

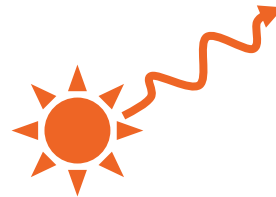
Emerging Photovoltaics: III-V

Goals and portfolio overview

This?

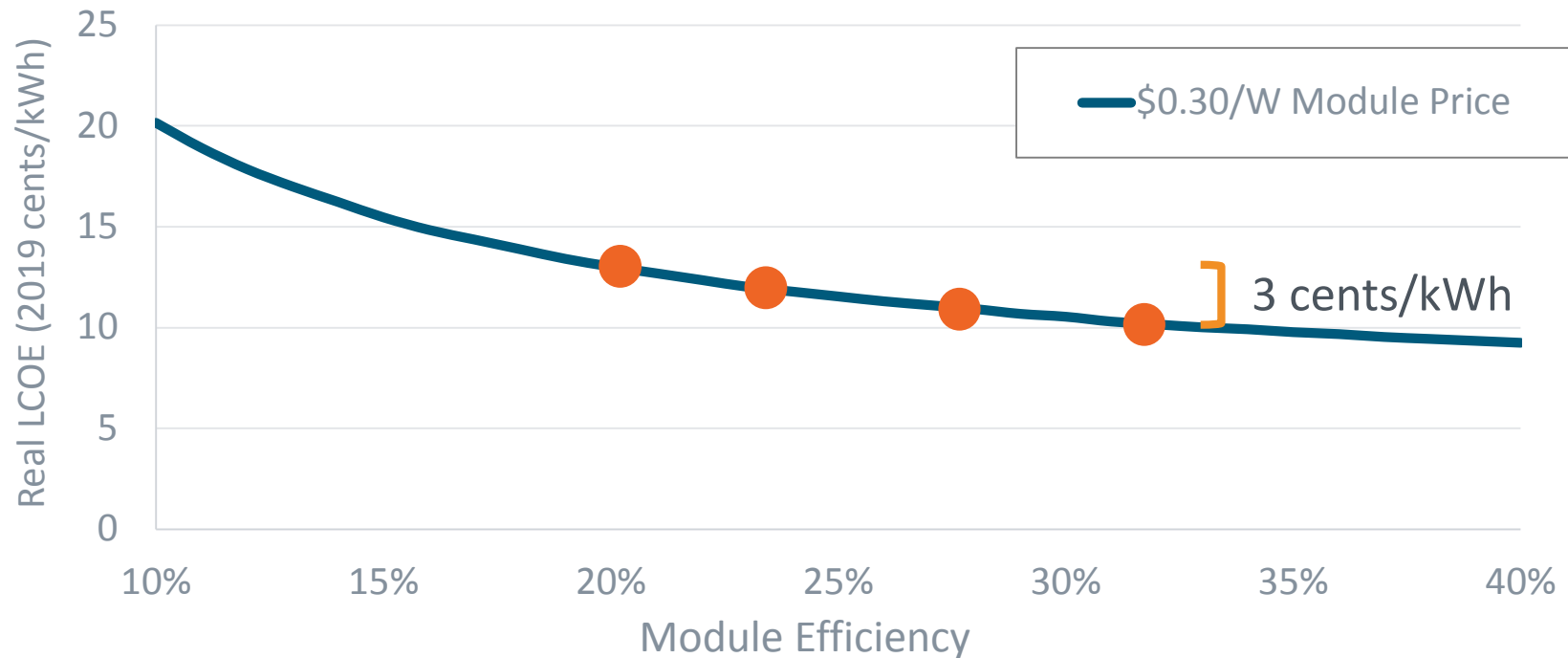


