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pv magazine webinars

Scaling back contact for every scenario

27 November 2025

9:00 am – 10:00 am | CET, Berlin, Madrid, Paris
1:30 pm – 2:30 pm | IST, Delhi
7:00 pm – 8:00 pm | AEDT, Sydney

Mark Hutchins
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LONGi

Welcome!

pv magazine webinars

Do you have any questions? ❓ 🙋

Send them in via the Q&A tab. 👉 We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 📹

We‘ll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience. 👀 💡

LONGi

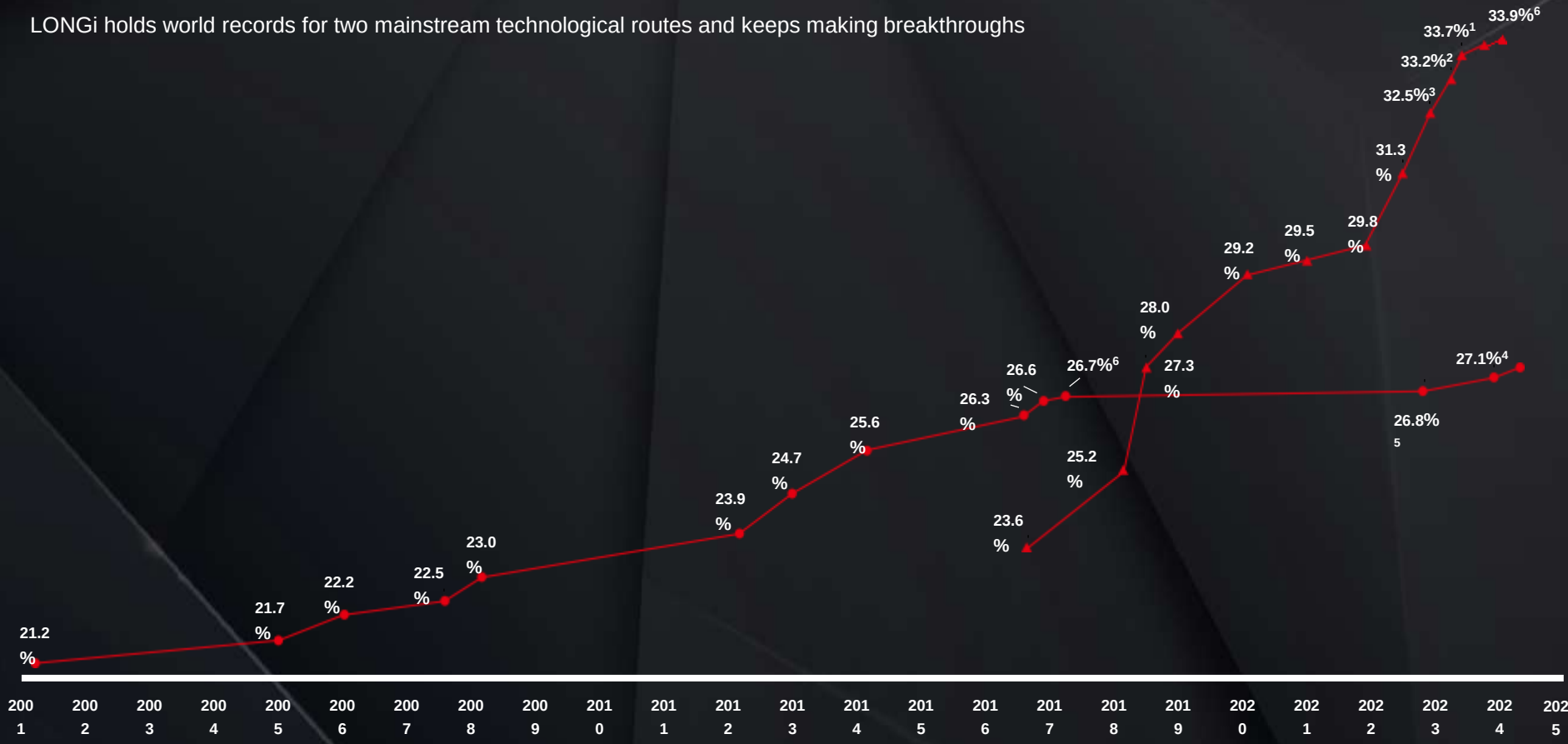
BEYOND CHAMPIONSHIP
CREATE NEW HORIZONS

Scaling back contact for every scenario


WHY IS BC THE MOST OPTIMAL CHOICE?

WE’ RE MAKING HISTORY, AND THE QUEST GOES ON

LONGi holds world records for two mainstream technological routes and keeps making breakthroughs



34.85%

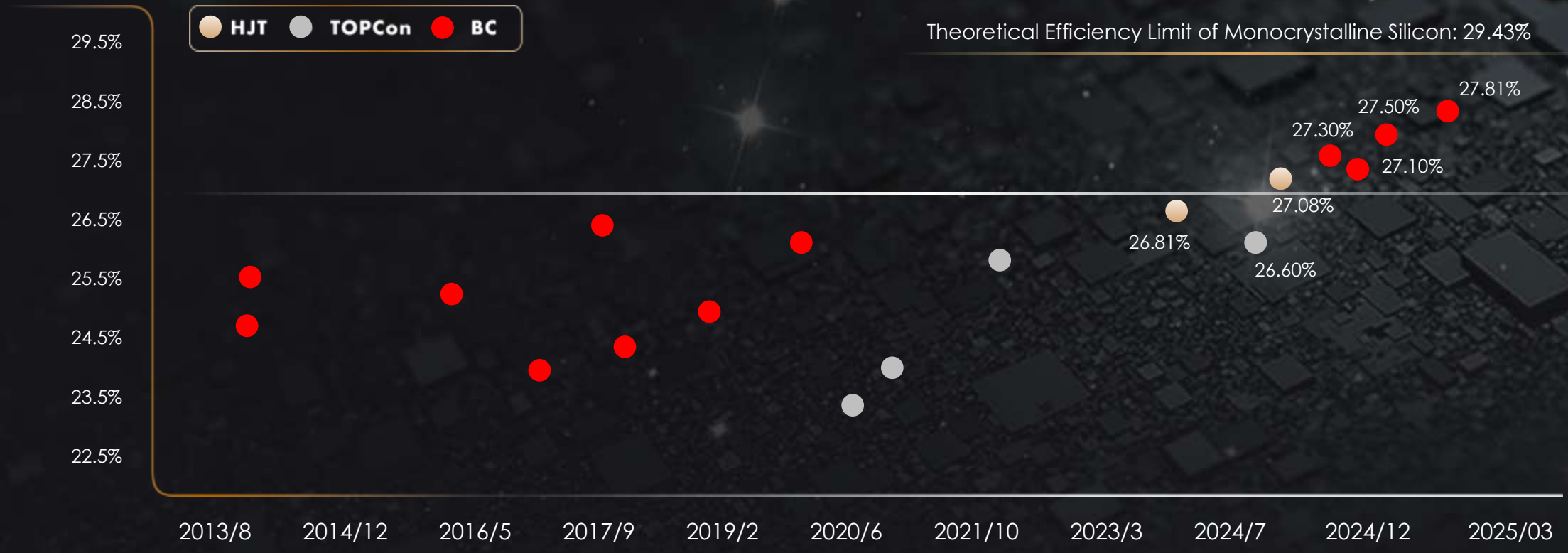
2025.4
LONGi Silicon-perovskite tandem solar cell world record

27.81%

2025. 04
LONGi Crystalline silicon HJT back-contact solar cell world record

Note – 1- 2023.04, KAUST (KPV-Lab) 2- 2023.06, KAUST (KPV-Lab) 3- 2022.12, Helmholtz-Zentrum Berlin (HZB)
4- 2023.12 LONGi 5- 2022.11 LONGi 6- 2017.03, Kaneka Corp. 6-2023.11,NREL

BC IS THE SOLAR CELL TECHNOLOGY CLOSEST TO THE THEORETICAL EFFICIENCY LIMIT



BC IS THE THEORETICALLY ULTIMATE TECHNOLOGY

Zero

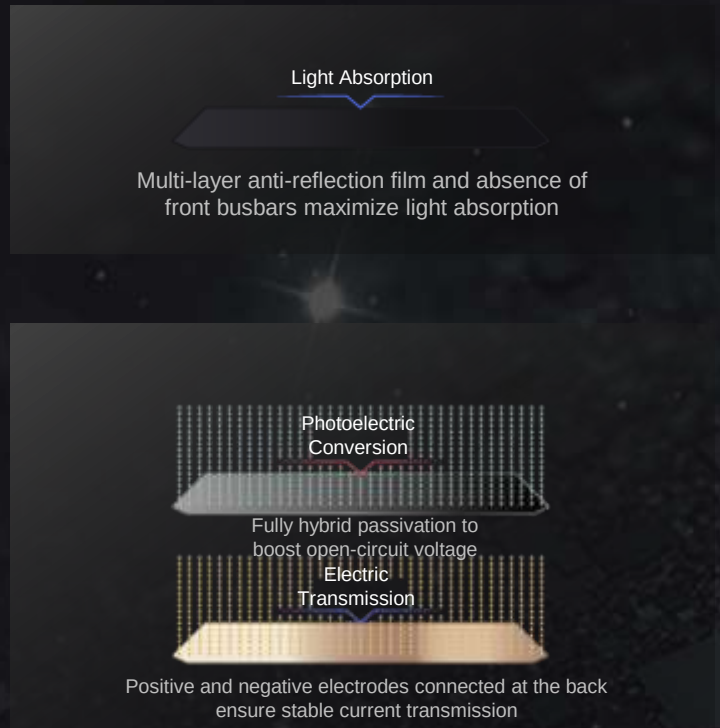
Light loss

60% +

Reduced current loss[1]

Maximum

Technology compatibility



29.1%

Highest practical cell efficiency among all Si technologies[2]

