

Investigation and Industrialization of Efficient Perovskite/c-Si Tandem Solar Cells at LONGi

LONGi Central R&D Institute - Dr. Yongcai He

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Opportunities and Challenges

The core problems currently facing

Focus on cutting-edge technologies, analyze the strategic layouts of industry leaders, and explore future commercial value.

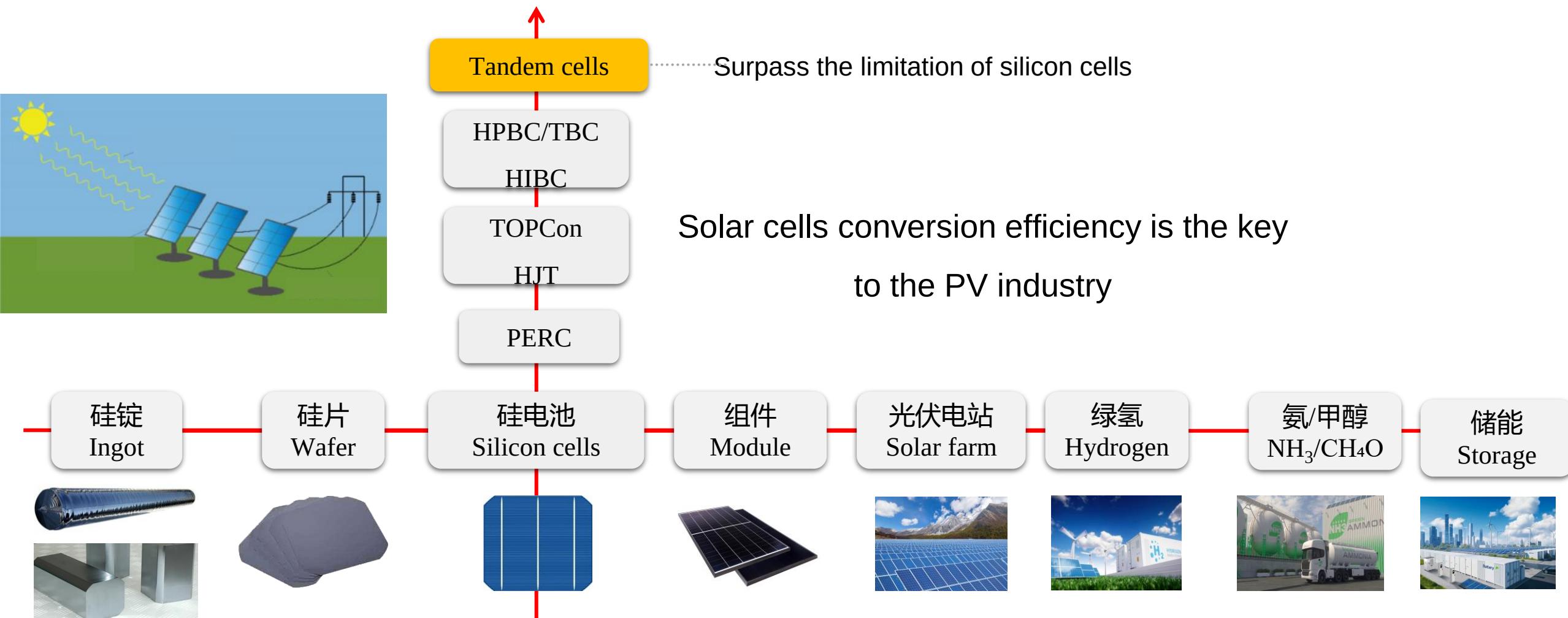
Perovskite Tandem PV

01

Overview of Perovskite Tandem PV Technology

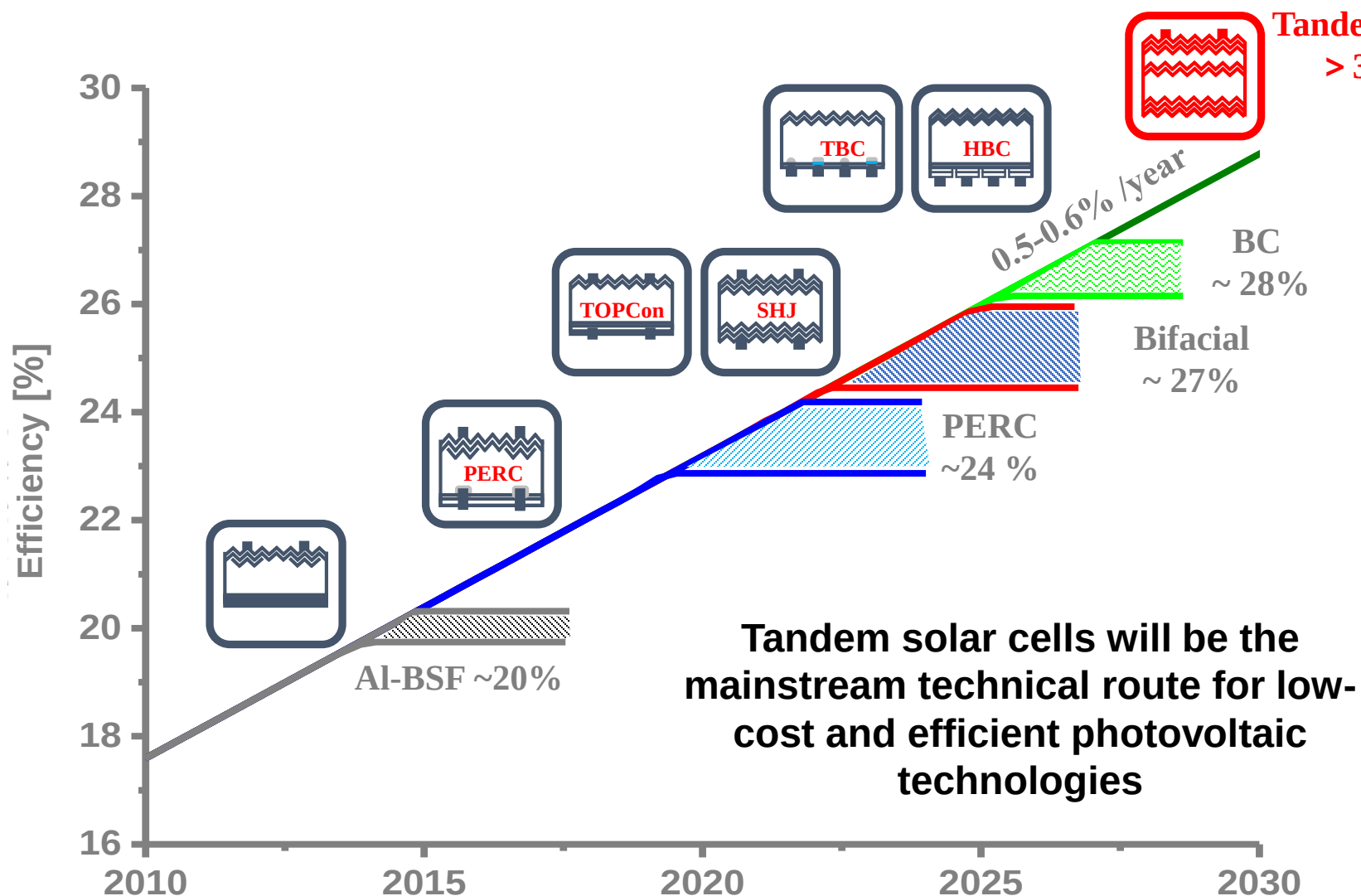
CHAPTER OVERVIEW

Photovoltaic Industry of silicon cells



Evolution Trend of Photovoltaic Technology

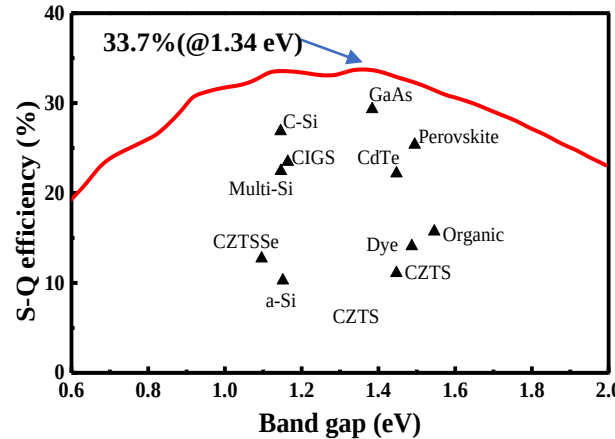
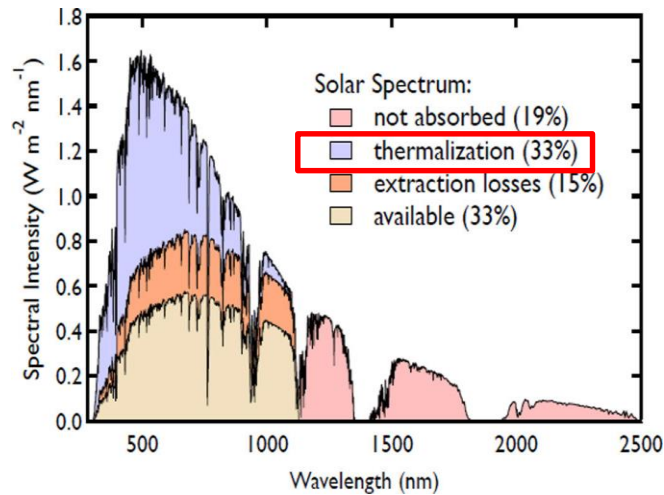
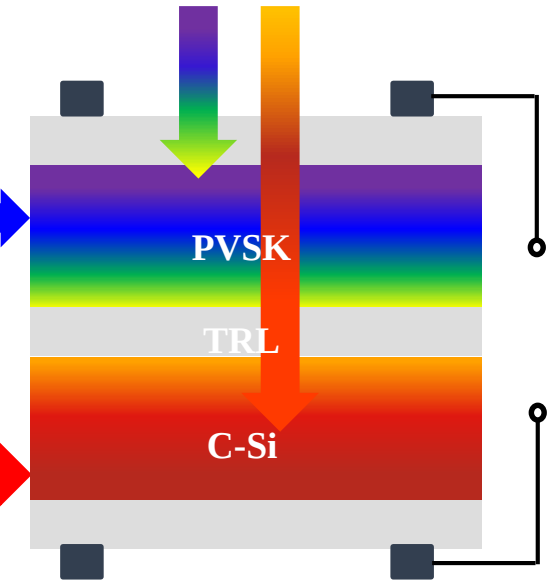
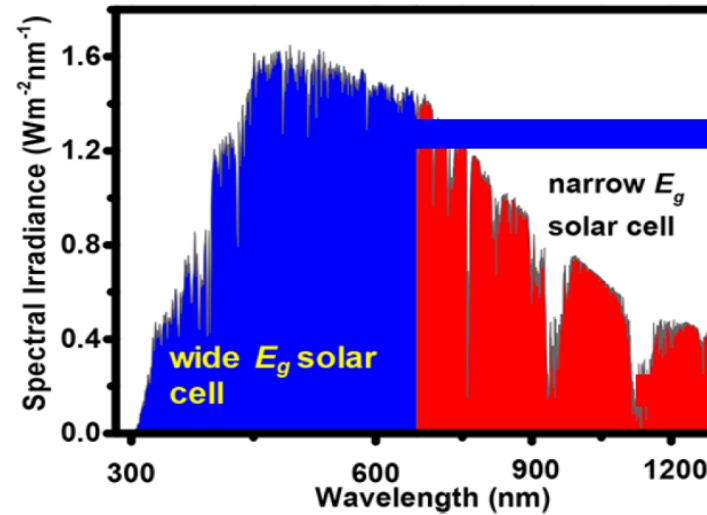
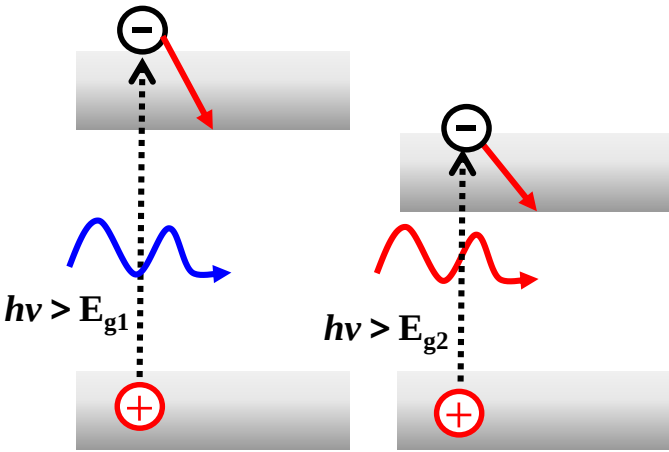
LONGi



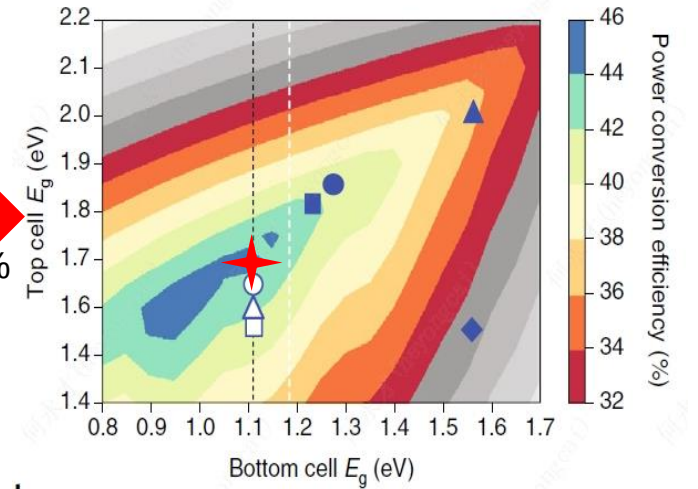
**35.2%
(ESTI)**



Mechanism of Tandem Solar Cells



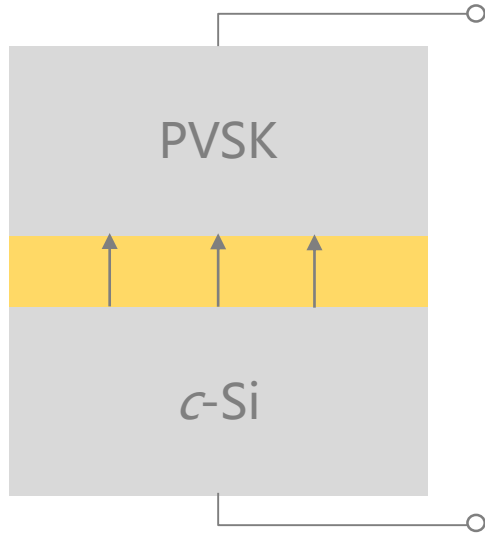
Theoretical Eff
Increase by 12%



- Reducing thermal relaxation losses(33%) in crystal silicon cell;
- Tandem cells can surpass the limits of single-junction cells(33.7%&29.4%);
- Tandem solar cells can enable the technical upgrading of crystalline silicon industry;

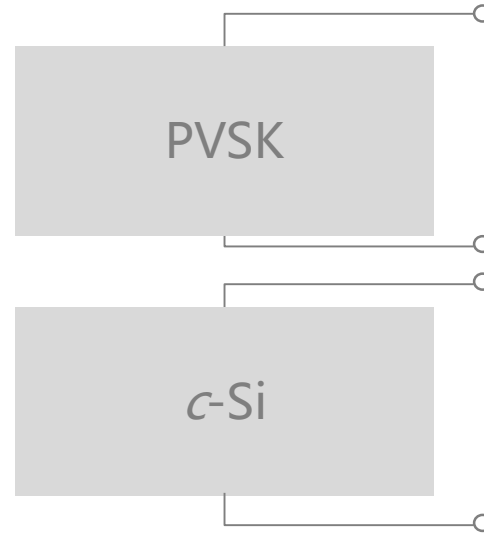
Structural types of perovskite tandem cell devices

Double-terminal lay-up



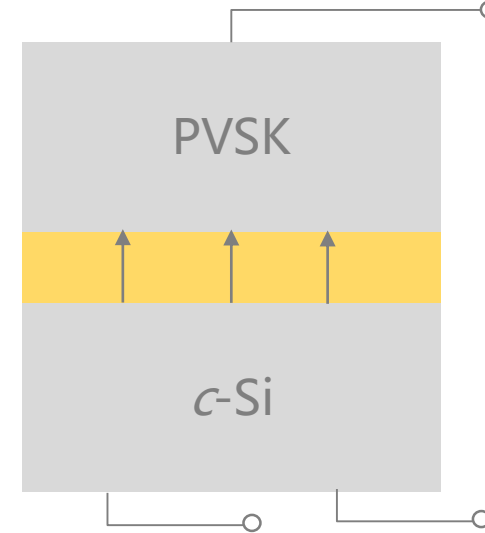
- Electrical series connection / Optical superposition
- Band gap ≈ 1.68 eV
- **Current matching issue**

