International Labour Organization

▶ ILO brief

ILO Brief

December 2024

Renting a Portable Solar Energy System in Lebanon

The Experience of Deir El Ahmar's Union of Cooperatives with Portable Solar Units in Lebanon

Highlights

- Lebanon's agriculture sector faces escalating energy costs, with farmers relying heavily on diesel-powered systems for essential operations like irrigation and cold storage.
- While solar energy adoption is growing in urban areas, smallholder farmers remain excluded due to high upfront costs and limited access to technology.
- Portable solar rental schemes, such as those developed by YY ReGen, offer an affordable, scalable alternative for farmers with seasonal energy needs.
- Pilot with cooperative on portable solar energy rental model have demonstrated significant cost savings and environmental benefits, achieving a 50% reduction in energy costs and benefiting more than 150 farmers.

Energy Challenges in Agriculture: A Call for Innovation

Lebanon's agriculture sector faces a severe energy crisis, where farmers depend heavily on power for essential activities such as water pumping, greenhouse operations, and cold storage. Traditionally, diesel generators serve as the primary energy source, but escalating fuel costs—compounded by subsidy removals and the financial crisis—have rendered diesel increasingly unaffordable for many farmers.

While solar energy adoption in Lebanon has surged in recent years, the benefits have primarily reached urban and industrial customers with the financial capacity to invest in off-grid systems. Smallholder farmers, on the other hand, remain largely excluded from this shift, as they lack the financial means to purchase solar energy systems and have limited knowledge about solar technology and suppliers. Additionally, solar companies have been hesitant to serve smallholders, viewing them as a high-risk and commercially unviable market segment.

The situation has worsened with the conflict, which has heightened investment barriers for farmers and increased risk aversion among solar companies. As a result, many smallholders continue to depend on costly and polluting diesel generators, even though solar energy represents a cleaner and more affordable alternative.

Bridging the Gap: Innovative Financing and Service Delivery Models

In response to these challenges, innovative financing and service delivery models, such as rental schemes for portable solar energy systems, are emerging to make solar technology accessible to smallholder farmers. These models can provide a more accessible pathway to solar energy adoption, by addressing financial and operational barriers, offering a lifeline for Lebanon's struggling agriculture sector while promoting sustainability and economic resilience.

YY ReGen: Introducing portable solar rentals

YY ReGen, a Lebanese startup, pioneered a containerized portable solar energy system offering 12–15 kW of power. This innovative unit can be disassembled, relocated, and reassembled within a single day, making it ideal for seasonal and flexible energy needs. Their rental solution is particularly appealing to customers who do not have adequate access to the energy grid and who cannot afford to pay for an energy system upfront.

Process of installation of portable solution

While ownership of fixed solar systems is a more attractive long-term solution, the rental model is particularly beneficial for farmers with limited financial resources. It provides an affordable, scalable, and environmentally friendly alternative to diesel-powered generators.

This solution is also particularly appealing for farmers with seasonal energy needs, who can therefore rent the solution only for the months when they need it most (for instance during the spring and summer when they are pumping water and irrigating their land).

The ILO, through its Systems Change Initiative (SCI) and the BOUZOUR project, has actively supported the piloting of YY ReGen's portable solar energy rental model within agricultural cooperatives. These pilots aim to demonstrate the feasibility and benefits of solar energy solutions for cold storage usage, addressing energy challenges faced by smallholder farmers.

Spotlight: Union of Agricultural Cooperatives in Deir El Ahmar

The Union for Agriculture Cooperatives in Dier El-Ahmar groups together 14 cooperatives and approximately 350 farmers. The cooperative manages multiple cold storage rooms used for preserving crops such as apples, potatoes, and potato seedlings. These facilities are critical for extending the shelf life of produce, reducing post-harvest losses, and ensuring a steady supply to markets. However, the rising cost of diesel had made operating these cold storage rooms prohibitively expensive, directly impacting farmers who rely on these services.

Through the pilot, the cooperative rented two portable solar energy systems from YY ReGen. The systems, capable of producing 12–15 kW each, were used to power two cold storage rooms during the harvest season. This setup reduced the reliance on diesel generators during peak demand periods.

Key Outcomes:

- **Cost Savings:** The cooperative reduced its energy expenses by 50%, with the cost of storage per crate of produce dropping from USD 5–6 to USD 3–3.50.
- **Farmer Benefits:** Lower operational costs led to reduced storage fees for smallholder farmers, allowing more than 150 cooperative members to benefit from more affordable storage services.
- **Environmental Impact:** By reducing the usage of diesel generators, the cooperative reduced its CO2 emissions by 655kg during the pilot period.

- **Sustained Use:** Following the initial pilot period, the cooperative opted to extend its use of the solar units, highlighting its satisfaction with the performance, reliability, and cost-effectiveness of the solution.

Conclusion and next steps

Based on the experience with the Union of Agricultural Cooperatives in Deir El Ahmare, YY ReGen has recognized the potential of customers operating post-harvest facilities, especially cold storage operators, which can rent their service during the Winter and Autumn. The startup is now more actively searching for such customers and can point to their experience with the Union of Cooperatives of Deir El Ahmar as a testament to the viability of this solution for cold storage facilities.

The ILO is actively advancing initiatives that promote solar energy solutions in the agriculture sector. As part of this, the ILO organized two roundtables with 26 stakeholders from the solar energy and agriculture sectors to showcase successful applications of solar energy, particularly in powering cold storage and other agricultural uses. The ILO is also developing practical tools to support farmers in estimating their energy needs, designing solar systems, and calculating payback periods.

These initiatives aim to make solar energy adoption more accessible and cost-effective for smallholder farmers, agricultural cooperatives, and agri-businesses. By reducing reliance on expensive diesel generators, these solutions not only enhance the sustainability of agricultural operations but also contribute to strengthening the sector's resilience and profitability.

Portable solution installed in the Union of Cooperatives of Deir El-Ahmar

ILO Projects Background

The ILO Systems Change Initiative (SCI) is the leading UN initiative applying a market systems development (MSD) approach to employment creation and job quality. With analysis, local partnerships and evidence-based adaptation at the centre, the SCI supports projects in addressing the underlying reasons that decent work deficits exist and persist, and promote innovative solutions to promote sustainable and scalable job opportunities.

The ILO Building Inclusive Markets and Decent Work for Syrian Refugees and Lebanese Host Communities (BOUZOUR) project, funded by Swedish International Development Agency (Sida), focuses on developing key agricultural and agri-food value chains with potential for decent job creation to improve livelihoods of both Lebanese and Syrian population groups in Lebanon.

Projects contact details:

- Isaac Cowan-Gore, SCI Technical Officer
  E: cowan-gore@ilo.org
- Luana Ayala, BOUZOUR Project Coordinator
  E: ayalal@ilo.org

Supported by
السويد
Sverige
Sida

International Labour Organization
Regional Office for Arab States
Aresco Centre - Justinien Street – Kantari
Beirut – Lebanon

T: +961-1-752400
E: beirut@ilo.org
@iloarabstates

DOI: https://doi.org/10.54394/SIVT0577