Building a Domestic PV Manufacturing Ecosystem: U.S. Pathways & Challenges

Alex Zhu

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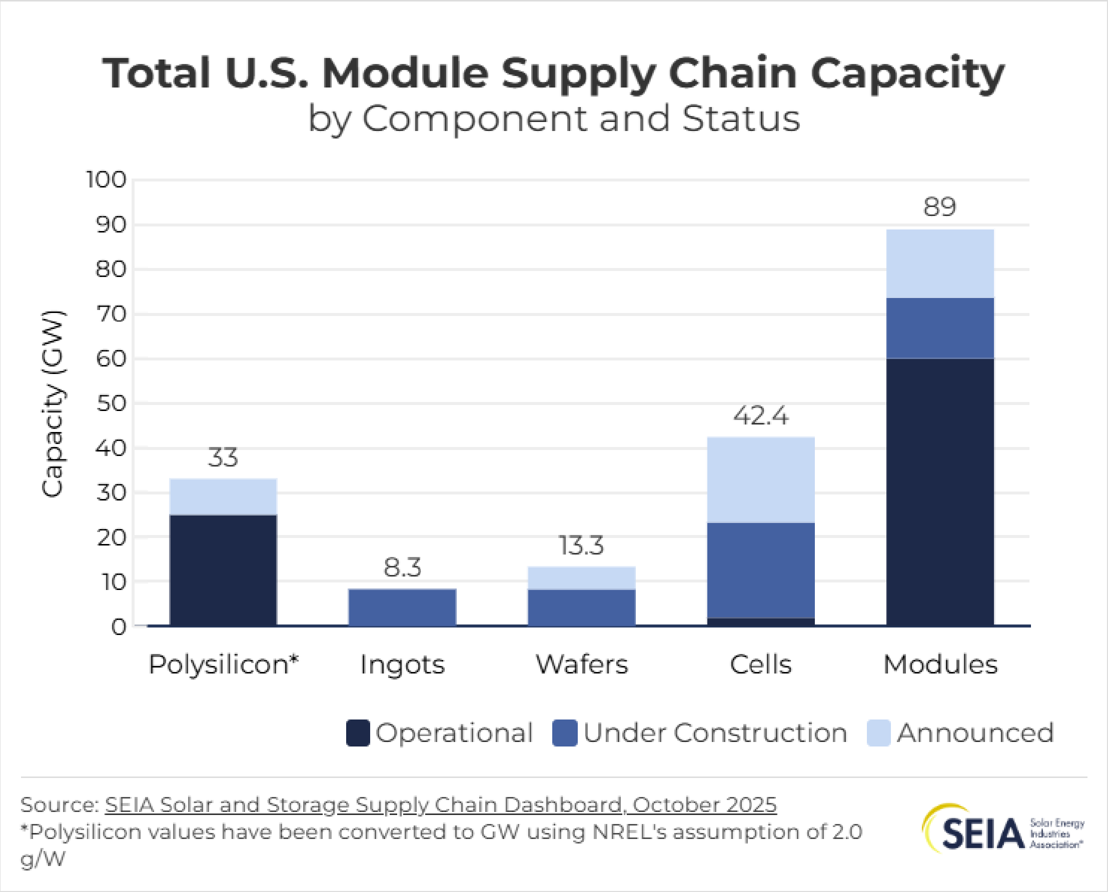
ES Foundry overview

- ES Foundry Corp was founded in Oct 2023, backed by Australia investor
- Located in ex-Fujifilm campus in Greenwood, SC
- 1GW PERC capacity, Grand Opening in Jan 2025, Shipment started in April 2025
- 3GW PERC capacity by Q1 2026, fully automatic line with AGV

Huge gap between announced and actual capacity

- US solar supply chain is not balanced
- Huge operational module capacity vs limited supply of solar cell
- Ingot/Wafer is key to link US poly to cell manufacture



Challenges to scaling in the U.S.

