Acoustic Cleaving of SiC for PV Inverters

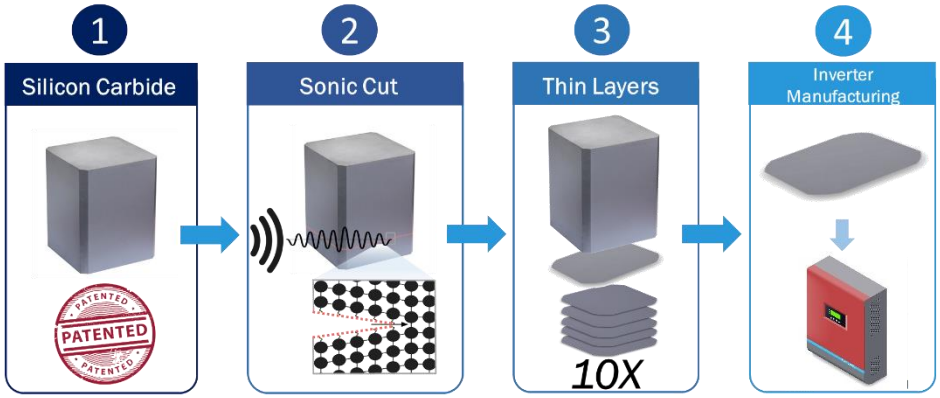
Goal

We develop a novel wafering technology to slice SiC to significantly reduce the cost of SiC wafer used in PV inverters.

Our Idea

Low wafer cost and high volume processing has positioned Silicon as the dominant material for PV inverters. Silicon Carbide (SiC) offers higher performance, however, the cost of a standard SiC wafer is multiple time higher than silicon.
We propose to reduce the cost of SiC solar inverters by tackling the fundamental cost driver: the cost of the initial SiC substrate.

- ***Acoustic cleaving of 60 μm-thick wafers with GaAs substrate reuse (Steps 1-3)***



CRYSTAL SONIC

Team and Partner Organization

Pablo Guimera Coll / Crystal Sonic, Inc.
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Lara Bathurst / Crystal Sonic, Inc.
Mariana Bertoni / Crystal Sonic, Inc.

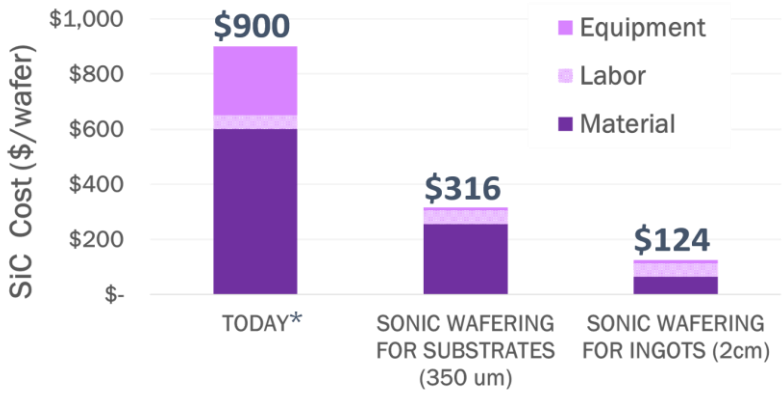
Demo Day Deliverables

Set!
- Acoustically cleave a 60 microns wafer from a 350μm SiC substrate

Go!
- Acoustically cleave five wafers from the same SiC substrate

Impact

By cleaving multiple SiC wafers from the same substrate and achieving similar device performances we can potentially disrupt the cost of inverters in the near future. Low-cost SiC wafer will offer more reliability and power in PV inverter.



* Horowitz K, Remo T, Reese, S. A Manufacturing Cost and Supply Chain Analysis of SiC Power Electronics Applicable to Medium-Voltage Motor Drives. (2017). Technical Report, NREL/TP-6A20-67694