Digitalization in Off-Grid Systems

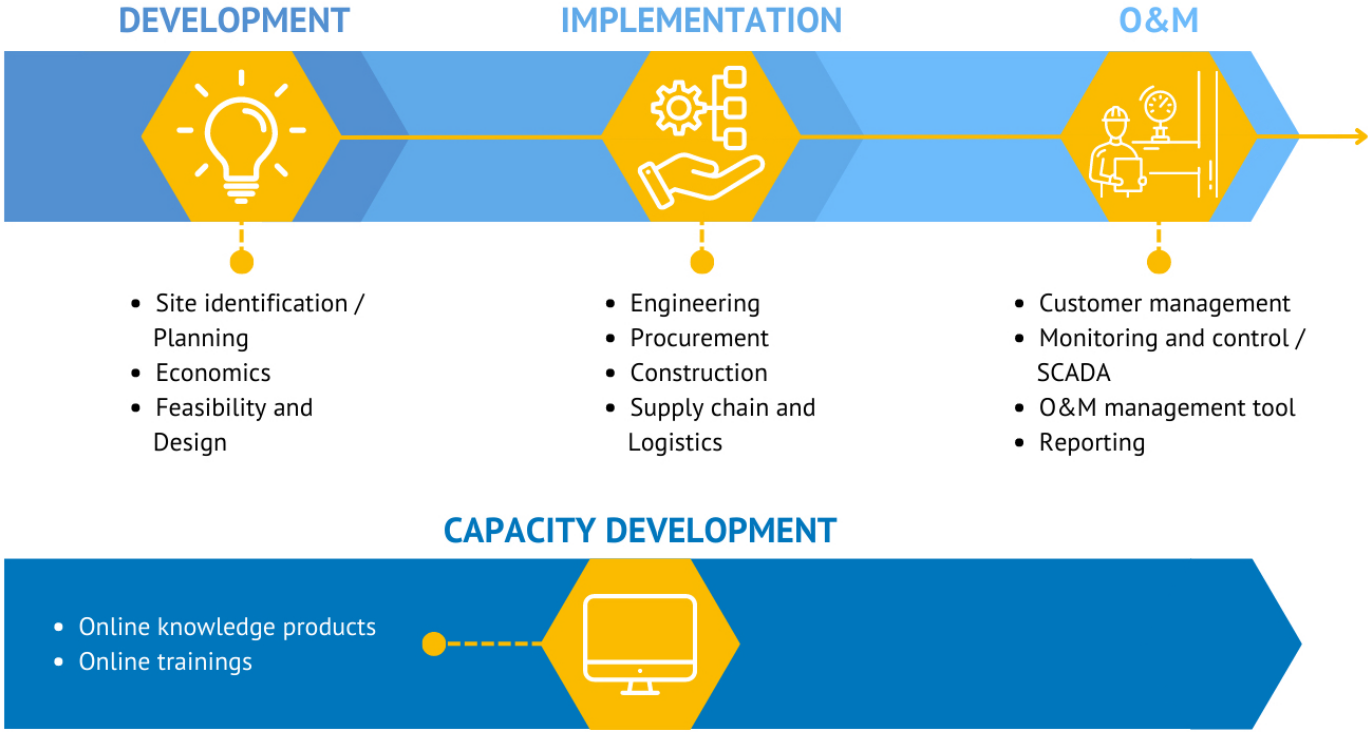
Task 18: Off-Grid and Edge-of-Grid Photovoltaic Systems

July 2025

Motivation and objectives of report

- Highlight the growing importance of digital tools in optimizing off-grid PV systems for remote and underserved areas.
- Provide structured guidance by mapping tools across the project value chain: Development, Implementation, O&M, and Capacity Building.
- Evaluate tools using a 7-dimension innovation framework (e.g., usability, AI integration, data protection).
- Offer a curated annex of 60+ digital tools with practical insights for selection and application.
- Encourage community-driven updates via online platforms like Energypedia and an open-access survey tool.

Main results: Project value chain and tools



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PVPS

Summary and recommendations

- Digital tools significantly enhance the efficiency, reliability, and scalability of off-grid PV systems across all project phases.
- Strategic integration of tools—not just individual use—yields the greatest impact on project performance and sustainability.
- Capacity building and digital literacy are essential to fully realize the benefits of digitalization in off-grid contexts.
- Continued collaboration, open data sharing, and dynamic platforms (e.g., Energypedia) are key to driving innovation and adaptation.

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