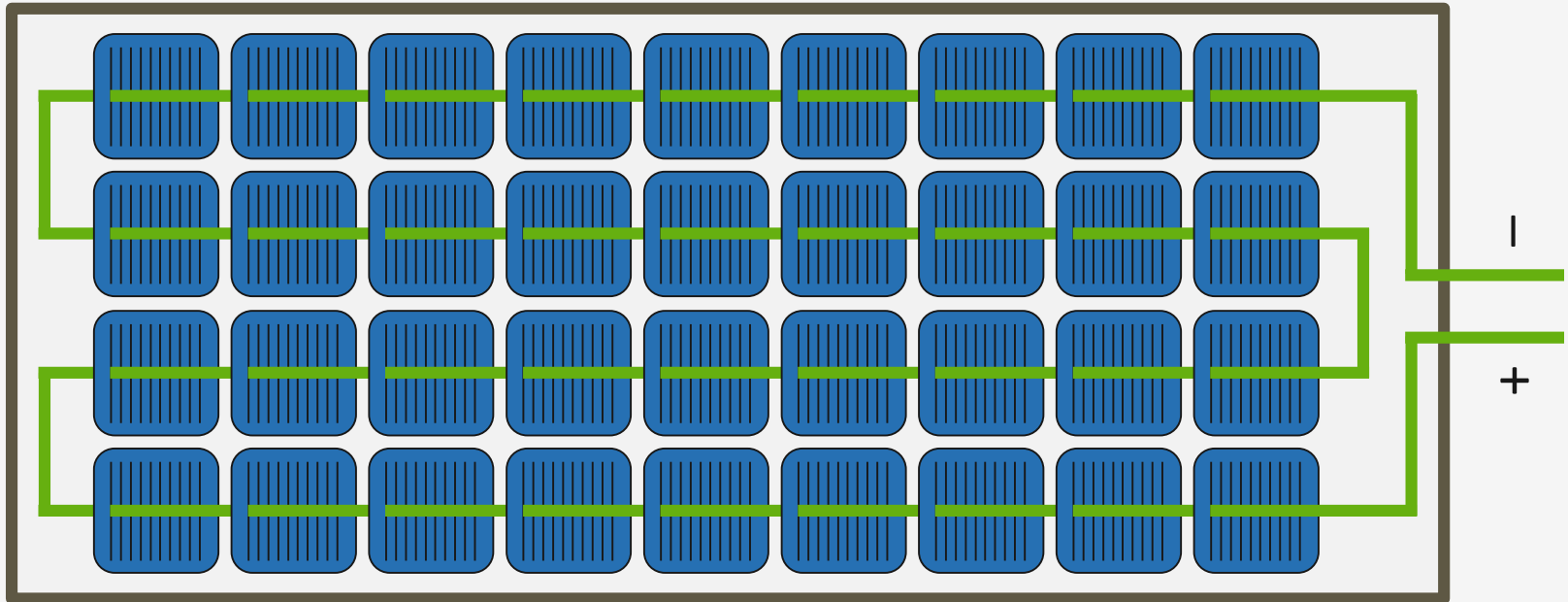
Modules

$$V_{OCcell} = 0.6V$$

$$I_{SCcell} = 5A$$

$$V_{OCmodule} = 21.6V$$

$$I_{SCmodule} = 5A$$



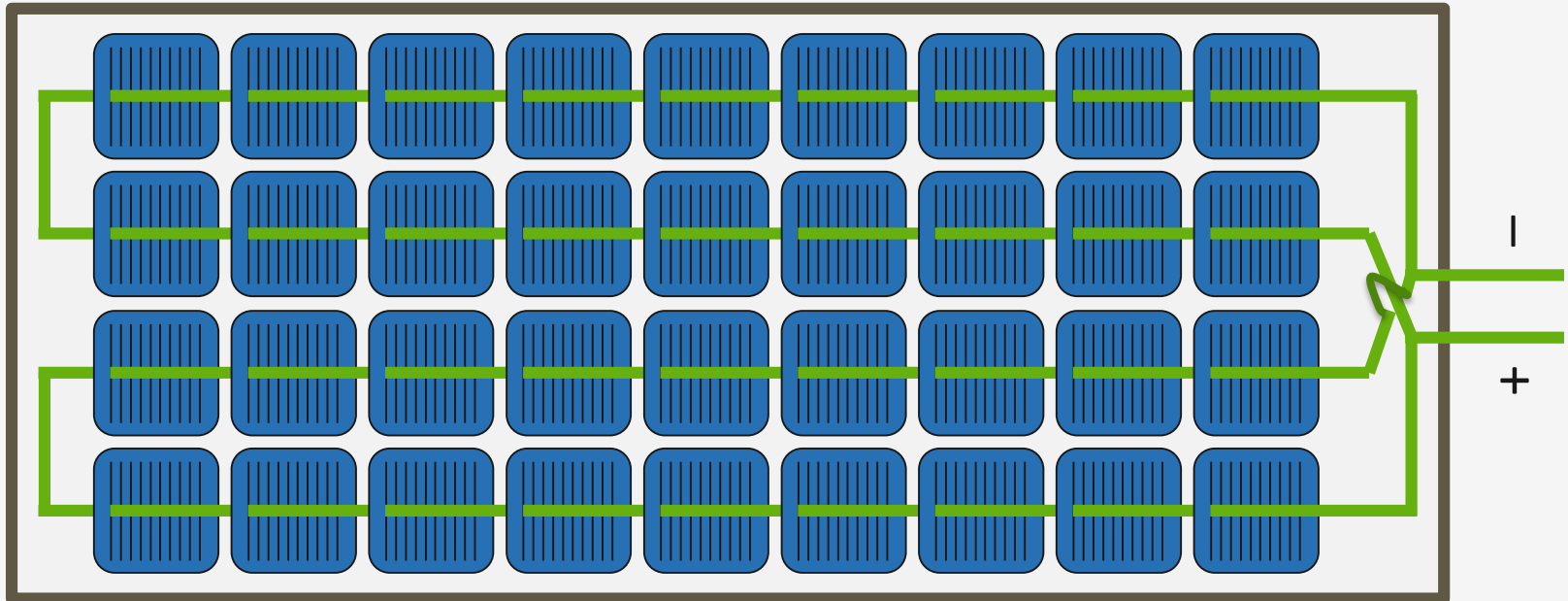