Four-terminal lay-up



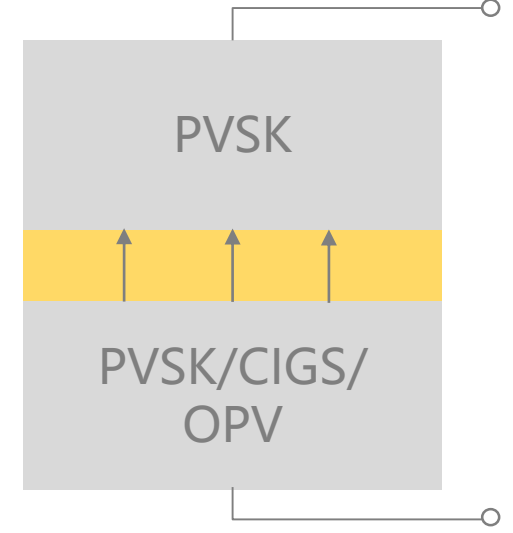
- Mechanical/optical superposition
- Independent sub-cells
- Wide bandgap window
- **Absorption loss of back electrode & complex system**

Three-terminal lay-up
(**Intelligent Lay-up**)



- Based on BC cells
- Electrical series connection
- Wide bandgap window
- **Cell interconnection issues**

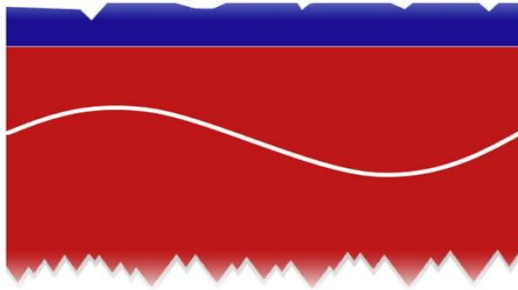
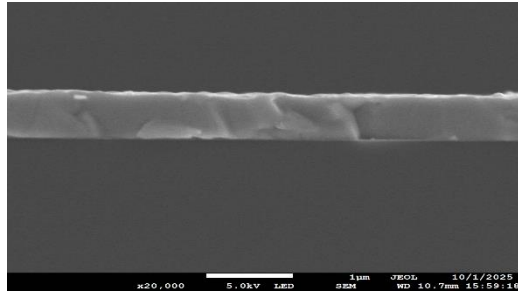
Other lay-up



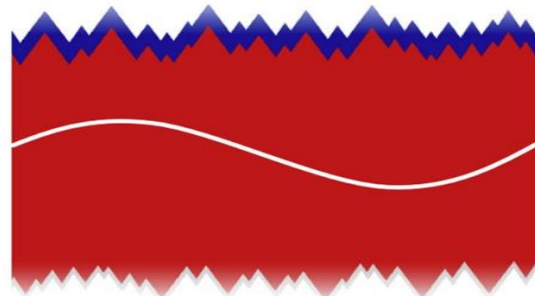
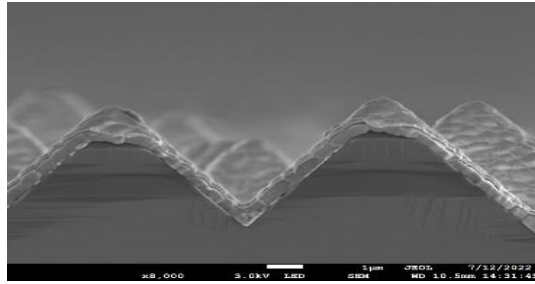
- Efficiency
- Stability
- Process Maturity
- **Focus on Academic Research**

- **2T Silicon-perovskite tandem cells boast the strongest engineering feasibility and technological competitiveness among existing tandem cell technical routes**
- **Our group focuses on this promising candidate technology**

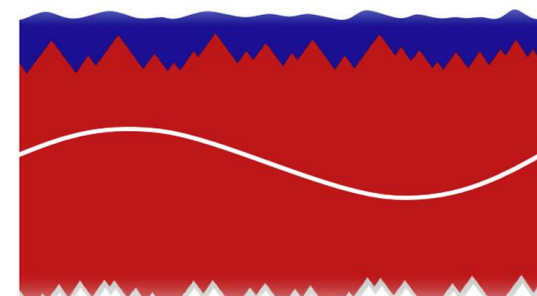
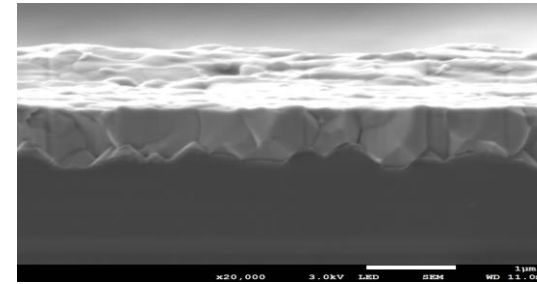
Configuration of 2T PVSK/SHJ tandem solar cells



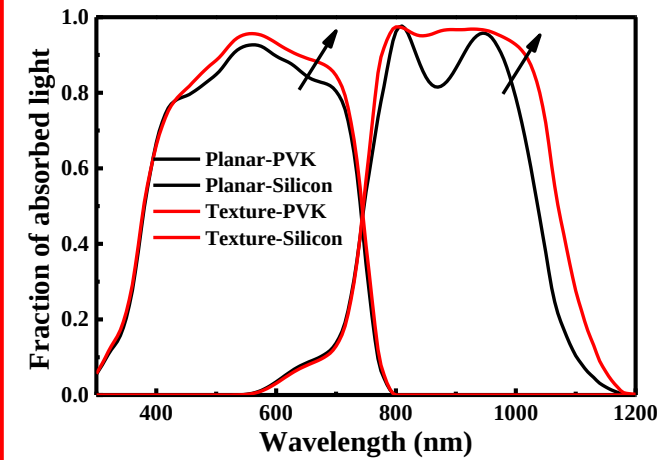
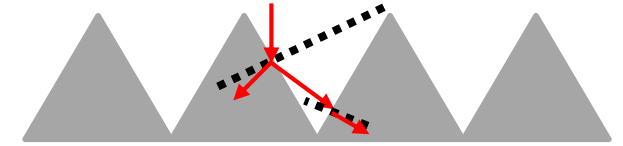
Front side-polished



Fully textured



Front side-mildly textured



- **Bad optics**
- Good passivation
- Interface design

- Good optics
- Industrial compatibility
- **Possible bad passivation**

- Good bottom cell optics
- Excellent crystallization
- Composition & passivation design

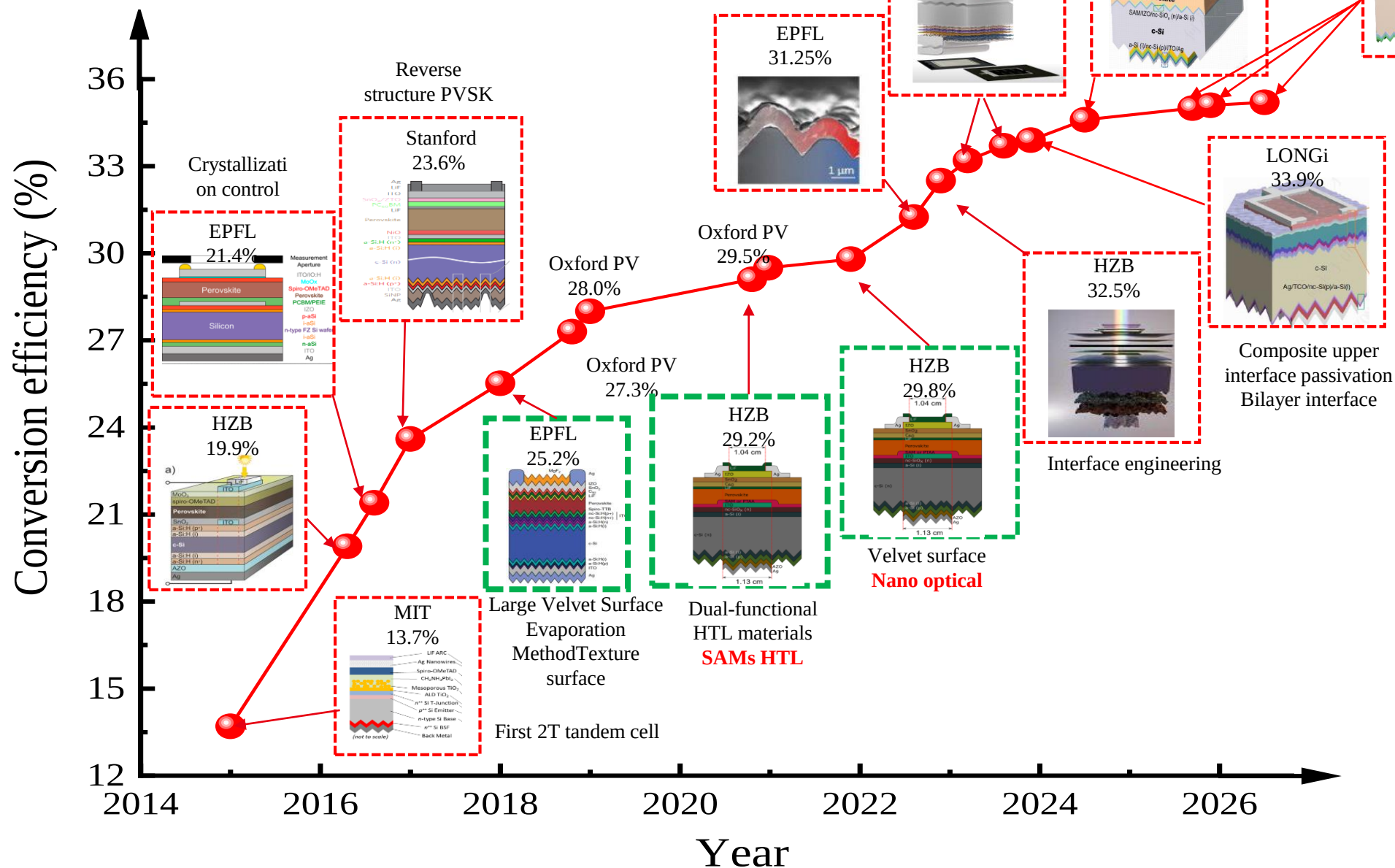
- Better IR response for texture structure
- Pyramid size influence on Jsc

Parameter for 2T Tandem cells

Institution	V _{OC} (V)	J _{SC} (mA/cm ²)	FF (%)	PCE (%)	Texture size	Methods	Time
Stanford/ANU	1.65	18.09	79.0	23.60	Frontside polish	Solution	2016
EPFL	1.79	19.53	72.30	25.20	Large texture	Hybrid	2018
Oxford PV	1.81	19.99	75.4	27.30	Large texture	/	2018
Oxford PV	1.80	19.75	78.7	28.00	Large texture	/	2018
HZB	1.90	19.26	79.5	29.15	Frontside polish	Solution	2020
Oxford PV	1.88	20.26	77.3	29.5	Large texture	/	2020
HZB	1.92	19.40	79.8	29.80	Frontside polish	Solution	2021
EPFL	1.95	19.81	79.9	30.93	Large texture	Hybrid	2022
EPFL	1.91	20.47	79.8	31.25	Large texture	Hybrid	2022
HZB	1.98	20.24	81.2	32.50	Nano texture	Solution	2023
KAUST	1.96	20.97	80.7	33.20	Nano texture	Solution	2023
KAUST	1.97	20.99	81.3	33.70	Nano texture	Solution	2023
LONGi	1.97	20.76	83.0	33.89	Nano texture	Solution	2023
LONGi	1.99	20.70	83.6	34.60	Nano texture	Solution	2024
LONGi	2.00	21.10	82.8	34.85	Nano texture	Solution	2025
LONGi	2.01	20.76	84.3	35.00	Nano texture	Solution	2025
LONGi	2.00	20.55	85.2	35.20	Nano texture	Solution	2025

- Solution method shows better Voc&FF benefits from the high-quality perovskite film and excellent passivation (eg: bulk or interface);

Development Trend of Efficiency



New structure and passivation strategies

Current Status of Industrialization of Silicon-Perovskite Tandem Cells

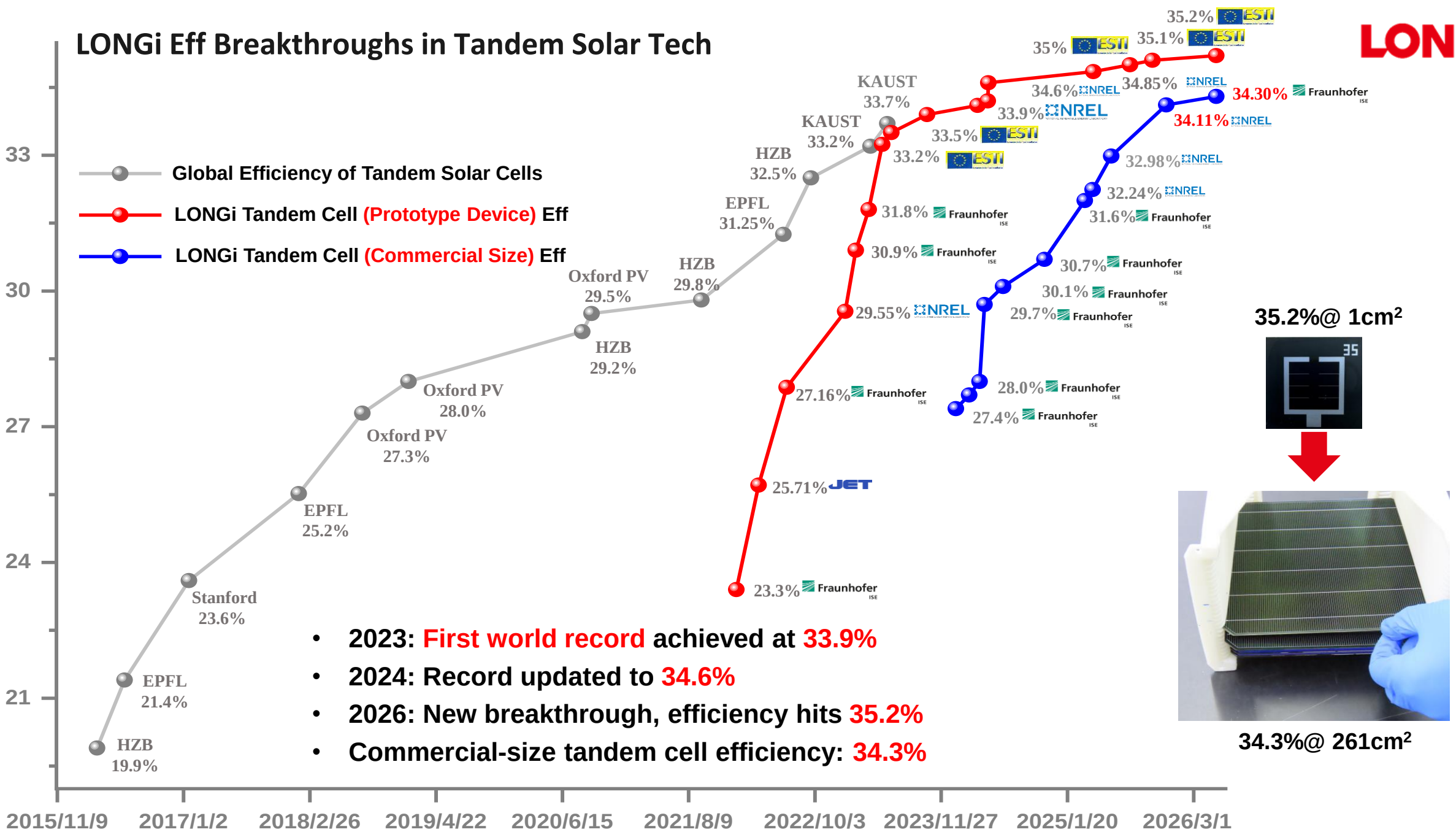
	Institution	R&D inves.	Research status
UK	Oxford PV	142 million USD	28.6% @ 258 cm ² ; Pioneer in the industrialization of tandem cells (2018); A 250 MW pilot production line for tandem cells was built in Germany
EU	PEPPERONI Project	18.8 million EUR	A joint R&D project involving 17 institutions from 12 EU countries aims to achieve gigawatt-scale tandem manufacturing capacity
EU	NEXUS Project	3.6 million EUR	9 European Union countries and 12 institutions have jointly developed two-terminal tandem solar cells via the full evaporation method, achieving an efficiency of over 30%.
EU	PrEsto Project	4.25 million EUR	Three EU countries and nine institutions jointly research the industrial-viable technical routes for stacked batteries
USA	TEAMUP Project	12.20 million USD	A total of 12 American institutions have jointly researched solutions to improve the reliability of two-terminal and four-terminal laminates under actual operating conditions.
USA	ADDEPT Project	11.25 million USD	A joint research project by eight U.S. institutions develops technical solutions that use machine learning and robotic screening to enhance the performance and service life of two-terminal and four-terminal stacked devices.
USA	PV PACT Project	9 million USD	Twelve American institutions have jointly conducted research to develop performance and reliability testing standards for stacked batteries for industrial applications
Japan	Kaneka	-	29.2% @ 1 cm ²
Korea	Q Cells	100 million USD	29.9% @ 1 cm ² ; Invest 100 million to build a stacked pilot production line in South Korea; participate in the EU PEPPERONI project
Singapore	SERIS/REC	57 million USD	Target > 30% two-sided laminated battery
China	Yaoneng	14 million USD	32.44% @ 1 cm ² ; 30.83% @ 25 cm ² (Certified by the National Institute of Metrology, China); the stacked pilot production line is under construction
China	Jinko	6.6 million USD	Dual-sided stacked TOPCon based cell achieves an efficiency of 34.9% @ 1 cm ² (Certified by China National Institute of Metrology)
China	Trina	17 million USD	32% @ 1 cm ² Two-end stacked structure; 32.6% commercial-sized stacked battery;
China	LONGi	>51.47 million USD	35.2% @ World record for tandem stacking on an area of 1 square centimeter; World record of 34.3% efficiency for full-size monolithic silicon tandem solar cells. 25.8% @ World record for the efficiency of square-meter-scale four-terminal tandem modules, reaching 29.1% for square-meter-scale tandem modules; all results are certified by authoritative international institutions.

