Regulatory Review of the Electricity Market in Seychelles:
Towards Crowding-in Private Sector Investment
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This analysis is based on policies, laws and regulations adopted until April 2022. Therefore, the results will not consider and/or reflect the impact of policy and regulatory changes adopted thereafter.

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Acknowledgements

The regulatory review of the electricity market of Seychelles is a result of a continental initiative to crowd-in private sector participation in Africa’s electricity market in collaboration with member States, in this case, the Republic of Seychelles. This review process enjoyed valuable cooperation from the Ministry of Agriculture, Climate Change, and Environment and from the Seychelles Energy Commission. The initiative is a result of partnership between the UN Economic Commission for Africa (ECA), through its SDG 7 Finance initiative under the leadership of Mr. Antonio Pedro, Acting Executive Secretary of ECA, and the RES4Africa Foundation, through its Missing Link initiative spearheaded by Mr. Roberto Vigotti, Secretary General of RES4Africa Foundation. The Seychelles regulatory review, under the guidance and technical contribution of Mr. Robert Lisinge, Chief of Section for Energy, Infrastructure, and Services Section of ECA (EISS), was led by Mr. Yohannes G. Hailu, energy policy expert at EIIS of ECA, and by Mr. Andrea Renzulli, senior policy officer at RES4Africa, with technical and analytical contributions from Mr. Antonio Passero, Mr. Leonhard Braun, and Ms. Iarina Ciceu, and the participation of Ms. Cristiana Lisi from RES4Africa. Ms. Sissay Tadesse provided administrative and logistical support which were valuable in the effective implementation of the initiative.

The national policy and regulatory data necessary for objective regulatory review, as well as the draft country economic, energy sector, and regulatory context was ably developed by the national team led by the consultant Mr. Colin R. Vel, from the Electricity Regulatory Section of the Department of Energy and Climate Change, and ably supported by Ms. Petra Morel, Ms. Bernice Charles and Mr. Errol Renaud. The regulatory analysis was based on extensive national regulatory and policy database, which was validated by experts invited from the Ministry of Agriculture, Climate Change, and Environment, Public Utilities Corporation, Procurement Oversight Unit, National Tender Board, Central Bank of Seychelles, Seychelles Investment Board, Ministry of Finance, Economic Planning and Trade, Seychelles Energy Commission, and other institutions. The following experts provided validation inputs: Mr. Errol Renaud; Mr. Ravin Sunasee; Mr. Tony Imaduwa; and Mr. Colin R. Vel.

This work received initial national sector leaders consultation support from Mr. Jean-Paul Adam, Director of the Technology, Climate Change and Natural Resources Management Division of ECA towards initiation of the country regulatory review. Publication logistical support is received from ECA Sub-Regional Office for Eastern Africa. The technical and graphic design work by Epsilon Publishers Ltd, which has improved the quality of this publication, is acknowledged.
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Executive Summary

Seychelles is pursuing sustainable development guided by visionary pro-transformation strategies. Through Vision 2033, it aims to achieve a more diversified economy resulting in a people-centered prosperous nation while remaining in harmony with nature. It is also pursuing a Blue Economy development roadmap aimed at leveraging its expansive marine resources towards sustainable development. The vision is being implemented through the National Development Strategy (2019-2023) in the short to medium terms.

Affordable, reliable, and sustainable energy supply is essential to meeting these development aspirations. The electricity market is responding to these requirements. Electricity consumption grew considerably by 43 percent between 2010 to 2019. Generation capacity has also grown from about 54 MW installed capacity in 2010 to 86 MW by 2019. Seychelles has already achieved universal access to electricity; however, demand for energy for development purposes is rising. Meeting the growing electricity demand and strengthening the energy pillar for the transformation agenda requires further developing electricity generation, transmission, and distribution capacities.

Towards this end, effective support to the people-centered transformation agenda requires investment in generation, transmission, distribution, and off-grid system capacities. Particularly in the context of COVID-19, its economic impacts and public finance constraints, effective engagement of the private sector to bridge the infrastructure investment gap is essential. In this context, facilitating effective public and private sector partnerships and further improvements in the regulatory and business climate are crucial steps towards crowding-in private sector investment.

Through the Energy Act of 2012, Seychelles has demonstrated the political will for reform through instituting regulatory provisions and oversight on the proper functioning and development of the electricity market. Through the Grid Code, and further regulatory provisions, such as the Energy License Regulation of 2016, further development of the regulatory and policy environment is observed to meet emerging electricity market regulatory requirements.

This report provides an analysis of electricity sector policies, laws, and regulations of Seychelles in relation to crowding-in private sector investment in the electricity value chain. It is part of the United Nations Economic Commission for Africa and RES4Africa Foundation joint program on *Regulatory Review of the Electricity Sector in Africa: Towards Crowding-in Private Sector Investment* currently being implemented in seventeen African countries.

The purpose of this regulatory review is to pinpoint the main strengths and gaps of the policy and regulatory framework currently in force vis-a-vis private sector participation in the electricity market. It further aims to offer concrete recommendations for regulatory improvement and reform towards attaining a competitive, resilient, and sustainable electricity market which effectively crowds-in private capital.

The regulatory analysis is undertaken following a comprehensive UNECA and RES4Africa regulatory review methodology, which was developed with the participation of African and international regulatory experts. The approach enables three broader assessments: the degree of *openness* of the electricity market to the private sector based on evaluation of the power
Executive Summary

sector structure and governance; the attractiveness of the market based on an assessment of sector economics, fair competition, and overall economic regulation; and the readiness of the market based on an assessment of technical regulations.

Main findings related to the Generation segment

The generation market, related to regulation and private sector investment participation, demonstrates key areas of regulatory strength, and areas of needed regulatory improvements. The openness of the market is strengthened by superb system planning and moderate performance in power sector governance. Improving market openness would require further regulatory development in the areas of power sector framework and competition, enabling private sector participation business models, addressing procurement regulation, increasing generation off-taking options, and reviewing and updating national energy and climate change policies and strategies. The generation market is attractive in key areas, including strong contracts regulation and moderate support through credit enhancement. However, economic regulation and incentives to private investors are major areas of regulatory gaps. The market demonstrates readiness related to superb performance on the administration of authorizations and permits, network planning, and overall transparency and access to data. Further regulatory improvements in the grid code, related to grid access, and establishing system quality and security standards will improve market readiness to private sector investors.

Main findings related to the Transmission segment

Similar to the generation market, transmission system investment by the private sector is driven by market regulation. The openness of the transmission segment of the market to private investment is enhanced by strong system planning and moderately by power sector governance and procurement administration. Key challenges remain related to energy policy and strategy (such as binding targets, policy review procedures, and formal monitoring mechanisms), power sector framework (such as bundling transmission asset management and system operation services), and private sector participation business models for the transmission segment of the market (such as participation models of IPT, concession and merchant are not implemented). The attractiveness of the transmission segment to private participation is largely constrained due to challenges related to contracts regulation (such as standardized Transmission Service Agreement), economic regulation (such as clear network tariff definition), and the absence of credit enhancement instruments. The readiness of the transmission segment to private investment participation is similarly enhanced by moderate performance related to ease of authorization and permitting, and superb regulatory performance resulting from a well-developed grid code. However, regulatory challenges remain related to grid access and clarity on system quality and security standards. Overall, while aspects of the current regulation have advanced in some areas, numerous regulatory challenges require attention and development.

Main findings related to the Distribution segment

The distribution segment of the electricity market demonstrates key areas of regulatory strength, such as in availability of a sound grid code and good authorization and permits administration. Private sector participation in this market segment is constrained by several
challenges, including energy policy (such as review and monitoring procedure), prevailing market framework (which is functionally vertically integrated), contracts and economic regulation (standardization and tariffs definition for distribution networks), support to the private sector through credit enhancement, and other areas related to the readiness of the market (such as grid access and system quality and security standards). Overcoming these barriers will be essential if Seychelles, in the short to the long-term, seeks to crowd in private investment in distribution assets.

Main findings related to the Off-grid segment

Seychelles has achieved universal access to electricity. As a result, electricity sector policy and strategy are not largely driven by the electrification agenda. This is evident particularly in the off-grid market segment. Off-grid development is closely associated with access expansion, particularly in rural and peri-urban settings. With full electrification, this segment of the market and its related regulation are not well-developed. However, future population and economic growth will necessitate the need to develop sustainable energy, likely including in the off-grid market. It is, therefore, essential to put in place the requisite regulatory requirements for robust development of the off-grid market, including through effective private sector participation.

The following measures are recommended to reform and improve the electricity market regulatory environment towards enhancing the openness, attractiveness, and readiness of the market to private sector investment.

To enhance the Openness of the electricity market

- Incorporate clear generation and renewables targets, their formal review procedure, and a monitoring framework during the next policy and strategy development window.

- Address the lack of publicly available regulatory decisions (transparency); reform the lack of sufficient independence of the regulator from political authorities (such as autonomous mode of appointment of leaders and board members); resolve the lack of sufficient financial independence of the regulator and enforceability of its decisions, and empower the SEC by making its decisions legally enforceable.

- Address transmission and distribution services unbundling, separation of transmission assets management from system operation, and wholesale and retail market competition to reform the power sector framework towards greater resilience and private sector effective participation.

- Strengthen the applicability of private sector participation business models, and expand the regulatory space for alternative electricity generation, transmission, and distribution models.

- Strengthen the procurement system by enacting the draft PPP law, evaluating and considering the adoption of appropriate PPP models for project finance, adopting clear rules and procedures for the treatment of unsolicited proposals similar to solicited ones, instituting scheduling of tenders, and developing a track record of competitive and credible tendering.
Enable the adoption of models such as private (corporate) PPAs (mechanism for two private parties to negotiate power transactions) and adopt regulation that enables self-consumption coupled with net metering for surplus power to provide private investors with additional off-taking options.

To enhance the **Attractiveness** of the electricity market

- Expand on the existing tariff setting approach by adopting a transparent tariff methodology, within the existing cost-reflective approach, that would also support the identification of tariff components across generation, transmission, and distribution.
- Strengthen fair competition in the electricity market to reduce the need of offering more incentive packages to investors, with the exception of emerging markets such as off-grids, or certain technologies.
- Strengthen the system of financing options with innovative private sector financing instruments, including for financial risk mitigation, for energy infrastructure development.

To enhance the **Readiness** of the electricity market

- Strengthen the system of permitting and authorizations by expanding existing rules to address right-of-way regulation.
- Strengthen provisions of the grid code by addressing system operation rules, including the dispatch of ancillary services, efficient market settlement rules, market settlement information, and management of investor exposure to imbalance risks; curtailment compensation to generation investors, including specification of limitations on curtailment to generation investors; and ancillary services management, such as black start capacity, spinning reserves, and governing rules and regulations.
- Supplement grid access regulation by standardized contractual framework for grid connections by private parties, and expand on existing connection regulation to clarify the allocation of connection costs to different parties.
- Similar to the main grid quality and security standards, in anticipation of a growing off-grid market in the long-term, develop regulation related to quality and security standards for off-grid systems.
- Pursue the development of a dedicated off-grid electricity market regulation and laws.

