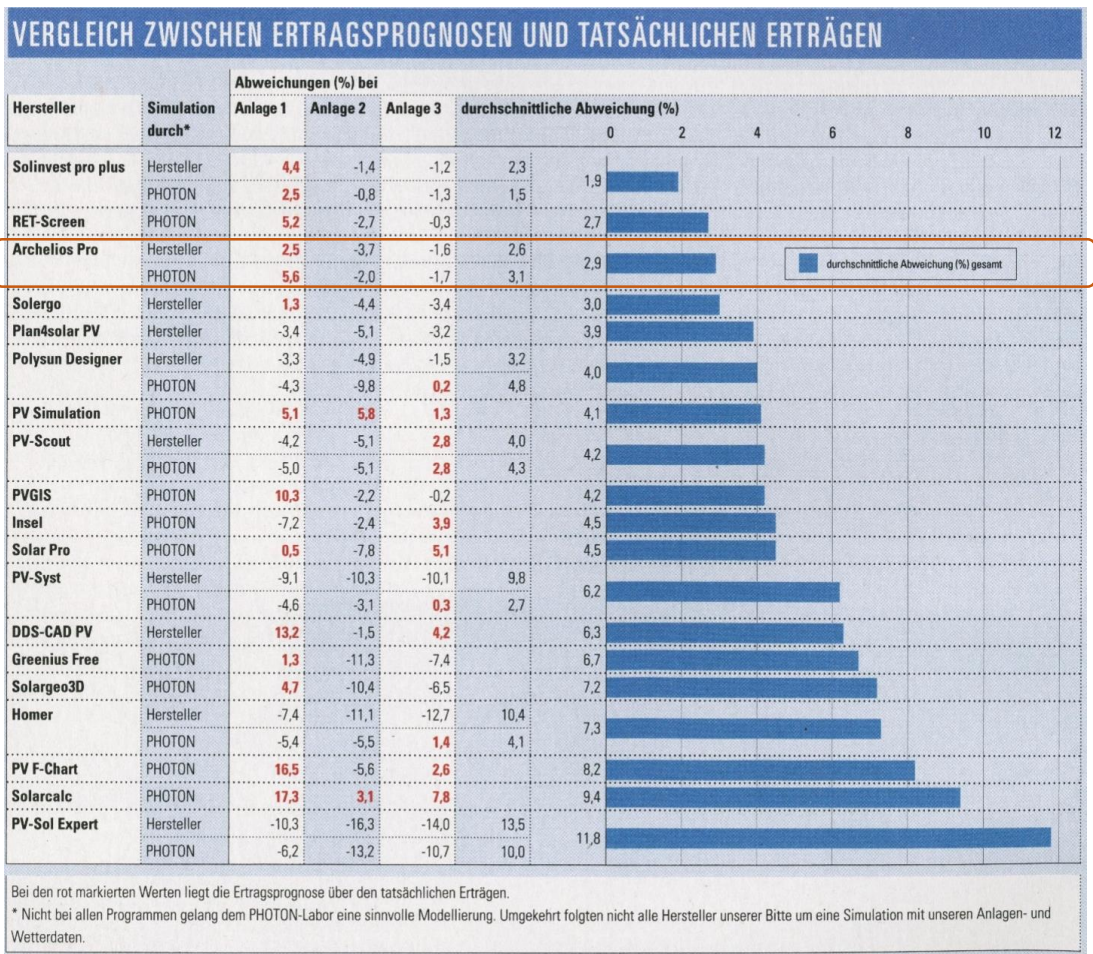


Photon

Photon Profil - German branch of Photon International - conducted a comparative study amongst the main photovoltaic pieces of software for the design, simulation and yield calculation in the market.

Photon Laboratory compared the results of 24 software and calculators according to the real results of existing photovoltaic installations. According to Photon, the majority of these software gives "usable" yield prediction, from which 11 were considered as very good by providing between 2 and 5% of difference to the actual results. The results show that neither some of the pieces of software considered as market references nor the most expensive happened to be the more reliable.

archelios™Pro was highly rated and according to Photon's study, archelios™Pro was ranked number one amongst PV commercial software used by professionals. This is a yield prediction vs. real data comparison:



For the values marked in red, the forecast yield is higher than the actual yield.

* The PHOTON Lab did not succeed in providing effective system modelling with all programmes. On the other hand, not all manufacturers (Hersteller) responded to our invitation to make a simulation with our system and weather data.

On a Virtual System simulation conducted by Photon Laboratory's technicians, simulation comparison results were taken into consideration, placing archelios™Pro first overall:

SYNTHETISCHE ANLAGE*: VERGLEICHSSIMULATION

Programm**	Simulation von	Prognose (kWh/Jahr)	Abweichung (%) vom Durchschnitt	Eigenverbrauchsanteil (%)***
Archelios Pro	PHOTON	4.381,0	-1,6	48,5
	Hersteller	4.311,0	-3,1	57,1
Greenius Free	PHOTON	4.047,4	-9,1	entfällt
Homer	PHOTON	4.642,0	4,3	39,7
	Hersteller	4.416,1	-0,8	98,4
Insel	PHOTON	4.905,7	10,2	35,2
Plan4solar PV	Hersteller	4.381,0	-1,6	entfällt
Polysun Designer	PHOTON	4.464,2	0,3	entfällt
	Hersteller	4.405,0	-1,0	36,8
PV Simulation	PHOTON	4.745,6	6,6	entfällt
PV-Sol Expert	PHOTON	4.101,7	-7,8	32,3
	Hersteller	3.956,5	-11,1	37,5
PV F-Chart	PHOTON	5.082,2	14,2	47,1
PVGIS	PHOTON	4.594,4	3,2	entfällt
PV-Scout	PHOTON	4.612,5	3,6	entfällt
	Hersteller	4.140,0	-7,0	entfällt
PV-Syst	PHOTON	4.475,4	0,6	36,8
	Hersteller	4.102,5	-7,8	39,7
RET-Screen	PHOTON	4.651,0	4,5	92,6
Solar Pro	PHOTON	4.745,2	6,6	entfällt
Solarcalc	PHOTON	4.738,8	6,5	entfällt
Solargeo3D	PHOTON	4.138,7	-7,0	entfällt
Solergo	Hersteller	4.525,1	1,7	56,8
Solinvest pro plus	PHOTON	4.242,4	-4,7	entfällt
Durchschnitt		4.450,2		

* 4,84 Kilowatt Leistung, 22 polykristalline Module vom Typ Sunmodule Plus SW 220 poly von Solarworld, Wechselrichter SMC 4600A von SMA, Standort: Berlin, Südausrichtung, 30° Neigung

** für DDS-CAD PV lagen keine Vergleichsdaten vor

*** die Programme, die Eigenverbrauchsberechnungen unterstützen, wurden entweder mit einem Lastprofil oder mit einem Jahresstromverbrauch von 4.480 kWh parametrisiert

* 4,84 kilowatt power, 22 polycrystalline modules from Solarworld, type Sunmodule Plus SW 220 poly, inverter SMC 4600A; facility site: Berlin, south-orientation, tilt angle 30°.

** no comparative data available for DDS-CAD PV.

*** the programmes capable of carrying out in-house calculations were parameterized either with a load profile or with an annual power consumption of 4,480 kWh.