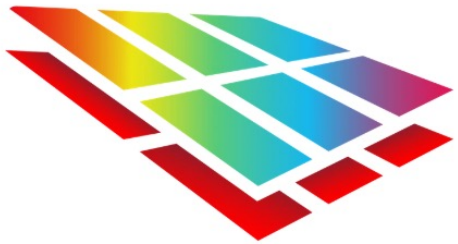
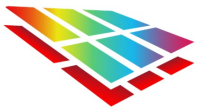
Towards Commercialization of Perovskite on Silicon Tandem Panels

Terry Banks
Metrology Engineer



Tandem PV



Who We Are

- San Jose, CA based company developing mechanically stacked perovskite + silicon tandem solar panels
- Our goal is to help the solar industry reach 50% of global energy production by 2050

Company History

2016
Tandem PV Founded
Stanford TomKat Award

2017
Incubated at Cyclotron Road (Lawrence Berkeley National Laboratory)

2018
$0.75M Grants from ARPA-E and NSF

2019
Seed Round led by Silicon Manufacturer

$1M Grant from California Energy Commission

Established private laboratory in Santa Clara

2020
$0.5M Grant from DOE

Investment from US Utility

First field trial commitments

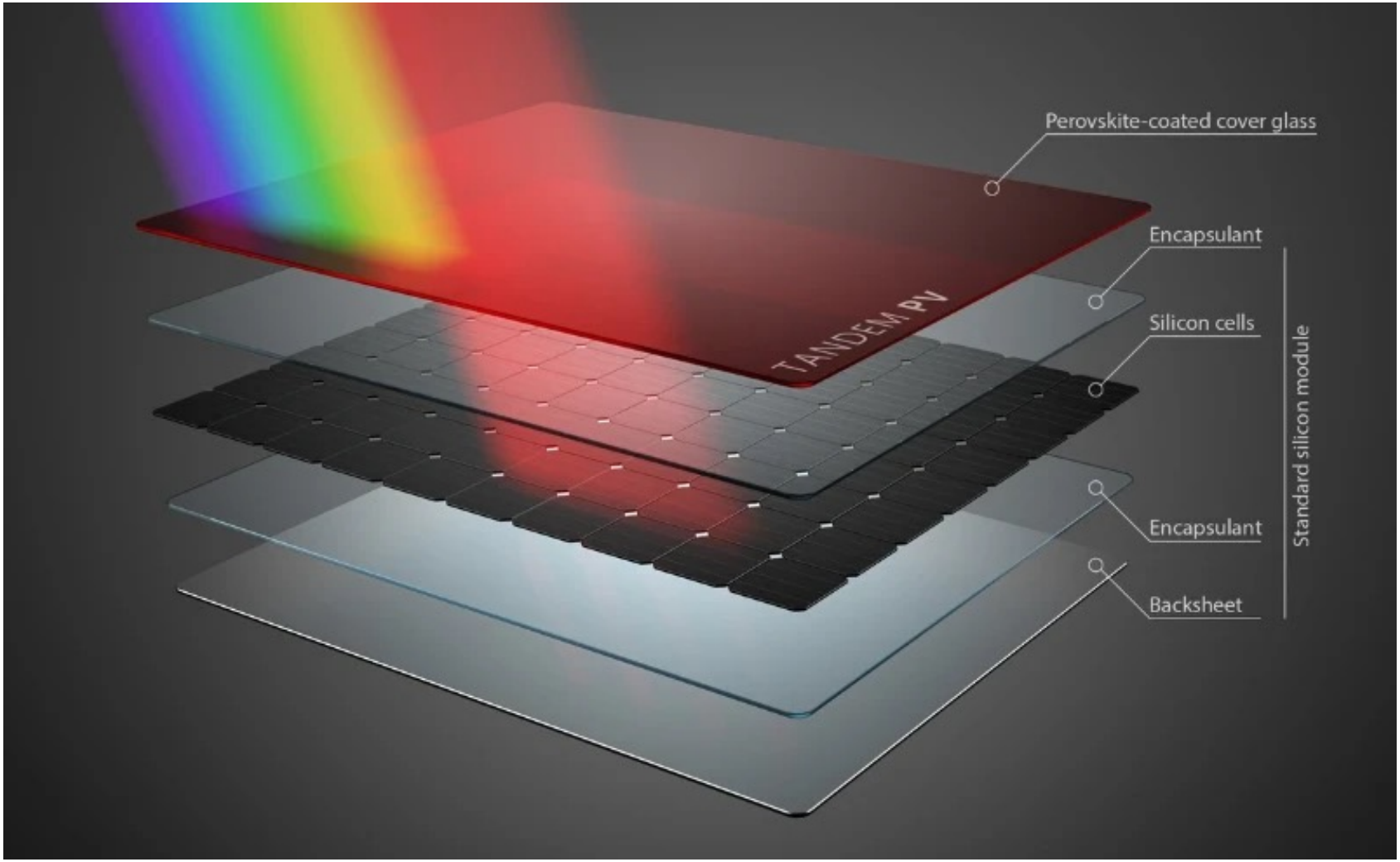
2021-2022
$2M Manufacturing Grant from DOE

