LEAPTON SOLAR®

# LEAP SERIES

Higher Efficiency • Lower LCOE • Better Performance

L-TOPCon
Next-Generation TOPCon Technology

# WHY CHOOSE LEAP SERIES

Driven by global carbon neutrality goals and the transition to clean energy, solar power has become a key driver of the energy mix. Improving module efficiency is now essential for reducing costs and maximizing energy output.
Conventional PV modules are nearing their physical efficiency limits and struggle to meet the rising demand for higher power density in utility-scale and distributed applications.
High-efficiency modules with conversion efficiency above 24% represent the next industry direction, offering higher energy yield, lower LCOE costs, and stronger long-term investment returns.

## LEAP Into The Next Generation



# Chapter1 Technological Leap

## 1.1 Optimized Current Path Design

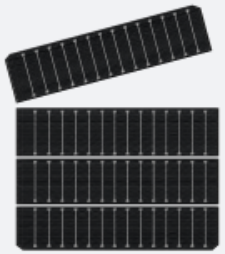
The L-TOPCon cell features a quarter-cut design that optimizes current pathways and reduces internal losses. Compared with half-cut modules, it achieves significantly lower resistive loss, while edge passivation effectively suppresses recombination at cut edges, enhancing efficiency and reliability.

Customer Value:

Higher power generation efficiency with reduced internal losses

More uniform current distribution and lower operating temperature

Improved long-term stability and reliability



75% Less Internal Loss Than Half-Cut Modules

Edge passivation effectively reduces edge recombination loss

## 1.2 Negative Spacing Shingled Technology | Higher Active Area & Increased Power Output

The negative-spacing shingled design adopts a -0.5 mm cell overlap, effectively eliminating inactive spacing and increasing module packing density. This structural optimization improves the effective light-receiving area by approximately 1.82%, delivering up to +11W additional power under the same module footprint.

Customer Value:

Increased active area for higher energy yield

Higher power output within the same module footprint

Improved power density at system level

Enhanced return on investment (ROI)

## 1.3 Reduced Cell-Level Thermal Stress via Quarter-Cut Architecture

L-TOPCon reduces individual cell size, limiting the thermal impact of local anomalies at the cell level. Compared with half-cut modules, it helps suppress hotspot formation by distributing current more evenly across smaller cell segments, improving intrinsic thermal stability of the module structure.

Customer Value:

Lower risk of hotspot-induced failure

Enhanced operational safety at cell level

Improved long-term structural reliability

## 1.4 Improved Current Distribution for Partial Shading Conditions

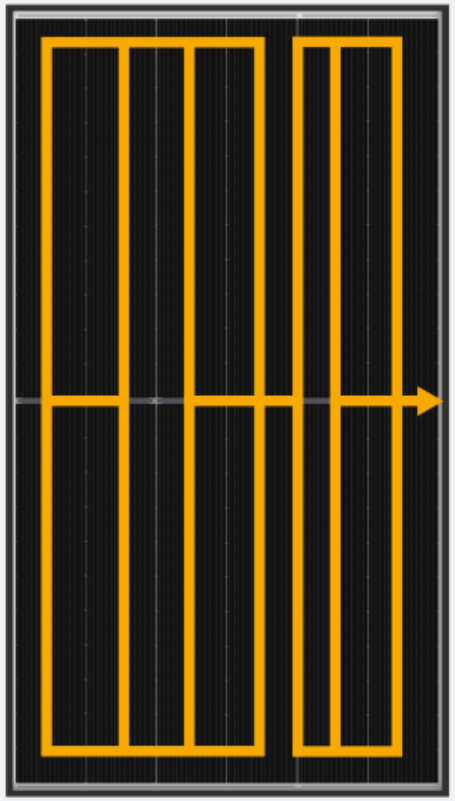
L-TOPCon increases the number of current pathways within the module, enabling more balanced current distribution under non-uniform irradiation. This structural design reduces the sensitivity of the module to localized shading and improves electrical stability at the string level.