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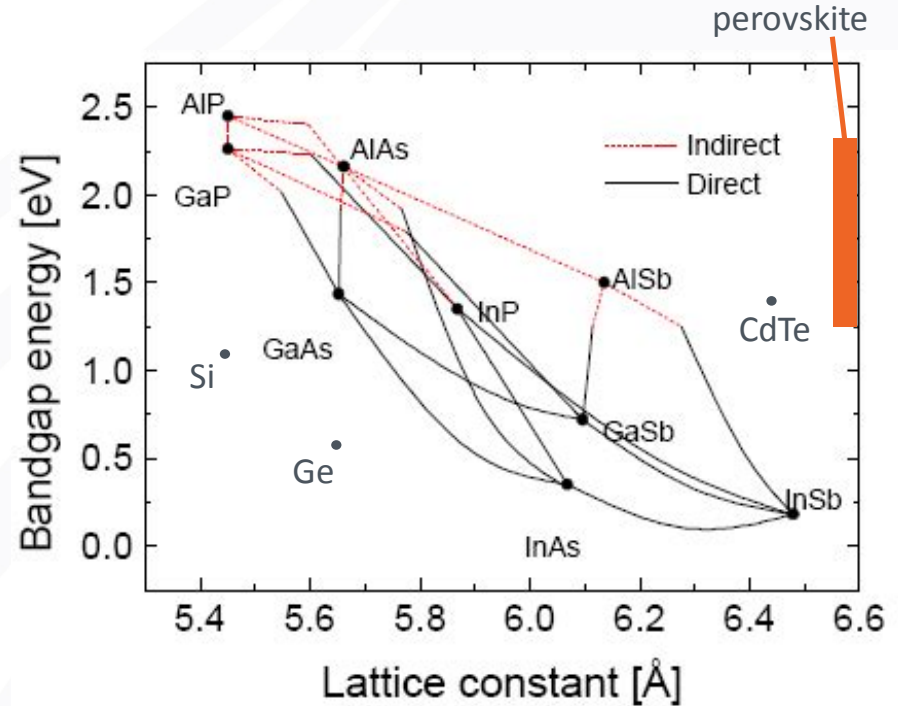
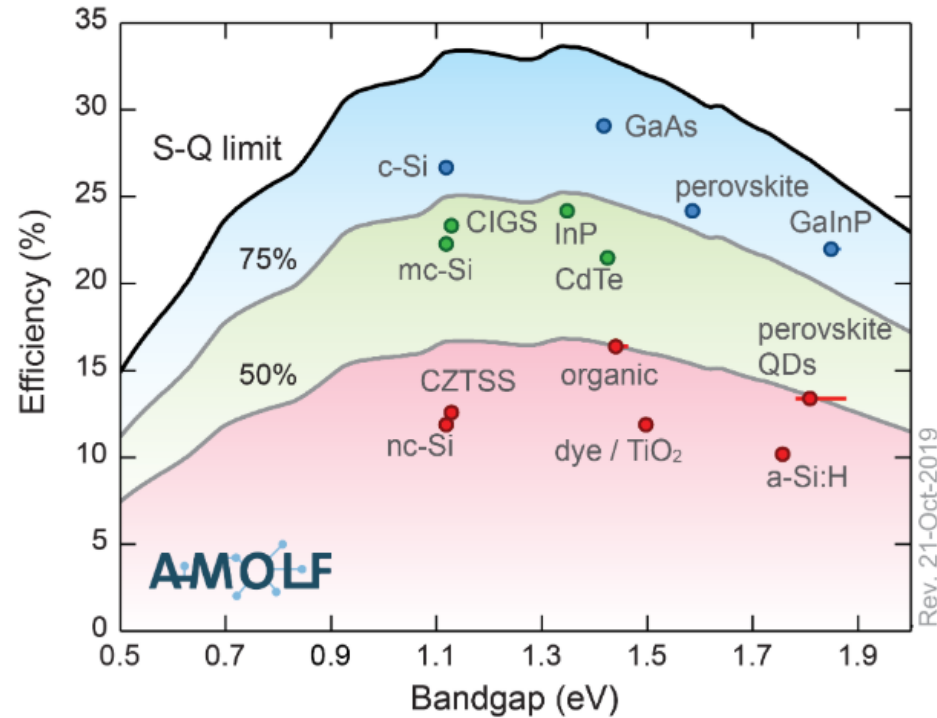


