



HERAUSRAGENDE MASTERARBEITEN AM DISC

- FACHBEREICH ➤ Management & Law
- STUDIENGANG ➤ Nachhaltige Entwicklungszusammenarbeit
- MASTERARBEIT ➤

Project Financing of renewable energy projects in Sub-Saharan Africa – the challenge to ensure bankability

AUTOR/IN ➤
Thomas Benedikt van Lith

Executive Summary

In recent months, sustainable development and the achievement of the *United Nations Sustainable Development Goals* has gained unprecedented prominence. *SDG 7* aspires to achieve access to electricity for the entire world population by 2030 and - at the same time - to significantly increase the share of renewable energy in the power mix. This target translates into ambitious electricity supply and renewable energy asset growth scenarios for Sub-Saharan Africa, the least developed region worldwide. Though theoretical renewable energy potential is abundant and capital generally available, progress has been slow. Aside funds from donors and *Development Finance Institutions*, private commercial capital is required to accelerate the progress. Project Finance has successfully attracted private funds for renewable energy assets in other jurisdictions but has played a negligible role in the energy transition in Sub-Saharan Africa. A variety of reasons are identified that impede their implementation, which are categorised into (i) unsatisfactory project pre-requisites and preparation, (ii) challenging host country conditions, (iii) elevated non-financial project risks and (iv) risky financial transaction structures. While a review of potential mitigation measures reveals that the risk factors are theoretically addressable, most require a multi-stakeholder alignment and exhibit some implementation complexity. Putting them into practice will therefore take time and will require a high level of commitment from host governments, sponsors, and financial institutions. While pressure and urgency are mounting, time will tell whether the project parties are more successful going forward.

Abbreviations

AEGF	=	African Energy Guarantee Facility
AFC	=	Anti-Financial Crime
AfDB	=	African Development Bank
ATI	=	African Trade Insurance
BIS	=	Bank for International Settlements
BIT	=	Bilateral Investment Treaty
CAGR	=	Compounded Annual Growth Rate
COD	=	Commercial Operation Date
CPRI	=	Credit & Political Risk Insurance
CSP	=	Concentrated Solar Power
DBSA	=	Development Bank of Southern Africa
DFI	=	Development Finance Institution
DSCR	=	Debt Service Cover Ratio
DSRA	=	Debt Service Reserve Account
e.g.	=	exempli gratia
ECA	=	Export Credit Agency
EEA	=	European Economic Area
EIB	=	European Investment Bank
EP	=	Equator Principles
EPC	=	Engineering, Procurement & Construction
ESAP	=	Environmental & Social Action Plan
ESDD	=	Environmental & Social Due Diligence
ESIA	=	Environmental & Social Impact Assessment
FC	=	Financial Close
i.e.	=	id est
IFC	=	International Finance Corporation
IPP	=	Independent Power Producer
IWPP	=	Independent Water & Power Producer
KES	=	Kenyan Shilling
KfW	=	Kreditanstalt für Wiederaufbau
LCOE	=	Levelised Cost of Energy

GFC	=	Global Financial Crisis
GW	=	Gigawatt
MCC	=	Millennium Challenge Corporation
MDB	=	Multilateral Development Bank
MNC	=	Multinational Corporation
MoF	=	Ministry of Finance
MW	=	Megawatt
NDB	=	National Development Bank
NDP	=	National Development Plan
NGN	=	Nigerian Naira
ODA	=	Official Development Assistance
OEM	=	Original Equipment Manufacturer
p.a.	=	per annum
PAP	=	Personally Affected People
PPA	=	Power Purchase Agreement
PPF	=	Project Preparation Facility
PPP	=	Public Private Partnership
PRI	=	Private Risk Insurer / Insurance
PV	=	Photovoltaics
RES	=	Renewable Energy Sources
RoE	=	Return on Equity
RWA	=	Risk-Weighted Asset
SDG	=	Sustainable Development Goal
SME	=	Small and Medium-sized Enterprises
SPV	=	Special Purpose Vehicle
SPE	=	Special Purpose Entity
SSA	=	Sub-Saharan Africa
TDB	=	Trade & Development Bank
UN	=	United Nations
WALL	=	Weighted Average Loan Life
WBG	=	World Bank Group
WEO	=	World Energy Outlook
ZAR	=	South African Rand

Table of Contents

1.	Renewable energy project financings in SSA - setting the scene	- 9 -
1.1.	Importance of Project Financings of renewable energy assets in SSA	- 10 -
1.2.	Low success rates - project bankability as root cause	- 15 -
2.	Systematic literature review to assess the research question	- 22 -
3.	Fundamental pre-requisites - RES potential, power demand, and private capital	- 25 -
3.1.	Renewable energy potential in Sub-Saharan Africa	- 25 -
3.2.	Electricity supply and demand outlook for Sub-Saharan Africa	- 26 -
3.3.	General availability of financial capital for energy projects in SSA	- 28 -
4.	The enabling factor – project bankability and its challenges	- 31 -
4.1.	Unsatisfactory project pre-requisites and preparation	- 33 -
4.1.1.	Strategic importance of the project	- 33 -
4.1.2.	Reputational risks associated with the project	- 34 -
4.1.3.	Lack of sponsor appetite	- 36 -
4.1.4.	Lack of project development capabilities	- 40 -
4.2.	Challenging host country conditions	- 42 -
4.2.1.	Insufficient anti-financial crime regulation	- 44 -
4.2.2.	Political, ethnical, and societal instability and volatility	- 46 -
4.2.3.	Lack of institutional capabilities	- 50 -
4.3.	Elevated non-financial project risks	- 53 -
4.3.1.	E&S project risks	- 53 -
4.3.2.	Technological project risks	- 56 -
4.4.	Risky financial transaction structures	- 58 -
4.4.1.	Off-taker implied credit risk	- 59 -
4.4.2.	Macroeconomic risks	- 61 -
4.4.3.	Lack of direct lending, insurance, and guarantee market support	- 64 -
4.4.4.	Inability to determine project risk allocations	- 70 -
5.	Mitigation options to facilitate project success	- 71 -
5.1.	Improvement of host country and project conditions	- 71 -
5.2.	Enhanced support from risk cover providers	- 74 -
5.3.	Adjustments in the investment approach of sponsors	- 77 -
6.	Summary of risk factors and mitigation options	- 78 -

7. Conclusion	- 85 -
References	- 86 -
Appendix	- 110 -

Table of Figures

- Figure 1: Potential funding providers for renewable energy projects in SSA - 10 -
- Figure 2: Funds provided for infrastructure projects in Africa from 2014 to 2018..... - 11 -
- Figure 3: Global asset finance investments into renewable energy from 2004 to 2019 - 14 -
- Figure 4: Standard Project Finance transaction structure..... - 15 -
- Figure 5: Implemented and cancelled Project Finance transactions by region - 16 -
- Figure 6: Transaction phases from initial engagement to financial close - 18 -
- Figure 7: Illustration of the bankability assessment - 19 -
- Figure 8: Challenges for the bankability of renewable energy projects in SSA - 20 -
- Figure 9: Marco and micro level requirements and processes for transaction success - 21 -
- Figure 10: Project Finance transactions by region and by involvement for SSA - 23 -
- Figure 11: Theoretical renewable energy production potential in SSA - 25 -
- Figure 12: Electricity demand and supply growth in Africa - 27 -
- Figure 13: Electricity capacity and production technology mix in Africa - 28 -
- Figure 14: Availability of capital for renewable energy assets in SSA..... - 30 -
- Figure 15: Cumulative default rates of Project Finance transactions by region..... - 31 -
- Figure 16: Ultimate recovery rates and years to emergence for PF transactions..... - 32 -
- Figure 17: Project Finance transaction defaults by sector - 33 -
- Figure 18: Private Equity and Venture Capital returns in Africa..... - 38 -
- Figure 19: Firms' project level RoE spreads in Africa - 39 -
- Figure 20: Details on the PPF of the US Trade and Development Agency..... - 42 -
- Figure 21: Selected Project Preparation Facilities for SSA..... - 42 -
- Figure 22: Macro-level indicators of host country conditions - 43 -
- Figure 23: Anti-money laundering indicators for SSA - 45 -
- Figure 24: Corruption indicators for SSA..... - 46 -
- Figure 25: Political stability and rule of law indicators for SSA - 48 -
- Figure 26: Doing business ranking of SSA countries relative to peers worldwide - 51 -
- Figure 27: Business environment and public administration indicators for SSA..... - 52 -
- Figure 28: The IFC Performance Standards - 54 -
- Figure 29: Global cumulative installed renewable energy capacity since 2011..... - 57 -
- Figure 30: Learning curve estimate for solar PV assets - 58 -
- Figure 31: Sovereign credit risk ratings in SSA - 60 -

Figure 32: Cumulative default rates by credit rating tier - 61 -
Figure 33: Foreign exchange rate pairs for selected SSA currencies against the USD - 62 -
Figure 34: GDP growth volatility in SSA - 63 -
Figure 35: Public and private direct lending and risk cover providers for SSA - 65 -
Figure 36: Insurance and guarantee product parameters - 66 -
Figure 37: Selected examples of ECA and PRI risk cover availability for SSA - 68 -
Figure 38: Selected examples of limitations to DFI, ECA, and PRI risk cover provision - 69 -
Figure 39: Structure of the African Energy Guarantee Facility - 74 -
Figure 40: Bankability challenges in summary - 79 -
Figure 41: Summary of bankability challenges and mitigation options - 80 -

1. Renewable energy project financings in SSA - setting the scene

The *Agenda 2030* of the *United Nations (UN)* is the most important international guidepost for sustainable development. Its objectives are summarised in *17 Sustainable Development Goals (SDGs)*. The relevant goal underlying this thesis is *SDG No. 7*, which targets access to “*affordable, reliable, sustainable and modern energy for all*” (UNECE 2017, p. 7).

More precisely, it requires (i) to significantly increase the share of *Renewable Energy Sources (RES)* in the global energy mix and (ii) to provide electricity access to the entire (100% cover) world population (cf. UNECE 2017, p. 1).

To put (i) into perspective, renewables accounted for 26% of global electricity generation in 2018, while the same figure stood at 19% for Africa. To live up to its potential, the continent intends to double its RES generation capacity by 2030.¹ For now, it clearly lags the global renewable energy growth trend (cf. IEA 2020, IEA 2019a).

Regarding the second objective (ii), in 2019, c. 578 million people in *Sub-Saharan Africa (SSA)*² had no access to electricity, which corresponded to roughly 48% of the region’s population. The figures for urban and rural population were thereby 76% and 29% respectively. SSA is consequently also not on track to achieve this second target (cf. IEA 2020, IEA 2019a).³

The *IEA* estimates that annual investments of USD 32.5 billion are required to ensure full electrification of Africa’s population by 2030. In comparison, investment into renewable electricity generation stood at a mere USD 2.1 billion in 2016. The financing gap is huge (cf. IEA 2020, IEA 2019a).

¹ This is expressed by the so-called *Stated Policies Scenario* in the *World Energy Outlook (WEO)* published annually by the *International Energy Association (IEA)*, the principal international industry research institute. The scenario simulates RES capacity growth if currently applicable national policy targets are achieved. Though this trajectory implies substantial year-on-year RES growth rates (c. 10.2%), the *IEA* notes that it is still not sufficient to comply with *SDG 7* (cf. IEA 2020, IEA 2019a, IEA 2019b).

² The *IEA* uses the same country perimeter for Sub-Saharan Africa as the *World Bank Group (WBG)*, that is, all 54 African countries except for Algeria, Djibouti, Egypt, Libya, Morocco, and Tunisia (WBG 2021a). A detailed break-down of the electricity access rates can be found in the *IEA electricity access database* (cf. IEA 2020). Based on this, the author has reduced the estimate of 600 million people mentioned in the text to the presumably more accurate figure of c. 578 million people.

³ Thereby the complicating notion of *affordable* access to electricity, which is also part of *SDG 7* and more difficult to measure, simulate and assess, is not even considered.

1.1. Importance of Project Financings of renewable energy assets in SSA

In broad terms, funds to finance African development - incl. the implementation of renewable energy projects - come from a variety of sources. Figure 1 gives an overview of the different types of funding providers.

Figure 1: Potential funding providers for renewable energy projects in SSA

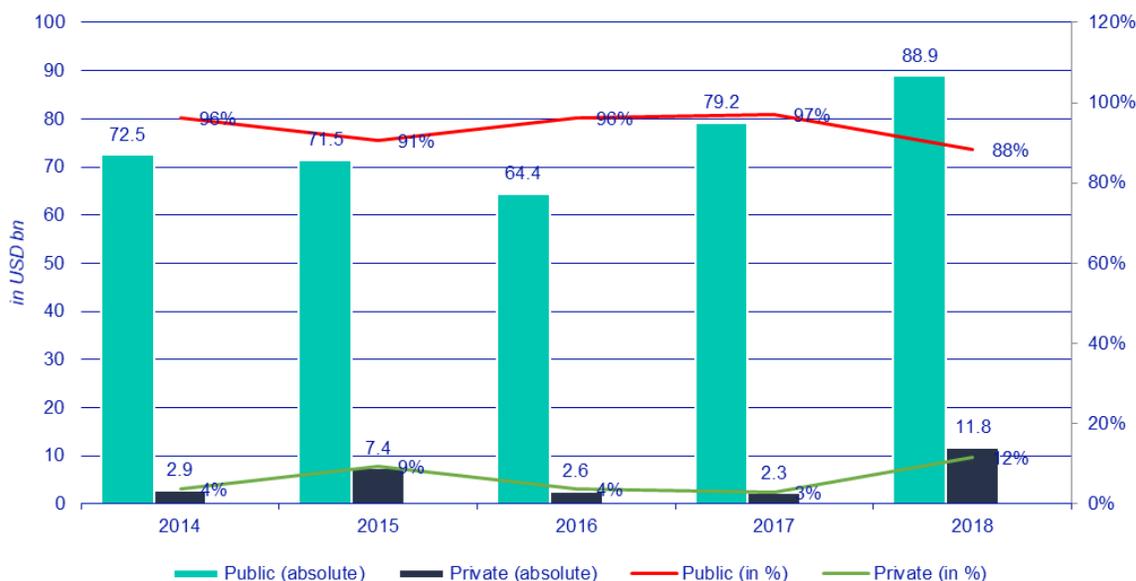
Category	Sub-Category	Examples
Public	SSA governments and SOEs	Republic of Ghana, CI-Energies (Ivory Coast)
	SSA public institutional investors	Botswana Public Officers Pension Fund
	SSA public financial institutions	Banque Nationale d'Investissement (Ivory Coast)
	DFIs	African Development Bank, European Investment Bank
	Non-SSA governments	Federal Republic of Germany, People's Republic of China
Private	SSA corporates	Dangote Group (Nigeria)
	SSA private financial institutions	Ecobank (Togo), Zenith Bank (Nigeria)
	SSA private institutional investors	Sentinel Retirement Fund (South Africa)
	Non-SSA corporates	Vinci (France)
	Non-SSA private institutional investors	Meridiam (France)
	Private donor organisations	Aga Khan Development Network

Source: own knowledge

Each of them has their own (i) focus (sector, countries, etc.) and (ii) capability profile (funding costs, speed, etc.). Their respective support also comes in different shapes and forms, from (a) outright grants via *Official Development Assistance (ODA)* by bilateral governmental donors to (b) local and foreign corporates that provide equity for project financings or finance investments from their own cash flow to (c) domestic and foreign financial institutions that structure and arrange debt financings on a private and commercial basis. Figure 2 depicts the funds that were provided by these various entities for infrastructure projects⁴ in Africa between 2014 and 2018 in USD billion. It also depicts the share between public and private contributors (cf. ICA 2018).

⁴ There are a variety of different definitions for infrastructure projects. *ICA* considers the following sectors to be infrastructure: energy, water and sanitation, transport, information and communication technology, and a combination of these (cf. ICA 2018, p. v). This is broadly in line with definitions of infrastructure by other reputable organisations.

Figure 2: Funds provided for infrastructure projects in Africa from 2014 to 2018



Source: ICA 2018

The chart conveys two pivotal messages: *Firstly*, even a broad variety of public and private stakeholders has so far been unable to close the infrastructure and renewable energy financing gap in Africa. *Secondly*, up until now, private funds have played a minimal role and inhibit a high potential for growth.

There are numerous ways in which private funds for infrastructure projects can be raised. Project Finance is just one of them. To be clear, this type financing is not exclusive to private financial institutions. In fact, the Project Finance market in SSA is dominated by DFIs employing public funds. The point is, that Project Finance has shown to be a suitable route to raise private capital additionally or in substitution for public money in other jurisdictions. This thesis therefore concentrates on funds from private and commercial financial institutions.⁵ Capital can also come from domestic or international sources. This thesis focuses on foreign capital providers, as they employ additional outside funds which are not recirculated monies generated in SSA itself (cf. ICA 2018, Moody's 2019).⁶

⁵ For avoidance of doubt, small scale, off grid renewable energy solutions are excluded from the scope of this thesis, as they are too small to be implemented in a Project Finance structure and are either realised through SME loans by local banks or grants and concessional loans by NGOs, DFIs, and bilateral donors.

⁶ To be precise, not all funds injected by foreign capital providers will come from outside the region. Some investors and lenders will re-employ some of their profits and freed up capital from their previous investments in SSA, thereby circulating it. However, this is a minor effect and does not invalidate the selection (cf. AVCA 2021, ICA 2018).

Dentons, a global law firm, defines Project Finance as follows:

“The financing of the development or exploitation of a right, natural resource or other asset where the bulk of the financing is to be provided by way of debt and is to be repaid principally out of the assets being financed and their revenues.” (Dentons 2013, p. 2)

An alternative, more comprehensive definition comes from *Moody’s*, a major international credit rating agency:

“Project finance (PF) is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. [...] In such transactions, the lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility’s output, such as the electricity sold by a power plant. The borrower is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project’s cash flow and on the collateral value of the project’s assets.” (Moody’s 2019, p. 55)

These definitions imply important characteristics of typical Project Finance transactions. Projects are preferably (i) significant in size, (ii) require a high upfront capital investment - which needs to be recouped over the lifetime of the operations of the underlying asset -, and (iii) are legally and structurally ring fenced. This type of financing thereby bears the following advantages:

- It ensures high-quality preparation and execution of projects as lenders require a thorough due diligence before committing funds to a project. An example is the environmental & social impact assessment, which will typically be performed according to *Equator Principles (EP)* and *IFC Performance Standards* (see Chapter 4.3.1 for details; cf. Dentons 2013, Sorge 2004).⁷

⁷ Chapter 4.1.4 will deal with the lack of appropriate project preparation in SSA. However, this is no contradiction. To achieve financial close of a Project Finance transaction in SSA, preparation needs to be to a high international standard. This allows to attract foreign capital and ensures a high-quality project execution, thereby lowering the risk of stranded dysfunctional assets that have negative E&S impacts. As we shall see, these strict requirements hinder the implementation of some projects, though it is the inappropriately prepared ones. Instead of lowering the preparation requirements, local capability build-up should increase the number of suitable transactions.

