

BIPV Education and Training Activities for Solar Architecture.

BIPV 光伏建筑一体化教育与培训活动

IEA PVPS has published a new report under Task 15, Enabling Framework for the Development of BIPV, analysing the global landscape of education and training for Building-Integrated Photovoltaics (BIPV).

近日，IEA PVPS Task 15 “光伏建筑一体化发展”工作组发布最新报告，对全球光伏建筑一体化领域的教育培训现状展开分析。

The report, BIPV: Education and Training Activities for Solar Architecture, provides the first structured international mapping of academic and professional training initiatives dedicated to solar architecture and integrated PV design.

该报告首次系统地梳理了全球范围内专注于光伏建筑一体化及光伏集成设计的学术与专业培训项目，并绘制了其国际分布图景。

Despite the growing availability of BIPV products and increasing interest in solar-integrated buildings, uptake remains limited. Today, BIPV accounts for only 1–3% of the global PV market, with skills gaps, fragmented education systems and weak integration between the construction and solar sectors identified as key structural barriers.

尽管 BIPV 产品日益丰富，且市场对光伏一体化建筑的关注度持续提升，但其应用规模仍较为有限。当前，BIPV 仅占全球光伏市场的 1–3%。研究指出，人才缺口、教育体系碎片化、建筑行业与光伏行业融合不足是制约其发展的核心结构性障碍。

“BIPV has the potential to transform the building envelope into an active energy-generating component. However, without a skilled and interdisciplinary workforce, this potential cannot be realised at scale,” says Pierluigi Bonomo, one of the main authors of the report.

报告主要作者之一 Pierluigi Bonomo 表示：“BIPV 具备将建筑围护结构转变为主动发电构件的潜力。然而，若缺乏具备跨学科能力的专业人才队伍，这一潜力便无法大规模实现。”

Key Takeaways

BIPV uptake remains limited, representing just 1–3% of the PV market globally,

primarily due to structural barriers including fragmented value chains, insufficient cross-sector collaboration, and a shortage of professionals trained in integrated BIPV design and implementation.

BIPV 应用规模仍有限，仅占全球光伏市场的 1–3%，主要受制于结构性障碍，包括价值链碎片化、跨行业协作不足，以及精通 BIPV 一体化设计与实施的专业人才短缺。

Education and training initiatives exist but are fragmented and unevenly distributed. The report maps 32 active BIPV-related courses across 14 countries, revealing that BIPV is still largely treated as a niche or elective topic rather than embedded in mainstream architectural and engineering curricula.

现有 BIPV 相关教育培训项目存在碎片化、分布不均问题。报告梳理了 14 个国家的 32 项在运行 BIPV 相关课程，结果显示，BIPV 在很大程度上仍被视为小众或选修内容，尚未纳入主流建筑与工程专业核心课程体系。

Practice-oriented, interdisciplinary training is critical to enable market-scale BIPV deployment. Programmes combining architectural design, PV technology, hands-on workshops and cross-disciplinary collaboration show the strongest potential to close skills gaps and support workforce development.

以实践为导向的跨学科培训，是实现 BIPV 市场规模化推广的关键。融合建筑设计、光伏技术、实操工作坊与跨学科协作的培训项目，在弥补人才缺口、支撑人才队伍建设方面展现出最强潜力。

The report further highlights that current training primarily targets architects and engineers, while other key stakeholders – including contractors, managers and decision-makers – remain underrepresented. It emphasises the importance of modular, flexible and applied learning formats that reflect real-world project processes and interdisciplinary collaboration.

报告进一步指出，当前培训主要面向建筑师与工程师，承包商、项目管理者及决策者等其他关键利益相关方参与度严重不足。报告强调，应构建模块化、灵活化、应用型的学习模式，贴合实际项目流程与跨学科协作需求。

The findings conclude that without structured and accessible education pathways, BIPV will remain a niche application. By strengthening training frameworks and embedding solar building literacy into architectural and construction education,

the sector can support broader market integration and long-term workforce development.

研究最终结论表明:若缺乏体系化、可及性的教育路径, BIPV 将长期停留在小众应用阶段。通过完善培训体系、将光伏建筑相关知识融入建筑与工程专业教育, 可推动 BIPV 更广泛地融入市场, 并实现行业人才队伍的长期建设。