

United States Floating Photovoltaics Market Assessment, By Product [Stationary Floating Solar Panels, Solar-tracking Floating Solar Panels], By System [Stand Alone FPV Systems, Hybrid FPV Hydropower Systems], By Application [Man-made Water Bodies, Natural Water Bodies], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

United States floating photovoltaics market is projected to witness a CAGR of 11.70% during the forecast period 2024-2031, growing from USD 92.39 million in 2023 to USD 223.90 million in 2031. Floating photovoltaic (FPV) systems are gaining attention in the solar cell market. Floating photovoltaics is a relatively new technology in the country, and it is expected to show deployment in the forecast years.

Floating photovoltaic systems utilize the same type of PV panels that are used on land. However, these panels are either floating in the water or suspended over a water body. In general, floating solar panels generate more energy than a similarly sized traditional system due to the cooling effect and reflectivity of water. The shading effect of solar panels may significantly reduce evaporation and may further enhance the quality of water by preventing the growth of some types of algae.

Floating photovoltaic systems gain more efficiency due to the natural cooling by water, which reduces energy loss through the increased temperature of land-based solar panels. The cooling effect helps to keep optimal operating temperatures for the panels and increases overall energy output, thereby making the FPV systems more feasible.

Qualified experts with the proper technical competencies are required to check floating structures for damage, ensure electrical safety in wet environments, and biofouling management of the growth of algae and other microorganisms on submerged parts. Currently, the low availability of experts in FPV installation and maintenance in the country could discourage utility companies and other investors from adopting floating photovoltaic technologies, which hinders market growth.

For instance, in 2023, in California, a 4.8-MW solar plant was installed on ponds at the city of Healdsburg's wastewater treatment plant in Sonoma County.

Mitigating Usage of Solar Panels on Land to Drive Market Growth

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Floating photovoltaics technology reduces land usage by using water bodies instead of land spaces to generate solar energy. This reduces demand on land and efficiently utilizes available resources. In the United States, floating photovoltaic systems are mounted on lakes, reservoirs, ponds, and water treatment plants.

Furthermore, floating photovoltaics technology is very functional, especially when deployed on multipurpose reservoirs and dams that have assigned functions, such as storing water, irrigation, or even hydropower production. Installing floating photovoltaic systems on reservoirs will enable solar energy generation without an additional area of land. Floating photovoltaics technology makes use of water bodies by deploying solar panels on floating platforms and leaving the land as free as possible for agriculture, development, or preservation, fostering the growth of the floating photovoltaics market in the United States.

For instance, the United States has roughly 26,000 reservoirs of various sizes, totaling 25,000 square miles of water. Covering 30% of the United States reservoir area with floating panels could generate 1,900 terawatt-hours of energy and save 5.5 trillion gallons of water annually from evaporation.

Easy Integration of FPV Technology to Boost Market Size

Floating photovoltaic systems are flexible in nature and easily integrate with existing hydropower plants, especially at large hydropower sites. The combination of floating photovoltaic systems and sources of renewable energy, such as wind and hydropower, create hybrid systems that are highly reliable and firm. The hybrid system would provide more options for grid management and the integration of energy storage solutions, which foster the floating photovoltaics market size. Using floating photovoltaics in conjunction with energy storage solutions, such as batteries, gives utilities the possibility of storing excess energy produced during peak production time and releasing energy when demand is higher. In addition, floating photovoltaic systems are efficient in storing and managing energy, which would help in the constant supply of energy to the country.

Furthermore, the synergies and efficiencies that are provided by floating photovoltaic systems integration may bring along different renewable energy technologies and more attractiveness towards investment. Apart from that, such projects are expected to garner government support, grants, and other incentives being doled out for the promotion of renewable energy in the United States.

Coupling floating photovoltaics with hydropower in reservoirs may enable the simultaneous generation of solar and hydroelectric power. The hybrid system boosts the reliability of energy and grid stability during peak periods or at times when one source is least productive. Such hybrid systems have become quite alluring to utilities and energy providers as they deliver a stable and reliable energy supply in the United States.

For instance, in March 2024, researchers from China and the United States proposed a novel modular floating photovoltaics solution to assess the behavior of offshore, multi-connected modules under combined wave-wind conditions.

Technological Advancements and Falling Capital Costs of PV Modules to Captivate Market Demand

Technological developments in the floating photovoltaics market have made the designs of FPVs more robust and efficient. Some of the innovations developed for floating structures include more resilient and lighter materials, such as high-density polyethylene or reinforced polymers for floating photovoltaic installations, that may withstand bad conditions in the environment, including strong winds, waves, and UV exposure. The upcoming innovations make floating photovoltaic systems more long-lasting and reliable, thereby cutting down the costs of maintenance.

In addition, the cost of PV modules is declining, which lowers the cost of floating photovoltaic plants. Technological advancements have given the world more efficient solar panels, capable of producing more electricity out of a given area of sunlight. Moreover, the falling capital cost of photovoltaic modules and technological development creates an enormous opportunity in the floating photovoltaics market.

Dominance of Stationary Floating Solar Panels Systems

The stationary floating solar panels have a higher adoption rate, which makes the segment dominate the United States market. Compared to solar-tracking floating solar panels, stationary floating solar panel design and installation are easier, less expensive, and do not require tracking systems or moving elements, making them less expensive than other systems.

In addition, stationary floating solar panels can be installed on various bodies of water, including lakes, ponds, reservoirs, and some offshore and coastal areas, which fosters the demand for stationary floating systems in the market.

Northeast to Lead the United States Floating Photovoltaics Market Share

Northeast is anticipated to dominate the share of the United States floating photovoltaics market in the forecast period. Alaska

and the Northeast are rich in lakes, artificial reservoirs, rivers, and ponds. Most of the water bodies remain underutilized and have the potential to be ideal sites for floating photovoltaic installation. The floating photovoltaic systems could use natural resources by laying down solar panels on the water surface area of these regions, making an attractive opportunity for renewable energy generation in the United States market.

Furthermore, several Northeastern states have set ambitious renewable energy goals and policies to reduce state greenhouse gas emissions and achieve cleaner energy, which boosts the United States floating photovoltaics market.

Future Market Scenario (2024 - 2031F)

-□Ongoing innovations and advancements in floating photovoltaics technology will improve floating platforms, buoyancy systems, and panel efficiency, which will enhance the feasibility and cost-effectiveness of these systems.

-□As environmental concerns push for more sustainable technological solutions, renewable energy sources will grow significantly.

-□Solar tracking features of hydraulic pumps will be used in floating photovoltaic systems, which is expected to boost floating photovoltaics market sales in the country.

-□Supportive government policies and financial incentives for renewable energy projects, including floating photovoltaics, in developing countries will continue to play a significant role in driving the growth of the United States floating photovoltaics market.

Key Players Landscape and Outlook

Continuous innovation characterizes the landscape of floating photovoltaics as the companies compete to outperform one another in terms of solar projects, energy efficiency, and unique features. The market prognosis remains positive, owing to increased demand for renewable energy. Floating photovoltaics players are concerned with supply chain resilience, energy efficiency, and environmental practices, which will define the industry's future. Collaborations and developing technologies are projected to increase competition in the fast-paced market.

For instance, in March 2023, Sungrow company announced to sign the Memorandum of Understanding (MOU) with Amp Co., Ltd., at the PV Expo for the supply of floating photovoltaics in several renewable projects.

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