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Developing the next generation technologies of renewable electricity and heating/cooling

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Next – generation interdigitated back-contacted silicon heterojunction solar cells and modules by design and process innovations



NextBase - Deliverable report

D7.4 High Efficiency 60-Cell module available for extensive characterization in WP8, incorporating the technologies developed in T7.1, T7.2 and T7.3

Deliverable No.	NextBase D7.4	
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Author(s)	Antonin Faes (CSEM) Samuel Harrison (INES)	2019-03-26
Checked by	Eszter Voroshazi (imec)	2019-03-27
Approved by	Kaining Ding (Jülich) – Coordinator	2019-03-XX
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Publishable summary

Because of the specific interdigitated back-contact cell configuration, new module integration schemes must be developed and validated in the project. Interconnection strategy has been completely adapted to the new cell constraints, while alternative glass and encapsulant materials have also been evaluated, both for improved performance and reliability, as well as reduced manufacturing costs. These different tasks have all been conducted through the different WP7 tasks, and main conclusions for the different elements can be found in previous deliverables D7.1, D7.2 and D7.3.

Latest progress on IBC and SWCT technology development lead to 23.2% (CTM of 97.2%) efficient module with very limited resistance losses. This samples reaches an impressive 99.3% CTM measured on the final FF of the record module, demonstrating the high performance module integration achieved with the develop scheme.

For the Next-Base project, the high-efficiency module will be combining the following materials and technologies:

- Full size IBC cells provided by Meyer Burger Research
- Adapted solar cell back-end and Smart-Wire Connection Technology interconnection scheme defined by CSEM and Meyer Burger Research
- Thermo-plastic encapsulant materials selected and demonstrated by CSEM
- Anti-Reflective Glass, provided by DSM

First proofs of concept modules have already been demonstrated with the chosen materials and technologies, to validate their performance, compatibility and reliability within the targeted cost. ,

In this report, we show a detailed matrix of experiments that has been jointly built with the WP7 partners, and the associated modules have all been manufactured and shipped for DH and TC reliability tests. Mini-laminates either with one 1 small area IBC manufactured on industrial tool and processes, or standard heterojunction cells when compatible have been used adapting to the progress and availability of cells within the project. This validates thus the initial goal of the deliverable, and even preliminary results from the reliability tests are already available at the time of writing this report. These results will thus help to refine the last material and technological choices, and allow the final integration of all technological improvements made in the Next-Base project in a mini-module in the coming weeks demonstrating the high-efficiency potential, before the fabrication of 60-IBC cells module that is expected by the end of the summer 2019.