As Seychelles takes further bold steps towards its energy sector regulatory reform, the UN Economic Commission for Africa and the RES4Africa Foundation remain committed to partnering with Seychelles in addressing any of the identified regulatory and policy gaps. They also commit to supporting regulatory capacity development, as well as any area of particular reform interest of Seychelles towards greater openness, attractiveness, and readiness of the electricity market.
Introduction
Introduction

Mahe Island, Victoria, Seychelles

Photo credit: Getty Images/Walter Bibikow
1. Introduction

Recognition that energy plays a key role in facilitating socio-economic development, and that its insufficient provision impedes it, has brought energy to the forefront of national, regional, and global agenda. National sector development strategies in most of Africa reflect the need to expand energy access rapidly, facilitated through the implementation of Sustainable Development Goals (SDGs), particularly SDG7. African governments have pursued the energy access agenda, devoted public finance for energy infrastructure and capacity expansion, and instituted measures to strengthen the energy sector.

Despite appreciable progress as a result of these measures, structural challenges remain within the electricity markets of Africa. Over 500 million people on the continent today lack access to electricity. Latest global SDG7 tracking reports warn that progress made so far is not on track to achieving universal access by 2030 and that nearly 90 percent of the population without access at the end of the decade will be residing in Africa, partly due to rapid population growth (IEA et al., 2020).

Financing energy development remains a key challenge. The cost of achieving the SDGs at large in the continent is estimated at USD 1.3 trillion per year. Africa would require USD 32 billion per year through 2030 on universal electricity access-related investments (AfDB, 2019a). According to the Infrastructure Consortium for Africa, 37 percent of infrastructure investments in the continent were undertaken by African governments in 2018, with the private sector accounting for 11 percent (ICA, 2018). Given the major infrastructure investment gap and the limited investment role of the private sector so far, addressing the crowding-in of private sector investment in the electricity market is crucial.

Towards the goal of crowding-in the private sector, feasibility (bankability) of projects, country risks, profitability (viability), and the legal/regulatory environment are often identified as key barriers. Indeed, the regulatory framework is crucial for attracting private investments. The Regulatory Indicators for Sustainable Energy (ESMAP, 2020) indicate that more than half of the global population lacking access to electricity remained in countries with weak regulatory frameworks by 2019. These regulatory challenges remain to be addressed.

Seychelles is a unique example in Africa. It has achieved universal access to electricity, making the pursuit of access not a prime objective of the electricity market. Furthermore, as an island State, Seychelles has unique features of regulation aimed at developing the energy market in relative isolation and innovation. These considerations offer a valuable opportunity to examine the electricity market regulation of Seychelles within these broader contexts, which are often not typically the case to most other member States of Africa.

Seychelles is pursuing sustainable development guided by visionary transformation agendas. Through its Vision 2033, it aims to achieve a more diversified economy delivering a people-centered prosperous nation while remaining in harmony with nature. It is also pursuing a Blue Economy roadmap to leverage its expansive marine resources to catalyze sustainable development. The vision is being pursued through the National Development Strategy (2019-2023) in the short to medium terms. Within this development context, affordable, reliable, and sustainable energy supply is essential to meeting these development aspirations. Meeting the growing electricity demand, and strengthening the energy pillar for the transformation agenda requires further expanding electricity generation, transmission, and distribution capacity.
Towards this end, effective support to the people-centered transformation agenda requires investment in generation, transmission, distribution, and off-grid system capacities. Particularly in the context of COVID-19, and its economic impacts and resulting public finance constraints, effective engagement of the private sector to bridge the energy infrastructure development investment gaps is essential. This calls for effective public and private sector partnership as well as further development of the regulatory and business environment to crowd-in private sector participation.

This regulatory review examines these and additional issues in-depth concerning the crowding-in of private sector investment in the electricity market of Seychelles. The goal is, through regulatory improvement and expected increase in private sector participation, to promote the achievement of SDG7 goals and develop a resilient, competitive, diverse, and vibrant electricity market that will sustainably attract private capital to supplement public investment. This is particularly crucial in a post-COVID-19 environment where public resources are even more constrained due to priorities in public health and social protection, as well as economic recovery.
Country Overview
Towards Crowding-in Private Sector Investment

Country Overview

Wind Turbines producing alternative energy, Mahe Seychelles

Photo credit: Getty Images/Eisenlohr
2. Country Overview

Seychelles is an island. It is an archipelago consisting of 115 islands with a 455 km² land area spread over 1.374 million km² Exclusive Economic Zone (Government of Seychelles, 2012b). Its geography offers a tropical green landscape, diverse marine biodiversity, and popular beaches offering nature-based tourism attractions. Its capital city, Victoria, is located on the Mahé island.

The UN estimates that the population of Seychelles in 2020 was 98,347 of which 56.2 percent reside in urban areas (UNDESA, 2019). Almost all people live on the three main islands of Mahé, Praslin, and La Digue.

The economy of Seychelles relies heavily on the tourism and fisheries sectors, which are largely related to the broader blue economy. It has a Blue Economy Strategic Roadmap aimed at transitioning the economy towards a high-value ocean-based blue economy for sustainable development.
2.1 Macroeconomic overview

In the last decade, before the onset of COVID-19, the economy of Seychelles enjoyed stable and solid growth, largely between 4 to 6 percent. The 2018-19 period saw GDP growth increase from 3.6 to 4.7 percent. The AfDB Seychelles Economic Outlook indicates that GDP contracted by 12 percent in 2020, reversing the growth of 4.7 percent in 2019, due to the effect of COVID-19 on the tourism and fisheries sectors. This has led to a deficit equivalent to 5 percent of GDP, and a current account deficit of 32.3 percent, up from 15.9 percent in 2019 (AfDB, 2021). Strong economic rebounds of 4.6 percent in 2021 and 5.8 percent in 2022 are projected.

Figure 1: GDP growth (%), 2010-2020


The stable and robust growth in Seychelles in the last decade led to major gains in terms of rising income. Per capita income increased from about $10,805 in 2011 to $16,199 by 2019, making Seychelles among the highest performers in this metric in Africa. The World Bank indicates that Seychelles is the highest per capita income earning country in Africa (World Bank, 2020). COVID-19 is having a major toll, leading to a sharp drop in per capita income from $16,199 in 2019 to $11,425 in 2020, reversing some of the gains of the last decade. Projected robust growth in 2021 and 2022 are expected to improve this dire impact.

Figure 2: GDP per capita (USD), 2010-2020

Country Overview

**Debt-to-GDP**

Seychelles started the last decade with a relatively high debt-to-GDP ratio of 75 percent in 2010. Since then, the ratio has been declining to as low as 52 percent in 2013 and stood at 59 percent before the onset of COVID-19. Similar to the effect of the pandemic in overall macroeconomic impacts, debt levels also rose sharply, reaching 86 percent by 2020. This will impose constraints in terms of the cost of future debt, and the ability of the public sector to sustain investments. Current projections of robust growth through 2022 could potentially alleviate the rising debt burden.

![Figure 3: Debt-to-GDP ratio (2010-2020)](source: The World Bank (2010-2015), Statistica (2016-18), and IMF (2019-20))

**Inflation and exchange rate stability**

Inflation management has largely been successful in the last decade. With the exception of sharp increases in 2012 and to some degree 2013, inflation stayed below the 4.3 percent rate. Inflation was reduced to 1.8 percent in 2019, but increased to 4.1 percent in 2020. Stabilization of the macro-economy is likely to enable the Central Bank to target a lower inflation rate going forward. Part of the challenge in inflation management has been the stability of the national currency, which deteriorated from 13.8 SCRs in 2019 to 21.2 SCRs in December 2020 (AfDB, 2021). In November 2008, Seychelles adopted a floating exchange rate. The local foreign exchange market’s legal basis is the Foreign Exchange Act, 2009, as amended. According to Section 3(1) of this Act, only authorized dealers (i.e., banks and bureaus de change) are allowed to set an exchange rate. As in a floating exchange rate regime, the domestic currency rate is determined by supply and demand in the market. The Central Bank of Seychelles (CBS) intervenes only to smooth out excess volatility and ensure proper development of the foreign exchange market. Occasionally the CBS participates in the foreign exchange market for reserve accumulation purposes and to support the market.
Figure 4: Inflation rate (% 2010-2020)


Business climate

The business environment of Seychelles has not improved considerably since 2015 when it registered a global ranking of 93rd. The ranking stood at 95th in 2017 and increased to 100th in 2019. This demonstrates the need to address challenges related to improving the overall business environment. However, it is important to note that Seychelles ranked 8th best-performing country in 2019 in sub-Saharan Africa in terms of conduciveness of the business environment. While this is noteworthy, further measures would increase investor confidence and transition the country towards better performance.

The Seychelles Investment Bureau (SIB) promotes and facilitates local and foreign investments in Seychelles. Seychellois and non-Seychellois receive equal treatment when processing their business proposal applications. They are guided by the Seychelles Investment Act (2010) and its regulations. The Act and its economic activities regulations clarify open and restricted sectors or economic activities. It is also in line with an existing government policy paper on a list of economic activities which only Seychellois investors can participate in and which ones are restricted to non-Seychellois investors. The energy sector is not on the restricted list. Foreign investors are permitted to engage in this sector in Seychelles provided that they are in line with all the regulations and standards required by relevant local authorities.

2.2 Electricity sector overview

Public Utility Corporation (PUC) is the utility in Seychelles providing electricity services to Mahé, Praslin, and La Digue islands. The Seychelles power system backbone is an 11 kV and 33 kV network in Mahé, and an 11 kV network in Praslin and La Digue (Brown, 2016). There is a power plant in Baie Ste Anne, on Praslin Island that has been in operation since 1981. It also supplies electricity to La Digue by a submarine cable which interconnects the two islands (PUC, 2018a).

Electricity consumption

Electricity consumption in Seychelles has increased significantly since 2010. Peak demand increased in Mahé, Praslin, and La Digue from about 49 MW in 2010 to 61 MW by 2015, reaching
70 MW in 2019. This demonstrates a 43 percent growth between 2010 to 2019, or 4.3 percent annual growth in peak demand. Alternative data on national electricity consumption also suggests a similar trend of modest increase in consumption in the last decade.

Figure 5: Electricity peak demand (MW, 2010-2019) and electricity consumption, total (GWh, 2010-2020)

Source: Left, SEC (2020); right, https://countryeconomy.com/energy-and-environment/electricity-consumption/seychelles

Individual consumption of electricity is relatively much higher than the African average. Per capita consumption has increased from less than 3,000 kW in 2010 to over 4,700 kW; an increase of 36 percent in the last decade. The growing consumption is also closely related to economic growth registered in the last decade, leading to significant increases in per capita income.

Figure 6: Electricity consumption, per capita (kW, 2010-2020)

Source: https://countryeconomy.com/energy-and-environment/electricity-consumption/seychelles

On-grid installed capacity and electricity production

Until 2013, the only sources of energy were diesel and wind all owned by PUC. The mix was 82.3 MW diesel and 6 MW wind. In 2014, on-grid solar PV was added to the mix, and it made up 7.65 MW of installed capacity, all from IPPs. The install capacity from wind energy remained the same, and diesel-based generation increased to 83.3 MW. In 2019, installed capacity was 98.5 MW, of which 85.5 MW was in Mahé.
Table 1: Installed generation capacity (MW, 2019)

<table>
<thead>
<tr>
<th>Power Station</th>
<th>Installed Capacity (MW)</th>
<th>Safe Generation Capacity (MW)</th>
<th>Peak Demand (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahé</td>
<td>85.5</td>
<td>69.5</td>
<td>60.0</td>
</tr>
<tr>
<td>Praslin and La Digue</td>
<td>13.0</td>
<td>8.8</td>
<td>9.9</td>
</tr>
<tr>
<td>Total</td>
<td>98.5</td>
<td>78.3</td>
<td>69.9</td>
</tr>
</tbody>
</table>

Source: SEC (2020)

Utility-scale power production started in 1970 in Mahé. Generation capacity that year was 6,856,267 kWh. The installed capacity was 3.38 MW, with peak demand of 1.57 MW. The safe generation capacity was 1.38 MW resulting in a deficit of 190 kW (PUC, 2020a). In 2010, the installed capacity was 53.5 MW, with peak demand of 42.6 MW. Safe generating capacity at 41.5 MW led to a deficit of 1.1 MW. In 2019, the installed capacity was 85.5 MW, a 60 MW peak demand, and safe generating capacity of 69.5 MW, leaving a surplus of 9.5 MW.

