



# Micro-Policy Intervention

CONTEMPORARY POLICY DISCUSSION IN CAMBODIA



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# Chapter 10 | Solar Rooftop Promotion in Rural Areas

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## Executive Summary

The problem of secure electricity coverage and consumption was a prominent issue in the city as well as in rural areas throughout Cambodia in 2019. Electricity is an essential basic necessity for people and serves as oxygen for the economy. This paper suggests this issue can be resolved by increasing solar power generation and illustrates productive pathways towards increasing the affordability and distribution of solar energy.

## Summary Points

- In 2018, 97.6% of Cambodian households had access to an electricity source, of which 71.5% was on the grid, and 26.1% was off the grid (World Bank, 2018).
- For a few months of 2019, Cambodia faced a 400MW electricity shortage due a prolonged regional drought that caused low water levels and impacted the production of electricity in some hydro-electricity power plants upstream along the Mekong river. This resulted in staggered 6-hour blackouts occurring daily in Phnom Penh (Tum, 2019).
- Solar power has been touted as a sustainable means of providing the required electricity to every Cambodian household (Seng, 2019a).
- By 2019, Cambodia had invested in two solar operations, in Bavet and in Kompong Speu Province. The Royal Government of Cambodia has planned to build more solar power operations in Pursat and Kompong Chnang, with a cost of US\$116 million (ODC, Electricity production, 2019).

- In order to promote solar panel installment throughout the country, the government should work with related ministries and deliver policy recommendations such as promoting lump-sum subsidies, reducing taxes on solar panels, providing loans via microfinance companies and providing technical assistants from developing partners to rural areas to increase the affordability of solar panels.

## Introduction

There are nearly 5 million Cambodians that have no access to electricity and are reliant on firewood or batteries; with the Royal Government of Cambodia aiming to provide full accessibility to all rural areas by 2030 (ADB, 2018a). Most electricity consumption comes from the burning of non-renewable energy sources and from the importation of electricity from neighboring countries such as Thailand, Vietnam, and Laos (Chan, 2017). In Asia, Cambodia is known to have the high irradiation necessary for solar energy generation. This has led to the prediction that within the next few years Cambodia can become a regional leader in the ASEAN sustainable renewable energy market (Seng, 2019b). The Royal Government of Cambodia has introduced national strategic plans such as the Power Development Plan 2030, the Rectangular Strategy, and the National Strategic Development Plan, and has collaborated with related ministries such as the Ministry of Mine and Energy, the Ministry of Economy and Finance, the Electricity Authority of Cambodia (EAC) and other development partners to plan for safe, clean and sustainable energy production in the future (WWF, 2016a). Given the suitability of solar energy for the Cambodian market, the requirement to provide electricity access throughout the Kingdom, and a history of strategizing around energy; how can the government promote rooftop solar panels in order to fulfill the electricity demand in rural areas before 2030?

## Background to the Problem

### Why is electricity a concern for Cambodian households?

According to World Data, the average electricity consumption per capita in Cambodia is 360 kwh, while a total of 5.86 billion kwh is consumed annually

by the country as a whole (2019). Every Cambodian household pays electricity bills at an average of 720 Riels per kwh (May, 2018). Electricity demand is met by the following sources: fuel oil (1.9%), hydro dams (48.5%), coal fired stations (34.5%) and importation from neighboring countries such as Vietnam (11%), Laos (0.7%) and Thailand (2.8%) (ODC, Energy, 2019).

In April 2019, when the weather was extremely hot, around 1.5 million households in Phnom Penh, as well as in the countryside, faced a six-hour cut off from the grid's electricity supply on a daily basis. This caused a negative impact on business (Khan, 2019). Small household businesses lost a lot of their customers as well as their income due to the issue, while larger businesses had the ability to buy expensive generators in order to maintain their normal operations (Hoekstra, 2019b). As we can see, the electricity shortage negatively impacted the condition and standard of living in Cambodia, entailing that this problem is of high concern for our daily life and our country.