- It lowers the financial burden of the project on state budgets. While Project Financings usually require an indirect support of the project by the host country state, in case of renewable energy projects through a long-term power offtake agreement with a state entity backed by a *sovereign guarantee*, e.g. the national power company, these contingent liabilities do not constitute debt in public accounts until they are called upon (cf. IMF 2020, p. 16).⁸ This is a crucial aspect, especially in SSA where many countries face public external debt sustainability challenges. Aside maximum debt targets in case of on-going IMF programmes, private capital providers (e.g. international banks) assess and closely monitor a country's debt sustainability. Project Finance transactions do not weight on the relevant metrics and thereby preserve debt sustainability, while still providing the required infrastructure (cf. IMF 2021b).
- It allocates project risks amongst EPC contractors, lenders, and other project parties according to which entity is best placed to manage it ⁹ (cf. Dentons 2013).
- It may tap private investor, bank, or capital market funds, which would otherwise not be available. This ties into the previous points. Well prepared projects, for which risks are clearly ring fenced, may mobilise capital that would otherwise shy away. For example, equity sponsors will only have to consolidate their pro rata shareholding in a project into their financial statements, if the financing is appropriately structured.
- It allows various equity providers with diverse backgrounds to step in at different stages of the project development through shareholder agreements without taking on legacy debt and other obligations. This is due to newly established *Special Purpose Vehicles (SPV)*¹⁰ acting as borrowing entities in Project Finance transactions. They serve as a *clean sheet*. This is particularly relevant in SSA where corporates regularly lack the balance sheet capacity to structure a transaction with full corporate

⁸ Some project financings will have private off-takers and consequently require no financial state support, except for minor expenses on granting authorisations, permits, and licenses. *Power Purchase Agreements (PPAs)* typical run for at least 15 years. Depending on the set-up of the tender, the asset ownership may be transferred back to the state after the expiry of the PPA (cf. Dentons 2013).

⁹ Throughout the thesis, the words *sponsor*, and *investor* will be used interchangeably, if not indicated otherwise. The same applies to *financial institution* and *lender*.

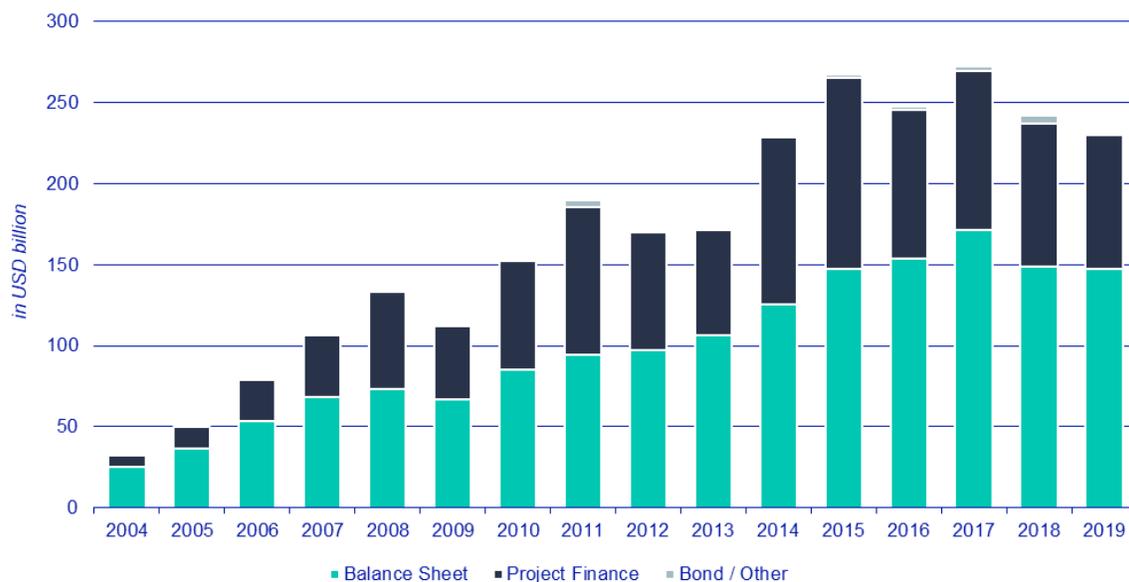
¹⁰ The terms *Special Purpose Vehicle (SPV)*, *Special Purpose Entity (SPE)* and *Project Company* are used interchangeably as they imply the same.

recourse or as the sole equity sponsor for a Project Financing (cf. Dentons 2013, IMF 2021a).

- It can lower the overall financial burden of a project for the country and consumers. Good examples are the international auction-type tenders for solar PV projects in GCC countries (Oman, UAE, Saudi Arabia), where fierce competition has led to an astonishing decline in *Levelised Cost of Energy (LCOE)* and ultimately lower electricity tariffs for consumers (cf. IRENA 2016).¹¹

Due to these characteristics and advantages, Project Finance has been a desirable financing type for renewable energy assets in numerous jurisdictions. Figure 3, depicts global RES investment volumes over the past 16 years (cf. FS-UNEP 2020). Two main conclusions are apparent: (i) In absolute terms, Renewable energy investments saw a significant growth since 2004. (ii) Project Finance, after a rapid increase in the early years, constituted a significant part (30-50% since 2010) of total investments, making it a pivotal source of capital for the energy transition.

Figure 3: Global asset finance investments into renewable energy from 2004 to 2019

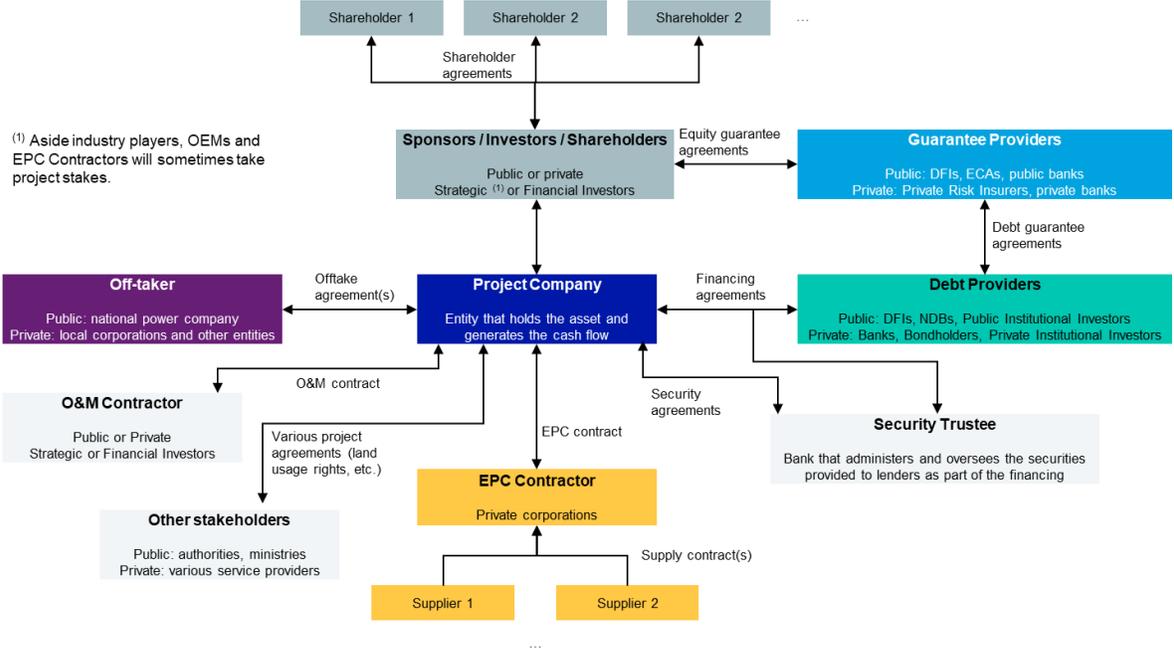


Source: FS-UNEP 2020

¹¹ It should be noted that lower LCOEs of single projects are not necessarily passed through to end consumers. Also, this argument of course only holds, if the LCOE is lower than for comparable projects financed through corporate balance sheets. However, for one, corporates will regularly lack the balance sheet capacity and risk appetite to support a full recourse transaction, especially in SSA, and, secondly, corporates have reported higher LCOEs (cf. IEA 2020).

To facilitate the further discussion and to guide the reader, Figure 17 illustrates a standard Project Finance structure and the involved counterparties. It should be caveated that each transaction is unique and structural features may vary significantly. The chart does therefore not claim universality (cf. Dentons 2013).

Figure 4: Standard Project Finance transaction structure



Source: Dentons 2013

1.2. Low success rates - project bankability as root cause

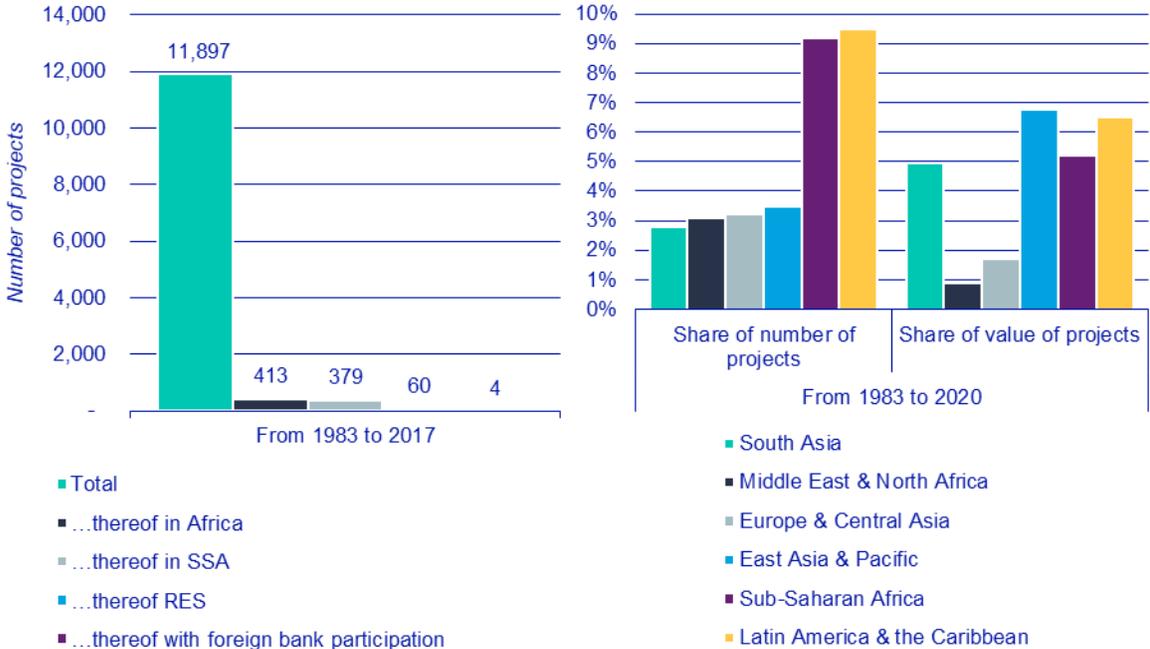
Though Project Finance has successfully attracted private commercial capital in various jurisdictions, it has been unsuccessful in doing so in SSA.

The left side of Figure 5 depicts the total number of Project Finance transactions globally over a 35-year period from 1983 to 2004. Thereof, only 4 transactions (0.03% share) have been RES Project Finance transactions in SSA.

The right side of the figure shows cancelled and distressed *Public-Private-Partnerships (PPP)* in SSA compared to other regions worldwide over a similar period. While not all PPPs are Project Finance transactions and not all Project Finance transactions are PPPs, some projects are. It is therefore worth noting that SSA had almost three times more cancelled and distressed PPP projects than any other region, except for Latin America and the Caribbean, which performed even worse.

McKinsey estimates that 80% of infrastructure projects in Africa stall at the *feasibility study* and *business plan stage*, while another 10% are aborted due to the inability to obtain necessary project approvals, to negotiate and secure the guarantee and offtake agreements and failure to finalise the technical design (cf. McK 2020). They reckon that only 10% achieve the financing stage. Though not all infrastructure projects are funded through non-recourse debt, some are. Overall, the various data points confirm, that Project Finance with foreign private commercial capital involvement in SSA has been scarce.

Figure 5: Implemented and cancelled Project Finance transactions by region



Source: IMF 2021a, McK 2020, Moody's 2019

Either (i) the fundamental macro level pre-requisites, that is, the theoretical renewable energy potential, the electricity demand and general availability of capital is not available or (ii) projects fail at the single transaction level. While (i) will be briefly analysed, the literature is unambiguous that these fundamental factors are fulfilled and that the slow growth in project implementation stems from the micro level (cf. ICA 2018, IMF 2021a, McK 2020).

To understand why this is so, it is crucial to comprehend the concept of *bankability*. For capital to be employed, a Project Finance transaction needs to be *bankable*. There is no clear-cut definition of this concept, however it is essentially a continuous and comprehensive

assessment of the risk-return profile of a transaction against a financial institution's risk appetite until financial close.¹²

So as a transaction progresses, additional project information is made available to lenders for their consideration. They will continuously decide whether to proceed or not. While this implies that at any point in time, a financial institution might withdraw its financing support for a transaction, the process is typically funnel-like (Figure 6). Meaning, the further an institution has already engaged, and the more information has already been made available to the satisfaction of the potential lenders, the lower the likelihood that they step-away at a later stage.¹³

Bankability is therefore neither a mechanical calculation or scientific method nor a guideline or industry manual that has been agreed between financial institutions. It is rather an individualistic assessment driven by the involved individuals and their past transaction experiences¹⁴, their institutions' culture, risk appetite and frameworks as well as the market conventions at the respective point in time.¹⁵ Thereby each funding provider performs its own, independent *bankability assessment*, though a market view tends to form around whether a transaction is doable or not.

¹² The date on which the financing is fully effective, that is, the loan agreement and all other relevant project documents have been signed and all *conditions precedent* have been fulfilled to the lenders' satisfaction.

¹³ There are of course exceptions to this and there are well known examples when a financial institution pulled out of a transaction at the last minute and after completion of the full project due diligence.

¹⁴ While every Project Finance transaction is unique, major transactional elements may be alike or similar. Therefore, previously closed transactions serve as a proxy and benchmark to sponsors, advisors, awarding authorities and financial institutions. The proxy is of course stronger the more elements are comparable, i.e. a follow-on wind offshore project in the same jurisdiction with the same sponsors and suppliers is a better guidance than a biomass project in a different country with other project counterparties.

¹⁵ Market standards and conventions evolve and have feedback loops in correlation with the monetary and fiscal cycles, stock, and bond markets as well as idiosyncratic events, like payment defaults by sovereigns or other high-profile entities. Abrupt events can suddenly change the market risk perception and bankability assessment, however typically, market standards gradually change over time, i.e. over several months or years.

Figure 6: Transaction phases from initial engagement to financial close

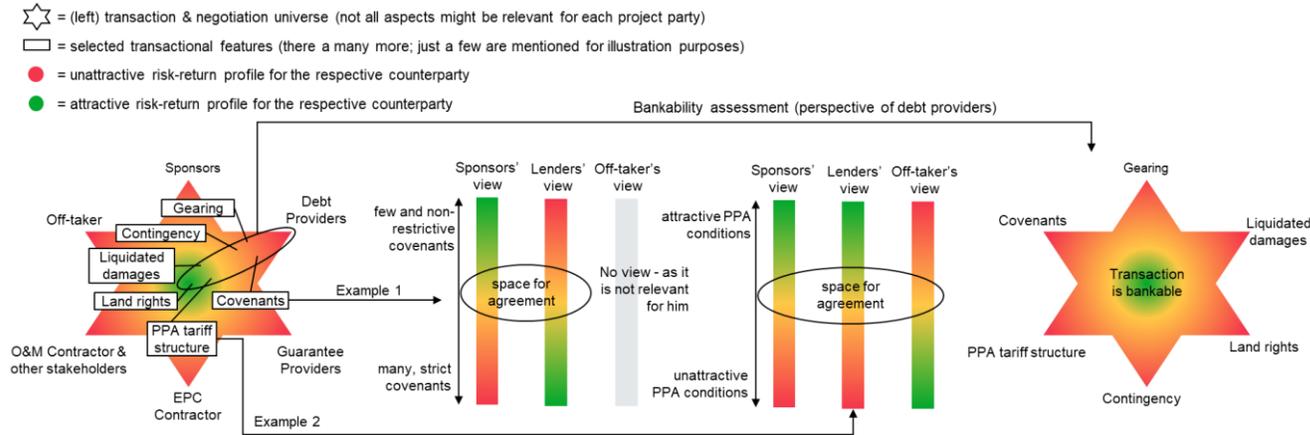


Source: own considerations

It should also be noted that *bankability* only refers to the perspective of the potential lenders. It does not compromise the risk-return assessment of other project counterparties, e.g. the sponsors and EPC contractors. While each party will perform their own assessment, which is equally relevant for the success of a transaction, this thesis focuses solely on *bankability* and therefore the perspective of financial institutions that provide debt financing. However, the various risk-return assessments inform and drive the risk allocation of a transaction, a key aspect of any Project Financing. Successful projects allocate the various project risks to the counterparty that is best able to manage them. Figure 7 illustrates the diametric interests of the various project parties and how the different transactional features interplay to achieve a structure that is acceptable to all participants. This is a balancing act and achieved through continuous negotiations and finetuning.¹⁶

¹⁶ To provide some additional explanations. The star on the left signifies the mentioned risk-return assessment by each respective project party. The transaction and negotiation universe implies that there are hundreds of transactional features - due to space constraints only a few selected items are mentioned - that are more or less relevant to each project participant and which will flow into the risk-return assessment of the respective party. The vertical bars in the middle demonstrate for two aspects how interests may be aligned or conflicting for different structural features. Lastly, the star to the right zooms in on the risk-return assessment of the debt providers, which is the bankability assessment. For each feature, financial institutions will have a view on what is acceptable and what is not. If the combination of all these different aspects and their interplay is satisfactory, the transaction is considered bankable.

Figure 7: Illustration of the bankability assessment



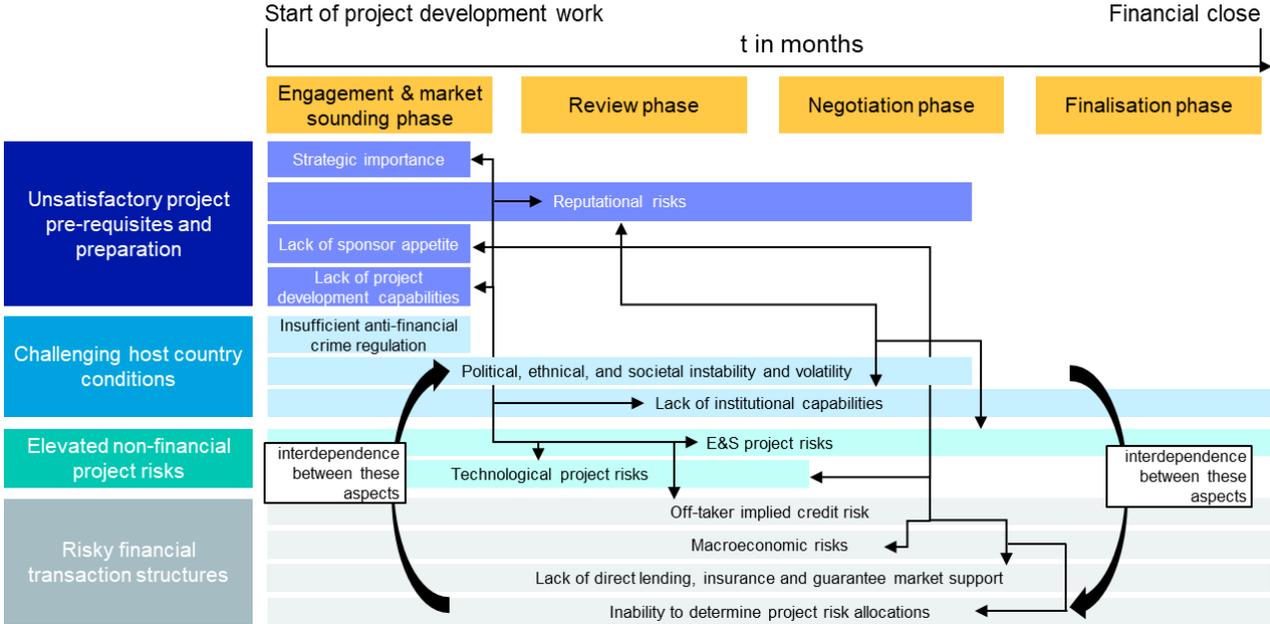
Source: own considerations

This concept sits at the core of this thesis and the next chapters will discuss the challenges for the bankability of renewable energy projects in Sub-Saharan Africa. Based on a systematic literature review, which is described in Chapter 2, the most relevant aspects have been identified and have been grouped in meaningful, coherent categories for their further description.¹⁷

Figure 8 outlines the four major categories and the 13 sub-categories. Furthermore, the length of the project's horizontal bars roughly indicates the relevance of the respective aspect throughout the different project phases (perspective of debt providers). For example, the project is either strategically important for the host country or not and it will become clear to the lenders during the initial engagement and market sounding phase.