Modules

$$V_{OCcell} = 0.6V$$

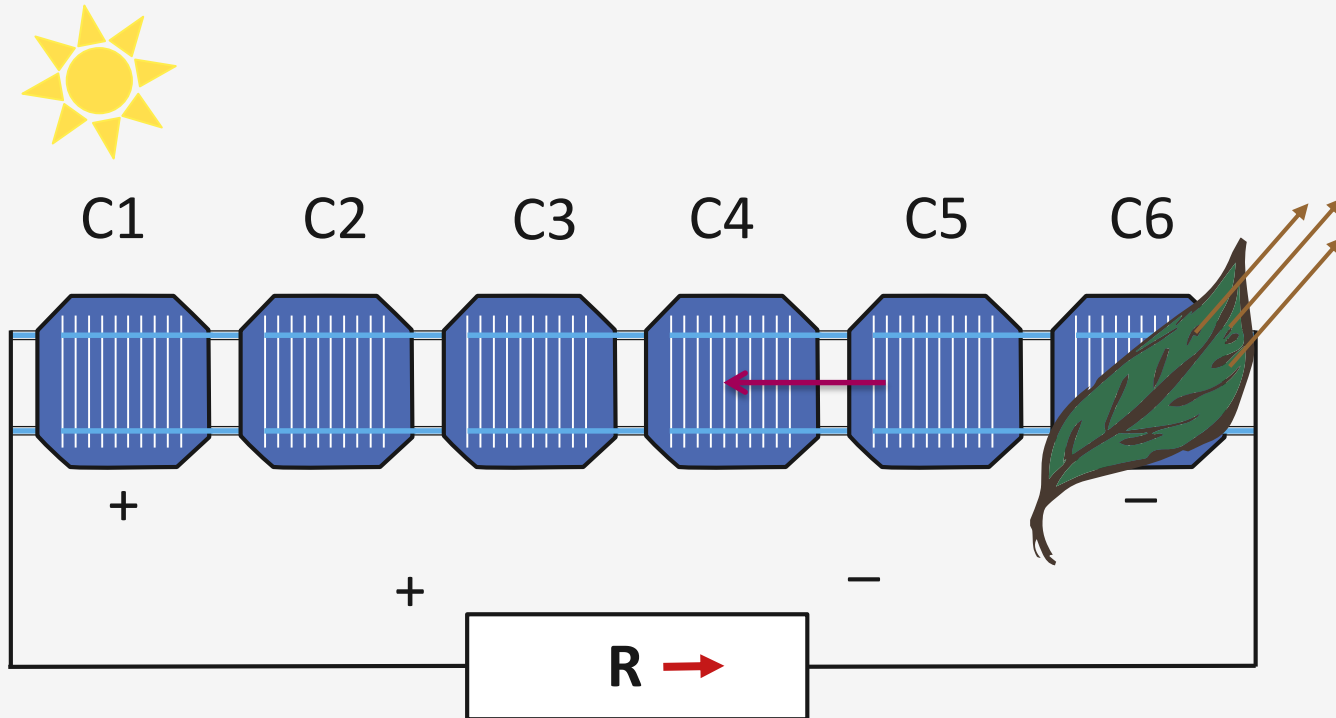
$$I_{SCcell} = 5A$$

$$V_{OCmodule} = 10.8V$$

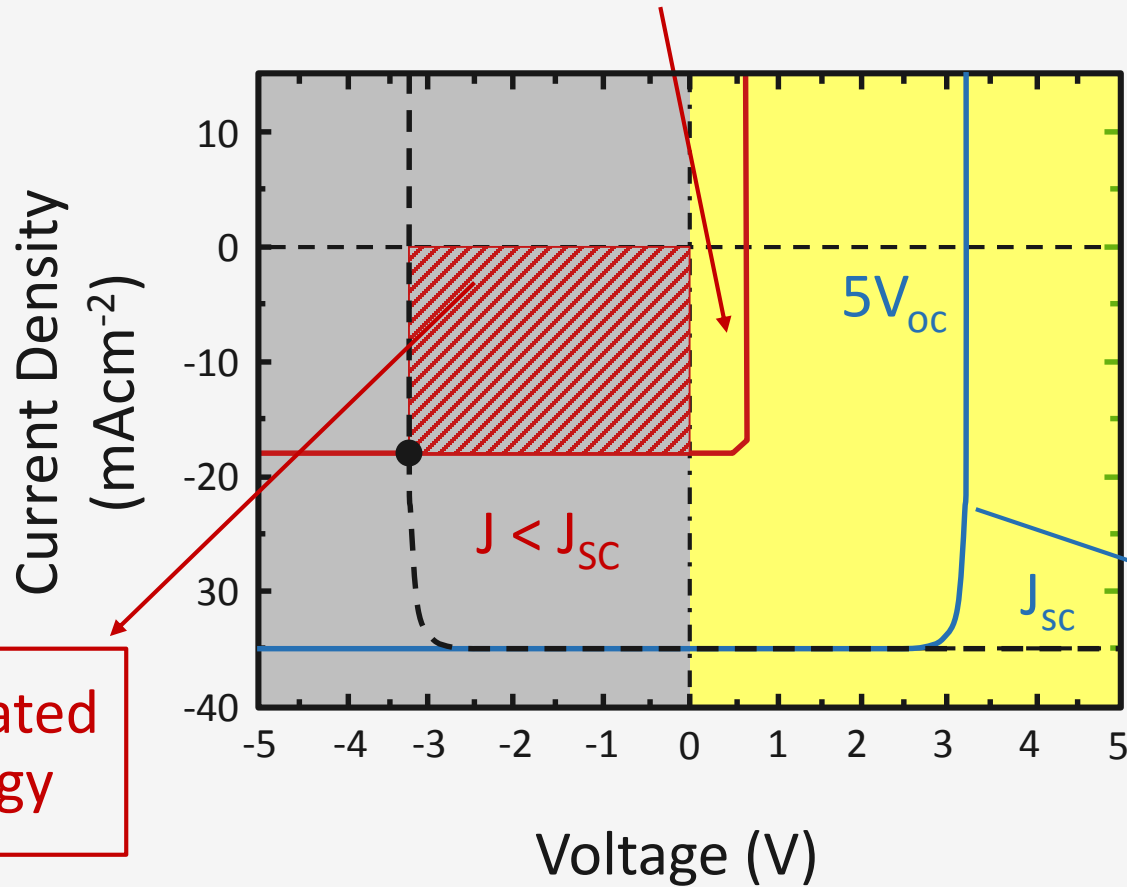
