



PV CELLTECH USA 2026 | 13–14 OCTOBER

Securing the PV Supply Chain

Traceable wafer supply for US cell manufacturing:
an India-based case study

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US cell capacity needs traceable wafer supply



US solar manufacturing capacity (GW)

modules
all technologies



75.3 GW

cells
crystalline silicon



~10.6 GW

Module makers still rely heavily on imported cells, US cell capacity is expected to reach about 20.5 GW by the end of 2027 (pv magazine).

Sources: SEIA Supply Chain Dashboard, Oct 2026 (modules); SEIA / Wood Mackenzie data via CarbonCredits.com (cells); SEIA, Q2 2026 and pv magazine, July 2026 (Outlook).

~7x

75.3 GW modules
~10.6 GW cells

US module capacity has scaled much faster than cell capacity. Ingot and wafer manufacturing only came online in October 2025.

FEOC

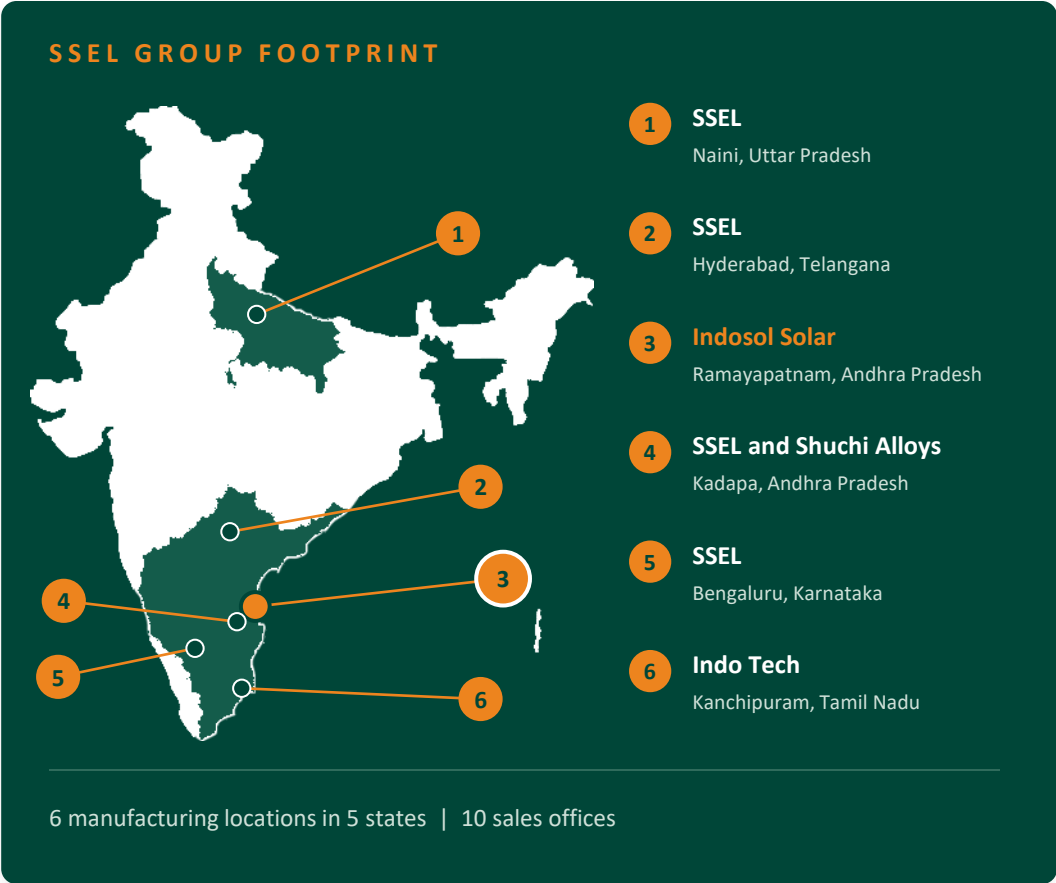
Strict FEOC and prohibited-foreign-entity rules, plus domestic-content incentives, demand verified non-FEOC sources.