Product prototype collaboration with Solar Module Super League Manufacturer

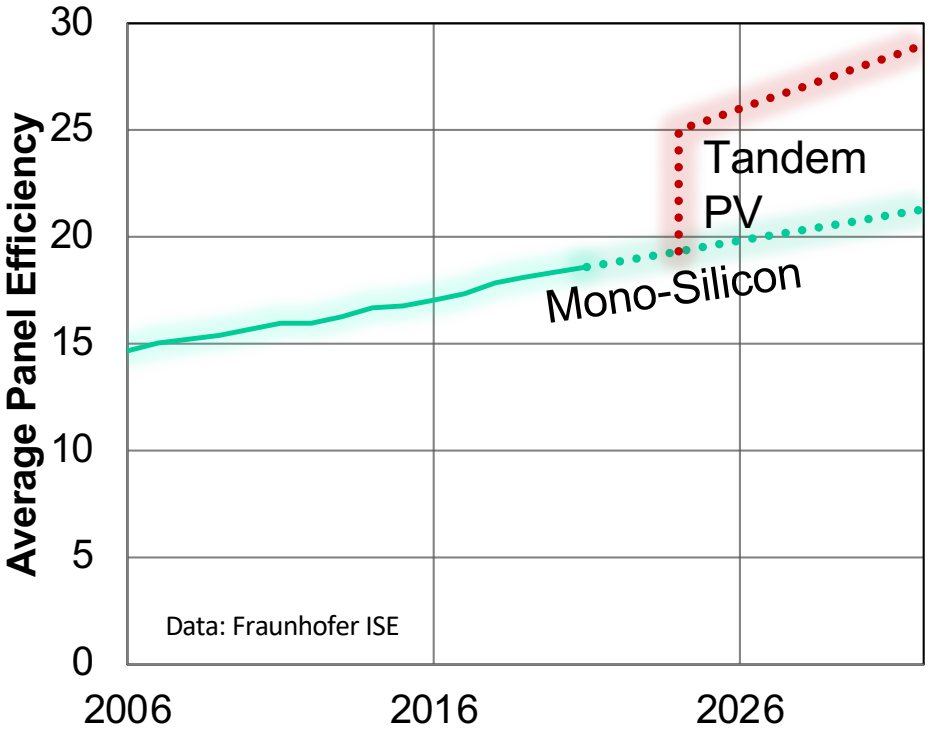
Raised Series A

Moved to pilot facility

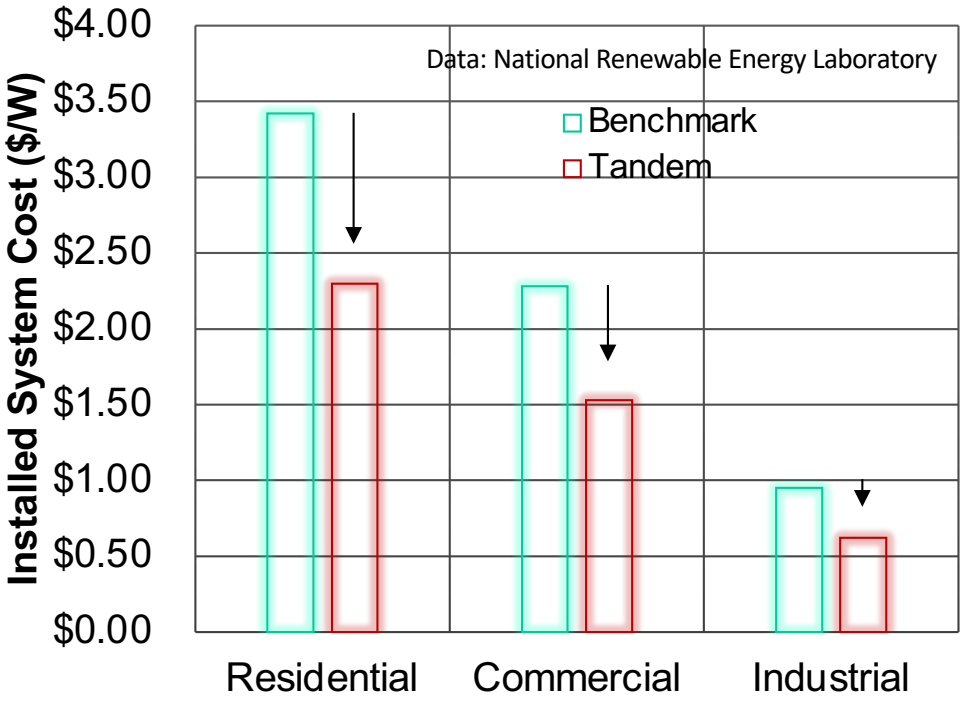
What is a Mechanically Stacked Tandem?



Why Tandem Panels?