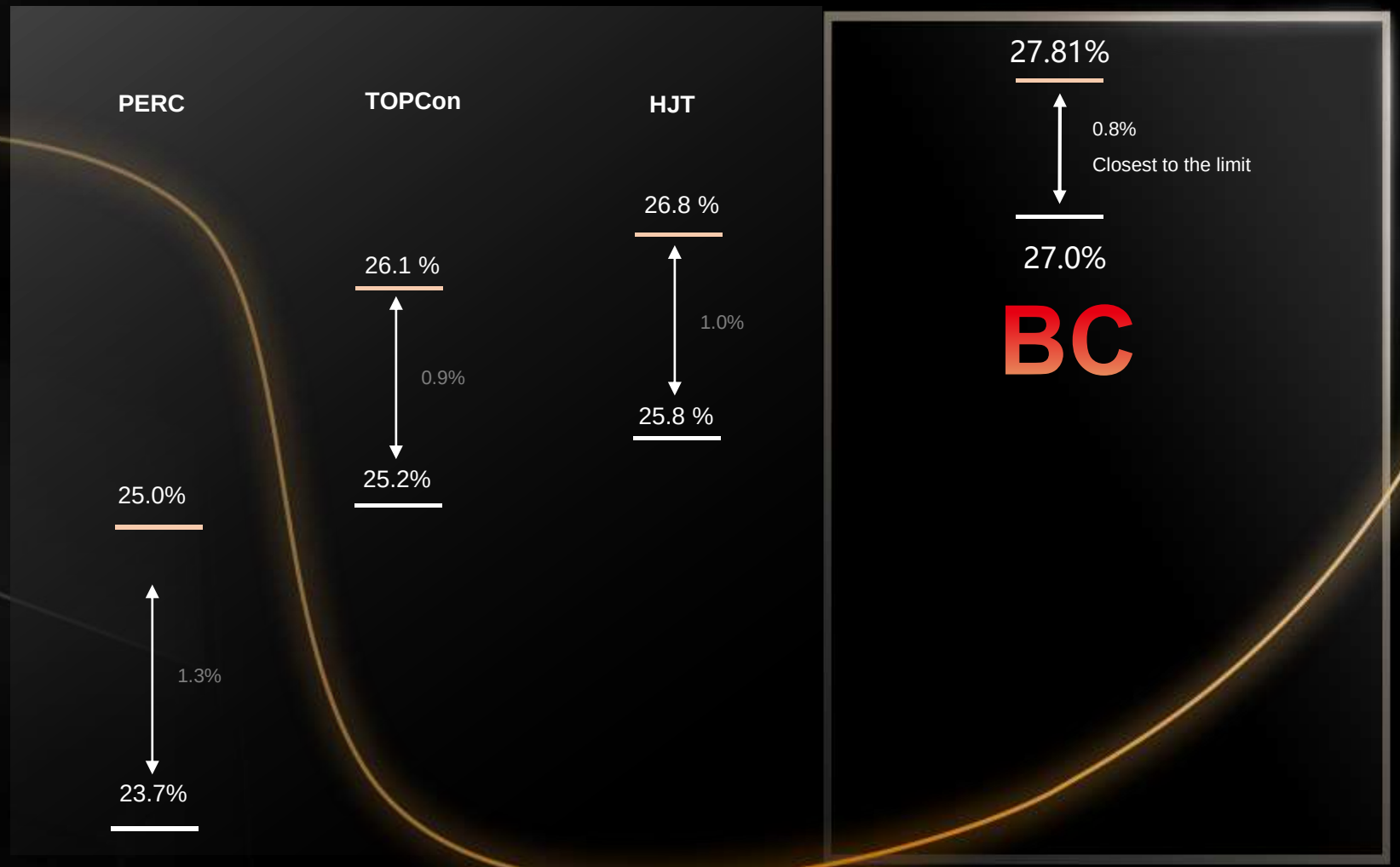
Note – 1- compared to TOPCon
2- single-junction crystalline Si cell technologies

WE ARE ON THE CLOSEST PATH TOWARDS THE EFFICIENCY WORLD RECORD

LONGi

CELL EFFICIENCY WORLD RECORD

CELL EFFICIENCY IN MASS PRODUCTION



DEDICATED INNOVATION MAKES THE COMMERCIALIZATION OF BC HAPPEN

2017
Propose cell concept and complete structural design

2019
Complete mass production prototype

2021
Technical breakthrough Successful produced

2022
Cell efficiency has exceeded 25.5% and mass production has been achieved

2024
Pursuing ultimate efficiency 27.3%

2025
Cell efficiency has exceeded 27%+ and mass production has been achieved

R&D investment

1+ Billion

Patent application filed

550+(HPBC)

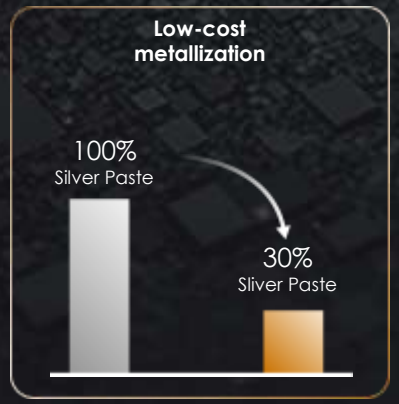
R&D team staff

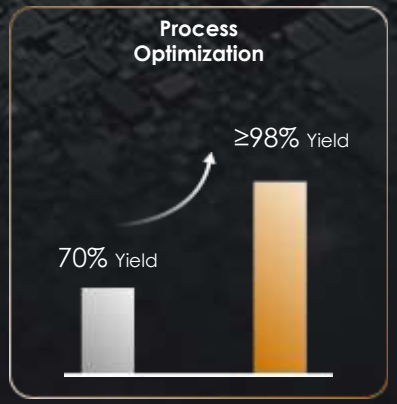
1000+

Number of patents granted

300+(HPBC)

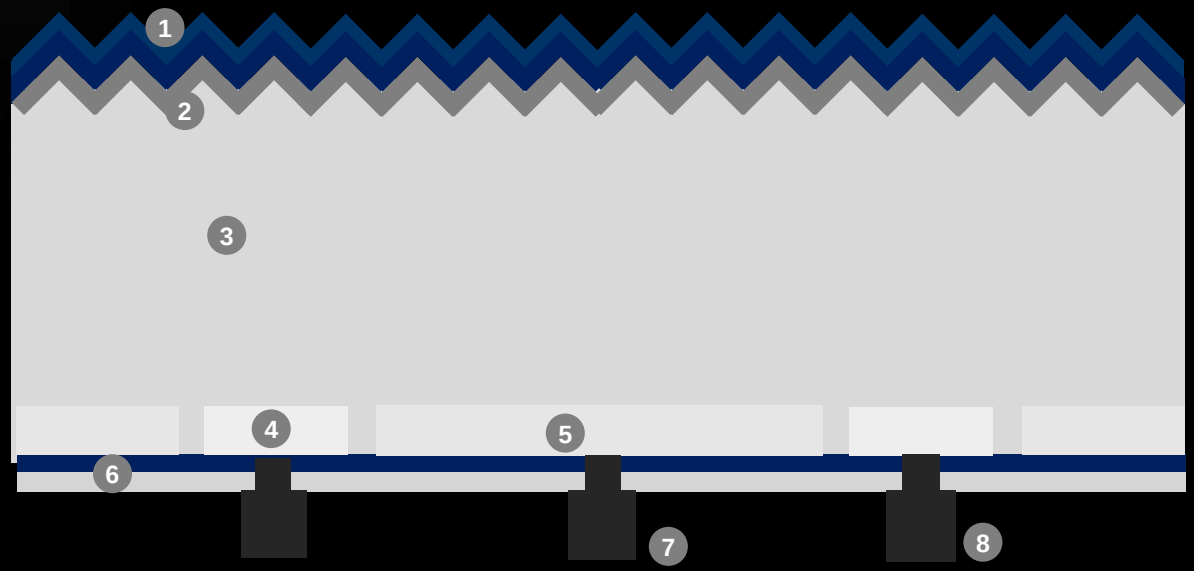
Technological breakthroughs





HPBC 2.0
SUPERIOR CONVERSION EFFICIENCY, POWER, TEMPERATURE COEFFICIENT, AND HIGHER RELIABILITY COMPARED TO THE PREVIOUS GENERATION

1. Multi-layer antireflection coating
2. Low-recombination passivation layer
3. N-type substrate
4. Passivation layer p+
5. Passivation layer n++
6. Multi-layer passivating antireflection coating
7 8. Positive and negative metal electrodes



Ⅰ Improved passivation performance, reduced dark saturation current J_0, increased V_{oc}, resulting in optimized power temperature coefficient and weak light performance.

Ⅱ **A f**ront with no gridline shading can maximize the optimization of the front optical film layer and front surface passivation.

Ⅲ Both the backside positive and negative electrodes are adopted with ultra-low-recombination heterojunction technology, matched with a low-resistance contact layer to reduce the contact resistance ρc and improve the efficiency of the **cell**.

GROUNDBREAKING TECHNOLOGY, REDEFINING INDUSTRY STANDARDS.

LONGi

Hi-MO 9 Full-scenario BC products

Up to 24.8%

670W

TOPCon

23.32% 630W

HJT

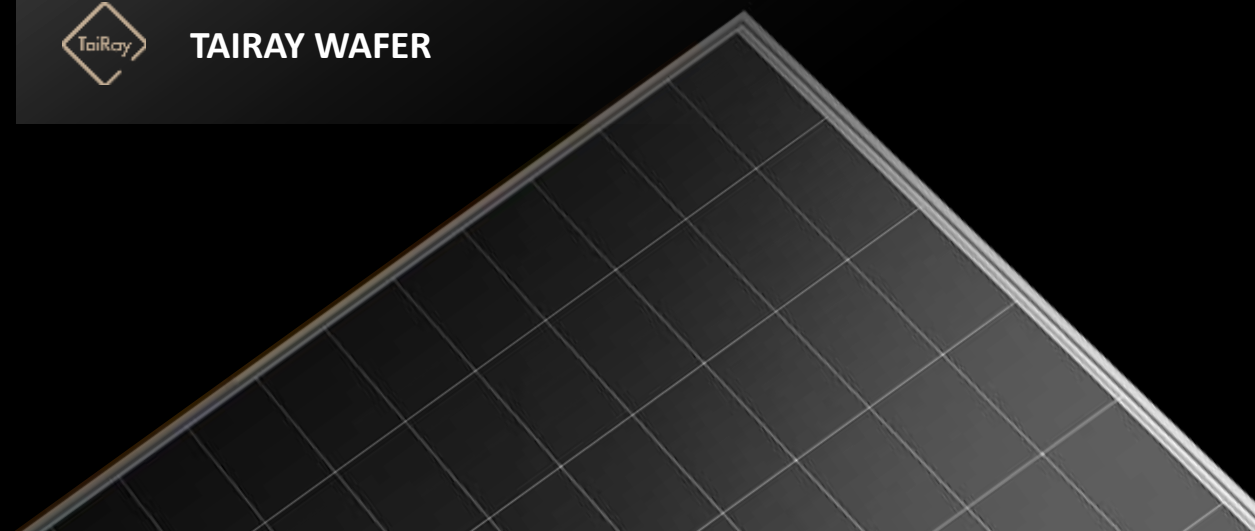
23.51% 635W

~6.4%more

installed capacity

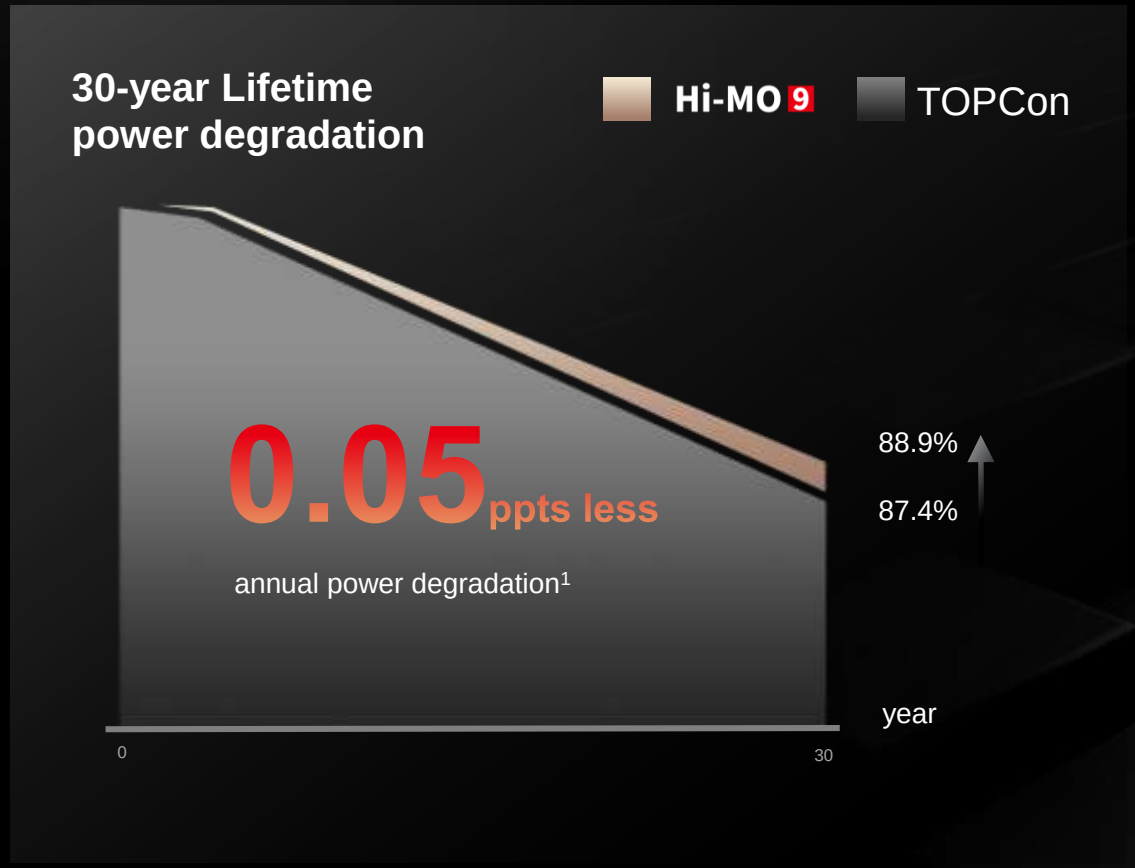
HPBC 2.0 TECHNOLOGY

TAIRAY WAFER



Note – compared with 630W TOPCon with the same module dimension at 2382mm x 1134mm, under the condition of same land area

