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Agrivoltaics in the Middle East: A Dual Solution for Clean Energy and Water-Efficient Farming

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Abstract

The Middle East is rapidly expanding solar PV while facing extreme heat, limited arable land, and increasing water scarcity. Agrivoltaics—the co-location of photovoltaic systems and agriculture on the same land—offers a strong solution for the region's energy–water–food challenges. Research in dryland conditions shows that partial shading from PV modules can reduce crop heat stress, lower evaporation, and improve water productivity, while also supporting PV performance through reduced module temperatures.

This presentation highlights the high potential for agrivoltaic scale-up across MENA, where suitability studies show strong overlap between areas favorable for agriculture and agrivoltaics. Key regional design considerations will be covered, including shading ratio, structure height, dust/soiling mitigation, irrigation integration, and crop selection, aligning with global best practices for dual land-use solar.