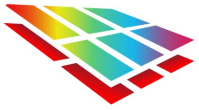
Step up in solar panel efficiency with tandems, otherwise 25% Silicon reached by line of sight only in 2050



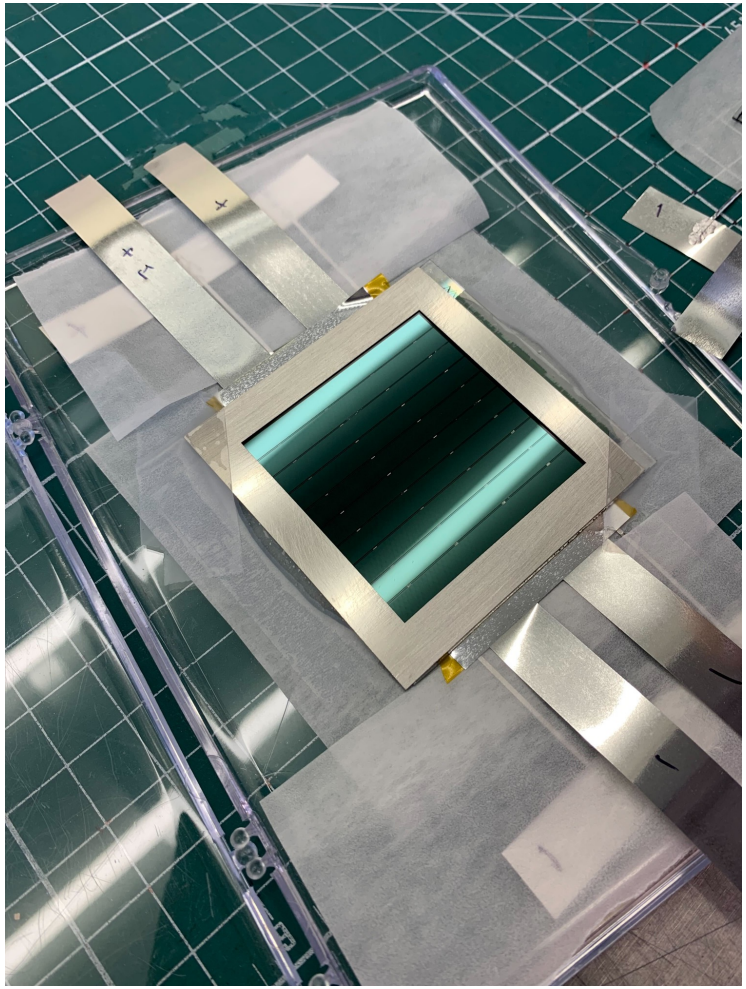
Immediate lower-cost system potential at 25%+ efficiency