02

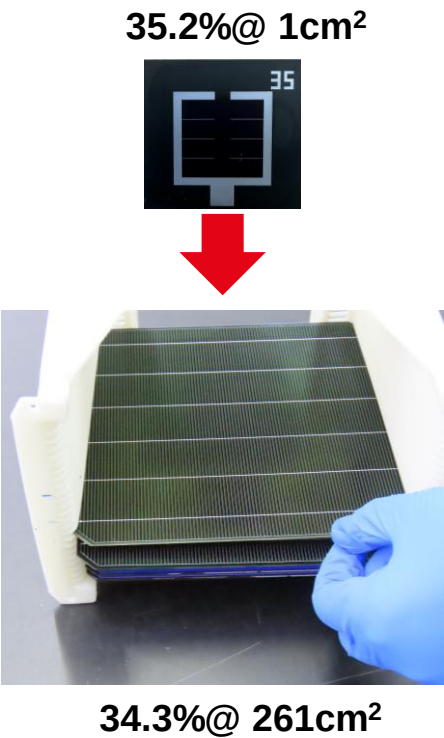
LONGi Progress & Achievements

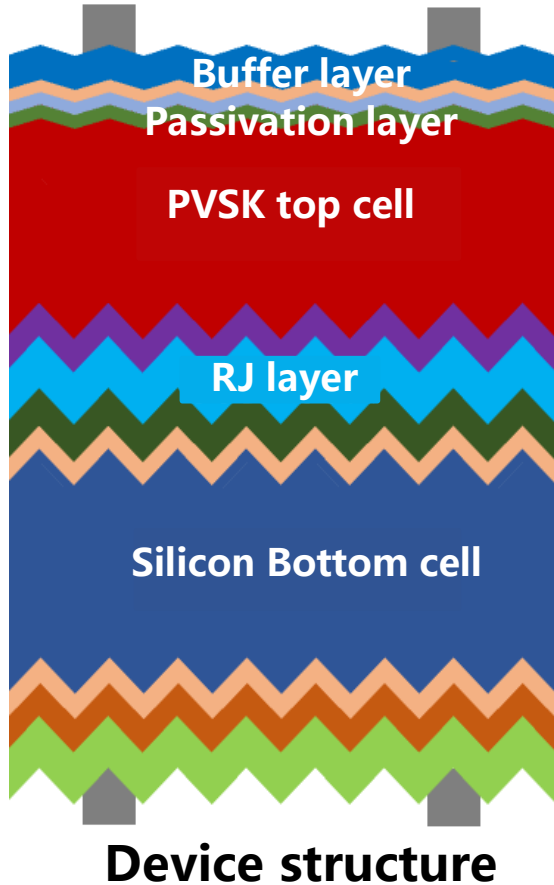
CHAPTER 2

LONGi Eff Breakthroughs in Tandem Solar Tech



- 2023: **First world record** achieved at **33.9%**
- 2024: Record updated to **34.6%**
- 2026: New breakthrough, efficiency hits **35.2%**
- Commercial-size tandem cell efficiency: **34.3%**





TOP cell

Interface Defect Passivation
and **Stability** Issues

Interface

Tune **Charge collection** and
Mechanical stress

**Bottom
cell**

Suitable **process** and
structure for efficient tandem

Nature 2024, 635, 596-603;

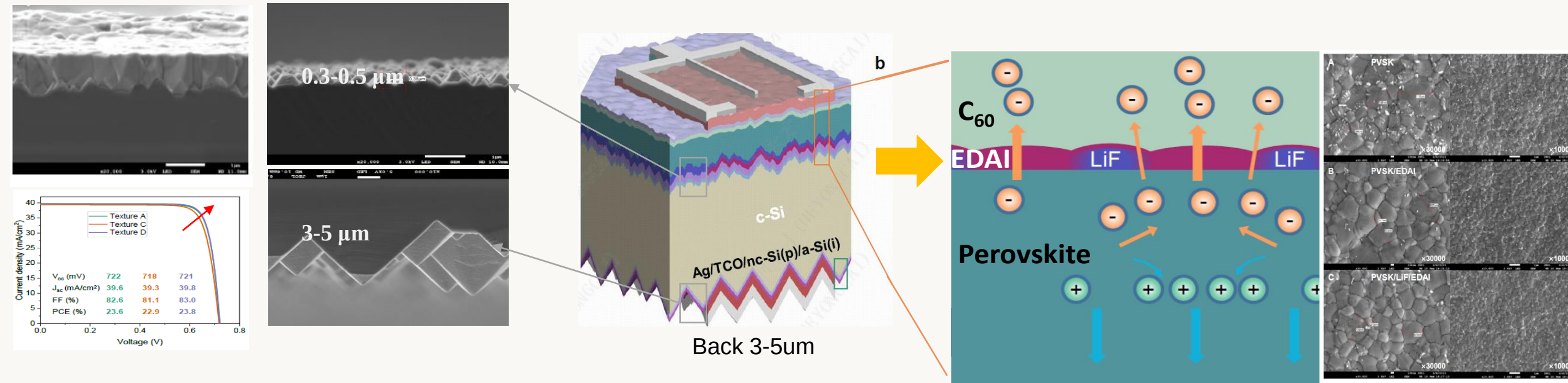
Nature 2025, 644, 912-919;

Science 2025, 389, 195-199;

Nature 2026, 649, 65-72;

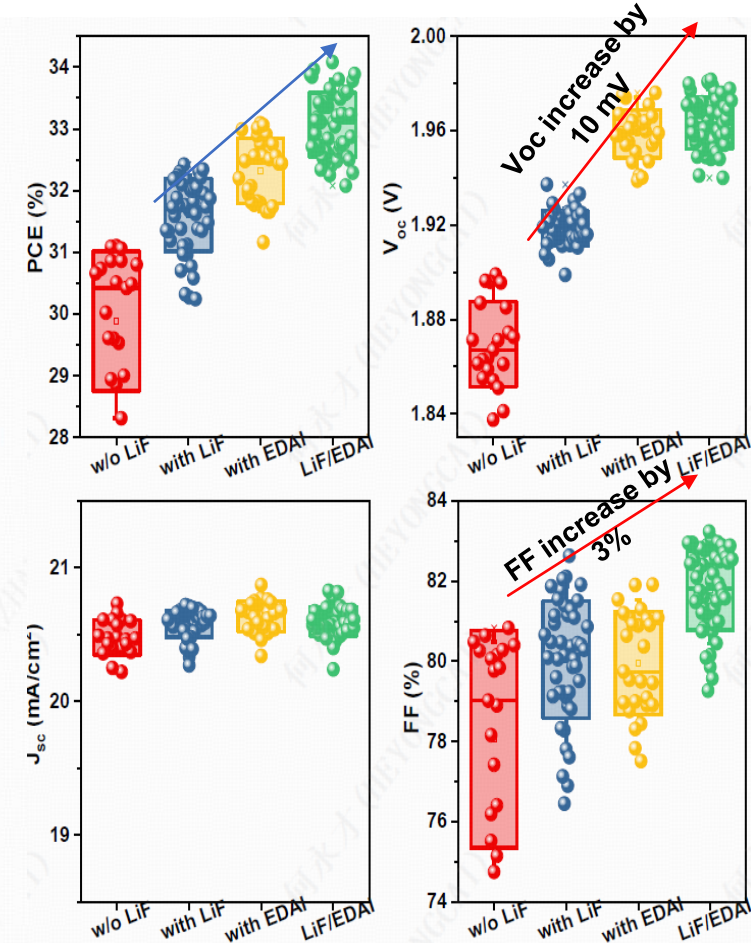
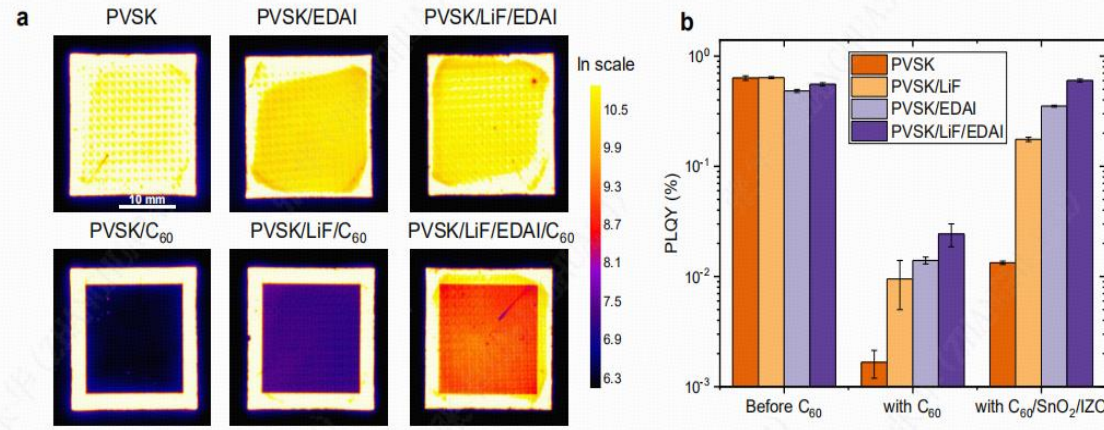
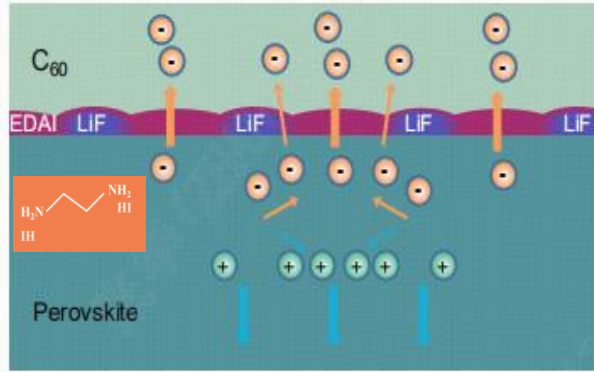
LONGi Innovation Tech 1: Bilayer Passivation & Asymmetric Textured Surface

Aiming at **leakage issues** from conventional **island-type LiF** localized passivation, an **ultrathin interwoven bilayer passivation** strategy using LiF and ethylenediamine iodine molecules is proposed. It combines **field-effect and chemical passivation**, overcoming the conflict between superior passivation performance and charge transport capability.



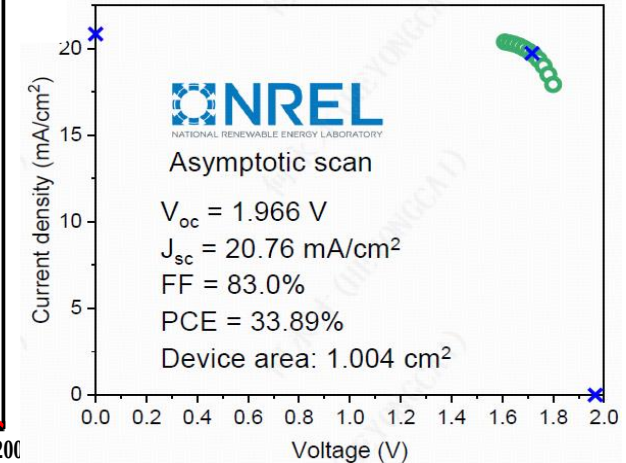
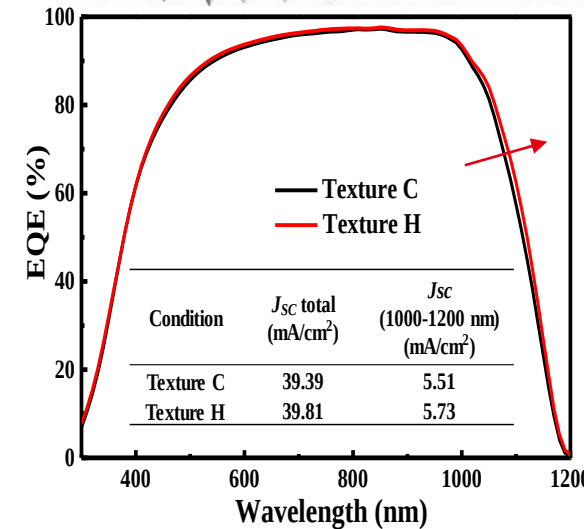
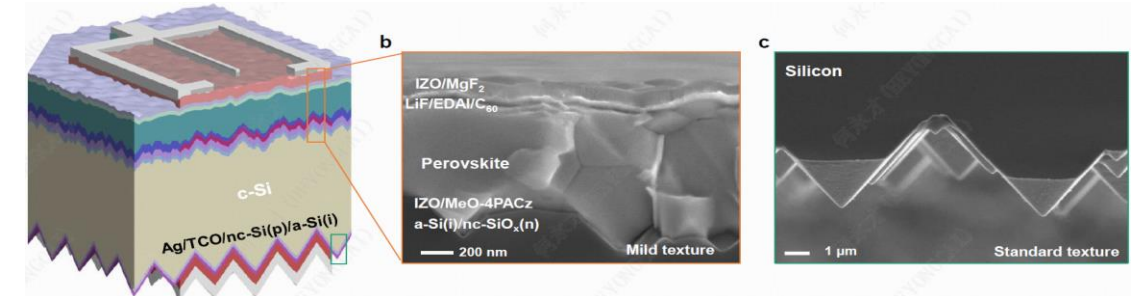
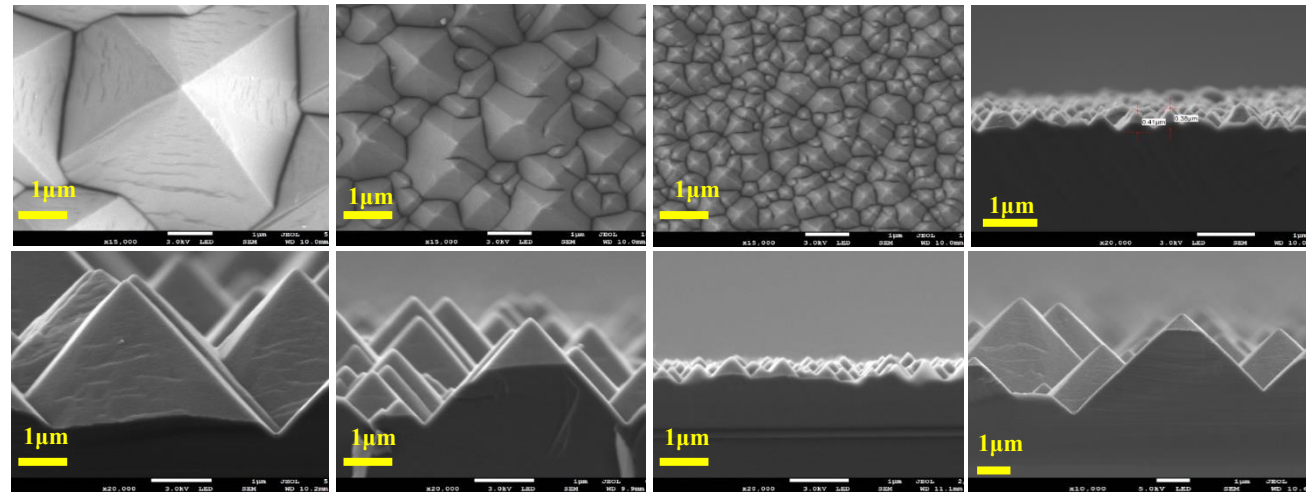
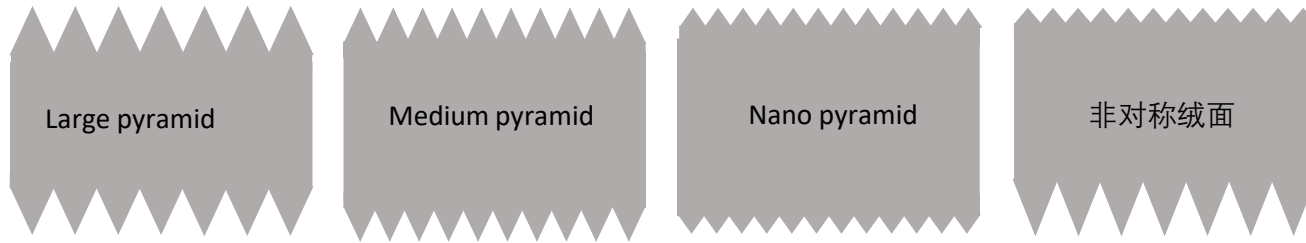
- Island LiF & EDAI Interwoven Bilayer Passivation Film
- Differentiated Texturing: Maximize Bottom Cell Performance

