
NORIA
Leaders in Floating Solar

NORIA ENERGY OVERVIEW

Who We Are

We are a pioneer and leader in floating solar PV (FPV) project development and technology. Our development expertise and groundbreaking R&D work place us at the industry's forefront in North America and abroad. Our mission is to deliver cost-effective and resilient FPV systems to our customers with complex needs.

Project Development

We specialize in designing and developing complex, first-of-a-kind, largest-of-their kind FPV projects in the U.S. and Latin America.

Products and R&D

Our industry-leading "N.E.R.&D." team develops a range of technology and solutions that lower barriers to floating solar adoption, driven by the unique needs of our customers.

Industry-Leading Financial Backing

Greenbacker℠

$2.0 B INVESTED

3.3 GW CAPACITY

400+ PROJECTS

Noria Energy is backed by Greenbacker Capital, who contributes not just capital but industry's top professionals, deep relationships, and winning processes to Noria and our work.

2018 Noria founded as specialist in FPV development

2020 Designed the largest FPV in North America

2021 1st DOE grant awarded, raised $7.5 million in capital

2022 1st commercial product installed; 2nd DOE grant awarded

2023 3 commercial pilots installed; 3rd DOE grant awarded

2024 4th DOE grant awarded, 600MW of pipeline

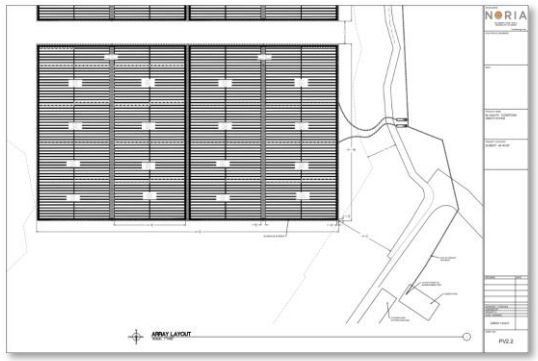
Leaders in Floating Solar: Project Development

Project Development Offerings

Feasibility Studies: Comprehensive assessment of the technical, environmental, and financial viability of floating solar systems, highlighting key milestones, roadblocks, and risk-mitigation strategies.

Development Services: We provide our customers designs, permitting and engineering packages. Also includes RFP assistance for customers needing competitive bids on capital-intensive projects.

Full-Service Power Purchase Agreements (PPAs): Offers the full feasibility, development, and construction of a FPV system with no upfront costs. This provides a predictable, long-term electricity rate through a floating solar system tailored to the customer's needs.



Customers and Partners (selected)

Chevron

BASF
We create chemistry

SILVI MATERIALS

SWEETWATER AUTHORITY

CITY OF HEALDSBURG
CALIFORNIA SINCE 1867

URRÁ
Generación Sostenible

TID WATER & POWER
Serving Central California since 1887

DNV

Large-Scale Floating Solar on Reservoirs

Floating Solar PV (FPV)

Floating solar PV (FPV), is a solar PV system designed to float on the surface of water bodies like reservoirs, lakes, and treatment ponds. Panels are racked 18-24” above the water surface, never in direct contact with the water

FPV uses Food-Grade High Density Polyethylene (HDPE) floats that are specifically designed to resist leaching and degradation from the high-humidity and high-UV conditions.

Systems are anchored using marine mooring lines and can be anchored to either the shore or the bottom of the waterbody.

FPV is proven both in the U.S and globally, with over 3 GW of installed capacity worldwide.

Systems in the U.S currently cover up to 22 acres of water with systems internationally reaching over 800 acres in size.

FPV projects maximize the use of existing human-made waterbodies and minimize environmental impacts, reducing the need for land-intensive energy infrastructure.

Development Success Story: First-of-its-Kind

Urrá Hydroelectric Facility, Colombia

Noria understands complex, remote, and/or first-of-a-kind FPV projects.

Customer's Goals

- Deploy a first of a kind FPV system to prove the viability of a 100+ MW FPV system that utilizes existing infrastructure and maximizes revenue
- Diversify and expand generation mix (350 MW)
- Offset on-site electric load to maximize energy generation, particularly in drought seasons

Unique Project Characteristics

- **FOAK:** The first FPV project on a hydroelectric reservoir outside of Asia and Europe
- **Remote:** 50+ miles from a major population center, complex local stakeholder dynamics
- **Complex:** Water level fluctuations of >100 ft.

Noria's Solution

- **Comprehensive Feasibility Study:** We conducted an in-depth feasibility analysis to ensure project viability, considering all environmental, technical, and economic factors.
- **Collaborative Design Process:** We incorporated feedback from local governments and key stakeholders, ensuring our designs and technology choices met community needs and regulatory standards for optimal permitting processes and local support.
- **Pioneering Project:** We designed and constructed a groundbreaking 1.5 MW FPV system, the largest of its kind in South America at the time of commissioning.
- **Specialized Anchoring Solution:** Our team engineered and installed a robust anchoring system capable of withstanding water level fluctuations of 120 feet.