In order to address these issues, the Royal Government of Cambodia and Ministry of Mines and Energy have implemented many plans and mechanisms to fulfill the electricity demand of Cambodians. The Rectangular Strategy in 2013 and National Strategic Development Plan in 2014 have pointed out four priorities for power development: further expanding electricity production, strengthening energy security, ensuring reliable and affordable electricity supply and distribution, and further encouraging private sector investment in technical and economic efficiency. The Electricity Authority of Cambodia has also worked with Electricite Du Cambodge to establish the Rural Electrification Fund in August 2012. The 2012 Fund has two mandates: to promote equitable rural electrification coverage by facilitating affordable, accessible prices for households in rural areas and to encourage the private sector to take part in providing sustainable rural electrification services (EDC, 2013). By 2017, around 336 Rural Electricity Enterprises other than EDC had supplied electricity to off-grid areas by diesel generation (ADB, 2018b). REF also established two programs: the "Solar Home System" in order to facilitate remote rural households' access to electricity and the "Power 2 Poor Program" in order

to provide interest free loans to meet the demand of poor households. 210 households in Koh Kong Province and 47 households in Takeo Province benefited from the P2P program (EAC, 2018).

In Cambodia, electricity is generated from four main types of power stations: hydropower, thermal power, diesel power, and wood and biomasses power. 90% of electricity is generated by hydropower and thermal power (VDB, 2018). There are two coal-fired plants in Sihanoukville and the government has given the green light to invest in a new two-unit coal-fired power plant in Sihanoukville Province (CCA, 2018). There are 7 hydropower plants that are connected to national grid to provide electricity for the nation and the government has recently revealed a plan to construct another hydropower plant in Pursat Province by the end of 2019 (CCA, 2019). In terms of renewable sources, there are two solar facilities located in Svay Rieng's Bavet and in Kompong Speu's Oudong district (Chea, 2019). Besides these two generators, Cambodian firm SchneiTec Co. Ltd was given permission to build three 60 MW solar energy plans in Pursat, Kompong Chhnang and Kompong Speu provinces to help to ease Cambodia from future power shortages (Lipes, 2019).

## Micro-implementation

### Short Term Solutions

#### Reducing Solar Panel's Tax to Lower Solar Batteries' Price

To install solar panels on a rooftop costs about \$50 to \$100 for the panels, with additional prices set by Cambodian solar energy companies for other equipment to connect to the grid. In order to store electricity, solar panels also need battery storage, which are expensive, costing around \$400-\$600 with a lifespan of 10 years. For the whole country, the government's Solar Home System program will spend an estimated \$500-\$750 million, based on the market size of existing battery charging stations (Anderson et al., 2015). Solar panels and other components, such as batteries, are subject to VAT. While solar batteries are subject to a 35 percent import duty, other solar equipment has a lower import tax of 7 percent (Perez-Gascon, 2017). Because of this high tax, solar batteries are extremely expensive. If the government reduced this tax, the price would decrease, allowing more

government investment on solar systems and greater obtainment of electricity from solar energy in the future.

### Providing Loans for Rural Areas via Microfinance

Since the cost of solar system equipment is very expensive, some households located in rural or off-grid areas cannot afford solar electricity or electricity generated from diesel. Rural Electrification Enterprise has cooperated with international institutions like ADB and WB, and has received loans to invest in microfinance companies that can provide rural households with low-interest rate loans (between 15% to 18% per year) to afford rooftop solar panels (Oung, 2008). If the government works with microfinance companies in order to reduce the interest rate to zero, people in rural areas will be able to afford and install solar panels on their rooftop and receive sustainable and efficient electricity.

### Providing Technical Assistance by Developing Partners

With the emergence of many organizations that focus on renewable energy, more developing partners could provide technical assistance to rural households that would like rooftop solar panels. They could assist with some training programs or campaigns to increase the technical feasibility of solar panel installation or they could provide free installations. With the help of these organizations, households in rural areas may be encouraged to put solar panels on their rooftops, helping the government reach its goal of complete national electrification by 2030.

## Long-term Solutions

### Liberalizing the Electricity Market

The EDC has a monopoly over the country's electricity provision market, so they have authority to set the electricity bills as well as supply the electricity. The government should open the electricity market further or liberalize electricity generators, so that other electricity companies will want to invest and compete with EDC in the market. Then, people will have the incentive and the ability to choose any company that provides affordable, accessible, and efficient electricity. Take a look at case of waste management: the government plans to allow 3 or 4 more companies to invest in waste

management, which will limit the monopolizing power of CINTRI, lower the service cost, and lead to more effective collection of city trash (Chan, 2019).

## **Conclusion**

With the four recommendations mentioned above, I believe that solar energy is the only suitable choice for Cambodia's electricity in the coming years, and it might meet the goal of supplying electricity to off-grid areas before 2030. If we wait until 2030 for EDC to expand the grid, people in rural areas will not have electricity access for 10 more years. Moreover, we are not even sure whether EDC can expand the national grid to rural areas by 2030 or not. Obviously, It is crucial to invest in the development of solar power in Cambodia in order to meet the national electrification goal by 2030.



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