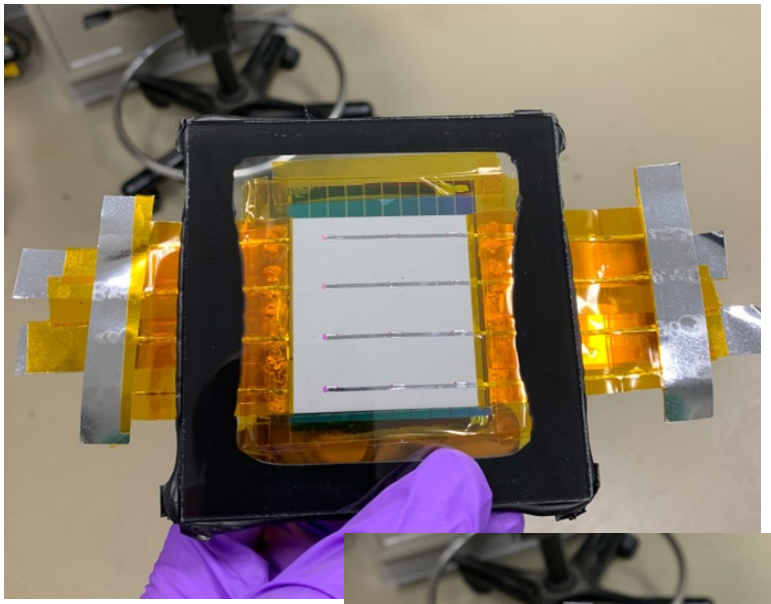
The Market is Excited About This New Technology and Approach

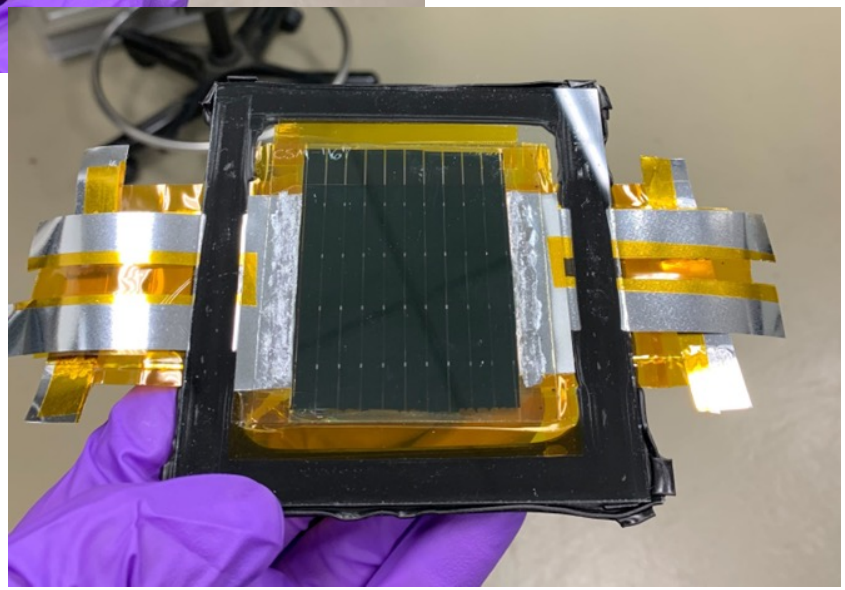
- Comments from installers and distributors:
  - “That would be a game changer”
  - “People will be willing to pay $1 to $1.25/W-plus depending on how efficient the solar panel is”
  - “As efficiency goes up, [it] reduces our costs dramatically”.
  - “Our market potential grows dramatically in size with higher efficiency and lower [system] price”
  - “100% - we want to install pilot rooftops with your solar panels. Sign us up”