Interface passivation for efficient 2T tandem cells



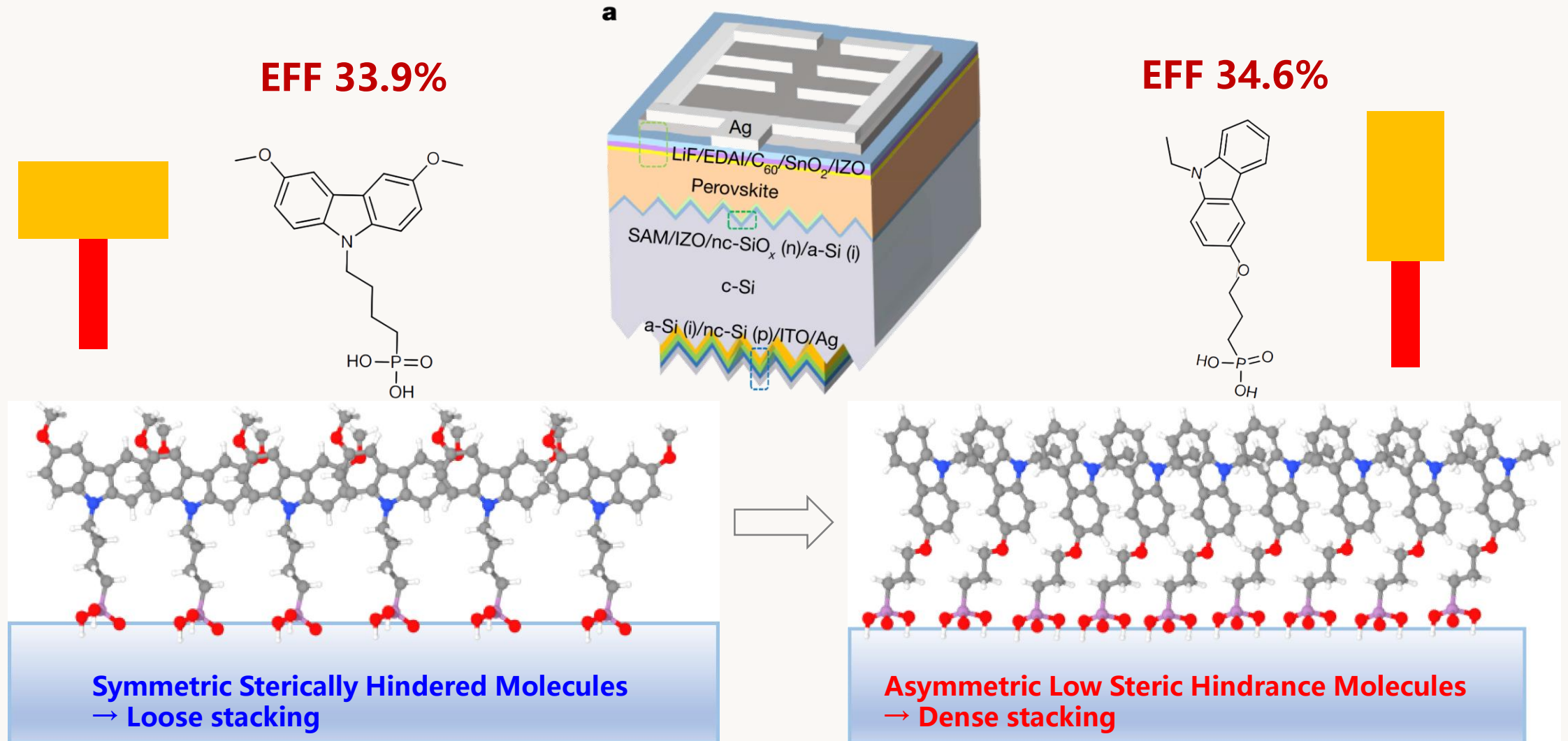
- LiF&EDAI bilayer reduces top surface non-radiative recombination and ensures carrier transport, which mitigates efficiency loss caused by interface;

Asymmetric textured for efficient 2T tandem cells

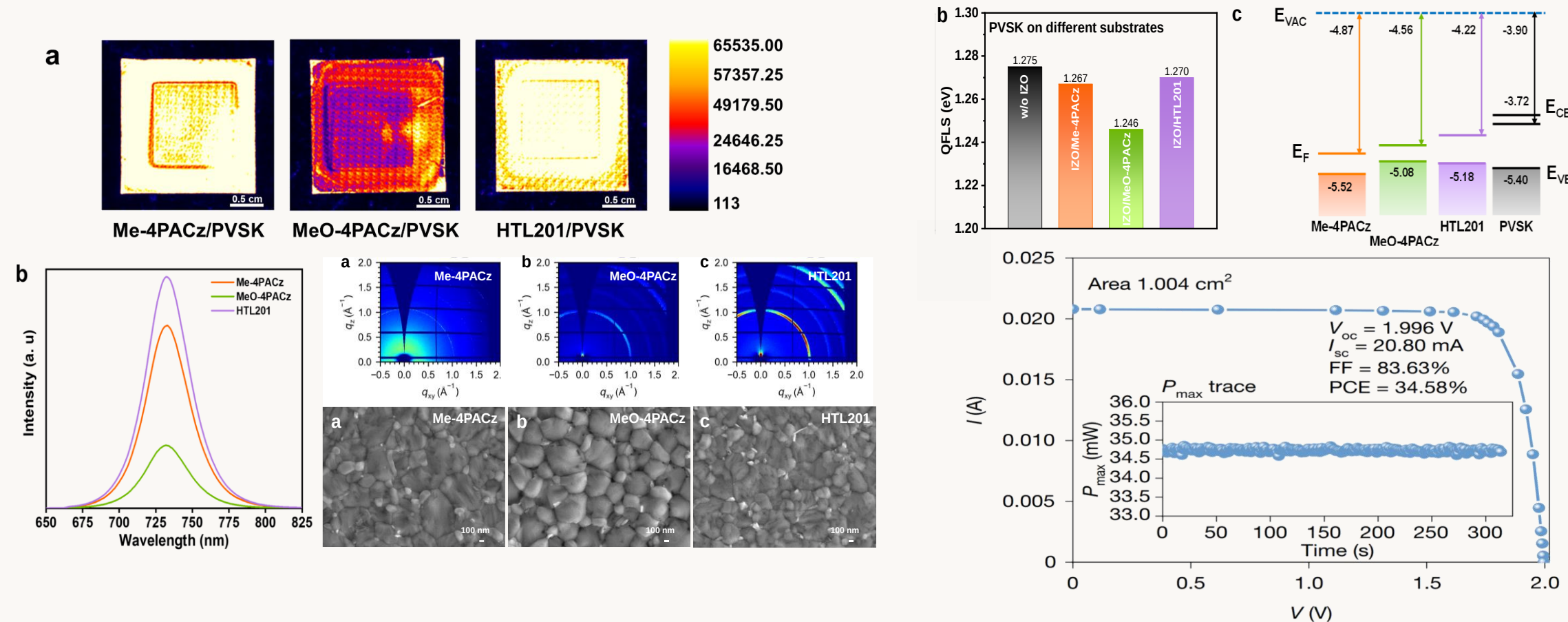


**Milestone World Record
Surpass 33.7% SQ Limit**

- The asymmetric textured structure enhance optical and passivation performance for bottom cell ;
- Enhanced electrical and optical performance facilitates efficient 2T tandem cells;
- Certified efficiency reached to 33.89%;
- Surpassed the 33.7% Shockley-Queisser (SQ) limit for single-junction PV materials;



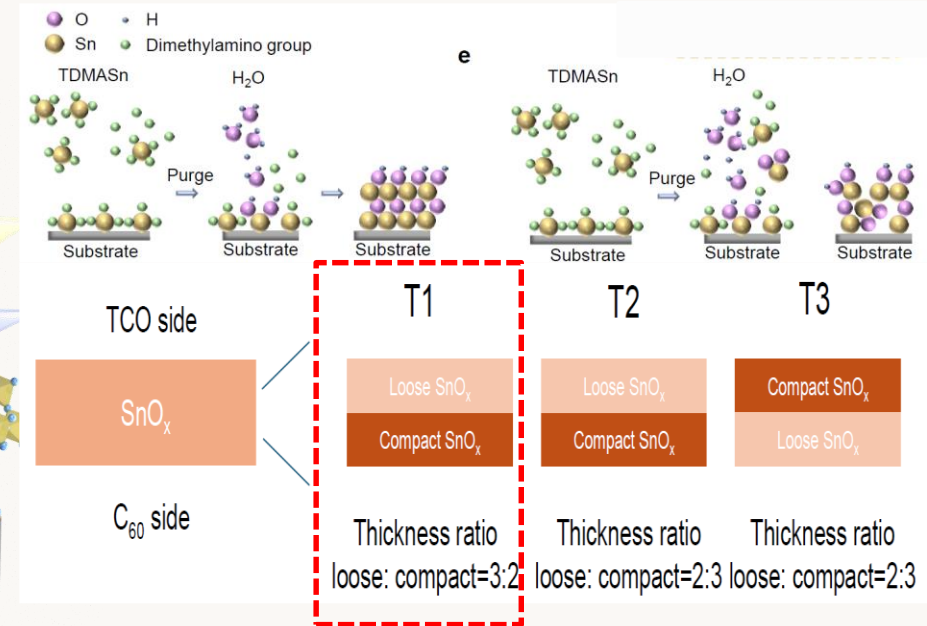
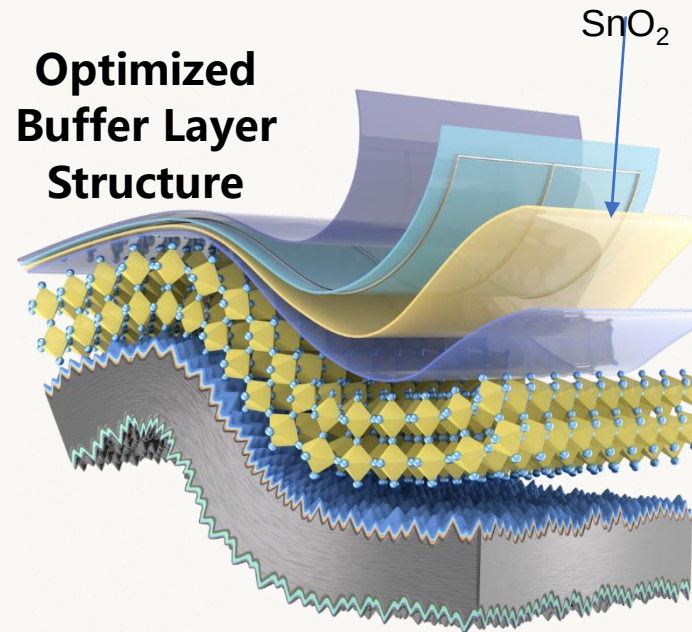
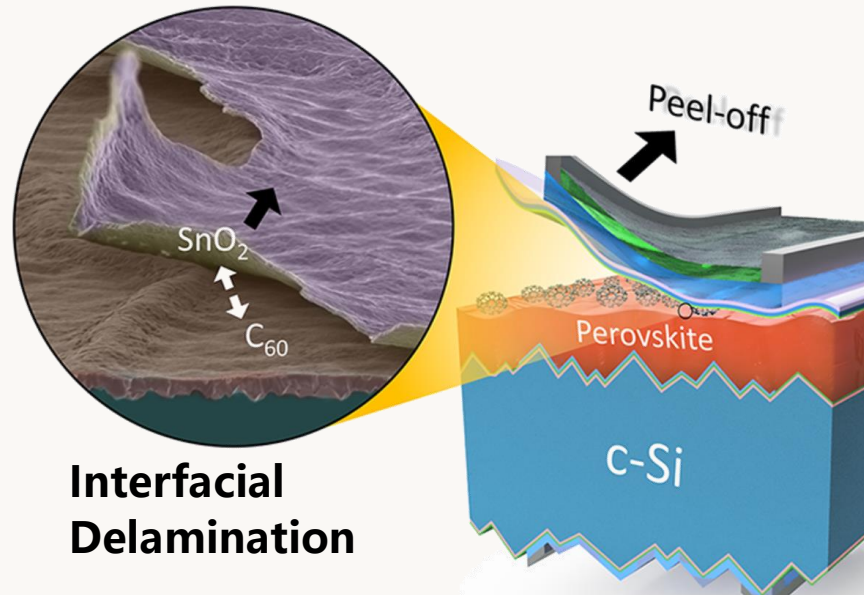
Longi Innovation Tech 2: Novel HTMs & Interface Modulation



- Buried interface passivation and band alignment;
- Internationally certified efficiency hits 34.6%, a new world record;
- Listed in the 65th Edition of Solar Cell Efficiency Tables by Professor Martin Green.

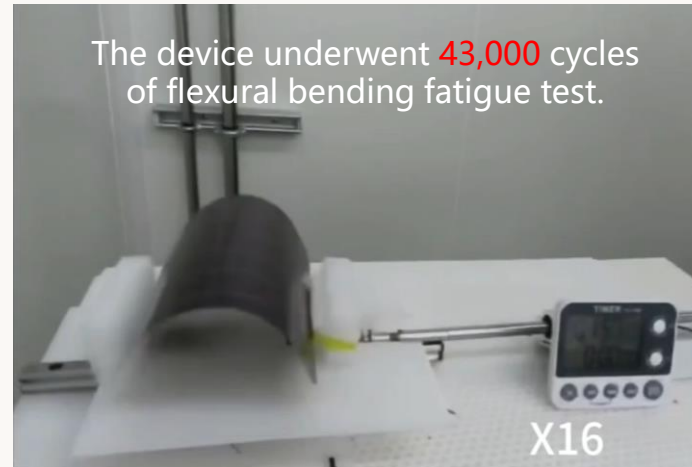
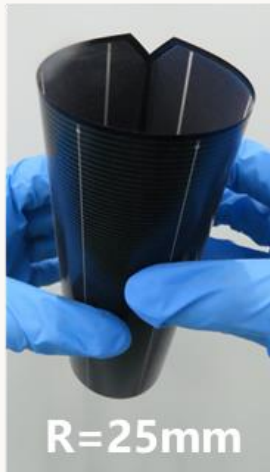
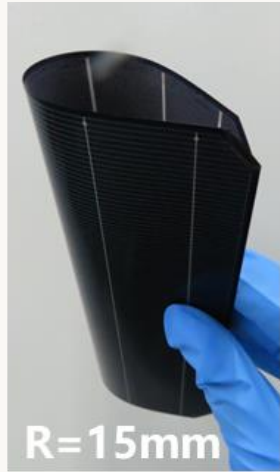
Longi Innovation Tech 3: Dual Buffer Layer Structure

- Flexible c-Si/perovskite tandem cells are widely recognized as the next-generation ultra-high-efficiency PV technology for space applications.
- Challenge: Ion bombardment** induces interfacial defects, which drastically weaken interfacial adhesion and degrade device performance.