Customer Value:

Reduced mismatch loss under shading

More stable energy output in complex environments

Better adaptation to real installation conditions

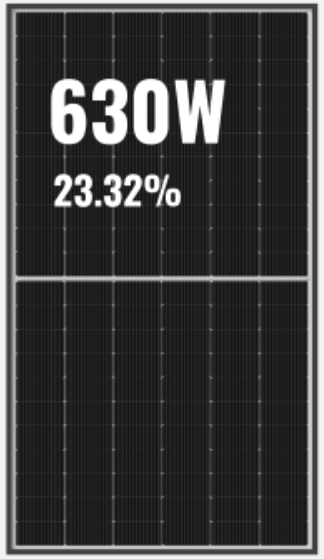


6 parallel current routes

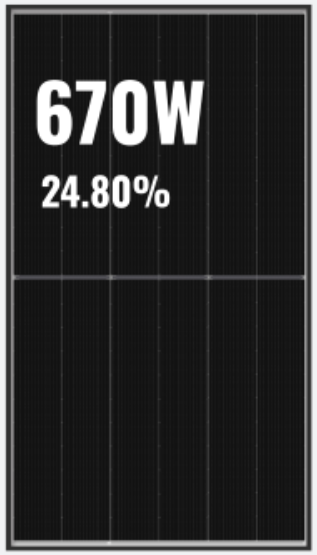
# Chapter2 Beyond Performance

## 2.1 Same Size. More Power.

TOPCon




L-TOPCon

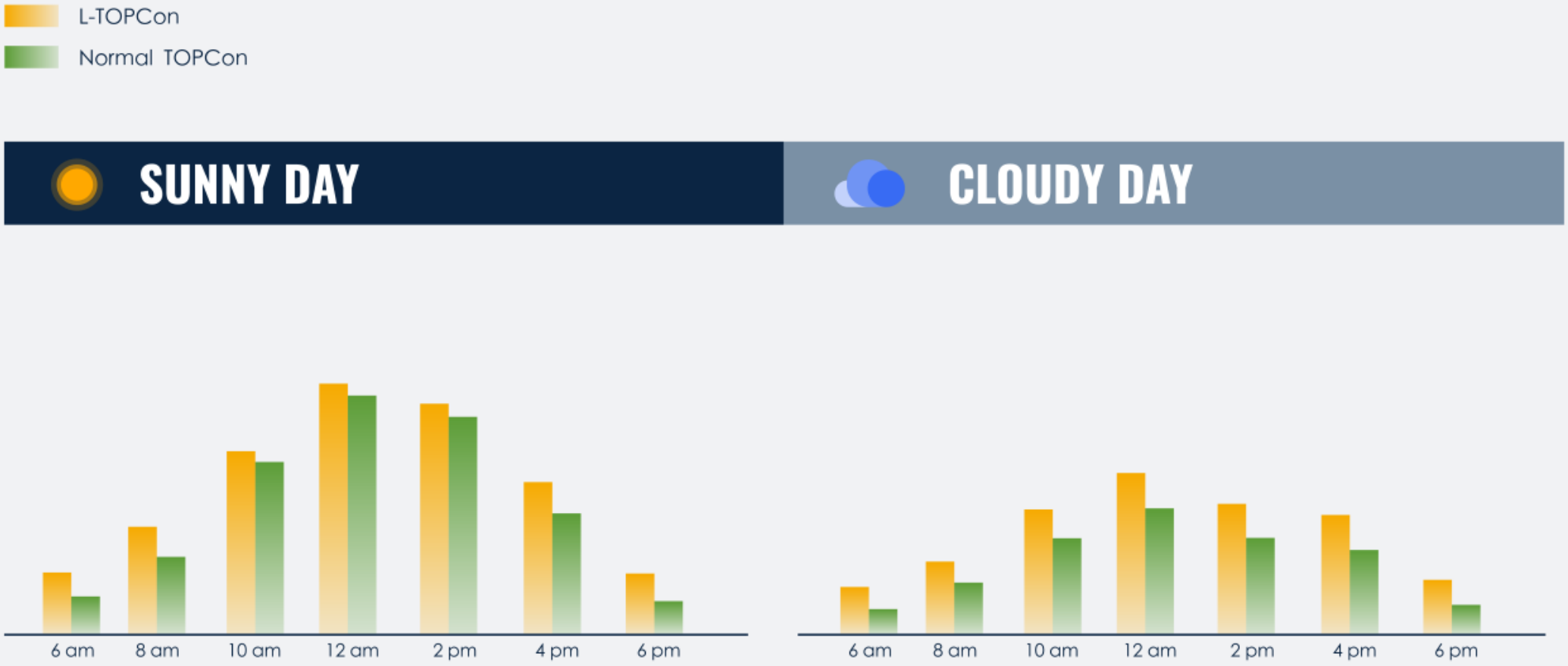



Power increased 30~40W

Module efficiency over 24%

## 2.2 Enhanced low-light performance

### Smaller current paths = Lower loss = More usable energy under weak sunlight




*The data is based on interal simulation and field testing Actual results may vary depending on location, installation and system configuration.