Access to electricity

In 1926, the residents of Victoria were supplied for the first time with DC electricity from 6 pm to 6 am by a private company using a 30 kW dynamo (Fielden, 1984). In 1940, the DC generator’s size increased to 300 kW; however, electricity demand did not change significantly (Ibid). In 1960, the power station was upgraded to AC generators, and in 1961, 613 consumers received 24 hours supply (PUC, 2020a). Due to the growth in electricity demand, the generation capacity was further increased by 2.5 MW in 1975 to supply a wider area of Mahé (Fielden, 1984). The construction of the 33 kV line started in 1979 to connect the Western and Southern areas of Mahé (PUC, 2020a).
In 1990, another 5 MW generator was installed, and electricity supply reached Cerf, Ste. Anne, and Long Islands via undersea cable (PUC, 2020a). In 1991, SCADA was commissioned to monitor and control production and distribution infrastructure in Mahé and Praslin (Ibid). In 1994 a 4 MW gas turbine was commissioned to meet the growing demand, and in 1995, a mobile generator of 1 MW was installed to meet peak demand (Ibid). In 2000, a new 42 MW power station was built and new transmission and distribution lines were also commissioned (Ibid).

The generation capacity was increased in 2013, with the 6 MW wind farm, which was the first renewable plant that came online (SEC, 2019). In that same year, the procedure to allow grid-connected PV to the grid by customers was introduced.

After an electrification study in 1980 in Praslin, a new power plant was built and worked on a distribution line to serve the island. The supply of electricity started in 1981 (PUC, 2020a). The same study was done on La Digue in 1984, and work started to lay the undersea cable linking Praslin and La Digue, and eventually, in 1985, La Digue was electrified (ibid). As demand on Praslin and La Digue grew, a 673 kW generator was installed in 1989 at the Baie Ste Anne power station (ibid). In 1995, Praslin’s capacity was increased by 3 MW, which was supplemented in 1996 with a 1.5 MW set to meet increasing demand (ibid).

Seychelles enjoyed near-universal access to electricity in 2010, reaching 97 percent of the population. World Development Indicators data of the World Bank indicates that universal access to electricity is achieved since 2014.

**Electricity service quality and reliability**

In 1972, the number of customers in Mahé was 3,803. During this period, there was no electricity in Praslin and La Digue. A decade later, the number of customers more than doubled, reaching a total of 9,462. In 1991, there was a reduction of 3,133 customers compared to the previous year because of dead account adjustments. From 1992 to 2000, the number of customers increased by an average of 1,000 customers per year. From 2001 to 2015, customer numbers fluctuated. In 2016, the number of new connections increased by almost 2,000, after opening a new residential estate.

The first power station on Praslin was established in 1981, and it supplied electricity to 184 customers. In 1986, La Digue was interconnected through an undersea cable to the power station on Praslin, and 241 customers were connected. By then, the number of customers on Praslin had increased to 752. In 1994, the number of customers doubled, giving La Digue a total of 500 customers while Praslin reached 1,520. In 2019, the number of customers in Praslin was 3,927 and 1,383 in La Digue. The number of utility customers increased in La Digue from 970 in 2010 to 1,383 by 2019; in Praslin from 2,907 in 2010 to 3,927 by 2019; and in Mahé from 25,534 in 2010 to 34,867 by 2019.
In terms of the quality of service, the transmission and distribution losses for all three islands include metering and commercial losses. In 2013, the overall loss was 10.64 percent. In 2016, it increased to 11.24 percent. The loss rate might be the result of non-payment and faulty metering. In 2019, there was a significant reduction in the overall loss to 7.94 percent. This might be mainly due to the upgrading of meters and a lower rate of non-payment.

Table 2: Aggregate technical transmission, distribution and commercial losses

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</tr>
</thead>
<tbody>
<tr>
<td>Energy Sent out (kWh)</td>
<td>343,363,491</td>
<td>350,937,617</td>
<td>365,281,202</td>
<td>397,724,312</td>
<td>411,804,672</td>
<td>415,670,237</td>
<td>434,881,789</td>
</tr>
<tr>
<td>Energy Sold (kWh)</td>
<td>306,819,277</td>
<td>321,581,209</td>
<td>324,221,458</td>
<td>365,884,338</td>
<td>381,495,466</td>
<td>386,033,371</td>
<td>400,339,942</td>
</tr>
<tr>
<td>AT&amp;C1 Loss (kWh)</td>
<td>36,544,214</td>
<td>38,356,408</td>
<td>41,059,744</td>
<td>31,839,974</td>
<td>30,309,206</td>
<td>29,636,866</td>
<td>34,541,847</td>
</tr>
<tr>
<td>AT&amp;C1 Loss (%)</td>
<td>10.64</td>
<td>10.93</td>
<td>11.24</td>
<td>8.01</td>
<td>7.36</td>
<td>7.13</td>
<td>7.94</td>
</tr>
</tbody>
</table>

Source: SEC (2020)

The data obtained from PUC regarding outages and duration starts from 2014. In that same year, there were 87 outages, and the average duration for the outage was 2.13 hours. This increased in 2015 to 91 outages, and average outages were 2.43 hours. The years 2018 and 2019 saw worsening of outages. Even though outages were less than in 2015, standing at 62 and 64, respectively, average duration of outages were 3.43 hours and 3.87 hours, respectively. In 2020 there were 45 outages, and the average outages were 1.63 hours.

### Table 3: Number of outages per year and average outage duration

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of 33/11kv Outages</th>
<th>Total hours of Outages</th>
<th>Average hours of Outages</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>87</td>
<td>185.2</td>
<td>2.13</td>
</tr>
<tr>
<td>2015</td>
<td>91</td>
<td>220.75</td>
<td>2.43</td>
</tr>
<tr>
<td>2016</td>
<td>68</td>
<td>130.4</td>
<td>1.92</td>
</tr>
<tr>
<td>2017</td>
<td>50</td>
<td>119.15</td>
<td>2.38</td>
</tr>
<tr>
<td>2018</td>
<td>62</td>
<td>212.78</td>
<td>3.43</td>
</tr>
<tr>
<td>2019</td>
<td>64</td>
<td>247.85</td>
<td>3.87</td>
</tr>
<tr>
<td>2020</td>
<td>45</td>
<td>73.41</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Source: PUC datasheet (2020)

While electricity production in Mahé started in the 1920s, there is no data on how electricity reached to customers. Data collection for network extension started in 1970. However, the data did not include the length of the network. During that same year, the distribution network was upgraded to 6.6 kV (PUC, 2020a). In 1973 two 11kV underground circuits were constructed to connect the plants to Victoria and its suburbs (ibid). In 2001, a new 33 kV transmission network was commissioned to facilitate bulk transfer from the power Roche Caiman power station to the North of Mahé (ibid).

In 2008, a second undersea cable was commissioned to increase power transfer capacity and quality of supply from the island of Praslin to La Digue (ibid). In 2009, the electricity distribution network was developed to supply development on Ile Du Port, and an underground distribution network was also developed to supply Eden Island. In 2011, the new residential developments on Ile Perseverance were provided with electricity supply, and in 2014 the 33 kV network for the North of Mahé was reinforced, and 5 km of 11 kV network was added (ibid). In 2016, the 11 kV network length was increased by 8 km, and in 2020 this was further increased by 23 km (PUC, 2020b). Simultaneously, the 33 kV network was increased by 57 km in 2019 (ibid).

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**Off-grid electricity market**

The off-grid sector in Seychelles is an area where data is normally not collected, and this creates a significant data gap when it comes to the electricity sector. Most outer islands and Silhouette are supplied by the Islands Development Company (IDC). The IDC was created to manage the outer islands and Silhouette to ensure their economic development (IDC, 2020). Tourism and conservation are essential parts of many of these islands. However, there is no data on electricity production, or transmission and distribution activities.
2.3 Electricity sector governance and market structure

Overview of electricity sector reforms

In 1925, the Société Cooperative d’Electricite Ltd was formed to supply DC electricity to private houses in Victoria. The following year, after the construction of a power station at Huteau Lane and the installation of all necessary plants and equipment, electricity was available for twelve hours daily and was generated from a 30 kW dynamo. In 1960, the Societe Cooperative d’Electricite Ltd was sold to the government, and it became a public entity. In 1980, the Seychelles Electricity Corporation Limited was incorporated in Seychelles under the Companies Act (1972). The majority shareholder was the Government of Seychelles.

The PUC was formed in 1986 following the Seychelles Water Authority and Seychelles Electricity Corporation Limited merger. PUC was then a self-regulated entity. In 2012, the Energy Act came into force and set up the Seychelles Energy Commission as Seychelles’ electricity market regulator.

Institutions governing the electricity sector

Several institutions have a direct impact on the power sector. The Ministry of Agriculture, Climate Change, and Environment (MACCE) is responsible for developing energy policies, strategies, and action plans to guide the energy sector. These policies are prepared on behalf of the Ministry by the Department of Climate Change. The Ministry responsible for Finance also has a role in running PUC. It is responsible for setting the corporation budget and has the power to lend public money to PUC. This has an impact on how, where, and when investment in the power sector takes place.

The Seychelles Energy Commission (SEC) was set up in 2012 as the country’s electricity regulator. It is thus responsible for regulating electricity production, distribution, and consumption activities in the electricity market. It is also responsible for the issuance, renewal, suspension, and termination of licenses, the procedures for setting and reviewing tariffs, and the approval of Power Purchase Agreements between an IPP and PUC.

Table 4: Institutions governing the electricity sector

<table>
<thead>
<tr>
<th>Institution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Agriculture, Climate Change, and Environment</td>
<td>The Ministry of Agriculture, Climate Change, and Environment is charged with ensuring the constitutional right of every person to live in and enjoy a clean, healthy, and ecologically balanced environment, the provision of a reliable, affordable, and safe water and energy supply, and build resilience against climate change and disasters.</td>
</tr>
<tr>
<td>Seychelles Energy Commission</td>
<td>The Seychelles Energy Commission (SEC) was established by the Seychelles Energy Commission Act (2010) with functions of development and implementation of energy policy and strategy; formulation of national energy plan; enforcement of energy supply laws and review of laws related to energy; promotion of energy efficiency and conservation; production of national energy statistics, and promotion of research.</td>
</tr>
</tbody>
</table>
**Market players**

The leading player in the electricity sector is still PUC which is still the sole grid electricity provider. PUC is a parastatal body owned by the government. It reports to the MACCE through its Board and is regulated by the Public Utilities Act (1986). It is a vertically integrated utility company that provides electricity, but also water and sewerage services. It should be noted that while the SEC is the regulator, PUC still has retained its regulatory functions under its Act, since the Act is not revised. There are some small distributed PV generators representing about 1.2 percent of the electricity produced. The private sector does not have a significant role within the sector. The country does not have a commercial IPP, though this will change soon, with the 5 MW floating PV plant.