LOWER DEGRADATION FOR UNWAVERING PERFORMANCE

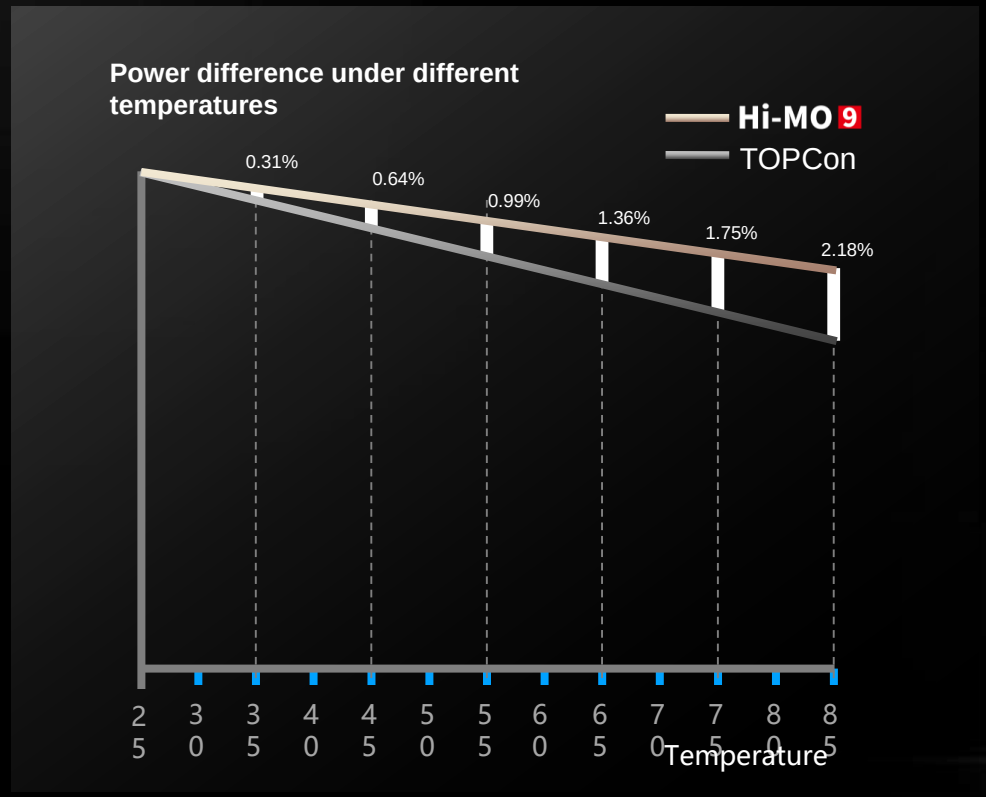


1.51% more

power generation[2]

1 – Compared with TOPCon
2 - Per watt power generation compared with TOPCon, includes degradation adaptation optimization

LOWER TEMPERATURE COEFFICIENT, BOOSTED PERFORMANCE



UP TO

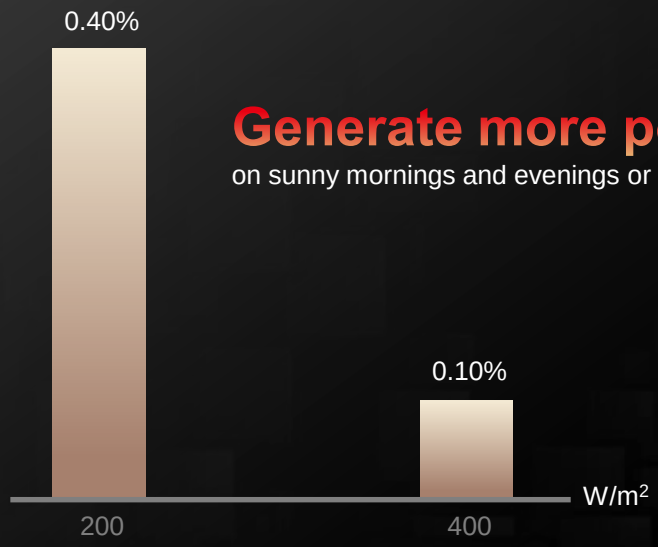
power

2.18% higher

Note – per watt power generation compared with TOPCon under the same environmental condition

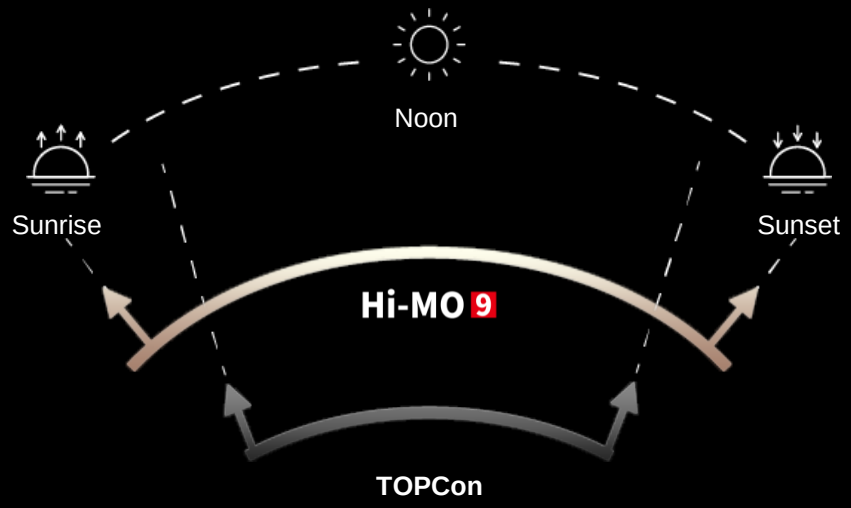
THE DAYTIME BRIGHTNESS IS EXTENDED

Daytime Power Improvement
under different Solar Irradiance



Generate more power
on sunny mornings and evenings or cloudy days

Longer time for power generation



Note – compared with TOPCon under low-irradiation condition

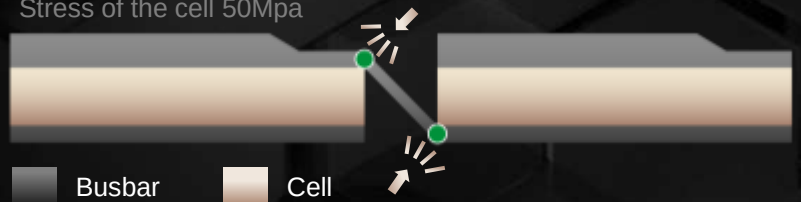
EXCEPTIONAL STRUCTURE FOR INCREASED STRENGTH

Hi-MO 9

Less risk of micro cracking
Stress of the cell 26Mpa

Traditional products

Higher risk of micro cracking
Stress of the cell 50Mpa



With a busbar soldered on the back,

50% less

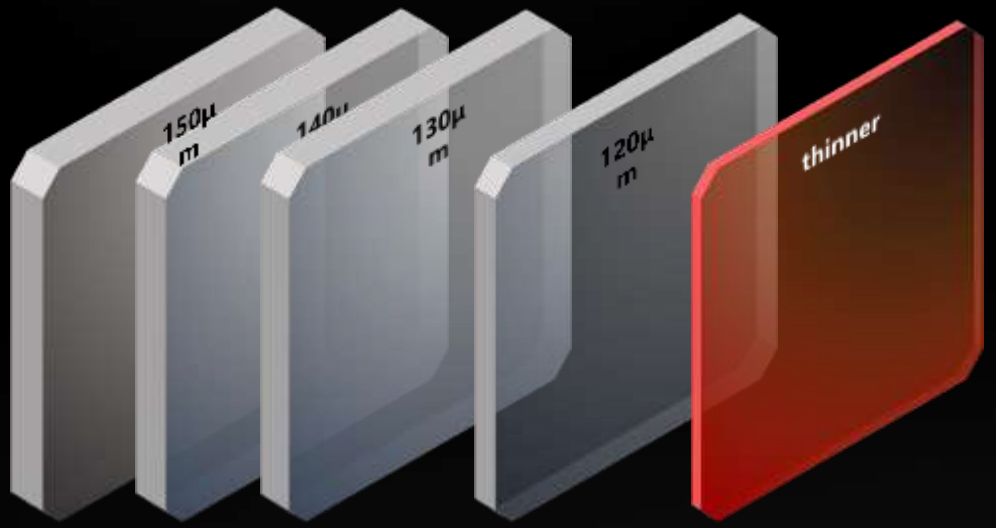
stress to the cell and
stronger resistance to micro cracking

