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To: California Energy Commission

Re: Development of the California Energy Commission Electric Program Investment Charge Investment Plans 2021-2025

Dear CEC,

Swift Solar is a California-based startup company working to commercialize a novel thin-film solar technology, perovskite tandem solar panels. Swift aims to develop and manufacture flexible, lightweight and efficient solar panels that will be cheap and easily deployable, which will help California reach its carbon and climate goals. Swift is currently funded by a combination of US government grants, VC firms and private equity, but here we see an opportunity for CEC funding to strengthen California-based manufacturing.

In addition to Swift, there are other California-based startups developing perovskite-based technologies. These companies are targeting a range of applications and markets. Tandem PV (TPV) is one of these companies working to produce perovskite-silicon tandem solar panels, and while Swift and TPV are aiming to produce somewhat different products, as small startups working with similar materials we share common challenges. Specific to this CEC investment plan, we face challenges in material supply and quality control. The CEC is well placed to support a collaborative California-based effort on solving these common challenges.

We have found that incoming perovskite precursor materials from chemical vendors vary wildly in their quality, even within the same specified materials from the same vendor. This can have a negative impact on our product performance, and introduces an uncontrolled variability, a problem that Tandem PV has also identified. There is a clear need for routine quality control and testing, but as small startups we do not have the capacity to define materials standards for large chemical companies nor to devote sufficient resources to development of in-house quality control protocols and equipment. TPV and Swift Solar suggest that the CEC could support efforts to collaborate with California-based universities and chemical suppliers to develop material standards and rapid quality control techniques that would accelerate product development and CA-based production of perovskite technologies. Such a project could involve University work on identifying chemical impurities in precursors, solar companies working to identify the sensitivity of produced materials to the impurities and their levels, and chemical suppliers tuning their production processes to minimize detrimental impurities. Furthermore, this supported work could subsequently involve the development of in-line metrology systems for perovskite production lines, via the collaboration of University groups and the perovskite companies to determine the fastest ways to identify perovskite quality during manufacture. This would be a crucial step to enabling rapid manufacturing of perovskite technologies.

Swift Solar recommends that the CEC leverage this opportunity to accelerate the CA-based production of next-generation thin-film solar technologies, by supporting collaborative CA-based efforts to solve common challenges in bringing perovskite technology to market.

Sincerely,



Giles Eperon
CSO, Swift Solar