**Table 5: Market players**

<table>
<thead>
<tr>
<th>Public Utilities Corporation</th>
<th>The PUC is a parastatal established in 1986 following the merger of the Seychelles Water Authority and the Seychelles Electricity Corporation Limited. It provides electricity, water, and sewerage services to customers on Mahé, Praslin, and La Digue. PUC owns and operates electricity generation, transmission, and distribution assets in a vertically integrated single-buyer model.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPP</td>
<td>Seychelles attracted its first and notable IPP related to its 5 MW floating solar project under a PPA with PUC.</td>
</tr>
</tbody>
</table>

**Electricity market model**

The Seychelles power system has been a monopoly since production started in 1926. It was then a private monopoly, and in 1970 it became a government monopoly until 2012. With the passage of the Energy Act (2012), generation is open to private sector participation, under the single buyer model. All electricity produced is to be sold to the PUC, which remains a generator and the sole transmission and distribution operator. The Seychelles Energy Commission is the energy sector regulator.

**Figure 9: Structure of the electricity supply industry**
2.4 Policies and regulations governing the electricity supply industry

The electricity market of Seychelles is governed through numerous position papers, strategies, policy documents, and laws summarized in the next section.

Table 6: Energy sector strategies, policies, and plans

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seychelles Energy Policy: 2010-2030</td>
<td>The Seychelles Energy Policy (2010-2030) aims to pursue the sustainable development of the energy sector through improvement in energy efficiency, development of renewable energy, and reducing reliance on imported fuels to enhance energy security. It targeted a 5 percent integration of renewables in electricity supply by 2020, and 15 percent by 2030.</td>
</tr>
<tr>
<td>National Development Strategy: 2019-2023</td>
<td>The Strategy aims to pursue “a resilient, responsible, and prosperous nation of healthy, educated and empowered Seychellois living together in harmony with nature and engaged with the wider world” (Ministry of Finance, Trade, Investment and Economic Planning, 2019a). It prioritizes economic transformation to increase living standards by looking into the ocean economy, mainly through tourism, fisheries, mariculture, energy generation, and resource extraction in a sustainable manner.</td>
</tr>
<tr>
<td>Seychelles Vision 2033</td>
<td>The Vision pursues the ultimate aspiration of developing “a resilient, responsible and prosperous nation of healthy, educated, and empowered Seychellois living together in harmony with nature and engaged with the wider world” (Ministry of Finance, Trade, Investment and Economic Planning, 2019b). It particularly aims to achieve a modern, diversified, and resilient economy; prosperous people-centered nation; sustainable tourism; creating a strong enabling environment for free enterprise and foreign direct investment; becoming a global knowledge hub for the Blue Economy; and seeking innovative solutions to unique opportunities and challenges, including on energy security.</td>
</tr>
<tr>
<td>Seychelles Strategic and Land Use Plan 2040</td>
<td>The Plan “ensures that the anticipated growth is accommodated sustainably by indicating what development is needed, where it should be located, and how it should be delivered over the next 25 years” (Government of Seychelles, 2015). The plan aims to make the best use of land, define a settlement hierarchy, concentrate development in regional hubs, supports growth, provide improved transport and utility infrastructure, and protect agricultural and environmental lands.</td>
</tr>
<tr>
<td>National Climate Change Policy</td>
<td>Seychelles, as an island country, is more vulnerable to the negative impacts of climate change. The Policy notes that while Seychelles contributes less than 0.003 percent of global GHGs, about 95 percent comes from the energy sector and transport (Ministry of Environment, Energy and Climate Change, 2020). The overall goal of the Policy is to “facilitate a coordinated, coherent, proactive, and effective response to the local, regional, and global challenges and opportunities presented by Climate Change.” To do so, it established the National Climate Change Council.</td>
</tr>
<tr>
<td>Seychelles Blue Economy: Strategic Policy Framework and Roadmap 2018-2030</td>
<td>The Policy Framework recognizes that “with an Exclusive Economic Zone (EEZ) of 1.37 million km², a land area of 455 km², and a population of 94,000 mainly concentrated in Mahé, Praslin, and La Digue, Seychelles can be considered as a large ocean state with current and future prosperity uniquely linked to its ocean and coastal resources” (Government of Seychelles, 2018). The Framework seeks to develop the Blue Economy to realize the national development potential, through a partnership between the public and private sectors, as well as civil society, including through the priority action area of creating the business environment for effective private sector engagement.</td>
</tr>
<tr>
<td>Electricity Master Plan</td>
<td>The Electricity Master Plan (EMP) has been prepared to reach the country’s renewable energy generation targets of 5 percent by 2020 and 15 percent by 2030, and to provide a holistic plan for the electricity sector. The EMP contains a forecast for electricity demand until 2030 and various scenarios based on GDP evolution and demand elasticity (PUC, 2018a). It also provides a list of renewable generation technologies with the potential to be used in the new generation mix (ibid). The Master Plan also includes generation planning and scenarios for future electric generation in the country, while the network planning provides an evaluation of the impact of each generation scenario on the grid, including the impact of demand evolution (ibid). The EMP also provides tariff recommendations to achieve the 15 percent renewable energy targets in 2030 and looks at the social and environmental impacts of the various measures required to implement the EMP (ibid).</td>
</tr>
</tbody>
</table>

2.4.1 Key laws and regulations for the electricity supply industry

**Foundational legislation**

Two main pieces of regulation govern the electricity sector of Seychelles, the Public Utilities Corporation (PUC) Act (1986) and the Energy Act (2012).

The PUC Act established the corporation responsible for supplying electricity, water, and sewage services on the main islands. Under the PUC Act, the Minister responsible for finance
can lend the Corporation public money and approves its annual budget. PUC being a State-owned entity, it cannot enter into any agreement above SCR 500,000 without the approval of the Ministry of Finance (PUC Act, 1986). This has far-reaching implications due to the difficulty for PUC to finance planned and needed additional generation and transmission capacity (Van Vreden et al., 2010). Under the PUC Act, PUC can still grant permits to private generators if it cannot provide the service and regulate its decision-making proceedings. This is still the case today despite the existence of a dedicated sector regulator, the Seychelles Energy Commission.

The Energy Act (2012) establishes the Seychelles Energy Commission (SEC) as the market regulator, regulates electricity generation, transmission, and distribution and their licensing, and defines general principles for tariff setting. The SEC’s objectives are to regulate electricity-related activities for adequate, reliable, cost-effective, and affordable electricity while protecting and conserving the environment. The SEC is required to “regulate the generation, transmission, distribution, supply, and use of electrical energy; ensure the sustainability and viability of electricity-related activities; ensure the efficient supply of electricity; and ensure electricity supply security.”

Licensing provisions are further expanded by the Energy Licence Regulations (2016). These Regulations set out the conditions and requirements for applying for a Registration Certificate and a license to generate electricity as an IPP, auto producer, or utility. The regulation is not limited to generation. It also makes provision for applying for transmission, distribution, and supply licenses if the government sees the need for another provider (Ministry of Environment, Energy and Climate Change, 2016). The regulation also outlines general rules, rights, and obligations applicable to all licensees and includes relevant forms for applying for a Registration Certificate and license to enter the electricity sector.

**Grid Codes and technical regulations**

The Grid Code provides clear guidance and rules for the grid operator, the regulatory authority, and any market participant using or accessing the grid (PUC, 2018b). The Grid Code covers all technical aspects regarding the transmission and distribution system. It also provides rules and technical requirements for plants and apparatus connected to the transmission and distribution network.

**Tariff regulation**

The Energy Act (2012) established the Seychelles Energy Board (SEB) consisting of members from Ministries responsible for energy and finance, as well as experts from the energy sector. The Board has a mandate to issue, renew, modify, suspend or revoke licenses related to electricity sector activities, in consultation with other authorities. It also sets electricity tariffs, as well as connection and usage fees for transmission and distribution networks. The Board is essential institutional entity in assessing and setting tariffs by the mandate provided to it by the Energy Act (2012).
2.4.2 Other regulations for private sector participation

**Private sector participation models**

The government of Seychelles has put in place policies that deal with private sector participation. Namely, the National PPP Policy 2017 provides areas that the government seeks to focus on using PPP models and institutional arrangements. This comes with a PPP manual that covers central aspects of PPPs in Seychelles. There is a drafted act that will govern the PPP process. The existing National PPP policy guides private sector participation. The following models are covered under the policy: service contracts; operation and maintenance contract (O&M); design, building, finance, operate model (DBFO); build, operate, transfer model (BOT); build, own, operate model (BOO); and a buy, build, operate model (BBO).

The Seychelles National Development Strategy (2019-2023) encourages PPPs to engage private sector participation and finance infrastructure projects in the energy sector (Ministry of Finance, Trade, Investment and Economic Planning, 2019a). The Seychelles Investment Board (SIB) supports investors, including assisting them in getting an appropriate permit to set up and operate a business and leasing or purchasing real estate for the activities (Government of Seychelles, 2010a). It also acts as the Government representative in coordinating, facilitating, implementing, and monitoring PPP projects under the Investment Act.

**Procurement processes**

The procurement process is governed by the Procurement Act 2008 and its subsequent regulations. The Procurement Act provides the basic principles and procedures to be applied in and regulate related to the public procurement of goods, public works, consultancy services, and other services and identifies the institutions responsible for these matters. The implementation of this Act is done by the Procurement Oversight Unit (POU) and the National Tender Board (NTB). The NTB core functions are to:

- to receive and publicly open bids;
- to review the recommendations of an evaluation committee;
- to approve or reject the award of a contract; and
- make a further evaluation or seek independent evaluation (Government of Seychelles, 2008).

The POU serves as a procurement policy making and monitoring body. In line with the performance of its duty, it is responsible for:

- issuing of public procurement circulars and publications;
- formulate policies relating to procurement; and
- issue standard forms of contracts, bidding documents, pre-qualification documents, requests for proposals, amongst similar documents for mandatory use by every public body implementing procurement (ibid).

The POU acknowledges the challenges in dealing with energy projects. It proposes specific technical regulations that cater for complex projects like energy under the Procurement Act.
**Incentives**

The Investment Act (2010) of Seychelles outlines the protection accorded to investors. This includes guaranteeing investors fair and equitable treatment concerning investments. It ensures that any investment made in Seychelles shall not be nationalized or expropriated except by law and in the public interest, on a non-discriminatory basis, and with prompt and full compensation. The Act ensures that investors can transfer financial resources related to their investment freely in a convertible currency without delay and on a non-discriminatory basis.
Analysis of Electricity Market Policy and Regulatory Framework
Solar farm on Romainville Island, Seychelles
Photo credit: Getty Images/Anna Gorbacheva
3. Analysis of Electricity Market Policy and Regulatory Framework

UNECA and RES4Africa Foundation have developed a custom methodology to assess countries’ policy, legislative, and regulatory frameworks in their ability to encourage the participation of private sector investors. The approach encompasses the entire electricity supply industry value chain, covering the generation, transmission, distribution, and off-grid segments of the market.

3.1 UNECA and RES4Africa methodological approach

The methodology identifies three areas, referred to as Dimensions, under which policy, legislative, and regulatory elements are clustered. These Dimensions are as follows.

- **Openness** – or power sector structure and governance. This Dimension covers policies, laws, and regulations meant to define energy policy and strategy priorities, market-entry, infrastructure planning, sector governance, market structures, and related considerations. These instruments combined provide an overall view of the openness of the electricity market to investors.