19% less

loss from soldering related risks

PREMIUM QUALITY BACKED BY THICKER WAFER

The thinner the wafer, the higher the risks of reliability



Hi-MO 9

10μm thicker

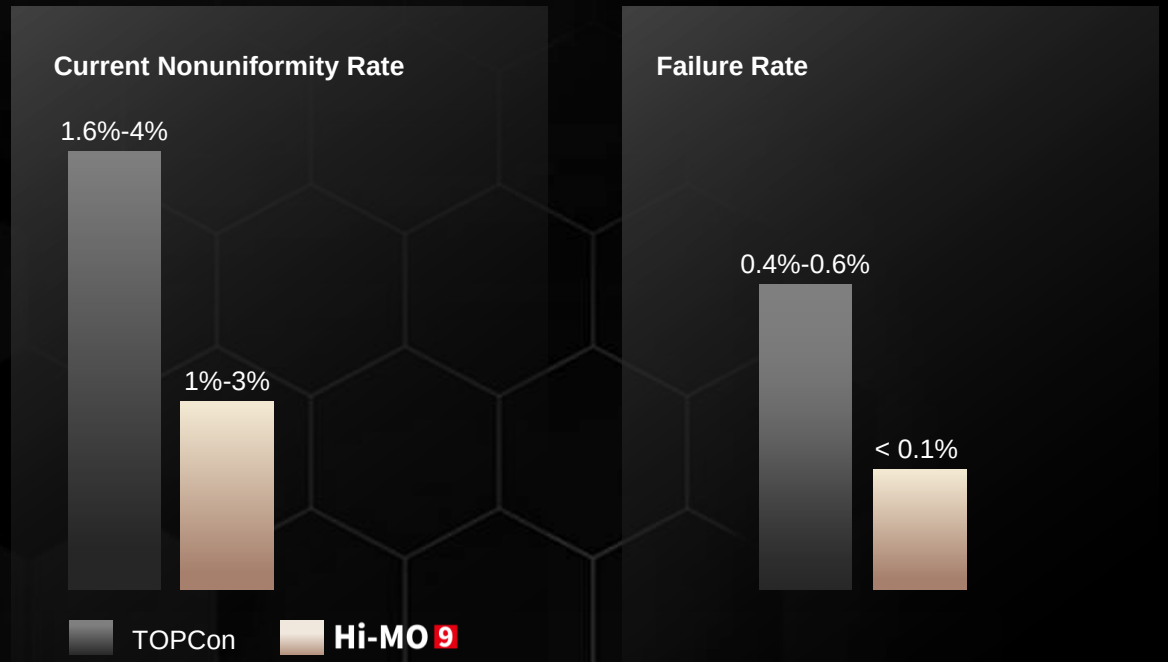
SIGNIFICANT POWER GENERATION ADVANTAGE UNDER UNEVEN IRRADIATION

up to 92% less

Power generation loss from uneven light irradiation

Note – compared with TOPCon with same layout under same condition

LOWER RISK FROM CURRENT NONUNIFORMITY
NO MORE FAILURE WORRIES



~30% less

Risk of current nonuniformity

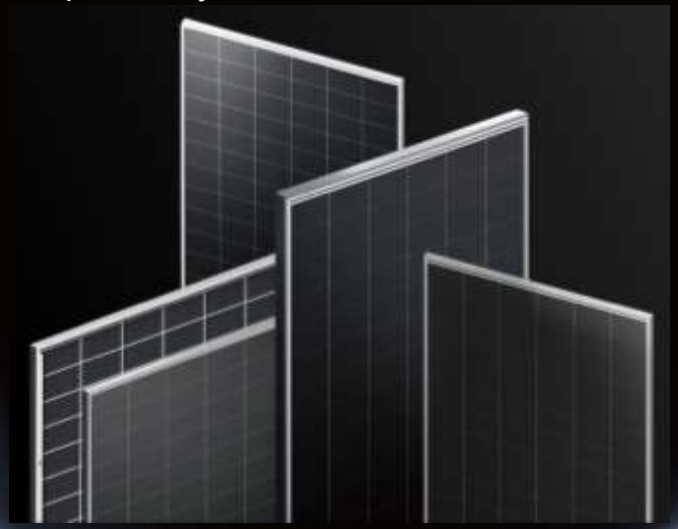
~80% less

Subsequent failures

Note – compared with TOPCon, the data is based on industry research and theoretical simulation, the real results depend on the project situation

Hi-MO 9 Scenario-based

Designed specifically for customers' diverse scenario needs



HPBC 2.0

More power generation| High reliability

- Leap the Cell Technology Barrier
- Leap the Silicon Substrate Limitations
- Leap the BC Manufacturing Dilemma

High standards Intelligent manufacturing

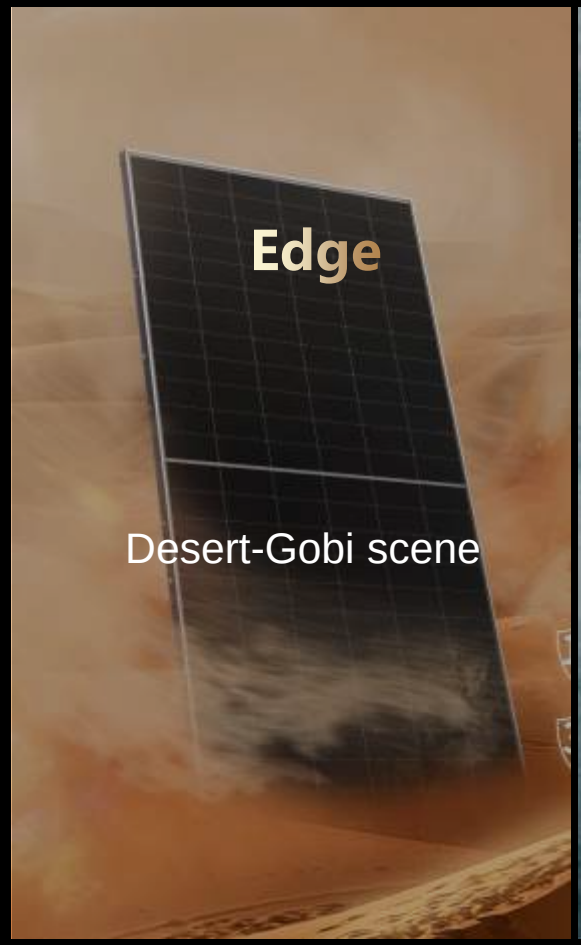
High quality| Long-term returns

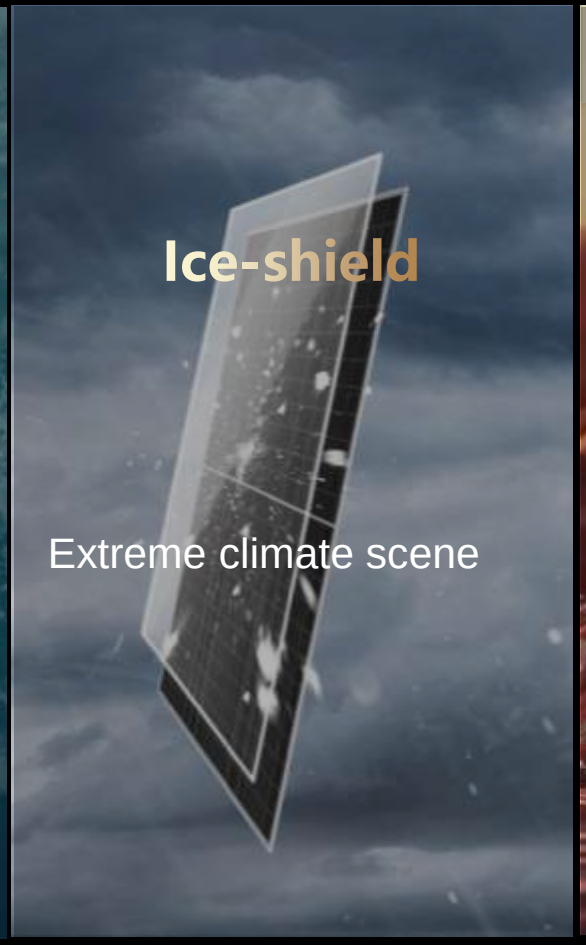
- LONGi Product Life Cycle Standards
- The Only Lighthouse Factory in the PV Industry
- Heightened Test

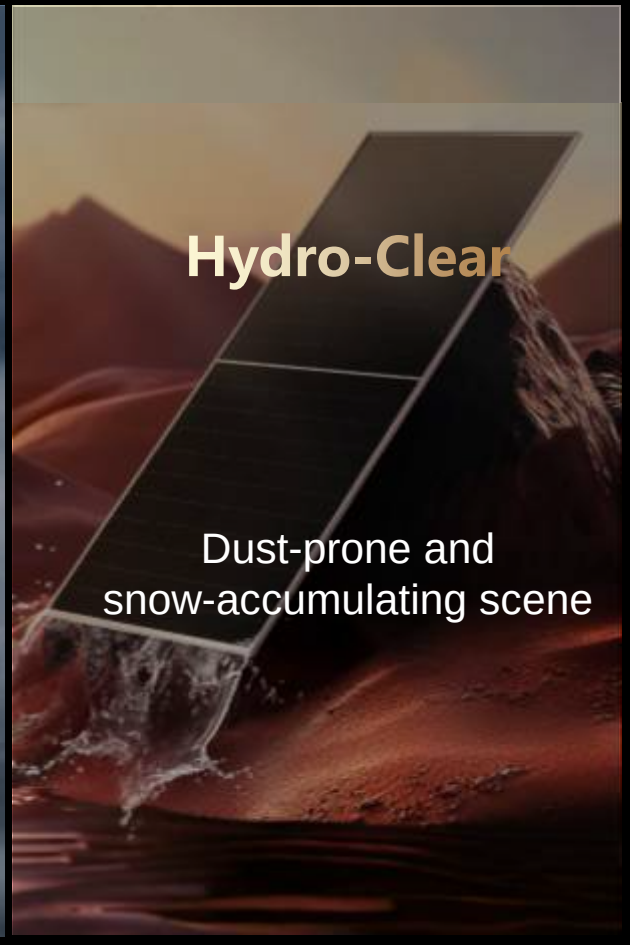
Modules scenario-based design

Hi-MO 9 Scenario-based Series

Designed specifically for customers' diverse scenario needs







WHAT DOES Hi-MO 9 MEAN TO U ?

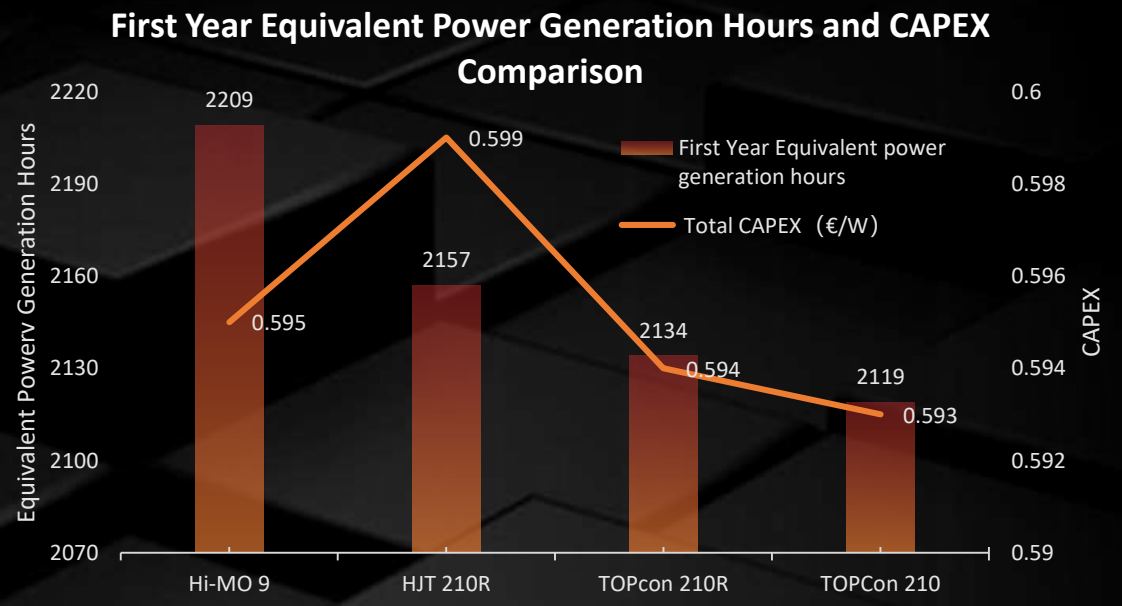
Hi-MO 9 Third Party Technical Advisor Value Endorsement Map

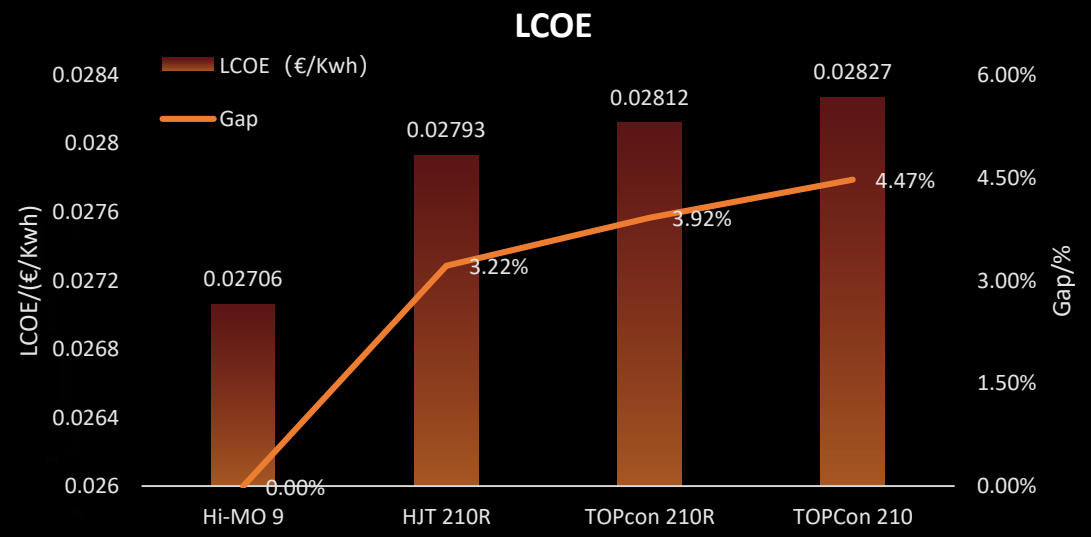
Value Analysis by Third Party Technical Advisor

- LONGi has collaborated with Enertis, a well-known third-party technical consulting company in Europe, to conduct a comprehensive analysis and simulation of the use of different modules in utility PV projects in Spain.