Effect of Efficiency

Residential Rooftop PV Area-Constrained Case



III-V efficiency and bandgap flexibility

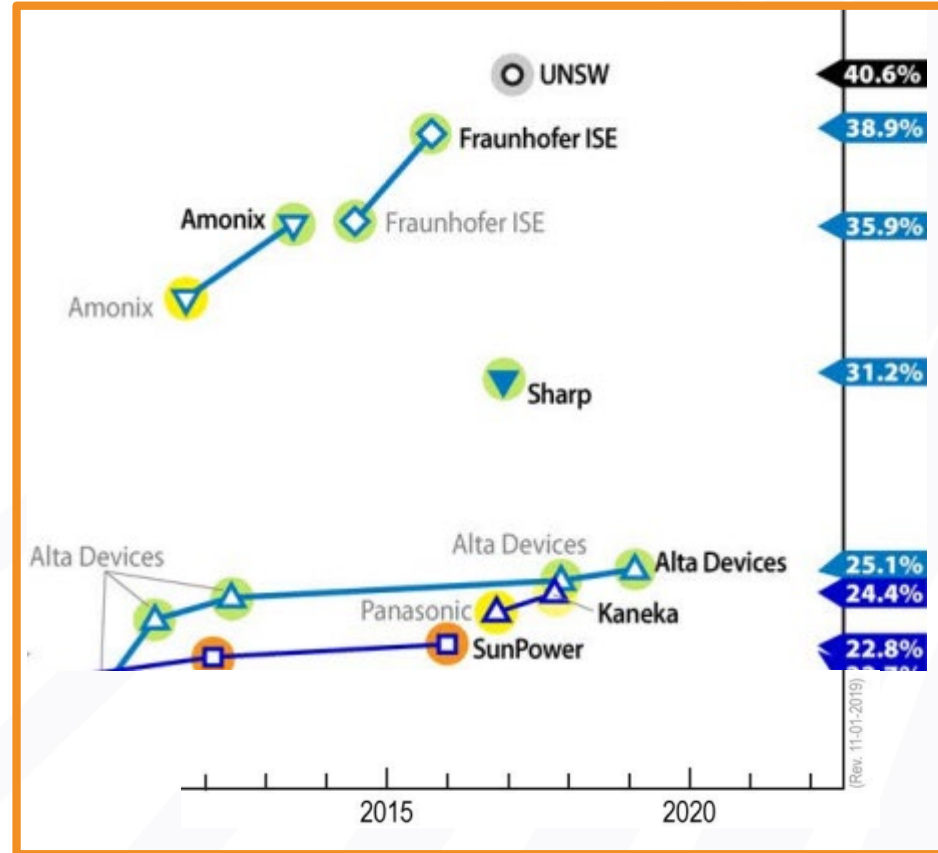
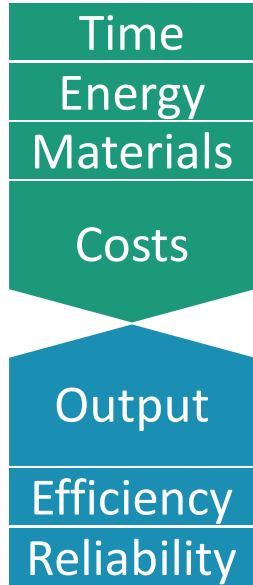


Hajjiah, Ali. (2020)

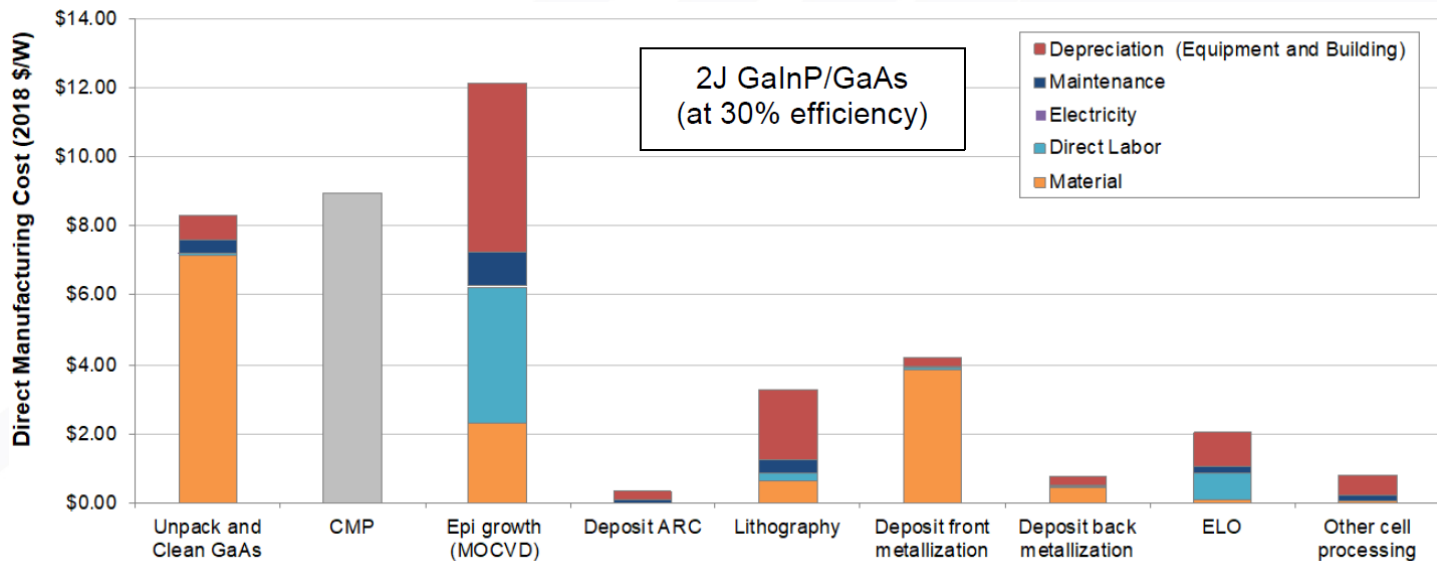
Emerging?