Gap

US wafer capacity remains insufficient for the cell capacity now being built. The question is which imported wafers can support compliance review.

The constraint is moving upstream, to cells and wafers

Indosol Solar at a glance



INDOSOL SOLAR

A giga-scale solar PV manufacturing ecosystem at Ramayapatnam, Andhra Pradesh, spanning ingot, wafer, cell and module.

1.3 GW	Oct 2026	10 GW
Phase 1: ingot, wafer, cell and module	Commissioning, with trial production to follow	Ingot-to-module target, 2028

BACKED BY SSEL GROUP | 30+ YEARS | 38+ COUNTRIES SERVED

One of India's largest transformer manufacturers

Diversified range:

- Transformers from 5 KVA to 500 MVA
- Reactors up to 125 MVAR
- Transformers for special applications including IDTs

50,000 MVA	48,000 MT
Annual transformer capacity	Annual conductor and cable capacity

An integrated manufacturer inside an established industrial group

A 1.3 GW integrated campus in Andhra Pradesh, India



1.3 GW

Phase 1: ingot, wafer, cell and module

~70 acres

Campus at Chevuru, by Ramayapatnam Port

STATUS

Commissioning in October 2026
Trial production follows

Production

1 Ingot 2 Wafer 3 Cell 4 Module

Warehouses and yard

5 RM warehouse 6 FG warehouse 7 Scrap yard

Utilities

8 Ultra-pure water 9 Chillers, cooling towers 10 Substation

Environment and recovery

11 ETP and STP 12 Treated effluent storage 13 Si kerf recovery

Chemicals and gases

14 Chemicals 15 NH3 16 Gas yard 17 Ar storage, recovery
18 O2, N2 storage and ASU

Ingot, wafer, cell and module on one site

The line: from ingot to module



1 Ingot pullers



2 Diamond wire slicers



3 Wet chemical tools



4 PECVD poly



5 Printing lines



6 Stringers (module line)

Equipment installed across ingot, wafer, cell and module

Introducing INDOSOL PURE™



I N T R O D U C I N G . . .

INDOSOL PURE™ N-type G12R wafer



G12R
182.3 × 210 mm, rectangular

N-type
CZ monocrystalline

130 ± 8 μm
Thickness

≥ 1,000 μs
Minority-carrier lifetime

KEY PARAMETERS

Resistivity	0.9 – 1.6 Ω·cm	Oxygen [Oi]	≤ 6.0 × 10 ¹⁷ at/cm ³
Carbon [Cs]	≤ 5.0 × 10 ¹⁶ at/cm ³	Etch pit density	≤ 500 per cm ²
Total thickness variation	≤ 20 μm	Warp	≤ 40 μm
Orientation	< 100> ± 2°	Cutting	Diamond wire

Lifetime by QSSPC at 5E14 cm⁻³ injection; oxygen and carbon by FTIR. Specifications subject to technical changes and testing.