Project Basic Information:

Spain-Seville 47MW 1P Tracker Project				
Module Type	Hi-MO 9	HJT 210R	TOPCon 210R	TOPCon 210
Module Dimension	2382*1134*30mm			2384*1303*33mm
Power Bin/W	650	630	620	710
Module Price€/W	BL	BL	BL-0.007	BL-0.007





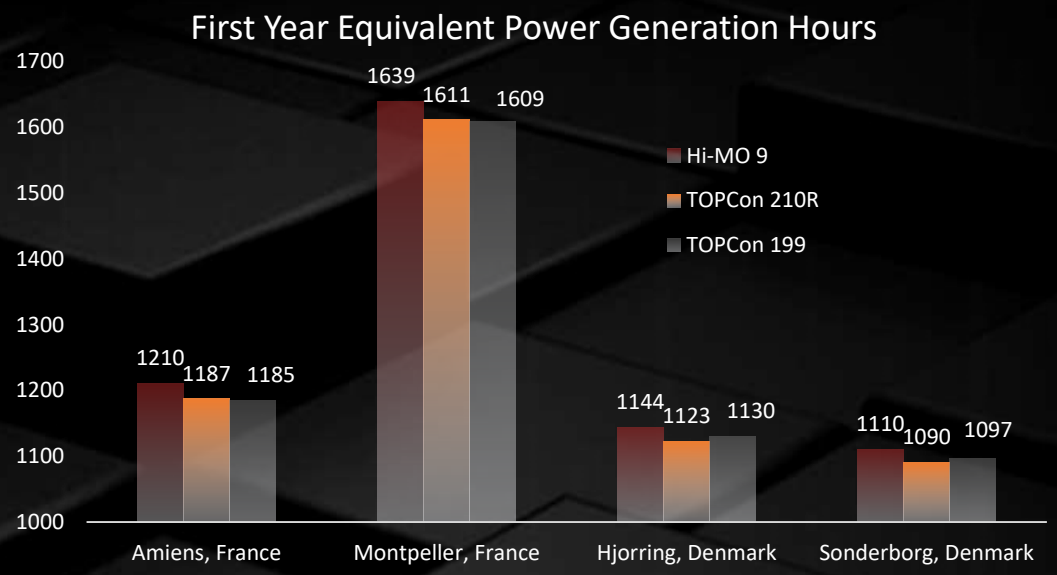
Value Analysis by Third Party Technical Advisor

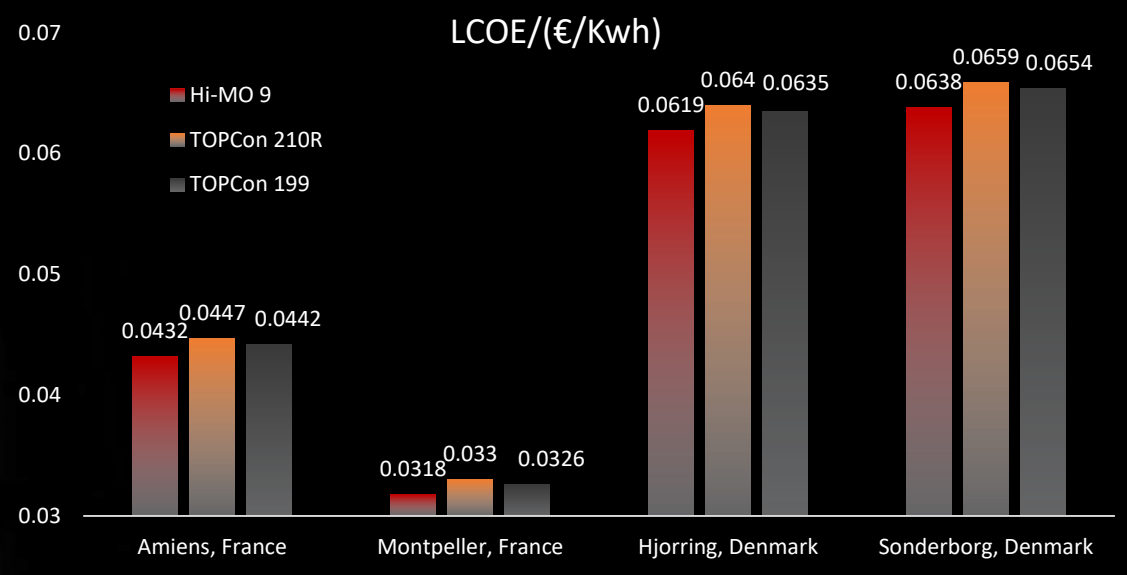
- LONGi has collaborated with IPVF, a well-known third-party technical consulting company in Europe, to conduct a comprehensive analysis and simulation of the use of different modules in utility PV projects in France and Denmark.

Project Basic Information:

France Amiens & Montpeller 50MW Fixed Project
Denmark Hjorring & Sonderborg 50MW Fixed Project

Module Type	Hi-MO 9	TOPCon 210R	TOPCon 199
Module Dimension	2382*1134*30mm		2465*1134*30mm
Power Bin/W	655	620	635
Module Price€/W	BL	BL-0.01	BL-0.01



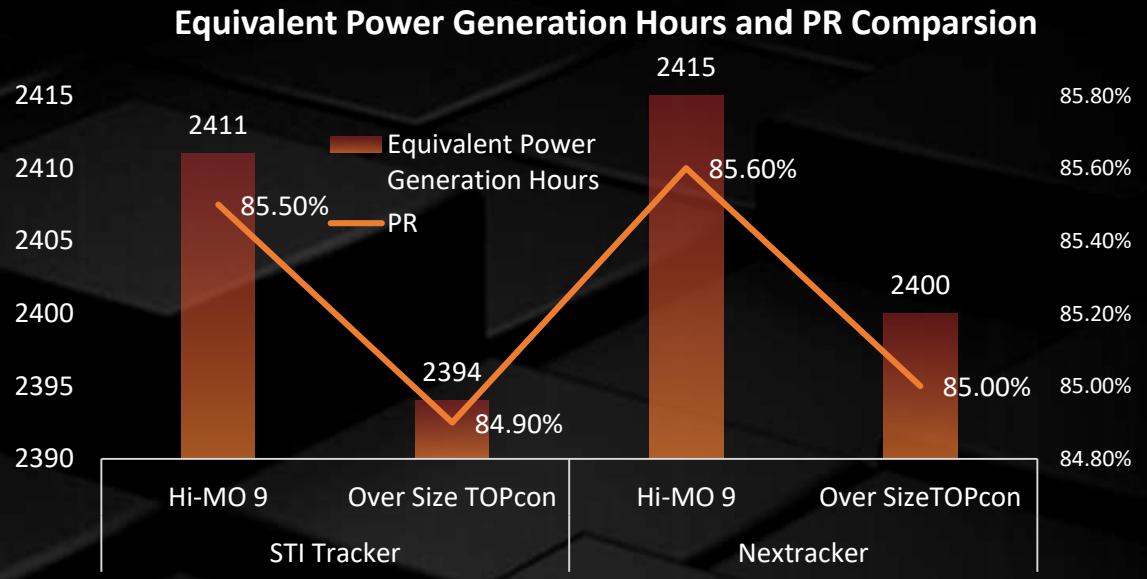


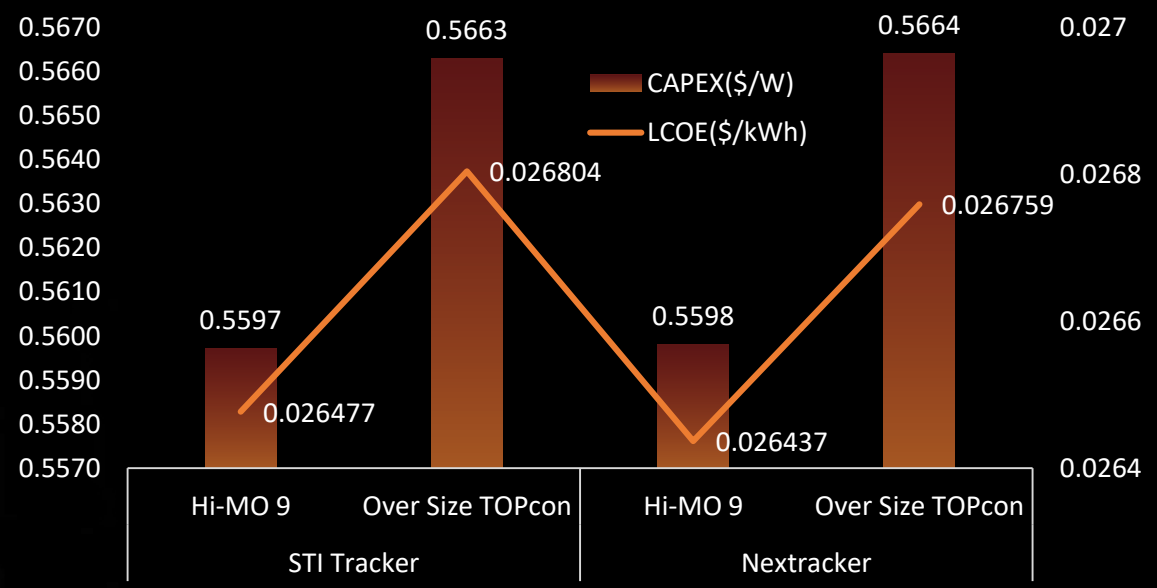
Value Analysis by Third Party Technical Advisor

- LONGi has collaborated with Fotovoltec Solar, a well-known third-party technical consulting company in LATAM, to conduct a comprehensive analysis and simulation of the use of different modules in utility PV projects in Brazil.