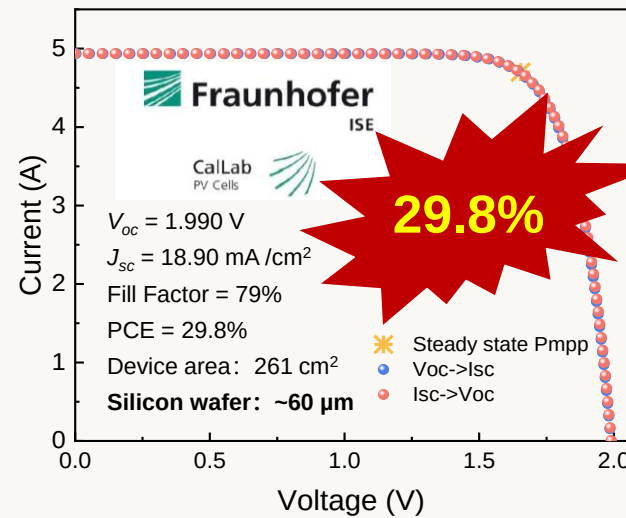


A dual buffer layer of **loose and compact SnO_x** is proposed to reduce ion bombardment damage and interfacial delamination, achieving large-area tandem devices with superior durability and stability.

Longi Innovation Tech 3: Dual Buffer Layer Structure

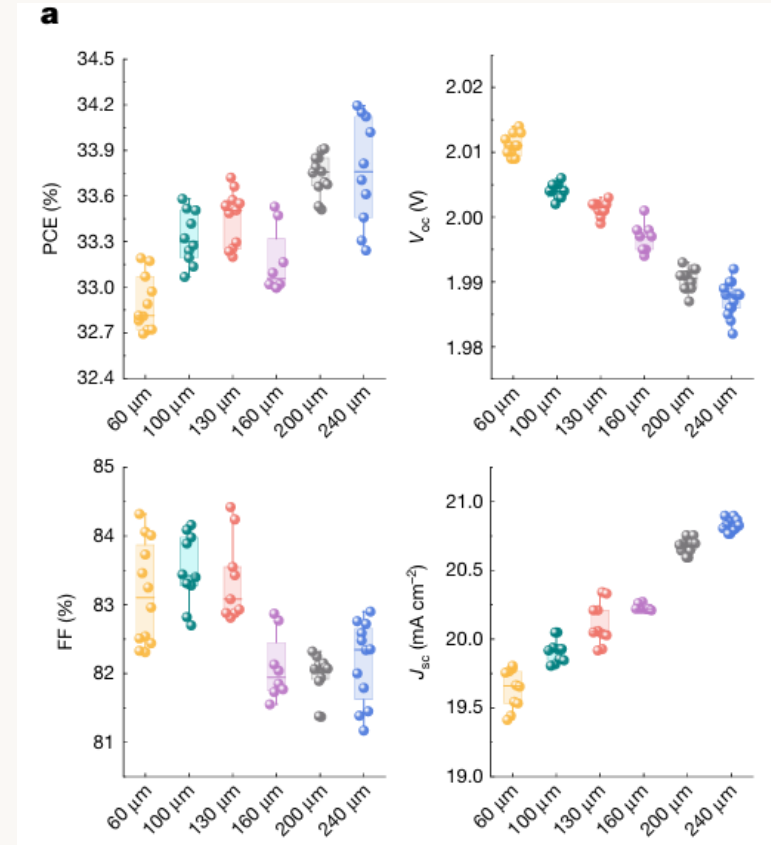


Ultra-thin & Ultra-light Full-wafer Tandem Devices



Area > 260 cm²

1.77 W/g

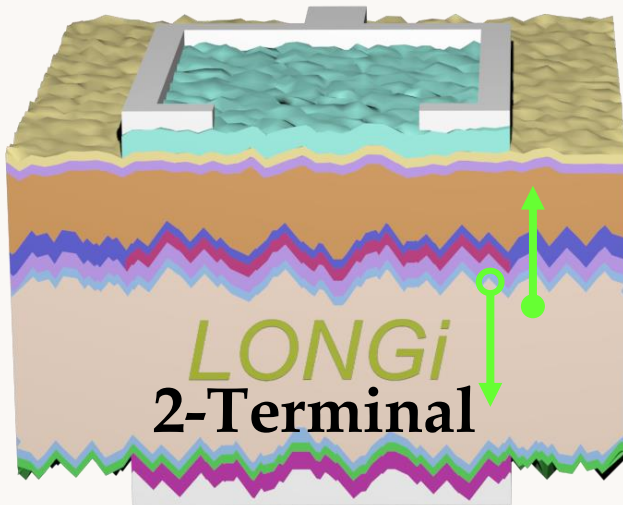


- Ranked in 2025 Top 10 Scientific Advances of China.
- LONGi pioneered wafer-scale manufacturing of high-eff flexible tandem cells in the PV industry worldwide.

Nature 2026, 649, 65-72

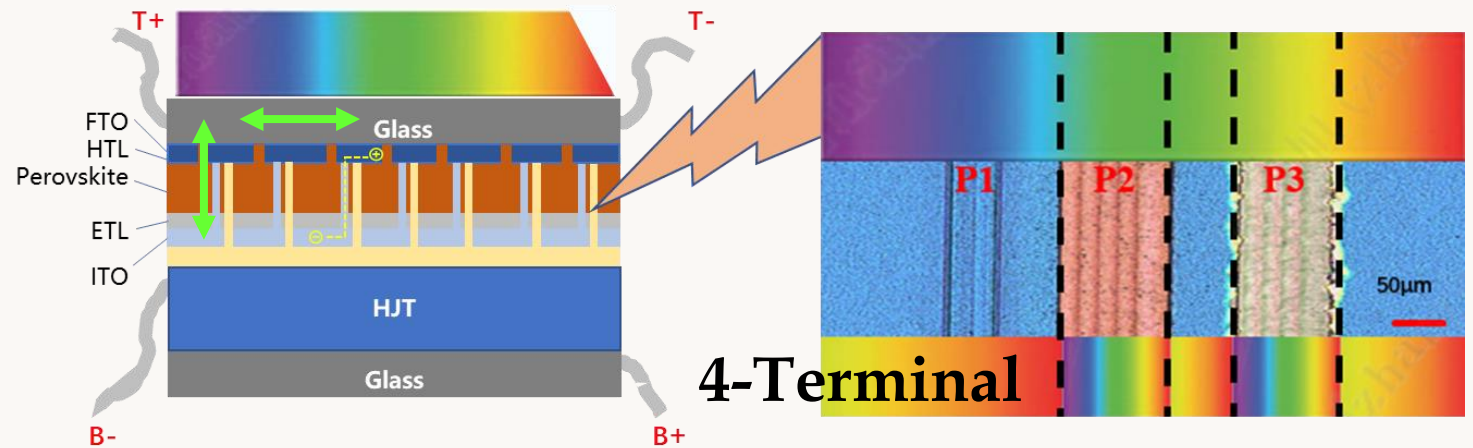
2-Terminal vs 4-Terminal Tandem

Compatible with conventional c-Si cell technology



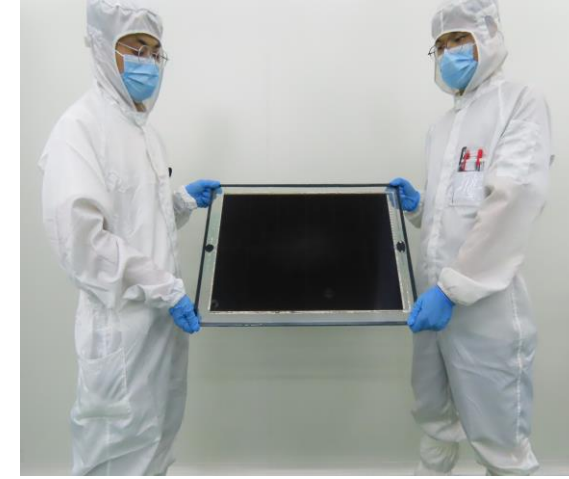
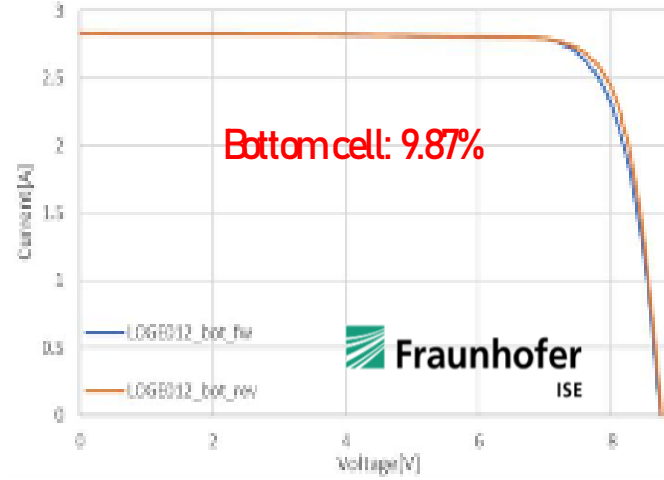
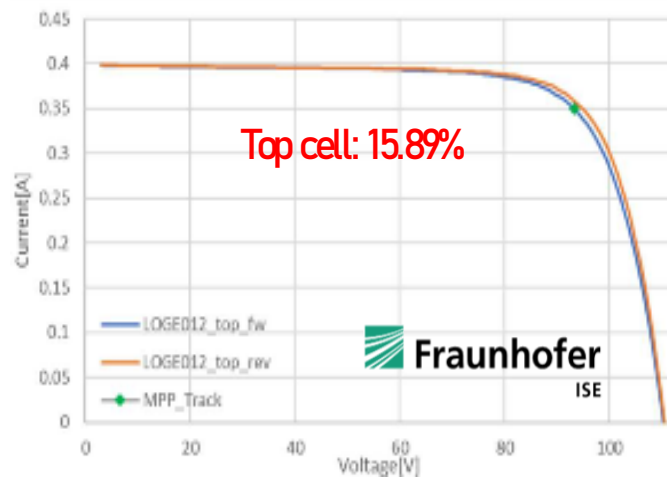
- Good vertical carrier transport is essential.
- No size effect exists in theory.
- The eff of wafer-scale tandem cells can reach 34%.
- A natural choice for conventional C-Si manufacturers.

Thin-Film Cell & Module Technology



- Good vertical and lateral carrier transport must be ensured simultaneously.
- Size Impact, with eff declining as the dimension increases.
- Have to widen the structure of P2 and P3 to:
 - 1, Achieve better isolation and charge transport between sub-cells.
 - 2, Light transmission in scribing dead zones can be fully utilized by the bottom c-Si cell.
- It is the preferred route for manufacturers of single-junction perovskite cells.

Research progress on 4T tandem modules



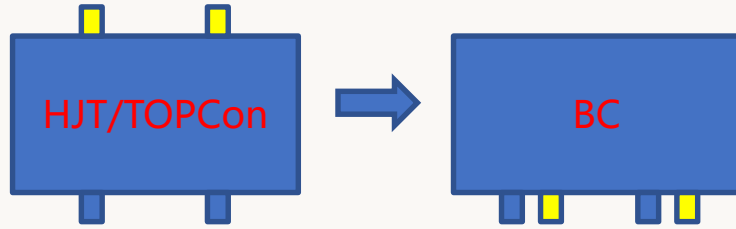
Cell	Isc [A]	Voc [V]	Impp [A]	Vmpp [V]	Pmpp [W]	FF [%]	Efficiency [%]
Top	0.399	110.44	93.394	0.349	32.638	0.7541	15.89
Bottom	2.83	8.78	2.69	7.53	20.27	0.8181	9.87
Tandem	Module area: 0.2054 m ²				52.91		25.76%

- This is the first 4T tandem module certified by an international authoritative organization (2024)
- This record has been included in the 64th edition of the Martin Green Efficiency Chart.

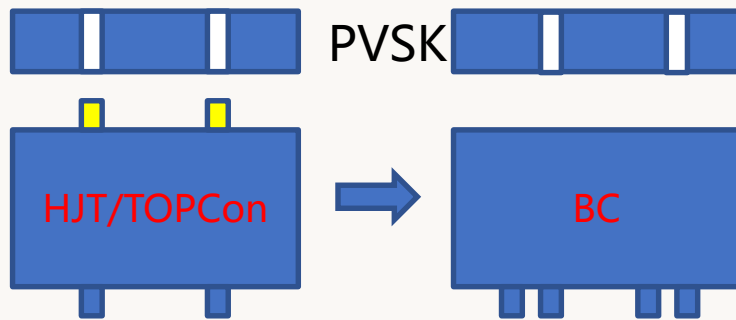
Research Progress of LONGi Tandem Modules - Future Breakthrough Direction

Advantages of the Tandem BC Cell Technology

BC cells serve as the "ideal bottom cell" for perovskite/c-Si tandem cells, offering critical performance, process, and cost benefits for both 4T and upcoming 3T architectures.

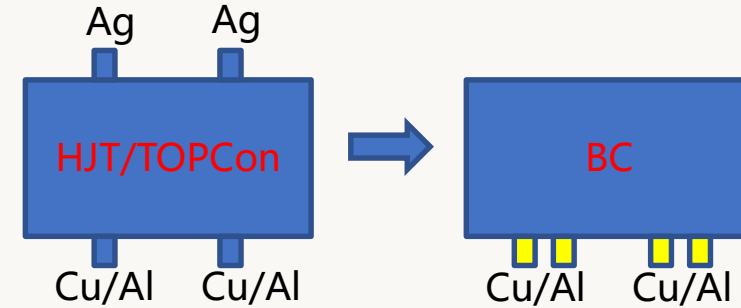


- High efficiency with superior visual appeal

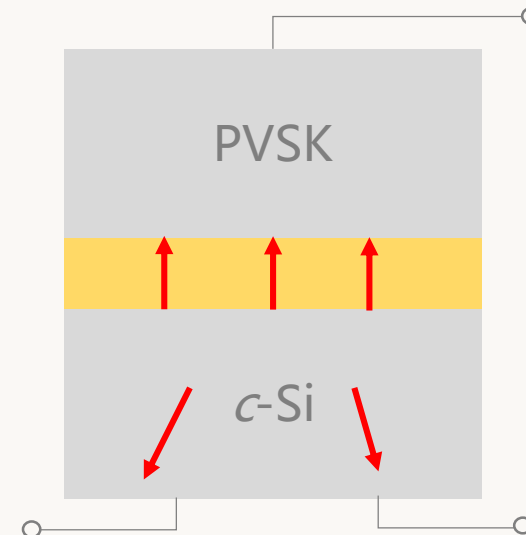


4T tandem cells require BC bottom cells

- Natural anti-hotspot design
- Superior aesthetic design



- Silver-Free Metallization



3T tandem preserves 4T's process flexibility and stability, resolves its extra cost issues, and bypasses 2T's current-matching challenges.

