# Solar irrigation for resilient rice: Development investment proposal

DATE: 07 May 2025

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| NAME OF CLIENT | SOLAR GREEN ENERGY (CAMBODIA) CO., LTD |
| CLIENT WEBSITE | HTTPS://SOGECAMBODIA.COM |
| REGION | ASIA |
| COUNTRY | CAMBODIA |
| SECTOR | AGRICULTURE AND WATER & SANITATION |
| SIGNING DATE | 30 DAYS FROM PUBLICATION AT WEBSITE |
| TOTAL FINANCING | USD 370,000 GRANT |
| FUND | ORIGINATION FACILITY "OF" |

- **Who is our (prospective) client?**

Solar Green Energy (Cambodia) Co., Ltd. (SOGE) is Cambodia's largest solar irrigation company, providing sustainable water access for smallholder farmers. Founded in 2014, SOGE offers irrigation services via multiple business models. This includes building, operating and/or owning 19 solar-powered irrigation stations serving over 3,000 hectares, in addition to over 3,000 individually installed solar pump units across Cambodia.

The DFCD Origination Facility will support SOGE to strengthen its business and investment plans to scale their services across Cambodia. DFCD will do so through the de-risking and development of 18 solar-powered irrigation schemes, covering over 18,000 hectares and benefiting more than 10,000 farming households.

*Photo: Aerial view of SOGE's first solar irrigation station in Batheay District, Kampong Cham*

A women-owned and led business, SOGE is headquartered in Phnom Penh and currently employs 40 staff members

across seven divisions (including technical support, marketing, project coordination, and accounting). The company serves smallholder rice and horticulture farmers providing them with more affordable, more reliable and more effective irrigation, often by replacing diesel-based pumping and by refurbishing irrigation infrastructure.

SOGE's solutions are tailored to Cambodia's specific agricultural context. Access to irrigation remains a key constraint on food security, productivity, and rural development. With high vulnerability to climate change, especially erratic rainfall and extended dry periods combined with low adaptive capacity, solar-powered irrigation presents a low-emissions and climate-resilient solution to the challenges facing many of Cambodia's farmers. SOGE's existing client base and pipeline highlight the high demand for water-as-a-service business models that allow farmers to pay per hectare irrigated without upfront investment themselves.

*Photo: Picture of Ms. Keav Thida, CEO of SOGE and her Technical Advisor at Batheay Solar Irrigation Scheme in Kampong Cham province.*

- **Why do we fund this project**?

Investment in irrigation is critical to Cambodia's climate resilience. The country has a large rural and agriculture-dependent population exposed to both extreme events and projected climate changes. These will severely threaten their livelihoods due to forecast reductions in yields of rice - the predominant crop and primary source of calories in the country. Improving access to irrigation is a key determinant of adaptative capacity and resilience as well as eliminating malnourishment. However, less than 50% of Cambodia's 2,500 irrigation systems are partially or fully functioning and they require investment in their maintenance and upgrading.

SOGE was a former grantee of the SNV IAP (Innovations Against Poverty) program and their first "company-owned, company-operated" station was in part developed with support from SNV in 2021. Through ongoing contact with the SNV office in Cambodia, the DFCD was able to analyse the

company's progress and strong alignment with the DFCD's objectives. SOGE's mission is to expand the use of green energy in agriculture and to address challenges like energy scarcity and the high operational costs for irrigation pumps and systems. Their business model, particularly the company-owned, company-operated stations, overcomes some of the barriers that farmers face in resolving the irrigation needs themselves, such as access to capital, access to power, technical expertise and servicing requirements. SOGE's innovative products, including smart water pump services and solar-based irrigation systems with sun trackers, have helped to enhance irrigation and cost efficiency of these stations.

