

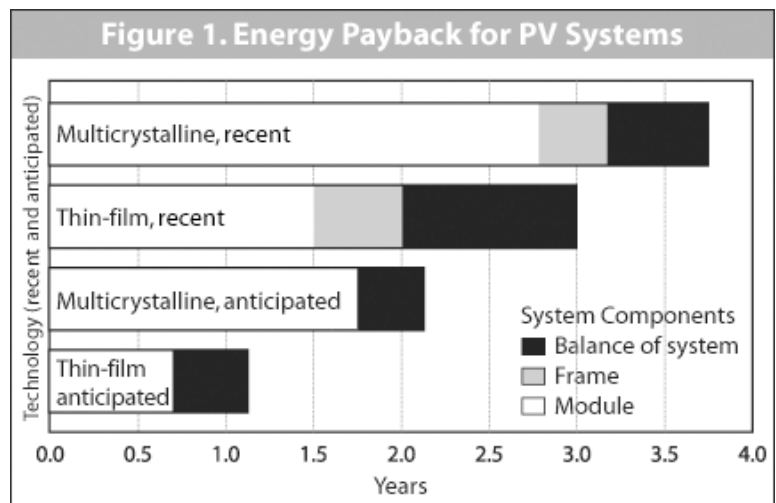
Solar cells and energy payback

There is a common but mistaken notion that solar cells never produce more energy than it takes to make them. The term 'energy payback' captures this idea. How long does a PV system have to operate to recover the energy - and associated generation of pollution and CO₂ - that went into making the system, in the first place?

The following is a summary of a report produced by the National Renewable Energy Laboratory (NREL). The full report is available through the link below.

Energy payback

Reaping the environmental benefits of solar energy requires spending energy to make the PV system. But as Figure 1 shows the investment is small. Assuming 30-year system life, PV systems will provide a net gain of 26 to 29 years of pollution-free and greenhouse-gas-free electrical generation. Specifically, paybacks for multicrystalline modules are 4 years for systems using recent technology and 2 years for anticipated technology. For thin-film modules, paybacks are 3 years using recent technology, and just 1 year for anticipated thin-film technology.



CO₂ and Pollution payback

As highlighted above a PV system can repay its energy investment in about 2 years. During its 28 remaining years of assumed operation, a PV system that meets half of an average household's electrical use would eliminate half a ton of sulphur dioxide and one-third of a ton of nitrogen-oxides pollution. The carbon-dioxide emissions avoided would offset the operation of two cars for those 28 years (see Figure 2).