¹⁷ The author has chosen to structure the categories according to the similarity of the challenges. Another approach would have been to categorise by counterparty responsibility, i.e. host country government and project sponsors.

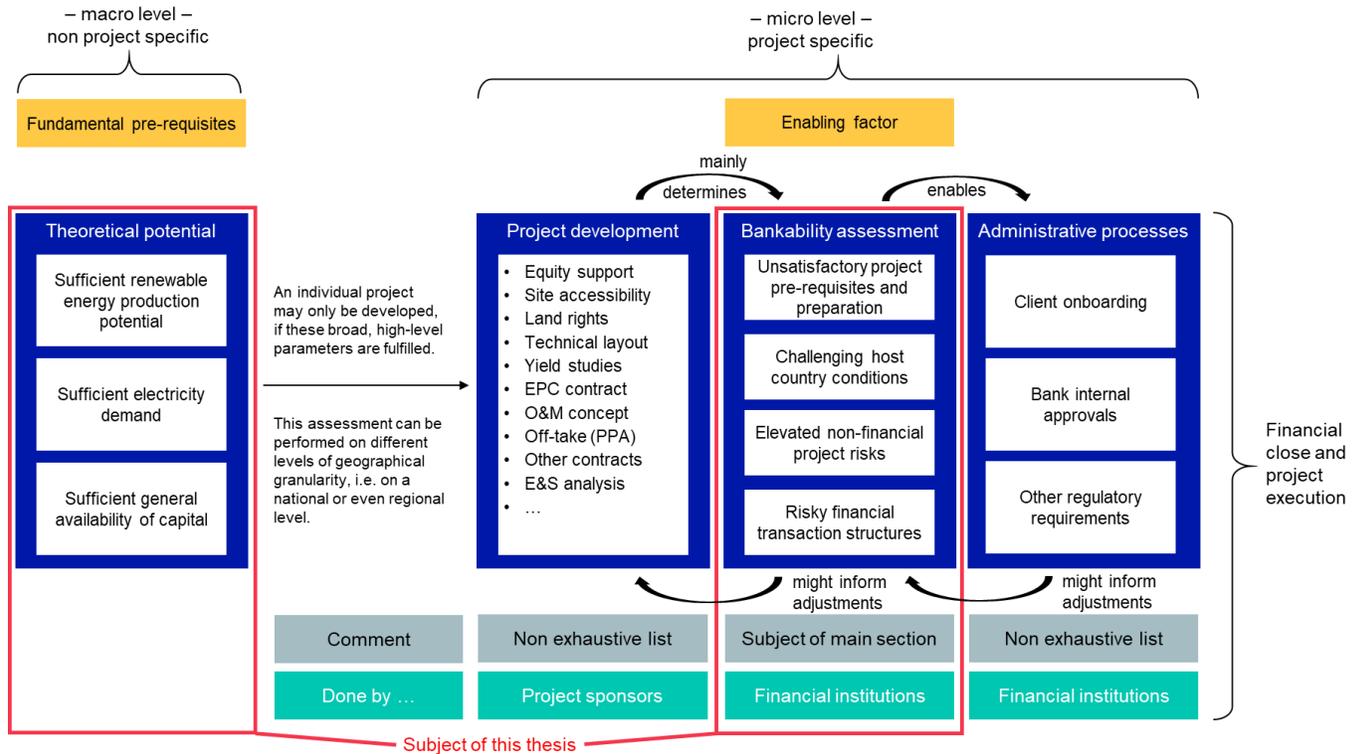
Figure 8: Challenges for the bankability of renewable energy projects in SSA



Source: own considerations

In a broader project development and implementation context (Figure 9), *bankability* must be understood as an enabling factor, which will either allow the financial institution to proceed or not. The project development thereby has a major impact on whether a project becomes bankable or not. For some elements of the project preparation, adjustments might be possible based on an early and continuous engagement with financial institutions, so an interdependent feedback loop might allow project sponsors structural improvements of the transaction to make it bankable (when it was not before). There is also a feedback loop between the bankability assessment and the administrative processes, though it is typically less pronounced. For example, the detailed due diligence might bring credit-related, environmental, or reputational risks to light, which might need to be mitigated to achieve bank internal approvals.

Figure 9: Marco and micro level requirements and processes for transaction success



Source: own considerations

The rest of the thesis is organised as follows. Chapter 2 outlines the systematic literature review to assess the research question at hand. Chapter 3 assesses if the basic requirements for renewable energy asset growth in SSA are in place, namely the prevalent natural conditions, electricity demand and the availability of employable financial capital. Chapter 4 is the main part of the thesis, which presents and analyses the key challenges to RES Project Finance bankability in SSA, while Chapter 5 discusses potential mitigation options. The analysis is summarised in Chapter 6, before final conclusions are drawn in Chapter 7.

2. Systematic literature review to assess the research question

The literature is reviewed in the context of the hypotheses that several root causes impede the realisation of renewable energy Project Finance transactions in SSA. The relevant assessment perimeter is thereby quite specific in that it limits the focus geographically (SSA only), sector-wise (renewable energy power generation only) and financing-structure-wise (Project Finance only). A few reasons limit the availability of suitable literature.

Firstly, Project Finance is not yet a standard structure for financing infrastructure assets in Emerging Market jurisdictions. While variations of Project Finance have been around for hundreds of years, it has only turned mainstream in Developed Markets in the last 30 years (cf. Dentons 2013). Consequently, the number of Project Finance transactions, particularly in SSA, which is largely comprised of low-income countries (World Bank definition), is relatively low (see left side of Figure 10). Hence, there are fewer banks, advisors, law firms, NGOs, financial service providers, information services, associations, think tanks and other stakeholders that are involved in such transactions. Information flow and dissemination is therefore *per se* lower (cf. CEPA 2014, ICA 2018, IMF 2021a).

Secondly, up until now, very few Project Financings in SSA have seen a foreign commercial bank involvement (see right side of Figure 10).¹⁸ While the title is agnostic to whether the Project Financing is implemented by a DFI or a commercial bank, as outlined in Chapter 1, renewable energy growth in SSA needs private finance to take off. Therefore, the commercial bank market perspective is the focus of the thesis (cf. AFC & BCG 2017, CEPA 2014).

Thirdly, the market for renewable energy Project Finance transactions in SSA - though currently small and challenging - is nonetheless competitive. This partially due to the very reason that there few suitable and well-developed projects, which sponsors then focus on. Specific project information is therefore private and confidential.

Fourthly, the thesis is concerned with the challenges to make projects bankable. For this task, the analysis of cancelled transactions would be ideal. However, (i) the number of official aborted projects is low (see right side of Figure 10)¹⁹, (ii) information on these few projects is limited and (iii) a significant number of projects do not even make it to a stage where they are captured by reliable databases. It is also worth noting that (iv) a decent number of

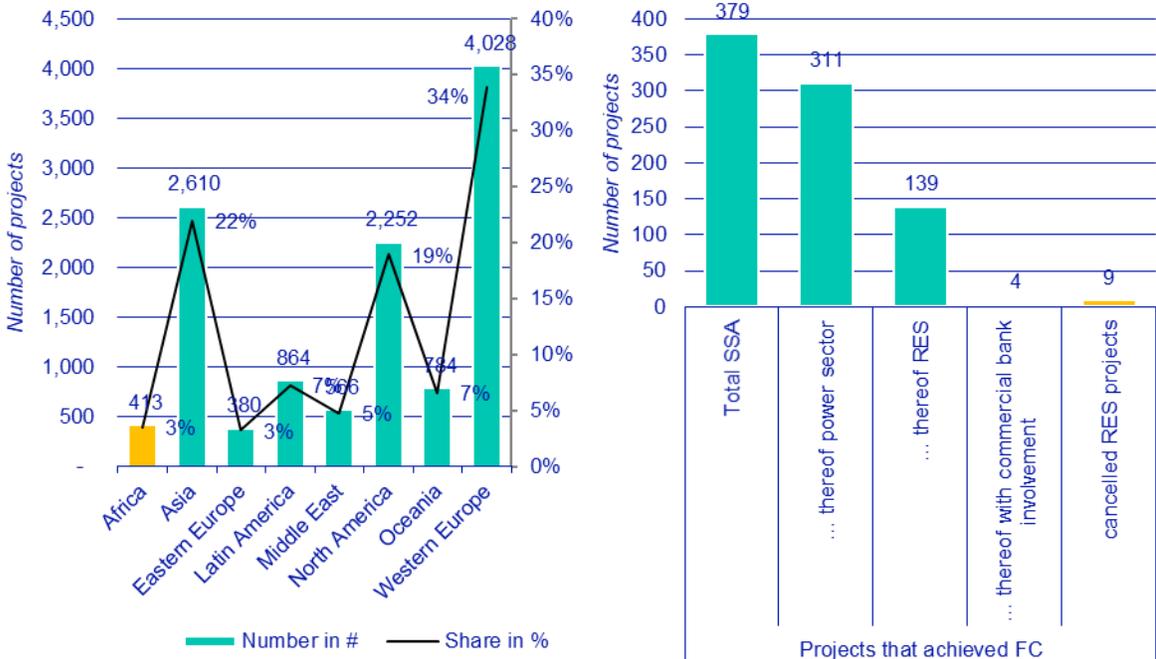
¹⁸ South Africa has been quite successful in implementing renewable energy Project Financings through its *Renewable Independent Power Producer Programme (REIPPP)*.

¹⁹ This figure is the highest of the three cross-checked databases (*Inframation, IJ Global, WBG Private Participation in Infrastructure (PPI)* database).

projects *muddle through*, which is to say that their scope and structure is adjusted multiple times with significant delays, but that they are finally being realised.

Fifth and lastly, neither publicly available (i.e. *WBG's PPI database*) nor private pay-per-use databases (i.e. *IJ Global*) are likely to cover the market comprehensively. It is difficult to identify these projects that *fell through the cracks*.

Figure 10: Project Finance transactions by region and by involvement for SSA



Source: *IJ Global database, Inframation database, Moody's 2019, WBG PPI database*

Due to the aforementioned difficulties, the scope of the reviewed literature is broadened to include related sources that serve as suitable proxies.

For one (i), literature on Project Financings in any sector in SSA is considered, except when the respective topic at hand has challenges idiosyncratic to the renewable energy sector, e.g. technology risks (see Chapter 4.3.2).

Secondly (ii), Project Financings with DFI involvement are analysed. These institutions - due to their public, multilateral mandate - have implemented certain complaint processing mechanism, which trigger - if warranted - independent reviews that are made available to the public. A prominent example is the *Inspection Panel* of the World Bank Group.

Also (iii), transactions that have achieved financial close will be of relevance as their preparation, implementation and operation might still showcase challenges that made the financing process cumbersome. It is often a fine line between projects pushing through to financial

close or not. Issues that were overcome due to, for example, sponsor persistence, might make the transaction fail in a slightly different set-up.

Lastly (iv), not all sources consistently differentiate between all of Africa and Sub-Saharan Africa. Though North Africa is ethnically and culturally quite distinct (strong Muslim and Arab character), the economic and institutional parameters, which have a strong influence on the bankability of Project Financings, are quite similar.

In terms of the type and eligibility of used sources, the author tried to resort to recent (last five years) working papers, reports, and press articles. Main reason for this is the actuality of the topic and the dynamic nature of the financial markets. Thereby due care was taken to consult reliable sources. These include (i) DFIs, like the *AfDB*, *IMF* and *World Bank group*, (ii) other multilateral organisations, like the *OECD* and *IEA*, and (iii) reputable specialised NGOs, consultancies, and agencies, like *Transparency International*, *McKinsey & Company*, and *Moody's*. For press articles, either reliable publishing houses were used, or the finding was double checked via at least two separate sources. Lastly, to derive transactional data to inform certain diagrams, *IJ Global*, *Inframation* and the *WBG PPI*, three well-known industry project databases, were used.

To identify suitable literature, in a first step, pertinent words like '*infrastructure*', '*renewable energy*', '*Sub-Saharan Africa*', '*Project Finance*', '*infrastructure financing gap*', were used in different combinations in a *Google Scholar* search. This yielded hits on recent high-quality studies from DFIs, like the *IMF* and the *WBG*. Bibliographies as well as cited project case studies and examples allowed the identification of further relevant literature. For more specific topics, e.g. insights on the *PRI* insurance market, a standard *Google* search with relevant keywords was performed. To give anecdotal evidence on past or live transactions the project databases served as a starting point. After filtering for suitable projects ('*primary financing*', '*SSA*', '*Renewables*', '*past 5 years*') the transaction information was assessed and additional press articles were searched via *Google* using the project name, location, names of the project sponsors and other idiosyncratic project parameters.

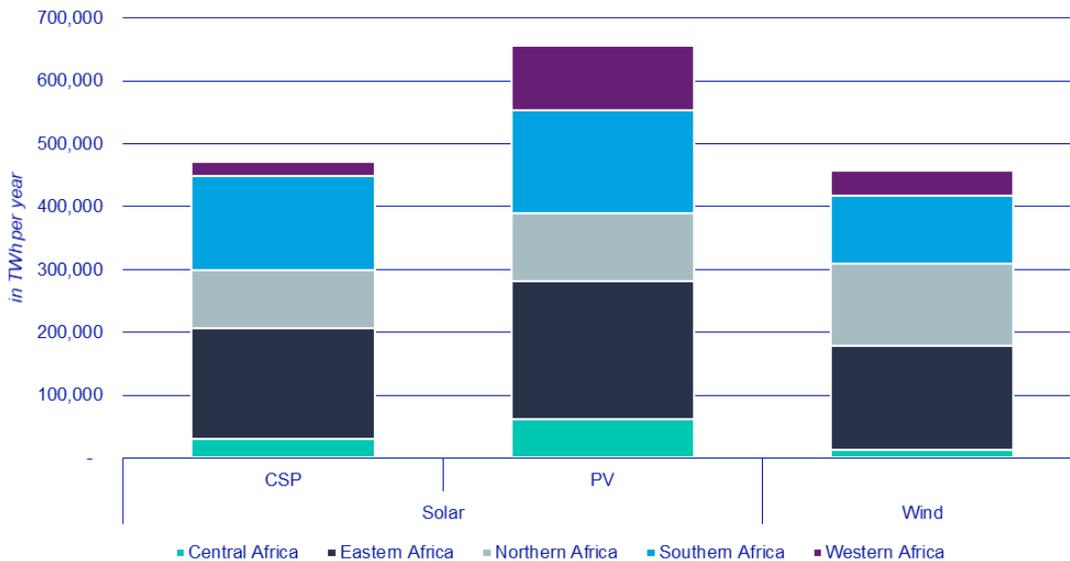
3. Fundamental pre-requisites - RES potential, power demand, and private capital

To rule out that fundamental pre-requisites impede renewable energy deployment in SSA, this section assesses the theoretical potential of renewable energy technologies in the region, the forecasted electricity demand growth, and the general availability of financial capital.

3.1. Renewable energy potential in Sub-Saharan Africa

The pertinent study, which assessed renewable energy potential in SSA, was published by the *International Renewable Energy Association (IRENA)* in 2014. It identified immense potential for solar PV (c. 657,000 TWh p.a.), solar CSP (c. 472,000 TWh p.a.) and onshore wind (c. 458,000 p.a.)²⁰ energy (Figure 11). To put this potential into perspective. The *IEA* estimates that c. 84 TWh of electricity p.a. will be produced from solar PV by 2030 under the *Stated Policies Scenario*²¹. This figure would not even be visible in perspective to the theoretical potential in the chart below (cf. IEA 2020, IRENA 2014).

Figure 11: Theoretical renewable energy production potential in SSA



Source: IRENA 2014

²⁰ The study does not explicitly differentiate between on- and offshore wind in its nomenclature, but the former is meant.

²¹ The *IEA* defines this scenario as follows: “The *Stated Policies Scenario* reflects the impact of existing policy frameworks and today’s announced policy intentions.” (IEA 2019b) While the *IEA* has recently also developed an *SDG Scenario*, a granular electricity capacity and production forecast is not yet available for it.

The study did not include an analysis for hydro and geothermal energy sources, however *IRENA* estimates that more than 90% of Africa's hydroelectric energy potential was untapped in 2014 and that its geothermal potential stands at c. 15 GW (cf. *IRENA* 2016).²² For reference, the *IEA Stated Policies Scenario* requires 21 additional GW of hydro power and 3 GW of geothermal energy sources.

It may therefore be concluded that Sub-Saharan Africa offers an abundance of theoretical renewable electricity production potential and that the resource availability poses no bottleneck to its growth.

However, there are many different reasons, why theoretical renewable energy potential does not translate into actual capacity and production. The next two sub-chapters (Chapters 3.2 and 3.3) look at the other fundamental, macro-level pre-requisites for renewable energy capacity growth, namely the demand for electricity and the general availability of funds. The remainder and core of the thesis then looks at the micro-level, project-specific challenges that impede RES capacity growth.

3.2. Electricity supply and demand outlook for Sub-Saharan Africa

Main drivers of electricity demand are population and economic growth. The *IEA's* electricity demand projections for Africa under the *Stated Policies Scenario* are depicted in Figure 12²³. The *IEA* forecasting methodology does thereby not differentiate between supply and demand, as electricity supply is modelled to meet projected demand.²⁴

As of 2018, SSA had a significant share of renewable electricity generation capacity (left side of the figure) but is expected to almost double this figure to c. 39% in 2030, which is estimated to not even be ambitious enough to comply with the *SDGs*. The underlying installed capacity figures for renewables are 48 GW in 2018 and 154 GW in 2030 and 244 GW and 400 GW respectively for the total electricity production capacity. So, the RES capacity is estimated to triple implying a staggering *Compounded Annual Growth Rate (CAGR)* of 10.2% (versus 4.2% for the total capacity). The trend is broadly mirrored by the RES

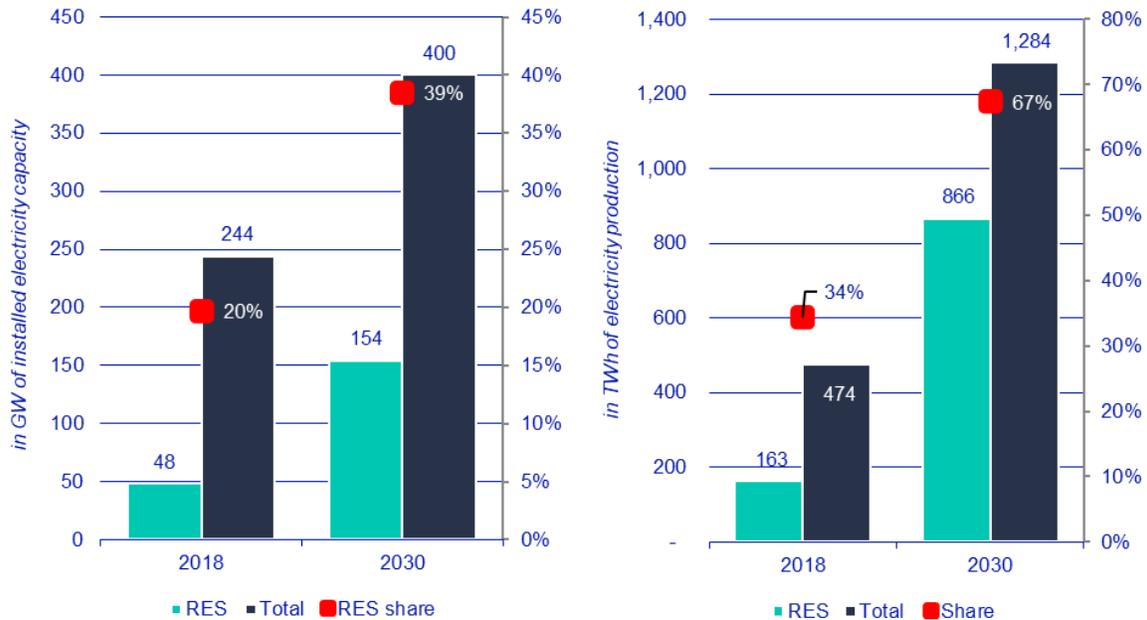
²² There are various other sources confirming these abundant renewable energy resources. The *IEA* for example mentions a new analysis in its *Africa Energy Outlook 2019* that estimates an annual hydropower potential of 1,120 TWh in just 12 countries on the continent even under consideration of environmental constraints (cf. *IEA* 2019a).