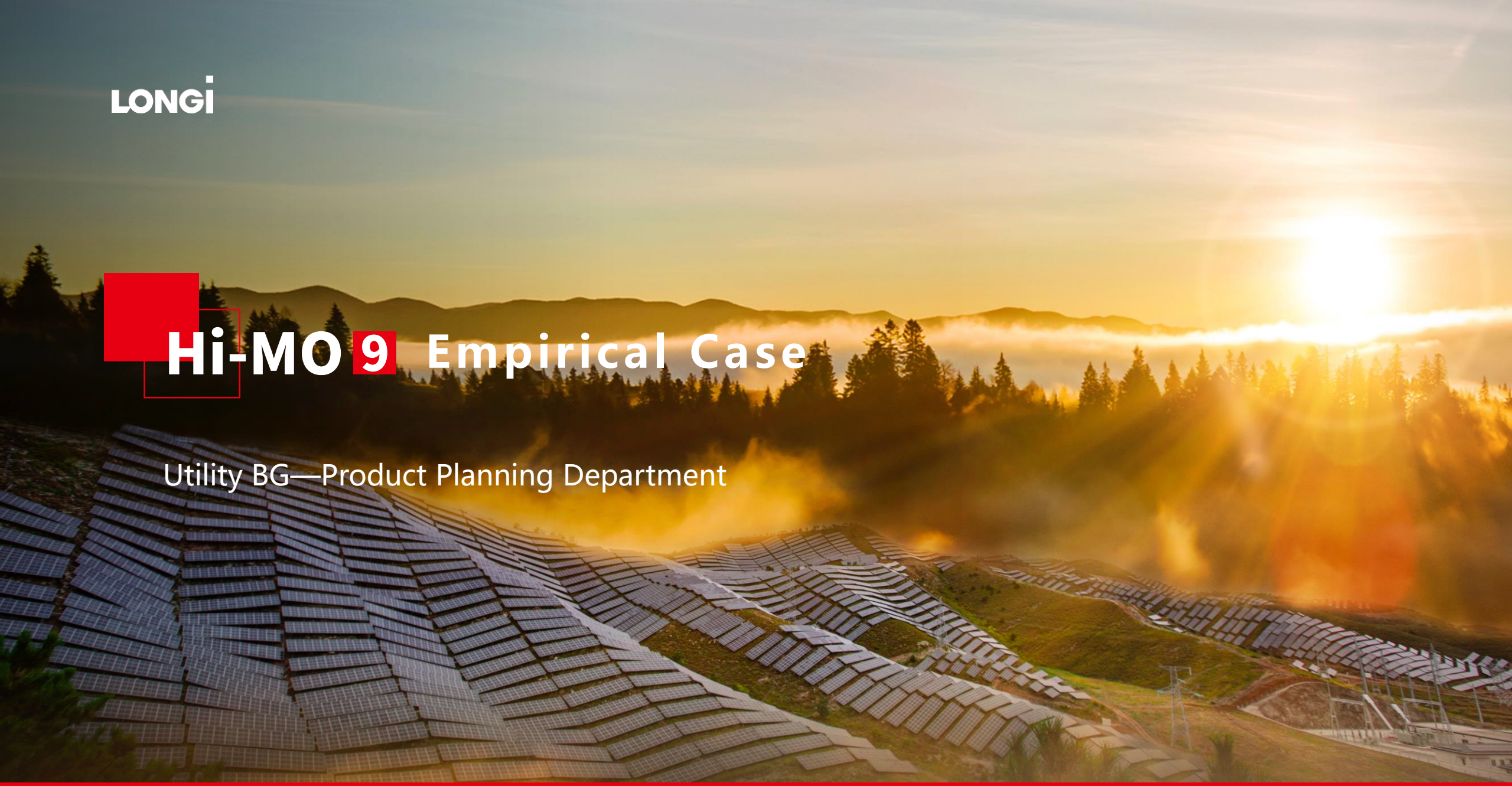
Project Basic Information:

Brazilian Northeast 194MW(DC)		
Module Type	Hi-MO 9	TOPCon Over Size
Module Dimension	2382*1134*30mm	2384*1303*33mm
Power Bin/W	645	700
Tracker Supplier	STI or Nextracker	
Module Price€/W	BL	BL





zhoujiayue@longi.com

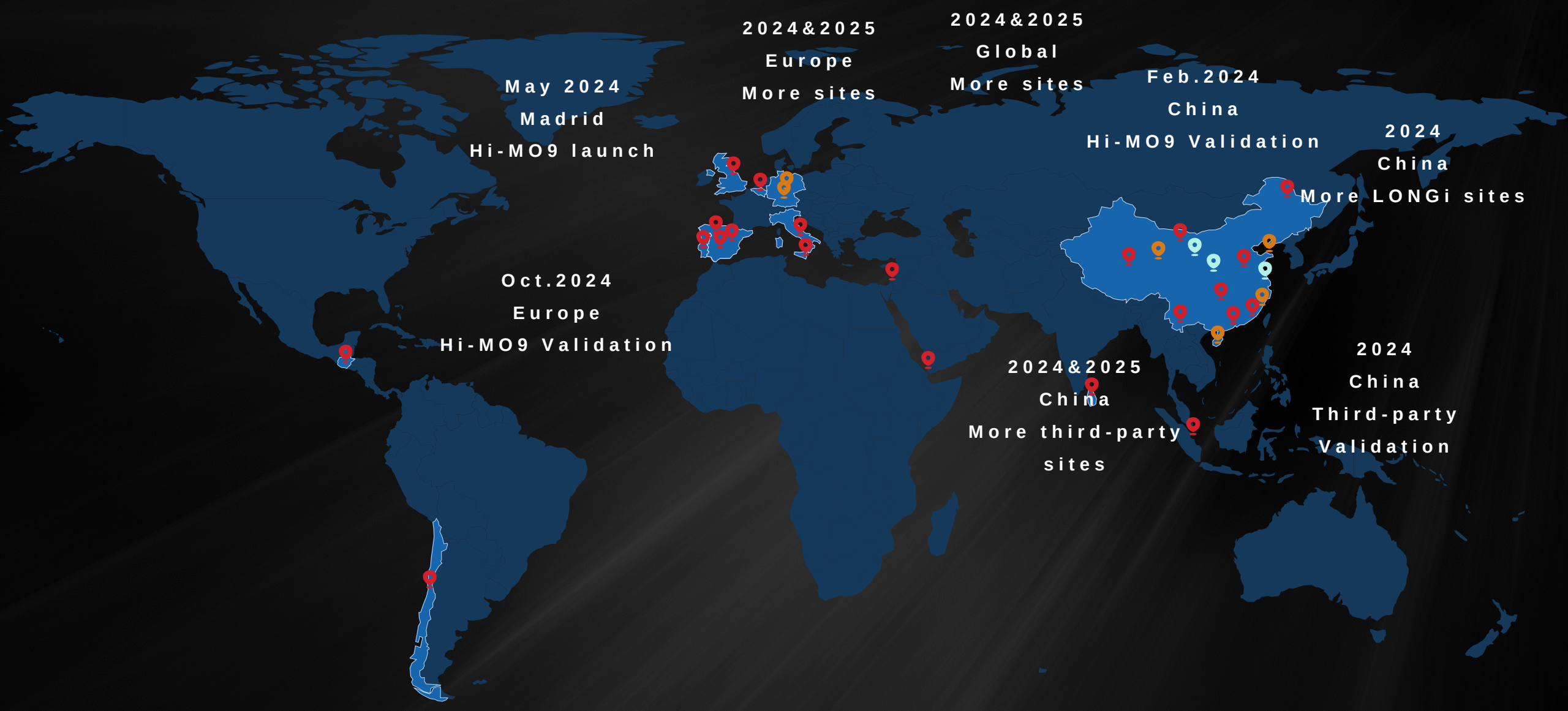


Hi-MO 9 Empirical Case

Utility BG—Product Planning Department

Contents

Hi-MO 9 Global Empirical Platform Since 2024 Launch



LONGi Global Validation Platform Since 2019

LONGi

Real Time | Reliable Yield | Trustable Addition

How We Build a Global Empirical Platform?

Methodical Data Acquisition & Structuring

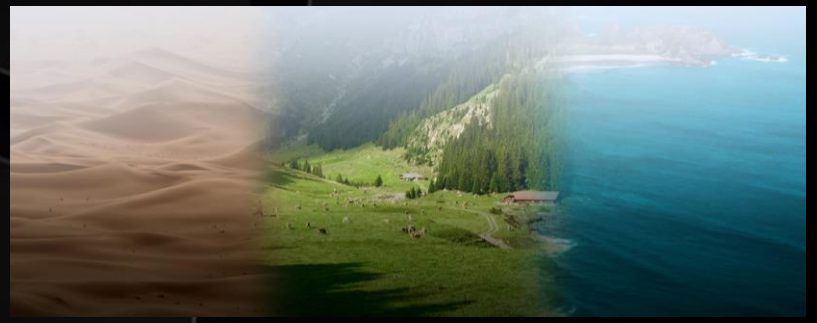
LONGi

Empirical Objectives:

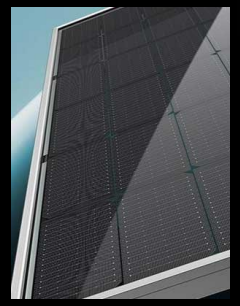
Validate module design performance across multiple scenarios and climatic conditions (varying latitudes/longitudes, high-temperature, high-humidity, extreme cold, salt spray, water-based, desert, and etc.).

Field Testing Planning → Data Collection → Database Establishment → Data Comparison → Module Performance Validation

Empirical Categories:



Scenario Dimension



Technology Dimension

鉴衡认证 CHINA GENERAL CERTIFICATION

CPVT 国家光伏质检中心

国检集团

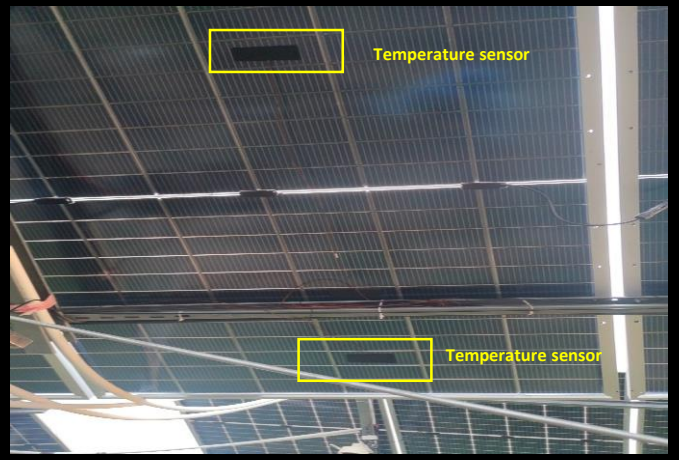
TÜVRheinland® Precisely Right.

