THE INTERNATIONAL REC STANDARD

Country Assessment Report

Country: Cambodia

Cambodia was one of the fastest growing economies in Southeast Asia prior to the pandemic. From 2010 to 2019, its economy expanded at an average annual rate of 7%. The pandemic has resulted in a significant contraction of the economy with GDP declining by 3.1% in 2020. The GDP is expected to grow 1.9% in 2021 and 5.5% in 2022. (Asian Development Bank [ADB] 2021])

Clean power generation—and the use of energy attribute certificates (EACs) to track its production and consumption—are essential to meeting the commitments of international brands with operations and suppliers in the country. As the economy rebounds, the country is working to improve rural electrification, grid stability, energy efficiency, and crucially, to scale up power generation from renewable resources. The introduction of a credible EAC system has been cited by international brands with operations in Cambodia as an essential step for promoting further foreign direct investment into the economy.

Generation and demand: (type, MW, TWh)

Generation and Supply:
The total capacity of power generation sources in Cambodia, including both domestic capacity and imports, was 3,897 megawatts (MW) at the end of 2020. Of the 2,916 MW domestically installed at the end of 2020, hydropower accounted for a 45.6%, coal 23.2%, fuel oil 22.1%, solar 8.1%, and biomass 1.0%. (ADB 2021).

Cambodia's first utility-scale solar PV project reached financial close in May 2017, a 10 MW farm in Bavet City, Svay Rieng Province. Since August 2019, a solar park in Kampong Speu with a total capacity of 60 MW has also come online. In 2019, a 60 MW solar farm tender resulted in a price of 3,877 USD ¢/kWh which is cheaper than any hydro project in Cambodia. The government has recently approved a 60 MW solar farm in Kampong Chhnang Province, as the first part of a 100 MW National Solar Park, as well as a 60 MW farm in Pursat. Cambodia's council of ministers announced in July 2019 that it had approved four new large-scale solar power projects with 140 MW of total capacity. The projects, which were submitted by the local group Schneitec Infinite, Chinese panel maker Risen Energy, Ray Power Supply, and Green Sustainable Ventures, will be constructed on a Build-Own-Operate (BOO) basis. The total amount of solar capacity expected to be built by 2022 is 410 MW. The Blue Circle is planning the first wind farm in the country, and some rice rusk biomass generation operates on a small-scale.

Demand
Electricity demand has increased significantly atop economic growth, jumping from 2,515 gigawatt-hours (GWh) of demand in 2010 to 11,738 GWh in 2019. At the same time, access to electricity is the second lowest in the Southeast Asian region, at 74.8% of the population in 2019. Although the country has made progress to scale electricity access (and targets 95% electrification by 2030), power outages continue to be a normal occurrence, and are cited as a key barrier to business growth. Increasing power generation will be critical to supporting economic growth and inclusive development.

Electrical interconnection and import/export:

Cambodia is a member of the Greater Mekong Subregion (GMS), established in 1992 to share the region's diverse energy resources amongst other economic cooperation policies. Imported power totaled 981 MW in 2020 (of the total 3,897 MW comprising imports and domestic), sourced

mostly from Viet Nam and Thailand, and marginally from the Lao People's Democratic Republic. Domestically, not all of the country enjoys grid connectivity. Areas around the capital, Phnom Penh, as well as border areas with Vietnam (which host industrial parks) are connected, while rural portions of the country are often not covered by national grid infrastructure.

Historical support for development of renewables in the country/region:

Cambodia does not, at the time of writing, provide feed in tariffs or similar subsidies for renewable energy projects. However, it has received considerable support form development partners to structure and implement renewable energy project financing modalities. For instance, from 2019 to 2021, (ADB helped the government design a reverse auction for solar installations, which resulted in the lowest tariff in Southeast Asia, provided by a blend of public and private sector financiers.

Electricity market structure:

The Cambodian electricity market follows a single-buyer, single-seller model, operated by a state-owned power utility—Electricite du Cambodge (EDC).

The current energy sector organization in Cambodia was established pursuant to the enactment of the Electricity Law in 2001. The law provides the governing framework for electric power supply and services throughout Cambodia. It covers all activities related to the supply of electricity, provision of services and use of electricity, and other associated activities of the power sector.