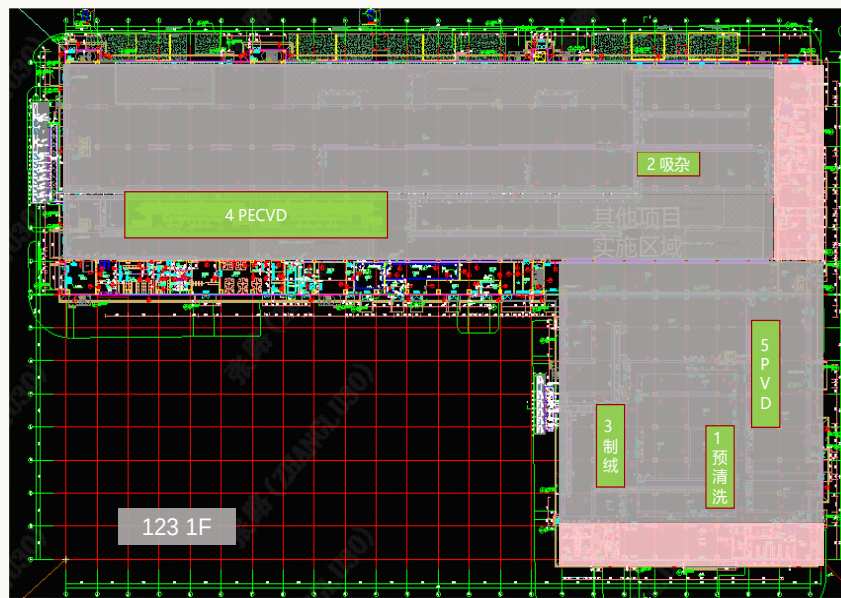
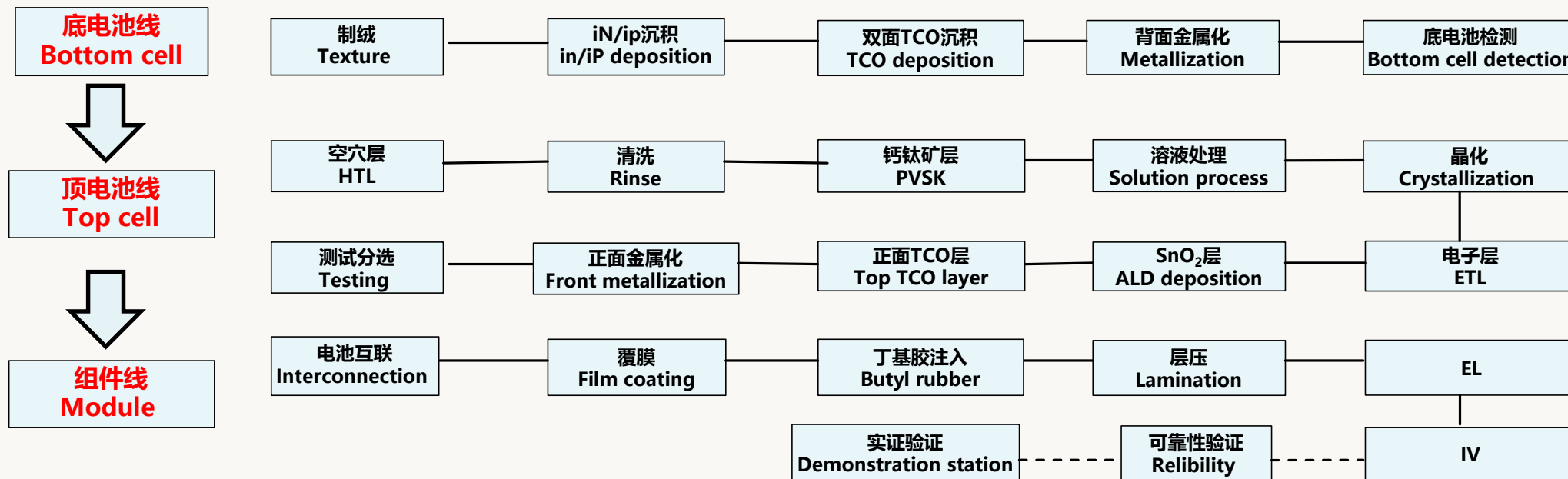
As the key future direction for perovskite/c-Si tandem, it finds its perfect bottom cell match in BC cells' back-contact design.

03

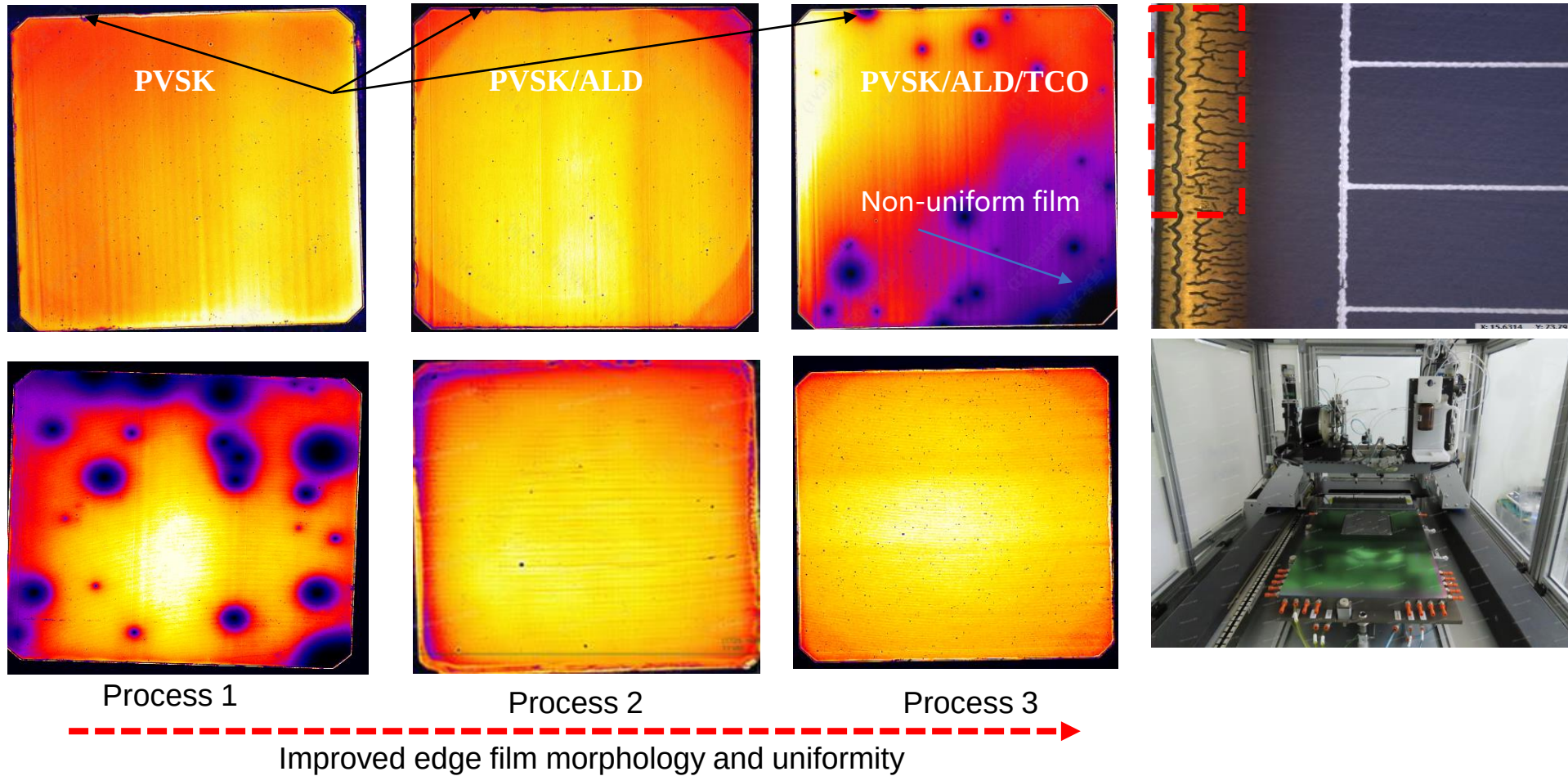
LONGi Progress in Tandem Cell Mass Production

CHAPTER 3

2T Perovskite/c-Si Tandem Cell Production Pilot Line

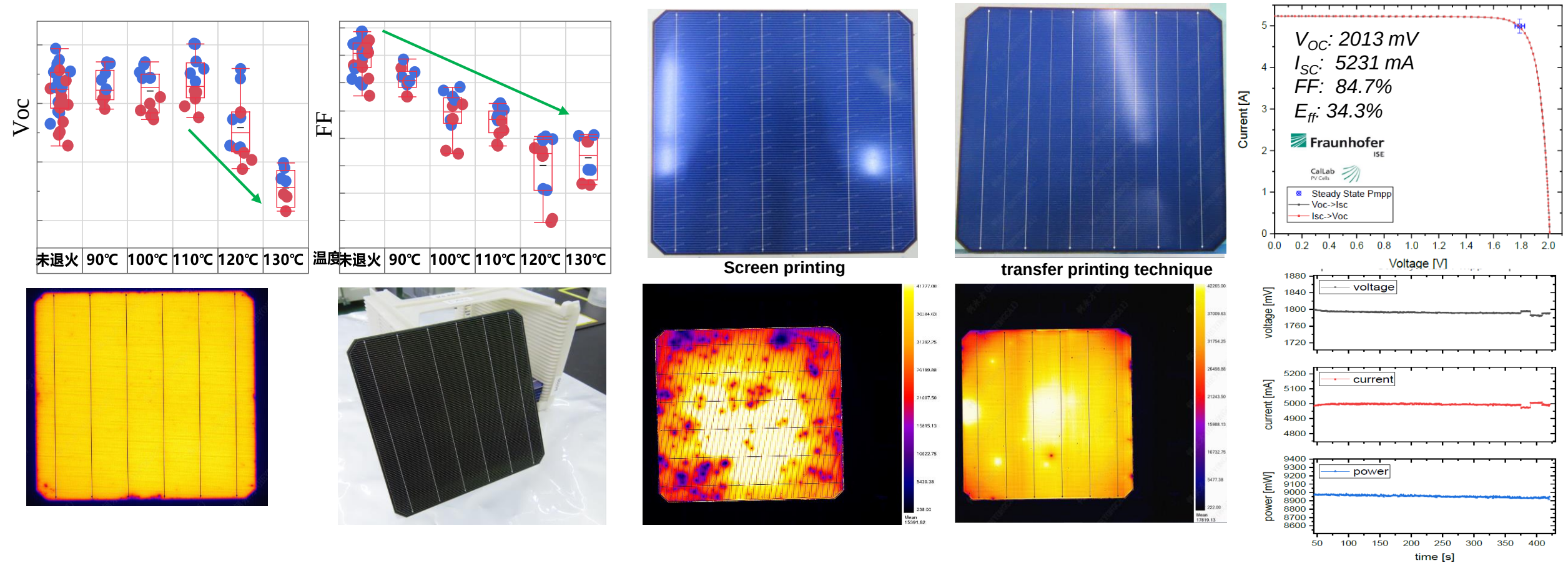


Preparation of PVSK under ambient air conditions



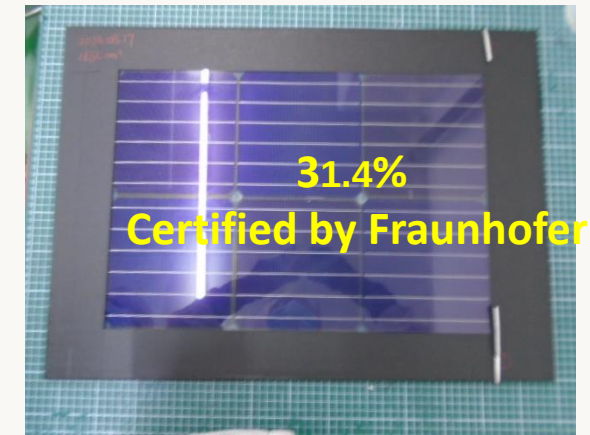
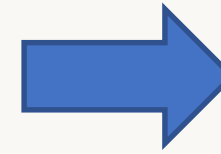
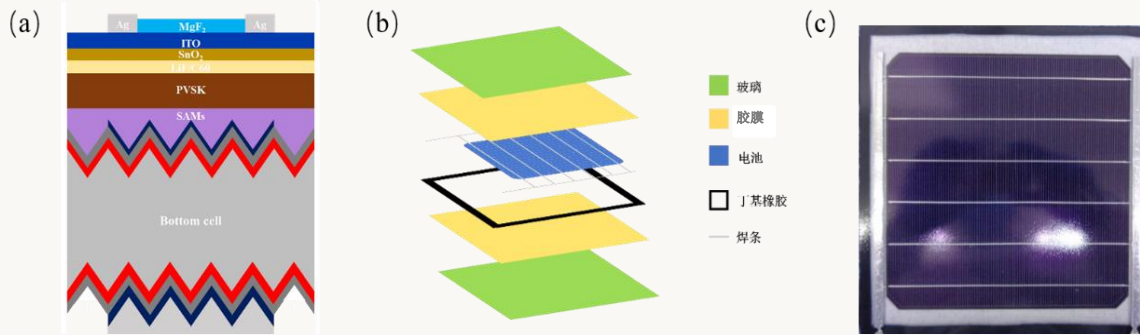
- Solvent engineering eliminates non-uniform PL images induced by edge film shrinkage
- Mass-producible equipment deposits uniform and non-destructive perovskite films on wafers

Low-temperature and damage-free metalization technology

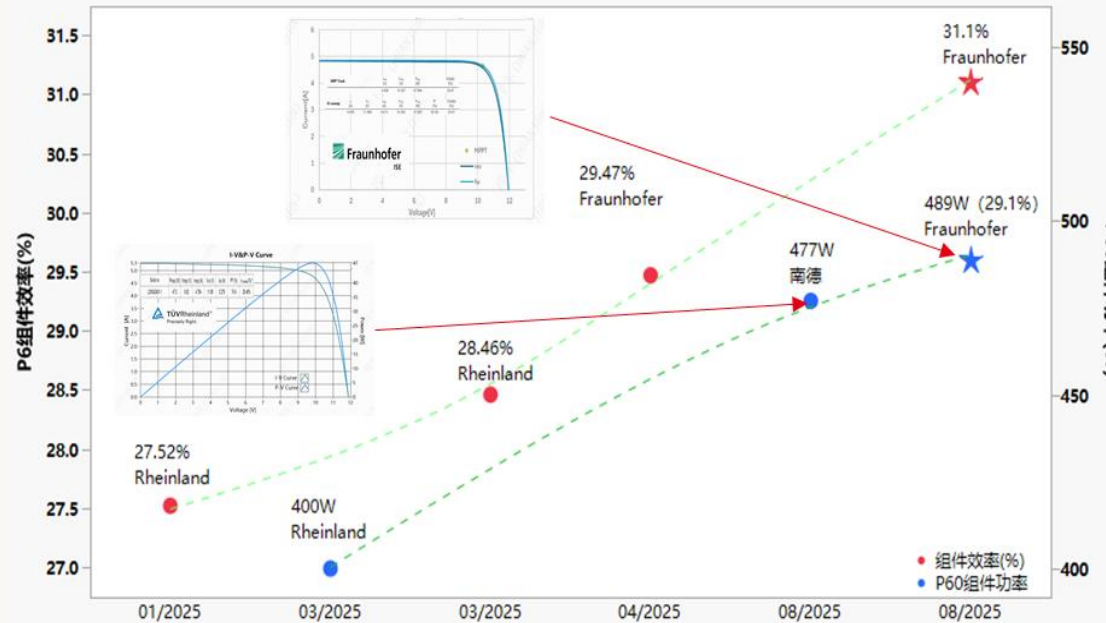


- Ultra-low-temperature (<120 °C) metallization technology eliminates the impact of thermal effects on device performance;
- Contactless metallization technology eliminates damage caused by the laser transfer printing process;
- **Advanced metallization and large-area film technologies** push commercial-size tandem cell efficiency to **34.3%**;

Perovskite Tandem Modules



China's First standard c-Si/Perovskite Tandem Module



- Development of high water-vapor and oxygen barrier encapsulation process to eliminate environmental factors;
- Development the suitable interconnection and low-temperature encapsulation method for 2T tandem cells ;

China's First 10MW-Class Tandem Cell Production Line



陕西省企业投资项目备案确认书

项目名称：新型晶硅-钙钛矿叠层太阳能电池技术及装备产业化

项目代码：2505-611206-04-01-726794

项目单位：隆基绿能科技股份有限公司西咸新区分公司

建设地点：陕西省西咸新区泾河新城范围内，原点大道以南、泾干二街以北、原点西一路以西、原点西二路以东

项目单位登记注册类型： 私营股份有限公司

建设性质：改建

计划开工时间：2025年11月 总投资：20353万元

建设规模及内容：本项目占地面积4000平方米，在原备案项目“隆基股份中央研究院一期中试项目(项目备案号为2203-611206-04-05-155242)”厂房内，使用原项目租用厂房及配套设备再拟投入钙钛矿薄膜沉积装备、钙钛矿快速晶化装备和功能层薄膜沉积装备等设备，主要建成1条100MW高效晶硅-钙钛矿叠层电池中试产线，进行新型高效晶硅-钙钛矿叠层电池研究开发与中试。