25 cm² Unencapsulated Mechanically Stacked Tandem Panel

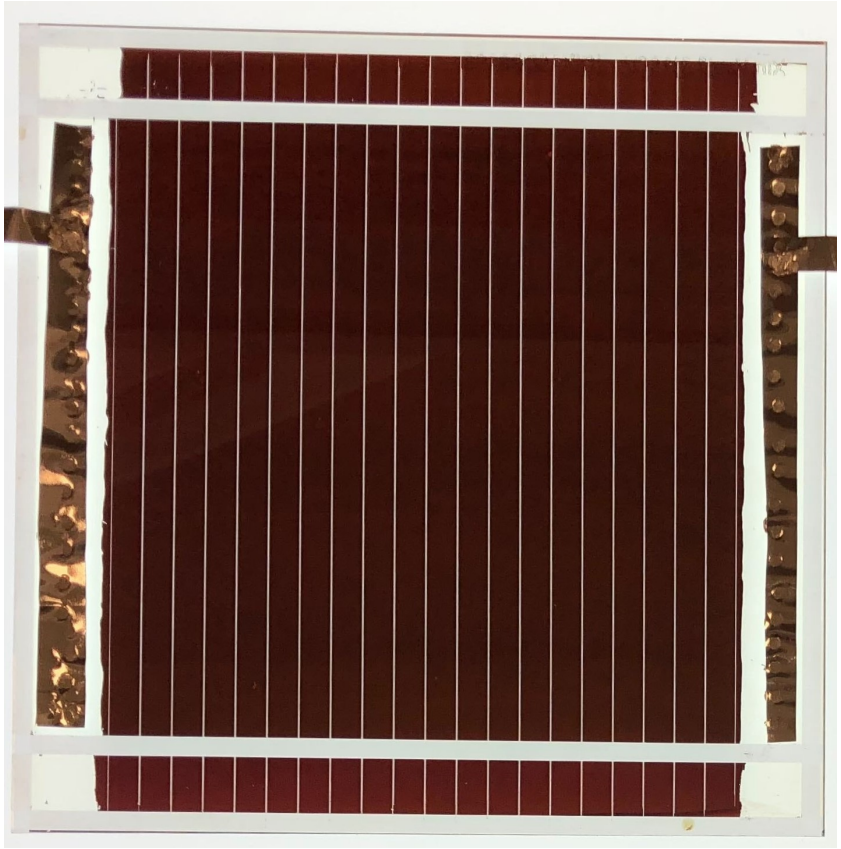






Achievements to Date

- Tandem PV has achieved predicted T80s of >10,000 hours on indoor MPP testing.
- We have conducted extended outdoor testing on a variety of minimodule sizes for up to 3 months with no measurable power loss.
- Currently producing minimodules from 1 cm^2 to 100 cm^2 and increasing



We’re now in a position to accelerate our development

- Tandem PV has now acquired the necessary equipment to produce up to 250 cm^2 devices.
  - Deposition tools
  - Scribing tools
  - Custom test equipment
- We have also developed a battery of tests for our devices:
  - Maximum power point tracking (indoors and outdoors)
  - Accelerated environmental tests
  - Imaging techniques and tools

Questions?

- Contact Information:

Terry Banks
Metrology Engineer
Tandem PV
575 Dado Street
San Jose, CA
tbanks@tandempv.com
1-216-272-0332