²³ Neither SSA regional data is available nor a breakdown for single countries. Consequently, growth projections for all of Africa, incl. North Africa, are being used as a proxy for SSA.

²⁴ The modelling assumptions are thereby aligned to the stated policies and the theoretical energy input potential.

production growth (right side of the figure), which is estimated to increase from 163 TWh in 2018 to 866 TWh in 2030. This quintupling implies an even higher CAGR of 14.9% driven by an increase in the average capacity load factor.²⁵

Figure 12: Electricity demand and supply growth in Africa



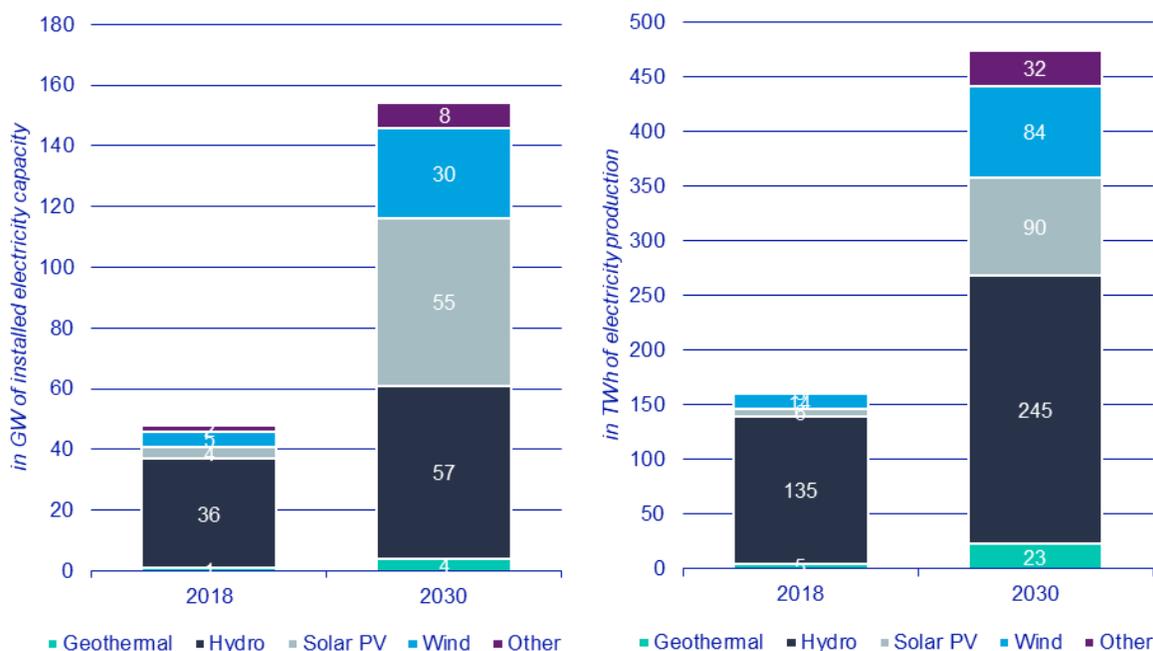
Sources: IEA 2020

In terms of renewable technologies, solar PV, onshore wind, and hydro power are expected to deliver the bulk of the capacity and production growth. CAGRs are 24%, 16% and 4% for capacity and 25%, 16%, and 5% for production. The respective *multiples* are c. 14x, 6x, and 1.6x for capacity and 15x, 6x, and 1.8x for production.

Figure 13 gives a break-down of the renewable energy mix as estimated by the *IEA*. It should be noted that the relatively low growth rates in hydro must be considered in light of the significant operational hydro energy capacity. In 2018, it constituted c. 75% of the total installed RES capacity and c. 83% of the total renewable energy production on the continent. Consequently, while growth rates are lower than for other technologies, absolute capacity, and production figures in 2030 make hydropower the key RES technology for SSA next to solar PV and onshore wind.

²⁵ This is the utilisation rate of the power production asset. It is expressed as a percentage with the estimated or actual annual hours of production of the respective power plant in the numerator and the maximum annual hours of production (8,760 h) in the denominator.

Figure 13: Electricity capacity and production technology mix in Africa



Sources: IEA 2020

3.3. General availability of financial capital for energy projects in SSA

There are numerous external private finance parties that cover SSA (see Figure 1 for an exemplary selection). They may be either project sponsors providing *equity*, usually corporations or specialised funds, or financial institutions providing *debt*.

For some of these entities, the financial capital is highly fluid and not generally earmarked for SSA. International banks will for example determine maximum risk appetite limits, which function as a ceiling for their exposure, but will not specifically set aside capital to be employed in SSA. For them, it is an opportunistic assessment vis-à-vis other options to deploy their capital.

By contrast, specialised equity investment funds may have raised capital explicitly for employment in SSA. In the short-term, these funds are earmarked. In the mid- to long-term however, any capital provider will benchmark the risk-return proposition of the renewable energy Project Finance asset class in SSA against alternatives in other regions and sectors. So unlike DFI and bilateral donor funds, private commercial capital will seek the most attractive, accessible employment.

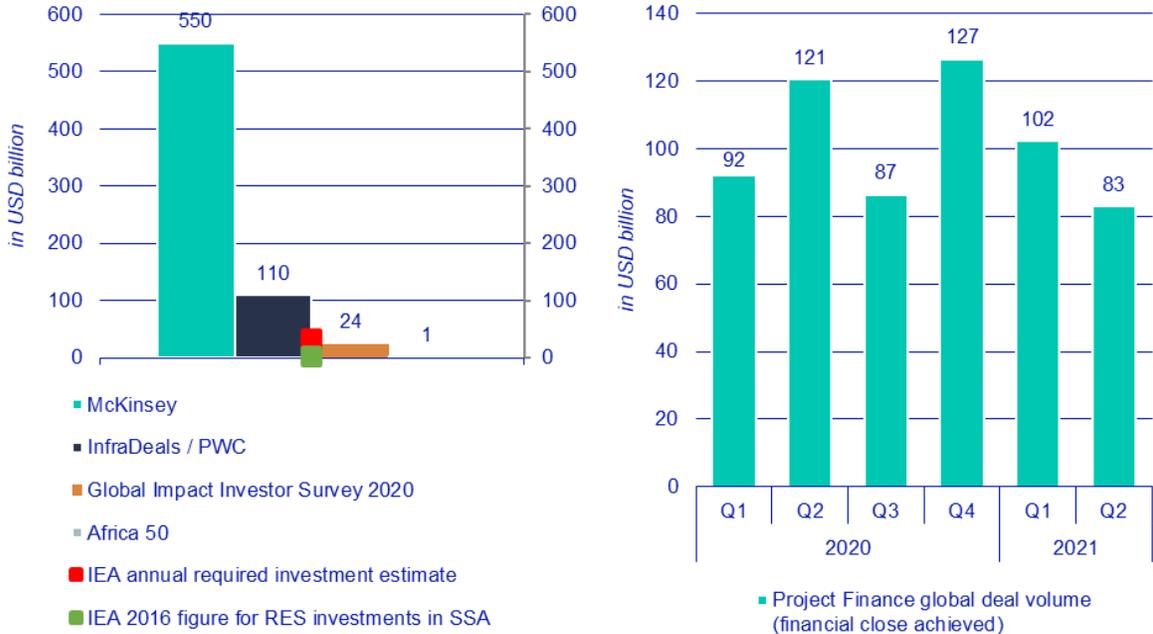
While the low-interest rate environment in OECD countries and the resulting hunt for yield might push investors into alternative asset classes, like renewable energy projects in SSA,

the relative attractiveness of the risk-return profile remains key. For the various assessments throughout the thesis, it is therefore relevant, whether discussed risks are idiosyncratic to SSA and elevated in comparison to other jurisdictions, in absolute and relative terms.

It is difficult to find reliable data on capital earmarked for infrastructure investing and financing in SSA, and more particularly for the renewable energy sector. The left diagram in Figure 1 depicts the publicly available datapoints. *McKinsey* estimates that capital of USD 550 billion is available for infrastructure funding in Africa (cf. McK 2020). A 2017 report by *PWC*, the accounting and financial advisory firm, mentions that “US\$ 110bn of dry powder is available to deploy globally from unlisted equity funds” (PWC 2017, p. 13). The *IMF* notes that 11% of global impact investor funds of USD 221 billion are allocated to SSA (cf. IMF 2021a, p. 38). These figures are not directly comparable as one encompasses both equity and debt capital sources for Africa, another is limited to available equity capital in unlisted fund vehicles worldwide and the third focuses on impact investors only. All three datapoints neither focus on Sub-Saharan Africa nor on the renewable energy sector. Though it represents a single entity only, the figure also depicts the capital subscribed to *Africa50*, a pan-African organisation backed by the AfDB and 20 African states. It stands at c. USD 783 million and 90% of this amount is earmarked for Project Finance transactions. Up until now, c. 50% of its capital has been committed to 7 projects (cf. Africa50 2019).

For reference, the *IEA* estimates that USD 32.5 billion of annual investment is required to achieve 100% electricity access for the entire African population by 2030. The actual investment into renewable energy in SSA in 2016 amounted to USD 2.1 billion (cf. IEA 2020).

Figure 14: Availability of capital for renewable energy assets in SSA



Source: Africa50 2019, IEA 2020, IJ Global database, McK 2020, PWC 2017

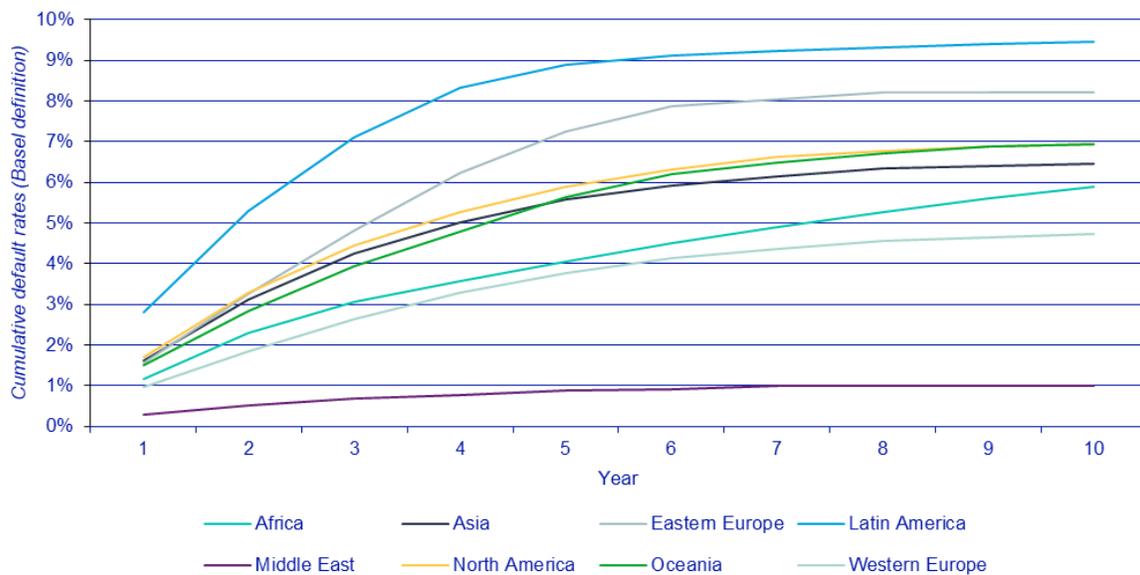
The right-hand side of Figure 14 depicts the volume of Project Finance transactions globally that achieved financial close in each respective quarter in the past one and half years as reported by *IJ Global*, a specialised industry database. If all renewable energy investments in SSA in 2016 had raised Project Finance debt, they would have still only comprised 0.5% of the total global PF market volume in 2020.

While these are crude comparisons involving datapoints that are difficult to relate to each other, available capital seems to be abundant. This assessment is confirmed by the analysis of the reviewed literature. Not a single paper or article, mentions the *general* availability of funds as a bottleneck for the expansion of project-financed renewable energy assets in SSA. However, as we shall see in subsequent chapters, these transactions are not necessarily the most attractive option for capital employment.

4. The enabling factor – project bankability and its challenges

Most bankability aspects²⁶ discussed in this thesis essentially feed into the transactional credit risk profile, which tries to estimate the ability of the project company to repay its debt obligations. In case a project fails to repay, it is considered a default. Figure 15 shows the cumulative project default rates for all regions worldwide from the previously mentioned benchmark study by *Moody's*.²⁷ It is interesting to note that Africa shows the third lowest trajectory, after the Middle East and Western Europe (cf. *Moody's* 2019).

Figure 15: Cumulative default rates of Project Finance transactions by region



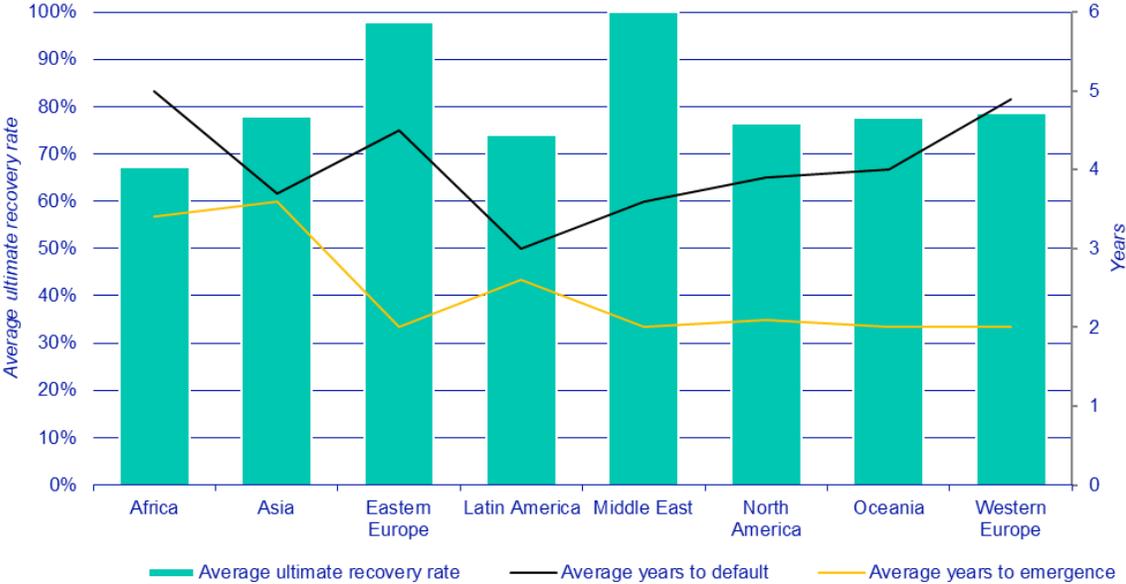
Source: *Moody's* 2019

However, equally relevant for financial institutions are (i) the *time of emergence from default* and (ii) the *ultimate recovery values* once a project fails. These are depicted in Figure 16 and identify Africa as the worst performer (cf. *Moody's* 2019).

²⁶ Exceptions are Chapters 4.1.2 (reputational risks) and 4.1.3 (sponsor appetite). The former does usually not impact the economic performance of a transaction and the latter is a pre-requisite without which the project could not even be assessed by lenders.

²⁷ For each analysed transaction, the cumulative default rate is set to zero at financial close and the rates are subsequently summed up for all years. As mentioned before, this is a comprehensive study capturing 8,257 projects across all sectors and regions over 35 years (1 January 1983 to 31 December 2017), thereby covering an estimated 69.4% of the total global PF market over this period (cf. *Moody's* 2019).

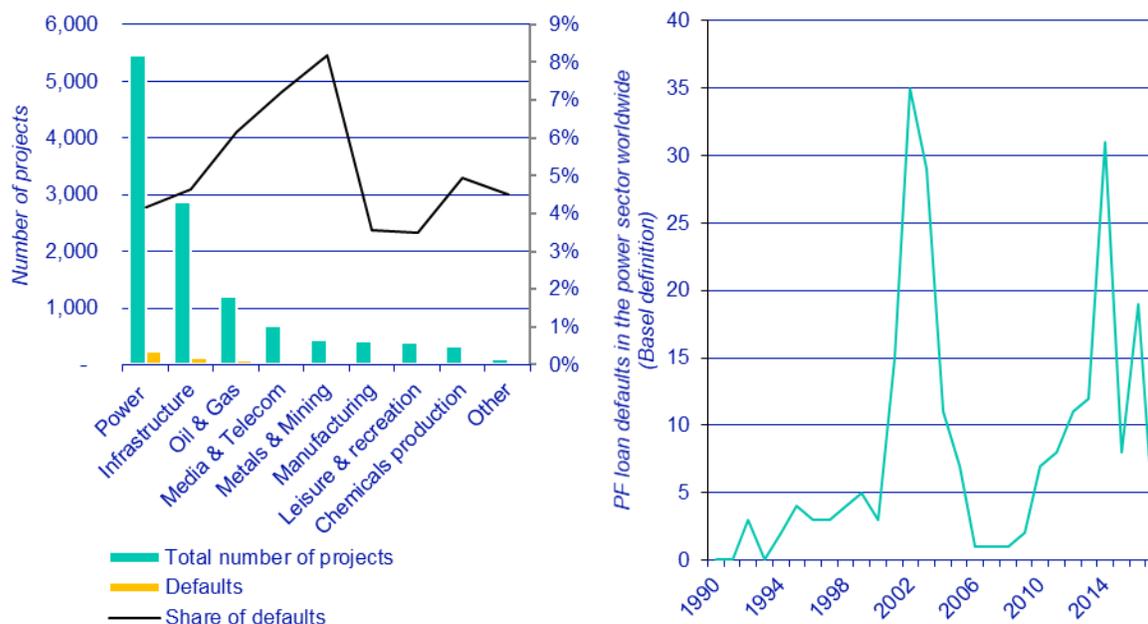
Figure 16: Ultimate recovery rates and years to emergence for PF transactions



Source: Moody's 2019

Lastly, it is worth looking at sector default rates. The left side of Figure 17 shows the total number of projects in each sector, the PF loan defaults, and their share in the aggregate (right axis). The right side depicts the number of defaults in the power sector over time. While this data does not allow conclusions about idiosyncratic Project Finance risk in the renewable energy sector in SSA, it does permit to infer that (i) the sector itself is relatively attractive (high number of projects and low default rates) and that (ii) market cycles were a main determinant of project success.

Figure 17: Project Finance transaction defaults by sector



Source: Moody's 2019

Considering all aspects, Project Finance transactions in Africa have a decent track record. Nevertheless, as discussed in the introduction, they are rare. This is no contradiction. In fact, the next chapters will outline why few projects are attractive enough to be implemented. It does not dispute that the ones that do, are comparable in quality to transactions in other jurisdictions and sectors, as the data above suggests.