- **Attractiveness** – or sector economics. This Dimension assesses policies, laws, and regulations that ensure the economic viability of electricity infrastructure investments, as well as fair competition among market operators. A review of these instruments provides an overall synthesis of the attractiveness of the electricity market to private sector investors.

- **Readiness** – or sector maturity. This Dimension investigates technical regulations designed to ensure the implementation into, and efficient integration and management of electricity infrastructure within the energy system. A review of these elements of the Dimension provides an overall picture of the readiness of the electricity market to investors along the value chain.
Figure 10: Overview of the Topics assessed within each Dimension

**Openness**
- Energy strategy
- System planning
- Power sector governance
- Power sector framework
- Power sector competition
- Private sector participation model
- Procurement process
- Generation off-taking options

**Attractiveness**
- Contracts regulation
- Economic regulation
- Incentives
- Indirect incentives
- Credit enhancement
- System quality and security standards
- Access to data
- Mini-grid integration

**Readiness**
- Authorization and permits
- System planning
- Grid code
- Grid access
- System planning
- Generation off-taking options
Each of these Dimensions is then disaggregated into three further levels, namely Topics, Indicators, and KPIs (key performance indicators).

- **Topics (1st Level)** define the main areas of policy and regulatory assessment (such as energy strategy, system planning, and grid code) specific to each of the dimensions. Topics are composed of Indicators. See Annex B for an overview of the Topics assessed.

- **Indicators (2nd Level)** cover single policy or regulatory elements (such as energy policy, Electricity Act, public PPAs, retail tariff structure, and grid connection). Each Indicator is composed of a series of KPIs.

- **KPIs (3rd Level)** are single elements, or specific questions, that provide a detailed understanding of Indicators, which in turn inform Topics.

*Figure 11: Methodological building blocks*

The methodology, cascading from the broader to the micro-level, enables proper assessment and understanding of the degree of openness, attractiveness, and readiness of electricity markets to private sector investors. This approach led to the formulation of a set of questionnaires – one for each segment of the electricity market, that is generation, transmission, distribution, and off-grid. Based on YES/NO questions, the approach enables the assessment of the policy, legal, and regulatory environment related to its fundamental attributes: clarity, predictability, transparency, and accountability.

The quantitative result from this methodological exercise is estimated by summing the positive (YES) answers to the detailed questions (KPIs). To reflect on the relative relevance of a particular KPI under a given Indicator, and to assess the impact that a particular Indicator has on its Topic, Indicators, and KPIs are subjected to relative weights on a scale system. The weights were reviewed and validated by a panel of African and international experts, and reflect the average input of the experts.

To compute the necessary quantitative results based on data input from countries, UNECA and RES4Africa developed the *ROAR* (Regulatory review of the openness, attractiveness, and readiness of electricity markets...).
readiness) tool. The ROAR tool computes results by country based on country data inputs and a defined weighting methodology.

The quantitative results, therefore, are presented at the Topics level and use a scoring system based on a 0 to 3-point scale, where 0 is the lowest score – indicating a lack of regulatory preparedness on the assessed Topic related to private sector investment participation – and 3 is the highest – indicating a full regulatory preparedness on the assessed Topic.

### 3.2 Main findings

The section below presents the quantitative results of the regulatory assessment of electricity sector policies and regulatory framework related to the crowding-in of private investors to the electricity market.

#### 3.2.1 Generation segment

*Figure 12: Overview of the generation segment*

The generation market of Seychelles, related to regulation and private sector investment participation, demonstrates key areas of regulatory strength, and areas of needed regulatory improvement. The openness of the electricity market is largely strengthened by superb system planning in place, and moderate performance related to governance of the power. Improving market openness would further require regulatory development related to the
power sector framework, enabling viable business models, addressing gaps in procurement regulation, increasing generation off-taking options to private investors, and reviewing and updating the national energy and climate change policies and strategies. The generation market is attractive in key areas, including strong contracts regulation and moderate support through credit enhancement. However, economic regulation and incentives to private investors are major areas for regulatory improvement. The electricity market demonstrates readiness demonstrated by the superb performance related to authorizations and permits administration, network planning in place, and overall transparency and access to economic and market data. Further regulatory improvements are needed related to the grid code, access to the grid by third parties, and sound system quality and security standards. Detailed assessments in each of these are as follows.

A deep dive into the Openness dimension

Figure 13: A deep dive into the Openness dimension for generation

Seychelles performs moderately related to its energy strategy (energy and climate policy). There is an energy policy in place, with clearly stated renewable energy targets of up to 15 percent by 2030, as well as a climate policy describing the laws dealing with climate change. However, gaps related to setting generation expansion targets, formal procedure for policy reviews, binding targets, and formal mechanism for targets monitoring limit enhanced policy openness.

System planning is a strong feature of the electricity sector of Seychelles. The plans are guided by the power sector master plan. It contains an assessment of generation expansion needs on an annual basis. Technology options are also evaluated, along with renewable energy resources assessment and mapping.
### Power sector governance

Seychelles performs moderately related to power sector governance. The Energy Act 2012 is in place, which clarifies the roles and responsibilities of entities along the electricity value chain. The electricity market is also overseen by the regulator – the Seychelles Energy Commission. The powers and responsibilities of the regulator are clarified in the Energy Act. Through the SEC, there is also a dispute resolution mechanism in place. However, there are key areas of regulatory improvement. First, public availability of regulatory decisions is crucial to increase transparency. Second, the independence of the regulator is limited related to the manner in which Board members are appointed. Furthermore, though the SEC is the regulator as per the Energy Act 2012, the PUC Act of 1986 making PUC a self-regulating entity is not repealed. Third, the regulator, depending directly on the government budget, is also not financially independent. Fourth, the regulator is not necessarily able to enforce its decisions. Addressing these gaps will enhance power sector governance and overall market openness.

### Power sector framework

The power sector framework has regulatory limitations in Seychelles. The PUC is a state-owned entity operating under a vertically integrated monopoly. Transmissions service is not unbundled from other services. Transmission assets management is also not separated from system operation services. The distribution and retail market segments are also bundled. As a result, the market framework limits the degree of openness of the market to private sector participation across the value chain.

### Power sector competition

The Energy Act 2012 permits competition in the generation segment of the market by enabling the presence of IPPs. This opens the scope for private sector participation in generation investments. However, wholesale and retail markets are not open to competition due to the prevailing power sector framework.

### Private sector participation model

The scope of private sector participation in generation investment extends to share ownership through privatization, or divestiture. The private sector is also permitted, though an IPP, to construct, own, and operate a generation plant. However, the generation concession model is not covered under the Energy Act. Merchant generation investment is similarly not practiced, since the market framework is not an open market. Therefore, while there is scope for IPP participation, there are limited private sector participation models enabled by regulatory provisions.

### Procurement process

The management of procurements is crucial for the overall openness of the electricity market to private sector participation. Seychelles has not yet enacted a public-private partnership (PPP) law; however, a draft PPP Act is developed. An investment department, that also oversees PPPs, is in place. However, clear processes for selecting PPPs, and defined PPP models for generation, such as BOO, BOOT, and BTO are not available. EPC+finance model for generation investment is also not available. For solicited proposals, there is a better procurement management system. Solicited proposals are issued, following a competitive tendering approach with clear rules and procedures for their treatment. An official valuation system for such proposals is in place. However, for unsolicited proposals, though they could be submitted, there are no clear rules and procedures, as well as a valuation system for treating them. The enactment of the drat PPP Act is expected to address some of these challenges.
The regulatory environment of Seychelles enables limited options to electricity generation off-taking. The electricity market operates under a single buyer and dedicated off-taker, model through PUC. A spot market is absent. Private PPAs are also not enabled through regulatory provisions. In the context of private PPAs, private electricity generators are not authorized to wheel the energy through the grid, and surplus power is not permitted to be sold to the system.

### A deep dive into the Attractiveness dimension

**Figure 14: A deep dive into the Attractiveness dimension for generation**

Contracts regulation is crucial to the attractiveness of the electricity market. Regulation related to PPA contracts in Seychelles demonstrates top performance. Public PPAs are standardized and provided as a model by the Seychelles Energy Commission. Its development was supported by the African Legal Support Facility of the AfDB. The standardization includes key provisions including capacity component, validity and terms, key performance indicators (such as commissioning and availability), frequency of payments, foreign currency denomination of contract (or indexing), inflation indexing, force majeure, a dispute resolution process, and termination provisions, including transfer obligations and early termination.

Economic regulation related to tariffs management is a key pillar of the attractiveness of electricity markets to private sector investors. The overall performance of Seychelles in economic regulation suggests room for improvement. Attractive attributes of tariff administration are the cost-reflectivity of tariffs, based on fixed cost (demand charge based on CAPEX recovery) and variables costs (fuel price adjustment checked quarterly), and periodic review of tariffs by PUC. However, there is no clear methodology for...
Towards Crowding-in Private Sector Investment

Analysis of Electricity Market Policy and Regulatory Framework

establishing a retail tariff structure that is made public, and there is no clear delineation of generation, transmission, and distribution-related tariff components.

A major constraint in terms of the attractiveness of the generation market in Seychelles is a major lack of incentive schemes to potential investors. Currently, no major incentive in terms of feed-in regimes, auctions, capacity payments, green certificates, and renewable quotas are available in the market.

Indirect incentives such as carbon pricing, results-based financing, and VAT relief are also not available to generation investors. However, direct financing of generation investments and import duty relief for generation assets are extended.

For investors in generation assets, financing is a major constraint; therefore, leading most to inquire about credit enhancement opportunities to improve project feasibility. Government guarantees could be available to generation investors. However, revenue escrow agreements are not available. Furthermore, multilateral guarantees and concessional lending are not extended to such investors. Regulation related to credit enhancement at large could be reviewed to improve performance in this area. The Seychelles Energy Efficiency and Renewable Energy Program (SEEREP), for example, offers subsidized loans to households and enterprises to improve energy efficiency. Such programs could lend valuable experience towards addressing the overall challenge related to generation market credit enhancement.

**A deep dive into the Readiness dimension**

*Figure 15: A deep dive into the Readiness dimension for generation*
### Authorizations and permits

Readiness of the generation market is essential to effectively crowd-in private investment. Authorization and permits administration and their processing efficiency determines administrative and transaction costs; therefore, are crucial considerations to private investors. Seychelles performs superbly in this regulatory area.

- Environmental approval processes are well developed, with clear rules established at the national level. There are clear and publicly available procedures for authorization and licenses enabled by a one-stop shop.
- Land rights are governed by clear national rules that grant private investors access to land. Rights can be acquired either through a lease from the government (60-90 years depending on the type and scale of investment) or transaction with private landholders. Land rights governance is accompanied by publicly available procedures for authorization, also enabled by a one-stop shop.
- Water rights similarly enjoy clear nationally defined rules on access, accompanied by clear and publicly available procedures to acquire authorizations. A one-stop shop facilitates the acquisition of water access rights.
- Construction permits are governed by rules that are also defined at the national level. There are clear rules for certificates of competencies. The permit issuance process for construction activities is clearly and publicly stated. Similar to other authorization and permits, a one-stop-shop facilitates such service.

### System planning

The assessment on system planning focuses on the network development plan, where Seychelles performs very well. The system planning is part of the power sector master plan. PUC undertakes regular assessment on system plans through a formal procedure for generation expansion plan as well as network expansion needs. Assessments on grid flexibility needs and renewables integration are also undertaken periodically.