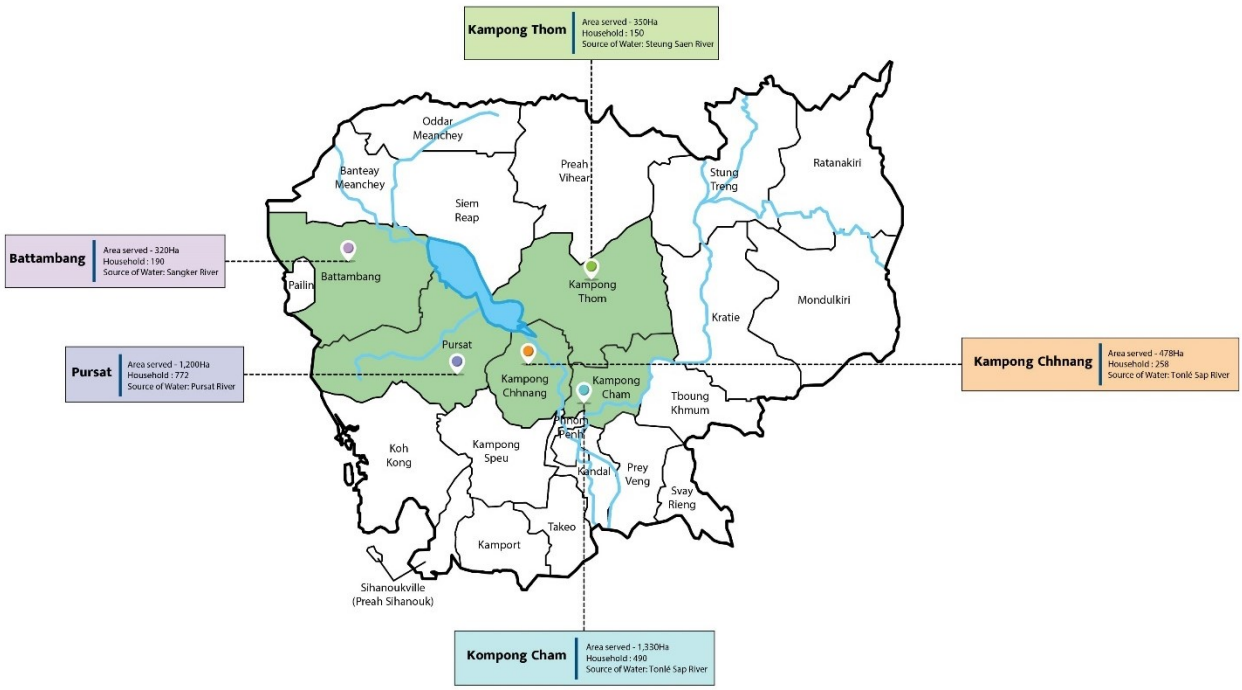


*Figure: Solar irrigation services provided by SOGE across five provinces in Cambodia.*

SOGE's solar irrigation model addresses multiple DFCD priorities: climate adaptation, mitigation, and inclusive rural development. It replaces diesel-powered systems with clean energy, strengthens farmer livelihoods, and enables year-round food production. The project will improve adaptive capacity, reduce GHG emissions, support food security among Cambodia's vulnerable groups, and further the country's climate policy goals. Without DFCD support, SOGE would face barriers in scaling due to high upfront feasibility costs and weak water governance.

- **What is the intended funding objective (type of activity)?**

This Origination support seeks to de-risk the cost and build capacity of the technical staff, systems, and resources deployed by SOGE to accelerate development of its **solar powered irrigation stations**. This will ultimately enable the company to raise investment for these coop stations, develop them, and increase its impact by over 10,000 households over the next three years.

The DFCD grant will fund feasibility assessments, institutional strengthening, and improvements to the company's environmental and social systems to support SOGE's ability to scale its portfolio. These activities will accelerate SOGE's path to investment-readiness for a USD 13 million expansion across three phases between 2025 and 2028.

- **The grant will be used for undertaking:**

The Origination Facility grant, alongside SOGE's own resources, will fund a targeted set of activities that directly address the technical, legal, environmental, and financial risks currently preventing investment in Cambodia's solar irrigation sector. These include:

1. **Industry strategy and regulatory environment assessment:** to clarify legal and regulatory uncertainties around water use and irrigation licensing, helping to ensure strategic alignment to national priorities and long-term investability and compliance.
2. **Feasibility studies of pipeline of Solar Water Irrigation stations:** to reduce the technical, social and environmental risks of the 18 shortlisted stations through detailed assessments of engineering needs, water sustainability, farmer economics and socio-cultural impacts.
3. **Scale-up business plan and financial systems strengthening:** to address institutional risk by improving SOGE's financial planning, transparency, and readiness to manage expansion.
4. **Environmental and Social Safeguard Assessment:** to strengthen the company's risk management systems in accordance with international standards.
5. **Gender Equality and Social Inclusion (GESI) Assessment:** to ensure inclusive impact and reduce social risk by identifying barriers to participation and embedding GESI across operations.

- **What are the expected impacts of the company?**

The expected impacts of the proposed USD 13 million investment which the Origination Facility aims to unlock include:

- ✓ 18,250 ha with new or improved access to irrigation.
- ✓ 10,835 families have new or improved access to irrigation water and electricity (of which an estimated 80% will be smallholder farmers).
- ✓ Up to 50% increase in agricultural yields.
- ✓ 20% to 50% increase in family income.
- ✓ 8,000 tons per year C02 emission reduction from changing of using diesel-powered to solar irrigation.[i]

Beyond these 18 pre-identified sites, SOGE's experts estimate that a total of 100,000 hectares, requiring investment of USD 75m, is suitable for the establishment of similar irrigation schemes.

- **Environmental and social risks and rationale:**

SOGE's operations support climate resilience through year-round access to irrigation, reducing vulnerability to climate shocks and improving food and income security for rural farmers. The project

contributes to sustainable land use, reduced methane emissions through alternate wetting and drying (AWD), and mitigation of diesel use. It is classified as Rio Marker 2 for climate adaptation.

The Origination Project includes the design and implementation of a company-wide ESMS and GESI framework. Feasibility studies will evaluate water source sustainability, community impacts, and potential land or livelihood risks. SOGE will also conduct greenhouse gas assessments to quantify emission reductions from diesel replacement.

The initiative aligns with IFC Performance Standards and Cambodian government priorities on irrigation, agriculture, and renewable energy. With proper stakeholder engagement, technical design, and regulatory analysis, the project will ensure environmental sustainability and inclusive community benefits, especially for women farmers who stand to benefit from more accessible and reliable irrigation services.

SOGE's existing partnerships and strong governance structure enable the successful implementation of safeguards and capacity-building efforts across its team and operations. Following the framework of the IFC Performance Standards, the preliminary risk assessment has rated the investment as category B.

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[i] All these figures are extrapolated from impact monitoring data from SOGE's existing irrigation schemes.