Solar-Equipped Trucks

12-Month Savings Analysis in 2024

Tank to Wheel Results: Trucks in 2024

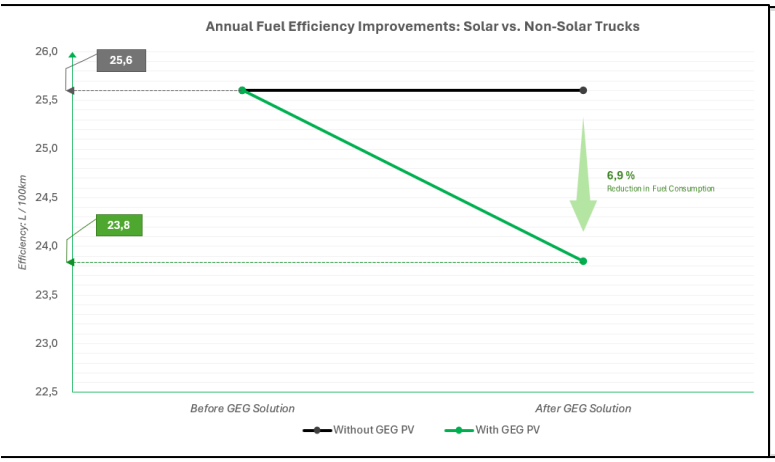
Date: 01/04/2025

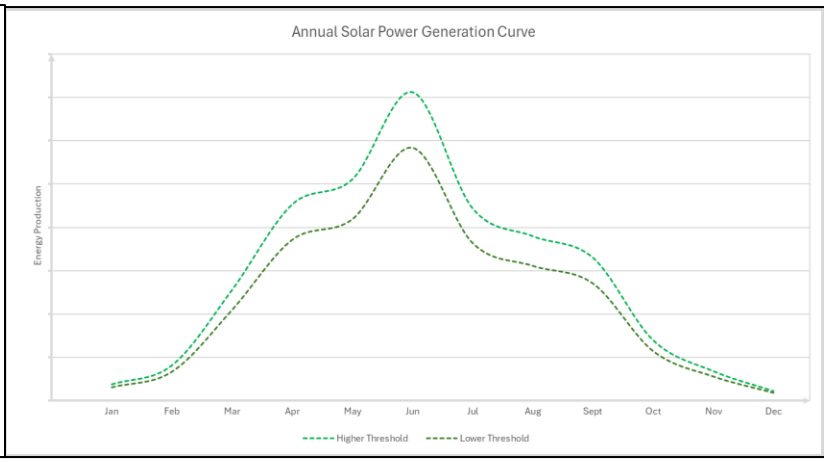
This 12-month study (Jan 1 – Dec 31, 2024) was conducted with together our customer Samat International AB. It compared 21 solar-equipped trucks installed with identical 165 Wp solar sets to 23 non-solar trucks. The 44 trucks were a mix of Scania and Volvo trucks with similar load profiles. The analysis is based on an average annual mileage of 89.957 km per vehicle.

Annual average fuel saving percentage:	**6,9 %**
Energy production *per vehicle per year*:	**92,3 kWh**
Fuel saving *per vehicle per year*:	**1.478 Litres**
Reduction in CO_2 emissions *per vehicle per year*:	**3,96 Tonnes**

Data

Timeframe:	**12 months**
Annual mileage per vehicle:	**89.957 km**
Diesel price per litre:	**1,30 €**
Solar set list price (2024):	**1.811 €**
Payback period:	**11 months**





Green Energy Samat

Results from 2024

Data Description

Date: 01/04/2025

	With Green Energy Group Solution	Without Green Energy Group Solution
Number of Trucks Monitored	21	23
Vehicle Brands	Scania and Volvo	
Total Distance Driven	3.958.100 km	
Avg. Distance per Vehicle	89.957 km	
Avg. Weight Range Load	27 - 31 Tonnes	25 - 28 Tonnes
Solar Radiation Spectrum	995 to 1.265 kWh/kWp typically Northern and Central Europe	
Diesel Price Applied (W/O. VAT)	1,30 €	-
Solar Set List Price (2024)	1.811 €	-
Annual Fuel Cost Saving per Vehicle	1.921 €	-
Payback Period:	11 Months	-

Explanations:
The **conversion factor** quantifies the relationship between solar energy production and fuel savings. As this can vary based on operating conditions, we have divided them into two modes:

- Driving Mode – where solar energy reduces direct fuel consumption by supporting electrical systems.
- Idling Mode – where solar energy replaces fuel usage for powering onboard electronics while stationary.

Payback Period – The time required for fuel savings to fully recover the initial investment. It is calculated by the fractal of 'annual fuel savings per vehicle' and 'solar set list price' multiplied by 12 months.

Kilowatt hour (kWh) is the unit of energy that is produced from PV that measures how much electricity is produced or consumed over time.

Watt peak (Wp) is the maximum power output a solar panel can generate under ideal sunlight conditions. Wp is used to compare solar panel capacity.

Inactive days is the number of days a vehicle is not in operation, meaning it is either parked, undergoing maintenance, or not actively contributing to fuel consumption and energy production. On average, the vehicles had between 5 and 8 inactive days per month, depending on seasonal and operational factors.

Solar Radiation Spectrum determines the amount of solar energy available for conversion into electricity by the solar panels. The range 995 to 1.265 kWh/kWp covers areas with moderate solar irradiation, e.g. Northern and Central Europe.

Tank-to-Wheel (TTW) measures a vehicle's energy efficiency and emissions from the moment fuel enters the tank (or energy into the battery) until it powers the vehicle, excluding fuel production and distribution.