### Grid code

Seychelles has a grid code in place. Related to system operation, the grid code defines the rules, including services related to the dispatch of ancillary services. The code also clarifies grid connection to generation investors through a connection rule, along with clear procedures to acquire authorizations. Application is filed with the PUC, following which an approval leads to the SEC for registration and application for a license. However, the grid code has not provided regulatory guidance in a few key areas. Dispatch is one of them. Dispatch is not run under economic merit order, and market settlement rules to generators are lacking. Some technologies, such as renewables, do not receive dispatch preference. Another area of regulatory gap relates to curtailment. There is no regulatory provision related to compensation for curtailed energy, as well as on curtailment limitations. Furthermore, even though reactive power as ancillary service exists (required by generators to stabilize the system), regulatory provisions are lacking related to black start capability and spinning reserves as ancillary services. In general, rules and regulations related to ancillary services, dispatch, and curtailment require regulatory development.
Grid access, or grid connection and operation agreement, is a major constraint affecting the readiness of the electricity market of Seychelles. Existing regulatory provisions establish rules for grid connection and access. However, a contractual framework for such connection and use of the network is not available. Allocation of connection cost is also not clarified.

Quality and security standards are part of the overall readiness of the electricity value chain to private investment. Quality and security criteria for operating the system are available, even though they are not made publicly accessible.

Transparency and market data are crucial components of the electricity market that increase the readiness profile of the market. Data and information increase investor confidence in the market. In this regard, Seychelles performs very well. Socioeconomic data is readily available. The balance sheet of the utility is publicly available. The electricity market supply and demand data are accessible.

3.2.2 Transmission segment

*Figure 16: Overview of the transmission segment*
Similar to the generation market, private sector investment participation in the transmission system is driven by market regulation. The openness of the transmission segment of the market to private investment is enhanced by strong system planning and moderately by power sector governance and procurement administration. Key challenges remain related to the energy policy and strategy, the power sector framework in place, and availability of private sector participation business models. The attractiveness of the transmission segment to private participation is largely constrained due to challenges related to contracts regulation, economic regulation, and the absence of credit enhancement instruments. The readiness of the transmission segment to private investment participation is similarly enhanced by moderate performance related to ease of authorization and permitting, and superb regulatory performance resulting from a well-developed grid code. However, regulatory challenges remain related to grid access and system quality and security standards. Overall, while aspects of current regulation have advanced in some areas, numerous regulatory challenges require attention and development. Detailed analyses in each of these areas follows.

**A deep dive into the Openness dimension**

*Figure 17: A deep dive into the Openness dimension for transmission*

In the generation segment of the regulatory review, key openness assessments related to energy policy and strategy, system planning, power sector governance, power sector structure, and procurement are provided. These assessments also apply to the transmission segment of the market. However, the following additional assessments are useful to the transmission segment of the market. Related to system planning, a network development plan is available. It is supplemented by a transmission investment plan, which is crucial for implementation. A regulation, or methodology, to evaluate network
Investments (such as cost-benefit analysis) is nonetheless not in place. Such methods would assist the regulator in evaluating investment plans and in granting appropriate decisions.

<table>
<thead>
<tr>
<th>Power sector framework</th>
<th>The power sector framework is also reviewed under the generation-openness section. For the transmission segment of the market, it is worth noting that the current regulation of Seychelles permits private parties to invest/operate transmission assets under a license. The SEC may authorize the operation or installation of transmission assets. The requirements and process to acquire such a license are clarified. Licensing rules do not clarify penalties for non-compliance related to the operation of transmission assets. Therefore, provisions related to market entry in the transmission segment are open by regulatory intent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private sector participation model</td>
<td>Even though the transmission segment of the market is not closed to potential private sector investment by regulation, currently the PUC operates as the sole operator of the transmission system. As a result, concession, privatization, merchant, or IPT models of private sector participation are not implemented.</td>
</tr>
<tr>
<td>Procurement process</td>
<td>The procurement process is already reviewed under the generation segment. For the transmission segment, it is worth noting that defined PPP models and EPC+finance models are so far not applicable. However, competitive tenders for transmission tenders could be possible if the Minister, in consultation with the SEC, calls for such a tender from transmission operators. This call depends on PUC considering it impractical, or not feasible, for it to ensure transmission services in a specific area. A public schedule of such transmission investments for the private sector is often not available.</td>
</tr>
</tbody>
</table>

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**A deep dive into the Attractiveness dimension**

**Figure 18: A deep dive into the Attractiveness dimension for transmission**
Contracts regulation

Contracts regulation is an area of regulatory gap in the transmission segment of the market. Standardized agreements minimize administrative and transaction costs. A standard Transmission Service Agreement (TSA) is currently not available, along with performance requirements, payment modalities, indexation for hard currency and inflation, as well as termination and dispute resolution. Even though current regulation permits the participation of the private sector in transmission services, gaps in standardized TSA limit the effectiveness of contracts regulation; therefore, the degree of attractiveness of this segment of the market.

Economic regulation

Electricity tariffs in Seychelles are intended to be cost-reflective. This is a positive step. In general, a formal tariff methodology across the value chain is a regulatory gap. For the transmission segment of the market, there is no clear network tariff definition. Furthermore, there is no clear methodology in place for network tariff determination that is publicly available. Tariff revision mechanism, as a result, is not in place for transmission services. This impediment can be addressed through the adoption of a clear and transparent cost-reflective tariff setting mechanism, including cost differentiation for network services.

Credit enhancement

The absence of credit enhancement support to investors further limits the attractiveness of transmission services market to private sector participation is. Revenue escrow agreements, government guarantees, multilateral guarantees, and concession landing schemes are currently not available to transmission investments.

A deep dive into the Readiness dimension

Figure 19: A deep dive into the Readiness dimension for transmission
Regulatory performance related to system quality and security standards and access to data are already reviewed under generation-readiness. In the generation segment of the market, the superb regulatory performance of Seychelles related to authorization and permits administration are reviewed. This includes environmental approval, construction permits, water rights, and access to land. An area of regulatory improvement in this regard is the acquisition of right-of-way (ROW) for transmission network development, potentially by private parties. There are no ROW rules, and there is no clear and publicly available procedure, or a one-stop-shop related to ROW. Addressing this regulatory gap would further enhance the superb performance of Seychelles in this area of regulation.

The Grid Code is essential to define system operation rules. In this regard, the electricity market of Seychelles demonstrates readiness. System operation rules are clarified. Grid connection rules and authorization are specified. This also includes connection rules to final customers. In this regard, the grid code is well defined.

The grid system is accessible to generation investors and final customers. Rules provide mandatory connections to third-party generators. However, a contractual framework for connection and use of the transmission system is not in place. Similarly, open-access rules for final customers are in place. However, contractual framework related to end-users access to the transmission network is a prevailing gap. The allocation of connection costs is also not clearly defined and established. Regulatory development in these areas would supplement the effectiveness of open access regulations.

### 3.2.3 Distribution segment

*Figure 20: Overview of the distribution segment*
The distribution segment of the electricity market of Seychelles demonstrates key areas of regulatory strength and areas that require further regulatory improvement. Private sector participation in this market segment is constrained by several challenges, ranging from the energy policy in place, the market framework in operation, contracts and economic regulation, support to the private sector through credit enhancement, and other areas related to the readiness of the market. Overcoming these barriers will be essential if Seychelles, in the short to the long-term, seeks to crowd in private investment in distribution assets. The detailed regulatory review follows.

A deep dive into the Openness dimension

Figure 21: A deep dive into the Openness dimension for distribution

Openness assessments related to energy policy and strategy, system planning, power sector governance, power sector structure, and procurement are discussed in openness-generation and openness-transmission sections. These assessments also apply to the distribution segment of the market. However, the following additional assessments are useful to the distribution segment of the market. Related to system planning, a robust network development plan is in place. It is supplemented by an investment plan. There is no national electrification plan. This is largely related to the achievement of universal access to electricity in Seychelles. This makes the planning experience of Seychelles in distribution markets distinctly different compared with countries with high electricity access deficit, where electrification itself is a fundamental aspect of planning.
The power sector framework is also reviewed under the openness-generation and openness-transmission sections. For the distribution segment of the market, it is worth noting that the current regulation of Seychelles permits private parties to invest/operate distribution assets under a license. The SEC may authorize the operation and/or maintenance of distribution network systems. The requirements to obtain a distribution license are clarified by existing regulation, which is publicly available. Non-compliance penalties, however, are not well specified.

The distribution segment of the market is potentially open to private sector investment by regulation. The PUC currently operates the distribution system. Typical distribution market participation models of concession and divestiture are not currently in practice.

The procurement process is already reviewed under generation-openness and transmission-openness segments. For the distribution market segment, defined PPP and EPC+finance models are so far not applicable. This signifies practical challenges to private sector participation in distribution investment, even though the policy space is relatively open. Competitive tendering for distribution investment is also not practiced, even though solicited and unsolicited proposals are permitted.

### A deep dive into the Attractiveness dimension

Figure 22: A deep dive into the Attractiveness dimension for distribution
A standard Distribution Service Agreement (DSA) is currently not available, along with performance requirements, payment modalities, indexation for hard currency and inflation, as well as termination and dispute resolution. Even though current regulation permits the participation of the private sector in distribution services, gaps in standardized DSA impede the effectiveness of contracts regulation.

Similar to the transmission segment of the market, there is no clear network tariff definition for the distribution segment of the market. Furthermore, there is no clear methodology for network tariff determination that is publicly available. This gap could be addressed through the implementation of a methodology for tariff-setting, including cost differentiation for network services.

The attractiveness of the distribution market to private sector participation is further constrained by the absence of credit enhancement instruments. Revenue escrow agreements, government guarantees, multilateral guarantees, and concessional lending tools are not currently practiced in distribution investments.

**A deep dive into the Readiness dimension**

*Figure 23: A deep dive into the Readiness dimension for distribution*

Regulatory performance related to system quality and security standards and access to data are already reviewed under generation-readiness and transmission-readiness. Similar to transmission readiness, an area of regulatory improvement is the acquisition of right-of-way (ROW) for distribution network development by private parties, including rules for ROW and its facilitation through a one-stop shop.
The Grid Code is essential to define distribution system operation rules. In this regard, the electricity market of Seychelles demonstrates readiness. Rules for system operation and grid connection to final customers are clarified. The grid code defines system operation rules for the distribution segment of the market.

Grid access regulation is already reviewed under transmission readiness. Grid connection and operating rules are in place. The allocation of connection costs is not clearly defined and established. Regulatory development in this area would supplement the effectiveness of open access regulations.

3.2.4 Off-grid segment

Figure 24: Overview of the off-grid segment

Seychelles has achieved universal access to electricity. As a result, electricity sector policy and strategy are not largely driven by the electrification agenda. This is evident, particularly in the off-grid segment of the market. Off-grid development is closely associated with access expansion, particularly in rural and peri-urban settings. With full electrification, this segment of the market and its related regulation are not well developed in the context of Seychelles.
However, future population and economic growth will necessitate the need to develop sustainable energy, likely including in the off-grid market. Therefore, it is essential to put in place the requisite regulatory provisions for robust development of the off-grid market, including through effective private sector participation. A detailed regulatory review of this market segment follows.