Development Case Study: Largest-of-its-Kind

Healdsburg Wastewater Treatment Facility, CA

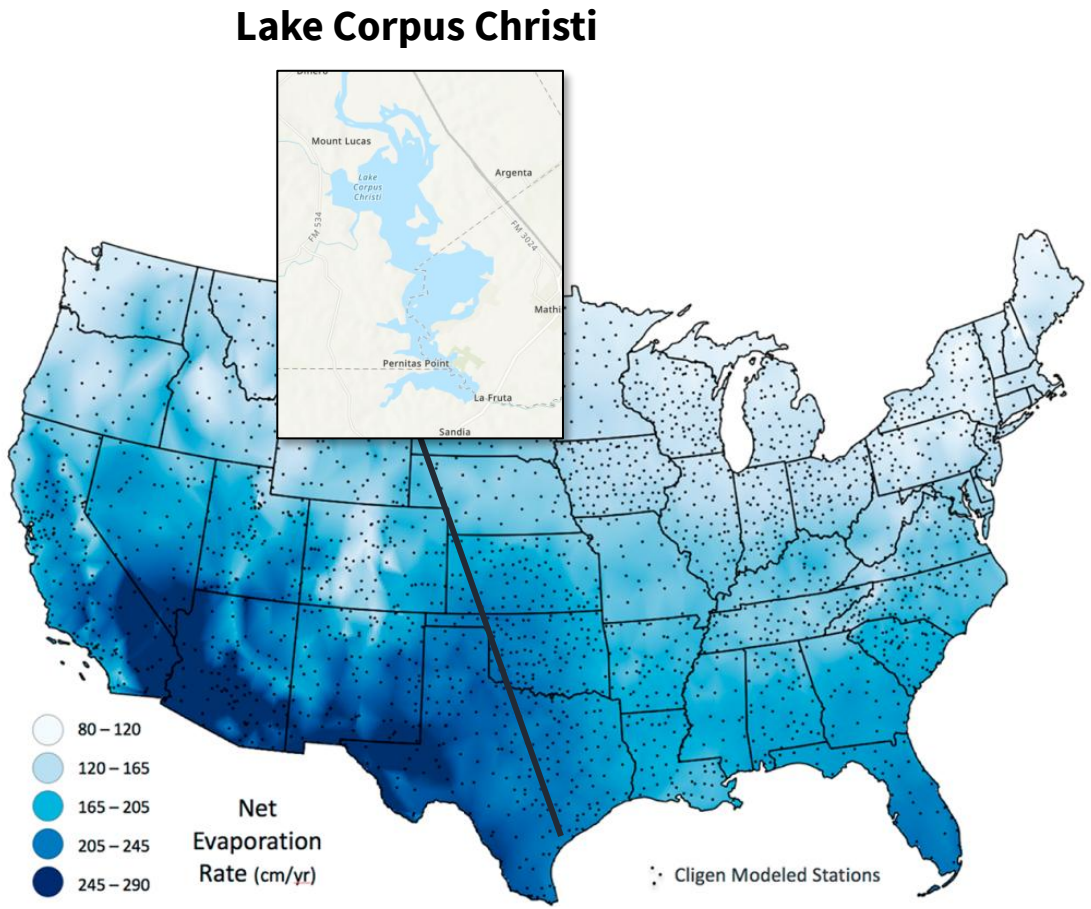
Largest FPV Project in the western hemisphere (when built, 2022)- 4.8 MW

Operates with fluctuating water levels including 0 ft. water level (directly on the ground)

Challenge	Noria's Solution
• The City of Healdsburg is surrounded by valuable vineyards and had limited space to meet their renewable energy goals.	• Noria utilized existing reservoirs for floating solar and interconnected to on-site electrical infrastructure.
• The City needed Renewable Energy Credits (RECs) to meet Renewable Portfolio Standards.	• The team structured a long-term PPA offering significant savings as well as RECs which is not typical with traditional PPAs.
• These ponds experienced consistent algae blooms and drought conditions which led to growing water security concerns for the water treatment facility and community.	• The team designed and deployed an FPV system to significantly reduce algae growth and water evaporation, preserving ~9.5 million gallons of water annually.
• Healdsburg's water treatment plant required annual inspections and pond-liner dredging.	• Noria designed the FPV system in moveable sections to allow access to entire waterbody liner when needed.