Electricity in Cambodia is generated by two types of licensees: (i) independent power producers (IPPs) who have a generation license and sell electricity to suppliers or industries through power purchase agreements (PPAs) and (ii) consolidated licensees (EDC and mainly Rural Electricity Enterprises [REEs]) that generate electricity to supply consumers connected to their distribution networks. Two types of licensees can transmit electricity: (i) the national transmission licensee, EDC, which has the right to transmit electricity to supply any distribution network and bulk power consumers throughout Cambodia; and (ii) the special purpose licensees, which have the right to own, operate, and manage identified transmission facilities for delivering and selling electricity in bulk. The consolidated licensees and distribution licensees have the right to own distribution facilities and distribute electricity in their authorized areas. At the end of 2017, valid licensees totaled 375: 1 consolidated generation, distribution, and national transmission license (EDC); 24 generation licenses to IPPs; 9 special purpose transmission licenses; 8 consolidated licenses consisting of a special purpose transmission and a distribution license; 270 distribution licenses; 5 retail licenses; and 58 consolidated licenses consisting of generation and distribution licenses.

The regulatory framework for electricity generation from PV solar power is the same as for other types since no specific laws or rules apply separately to renewables. The regulatory permits required for solar power plants include: (i) feasibility study, (ii) power investment authorization, (iii) approval of qualified investment project status with the environmental and social impact statement, (iv) electricity generation license, (v) registration with the Electricity Authority of Cambodia, and (vi) construction permit.
(ADB Sector Assessment and Roadmap, 2018)

Description of renewables support mechanism:

Cambodia's energy policies provide relatively little commercial support for the development of renewable energy. There were no feed-in-tariffs (FiT) as of December 2021, and regulations in place to support the installation of rooftop solar systems on commercial and industrial premises provide economic benefits to a limited number of stakeholders, depending largely on their annual load and

location in the country. The lack of FiT or similar subsidy models leads to a low risk of conflicts between domestic power sector support mechanisms and EAC issuance.

Responsible government department:

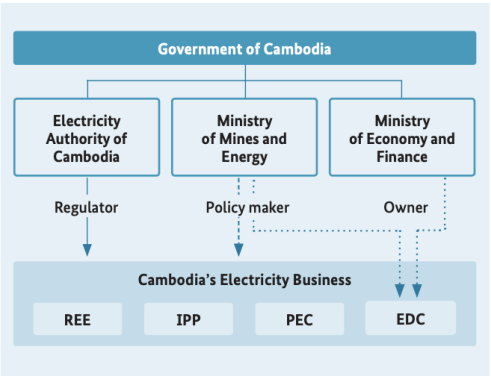
Overview: The Ministry of Mines and Energy (MME) is in charge of setting and administering government policies, strategies, and planning in the power sector. The Electricity Authority of Cambodia is responsible for regulating the electricity industry and has the duties of licensing, tariff setting, solving the disputes between producers/suppliers and consumers, setting up uniform accounting standards, enforcing regulation, reviewing of planning and financing performance. EDC is responsible for the generation, transmission, and distribution of power in the country. EDC is co-owned by MME and the Ministry of Economy and Finance (MEF). IPPs are private companies that received a license from the Electricity Authority of Cambodia to generate electricity and sell it to EDC. Similarly, REEs and Provincial Electricity Companies (PECs) are private-owned electricity providers who get a license from EAC to provide power outside the main economic centers. (GIZ/GBN 2021)

Grid operator: EDC is a state-owned power utility. It is responsible for electricity supply, transmission, and distribution. It does not receive budgetary support from the government and finances power purchases and transmission infrastructure costs from its operational cash flow. In 2019, 98.5% of power generated domestically was provided by IPPs.

Ministries: MEE is responsible for setting and administrating the government policies, strategies and planning in the power sector.

Regulator: Electricity Authority of Cambodia is the regulator for Cambodia's power sector. It is tasked with ensuring that the provision of Report on Power Sector for the Year 2018 3 Electricity Authority of Cambodia services and the use of electricity shall be performed efficiently, qualitatively, sustainably and in a transparent manner.