4.1. Unsatisfactory project pre-requisites and preparation

The following challenges are mainly the responsibility of the project sponsors in the early scouting phase of the transaction. Some of these aspects are interdependent with the host country conditions, which will be assessed in Chapter 4.2.

4.1.1. Strategic importance of the project

A fundamental pre-requisite for the success of infrastructure projects is their strategic importance. In an SSA-focused report, the *African Finance Corporation (AFC)*, a Nigeria based, African-led financial institution²⁸, and *Boston Consulting Group (BCG)*, a consulting firm, note that “private investors often complain of governments’ lacking the political will to

²⁸ The AFC is majority owned by private investors, in particular African financial institutions. However, it still has a strong public impetus due to a c. 45% ownership by the *Nigerian Central Bank*.

drive private investment in infrastructure” (AFC & BCG 2017, p. 23). The *OECD* opines that *“infrastructure is too often not prioritised to optimise private finance”* (OECD 2020, p. 28). In this context, the *Global Infrastructure Hub* (GIH), which publishes best practices for infrastructure implementation, highlights the importance of long-term infrastructure planning to focus political ambitions and to provide clear guidance to project developers (cf. GIH 2019). Though most African countries have published some sort of a *National Development Plan* (*NDP*) in the past few years (cf. Chimhowu, Hulme & Munro 2019), a majority is either not fit for purpose or is not being adhered to. Main reason is the missing link to state budgeting processes. In fact, most development plans do not even have a project priority list. A lack of political commitment and prioritisation implies longer project development lead times and higher costs for sponsors.²⁹ *Tyson* for example notes that *“the average developing country infrastructure project preparation time is seven years”* (ODI 2018, p. 9). Sponsors are also at risk of development cost write-offs in case a project is aborted altogether.

4.1.2. Reputational risks associated with the project

Public reputation is an important consideration for financial institutions to maintain a positive brand image, avoid legal disputes and to ensure mid- to long-term profitability. *Garnelo-Gomez et al.* note that a positive reputation increases (i) employer attractiveness on the job market, (ii) implies an above industry average profitability, and (iii) is correlated with the financial success of the institution (cf. Money et al. 2017). *Pohl & Zaby* find through direct feedback from 23 banks in Germany and Switzerland in 2017, that reputational risks are considered equally or even more important than credit and market price risks, which are integral risk factors of banking operations, by 87% of the respondents (cf. Pohl & Zaby 2019). The growing importance of the internet, social media and well-organised NGOs shaping local resistance and public opinion, has amplified the importance of this topic.³⁰ Even partially or completely unfounded negative news can be difficult to rebuke and undermine the public image of an institution’s integrity and trustworthiness (cf. Garnelo-Gomez et al. 2017).

²⁹ Sponsor representatives will incur higher travel and staff costs to negotiate and align with host country counterparties. Other non-cost implications, like *sponsor management fatigue* or a deterioration in host country conditions effectively closing a *window of opportunity* to implement a transaction, should also not be underestimated.

³⁰ In the survey by *Pohl & Zaby*, 74% of participating banks stated that the importance of this risk category has grown in the past 10 years (cf. Pohl & Zaby 2019).

Reputational risk management is also a regulatory requirement under national directives that have been implemented based on the recommendations of the *Basel III banking supervisory framework* of the *Bank for International Settlements (BIS)* ³¹.

The above considerations are reflected in how banks define reputational risks. As an example, *Deutsche Bank*, Germany's largest bank by balance sheet size, describes it as follows:

“... risk of possible damage to *Deutsche Bank's* brand and reputation, and the associated risk to earnings, capital or liquidity arising from any association, action or inaction which could be perceived by stakeholders to be inappropriate, unethical or inconsistent with the *Bank's* values and beliefs.” (Deutsche Bank 2017)

The following reputational risk factors are typically considered by financial institutions, though this list raises no claim to completeness (cf. Deutsche Bank 2017, Garnelo-Gomez 2017, IMF 2016):

- **Counterparty profile risks:** concerns in this category could be financial crime (e.g. money laundering and proliferation financing allegations) or sanctions and embargoes related ³².
- **Structure and terms of the transaction:** the transactional security or shareholder structure could be opaque, e.g. involving ownership titles via offshore jurisdictions like the *Channel Islands*.
- **Country risks:** aside country risks that can have a financial impact on the transaction, like macroeconomic and political risks (see later chapters), a project might also entail reputational country risk, for example if it is a highly visible asset in a jurisdiction that is known for human rights violations and infringements.
- **Environmental & social risks:** This category comprises of a variety of risk factors, which are particularly pertinent to Project Finance transactions as (a) financing proceeds always fund a ring-fenced, clearly defined project and (b) are typically greenfield (new development and construction). It would exceed the scope of this thesis to provide an overview of all E&S risk factors, however the following are usually of relevance in renewable energy project financings: (i) noise and air emissions, particularly during the construction phase; (ii) health and safety of construction and operational staff as well as the residents in the vicinity of the project perimeter; (iii)

³¹ The *BIS* is essentially the *Central Bank of the Central Banks*.

³² Even indirect and remote exposure to supplies from or the involvement of sanctioned entities could pose a potential risk.

physical resettlement and economic displacement of *Personally Affected People (PAP)*; and (iv) negative impacts on the local and regional biodiversity during the construction as well as operational phase of the project, under consideration of mid- to long-term ripple effects, e.g. *multiannual changes in regional temperature patterns* due to the construction of a large dam for a hydro power production.³³ To be clear, though they stem from the same risk factors (see above), E&S reputational risks are not the same thing and should not be confused with E&S risk mitigation requirements throughout the lifetime of the project, which are identified in the E&S due diligence phase (see Chapter 4.3.1).³⁴

4.1.3. Lack of sponsor appetite

While a project financing is always a complex interplay of different counterparties³⁵ in which each stakeholder must play their part, the (i) project sponsor(s) and (ii) *Engineering, Procurement, and Construction (EPC)* contractor are the most important parties in developing the project. The sponsors are the engine of the whole endeavour as they originate the project. Without their interest to earn an attractive risk-adjusted return and their willingness to -

³³ Another major reputational risk factor is the transaction sector and industry, i.e. gold mining. As renewable energy is not considered a high-risk industry *per se*, this information is just given for reasons of completeness.

³⁴ A recent, prominent example of reputational risks impeding the financing of a large-scale project in Sub-Saharan Africa is the *East African Oil Pipeline*. A consortium consisting of *Total*, *CNOOC*, the *Uganda Oil Company* and the *Tanzanian Oil Company* intends to construct a c. 1,450 km long, electrically heated oil pipeline from upstream assets in the *Lake Albert National Park* to the Tanzanian port city of *Tanga*. The consortium is advised by the Japanese bank *SMBC* and the law firm *Clifford Chance*. Although the project has been subject to an extensive E&S due diligence according to the *Equator Principles* and *IFC Performance Standards* (see Chapter 4.3.1), it has been under continuous scrutiny from NGOs (see for example the open letter from 263 civil society organisations to numerous international banks (cf. BankTrack 2021)). Aside a general tendency amongst financial institutions to divert financings to ESG compliant projects in recent months, the reputational risks involved in the transaction will have likely played a role in major French banks (*BNP Paribas*, *Société Générale*, *Crédit Agricole*) rejecting a participation in the financing. They declined, even though a French oil major is involved as an equity sponsor and though the project benefits from high-level political support (the *French President Macron* visited the country in August). Previously, *Barclays*, *Credit Suisse*, *ANZ*, the *AfDB*, and the *British Export Credit Agency UKEF*, which would have been relevant to provide political and commercial risk cover to participating banks, decided to abstain from the project. Though it seems that the project is nonetheless progressing, the decline of these well-known and reputable financial institutions will make it substantially more difficult to arrange the financing (cf. GTR 2021).

³⁵ Revisit Figure 4 in Chapter 1.1 for the depiction of a typical Project Finance structure and its main stakeholders.

at least partially - fund the development work and provide an equity contribution³⁶ from their own cash flow, no transaction would surpass the idea stage (cf. IMF 2021a).

The EPC contractor is just as pivotal.³⁷ Sponsors will pass on major project risks back-to-back, thereby transferring significant obligations and liabilities to the contractor. While its financial payment obligations, e.g. in case of project delays, will contractually be capped through *liquidated damages*, an insufficient performance can lead to financial distress and even insolvency.³⁸

Both types of counterparties are typically commercial enterprises that require an attractive risk-adjusted return relative to other asset classes and transactions. Sponsors are typically organised in consortia, comprising (i) *strategic investors*, essentially corporations, whose operational business is concerned with the project at hand, (ii) *financial investors*, whose main business is the investment of capital entrusted to them or (iii) a combination of both.

In the renewable energy space, examples for (i) are *EDF Renewables*, *ENEL Green Power* and *Acciona*. This category might also include (a) *Original Equipment Manufacturers (OEMs)*, like *Vestas Wind Systems*, the leading global manufacturer of wind turbines, and (b) *EPC contractors*, like *Larsen & Toubro* and *Siemens*. Though taking equity stakes is not the primary business purpose of these project parties, they will sometimes do so to enable their realisation (cf. IMF 2021a, IRENA 2016).³⁹ Examples for (ii) are *Meridiam*, the asset management division of *Macquarie*, and the *Old Mutual Group*.

To assess the attractiveness of SSA infrastructure projects as an asset class, the *IMF* compares *African Private Equity* and *Venture Capital* returns to other benchmark indices (cf. IMF 2021a, p. 27). The data is replicated in Figure 18. These are returns relevant for financial investors that accessed the asset class through fund structures. It is visible and the *IMF*

³⁶ Project Financing structures differ substantially. In some jurisdictions and sectors that have a good transactional track record, a *cash equity contribution* might not be required. However, alternatives, like *equity bridge loans*, that might be arranged to fund the equity instead, will still require recourse to the sponsors. Consequently, though it might differ in size and form, sponsors will always need to back up the equity portion of a Project Financing.

³⁷ A Project Financing does not necessarily require an EPC contractor. In some jurisdictions and for proven technologies, transactions can be bankable in a multi-contractor approach. However, in SSA, banks will currently still require an EPC Contractor as it reduces project complexity.

³⁸ The EPC contractor usually takes the construction risk on a fixed price basis, which leaves it with sub-supplier risks (production, delivery, etc.), technical design risk (plant performance, etc.), health & safety risks, and employee related risks (staff availability, quality, etc.). This list is by no means complete and is solely intended to demonstrate the importance of the EPC contractor, without which the project could - quite literally - not materialise (cf. Dentons 2013, IMF 2021a).

³⁹ Basically, the OEMs sustain and broaden their own supply markets with this practice.

indeed concludes, that “*financial returns in Africa seem to have underperformed comparable benchmarks in the past two decades*” (IMF 2021a, p. 27). It is interesting to note, that the *S&P 500 Index*⁴⁰, which is easily accessible for even unsophisticated investors through *Exchange Traded Funds (ETFs)* significantly outperformed the *Africa Private Equity and Venture Capital Index* in 5 out of the 6 depicted periods. Only over the longest period of 20 years did the latter fare better than the former.⁴¹ However, the spread is slim and stocks of *US blue chip* companies, which the *S&P Index* is comprised of, are certainly a less risky investment.

Figure 18: Private Equity and Venture Capital returns in Africa

Index	1-year	3-years	5-years	10-years	15-years	20-years
Africa Private Equity and Venture Capital Index	4.7	5.8	2.7	4.9	6.0	6.6
US Private Equity Index	18.6	16.8	14.2	15.9	13.3	11.4
Cambridge Associates LLC US Venture Capital Index	19.3	16.2	12.1	14.6	11.0	6.6
MSCI Emerging Markets Index	18.9	12.0	6.0	4.0	7.9	7.0
MSCI World Index	27.7	12.6	8.7	9.5	6.9	4.5
S&P 500 Index	31.5	15.3	11.7	13.6	9.0	6.1

Source: IMF 2021a, p. 27

The explanations for these relatively low returns are seen in (i) the *2014 commodity price collapse* and the associated currency depreciations of African countries, (ii) less aggressive investment strategies due to the operations in higher risk jurisdictions, and (iii) the lower number of attractive projects, which results in more intense competition.

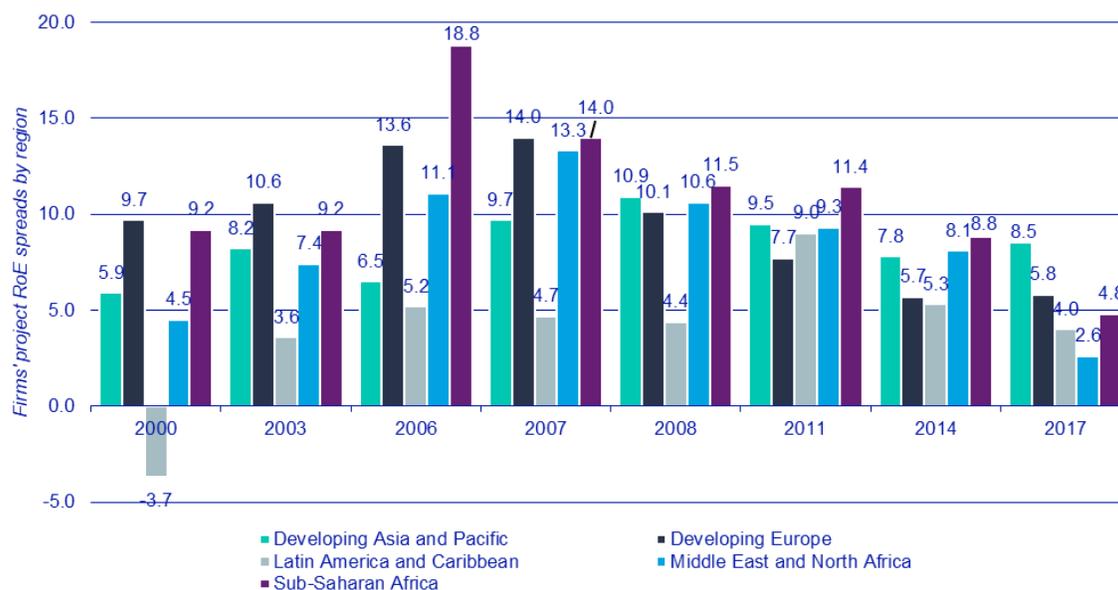
The *IMF* also looks at project and company returns of firms that are operating locally with foreign capital (cf. IMF 2021a, p. 28). Using this company-level data, Figure 19 depicts the spread between project equity returns⁴² and risk-free rates in the respective jurisdiction, which are typically short-term sovereign bonds that have - even in Africa - a low likelihood to default. There two things worth noting: (i) In SSA, spreads have fallen sharply since the *Commodity Crisis* in 2014. (ii) In 2017, the latest year for which the data is available, annual median spreads are at the lower end compared to other Emerging Market jurisdictions.

⁴⁰ A major stock index tracking the performance of the 500 largest corporations in the United States.

⁴¹ The likely explanation for this is the *Global Financial Crisis (GFC)* of 2008 and 2009. It likely fell in the 5-year period between the 15-year and the 20-year data range.

⁴² Expressed as the *Return on Equity (RoE)*.

Figure 19: Firms' project level RoE spreads in Africa



Source: IMF 2021a, p. 29

Aside expected returns, there are further relevant considerations for investors, namely **(i)** the *exit potential*, **(ii)** the *project size* and **(iii)** the *time to implementation*.⁴³

On **(i)**, the IMF notes that an “*investment exit seems to be more difficult in SSA than in other regions*” (IMF 2021, p. 29). This is suggested by an average increase in the time to exit a transaction (from c. 5 years in 2007 to c. 6.5 years in 2017), indicating difficulties to sell at the right price. It is backed up by private equity investor survey results from 2020, wherein 76% of respondents identified *exit risk* as the key challenge for transactions in SSA for the next three years. Reasons given are (a) comparatively underdeveloped and illiquid financial markets, (b) weak commercial, judicial, and regulatory host country conditions (see Chapter 4.2 for further analysis) and (c) limited *capital account openness* (see Chapter 4.2 also) (cf. IMF 2021a).

On **(ii)**, it should be noted that Project Finance transactions require the preparation of substantial *due diligence material* (commercial, legal, technical), which is costly and time-consuming to produce. The IMF estimates that, depending on the sector, project preparation costs “*can be as high as 4-10 percent of the total investment for infrastructure projects in Africa*” (IMF 2021, p. 40). While there is no official, industry-wide minimum cut-off threshold

⁴³ It should be noted that only idiosyncratic risks associated with investing in SSA are relevant for the analysis in this thesis. *Extreme weather risks* are for example only of relevance in case they are particularly elevated in Africa vis-à-vis other regions globally.

for a Project Finance transaction size, the *IMF* reckons that most private equity investors will target transactions of more than USD 100 million (cf. *IMF* 2021, p. 40). This is in line with the preference of international financial institutions, as the significant internal resources that need to be employed for a transactional due diligence do not change with project size.⁴⁴ Consequently, relatively small RES projects, e.g. 10 to 20 MW solar PV installations, may usually not target Project Finance debt (cf. *IMF* 2021a).⁴⁵

Chapter 4.1.1 already commented on **(iii)**, the long lead times for Project Finance transactions in SSA. Engaging into these transactions takes a lot of stamina, patience, senior management support and a sufficient development budget.

Lastly, it should be noted that *perceived risks* differ from *objectively assessed risks*. As decisions are largely based on the former, it can negatively impact project involvement. As a proxy for the investment risk *perceived* by the wider investor universe, the *IMF* cites a recent survey, which revealed “that 81 percent of impact investors perceived overall investment risk as likely or very likely to have changed as result of the pandemic due to macroeconomic, liquidity, and currency risks” (*IMF* 2021, p. 30).⁴⁶ Perceived risk is an underlying psychological factor, which may affect decision making on all levels of an organisation. It is thereby an overlay to how the various risk factors that will be discussed throughout the thesis are being processed. It not only affects sponsors. In fact, all project parties are prone to a misjudgement of *perceived* versus *objectively assessed* risk.

Overall, it may be concluded that SSA’s risk-return attractiveness is comparatively weak, limiting the appeal for investors to engage in projects in the region. *ODI* puts it more bluntly by stating that “investors respond to political and macroeconomic risk by not investing” (*ODI* 2018, p. 11).

4.1.4. Lack of project development capabilities

Another early-stage impediment to the development of infrastructure projects in SSA is the lack of local project development capabilities. The *IMF* notes that “governments, local

⁴⁴ Typically, risk-adjusted, and absolute revenue potential is higher for larger transactions, so the *ratio of income to review cost* improves with size. As lenders rely on project cash flows in Project Finance transactions, a detailed analysis is always required. In case non-standard structural elements are involved that add significant complexity, i.e. cross-border power offtake, this due diligence extends even further in scope.

⁴⁵ An exception are project portfolio financings. However, they are negligible in number due to their complexity (various projects need to be progressed and prepared in parallel to reach financial close in a broadly similar timeframe).

⁴⁶ The *pandemic* means the outbreak and spread of the COVID-19 virus in 2020.

institutions, and project managers lack the technical capability [...] to prepare projects to the standards required by private sponsors and financial investors” (IMF 2021, p. 40). McKinsey also highlights the low technical capabilities as a major factor hindering project implementation (cf. McK 2020). A root cause of this deficiency is the quality of public tender documents. For a well-managed publicly tendered concession project, the awarding host country authorities usually need to provide a comprehensive information package for bidders⁴⁷ to assess the project. For greenfield Project Financings in the power sector this package would typically comprise the *PPA* (incl. details on the tariff structure), *Direct Agreements* to provide step-in rights for financing parties, the permanent and temporary construction *site usage agreements*, the *electricity connection agreement*, a *topographical survey*, and *KMZ-files* indicating the exact site perimeter (cf. Dentons 2013).

