

# SOL02: Microinverter Market Dynamics

Technical Analysis Report | February 01, 2026

## 1. Data Overview

**Subject:** Enphase Energy (ENPH)  
**Analysis Period:** 2016-02-03 to 2026-01-30 (~10.0 years)  
**Total Observations:** 13,760 rows across 4 datasets  
**Stock Data:** 2,513 daily OHLCV observations  
**Data Sources:** Yahoo Finance API (yfinance), synthetic operational metrics

## 2. Methodology

### 2.1 Metrics Computed

- Microinverter shipment volumes
- Revenue per unit economics
- Gross margin by product line
- Storage attachment rates
- Installation base growth
- Geographic expansion metrics
- Customer NPS tracking

### 2.2 Risk Analytics (CFA Standards)

- Sharpe Ratio:**  $(\text{Return} - R_f) / \text{Volatility}$  ( $R_f = 0$  for relative comparison)
- Sortino Ratio:**  $\text{Return} / \text{Downside Deviation}$
- Value at Risk (VaR):** Historical 95% and 99% confidence levels
- Maximum Drawdown:** Largest peak-to-trough decline in cumulative returns

### 2.3 Technical Indicators

- Moving Averages:** SMA/EMA (20, 50, 200 day)
- Volatility:** Rolling standard deviation (20, 60, 252 day)
- Momentum:** RSI-14, Price momentum (20-252 day)

## 3. Risk Metrics Summary

Ticker	Total Return	Ann. Return	Volatility	Sharpe	Max DD
ENPH	1500.9%	32.1%	77.7%	0.41	-92.2%

## 4. Detailed Risk Profile

### Return Distribution

Metric	Value
Positive Days	50.8%
Best Day	42.44%
Worst Day	-28.14%
Sortino Ratio	0.63

### Value at Risk

Confidence	Daily VaR
95%	-6.68%
99%	-11.80%

VaR indicates expected maximum daily loss at given confidence level.

## 5. Data Quality Assessment

**Completeness:** All trading days covered for analysis period  
**Adjustments:** Prices adjusted for splits and dividends  
**Validation:** Stock data cross-referenced with Yahoo Finance

## 6. Key Observations

---

- Solar sector exhibits higher volatility than broad market indices
- Strong correlation with energy sector and interest rate movements
- Policy sensitivity (IRA, tax credits) impacts valuation multiples
- Technology improvements driving efficiency gains and cost reductions

---

Report prepared by Mboya Jeffers | MboyaJeffers9@gmail.com  
Data Source: Yahoo Finance (stock), Synthetic (operational) | Report Code: SOL02  
Portfolio Sample - Demonstrates data engineering methodology, not investment advice  
Generated: 2026-02-01 00:53:57