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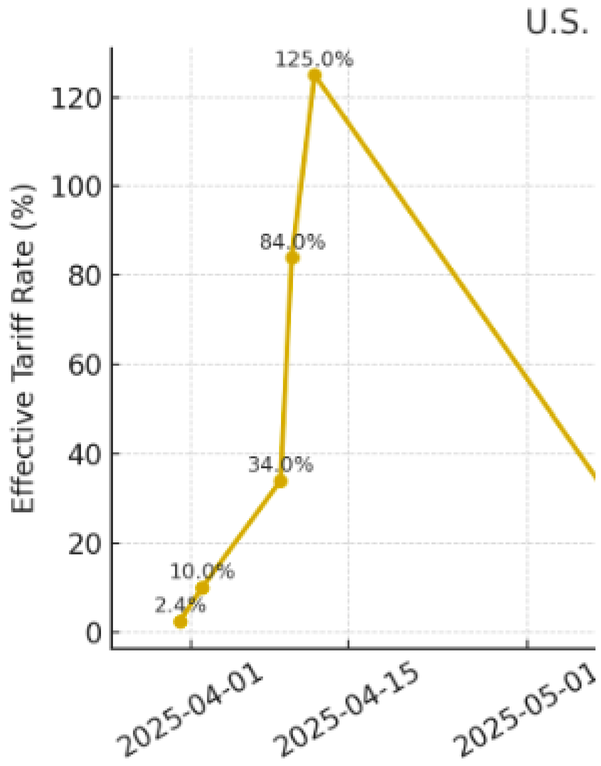
- Market uncertainty
- High CapEx
- Complex supply chain
- Workforce & skills gap (engineers, operators, automation expertise)

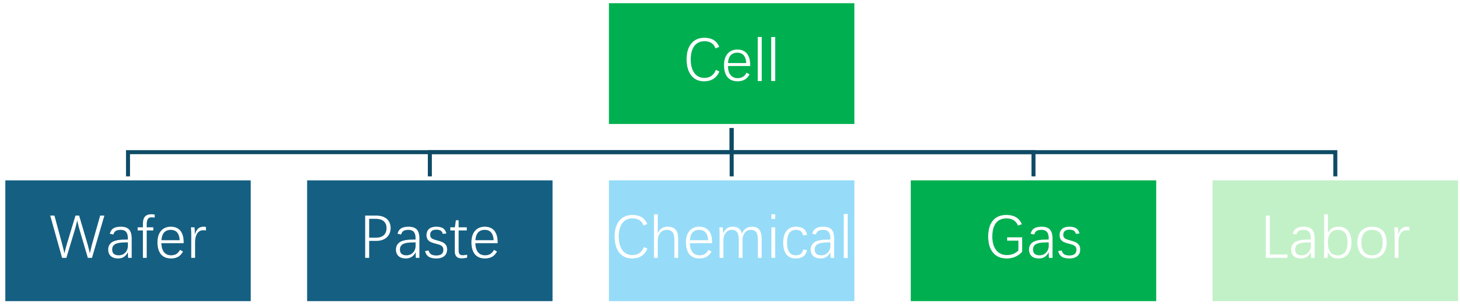
Policy uncertainty delayed investment

- Trade Policy
  - Reciprocal tariff
  - 232 semiconductor tariff
  - 232 poly tariff
  - Solar 1/2/3/4
  - Equipment 301
  - UFLPA

- Industry Policy:
  - IRA (45X, 45Y, 48E),
  - OBBBA domestic content, project safe harbor



Cell supply chain is TBD



- Solar cell supply chain is limited in US

- No significant US wafer shipment yet
- No US based paste supply (Silver/ Al)
- Limited chemical supply especially for HF
- Well established Gas supply chain
- Limited well trained labor for solar cell factory

Silver paste cost almost double in 2025

- Silver cost increase from 27.7 to 48, 73% increase
- With reciprocal tariff, the silver paste cost double within 10 months.

Gap exists between Production and Research

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- PERC technology is well established and proven technology. It is the best technology to revive US solar cell manufacturing

- Perovskite Solar Cells is the main frontier in University research

- US factory need AI-powered tool to help to increase operation efficiency, reduce waste and improve quality

Gap on Workforce Development

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- US has 3800+ institutes offering degree and 1000+ community college, however only handful of universities or community colleges have semiconductor/solar specific program
- According to BestColleges, 54 community colleges have "created or expanded semiconductor workforce programs.
- The "Community Colleges and the Semiconductor Workforce" report suggests that 28 community colleges have key potential roles in semiconductor workforce development.
- DOE Solar Training and Education for Professionals (STEP) mainly focus on training on solar installer, not factory technician and operator

Call to Action for the Ecosystem

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- Long-term policy stability beyond IRA/OBBB
- Need for wafer investment as the “missing critical”
- Virtual alliance from wafer to cell to module
- Industry collaboration on standards, R&D, workforce pipelines
- Building not just factories, but a resilient ecosystem