Fraunhofer ISE

Fraunhofer Institute for Solar Energy Systems ISE

Integrated Photovoltaics

Floating Photovoltaics

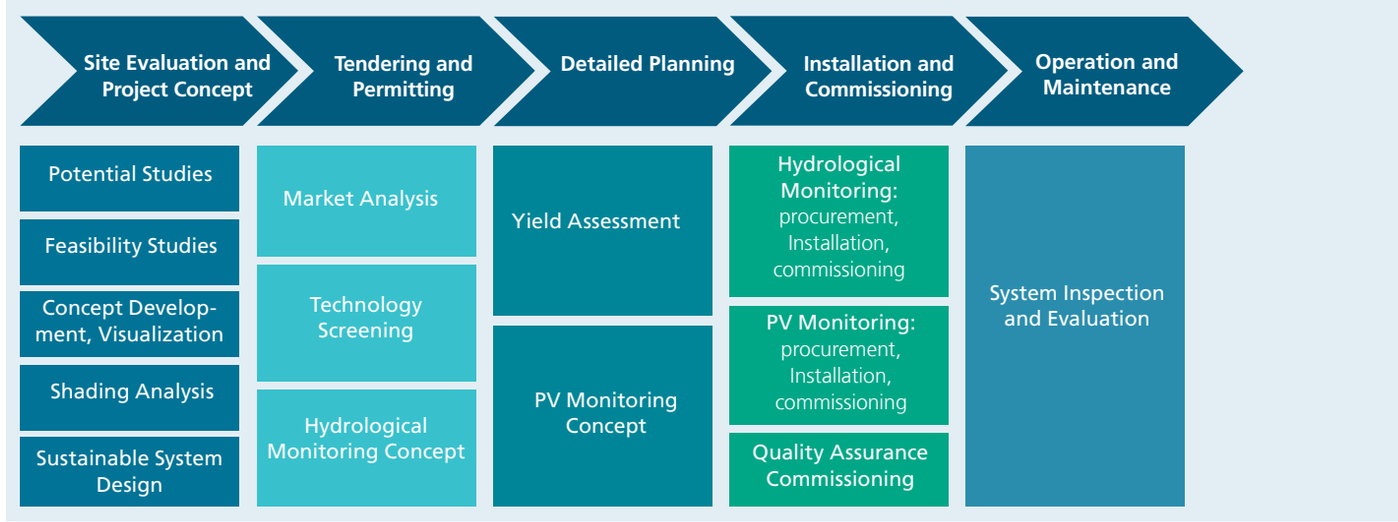
R&D for the Energy Transition

R&D Services for Floating Photovoltaics

Floating photovoltaics (FPV) is an innovative technology with the potential to contribute significantly to the energy transition. Installed on floating structures in artificial bodies of water or offshore, FPV power plants can be deployed in flooded mining lakes, gravel pits and reservoirs.

According to a recent study by Fraunhofer ISE, the technical potential of FPV in Germany ranges between 11.8 and 44.5 GW_p, depending on water coverage and system orientation. Our R&D services can help unlock this potential by providing expert solutions for the planning and implementation of FPV systems that are tailored to meet specific project requirements.

Measuring devices monitor wind, solar irradiance, and module temperature at the FPV system on Lac des Toules, in Switzerland.



Our services throughout the project development phases.

Years of experience in module and plant technology as well as power plant monitoring enable us to expand our expertise to floating photovoltaics. We carry out detailed studies and FPV performance analyses as well as monitoring services for PV and water for engineering firms, EPCs, and plant operators.

Support Across All Project Phases

Our expertise covers every stage of FPV project development. Our services take technical, economic, and environmental factors into account to generate optimal solutions.

Site Evaluation and Feasibility Studies
We evaluate potential locations for FPV, based on environmental conditions, water quality and infrastructure access, among others. Our proprietary software, Zenit, generates yield forecasts for FPV systems by considering variables such as system design, module orientation and ambient temperature. These results can be used as a basis for further analyses.

Comprehensive Concept Development, Market Analysis, and Technology Screening for PV Systems
We offer design concepts for innovative PV systems, backed by in-depth market analysis and supported by visualizations. By identifying relevant technologies and evaluating their market potential, we can select system components that align with the latest trends and meet our customers' requirements.

Sustainable System Design
We support sustainable system design for Floating PV by providing hydroecological forecasts tailored to site-specific conditions. Using advanced models, we assess potential impacts on water temperature, oxygen levels, and biomass production, allowing us to optimize layouts for minimal ecological disturbance.

Water Ecology and PV Monitoring
We develop monitoring strategies to track key water parameters such as temperature and oxygen levels, alongside PV-specific variables like solar irradiance and module temperature. Our approach integrates real-time data analysis and site-specific adaptations to provide precise and reliable assessments.

Quality Assessment and System Evaluation for Floating PV

Our quality assessment and system evaluation services provide our customers with a detailed performance analysis of their Floating PV system. Using advanced measurement technology and inspection methods, we examine the functionality and efficiency of all system components, from PV modules and inverters to electrical wiring. Visual inspections as well as thermographic analysis can detect potential defects early on by identifying hot spots, faulty bypass diodes, or poor electrical connections.

We perform finite element modeling and conduct both laboratory tests and field measurements to assess the impact of wave movement, water conditions, and long-term environmental influences of and on FPV systems. By combining precise data collection with simulations, we can generate detailed information on the current performance of your FPV system.

Our evaluations not only identify the potential weaknesses of your system but also include recommendations for optimization and maintenance. This ensures that your FPV system continues to operate at peak efficiency, maximizing its long-term energy yields.

Further informationen

ise.link/fpv

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