Challenges

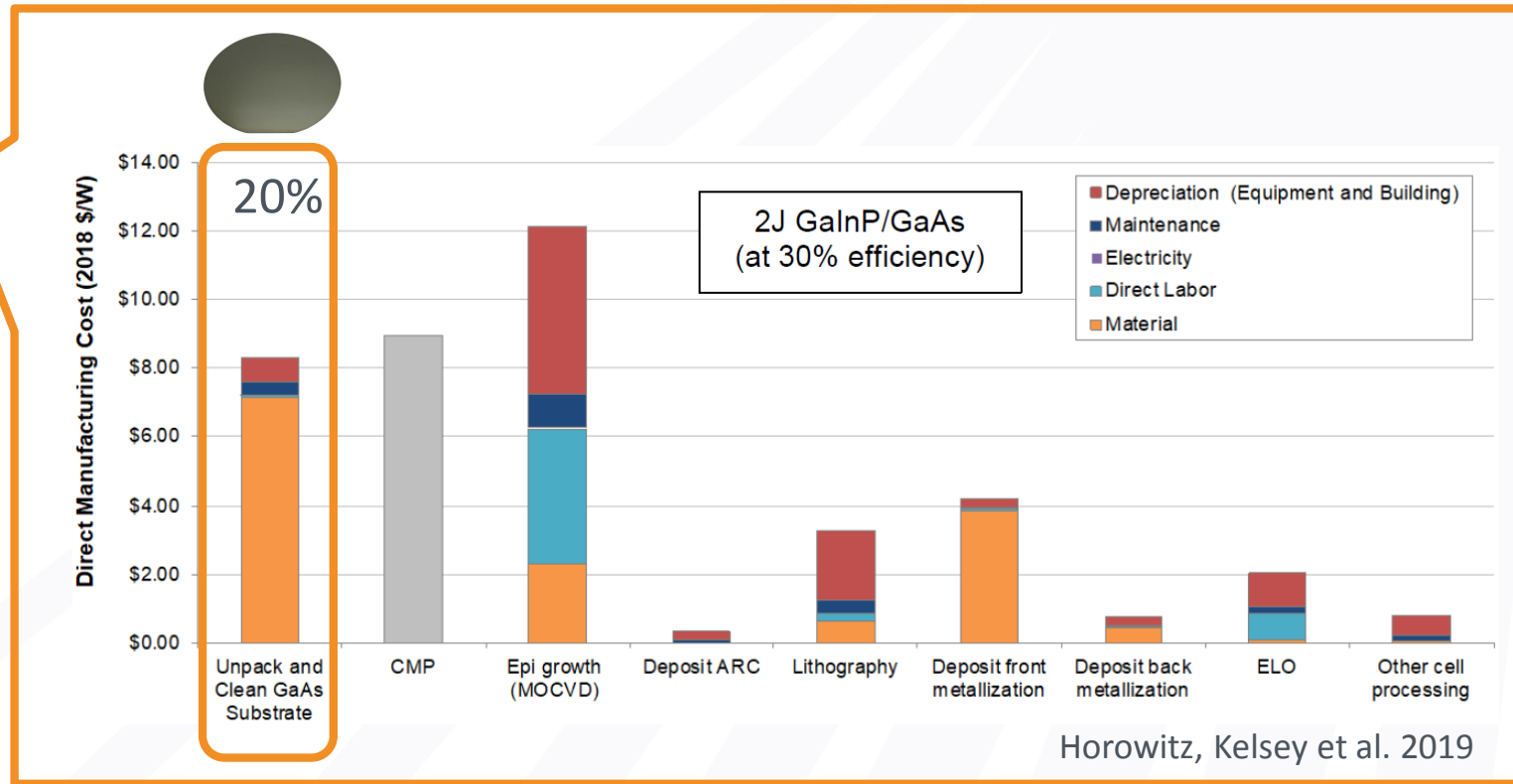


Challenges



