SUMMARY OF POTENTIAL PV IPCEI PROJECT

PROJECT NAME/TITLE	**Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts**
PROJECT/INNOVATION DESCRIPTION	The project will extend the European PV value chain by local manufacturing of silver paste and novel PV cells - the most valuable materials and devices for PV industry, substantially contributing to the competitiveness of latter stages of components and PV installations. European PV industry is on the verge of transition to new technologies. One of the most promising and fast growing in the years 2023-2027 is TOPCon technology, which likely will substantially increase its share on the market in the middle of this decade. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of all others TOPCon technology. PV cell manufacturers currently account for 20% of silver demand. The average annual demand of the PV industry for silver pastes in 2021-2030 will amount to 3 ths. tonnes and will require 2,5 ths. tons of silver. There are 55 producers of silver paste, including in the EU, only. One of the challenges for massive deployment of TOPCon is relatively higher use of silver paste for contacts, up to 26 t/GW_p (the minimum - 16 t/GW_p). Therefore the combination of parallel development and manufacturing of TOPCon and silver paste production technologies in the EU will bring synergy in PV cells technology development and will increase added value for European PV supply chain.
PROJECTED IMPLEMENTATION TIME (The beginning and the end of the project, years)	Both new project will be developed and implemented in the years 2022-2025
PURPOSE OF THE PROJECT	The main goal of the project is to build in 2025 a PV cell factory, capable of producing TOPCon cells with a total capacity of at least 1 GW, covering at least 50% of the demand in Poland in 2025-2030, and approx. 5% of annual new PV investments across the EU. The factory will produce the latest generation silicon cells significantly better parameters than the currently dominant PERC technology, which is massively used by Asian producers (technologies with little possibilities for further development). Increasing the efficiency of cells above 24% will reduce the cost of cell production below 0,1 €/W, and extending their working life and improving stability will ensure lower energy costs for PV energy producers. The major risk of cost competitiveness of TOPCon cells results from high, and growing costs of silver paste, which constitutes more than 60% of the PV cells manufacturing OPEX. Over las decade the share of world-wide silver consumption by PV industry grown from 11 to 20%, pushing substantially the silver prices. Polish company KGHM in 2021 was ranked as the 2st worldwide producer of silver am No 1 in the EU. This is the justification for starting silver powder and silver paste manufacturing in the EU, based on the biggest silver resources in Poland, combinded with material-saving and efficient technologies for silver paste processing and printing of optimised silver contacts on silicon PV cells.

BENEFITS OF THE PROJECT	Integrated development of important materials ad components of PV technologies Increasing competitiveness and security of supply of critical materials and key PV devices in Europe and reducing strategic dependencies (in line with the 2020 New Industrial Strategy)
PROJECTED INVESTMENT (Euros):	Up to € 150 mln
DECISIVE ARGUMENTS FOR IPCEI PV	✓ Market failures ✓ Innovative ✓ Share of own contribution to the PV market ✓ Openness for other EU participants (RTD, devices and materials, supply chain, offtakes)
PARTICIPATING COMPANIES	Project initiators: ✓ IEO (project manager), PL ✓ Giga PV (development of TOPCon manufacturing), PL ✓ KGHM (development silver paste manufacturing), PL Project Partners: ✓ Applied Materials, Int ✓ CEA, FR ✓ Fraunhofer, DE ✓ halm elektronik, DE ✓ INES, FR ✓ IPVF, FR ✓ ISC Konstanz, DE ✓ RCT Solutions, DE ✓ RISE Technology, IT ✓ Singulus, DE ✓ VITRONIC, DE
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