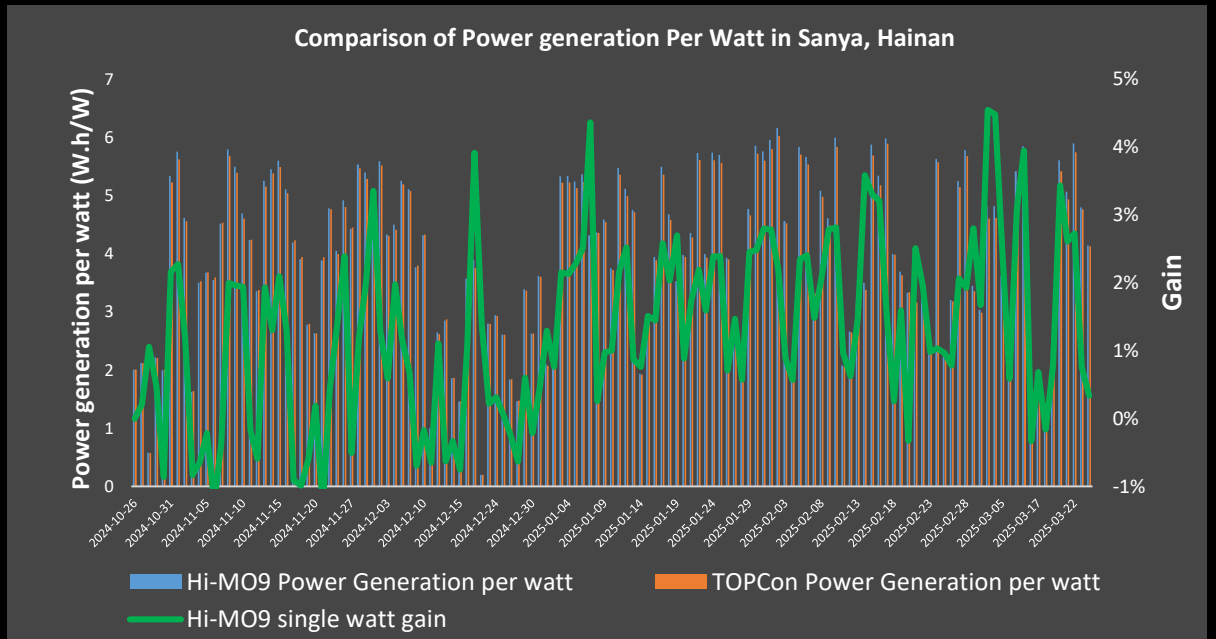
Institution Dimension

Contents

Third-party Empirical projects

Sanya, Tropical Zone, Grassy Ground





Compared to TOPCon modules, Hi-MO 9

- average power generation gain of 1.54% per KW,

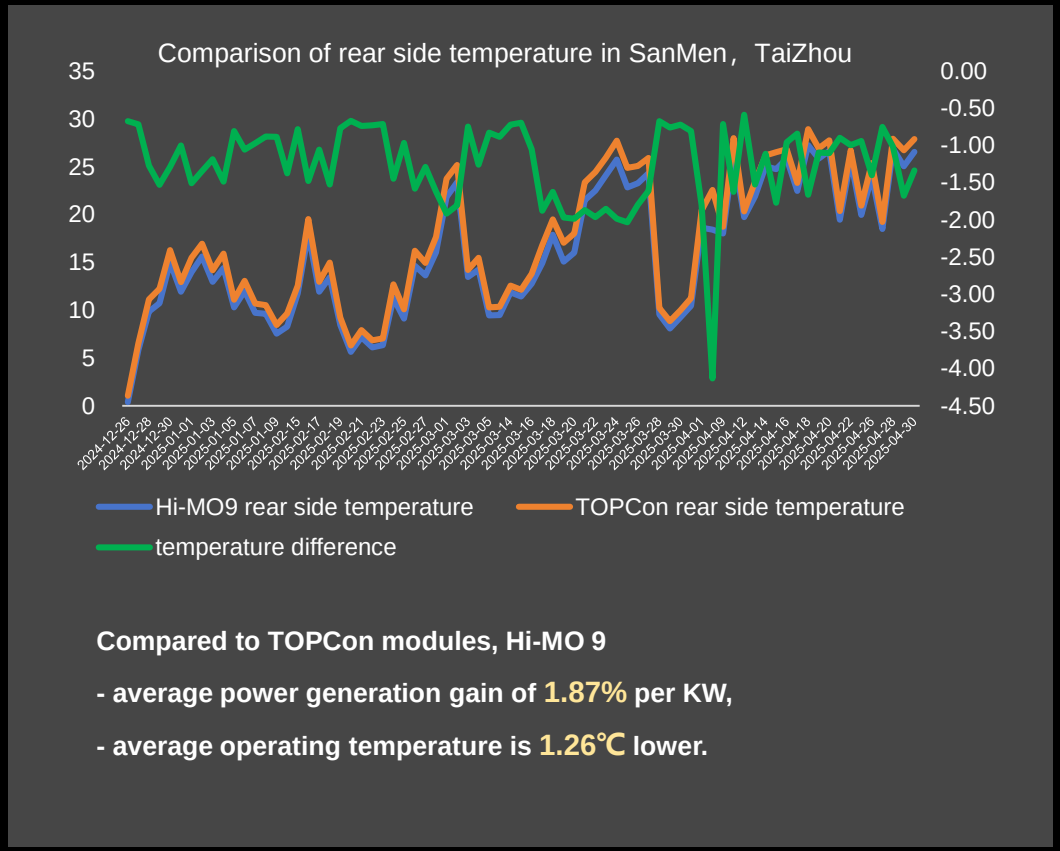
- average operating temperature is 1.21 lower.

***China General Certification Center**

Third-party Empirical projects

Taizhou, Subtropical Zone, Mudflat

Power Generation Data（2024.12.26~2025.7.30）			
Data	**Hi-MO 9**	**TOPCon**	**Power Generation Gain**
Cumulative power generation per watt （kWh/kWp）	684.04	671.46	**1.87%**



Compared to TOPCon modules, Hi-MO 9

- average power generation gain of 1.87% per KW,

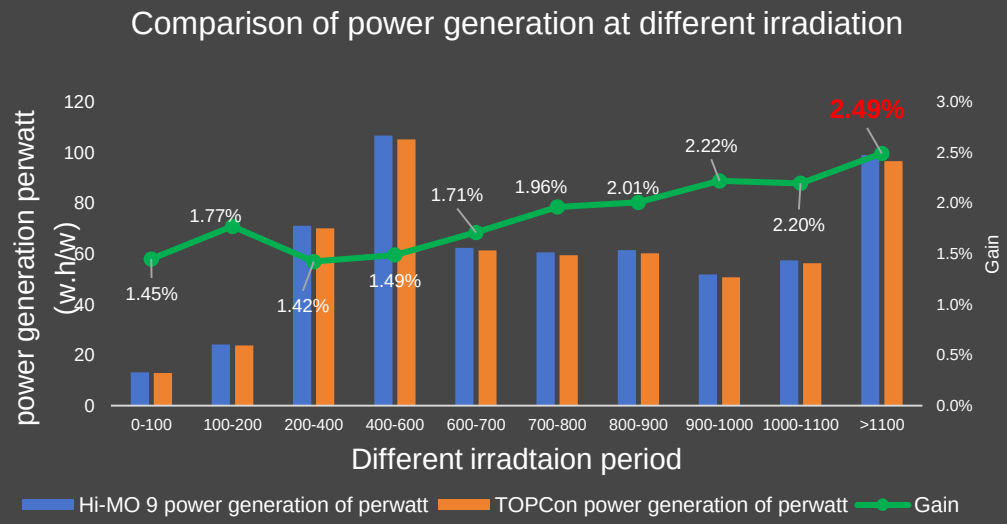
- average operating temperature is 1.26℃ lower.

**China General Certification Center*

Third-party Empirical projects

Yantai, Shandong, warm temperate zone,Offshore

Power Generation Data (2025.01.04~2025.06.30)			
Data	**Hi-MO 9**	**TOPCon**	**Power Generation Gain**
Cumulative power generation per watt (kWh/kWp)	589.32	578.12	**1.94%**



Compared to TOPCon modules, Hi-MO 9

- average power generation gain of 1.94% per KW,

- average operating temperature is 1.31℃ lower.