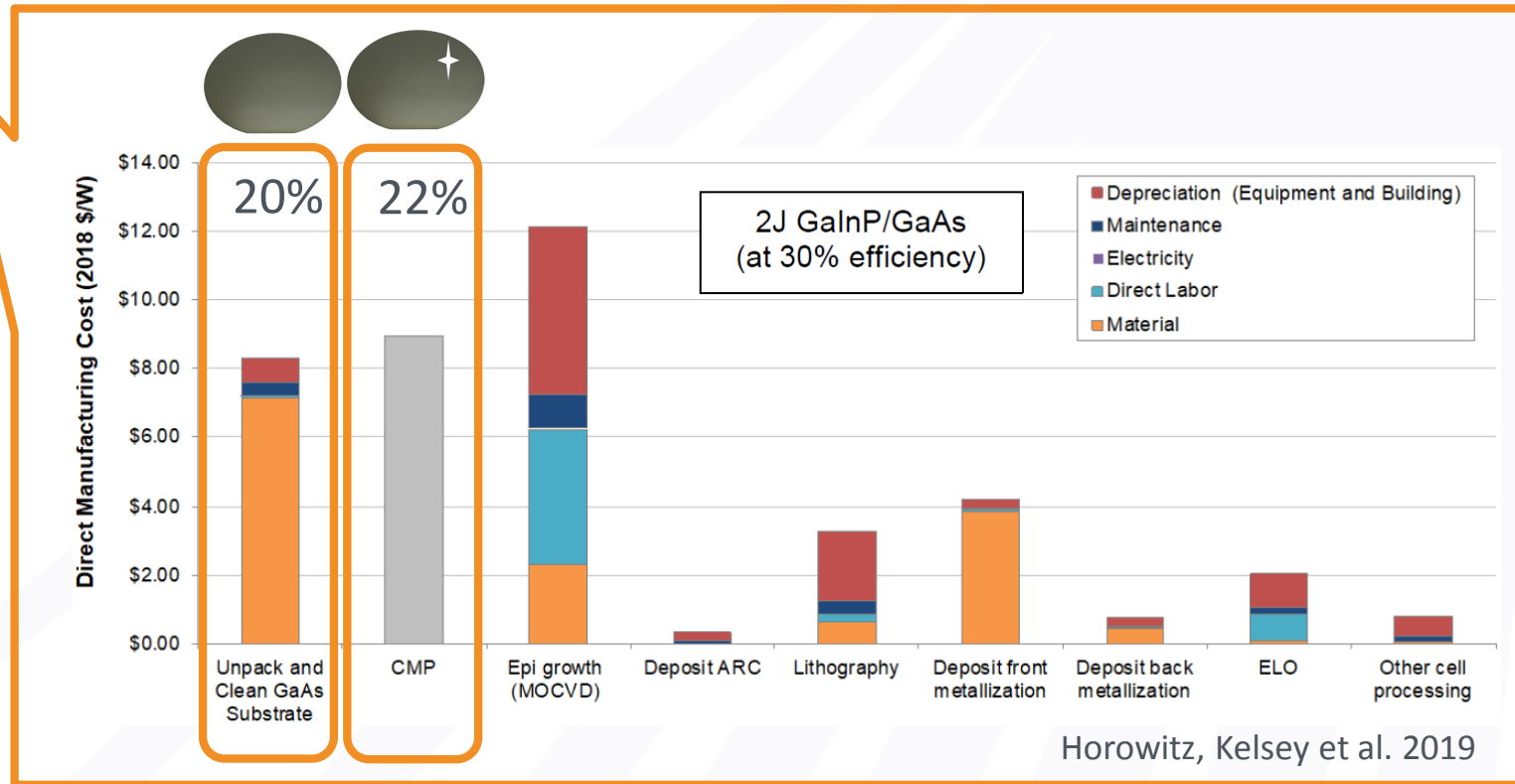
Horowitz, Kelsey et al. 2019

Challenges



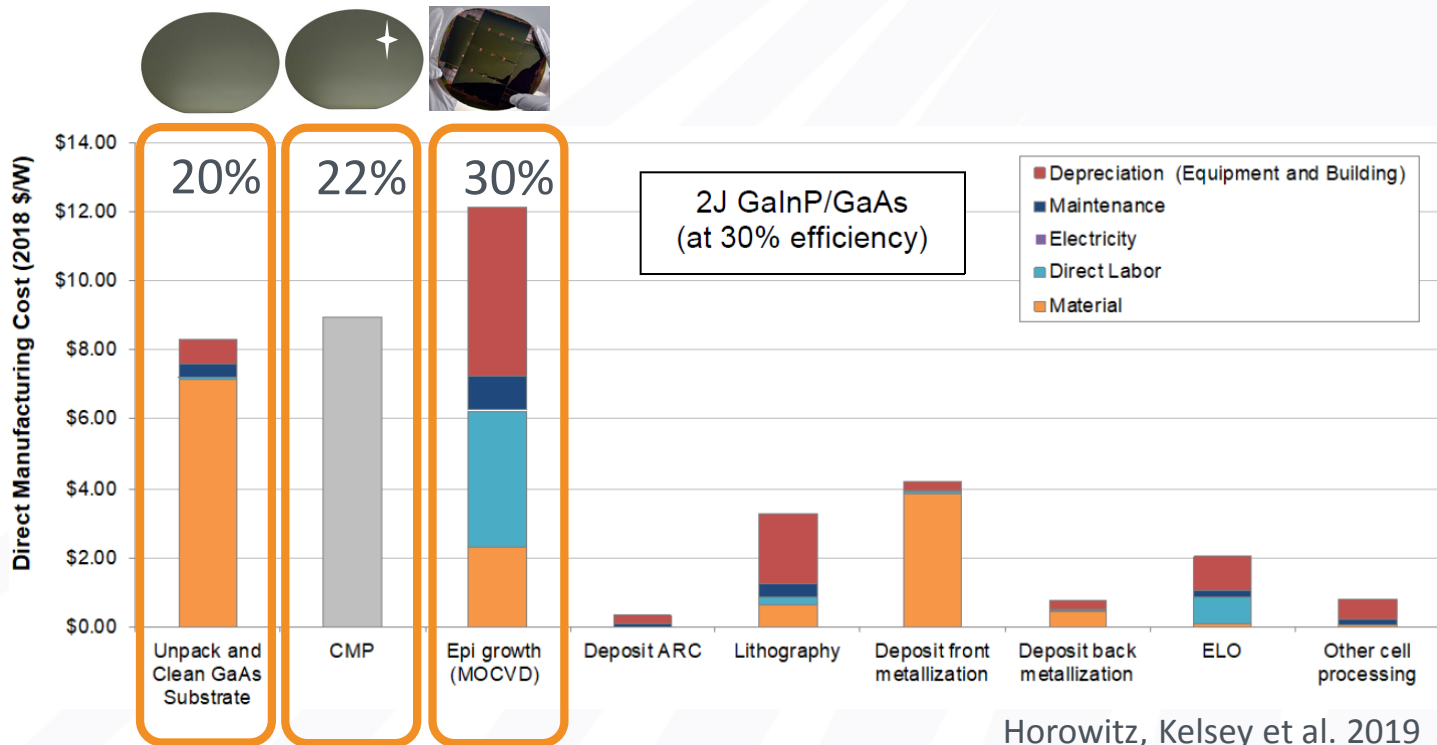
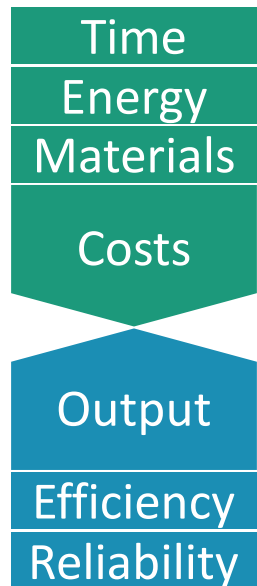
Horowitz, Kelsey et al. 2019