For private standalone projects and - as a pre-assessment - in the aforementioned publicly tendered transactions, a feasibility study will be conducted. These will either be commissioned by project sponsors (private initiative) or the public authorities (public tenders). They should consider the technical, economic, legal, operational, and scheduling feasibility of a project (cf. Mukherjee & Roy 2017). While numerous experienced financing institutions stress the importance of project feasibility studies for the successful implementation of projects, the literature is unambiguous that the quality is regularly inadequate and thereby an important reason for projects in SSA to fail at an early stage (cf. AFC & BCG 2017, Collier & Mayer 2014a, GIH 2019, IMF 2021a, McK 2020).

So-called *Project Preparation Facilities (PPFs)* are meant to address these shortcomings as they (i) partially or fully cover expenses for preparatory project documentation and studies, typically via grants, and (ii) provide technical expertise and advice. The *IMF* notes that about 20 PPFs were operational in Africa in the past few years (IMF 2021a, p. 51). These facilities support public authorities as well as private sector sponsors. However, the *IMF* concedes that the impact of these facilities “*has so far been limited*” (IMF 2021a, p. 51). Various reasons are given (cf. IMF 2021a, Kortekaas 2015):

- available PPFs - though significant in number - are nonetheless deemed “*too small in scale to decisively unlock the resources needed*” (IMF 2021a, p. 51);
- PPFs are typically unable to commit all their funds due to the lack of suitable projects, which meet the eligibility criteria;

⁴⁷ This is another term for the sponsors that are bidding for a project either by themselves or as a part of a consortium.

- lack of managerial capacity at the PPFs themselves;
- bureaucratic administration of PPF funds; and
- lack of early-stage involvement of PPF staff by sponsors.

To give an impression of typically required eligibility criteria, Figure 20 summaries the terms of a *Call for Initial Proposals* for projects in Sub-Saharan Africa by the *U.S. Trade and Development Agency* conducted in the second half of 2020 (cf. US TDA 2020).

Figure 20: Details on the PPF of the US Trade and Development Agency

Potential for...	Eligibility criteria and submission requirements
U.S. Exports	Project equipment and technology requirements incl. potential imports of US goods and service
Development impact	Description of how the project fosters economic growth and sustainable infrastructure development
Financing and implementation	Description of economic fundamentals, likelihood to attract private funds and to achieve FC
Project size	No strict minimum and maximum, but indicated range is USD 20 to 500 million
Other items	Further eligibility criteria and submission requirements
Project sponsor(s) background	Description of capabilities, credentials, financial strength and commitment
Implementation risks	Description of legal, regulatory, economic, technological, political and other risk factors
Terms of reference and budget	Description of tasks that shall be performed as part of the studies as well as the estimated cost
Eligible sectors	Agribusinesses, Energy, Healthcare, I&CT, Transportation

Source: US TDA 2020

Figure 21 gives a few examples of PPFs by financial institutions which are actively engaged in sustainable development finance in SSA. It is worthwhile to note the various eligibility criteria to receive funds as they can hinder the effectiveness of these programmes.

Figure 21: Selected Project Preparation Facilities for SSA

Provider	Level of support	Main eligibility criterium
AFD (France)	not specified	Focus is on support of SMEs
KfW-DEG (Germany)	50% of feasibility study cost, but max. 200,000 Euro	EU companies with less than EUR 500 million in turnover
AfDB (multinational)	not specified	Public entities and authorities in regional member countries of the AfDB

Source: AfDB 2021b, DEG 2016, AFD 2021

4.2. Challenging host country conditions

The conditions in the country the project will operate in are just as important as the sponsors, EPC contractors, and project set-up. Before analysing the main aspects in greater detail, a couple of charts provide a helpful macrolevel view.

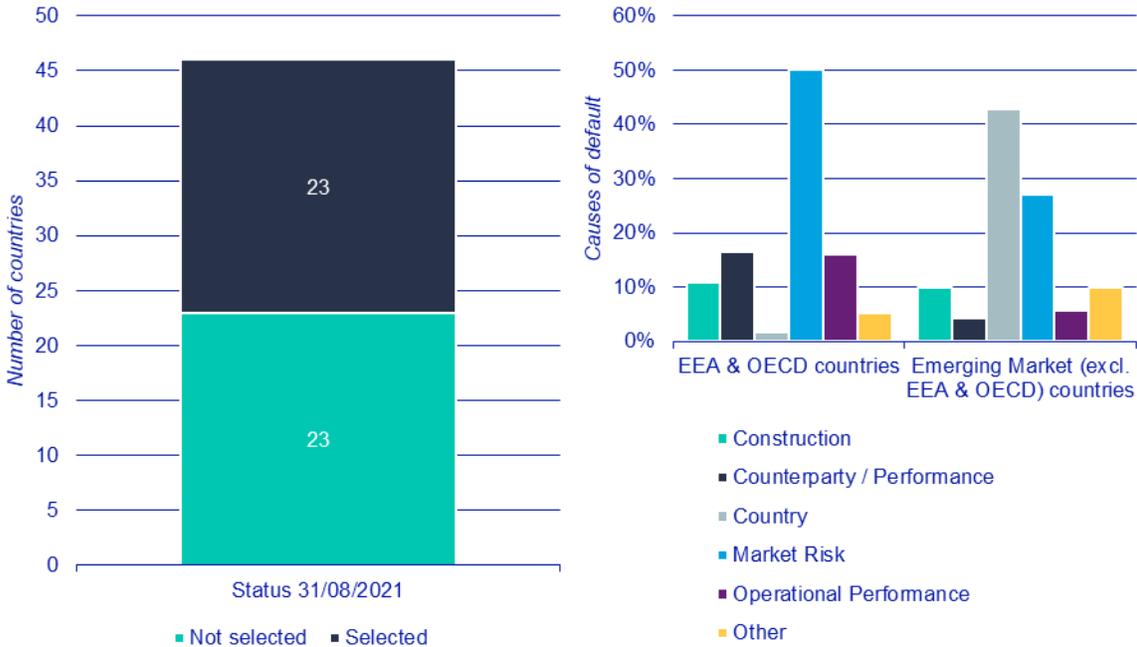
The left side of Figure 22 shows the number of countries in SSA, that have been selected for programme support by the *Millennium Challenge Corporation (MCC)*, a bilateral US foreign aid agency established in 2004. In order to receive funds, countries must score above a certain minimum threshold for 17 indicators assessing good governance and economic

freedom, e.g. *government effectiveness, control of corruption, rule of law, regulatory quality, fiscal policy and business start-up friendliness*.⁴⁸ Only 23, or 50%, of the 46 SSA countries have so far been selected for programme support (cf. MCC 2021).

The right side of Figure 22 depicts findings from a benchmark study by *Moody's*, one of the three large international credit rating agencies. It analyses 8,257 projects across all sectors and regions over 35 years (1 January 1983 to 31 December 2017), which is estimated to capture c. 69.4% of the total Project Finance transaction volume over this period.

A major finding is, that in Emerging Markets, *country risk* is identified as the primary cause for Project Finance loan defaults (42.9% of the total). For comparison, in EEA and OECD countries, the same figure stands at a mere 2.0%. *Country risk* is thereby defined as a default caused by “*currency transfer or convertibility constraints, local currency devaluation, expropriation, imposition of discriminatory taxation or regulation, contract repudiation by a sovereign entity, political force majeure, or war & civil disturbance*” (Moody's 2019, p. 72).

Figure 22: Macro-level indicators of host country conditions



Source: MCC 2021, Moody's 2019

⁴⁸ All assessment criteria of the MCC are listed in the Appendix for reference.

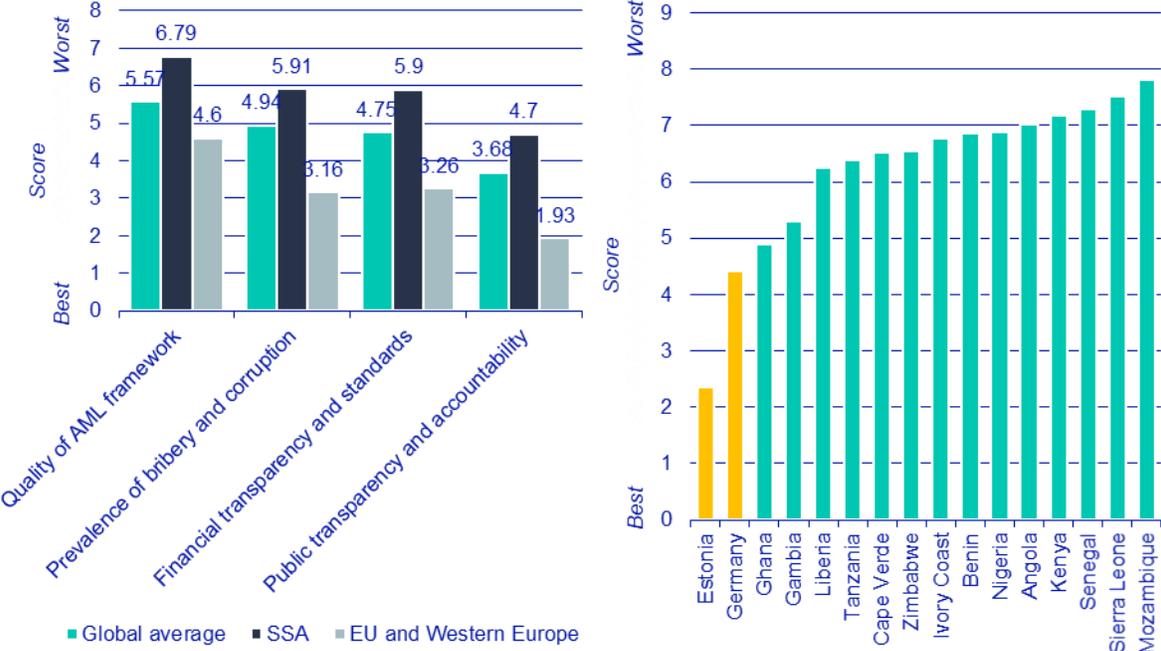
While these datapoints give an indication that SSA is a challenging environment to implement renewable energy Project Finance transactions, the following chapters assess the most relevant aspects in greater detail.

4.2.1. Insufficient anti-financial crime regulation

A major concern for lenders is financial crime. Financial regulation applicable to banks is thereby typically split into the three sub-categories (i) *Anti-Money Laundering (AML)* and *Terrorism Financing*, (ii) violations of *Sanctions* and *Embargoes*, and (iii) *Anti-fraud, Bribery* and *Corruption*. Misconduct and lack of controls in this regard might not only impact the reputation of an institution (see Chapter 4.1.2) but might also subject it to substantial fines by regulatory authorities and trigger criminal investigations against its employees. *Kyckr* estimates, that just in this year-to-date, 44 banks were fined c. USD 1.97 billion for AML offences (cf. *Kyckr* 2021).

The *Basel Institute on Governance*, a Swiss NGO dedicated to fighting financial crime, regularly publishes an *AML Index*. Results from the 2020 edition are depicted in Figure 23 (cf. *BloG* 2020). SSA countries are significantly trailing the global average in all categories, e.g. the *quality of the AML framework*, and the gap to the European Union and other Western European countries is vast (left side). On a country-by-country basis it is interesting to note that positive outliers get close to scores of EU countries (Germany, as Europe's largest economy, and Estonia, as the best scoring country, have been added for reference), while the bulk scores poorly.

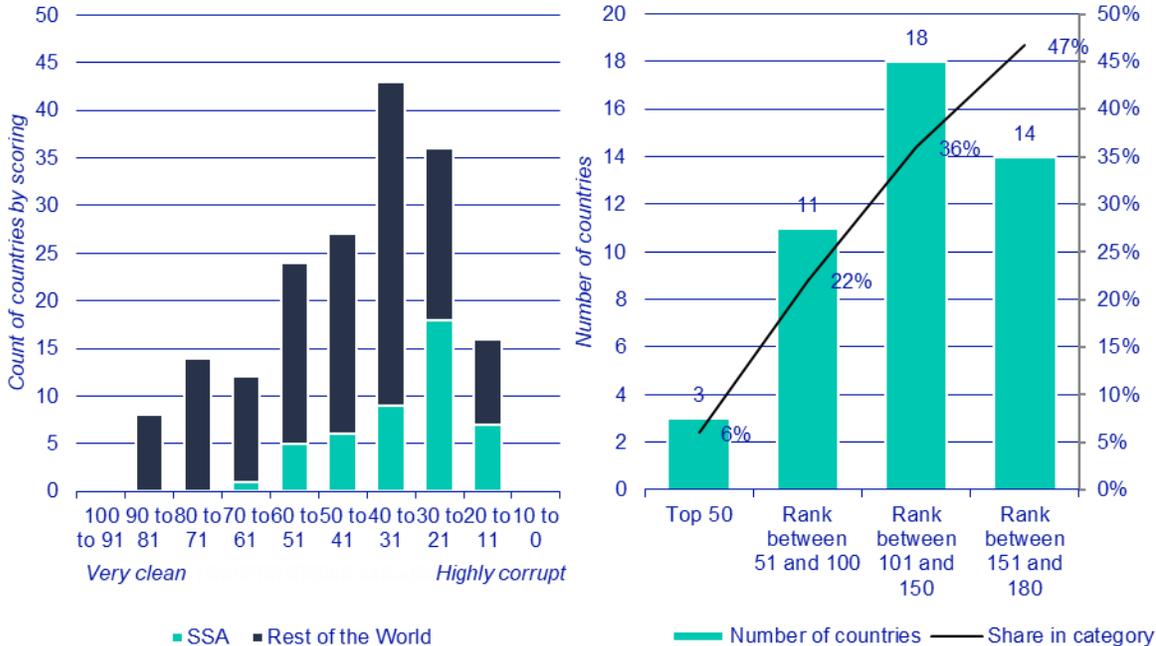
Figure 23: Anti-money laundering indicators for SSA



Source BloG 2020, TI 2020

The *Corruption Perception Index 2020*, published by *Transparency International*, a well-known and highly vocal NGO founded by ex-World Bank employees in Berlin in 1993, provides further insights (Figure 24). About 74% of SSA countries are rated as either *corrupt* or *highly corrupt* and they make up 47% of the countries in the lowest bracket (positions between 151 and 180 in the global ranking). Only three countries rank amongst the *Top 50*, which confirms the previous finding that these are positive outliers (cf. TI 2020).

Figure 24: Corruption indicators for SSA



Source: TI 2020

In conclusion, SSA is also a challenging environment from an AML perspective and exposes commercial bank lenders to a significant degree of financial crime risk. Hence, any project will require a thorough due diligence and higher expected returns to justify the elevated risk profile.

4.2.2. Political, ethnical, and societal instability and volatility

This topic comprises a variety of risk events that lead to material adverse changes to the contractual and governing framework the project is operating in, either due to adjustments in policies, guidelines, and governmental decrees or through non-institutional political and societal developments. The underlying reasons are manifold and include - amongst others - significant *political and ideological power shifts, revolutions, insurrections, coups d'états, sabotage, and terrorism*. Their effect on the project can be allocated to one of the following categories (cf. CEPA 2014, Mayer 2018, MIGA 2015):

- **Currency inconvertibility and transfer restrictions**, which will prohibit or restrict exchange of local into hard currency or vice versa and, for example, the servicing of offshore project accounts to pay suppliers. These restrictions are officially imposed

by the national or regional *Central Bank*, usually in agreement with the host country's *Ministry of Finance* (or an equivalent institution).⁴⁹

- **Breach of contract** by a project counterparty⁵⁰, e.g. payments by the national state-owned utility under the PPA are not honoured.
- **Expropriation**, thereby either directly seizing and nationalising project company assets or making it physically or financially unsustainable to operate the project through other discriminatory measures.

While *convertibility and transferability restrictions* as well as *breach of contract* might also be the result of a gradual deterioration in fiscal and monetary parameters (not just severe, sudden political events) - potentially even imposed externally by the IMF or other multilateral donor organisations - expropriation is usually triggered by one of the incidents listed above (revolution, etc.).

Various sources highlight the elevated risk of adverse political developments in SSA. Mayer points out, that "*investors cite political risk as the single most important constraint for investing in developing countries over the medium term*" (Mayer 2018, p. 7). Regarding *capital account openness*, the IMF states that "*14 countries had full control on outflows, with openness indices equal to zero in these countries on a scale from 0 to 1*" (IMF 2021, p. 37). Figure 25 depicts data from the *Mo Ibrahim Index of African Governance*, published by the Africa-focused *Mo Ibrahim Foundation*, as well as the *Marsh Political Risk Map*, released by the insurance brokerage and risk management firm of the same name (cf. Marsh 2021, Mo Ibrahim Foundation 2020).

Firstly (upper left chart), not a single SSA country was rated above *medium risk* in terms of political stability in 2021. However, there has been improvement over the past three years (42 countries were still considered high risk in 2018 vs. only 3 now). At the same time (lower left chart), the *Mo Ibrahim Index* detects a deteriorating trend for several countries. While the overall *Security & Rule of Law score* has only gone down slightly (upper right chart), the *number of governments involved in armed conflict* has increased (same chart; right axis;

⁴⁹ The IMF subsumes these risk factors under the term *capital account openness* (cf. IMF 2021, p. 37).