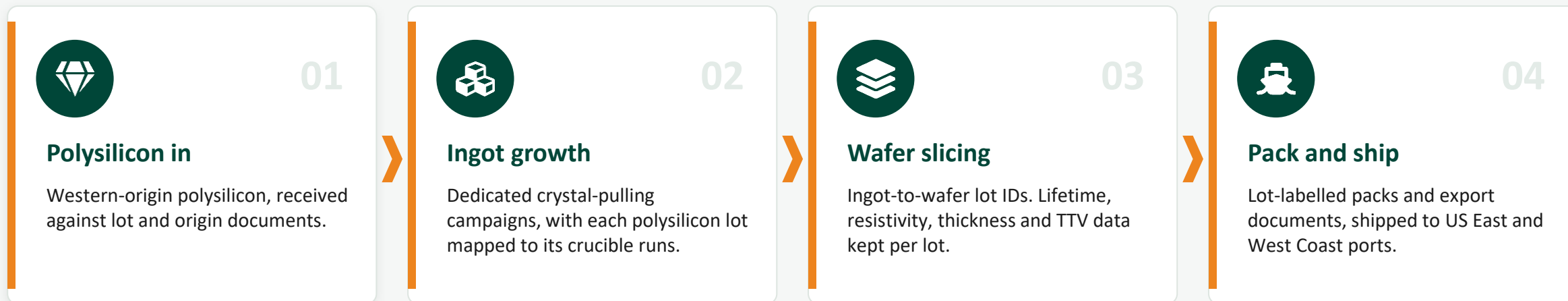


Qualification lots from November 2026

Also available: G12 and M10R formats

Controlled specification for N-type TOPCon cell lines

Traceable from polysilicon to wafer



SEGREGATED BY DESIGN

Commercial and qualification lots run in dedicated campaigns. Other material is kept separate, in the plant and in the records.

INDEPENDENT OWNERSHIP

No equity or funding from FEOC-country entities

Supporting ownership and funding documents available for your review.

WHAT YOU CAN REVIEW

- ✓ Polysilicon origin and supplier documents
- ✓ Lot-level traceability records
- ✓ Third-party audit and verification, on request
- ✓ Ownership, funding and supplier information for your FEOC and 45X review

We supply the documentation. Your counsel and tax advisers make the compliance determination.

Our cell line validates our wafers



TOPCon+ cell line: printing

25.5%

TARGET

Starting-efficiency target

G12R TOPCon+ line with LECO, EPD and poly-finger metallisation

WHAT THE CELL LINE WILL VALIDATE

- ✓ Minority-carrier lifetime
- ✓ Resistivity uniformity
- ✓ Thickness, TTV and warp
- ✓ Process yield and breakage behaviour

THE WAFER-TO-CELL FEEDBACK LOOP

1

Qualification lots

From November 2026

2

Our TOPCon+ line

Lots run through our own cell line

3

You see the result

How our wafers perform in a TOPCon process

Wafer qualification data will come from a TOPCon+ line on the same site

Roadmap: future cells define future wafers



All efficiency figures are targets, not measured results.

ANU COLLABORATION

Collaboration with the Australian National University, particularly on back-contact cell technology for the future, and on joint process improvements. It gives Indosol direct visibility of evolving wafer requirements.

WHY IT MATTERS FOR WAFERS

Our wafers are qualified on the same line that carries this roadmap, so wafer and cell requirements move together.

Working with ANU on back-contact technology and on process improvements

In the news: Indosol × ANU

Reported by eight outlets from 15 September 2026

THE HINDU

15 SEP 2026

Indosol Solar ties up with Australian university to enhance solar technology

pv magazine

16 SEP 2026

Indosol Solar, Australian National University partner to develop advanced TOPCon cells

TAIYANGNEWS

ALL ABOUT SOLAR POWER

16 SEP 2026

Indosol Partners With ANU On TOPCon Cell Development

PRESS TRUST OF INDIA

India's premier news agency

15 SEP 2026

Indosol Solar, Australian university team up for high-efficiency solar cell technologies

rediff

15 SEP 2026

Indosol Solar & ANU Partner for High-Efficiency Solar Cells

energetica

16 SEP 2026

Australian National University, India's Indosol Solar Partner on Giga-Scale TOPCon Cell Development

HyderabadTimes

SEP 2026

ANU and Indosol Solar Join Forces to Accelerate Next-Generation TOPCon Solar Cell Technology