$$I_{SCmodule} = 10A$$



Shading



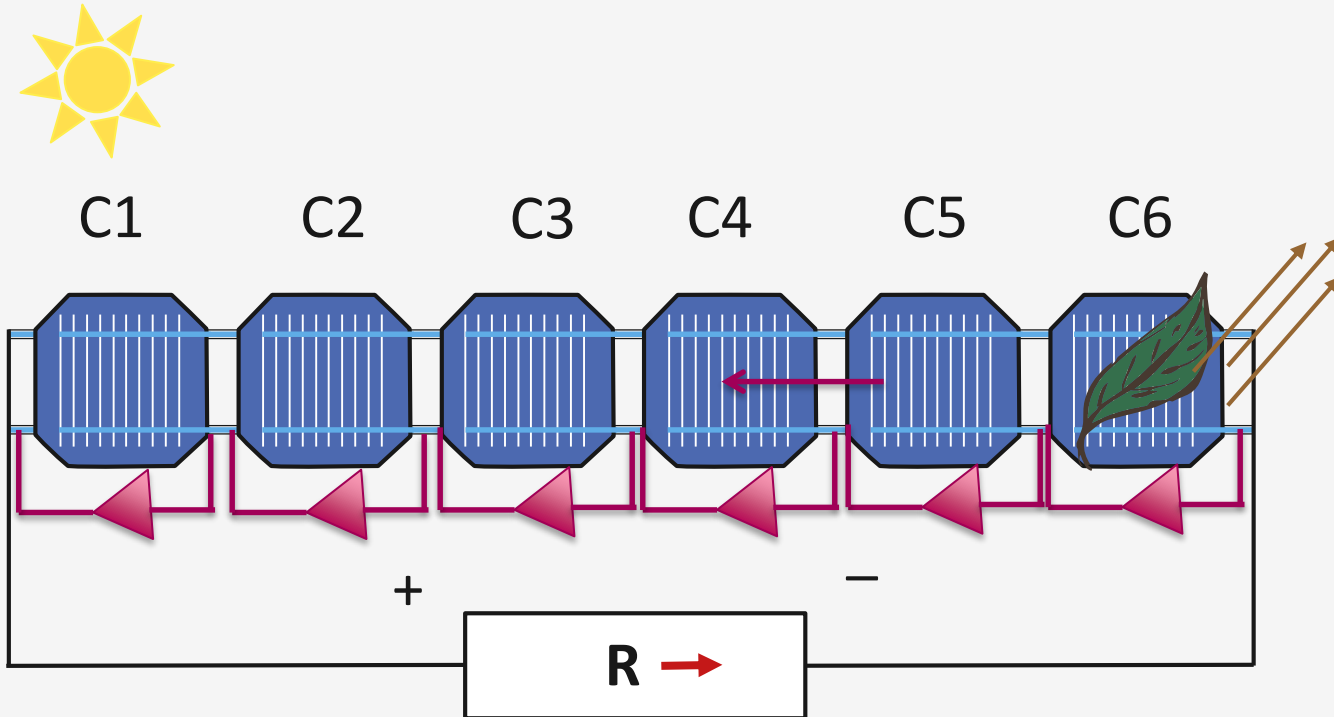
Current of shaded 6th cell



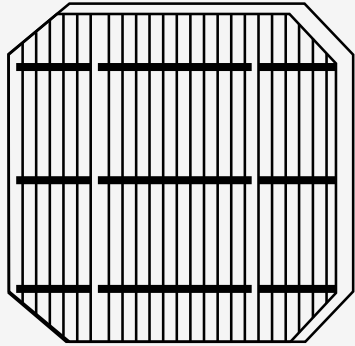
Dissipated energy

Current 5 From cells

