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ARDB ACE-GFA MONTHLY BULLETIN

PREPARE BY: ARDB ACE GFA
RESEARCH WORKING GROUP

ARDB ACE-GFA Background

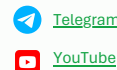
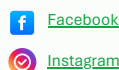
The Memorandum of Understanding (MoU) signed on 8 August 2024 between the Asia-Pacific Rural and Agricultural Credit Association (APRACA) and the Agricultural and Rural Development Bank (ARDB) of Cambodia marked the establishment of the APRACA Centre of Excellence for Green Finance in Agriculture (ACE-GFA). Its mandate focuses on promoting green finance solutions for agriculture, strengthening capacity through research, training, and exposure visits, and facilitating policy dialogues and evidence-based knowledge sharing. In addition, ARDB ACE-GFA provides technical support on climate-smart financial practices and fosters collaboration among national and international partners.



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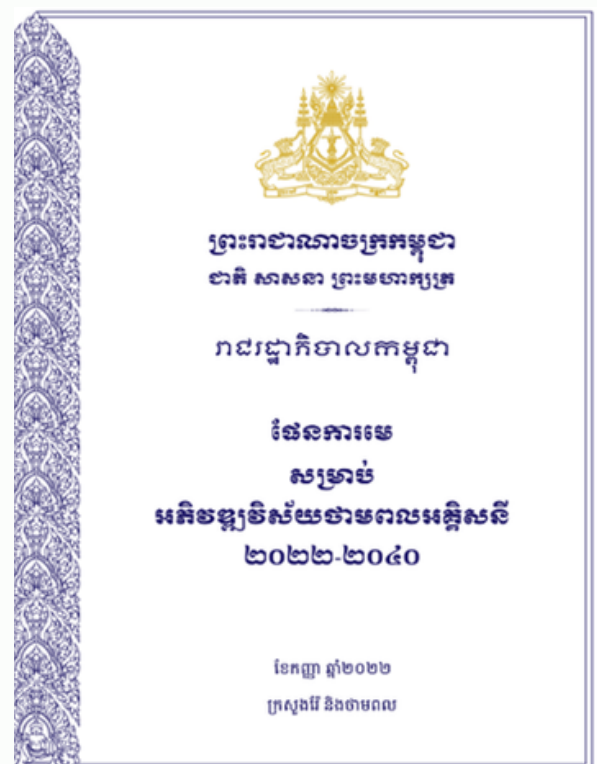
Renewable Energy Technologies for Smallholder Farmer Cambodia Context

Overview

Renewable energy technologies are becoming increasingly important for Cambodia's smallholder farmers because they reduce fuel costs, improve irrigation access, increase resilience to drought, and lower greenhouse gas emissions. The most widely adopted technologies are solar-powered irrigation, biogas digesters, and solar-powered post-harvest systems.

Power development masterplan 2022-2040

Cambodia's PDP 2022-2040 was developed with three main objectives: Firstly, to fulfil the future demand for power adequacy with the supply of electricity in a reliable¹ and affordable² way across all sectors in Cambodia. Secondly, to strengthen energy security by reducing the dependency on energy imports and maximizing the development of domestic energy resources. And thirdly, to increase the share of clean energy, including renewable³ and variable renewable energy⁴, and energy efficiency⁵, without compromising the reliability and affordability of supply, to contribute to the achievement of Cambodia's national environmental goals and global commitments to reduce greenhouse gas emissions. To fulfil the above objectives, the PDP was developed along four primary components: 1) demand forecasts, 2) generation expansion development plans, 3) a high voltage transmission development strategy, and 4) a distribution development strategy. A summary of these components is provided in the sections below and is divided into two parts: 1). A summary report on each component, 2). Annexes that contain tables and figures with the summarized results of the PDP.



Technologies Used



Solar-Powered Irrigation Systems Solar dryers & coolers

Solar irrigation is currently the fastest-growing renewable energy solution for Cambodian agriculture.

- Reduces dependence on diesel fuel
- Lowers irrigation costs
- Provides reliable water during dry seasons
- Increases crop yields and enables dry-season farming



Biogas Digesters

Biogas systems convert livestock manure and organic waste into cooking fuel and fertilizer.

- Provides clean cooking energy
- Reduces firewood use
- Produces organic fertilizer
- Improves sanitation and waste management



Solar Dryers and Cold Storage

Post-harvest losses are a major challenge for Cambodian farmers. Solar-powered drying and cooling technologies help preserve crops and increase market value.

- Reduces spoilage
- Improves product quality
- Increases farmer income



Solar Home Systems for Rural Farms

Small solar systems provide electricity for:

- Lighting
- Charging phones
- Water pumping
- Small machinery

CHALLENGES VS.OPPORTUNITIES

Challenge

- High upfront costs
- Limited financing
- Technical knowledge gaps
- Infrastructure barriers
- Socio-cultural inequality



Opportunities

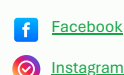
- Long-term savings from solar irrigation and reduced fuel costs
- Microfinance and grant mechanisms for renewable tech adoption
- Capacity-building programs and farmer training initiatives
- Community microgrids and local SME partnerships
- Inclusive programs targeting women and youth



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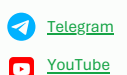
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FORWARD

- Public-private partnerships can bridge financing gaps and scale renewable technologies.
- Capacity-building programs are essential to ensure farmers can maintain and benefit from renewable systems.
- Policy support (subsidies, incentives, and rural electrification plans) can accelerate adoption.
- Knowledge-sharing platforms help spread awareness and best practices across farming communities.

Conclusion

Renewable energy technologies are helping Cambodian smallholder farmers become more productive, climate-resilient, and economically sustainable. Solar irrigation, biogas systems, and solar-powered post-harvest technologies are especially promising because they reduce costs, improve yields, and strengthen rural livelihoods. Continued investment, training, and financing support will be essential for scaling these technologies across Cambodia.

REFERENCES

- Ministry of Mines and Energy. (May 2023). Power Development Master Plan 2022-2040. https://www.moe.gov.kh/wp-content/uploads/2024/01/Article-6-OM_EN.pdf
- IFAD. (2021, May 31). Renewable Energy Technology or Smallholder Farmer. https://www.ifad.org/en/w/publications/renewable-energy-technology-for-smallholder-farmers?utm_



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