Challenges



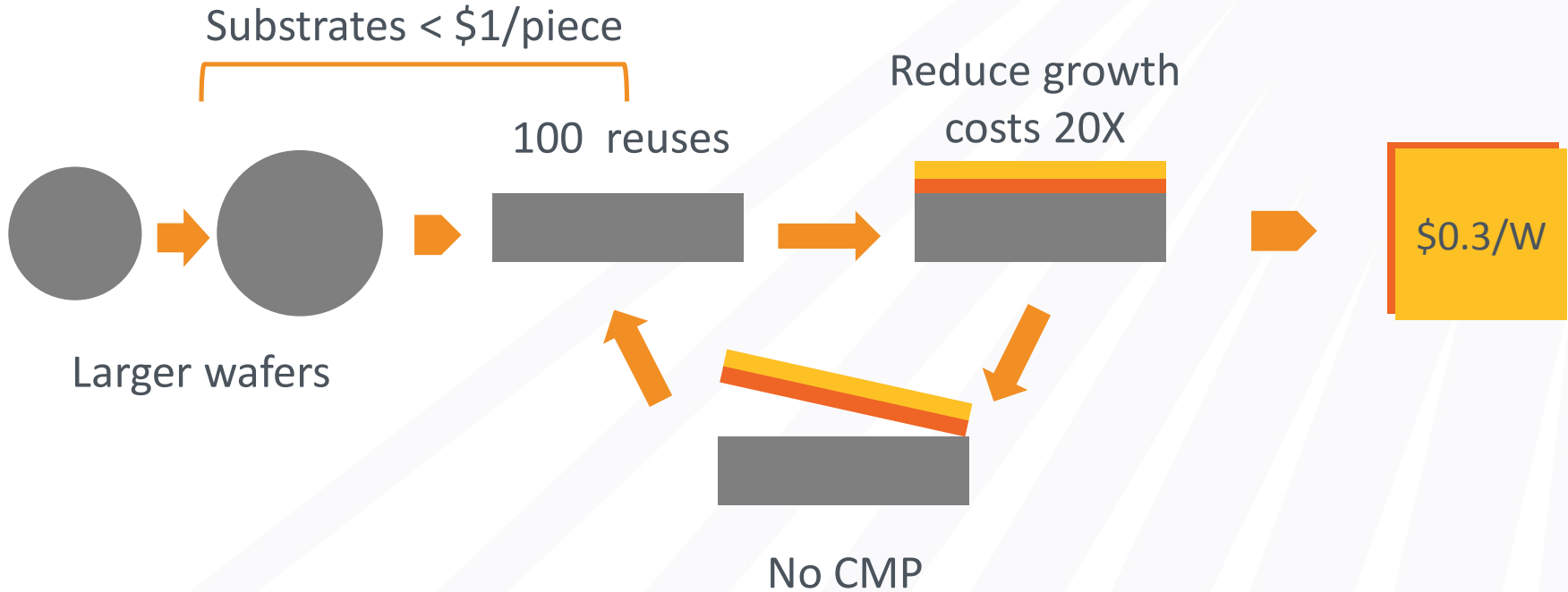
Horowitz, Kelsey et al. 2019

Challenges



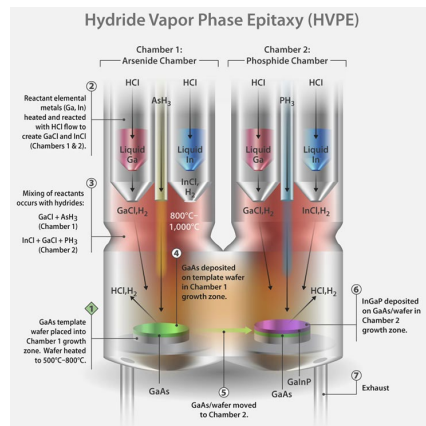
Horowitz, Kelsey et al. 2019

Possible path to \$0.30/W_{DC}





Myles Steiner, Aaron Ptak,
Emily Warren



AlGaInP
AlGaAs
GaAs

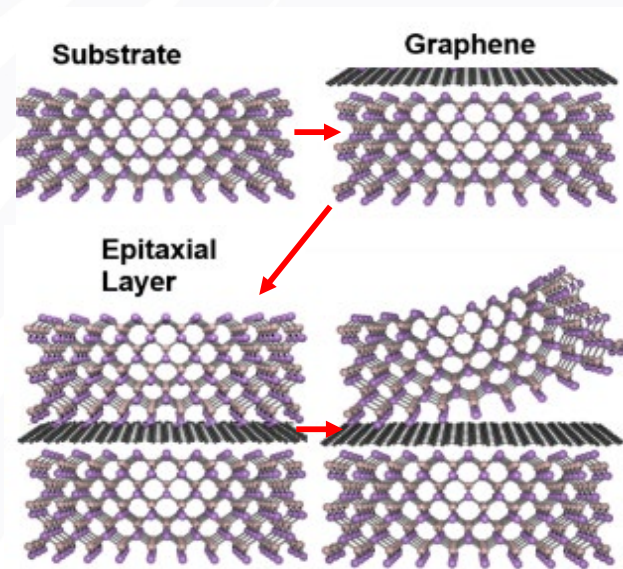
Si

GaAs
ZnSe
In₂Se₃
Bi₂Se₃

AllnP window
GaAs or InGaP
Cell



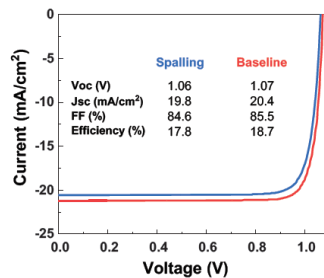
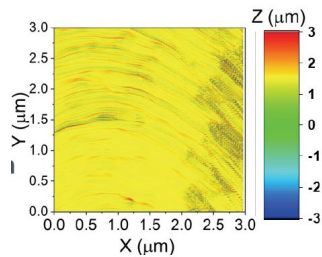
Jeewan Kim