A deep dive in the Openness dimension

Figure 25: A deep dive into the Openness dimension for off-grid

<table>
<thead>
<tr>
<th>Energy strategy</th>
<th>Seychelles has already achieved universal access to electricity. As a result, electrification is not a major policy preoccupation. This is reflected in the absence of a national electrification policy or program since the goal is already met.</th>
</tr>
</thead>
<tbody>
<tr>
<td>System planning</td>
<td>Seychelles has a well-developed electricity sector planning system. Such a plan does not extend to national electrification or articulate off-grid targets. This again relates to the achievement of universal access to electricity and preoccupation of the planning exercise in other pressing areas of energy sector development, such as generation planning and network development.</td>
</tr>
<tr>
<td>Power sector governance</td>
<td>The power sector governance in the context of the electricity market at large is already evaluated. Consistent with the limited need to focus on electrification in the context of universal access, unlike low access countries, Seychelles has no dedicated agency focused on electrification at large, or rural electrification in particular.</td>
</tr>
</tbody>
</table>
**Power sector framework**

Similar to other aspects of regulation that define market openness, within the context of the assessed market structure and entry, the off-grid segment is not reflected in existing regulation. The issues of off-grid operation license, procedures, exclusivity over a geographic area, and legal registration are not addressed. There is no mention of off-grids in the Energy Act and other related laws of Seychelles. With population growth, the rising importance of decentralized sustainable energy, and the potential interest of the private sector in this market segment, the development of regulation governing the off-grid market would provide better regulatory openness and required clarity to private investors.

**Private sector participation model**

In the context of the limited current importance of the off-grid market in Seychelles, lack of regulatory provision governing the market segment, and prevailing universal access to electricity, private sector participation in this market segment through common models is not largely practiced. EPC, concession, and merchant models are not implemented. With future growth of the off-grid market, the usefulness of such models could grow, if supported with the necessary regulatory provisions and policy guidance.

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**A deep dive in the Attractiveness dimension**

*Figure 26: A deep dive into the Attractiveness dimension for off-grid*

A well-developed off-grid market requires regulatory clarity on retail contracts and metering and billing to off-grid customers. Similar to the regulatory gap providing oversight and guidance to off-grid market development at large, contracts regulation related to off-grid private sector participation is currently not in place.
Similarly, the economic regulation of off-grid investments is uncertain and lacking. Off-grid tariffs are not deregulated. Such tariffs are not established based on standard tariff calculation for off-grid systems. The tariff for off-grid systems is also not regulated under a uniform national tariff approach. Therefore, economic regulation pertinent to off-grid market operation is a gap that requires to be addressed if the off-grid market is foreseen to play a significant role in energy capacity expansion in the near future.

The off-grid segment of the market does not enjoy dedicated incentives or credit enhancement. Again, this could be largely tied to the current market reality in Seychelles that universal access to electricity is already achieved.

**A deep dive in the Readiness dimension**

*Figure 27: A deep dive into the Readiness dimension for off-grid*

Different aspects of regulation that define the *readiness* of the electricity market are already reviewed. Of particular importance to off-grid systems, *readiness* is system integration regulation. In the context of Seychelles, off-grid system integration regulation is not established. As a result, there is no regulatory certainty related to whether mini-grid operators can function as small power distributors (SPD), or as producers (SPP), and if mini-grid assets
could be sold to the utility or are permitted to coexist with the main grid. Furthermore, regulatory uncertainty prevails related to the decommissioning and removal of mini-grid assets, or guarantee and compensation for stranded assets. All these aspects are often addressed through a dedicated off-grid electricity market regulation and laws.

<table>
<thead>
<tr>
<th>System quality and security standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently, there are regulatory gaps related to off-grid service standards, including quality of service, quality of product standards, and other technical standards. Regulatory guidance to private sector investors is required on off-grid market quality and security standards.</td>
</tr>
</tbody>
</table>
Conclusions and Recommendations
Aerial view of city Victoria, Seychelles with solar wind and energy installations.

Photo credit: Getty Images/Anna Gorbacheva
4. Conclusions and Recommendations

The Seychelles electricity market regulatory review provides analyses of the sector policy, laws, and regulatory frameworks towards crowding-in private sector investment. The analyses are conducted using a regulatory review methodology developed by the UN Economic Commission for Africa and the RES4Africa Foundation. It is based on three broader regulatory dimensions that review fundamental attributes to attracting private sector participation. These are the degree of *openness* of the electricity market in Seychelles (or power sector structure and governance), the *attractiveness* of the market to private investment (or sector economics), and the degree of *readiness* of the market (or sector maturity). Assessment is undertaken across these three dimensions.

Seychelles is pursuing sustainable development spearheaded by visionary transformation agendas. Through its Vision 2033, it is pursuing a diversified economy aimed at delivering a people-centered prosperous nation while remaining in harmony with nature. It is also pursuing a blue economy roadmap to develop its expansive marine resources to achieve sustainable development. The vision is being pursued through the National Development Strategy in the short to medium term. Affordable, reliable, and sustainable energy supply is essential to meeting these development aspirations. The electricity market is responding to these requirements. Electricity consumption, for example, grew by 43 percent between 2010 to 2019, or an annualized 4.3 percent growth. Generation capacity has also grown from about 54 MW installed capacity in 2010 to 86 MW by 2019. Seychelles has already achieved universal access to electricity, but demand for energy for development purposes is rising. Meeting the growing electricity demand and strengthening the energy pillar for the transformation agenda require further expanding the national electricity generation, transmission, and distribution capacity. Towards this end, effective participation of the private sector enabled by effective market regulation, could constitute one viable option in an environment of constrained public investment, particularly following COVID-19 and public finance challenges.

In all three regulatory review dimensions of *openness*, *attractiveness*, and *readiness*, Seychelles demonstrates good performance in key regulatory areas. On electricity market *openness*, the market is guided by strong system planning related to generation capacity expansion and network development. Market *openness* is moderately supported by the existing power sector governance and framework, as well as procurement administration, inclusive of the private sector. On electricity market *attractiveness*, Seychelles implements effective contracts regulation, largely due to standardization of key contracts, and provides some degree of credit enhancement, particularly on generation investment. On electricity market *readiness*, the market is best supported by strong systems planning, effective authorizations and permitting, and broader transparency demonstrated by access to vital socioeconomic and sector data. These regulatory provisions and advancements have raised the overall *openness*, *attractiveness*, and *readiness* of the electricity market.

However, there are remaining regulatory barriers and uncertainties that will impede effective participation of the private sector and, therefore, require regulatory assessment, improvement, and in some areas reform.
4.1 Takeaways from the regulatory review

Related to the Openness of the electricity market

Related to the openness of the electricity market, the generation segment of the market faces numerous challenges. The energy policy and strategy do not provide a generation expansion target and are not subject to regular monitoring and evaluation. The power sector governance benefits from the presence of a regulator; however, the institution is not sufficiently independent, including its mechanism of funding. The power sector framework, though open for competition, remains bundled and vertically integrated under PUC, limiting private sector participation models. The market regulation also permits limited generation off-taking options. The transmission and distribution segments face similar regulatory challenges. The openness of the off-grid market is constrained in all regulatory review areas, demonstrating a less open market to private investment emanating from policy and regulatory absence governing the off-grid market.

Related to the Attractiveness of the electricity market

Related to the attractiveness of the electricity market, economic regulation (tariff determination method and clarity), few direct and indirect incentives in the offer, and gaps in credit enhancement support are key challenges. The attractiveness of the transmission and distribution market segments is similarly challenged by a lack of methodology and clarity related to economic regulation (network tariff definition) and the absence of standardized network access contracts. Credit enhancement for network investment is also not notable. The off-grid market demonstrates a general gap in regulatory provision. With the exception of contracts regulation, these challenges constraint the potential attractiveness of the market to private investment across the value chain.

Related to the Readiness of the electricity market

Related to the readiness of the electricity market throughout the value chain, regulatory challenges related to effective grid access and clarity on system quality and security are the notable gaps. In the context of off-grid markets, readiness is further constrained by regulatory uncertainty related to off-grid system integration.

There is a notable advancement in the regulatory environment of the electricity market in Seychelles. Further improvement will contribute towards an enhanced regulatory and business climate conducive for crowding-in private sector investment. Therefore, regulatory and policy measures that address the challenges would constitute positive steps towards strengthening the energy sector.

4.2. Recommendations

Policy and regulatory actions are required to address the aforementioned barriers to effective private sector participation in electricity market investment towards enhancing market openness, attractiveness, and readiness. Towards this goal, the following measures are recommended mainly to the Ministry of Agriculture, Climate Change, and Environment, the Seychelles Energy Commission, the Public Utility Corporation, Ministry of Finance, Trade, Investment and Economic Planning as well as other relevant energy sector institutions.
Conclusions and Recommendations

To enhance the *Openness* of the electricity market

The energy policy and strategies of Seychelles (energy and climate policy) exhibit limitations related to the articulation of generation expansion targets and formal procedure for energy policy review and monitoring of targets. To improve the openness of the market from a policy perspective:

- Incorporate clear generation expansion targets, institute their formal review procedure, and implement a monitoring framework during the next policy and strategy development window.

Power sector governance has improved in Seychelles by instituting the Seychelles Energy Commission, and by adopting relevant proclamations and regulations. To further strengthen electricity market governance:

- Address the lack of publicly available regulatory decisions (transparency);
- Reform the lack of sufficient independence of the regulator from political influence (such as autonomous mode of appointment of leaders and board members);
- Resolve the lack of sufficient financial independence of the regulator and enforceability of its decisions; and
- Empower the SEC by making its decisions legally enforceable.

The power sector framework of Seychelles places a constraint on openness towards the participation of the private sector in the electricity market. Indeed, private parties are permitted by regulation to develop and/or operate generation, transmission, and distribution assets. However, the system functionally remains a single-buyer vertically integrated system. To further improve this framework:

- Address transmission and distribution services unbundling, separation of transmission assets management from system operation, and wholesale and retail market competition to facilitate effective private sector participation.

Private sector participation models in Seychelles are limited. In the generation segment, divestiture/privatization and IPPs are permissible. However, participation models through merchant generation investment model (independent generation assets), including merchant off-grid investment, and generation concession are not currently permitted by existing regulation. Participation models for transmission and distribution investors are also limited. Therefore:

- Expand the regulatory space for alternative electricity generation, transmission, and distribution models to enhance the openness of the electricity market to private sector investors.
Conclusions and Recommendations

Procurement administration in Seychelles shows moderate progress. A draft PPP law is developed, but not yet enacted. Clarity of PPP processes and availability of PPP models such as BOO, BOOT, and BTO highlight the remaining challenges in procurement management. Engagement of the private sector across the value chain through an effective procurement system needs to be further strengthened. Therefore:

1. Enact the draft PPP law;
2. Evaluate and consider the adoption of appropriate PPP models for project finance;
3. Adopt clear rules and procedures for the treatment of unsolicited proposals, similar to solicited ones;
4. Institute scheduling of tenders and develop a track record of competitive and credible tendering.

The degree of openness of the electricity market is constrained by the limited generation off-taking options, driven largely by reliance on a single buyer system. Therefore:

1. Address regulatory barriers on off-taking by enabling the adoption of models such as private (corporate) PPAs, or mechanism for two private parties to negotiate power transactions;
2. Adopt regulation that enables self-consumption coupled with net metering for surplus power.

To enhance the Attractiveness of the electricity market

Economic regulation, or tariffs administration, is essential to market attractiveness. The pursuit of cost-reflectivity in tariff setting is an attractive feature of tariff administration in Seychelles. However, there is no clear methodology for establishing generation, transmission, and distribution-related tariff components. Therefore:

1. Expand on the existing tariff setting approach by adopting a transparent tariff methodology, within an existing cost-reflective approach, that would also support the identification of tariff components across generation, transmission, and distribution.