# 2.3 Enhanced Shading Tolerance & Hot-Spot Resistance

In real-world applications, leaves, dust, bird droppings, and nearby obstacles often cause partial shading on solar modules.
Under these conditions, different module architectures respond very differently—not only in terms of power loss, but also in electrical stress and thermal behavior.
This is where cell design becomes critical, directly impacting shading tolerance and hot-spot risk at the module level.

TOPCon

## Dual-Circuit Architecture

Traditional half-cut modules typically use two independent circuits for the upper and lower sections.
When the upper section is shaded by leaves or other obstacles:

1. The entire upper circuit is affected

2. Power generation may decrease in shadow area.

3. The more concentrated the shading, the greater the power loss

L-TOPCon

## Advanced 6-Circuit Architecture

The L-TOPCon module features a more refined internal structure with 6 independent current circuits.
Even when only a small area is shaded:

1. Only one small circuit is affected

2. The remaining sections continue generating power normally

3. Power generation may decrease a little in shadow area.

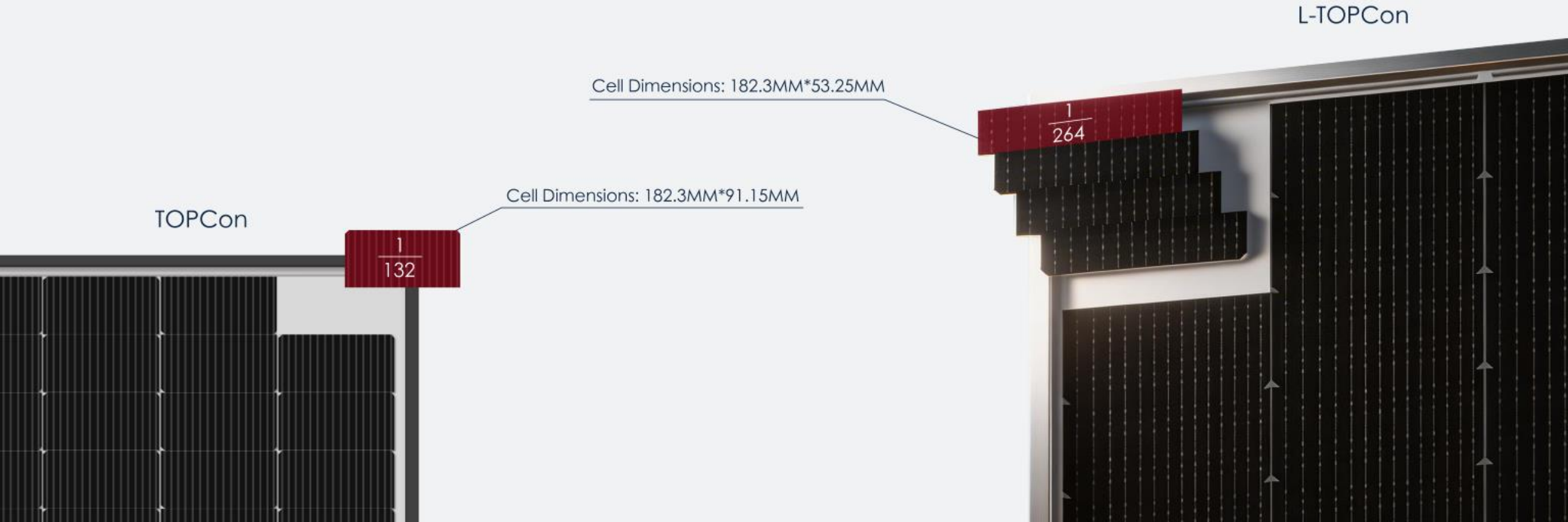
L-TOPCon four-cut cell design splits each cell into smaller segments and distributes current through multiple paths. This prevents current concentration under partial shading, significantly reducing local overheating and hot-spot risk, and improving overall module reliability.