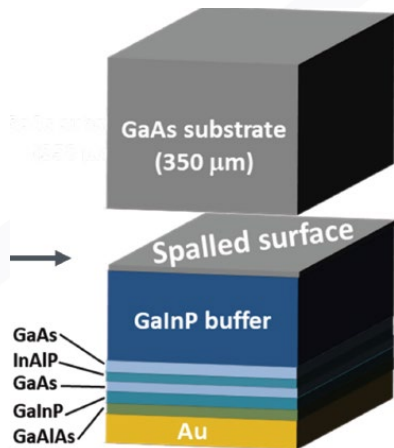
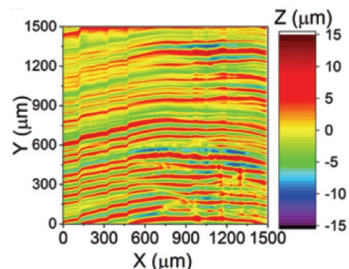


Mariana Bertoni

Acoustic Controlled



Traditional Spalling



Efficiency

THE NEXT LEVEL

COST, RELIABILITY



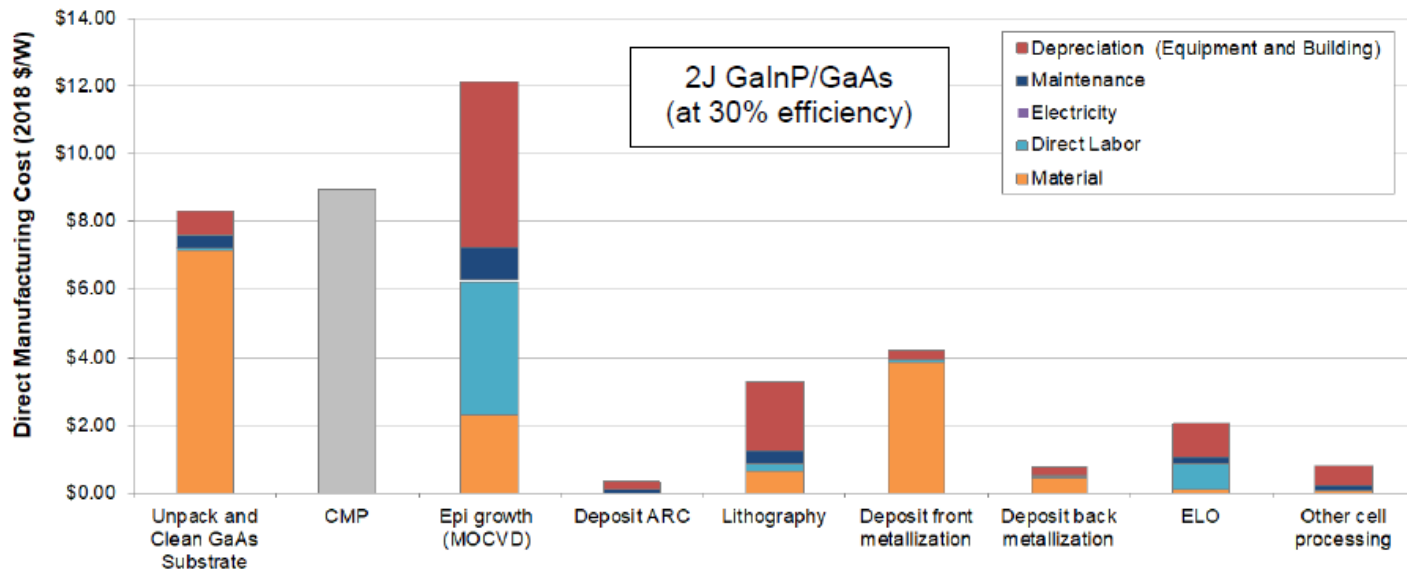


Figure 7. Step-by-step cost breakdown for (top) single junction GaAs solar cells at 28% efficiency and (bottom) 2J GaInP/GaAs solar cells at 30% fabricated via MOCVD in the base case

Assumes U.S. manufacturing at 3,800 cells/month (170kW/year - 182kW/year, depending on the efficiency); the CMP bar is gray because we do not have a bottom-up CMP cost model, but rather total costs obtained via industry interviews.