Division of responsibilities in the Cambodian Power Sector



Existing/Planned energy legislation:

The Electricity Law of the Kingdom of Cambodia was adopted by National Assembly in 2000, and amended in 2007 and 2015. It covers all activities related to supply of electricity, provision of services and use of electricity and associated activities of the power sector.

The Climate Change Action Plan for the Energy Sector covers the period of 2021–2023 and focuses on enhancing climate change adaptation and mitigation through building institutional capacity of MME and its staff, setting necessary policy and guidelines, implementing needed actions, and cooperating with

relevant stakeholders to cope with issues arising from a changing climate and extreme weather events such as floods, storms, droughts, as well as rising temperature. The Action Plan will continue to scale up existing actions and propose new dedicated actions most relevant to climate impacts on energy infrastructure and low-carbon development. The Action Plan directly sets the goal of "Establish[ing] a national greenhouse and energy reporting system for GHG inventory and energy balance." (Action Plan Respond to Climate Change in Energy Sector 2021-2023)

Establishing I-REC issuance criteria in the country can support this goal and assist the government in achieving its energy sector and nationally determined contribution (NDC) targets.

Environmental legislation for RE:

Cambodia has a number of national policy and regulation frameworks governing work related to climate change response that may directly or indirectly affect the sector's development, such as promoting the use of low-carbon technologies and use of renewable energy for electricity generation. These policies are set out in Cambodia's:

- - National development policies & strategies,
- - Climate change policies & strategies,
- - Energy sector development policies & strategies

The Cambodia Climate Change Strategic Plan (CCCSP) 2014-2023
CCCSP has the following strategic objectives:

- - Promote the use of renewable energy and energy efficiency to reduce greenhouse gas emissions and health effects:
  - • Renewable energy
  - • Energy efficiency
  - • Appropriate technology transfer
  - • Solid / liquid waste management through integrated measures in the capital city, urban areas, and animal waste management.
- - Analyze low GHG emissions by sectors (agriculture, energy, transportation, industry, land use and forestry management, and waste management).
- - Develop policies, legal framework[s], and action plans for low carbon development in accordance with national development priorities.
- - Promote the transfer of appropriate technologies to promote low-carbon development and facilitate the use of appropriate technologies through:
  - • Guidelines for technical assistance and partnership building
  - • Financial and tax incentives
  - • Carbon marketing mechanism
  - • Public and private partnership mobilization
- - Establish a system for registering projects and programs to reduce greenhouse gas emissions

- Establish a quality national greenhouse gas inventory system.

(Action Plan Respond to Climate Change in Energy Sector 2021-2023)

Existing/Planned energy certificate systems:

The government does not have an EAC system in place, and no international systems are active in the country at the time of writing. The Action Plan Respond to Climate Change in Energy Sector notes the intention to "establish a system for registering projects and programs to reduce greenhouse gas emissions" but no system exist, and there is no information on its planned development. Although there are no active EAC systems in Cambodia, renewable energy projects have been able to issue carbon credits through the Clean Development Mechanism (CDM) in the past. For an example, see **https://cdm.unfccc.int/Projects/DB/JCI1355902421.49/view**

In Southeast Asian countries where PPA and similar documents do not mention environmental attribute ownership (typically used to allow for I-REC issuance to project owners), Issuers under the I-REC Standard have used existing ownership criteria for environmental attributes established under CDM or similar carbon schemes. As such, the track record of carbon credit issuance in Cambodia may serve (at the discretion of the appointed issuer) as the basis for enabling I-REC issuance. As is the case in other I-REC countries where carbon instruments exist, the Issuer will be advised to avoid double issuance between carbon credits and I-RECs. Due diligence may comprise searching public records to ensure the same asset is not registered in more than one registry, as well as requiring attestations from (potential) Registrants that their respective projects are not receiving other environmental attributes of any sort.

Extent of engagement with government:

Upon request from both End-Users and Registrants, the I-REC Standard has not communicated with the Government of Cambodia about establishing the nation as an approved issuance country. The reason cited in both cases is high risk of corruption. The I-REC Standard Foundation remains interested in engaging with the government, while implementing all appropriate measures to reduce potential corruption risks. Accordingly, the authors of this document recommend establishing issuance criteria in Cambodia independent from the government (and in the first instance appointing the Green Certificate Company [GCC] as the issuer) and subsequently communicating with domestic entities, such as EDC, to discuss options for engaging a local entity as Issuer. This proposed approach has been vetted by domestic entities, who requested that any appointment of a government entity as Local Issuer be accompanied by careful guidance of international stakeholders, such as GCC, and monitored regularly.