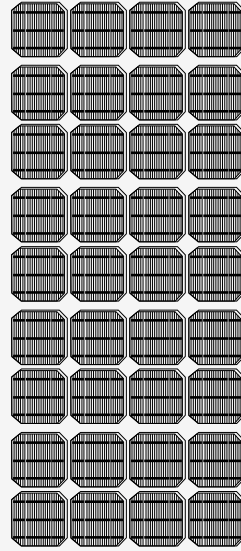
Bypass diode



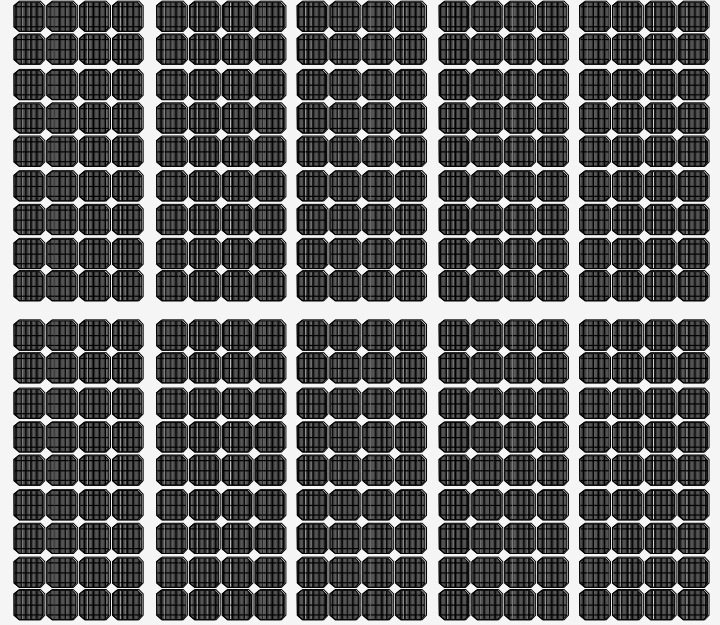
PV modules



Cell



Module



Array

Thank you for your attention!