The regulatory system of Seychelles accords limited incentives to private investors in the electricity value chain. No major incentives in terms of feed-in regimes, auctions, capacity payments, green certificates, and renewable quotas are available in the market. Though direct financing of generation investments and import duty relief for generation assets are extended, indirect incentives are
Conclusions and Recommendations

Indirect incentives

also largely not practiced. Private investors should expect to operate in a market with less cluster of incentives. Therefore, in the absence of key incentives:

- Strengthen fair competition in the electricity market to reduce the need of offering more incentive packages to investors, except for emerging markets such as off-grids, or certain technologies.

Credit enhancement

Financing is a major constraint, leading investors to inquire about credit enhancement opportunities to strengthen project feasibility. Revenue escrow agreements for private investors, government and multilateral guarantees, and concessional lending are not currently practiced. Therefore,

- Strengthen the system of financing options with innovative private-sector financing instruments, including for financial risk mitigation, towards energy infrastructure development.

To enhance the Readiness of the electricity market

Authorization and permitting management is superbly handled in Seychelles. Environmental approval, right to land, construction permits, and water rights are well defined and supported by a one-stop-shop. However, for potential network investment, right-of-way rules are not fully developed. Therefore:

- Strengthen the system of permitting and authorizations by expanding existing rules to address right-of-way regulation.

Grid code

Seychelles has a grid code in place, clarifying rules related to system operation, dispatch of ancillary services, and grid connections. However, economic merit dispatch, market settlement rules, and regulation of curtailment are not addressed. Reactive power as an ancillary service exists (required by generators to stabilize the system); however, regulatory provisions are lacking related to black start capability and spinning reserves as ancillary services. Therefore, expand on the existing grid code to address:

- System operation rules, including the dispatch of ancillary services;
- Efficient dispatch that would enable public availability of market settlement rules, market settlement information, and management of investor exposure to imbalance risks;
- Curtailment compensation to generation investors, including specification of limitations on curtailment to generation investors;
- Ancillary services management, such as black start capacity, spinning reserves, and governing rules and regulations.
Conclusions and Recommendations

Existing regulations establish rules for grid connection and access. However, a contractual framework for such connection and use of the network is not available. Allocation of connection cost is also not clarified. Therefore:

- Supplement grid access regulation by standardized contractual framework for grid connections by private parties;
- Expand on existing connection regulation to clarify the allocation of connection costs to different parties.

Quality and security standards are in place for the electricity system. Currently, there are regulatory gaps related to off-grid service standards, including quality of service, quality of product standards, and other technical standards. Therefore,

- Similar to the main grid quality and security standards, in anticipation of a growing off-grid market in the long-term, develop regulation related to quality and security standards for off-grid systems.

Off-grid system integration regulation is currently not in place. This would affect regulatory certainty related to whether mini-grid operators can function as small power distributors (SPD), or as producers (SPP), and if mini-grid assets could be sold to the utility, or are permitted to coexist with the main grid. Furthermore, regulatory uncertainty prevails related to the decommissioning and removal of mini-grid assets, or guarantee and compensation for stranded assets. Therefore,

- Pursue the development of a dedicated off-grid electricity market regulation and laws.

4.3 Way forward

The electricity market of Seychelles surpassed the early achievement of the SDG7 access goal, with universal access to electricity already secured. On the development front, Seychelles has ambitious economic transformation and sustainable development aspirations reflected in its Vision 2033, its Blue Economy development framework, and operational National Development Strategy. Such an ambitious development and transformation agenda has made the development of the energy sector among the priority areas. Effective support to the people-centered transformation agenda requires investment in generation, transmission, distribution, and off-grid system capacities. Particularly in the context of COVID-19, its economic impacts and public finance constraints, effective engagement of the private sector is essential to bridge energy infrastructure development investment gaps. This calls for effective public private partnership and further development of the regulatory and business environment to crowd-in private sector participation.

Towards this end, this regulatory assessment evaluated the openness, attractiveness, and readiness of the current electricity market of Seychelles across the value chain relative to the
crowding-in of the private sector. Key areas of regulatory system strength as well as gaps for further improvement are carefully identified. Key recommendations are offered to the Ministry of Agriculture, Climate Change, and Environment, the Seychelles Energy Commission, the Public Utility Corporation, the Ministry of Finance, Economic Planning, and Trade, as well as other relevant energy institutions. The recommendations are aimed at enabling further development of the electricity market with the effective participation of the private sector mainly.

As Seychelles pursues its energy sector development through greater participation of private sector actors, regulatory and policy instruments play key roles. Towards this end, this report offers constructive identification of areas of reform and system enhancement for a competitive and resilient electricity market with vibrant participation of the private sector.

The UN Economic Commission for Africa and the RES4Africa Foundation remain committed to supporting Seychelles in addressing the identified regulatory and policy gaps, supporting the necessary regulatory capacity development, as well as engaging in any area of particular reform interest of Seychelles towards greater openness, attractiveness, and readiness of the electricity market. They also call on the development community, NGOs, CSOs, national organizations, and the domestic and international private sector to play their constructive role in supporting Seychelles in this regulatory development process, aimed at economic transformation and achieving the SDG7 goal.
References


<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AfDB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>BOO</td>
<td>Build, Own, and Operate</td>
</tr>
<tr>
<td>BOOT</td>
<td>Build, Own, Operate, and Transfer</td>
</tr>
<tr>
<td>BTO</td>
<td>Build, Transfer, and Operate</td>
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<tr>
<td>CAPEX</td>
<td>Capital Expenditure</td>
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<tr>
<td>CBS</td>
<td>Central Bank of Seychelles</td>
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<td>CSOs</td>
<td>Civil Society Organizations</td>
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<tr>
<td>DC</td>
<td>Direct Current</td>
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<td>Distribution Service Agreement</td>
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<td>ECA</td>
<td>Economic Commission for Africa</td>
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<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>EISS</td>
<td>Energy, Infrastructure, and Services Section</td>
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<tr>
<td>EMP</td>
<td>Electricity Master Plan</td>
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<tr>
<td>ESMAP</td>
<td>Energy Sector Management Assistance Program</td>
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<tr>
<td>FiT</td>
<td>Feed-in Tariff</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>ICA</td>
<td>Infrastructure Consortium for Africa</td>
</tr>
<tr>
<td>IDC</td>
<td>Islands Development Company</td>
</tr>
<tr>
<td>IEA</td>
<td>International Energy Agency</td>
</tr>
<tr>
<td>IPPs</td>
<td>Independent Power Producers</td>
</tr>
<tr>
<td>IPP</td>
<td>Independent Procurement Program</td>
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<tr>
<td>KPIs</td>
<td>Key Performance Indicators</td>
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<tr>
<td>Kv</td>
<td>Kilovolt</td>
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<tr>
<td>Kw</td>
<td>Kilo-Watt</td>
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<tr>
<td>MACCE</td>
<td>Ministry of Agriculture, Climate Change, and Environment</td>
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<tr>
<td>MW</td>
<td>MegaWatt</td>
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<tr>
<td>NDS</td>
<td>National Development Strategy</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-governmental Organizations</td>
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<td>POU</td>
<td>Procurement Oversight Unit</td>
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<tr>
<td>NTB</td>
<td>National Tender Board</td>
</tr>
<tr>
<td>PPA</td>
<td>Power Purchase Agreements</td>
</tr>
<tr>
<td>PPAs</td>
<td>Power Purchase Agreements</td>
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<td>PPPs</td>
<td>Public-Private Partnerships</td>
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<tr>
<td>PUC</td>
<td>Public Utility Corporation</td>
</tr>
<tr>
<td>PV</td>
<td>Photovoltaic</td>
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<tr>
<td>RES4Africa</td>
<td>Renewable Energy Solutions for Africa Foundation</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>---------</td>
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</tr>
<tr>
<td>ROAR</td>
<td>Software for the Regulatory Review of Openness, Attractiveness, and Readiness of Electricity Markets</td>
</tr>
<tr>
<td>ROW</td>
<td>Right of Way</td>
</tr>
<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition System</td>
</tr>
<tr>
<td>SCRs</td>
<td>Seychelles Rupees</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SEC</td>
<td>Seychelles Energy Commission</td>
</tr>
<tr>
<td>SEEREP</td>
<td>Seychelles Energy Efficiency and Renewable Energy Program</td>
</tr>
<tr>
<td>SIB</td>
<td>Seychelles Investment Bureau</td>
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<td>SIB</td>
<td>Seychelles Investment Board</td>
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<tr>
<td>SPD</td>
<td>Small Power Distributors</td>
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<td>SPP</td>
<td>Small Power Producers</td>
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<tr>
<td>TSA</td>
<td>Transmission Service Agreement</td>
</tr>
<tr>
<td>VAT</td>
<td>Value-Added Tax</td>
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</table>
## Annexes

### Annex A: An overview of the Topics assessed

<table>
<thead>
<tr>
<th>Openness</th>
<th>Attractiveness</th>
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</thead>
<tbody>
<tr>
<td>Energy Strategy</td>
<td>The existence and characteristics of energy and climate policies.</td>
</tr>
<tr>
<td>System Planning (also Readiness)</td>
<td>The existence and characteristics of plans for generation expansion, network development and electrification.</td>
</tr>
<tr>
<td>Power Sector Governance</td>
<td>The existence of an Energy Act or Law defining the operational regime of market agents, and the existence and role of an energy regulatory authority.</td>
</tr>
<tr>
<td>Power Sector Framework</td>
<td>The degree of unbundling of generation, transmission, and distribution services.</td>
</tr>
<tr>
<td>Power Sector Competition</td>
<td>The Openness of the electricity market to competition.</td>
</tr>
<tr>
<td>Private Sector Participation Model</td>
<td>The number of available models for private parties to participate in the power sector.</td>
</tr>
<tr>
<td>Procurement Process</td>
<td>The characteristics of PPP procurement policy, competitive tenders, and solicited/unsolicited proposals.</td>
</tr>
<tr>
<td>Off-taking Options (for Generation)</td>
<td>The existence of a spot market or single-buyer as well as the regulatory characteristics of private PPAs and captive generation.</td>
</tr>
<tr>
<td>Contract Regulation</td>
<td>The structure and characteristics of public PPAs, TSAs, DSAs, and standard retail contracts for off-grid operators.</td>
</tr>
<tr>
<td>Economic Regulation</td>
<td>The structure and definition of the retail and network tariff.</td>
</tr>
<tr>
<td>Incentives</td>
<td>The existence of instruments incentivizing private investors to operate in the power sector (e.g., FIT, capacity payments, green certificates, RES quotas)</td>
</tr>
<tr>
<td>Indirect Incentives</td>
<td>The existence of policies or instruments indirectly incentivizing private investors to operate in the power sector (e.g., carbon pricing, result-based financing, tax relief)</td>
</tr>
<tr>
<td>Credit Enhancement</td>
<td>The existence of lending agreements or guarantees that reduce risk or costs for private investors entering the power sector.</td>
</tr>
<tr>
<td><strong>Readiness</strong></td>
<td><strong>Authorizations and Permits</strong></td>
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<tr>
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<tr>
<td></td>
<td><strong>System Planning</strong></td>
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<tr>
<td></td>
<td><strong>Grid Code</strong></td>
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<td></td>
<td><strong>Grid Access</strong></td>
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<tr>
<td></td>
<td><strong>System Quality and Security Standards</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Access to Data</strong></td>
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<tr>
<td></td>
<td><strong>System Integration (for Off-Grid)</strong></td>
</tr>
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