

# How emerging thin-film PV technologies can contribute to the EU Green Deal target

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The European Union (EU) has set an ambitious goal towards decarbonising energy production and achieving key climate change related objectives by 2030/2050 [1]. These objectives are anchored in the set of policy initiatives under the EU Green Deal aiming at supporting the Clean Energy Transition and reaffirmed by the European Recovery Plan [2]. Under these directives, the emergence of new PV applications in the society requires design of materials and devices with a different set of properties. At this scale, for a new photovoltaic (PV) technology is not sufficient to be only competitive with the commercially established Si and CdTe technologies in efficiency and reliability but one should also rely on green, environmentally friendly, and earth-abundant materials. In addition, the low capital expenditures need to be compatible with low-capex production processes to ensure rapid mass deployment scale-up. To make up >50% EU primary energy supply PV contribution by 2050, the deployment of entire PV supply chain must triple from 2023 levels by 2030, implying >100 gigawatts installing capacity every year. In this context, a critical question is: *What are the prospects of emerging thin film technologies to the EU PV industry, to contribute in bridging the gap and deliver the desired speed scale-up growth by 2050?* This talk will provide a comprehensive overview of the state of the art in development of emerging thin film PV technologies, possessing the highest potential for rapid scale-up uptake and mass deployment implementation in building integrated PV (BIPV) and Internet of Things (IoT) powered indoor PV (IPV) markets. The key challenges and barriers related to performance development and progress in emerging PV materials and solar cell devices will be revealed with translation of technology viability to case analysis demonstration in IoT powered IPV prototypes. The talk will conclude with possible recommendations in overcoming the challenges and succeeding, along with the opportunities and importance of collaboration and partnership in R&I in delivering successful emerging PV solutions.

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## References

- [1] Stepping up Europe's 2030 Climate Ambition Investing in a Climate-Neutral Future for the Benefit of Our People, COM/2020/562 Final.
- [2] Fit for 55 package. <https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/>.