UNI

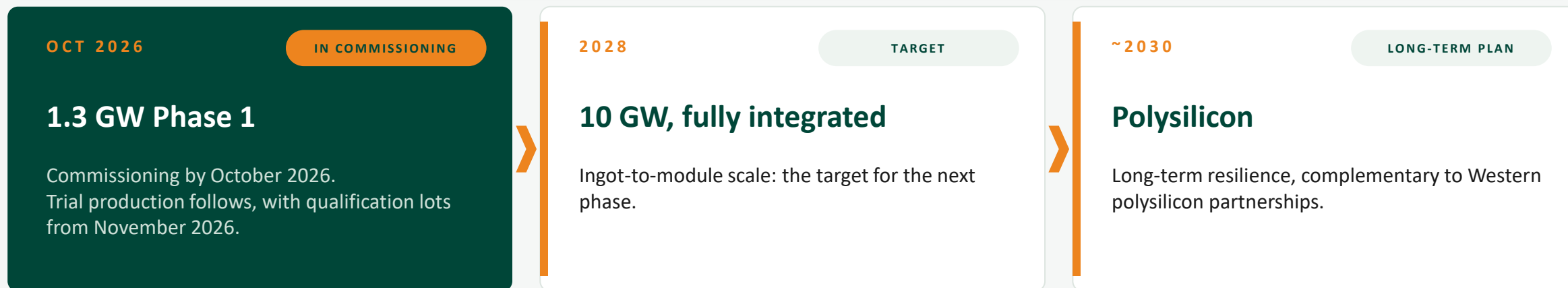
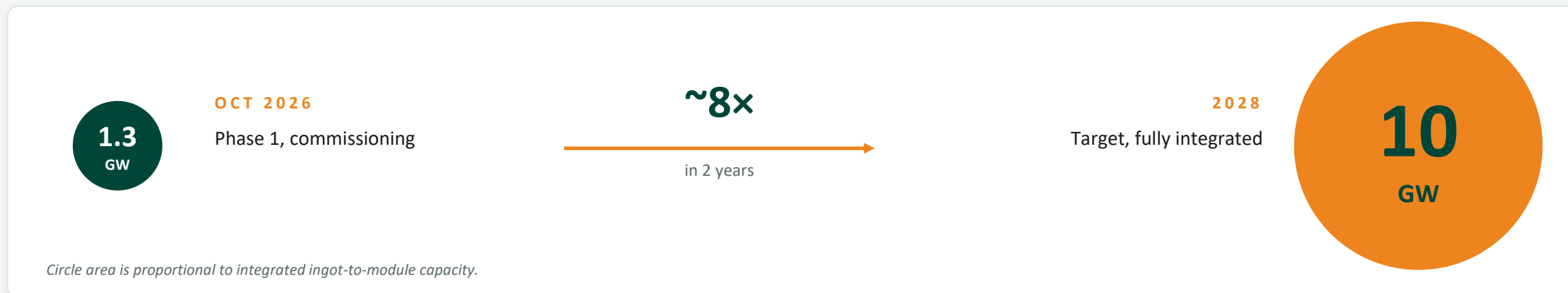
UNITED NEWS OF INDIA

15 SEP 2026

ANU, Indosol Solar sign pact to accelerate next-generation TOPCon solar technology

Collaboration with ANU on next-generation cell technology

Scale-up: from 1.3 GW to 10 GW



Capacity is being added in phases

From qualification to supply



01

FROM NOVEMBER 2026

Qualification

Engineering lots for your cell line using G12R N-type CZ wafers, with documented provenance and technical support.

WHAT IS DELIVERED

Lot-level wafer data and traceability records



02

AFTER QUALIFICATION

Commercial wafer supply

Multi-year wafer supply, with the volume ramp aligned to your cell-line schedule.

WHAT IS DELIVERED

Lot-labelled packs and export documents



03

ONGOING

Engineering partnership

Support through process matching, yield learning and next-generation wafer requirements.

WHAT IS DELIVERED

A wafer roadmap that follows your cell roadmap

Qualification comes first; supply follows

Key takeaways

IN SUMMARY

An independent India-based source of traceable G12R wafers for US cell manufacturing.

1

Traceable

Documented provenance from polysilicon to wafer.

2

Independent

No equity or funding from FEOC-country entities, with documentation to support your 45X credit review.

3

In-house validation

G12R N-type wafers, to be validated on our own TOPCon+ line.

4

Built to scale

1.3 GW Phase 1, with a 10 GW integrated target.

Traceable. Independent. Scalable.



PV CELLTECH USA 2026

Thank you

Questions and discussion

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