项目单位承诺：项目符合国家产业政策，填报信息真实、合法和完整。

审核通过

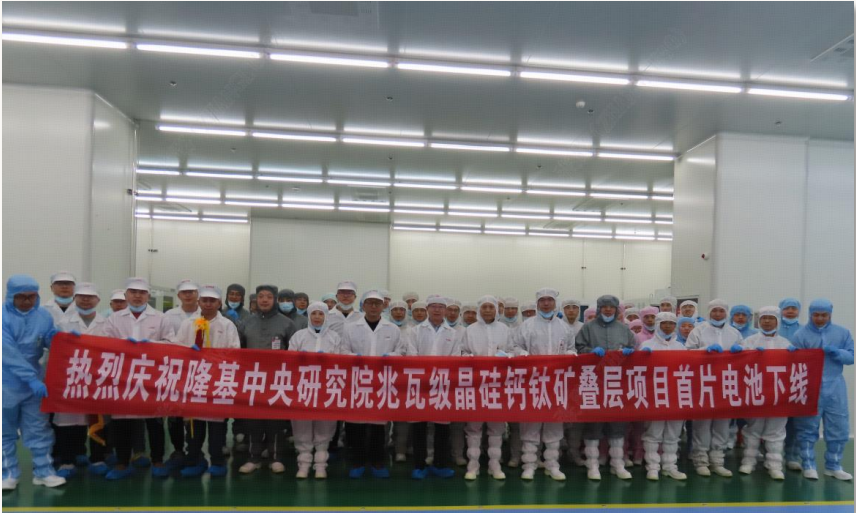


备案机关：陕西省西咸新区泾河新城管理委员会

February 2026
Investment filing completed

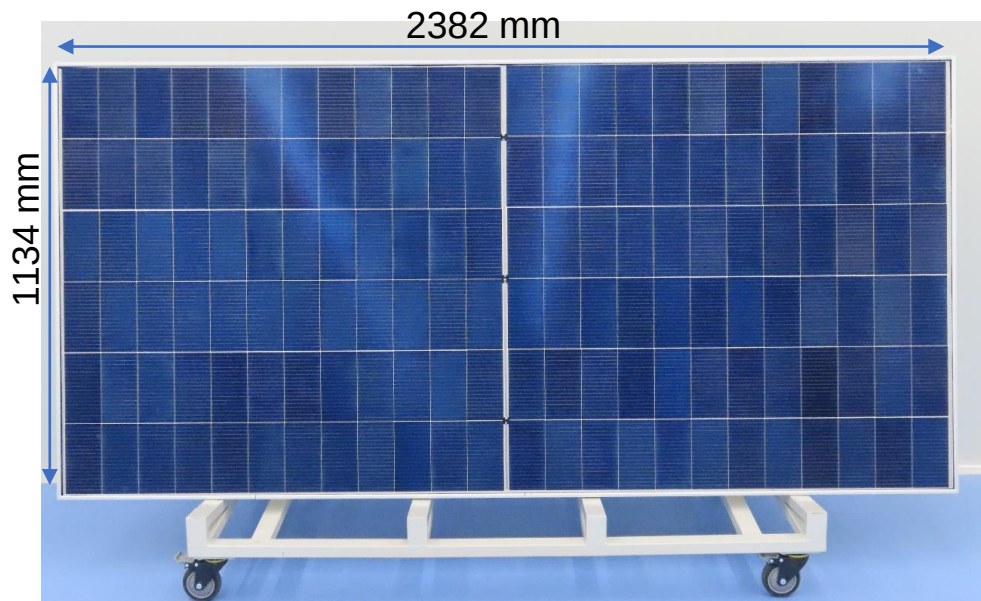


Feb – Mar 2026
Main equipment delivered,
installed and commissioned



On March 31, 2026, the first batch of
products came off the Phase I 10MW tandem
cell production line.

Standard Tandem Cell Module and Outdoor Reliability System

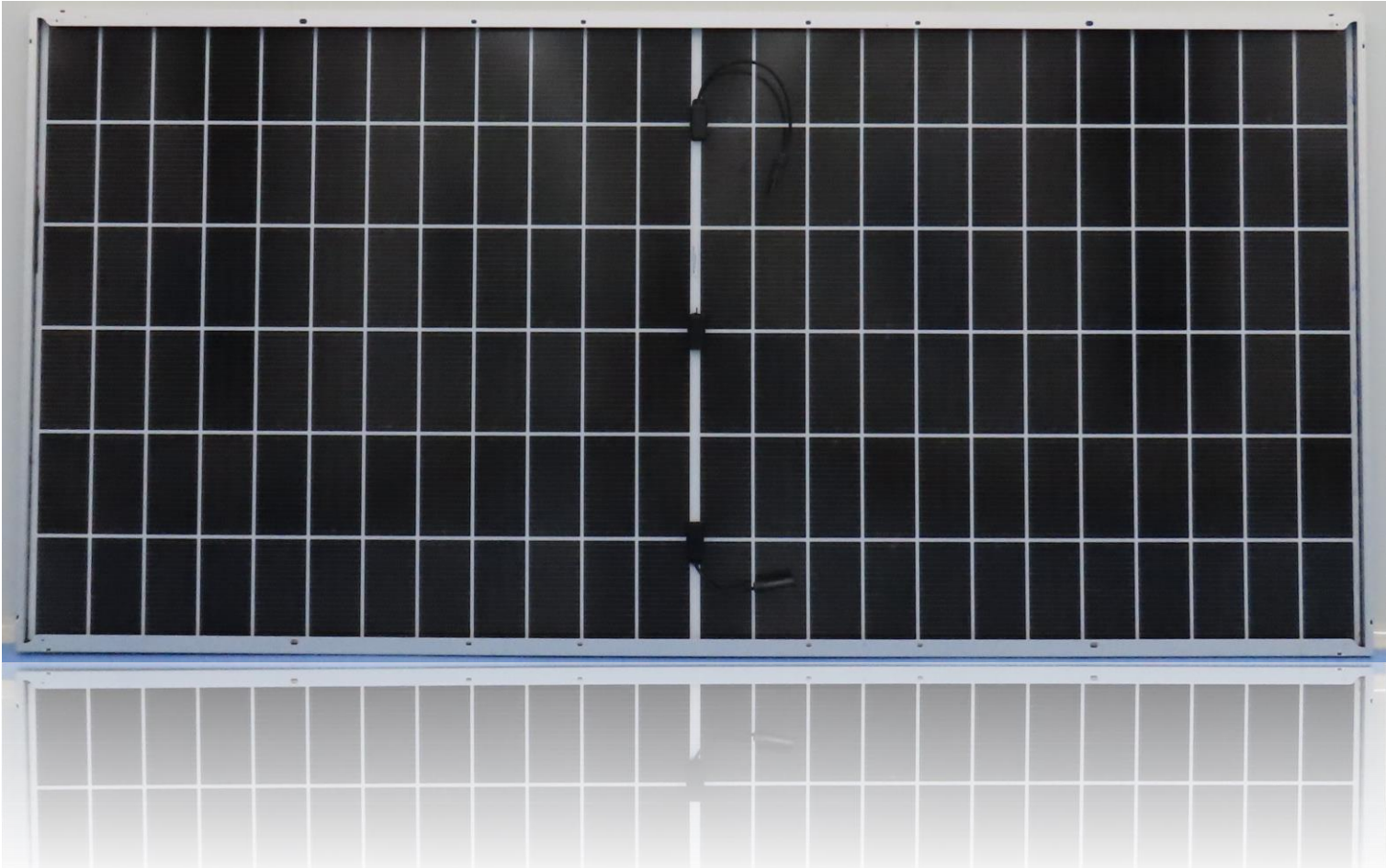


Reliability data have being collected, we will share the output data later

Overview of Mass-Produced Modules in Production Line



2T Perovskite-HJT Tandem Modules: Photo & Electrical Specs



Type	LRX-72-755	
Testing condition	STC	NOCT
Pmax / W	755	599
Voc / V	143.71	143.25
Isc / A	6.71	5.24
Vmp / V	122.15	120.87
Imp / A	6.19	4.96
Module Efficiency (%)	28%	
Module Size	2382*1134mm	
Expected to ramp up to 800W		

The current mass-produced LRX-72-755 module with dimensions of 2382×1134 mm delivers a peak power of 755 W and a module efficiency of 28% under STC conditions, while achieving 599 W under NOCT conditions, combining high power, high efficiency, and stable outdoor power generation performance.

Construction Timeline & Capacity Plan for Tandem Production Lines **LONGi**

- Core equipment procured and delivered
- Pre-production & reliability work underway
- R&D transferred to production
- Initial reliability verification completed
- Technical foundation laid for pilot line

10MW Production line construction launched

2025/9

2026/2

2026/3

2027/3

2027/4

2027/5

2028/3

Platform Setup Pre-launch Preparation

- Full equipment installation & commissioning completed; pilot line trial run launched
- Encapsulation reliability verified, and potential line risks eliminated
- Production & quality systems fully closed for product launch

First Roll-off Process Iteration

- First 2T tandem cell rolled off pilot line; key parameters optimized
- Full-process verification done, efficiency and reliability improved
- Advanced module production and yield ramp-up

Deep development of key processes

- Broke technical bottlenecks and finalized core tandem processes based on pilot data
- Released standardized process plans and parameters
- Provided solid technical support for 100MW-scale mass production

Full Lifecycle Verification of Modules

- Produced high-stability modules and completed long-term outdoor reliability tests
- Conducted manufacturability assessment and cut production costs
- Achieved steady yield improvement

Phase II 100MW Line Approved

- Summarized Phase I pilot achievements and got reliability reports approved
- Compiled expansion plan for Phase II 100MW line
- Launched site selection, design and preparation for mass production line

High-eff products officially delivered

- Phase II line put into operation; modules commercially delivered
- Met global demand for high-power and high-reliability PV products
- Achieved strategic goal from technical verification to industrial application

The 10MW tandem cell production line was scheduled to start construction in September 2025. Following pilot verification, process optimization and yield ramp-up, the Phase II 100MW line will be put into operation in March 2028, with high-efficiency tandem modules delivered commercially.

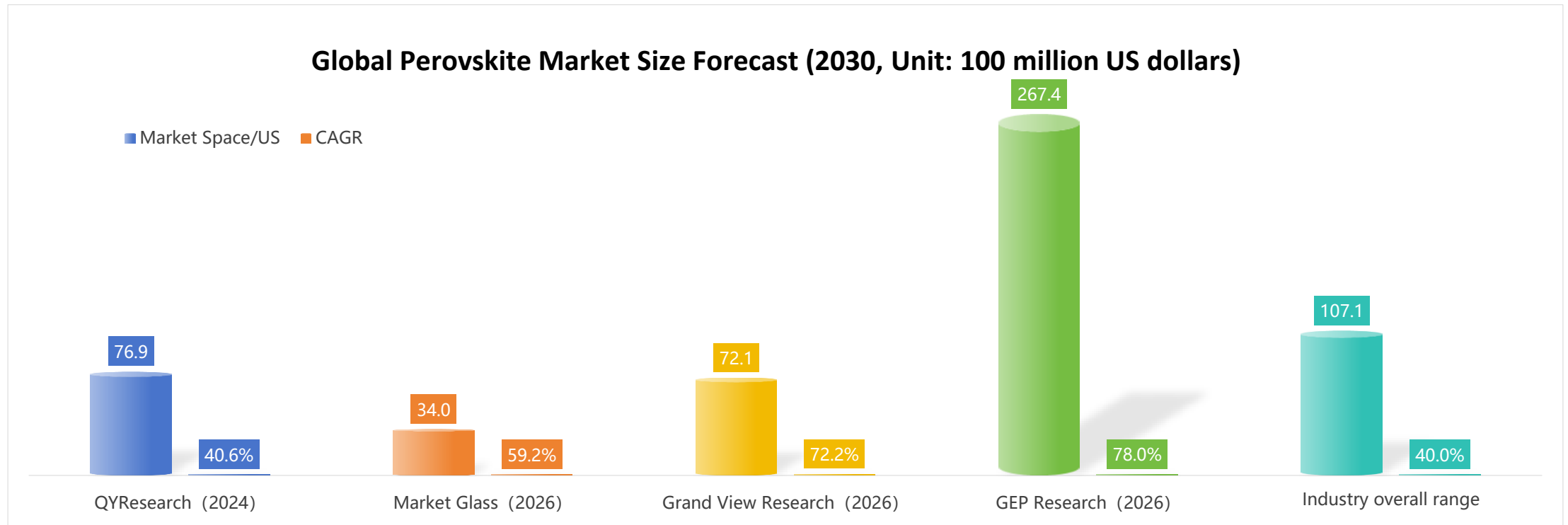
04

Analysis on the Expected Application Value

CHAPTER 4

Market to top \$7B by 2030, entering rapid growth phase.

According to forecasts from multiple institutions, the global perovskite market is on the verge of explosive growth, with its CAGR expected to exceed 40% over the next decade.



Prediction Interpretation

Although forecasts from different institutions vary, they all lead to a clear conclusion: **The market will witness explosive growth.**

- **Optimistic forecasts** (e.g., GEP Research): Based on assumptions of vigorous technological advancement and declining costs.
- **Conservative forecasts** (e.g., Market Glass): Focus on existing planned production capacities, featuring higher practicality.
- **Comprehensive and rational range**: Considering the gradual progress of technological maturity and market penetration, the market size is expected to reach **7-10 billion US dollars**.

Five Core Drivers for the Industrialization of Perovskite Technology

Perovskite solar cells (PVSK) adopt ABX_3 -structured materials as the light-absorbing layer, and their unique physical properties bring them disruptive competitive advantages.

Higher eff ceiling

The conversion efficiency of single-junction perovskite cells in laboratories has exceeded **28%**, and the theoretical limit of tandem technology surpasses **45%**. Its power generation per unit area is over 30% higher than that of crystalline silicon, redefining the technical ceiling of PV energy conversion efficiency.

Cost advantages

The **core material cost** is only one-tenth of that of traditional crystalline silicon, and the **process energy consumption** is reduced by more than 50%. With its tremendous cost reduction potential, the cost per kw is expected to fall well below that of coal-fired power, reshaping the landscape of the energy market.

A boom in app scenarios

It features unique physical properties such as translucency, light weight and flexibility, making it ideal for scenarios including BIPV, flexible electronic devices and space exploration. It breaks the physical limitations of crystalline silicon and opens up unprecedented market potential.

Policy & capital drive growth

Driven vigorously by the global carbon neutrality strategy, industrial giants such as LONGi and CATL are accelerating the layout of the entire industrial chain. China accounts for over **90%** of the global production capacity in key materials and equipment, establishing core competitive advantages.

Indus. tipping point comes

The GW-level mass production line will be officially put into operation in 2025, marking the entry of the technology into the large-scale commercial application phase. It is expected to become a mainstream technical route by 2030, with the corresponding market size reaching **7-10 billion US dollars**, and the industry will witness explosive growth.

Manufacturing Value: Technology Selection – 2T vs 4T Tandem Technologies

2T (Two-Terminal) Series-connected Structure

R&D Efficiency

35%

Construction Cost of 1GW

0.131\$/W

Core Competitive Advantages: Ultra-compact Design & High Cost-performance

No additional FTO conductive glass or separate junction boxes are required, featuring a highly integrated structure. The material cost is only US\$ 8.1/m². Despite a 90% cost increase, the conversion efficiency rises by 45.8%. Its cost per watt is markedly lower than the industry average, making it the optimal solution that balances technical performance and commercialization.

Preferred Route for Commercialization

It features high technical maturity and excellent supply chain compatibility, enabling rapid large-scale mass production. It serves as the core technical path for cost reduction and efficiency improvement at present.

4T (Four-Terminal) Mechanical Stack

R&D Efficiency

33%

Construction Cost of 1GW

0.164\$/W

Core Constraints: High Costs & Structural Redundancy

It necessitates additional FTO conductive glass, which accounts for more than 40% of the total material cost, as well as standalone junction boxes, resulting in a cumbersome structure. The material cost stands at \$17.7/m², almost twice that of the 2T solution. Despite a 126% cost growth, the conversion efficiency sees merely a 37.5% improvement. The unfavorable input-output ratio renders it incapable of meeting the cost reduction demands for large-scale commercial application.

Explore Other Advantages in Mass Production

Advantages in operational degradation and product reliability

Source: Research published in the journal *Watt* by Professor Liyuan Han's team from Shanghai Jiao Tong University, titled *Techno-Economic Challenges and Opportunities Behind the Perovskite-Silicon Alliance*.