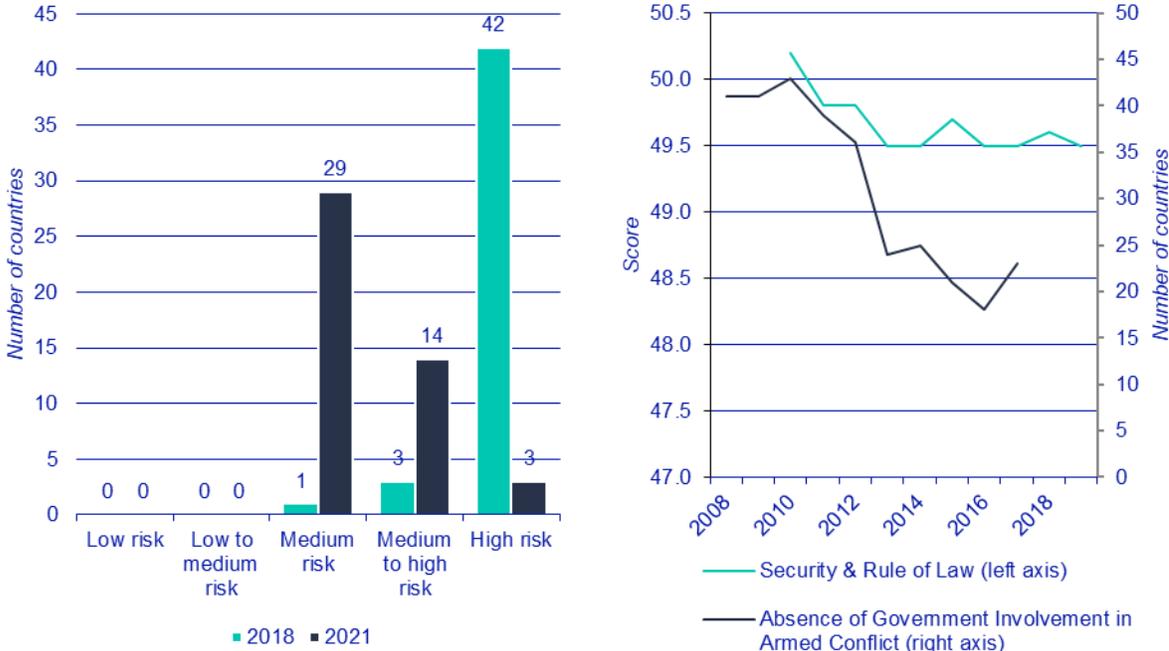
⁵⁰ This could be a breach by either a public or private entity. While public project counterparties are likely to get more directly affected by a political event, private counterparties might get indirectly impacted. This might impede or prohibit the private operator to honour its contractual obligations. For example, a privately owned and operated mining operation, which has concluded a PPA with the financed renewable energy project, starts to be heavily taxed, rendering its operation unprofitable and forcing it into liquidation.

inverted reasoning). The *Index* also sees an increasing deterioration in the *Security & Rule of Law* score for 20 out of 46 SSA countries (c. 43%) and the sub-category *Security & Safety* saw a decline in its score over the period 2010 to 2019 (lower right chart).⁵¹

Thereby the scoring is comprised of various relevant indicators that lead to the calibration of the overall score, like the below depicted *Absence of Government Involvement in Armed Conflict*, the *Absence of Violence by Non-State Actors*, and the *Absence of Social Unrest*, just to name a few.⁵²

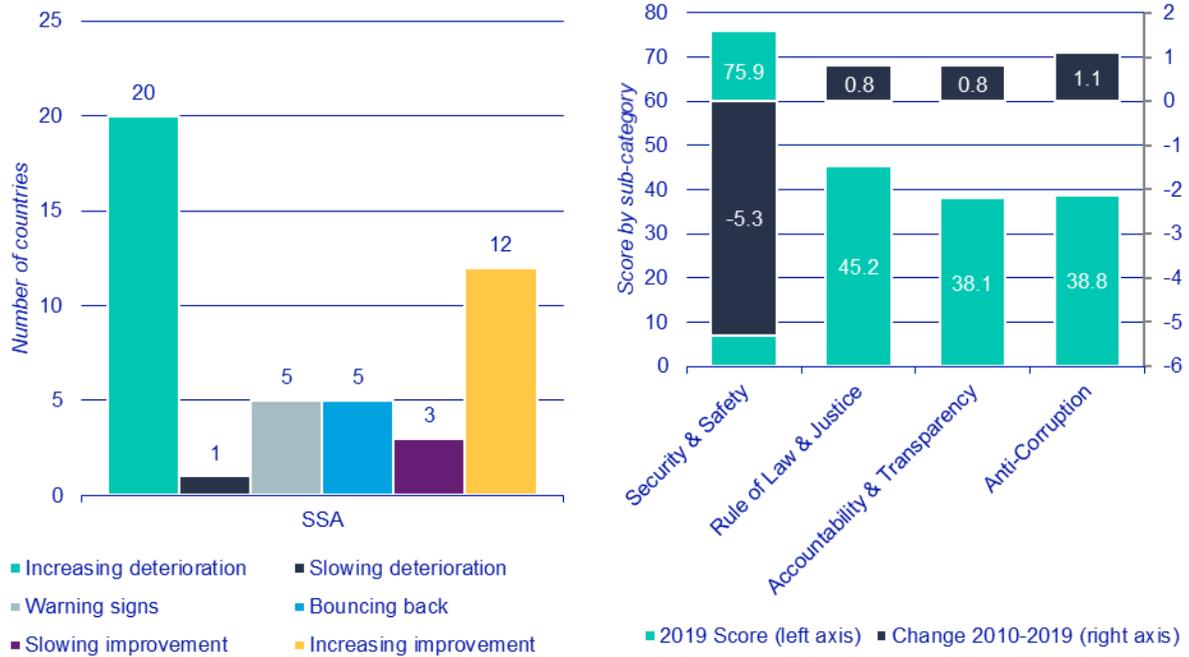
It would exceed the scope of this thesis to drill-down into all these sub-categories, however the overarching message is clear. SSA is a politically challenging environment, which heightens the perceived and actual risk for investors and lenders, thereby exacerbating project implementation backed by private commercial banks (cf. Marsh 2021, Mo Ibrahim Foundation 2020).

Figure 25: Political stability and rule of law indicators for SSA



⁵¹ To avoid confusion. *Security & Safety* is one of the main sub-categories of the overarching category *Security & Rule of Law*.

⁵² The Appendix lists all indicators for reference.



Source: Marsh 2021, Mo Ibrahim Foundation 2020

Elevated political risk in SSA is also evidenced by numerous concrete examples. Amid writing this thesis, Kenya’s President *Uhuru Kenyatta* has “ordered the cancellation of all ongoing and incomplete power purchase agreements being negotiated with the state distributor *Kenya Power*” (Reuters 2021). This is the country which hosted - after long delays - the successful financial close and implementation of the *310 MW Lake Turkana wind farm* project. It claims to be the single largest investment in the country’s history and relies on a 20-year PPA with the same state-owned entity quoted above (Kenya Power).

The country provides another example. After various preparation works had been completed over a period of three years, including the *feasibility and electricity grid connection studies*, an *Environmental & Social Impact Assessment (ESIA)*, the *system design* and the *financial analysis*, the *40 MW Kiamariga solar PV plant* was finally aborted, as the PPA was not granted (cf. Green Giraffe 2021). Interestingly, it did not proceed even though project preparation was carried out by a well-known and experienced financial advisory firm⁵³, exclusive land rights had been secured and solar irradiation at the site being excellent.

Another example is a 80 MW solar PV plant that a Canadian developer intended to implement in Nigeria. In July 2019, the country’s government started renegotiating the terms of

⁵³ The project was advised by *Green Giraffe*, which has achieved successful financial close for large, complex Offshore wind projects.

the PPA, which had been signed by both parties three years earlier (cf. PV Magazine 2019). The project was finally cancelled.

Lastly, sponsors of the USD 2 billion Corbetti geothermal power project in Ethiopia took years to negotiate a PPA with the relevant ministries, in part, due to the passing of a new geothermal power sector law that contradicted previously agreed contractual terms. With the country having recently been downgraded to CCC+ by *Standard & Poor's*⁵⁴, a major credit rating agency, it is questionable whether this project will move ahead anytime soon (cf. ThinkGeoEnergy 2017).

4.2.3. Lack of institutional capabilities

A Project Finance transaction requires a seamless interplay between various private and public stakeholders throughout project preparation, implementation, and operation. The counterparties include ministries, public authorities, state-owned enterprises, and courts at the national, regional, and even local level. The *IMF* notes in this regard, that the rule of law and clarity of the bidding process are decisive factors in infrastructure investing (cf. IMF 2021a). A functioning, effective, and efficient executive as well as judicial system is therefore crucial to achieve financial close for renewable energy Project Finance transactions.

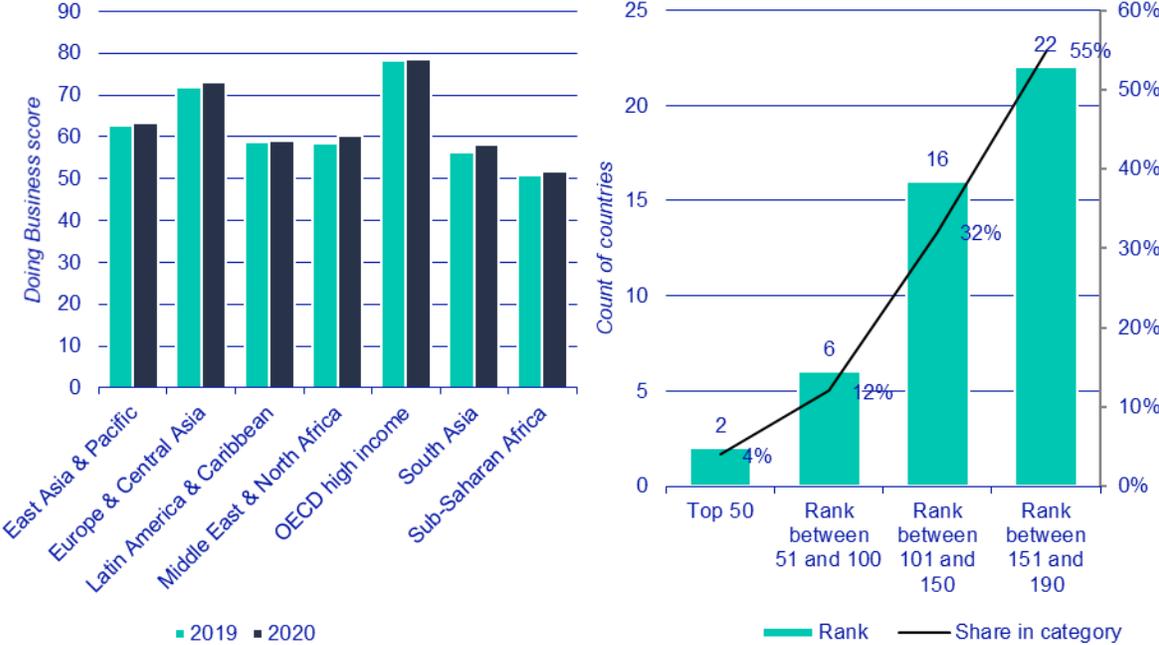
Figure 26 depicts data from the most recent *Doing Business* review of the *World Bank Group* (cf. WBG 2020). It assesses various aspects that are of relevance to Project Finance transactions, namely *dealing with construction permits, getting electricity, paying taxes, enforcing contracts, and resolving insolvency*.⁵⁵ Even though not all criteria might be relevant for a particular transaction, the data still serves as a proxy for host country institutions and their performance.

SSA yielded the lowest scores worldwide in the last couple of years (left side), though the region improved slightly year-on-year. When looking at single country scores (right side), the gap to other regions is even more striking. Countries in SSA constitute more than half (55%) of the countries in the lowest ranking bracket (positions between 151 and 190) and only 2 countries make it into the global *Top 50* (cf. WBG 2020).

⁵⁴ CCC+ means the country is considered to pose a substantial risk of payment default. Main reasons were the negative economic impact of the *COVID-19 pandemic* and the escalating *civil war*.

⁵⁵ All assessment criteria of the *Doing Business* survey are listed in the Appendix for reference.

Figure 26: Doing business ranking of SSA countries relative to peers worldwide

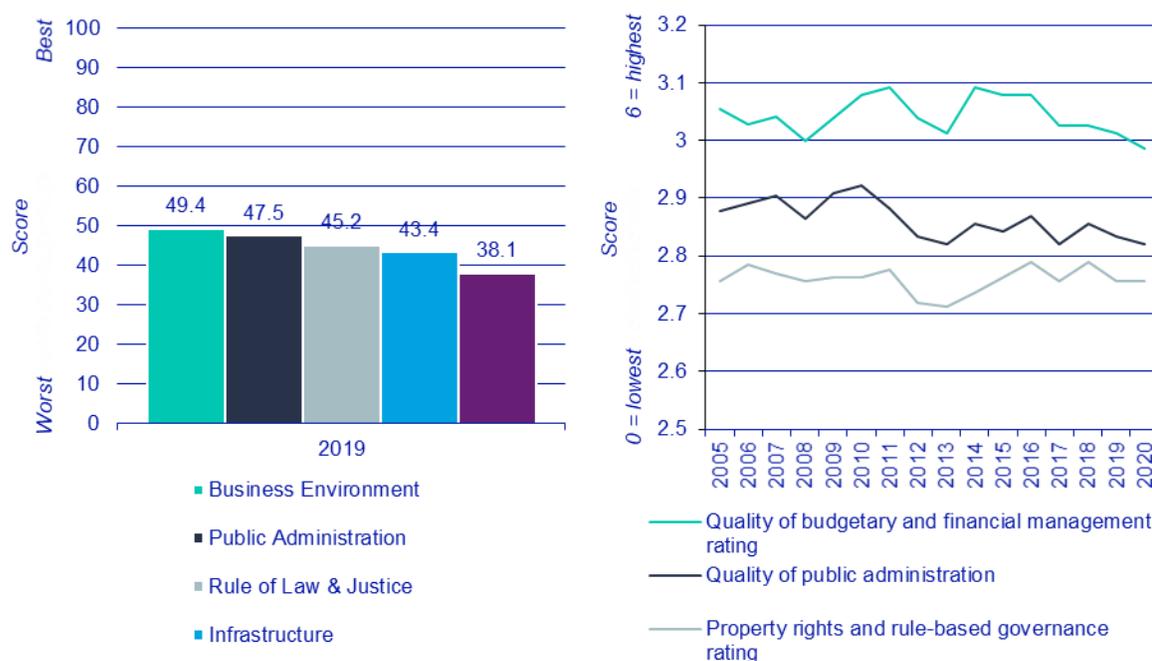


Source: WBG 2020

Further interesting data is illustrated in Figure 27. The left side shows sub-category scores for relevant criteria from the latest *Mo Ibrahim Index of African Governance*. Though the maximum score (= 100) would hardly be reached by any country or region globally, SSA does not exceed the midpoint of the scale (= 50) for a single measure. A similar picture can be drawn from *Country Policy and Institutional Assessment (CPIA)* data produced by the *World Bank Group*. For pertinent criteria like the *quality of public administration*, SSA has consistently scored at or well below the midpoint (which is 3, with 6 being the highest score) over the past 15 years. Even worse, all depicted measures have seen a decrease in their score. Though the decline is minimal, it is striking that the region has not made any progress since 2005 (cf. Mo Ibrahim Foundation 2020, WBG 2021c).⁵⁶

⁵⁶ Unfortunately, neither the *Mo Ibrahim Index* data nor the *CPIA* data is gathered for Developed Market jurisdictions, like the European Economic Area or the United States. They could have served as an interesting benchmark.

Figure 27: Business environment and public administration indicators for SSA



Source: Mo Ibrahim Foundation 2020, WBG 2021c

Institutional capabilities are also at play in case Project Finance transactions default. Aside the financial structure and contribution of various project counterparties, the *efficiency* and *righteousness* of the *local judicial system* plays a major role in recovery scenarios. It impacts both, the *time to emergence from default* and the *ultimate recovery value*. Important lender securities, like *pledged land rights*, are usually governed by *local law* and need to be enforced accordingly. The *IMF* notes that

“despite some improvements over the years, the regulatory and legal system is often challenging to navigate”

and goes on to say that

“the enforcement of the rule of law and regulations is often uneven and unpredictable in SSA, which is compounded by the weak capacity of lawmakers and some country officials.” (IMF 2021a, p. 36)

Other indicators for insufficient institutional capabilities are the previously mentioned long project lead times and project delays (see Chapter 4.1.1). While these developments are usually multi-causal, anecdotal evidence suggests that poor governance has a significant impact on project success.

Overall, the evidence is convincing that the institutional capabilities of most SSA countries are currently sub-standard and that they may not - broadly speaking - provide consistent

and comprehensive professional support to investors and lenders throughout a project lifecycle.

4.3. Elevated non-financial project risks

The environmental and social (E&S) impact of a project and the technology that is being applied for its implementation are two important non-financial risk factors lenders will consider.⁵⁷ While there are many factors that can go wrong in a Project Finance transaction, E&S and technology risk tend to have the most severe impact on project success in case the implementation deviates from the original scheduling and budgeting.⁵⁸

4.3.1. E&S project risks

The financial industry standard to identify, assess, avoid, mitigate, or offset E&S project risk is the *Equator Principles IV* risk management framework. It was released in July 2020 and at the end of September 2021, more than 120 financial institutions in 37 countries covering an estimated 70% of Project Finance debt in Emerging Market jurisdictions had signed up to them.

Aside transparency and reporting requirements, the *Equator Principles* embed the *Performance Standards on Environmental and Social Sustainability* by the *International Finance Corporation (IFC)* and the *Environmental, Health and Safety Guidelines* by the *World Bank Group*, which are tried and tested project standards to ensure environmental and social sustainability, into a common framework (cf. EPA 2021, IFC 2012).

Figure 28 lists the 8 IFC Performance Standards. In a first step, based on preliminary E&S reports, i.e. a scoping report or strategic environmental assessment (SEA), projects are classified as *high risk* (Category A)⁵⁹, *medium risk* (Category B) or *low risk* (Category C), depending on the involved E&S risk factors (cf. EPA 2021, IFC 2012).

⁵⁷ *Reputational risk* is a third important non-financial risk factor, which has been addressed in Chapter 4.1.2.

⁵⁸ Most risk factors can be mitigated *ex-ante*, that is before financial close. For example, *expropriation* and other political risk factors will be mitigated through *political risk insurance*. In case a political risk event materialises, the insurance pays out (assuming everything is appropriately documented). Though lenders will also anticipate and mitigate E&S and technology performance risk as much as possible prior to their commitment (mature technology, experienced contractors, back-to-back contracts with suppliers, liquidated damages, etc.), there are many inherent risk factors in constructing and operating projects that may appear *ex-post*, that is, after financial close. These risk events may be severe and are often interdependent leading to *knock-on effects* that tend to be difficult to contain.

⁵⁹ These are projects “with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented” (ICC 2021, p. 22). The necessity for significant

Figure 28: The IFC Performance Standards

Performance Standard...
1: Assessment and Management of Environmental and Social Risks and Impacts
2: Labour and Working Conditions
3: Resource Efficiency and Pollution Prevention
4: Community Health, Safety, and Security
5: Land Acquisition
6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
7: Indigenous Peoples
8: Cultural Heritage

Source: IFC 2012

By their very nature, commercial scale renewable energy projects will typically fall into *Category A*, which entails an extensive E&S process by sponsors, public authorities, and lenders to comply with the minimum requirements for project implementation.

Firstly, an *Environmental and Social Impact Assessment (ESIA)* according to international standards needs to be prepared.⁶⁰ *Secondly*, lenders will require an *Environmental and Social Due Diligence (ESDD)* by a reputable international consultant. Main output is an *Environmental and Social Action Plan (ESAP)*, which details measures to avoid or mitigate E&S risks. It (i) describes the requirements, (ii) defines the responsible project counterparties (usually the sponsors who pass it on to the EPC contractor) and (iii) specifies due dates (e.g. pre-construction start). *Thirdly*, *Category A* projects require an *E&S monitoring* over the lifetime of the project. Its frequency and form differs between projects and is decided on a case-by-case basis.

While it exceeds the scope of this thesis to further drill down into the E&S project assessment, it should be noted, that these processes and measures are time-consuming and costly. However, if improperly managed, they can jeopardise the overall project success. The *OECD* notes in this regard that

resettlement of the local, indigenous population to clear the project construction site will for example always imply a project to be categorised as *A*.

⁶⁰ In some cases, an *ESIA* will already have been drafted by a *local E&S consultancy*. These local firms rarely have the experience and capabilities to work according to *international standards*, which usually triggers the requirement for a so-called *gap analysis* by an experienced, *international E&S consultancy*. It identifies shortcomings in the *ESIA*, which need to be addressed to proceed with the project, at least if it shall be financed by DFIs or financial institutions that have signed up to the *EPs*.

“building capacity to conduct rigorous social and environmental impact assessments is crucial to mitigate potential risks associated with infrastructure development. Land acquisition and resettlement affect people’s livelihoods such as the loss of assets, job security, food security and economic conditions. Negotiations for land acquisition, resettlement and compensation generally take a long time, involving translation into local languages, clarifying land ownerships and agreeing on arrangements, which often affects the overall project timeframe. During this phase, projects may experience delays largely due to weak legal framework in land ownerships, disagreements for resettlement and compensation with local populations as well as political crisis.” (OECD, p. 26)

This quote also highlights one of the many interdependences in Project Financing transactions. Perceived and actual E&S project risks are influenced by the political and institutional capabilities in the host country, which were discussed in the previous chapters.

A suitable example how E&S processes can jeopardise project success is the *Lake Turkana wind farm* project in Kenya. While it finally achieved financial close, it experienced significant delays due to the lengthy community engagement process and a lawsuit filed by local communities claiming lack of consultation and participation in the land acquisition process. Development started in 2006 and the project finally achieved its *Commercial Operation Date (COD)* in January 2017, about 11 years later⁶¹.