Response from Government in relation to attribute tracking systems:

Please see above.

Demand-side market potential or strategic nature of market development:

Manufacturing accounted for as much as 16% of Cambodia's GDP in 2020, and is anticipated to play a key role in supporting economic recovery in the wake of COVID-19. The garments, bricks, and food and beverage subsectors are key power consumers in the manufacturing sector; and Cambodia's updated NDC highlights "promoting sustainable energy practices in manufacturing" as the first goal under its mitigation targets. At the same time, power buyers in the garments and electronics manufacturing subsectors have contacted the Secretariat to express interest in sourcing I-RECs to meet demand in 2021 and beyond. Increasing commitments of RE100 and SBTi brands with operations in the region—paired with growing brand-level interest to use I-RECs for addressing Scope 3 emissions linked to supply chains in Cambodia—are expected to feed growing demand for I-RECs in the country.

End-users in Cambodia have becoming increasingly vocal about clean energy demand, indicating that access to clean power may impact decisions on where to establish operations and supply contracts. Source

Further, as grid interconnections and power exchanges between GMS nations increase (atop planned cross-border power infrastructure development), Cambodia may be an important actor in regional clean energy transactions. Engaging the nation in the development of uniform EAC mechanisms to support regional clean energy power exchanges is critical at this stage.

Lastly, although Cambodia does not presently permit direct or virtual PPAs between IPPs and corporate offtakers, USAID and other development partners have expressed preliminary interest in supporting the development of such mechanisms in Cambodia. Corporate PPA structures will look, in large part, to the

success and lessons from a PPA pilot under development in Vietnam as of December 2021. The implementation of a credible EAC system in the country will be a necessary prerequisite for the success of corporate PPA structures in Cambodia, and recent experience supporting PPA developments in Vietnam places the I-REC Standard Foundation in an excellent position to help structure this development, provided corporate and asset owner interest persists.
Analysis of political disruptions or market risks: The most cited risk of political disruption to I-REC issuance and market operation in Cambodia is corruption. The I-REC Standard Foundation neither confirms nor rejects that these risks are material, but will remain alert—namely by factoring in recommendations from market participants to avoid direct government engagement in the issuance process until an international actor has established baseline issuance criteria and the first Cambodian I-RECs have been issued.
Analysis of regulatory risks including linkages with carbon markets and support systems: Given that renewable energy projects in Cambodia have received carbon credits under the CDM, the Issuer and Registry Provider will be advised to check all new Registrants and associated project registrations applying for I-REC(e) issuance to ensure projects have not already received carbon credits. Further, and as is the case in other issuance countries, Registrants will need to sign an attestation, prior to issuance, indicating that the Registrant is the rightful owner of all environmental attributes associated with the project, and that said attributes have not been used or registered in any other EAC or carbon credit ecosystem. There are no other clear regulatory risks at the time of writing.
Current environmental reporting in energy: To the knowledge of the authors, there are no environmental reporting systems active in the energy sector in Cambodia.
Mechanisms in place to support the reliable verification and issuance of I-RECs: Given that Cambodia has a single buyer and single seller model for its electricity market, the Issuer (GCC) may be instructed to follow similar procedures for verifying generation as it uses in other countries that follow this electricity market model. In most cases, GCC is able to reliably verify generation based on financial transaction statements issued to project developers by the single buyer—EDC in Cambodia. This process will be tested/approved if the country is authorized for issuance.
Local organizations of importance and their opinion on local I-REC market development: A total of three project developers have contacted the secretariat privately to indicate their interest in issuing and selling Cambodian I-RECs. Two different brokers with existing I-REC Participant accounts have also contacted the Secretariat privately to express demand for Cambodian EAC clients and corresponding interest in establishing issuance guidelines for the country. Further, H&M has indicated in public news articles that it is interested in sourcing clean energy and/or EACs in Cambodia.
Any other relevant information:

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