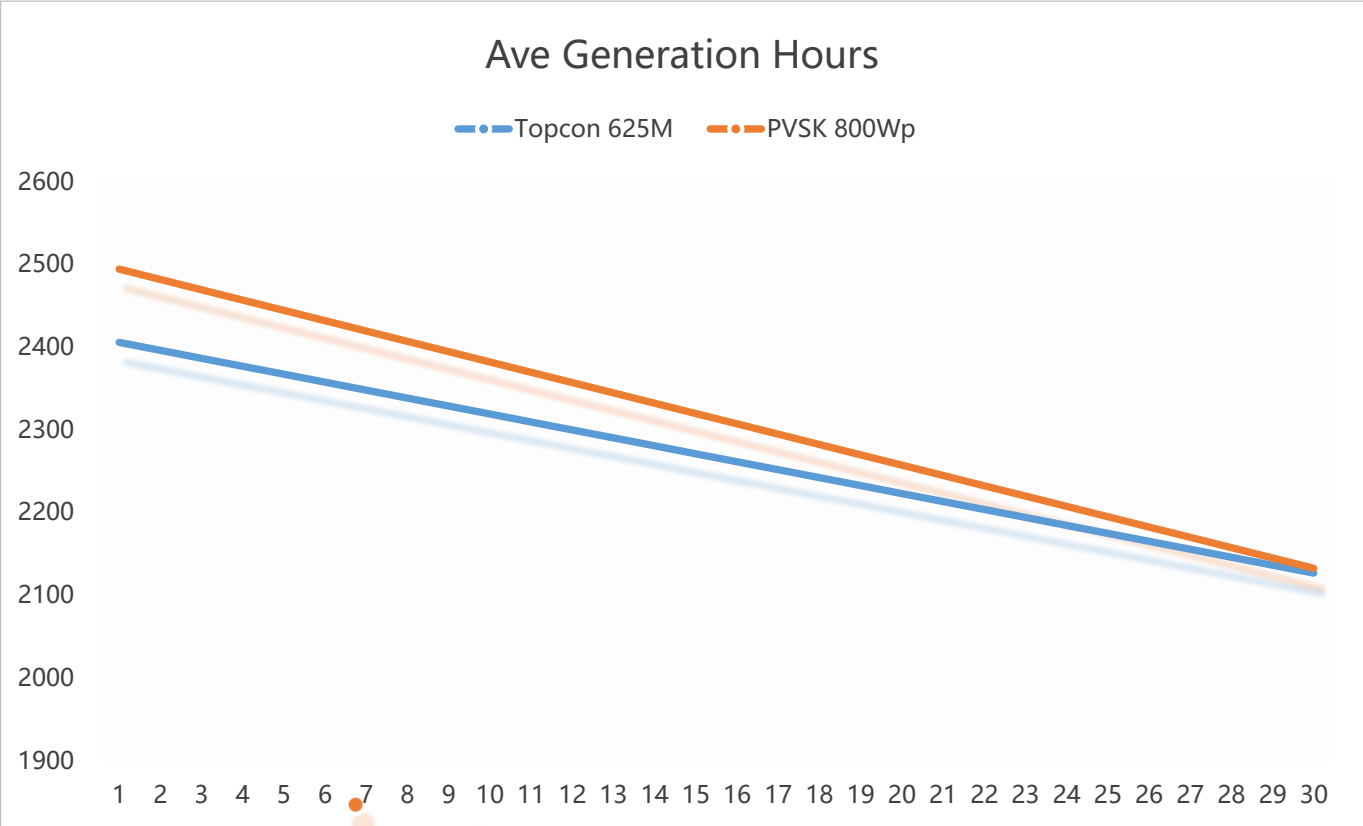
Published in the top international journal *Watt*.

Application Value: Efficiency Breakthrough & System Benefits



Power Yeild Analysis for 30 years

- ◆ Tandem modules deliver about **3.67% higher power generation in the first year.**
- Thanks to their better annual degradation performance, they maintain a **2.07%** higher total power output over the **full 30-year lifecycle.**



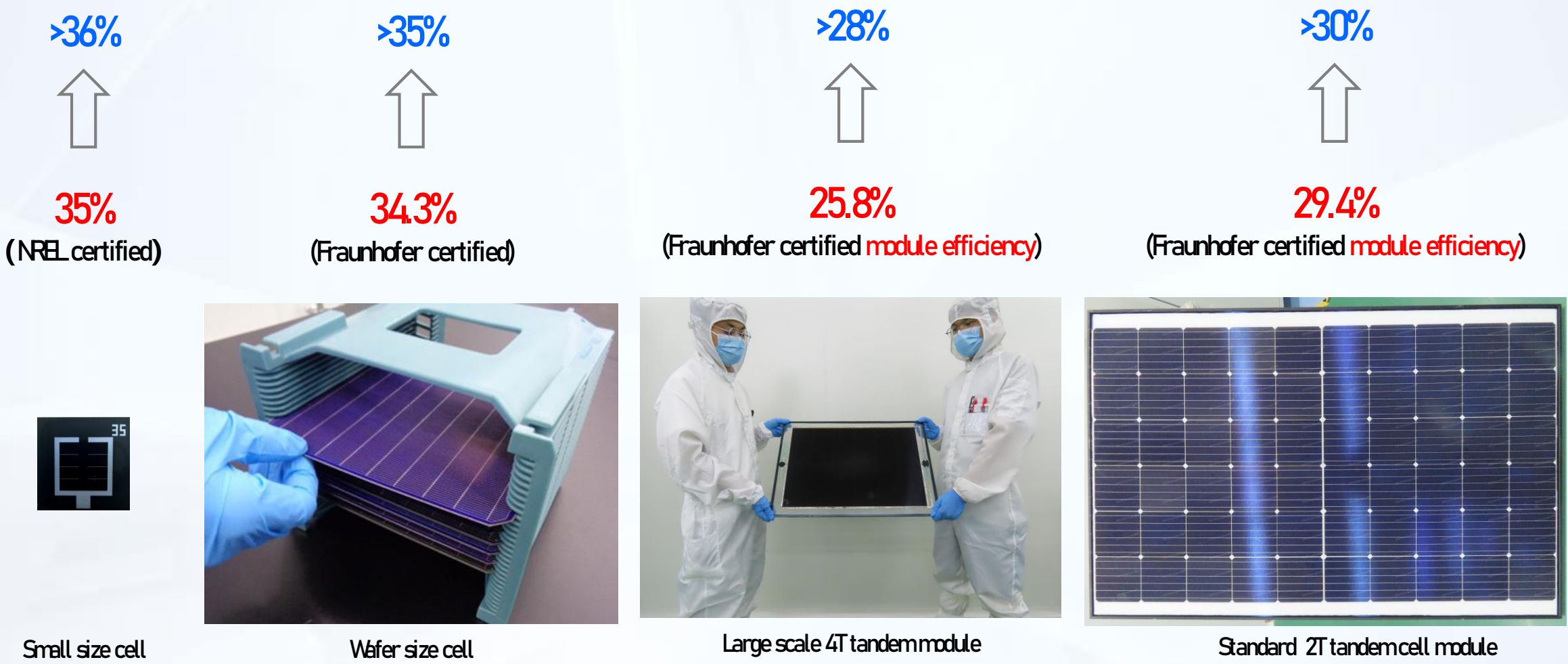
Module Type	Topcon 625M		PVSX 800Wp	
	Grid Power (MWh)	Ave. Annual Generation Hours	Grid Power (MWh)	Ave. Annual Generation Hours
1	269500	2406.0	279390	2494.6
2	268422	2396.4	277993	2482.1
3	267344	2386.7	276596	2469.6
4	266266	2377.1	275199	2457.1
5	265188	2367.5	273802	2444.7
6	264110	2357.9	272405	2432.2
7	263032	2348.2	271008	2419.7
8	261954	2338.6	269611	2407.2
9	260876	2329.0	268214	2394.8
10	259798	2319.4	266817	2382.3
11	258720	2309.7	265421	2369.8
12	257642	2300.1	264024	2357.4
13	256564	2290.5	262627	2344.9
14	255486	2280.9	261230	2332.4
15	254408	2271.2	259833	2319.9
16	253330	2261.6	258436	2307.5
17	252252	2252.0	257039	2295.0
18	251174	2242.4	255642	2282.5
19	250096	2232.8	254245	2270.0
20	249018	2223.1	252848	2257.6
21	247940	2213.5	251451	2245.1
22	246862	2203.9	250054	2232.6
23	245784	2194.3	248657	2220.2
24	244706	2184.6	247260	2207.7
25	243628	2175.0	245863	2195.2
26	242550	2165.4	244466	2182.7
27	241472	2155.8	243069	2170.3
28	240394	2146.1	241672	2157.8
29	239316	2136.5	240275	2145.3
30	238238	2126.9	238878	2132.8
Total	7616070.00	/	7774026.8	/
Gap	Baseline	/	2.07%	/

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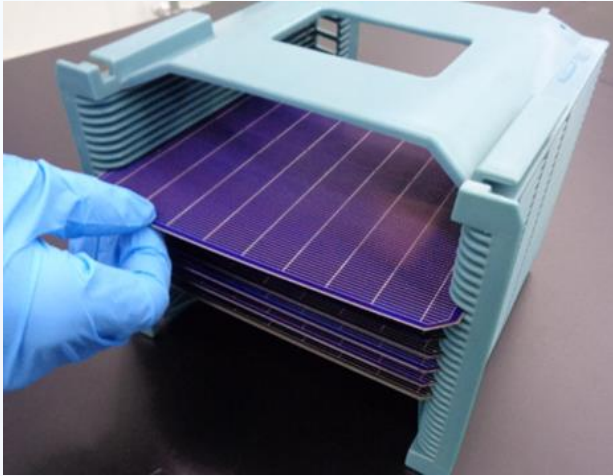
Opportunities and Challenges

CHAPTER 5

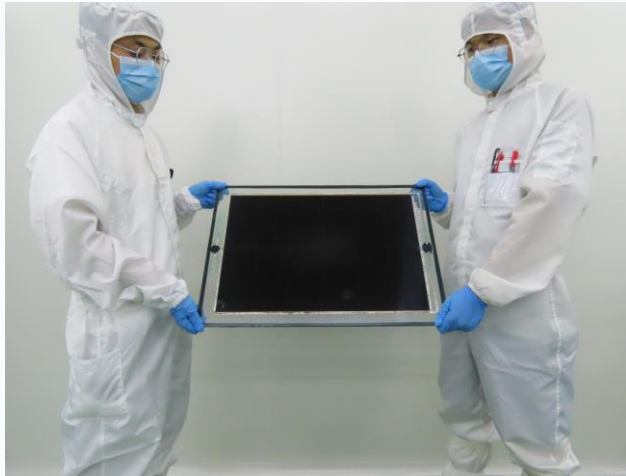
Prediction of the tandem technology



Small size cell



Wafer size cell



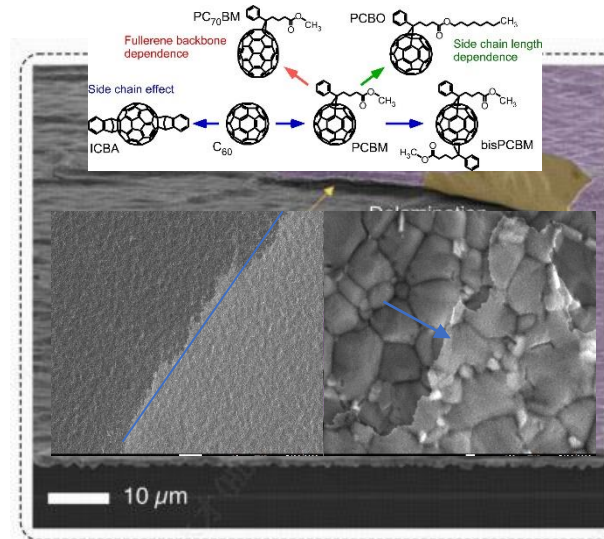
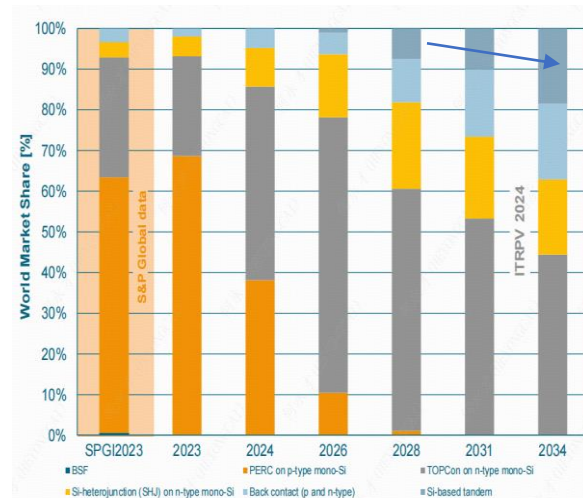
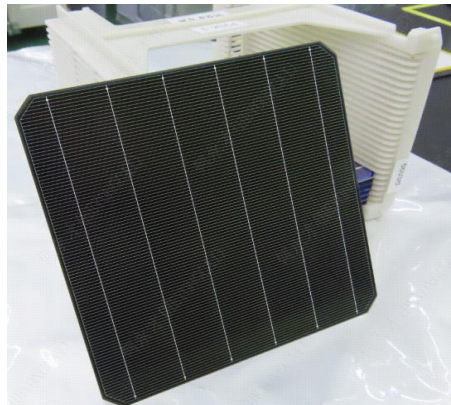
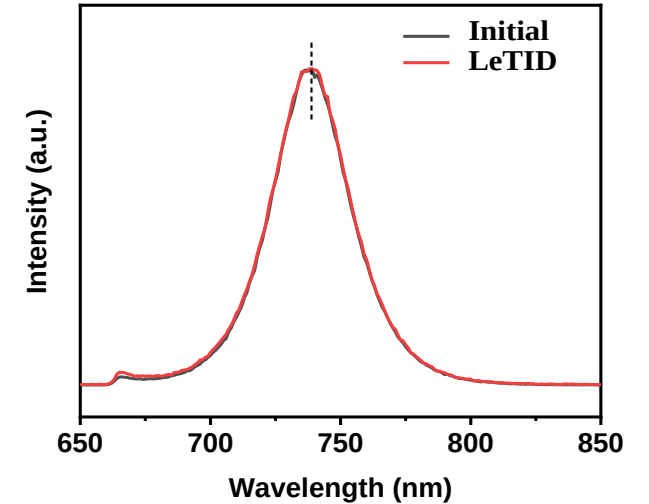
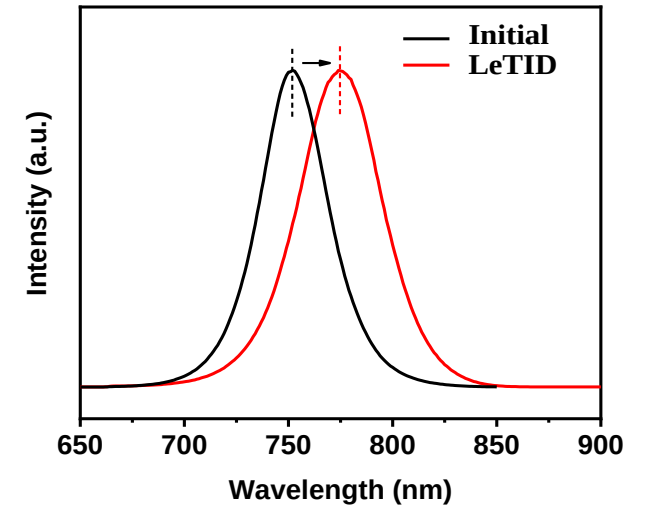
Large scale 4T tandem module



Standard 2T tandem cell module

Conclusion and outlook

- Optical optimization is an essential approach for 2T to achieving high-efficiency
- The bilayer passivation strategy/HTL201/Dual Buffer Layer reduce defect and stress, thereby significantly improving the cells efficiency exceed 35%
- Large-area uniform perovskite films have been fabricated on silicon wafer substrates
- Tandem cells has exceeded 34% in wafer size, and the tandem modules has surpassed 29%
- Reliability is the primary concern in 2T tandem cells, and significant progress has been achieved in both the academic and industrial.



Application Scenarios of Tandem Cells



Spacecraft



Vehicle PV

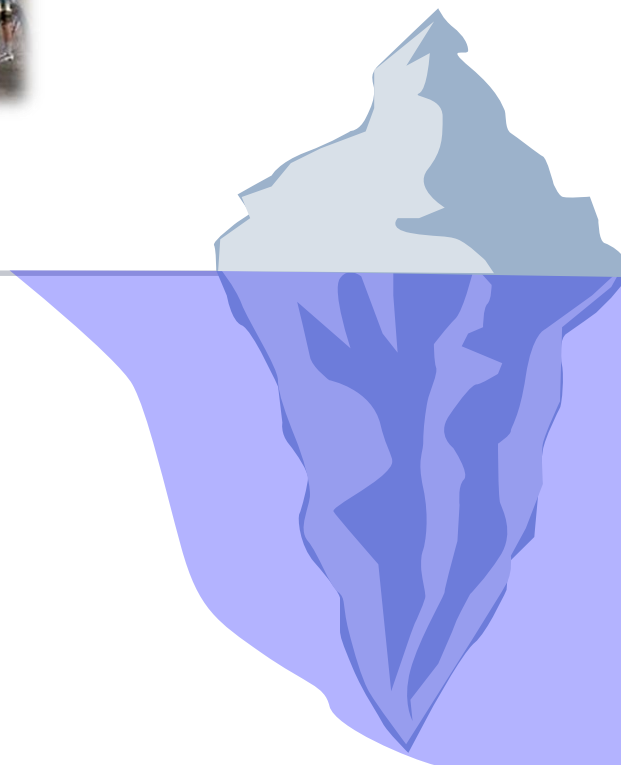


Cutting-edge Photovoltaic Technology

Distributed / Centralized PV Power Stations



Key Technologies for Carbon Neutrality



LONGi

THANKS