***The China Photovoltaic Testing Center** (CPVT)

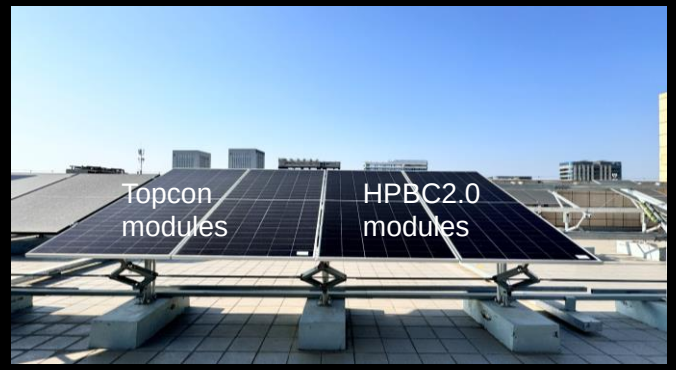
Contents

Empirical Map

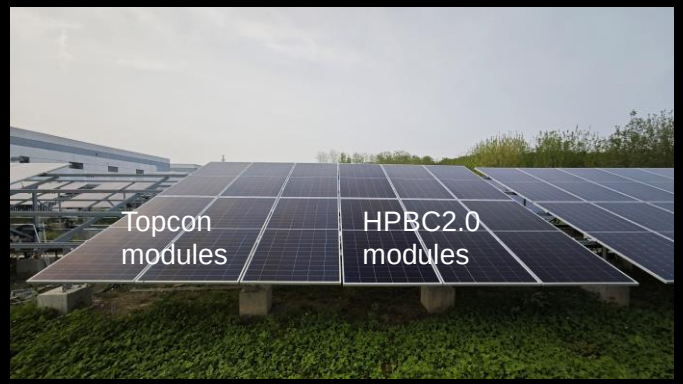
Multi-regional Empirical Cases

LONGi-owned Empirical Projects

Xi′ an | Warm Temperate | Rooftop Empirical

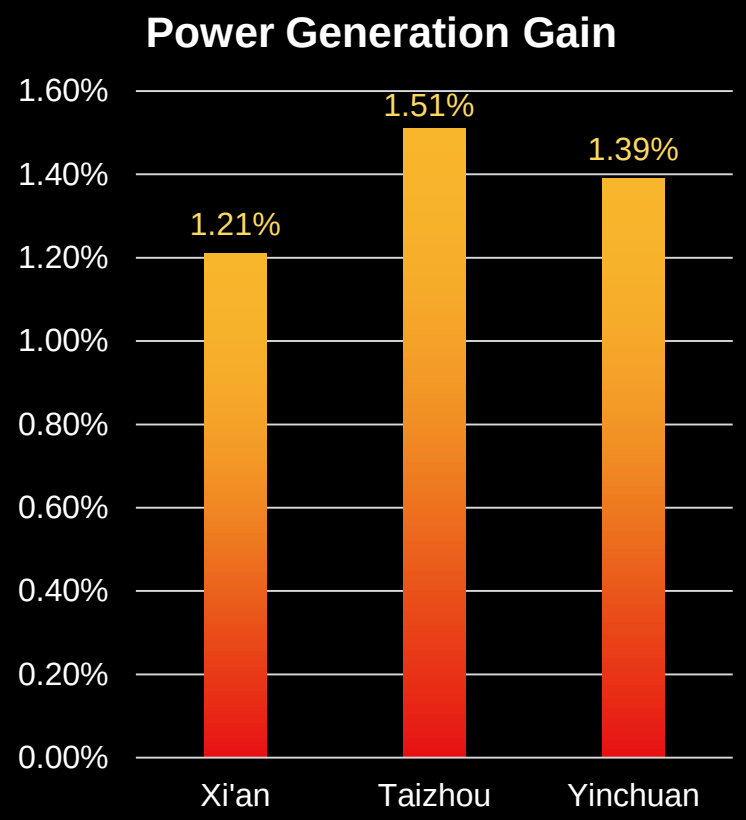


Taizhou | Subtropic | Grassland Empirical



Yinchuan| Temperate | Highly Reflective Ground Empirical

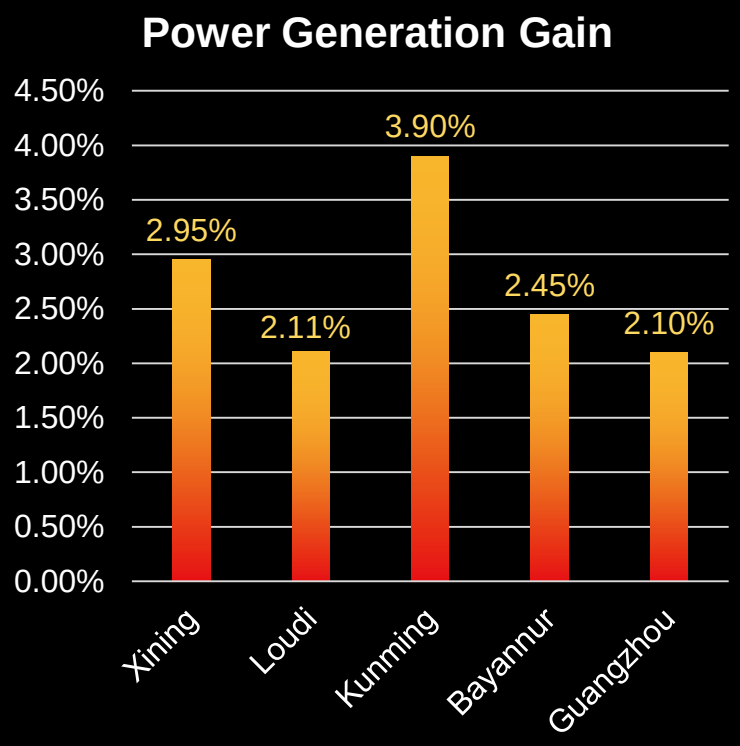
Empirical Project Setup			
Company	**Technology**	**Rated Power**	**Individual Module Area**
LONGi	**Hi-MO 9**	**645W**	**2.701㎡ (standard size)**
Manufacturer A	TOPCon	615W	2.701㎡



Multi-regional Empirical Cases

Customer Empirical Projects

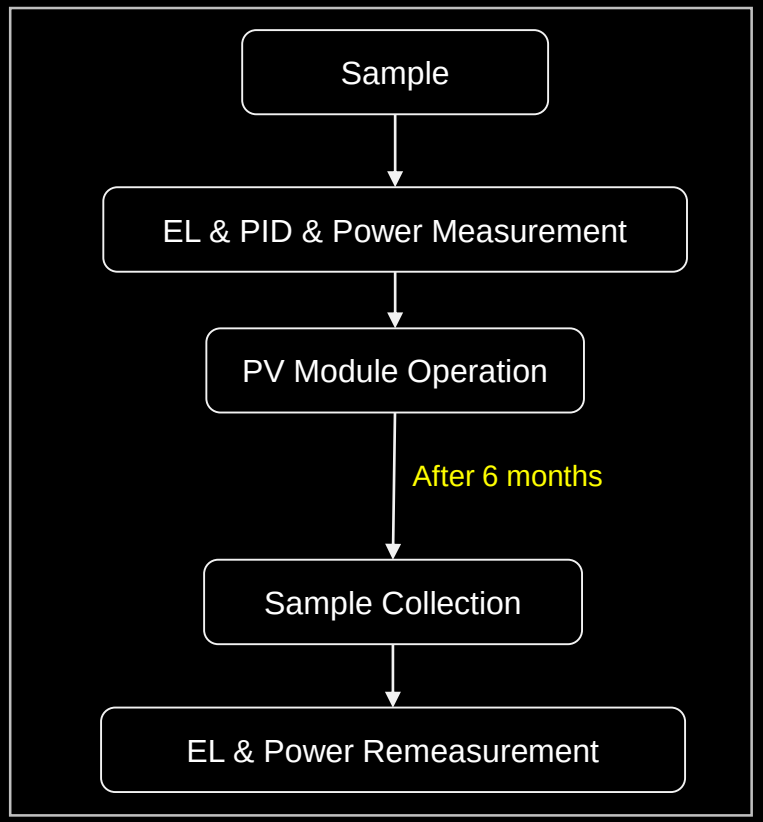
Empirical Project					
Location	Xining	Loudi	Kunming	Bayannur	Guangzhou
Climate	Temperate	Subtropical	Subtropical	Temperate	Subtropical

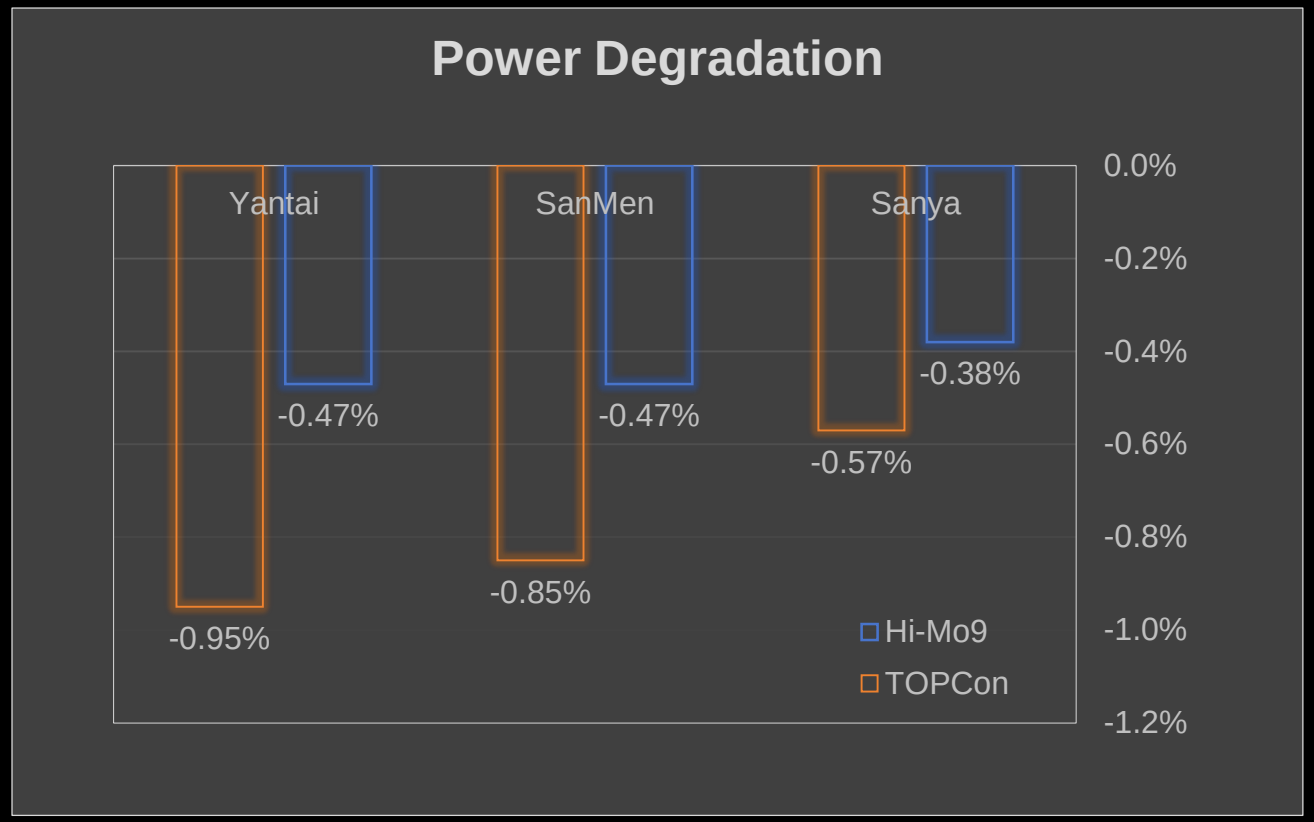


Contents

Proven Lower Degradation

Proven Superior Resistance to Degradation: BC vs. TOPCon



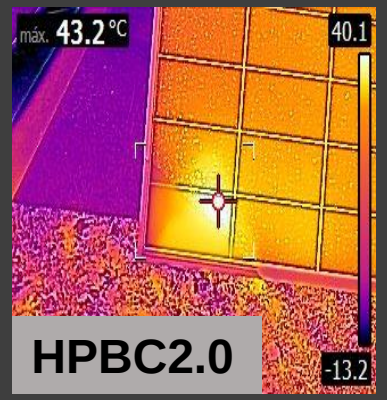


Shading Resistance

localized Shadow Sim.

Power Generation Data (2024.11.27~2024.12.4)					
Data	**Shading type**	**Real**	**Hi-MO 9**	**TOPCon**	**Power Generation Gain**
Cumulative power generation per watt (kWh/kWp)	Partially shadow	Bird Dropping	32.33	24.38	32.62%
	Column shadow	Local Object Shading	69.84	60.75	14.96%

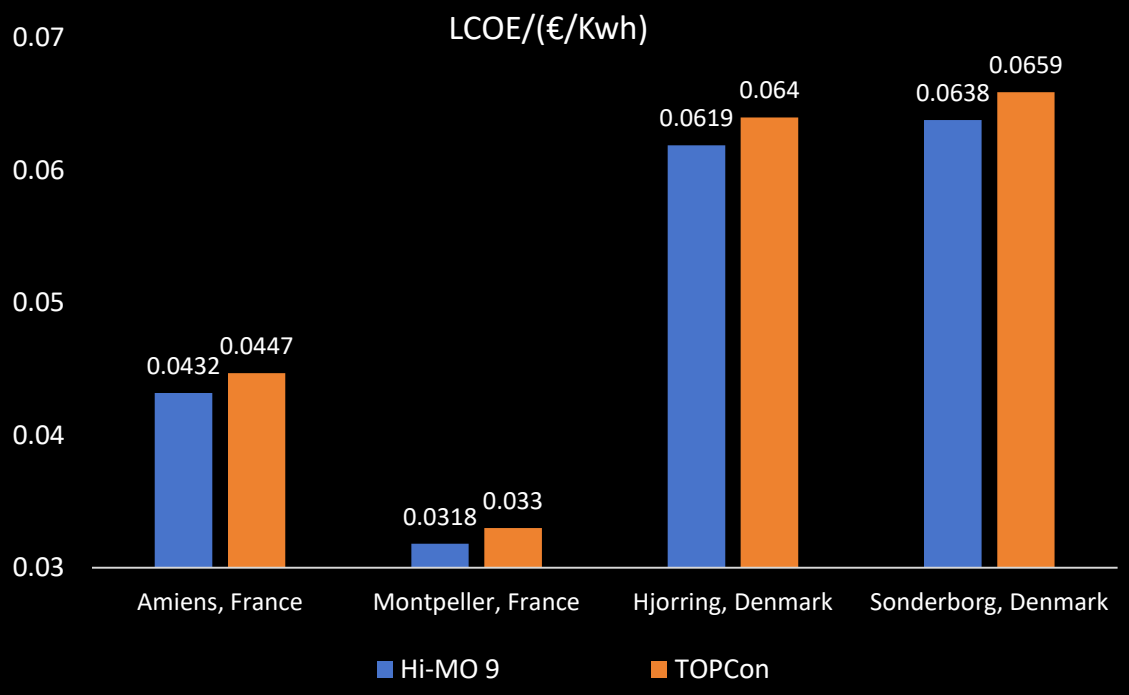
Tower Shadow Sim.



Hot spot temperature

62.8℃

High Value



- Location: Denmark and France
- Climate: Temperate marine climate

IPVF

LCOE

-3.32%

In Comparison to Conventional TOPCon

ENERT/S

Arplus

-4.47%

In Comparison to Conventional TOPCon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THANKS
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Scaling back contact for every scenario

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