FPV Water Quality Benefits and Evaporative Savings

Evaporative Rates across Corpus Christi



Evaporation rates from major reservoirs in Corpus Christi equate to billions of gallons of water lost annually

Lake Corpus Christi

Average Loss: 65 MGD

Maximum Loss: 85 MGD

MGD= Million Gallons/Day

Source: Spencer, R. S., Macknick, J., Aznar, A., Warren, A., & Reese, M. O. (2018). Floating PV: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental U.S. Environmental Science & Technology. doi:10.1021/acs.est.8b04735

Water Quality Issues

As temperatures increase and water levels in reservoirs drop, risk of harmful algal blooms rises.

Warmer water surface temperatures can create stratified conditions where algae can thrive

Algae decreases overall water quality, increases operational costs with water treatment and transport, and poses public health risk

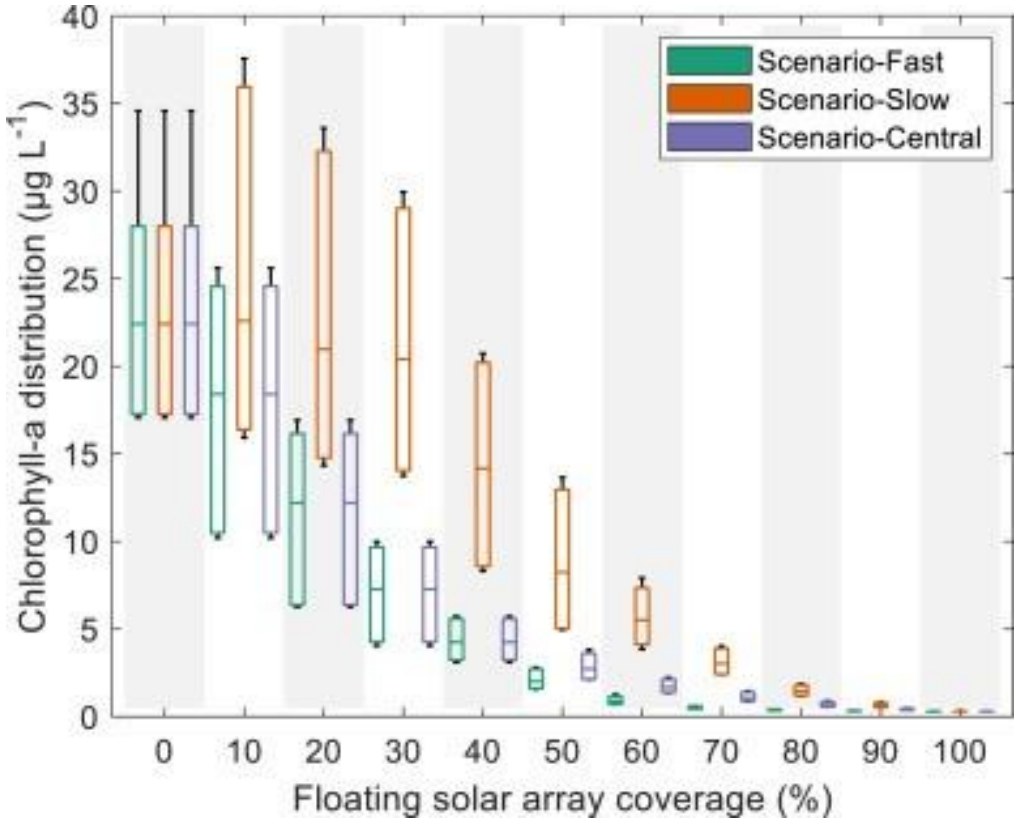
FPV Impact on Evaporation and Water Quality

Shading the water surface with FPV can reduce evaporation below the panels by up to 60%

- Floating solar reduces water temperature
- Reduced surface winds also contribute to lower evaporation

FPV shades the majority of sunlight from reaching the water surface, reducing growth conditions for harmful algal blooms near the surface of the water

Noria is an industry-leader in addressing water quality concerns, even deploying FPV-powered aeration and destratifiers to improve water quality



As FPV coverage increases, algae concentrations decrease in the water body.

Figure source: Exley et al., 2022, *Journal of environmental management*

Next Steps

- We recommend that the City of Corpus Christi hire Noria Energy to conduct a full feasibility study for FPV potential atop Lake Corpus Christi. Our analysis would include:
  - Assessment of the technical, environmental, and financial viability of floating solar systems on the two sites
  - Site-specific evaporation reduction assessment utilizing each site's local climatic and FPV-related considerations
  - Offtake options for energy produced by the floating solar array(s)
- Noria Energy can provide a Scope of Work (SOW) that outlines a full list of deliverables for the feasibility study as well as pricing

Thank You

CONTACT

Tate Tussing

Business Development

e. tate@noriaenergy.com