## 2.4 Enhanced Mechanical Reliability and System Fault Tolerance

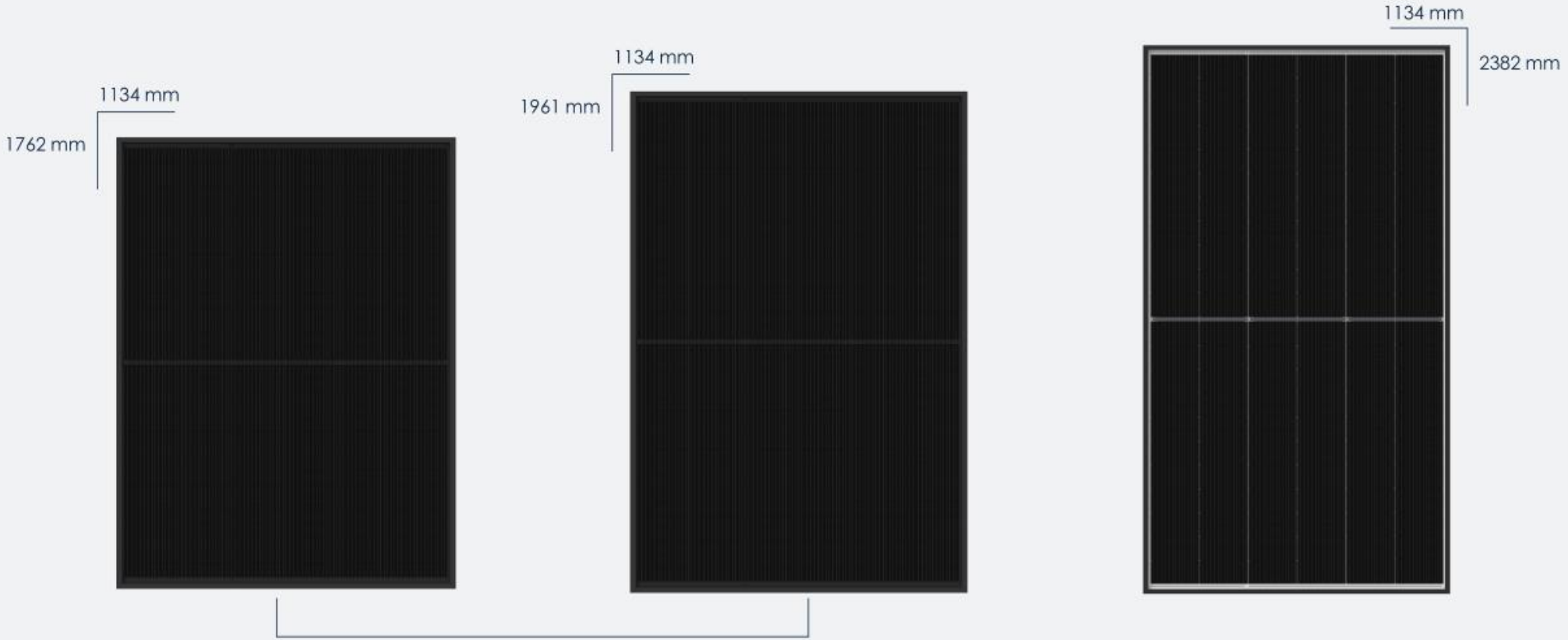
The L-TOPCon four-split-cell architecture reduces individual cell size, fundamentally improving mechanical and system-level reliability.

Taking L-TOPCon 670W and normal TOPCon 630W module as an example:

- A single cell failure in the four-split-cell L-TOPCon module affects only 0.37% of the system output.
- In contrast, half-cell 630W TOPCon module affects approximately 0.76% of the system output.



# Chapter3 Seamless Upgrade



# Chapter4 Lower LCOE, Greater Value

**Project Capacity: 2MW** **Climate Type: Monsoon climate – four distinct seasons, mild temperatures** **Annual Average Irradiation: 1387–1460 kWh/m²**

| Category | LP182*210-M-66-NB 630W | LP182*210-M-66Q-NB 670W | Advantage |
|---|---|---|---|
| Module Power | TOPCon 630W | L-TOPCon 670W | +6.3% higher per module |
| Module Quantity | 3,175 pcs | 2,985 pcs | -6.0% fewer modules |
| System Complexity | Higher | Lower | ↓ reduced system complexity |
| Electrical Connections | More | Fewer | ↓ ~6% fewer connection points |
| Installation Effort | Higher | Lower | ↓ ~5 – 7% installation workload |
| BOS Cost | Higher | Lower | ↓ ~4 – 6% BOS cost |
| Total CAPEX | Higher | Lower | ↓ ~1 – 2% total investment |
| Annual Energy Yield | 2,770 MWh | 2,850 MWh | +2.9% higher yield |
| 25-year Energy Output | Lower | Higher | +2 – 3% lifetime gain |
| Bifaciality | 80% ±5% | 85% ±5% | +5% higher rear-side gain |
| Annual Degradation | 0.40% | 0.35% | ↓ 12.5% lower degradation rate |
| LCOE | Higher | Lower | ↓ ~4 – 8% lower LCOE |

* Results are based on internal simulation and field testing. Actual values may vary depending on location, installation conditions, system design, and market price fluctuations.

LEAPTON SOLAR

> Helping distributors build a scalable and profitable solar business.

## OUR COMMITMENT

We focus on long-term market growth- together with our partners.

**GROW FASTER** | **REDUCE RISK** | **IMPROVE PROFITABILITY**