Since construction started, the project has also seen repeated negative press by human rights organisations brought about by the upheaval of the traditional community structures. The *Business & Human Rights Resource Centre* for example claims that temporary construction workers and indigenous people disappointed by unfulfilled job expectations brought unemployment, alcoholism, and prostitution to the local villages in the project catchment area (cf. BHRRC 2016). Interviewees accuse the project company of non-compliance with the *IFC Performance Standards* and non-fulfilment of its promises regarding *local community development*⁶². Though some issues have seemingly been resolved through a *community development fund* financed by the operations of the wind farm, the transaction exemplifies the tediousness of E&S processes in SSA.

There are numerous other examples, also in the renewable energy sector, how environmental and social risks have prohibited or at least delayed financings for infrastructure projects

⁶¹ For reference, the actual project construction period was estimated at less than three years and was adhered to.

⁶² A given example is the suspension of the construction of a local school.

in SSA. The literature therefore clearly identifies E&S processes as a major challenge for infrastructure projects in the region (cf. IMF 2021a, OECD 2020).

It may be concluded that while the *Equator Principles* and *IFC Performance Standards* are a standard requirement in Project Finance transactions, their application - in combination with the lack of local project development and institutional capabilities (see previous chapters) - proves particularly challenging in SSA.

4.3.2. Technological project risks

Another important consideration for lenders is the technology that is being deployed as Project Finance relies almost exclusively on the underlying asset to generate the required cash flow to repay the project debt.

The likelihood of delays or performance shortfalls is significantly higher for new, immature technologies that have not been tried and tested. Project Finance supported by private commercial lenders does therefore not tend to be a financing option for technological innovations.⁶³

This position is diametric to the interest of sponsors, who would like to limit the exposure to these types of transactions themselves. As technologies mature through successive application, they gradually move from being unacceptable to being bankable. This assumes that no defaults or major risk events occur in preceding transactions and that the transactional structure is otherwise appropriate. The technology risk is therefore always part of the overall project risk assessment illustrated in Chapter 1.2.

A case in point is the *offshore wind technology*. Early projects were mainly balance sheet financed. An exception was the *Thornton Bank offshore wind farm* in Belgium, which benefited from strong DFI support in a developed market jurisdiction, where country and market risks are essentially absent (cf. C-Power 2021). While the technology was immature, it could be implemented with other strong structural enhancements.⁶⁴

As the technology matured and sponsors, EPC contractors and suppliers had built a track record, the technology became bankable for private commercial lenders in new jurisdictions

⁶³ The case is different for DFIs, who have public, government-backed mandates to support early technology adoption in Project Finance structures.

⁶⁴ Only c. EUR 19 million out of a EUR 869 million debt financing package were provided on a private commercial basis without any risk cover. The project was almost exclusively financed by the *European Investment Bank* and commercial lenders with political and commercial risk cover from *Export Credit Agencies (ECAs)*. In this case support came from *EKF*, the Danish ECA, and *Euler Hermes*, the German ECA.

and with lower requirements for credit enhancement. This is exemplified by the financial close of the *Formosa 1 offshore wind farm* in Taiwan in 2018 (cf. Linklaters 2018).

In SSA, as discussed in Chapter 3.2, onshore wind, solar photovoltaics, and hydropower are expected to deliver the bulk of the renewable energy production growth. While these are all well-established technologies that have been employed for many years and in numerous different countries worldwide (Figure 29), each project must be tailored to the unique site and transport conditions.

Figure 29: Global cumulative installed renewable energy capacity since 2011



Source: IRENA 2021

Therein, SSA poses idiosyncratic challenges. *One aspect* (i) is the weak road infrastructure. The *World Bank* notes that “its average spatial density is very low by world standards, [...] maintenance is underfinanced, and road conditions are on average poor” (WBG 2021b). Unfortunately, suitable project sites tend to be in remote areas, which are difficult to access. In case of the *Lake Turkana wind farm*, the road connection from the coastal port of *Mombasa* to the project location in the isolated and sparsely populated Northern part of the country implied the usage of relatively small turbines with a *low installed capacity per unit* (cf. AfDB 2015).⁶⁵

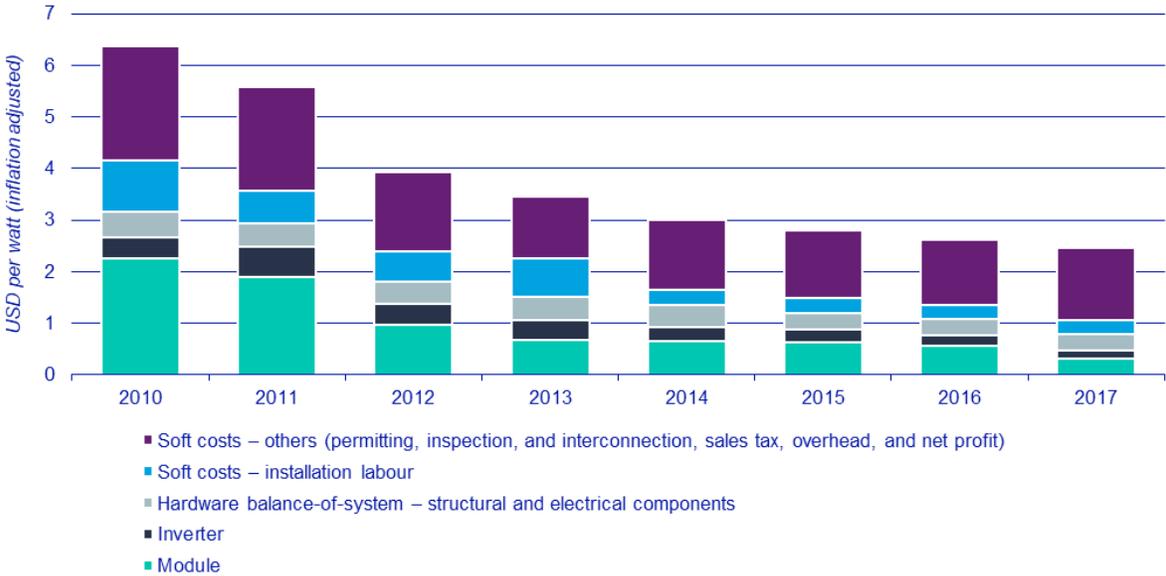
⁶⁵ The *Lake Turkana wind farm* employs the V52 Vestas turbine, which has a *nameplate capacity* of 0.85 MW. The industry has gravitated to ever higher capacities in the past few years to increase efficiency and lower the LCOE. For example, in the US, the *average nameplate capacity* in 2020 stood at 2.7 MW per turbine (cf. OoEE&RE 2021).

Another aspect (ii) is the lower availability of high-quality data to assess geological and topographical site conditions. This interplays with the limited local project development and institutional capabilities described in Chapters 4.1.4 and 4.2.3 (cf. OECD 2020).

Lastly (iii), the lack of *economies of scale* in supply chains and low *ancillary infrastructure density* (equipment, personnel) make transactions more costly and increase their *technological implementation risk*. These aspects are highly correlated with the *cumulated installed capacity*.

Figure 30 depicts the estimated *inflation-adjusted unit cost reduction* (USD per watt) for solar PV assets from 2010 to 2017. The implied *learning curve* is enormous. Particular noteworthy is the substantial reduction in *soft costs*, i.e. *labour installation costs*, *permitting costs*, and *inspection costs*, as these are almost exclusively *local cost components* (cf. OIES 2021). Solar PV projects in SSA do not yet fully benefit from these implementation efficiencies due to the low cumulative installed capacity in the region.

Figure 30: Learning curve estimate for solar PV assets



Source: OIES 2021

4.4. Risky financial transaction structures

Aside the non-financial risks that impact the credit risk profile of a Project Finance transaction, financial risks need to be considered. In combination, these risk factors determine whether the overall project architecture is acceptable (see Chapter 1.2 for a recap of this concept).

4.4.1. Off-taker implied credit risk

There are various forms in which the project off-take agreements may inhibit credit risk for lenders.⁶⁶

Firstly, the host country government may not provide a PPA at all or for a shorter tenor than the effective operational life of the asset. Under rare circumstances, a PPA may alternatively be concluded with private corporations.⁶⁷ *Secondly*, a PPA, though political backed and appropriate in tenor, may be offered by an entity with a weak credit risk profile. This may be a *State-Owned Entity (SOE)*, e.g. the national power company, which does not benefit from an explicit sovereign payment guarantee.⁶⁸ *Thirdly*, in case this governmental guarantee is granted, the host country's sovereign credit rating may be inadequate.

Figure 31 depicts (i) the *sovereign credit ratings* of SSA countries, (ii) their *IMF Debt Sustainability score* (both left side), and (iii) the *number of rating downgrades* during the height of the *COVID-19 pandemic* in 2020 (right side). For comparison, the worst rated countries in the *EU-27* are Croatia, Cyprus, and Romania with *BBB-*. This is also the lowest tier of what the financial markets and credit rating agencies consider an *investment-grade rating*, which determines the minimum threshold for an acceptable credit risk quality for major investors and asset managers, like re-insurers and pension funds (cf. Marsh 2021, Moody's 2021).

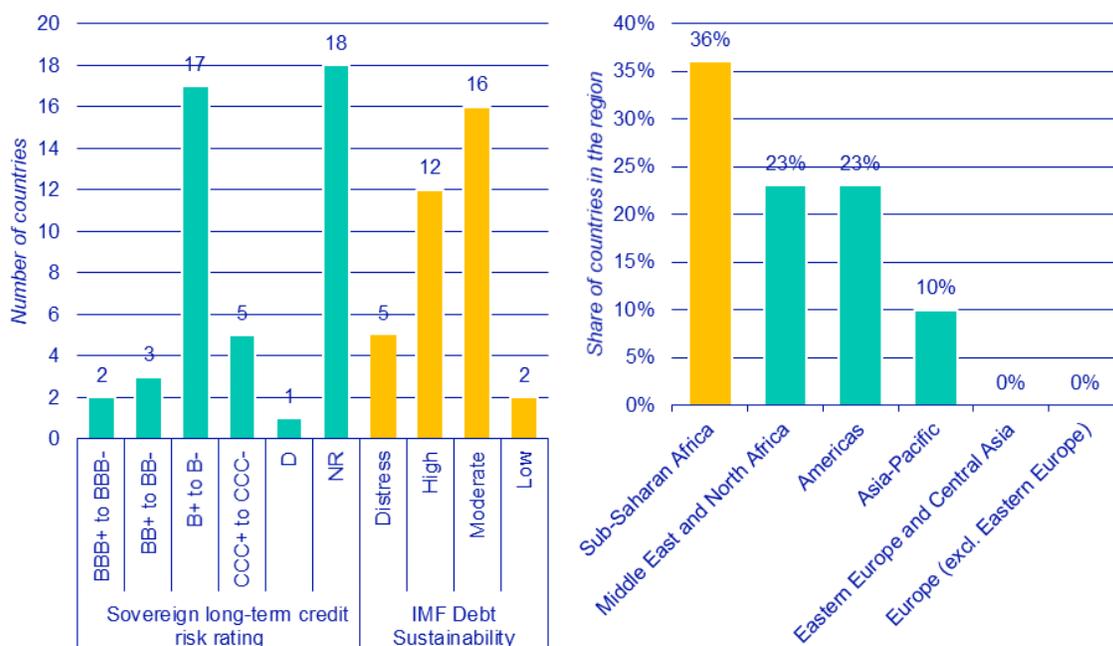
The data is unambiguous. SSA is a challenging region from an off-taker credit risk perspective. 18 states are not even rated, the debt burden of 17 countries is basically considered unsustainable and 36% were downgraded during the early months of the COVID-19 pandemic in 2020, which is by far the highest figure of all regions worldwide.

⁶⁶ Aside off-taker credit risk, feedstock supply risk is an important consideration for conventional *In-dependent Power Producers (IPPs)*, like gas-fired power stations. Except for biomass projects, renewable energy assets bear no feedstock supply risk.

⁶⁷ Though SSA's industrial density is low, some major, highly profitable industrial operations have the scale and credit risk profile to substitute sovereign off-takers. Examples are energy-intensive operations, like mining and the production of petrochemicals, owned by *Multi-National Corporations (MNCs)*. However, due to their marginal relevance, private power off-takers are disregarded in the subsequent analysis.

⁶⁸ SOE credit ratings are typically capped at the rating of the sovereign. There are rare exceptions for SOEs that are partially owned by external entities whose credit rating exceeds the sovereign rating of the host country.

Figure 31: Sovereign credit risk ratings in SSA



Source: Marsh 2018

While a financial institution will assign a *project credit risk rating*, which is based on the overall due diligence and various risk factors discussed in this thesis, the off-taker credit risk profile is a pivotal element. It therefore serves as a suitable proxy.⁶⁹

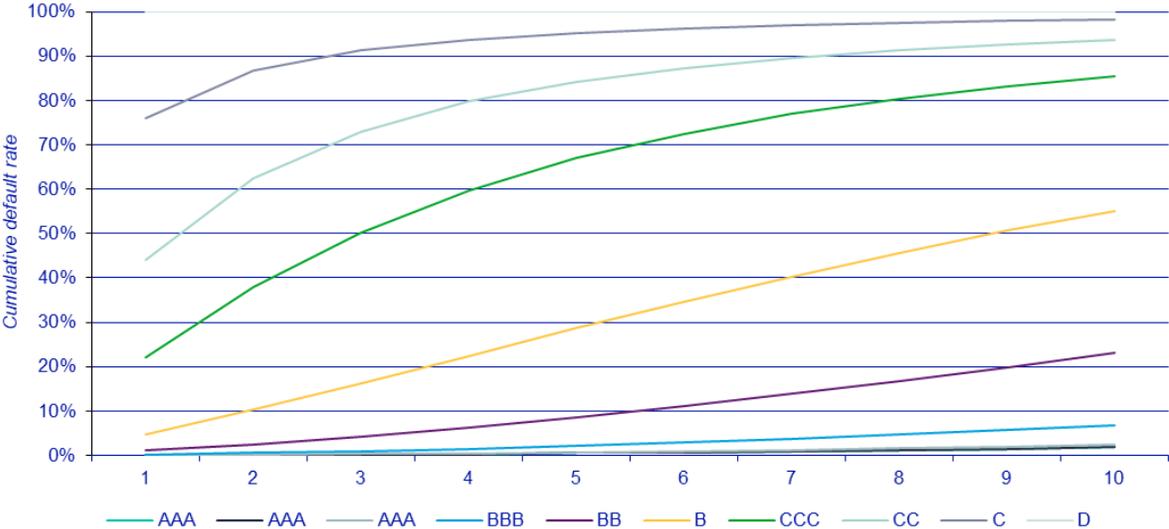
Figure 32 depicts the *cumulative probability of default* for the different credit rating tiers as stipulated by the *Basel III* banking regulation.⁷⁰ Two things are worth noting. *Firstly*, the cumulative default risk increases *over proportionally* further down the credit rating scale. *Secondly*, the absolute values are striking. As an example, a *single B* borrower defaults with a probability of c. 29% after 5 years and 55% after 10 years. Consequently, *Moody's* defines this tier as follows: "*Obligations rated B are considered speculative and are subject to high credit risk*" (Moody's 2021)⁷¹.

⁶⁹ Unfortunately, no data is available on single project credit risk ratings assigned to individual transactions by participating banks due to the confidentiality of the information.

⁷⁰ For ease of interpreting the diagram, the single notches in each rating tier were deleted, i.e. only A not additionally A+ and A- is shown.

⁷¹ For the interested reader, the cited publication gives a verbal description of each rating tier. While the credit rating nomenclature of the three major credit rating agencies differs slightly, the tiers are directly comparable and are expressed in *Standard & Poor's* format throughout the thesis for ease of reference.

Figure 32: Cumulative default rates by credit rating tier



Source: Moody's 2019

Transactions backed by these off-takers are only possible through significant structural enhancements that uplift the overall project credit rating to an acceptable level. There are many different risk mitigation options, ranging from (i) *full or partial guarantees by banks and sponsors*, (ii) *stricter covenants and a lower gearing*, to (iii) *political and commercial risk cover by multilateral, bilateral or private organisations*. The last aspect is the most important, especially in Emerging Market jurisdictions. Without substantial risk cover, private commercial banks could not even contemplate a participation in Project Finance transactions in SSA.⁷² These cover providers are the subject of Chapter 4.4.3.

4.4.2. Macroeconomic risks

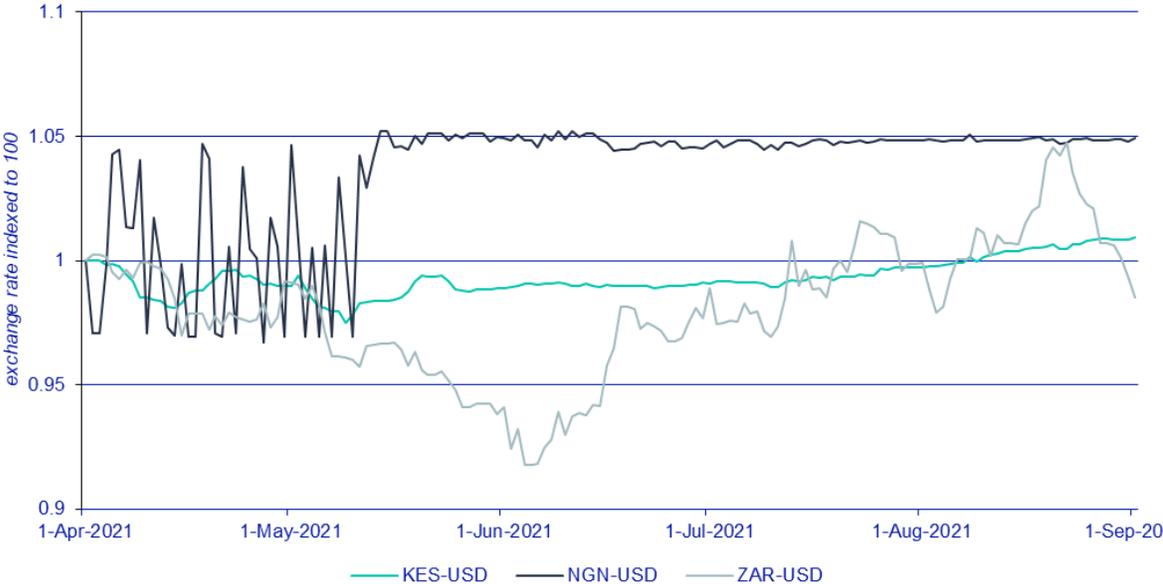
There are also various macroeconomic risks that sponsors and lenders are typically concerned about.

First and foremost, is **(a) foreign exchange rate volatility**. Renewable energy projects rely on long-term PPAs, which tend to be paid in local currency. The risk of a local currency depreciation vis-à-vis the sponsors' and lenders' preferred currency (usually USD, EUR, GBP, or JPY) exposes the project to potential revenue shortfalls over the lifetime of the transaction. As a concrete example, Figure 33 shows the indexed development of the *US Dollar* against

⁷² Apart from Botswana, Mauritius, and South Africa. The first two are the only investment grade rated countries in SSA and the latter has established institutions, a PPP framework, and a successful track record in implementing renewable energy projects.

the *Kenyan Shilling*, the *Nigerian Naira* and the *South Africa Rand* over a recent 6-months period.⁷³ The significant volatility is clearly visible and future exchange rate movements are unpredictable, particularly over long periods of time.

Figure 33: Foreign exchange rate pairs for selected SSA currencies against the USD



Source: Bloomberg terminal

Sponsors will typically try to hedge the foreign exchange rate risk through cross-currency swaps. However, commercial swap providers are currently still unwilling to take this type of exposure in African low-income countries (cf. CEPA 2014, The Lab 2014). Other options are hedges provided by DFIs and sovereign-backed swap guarantee schemes that provide sufficient risk mitigation for commercial providers to crowd-in.

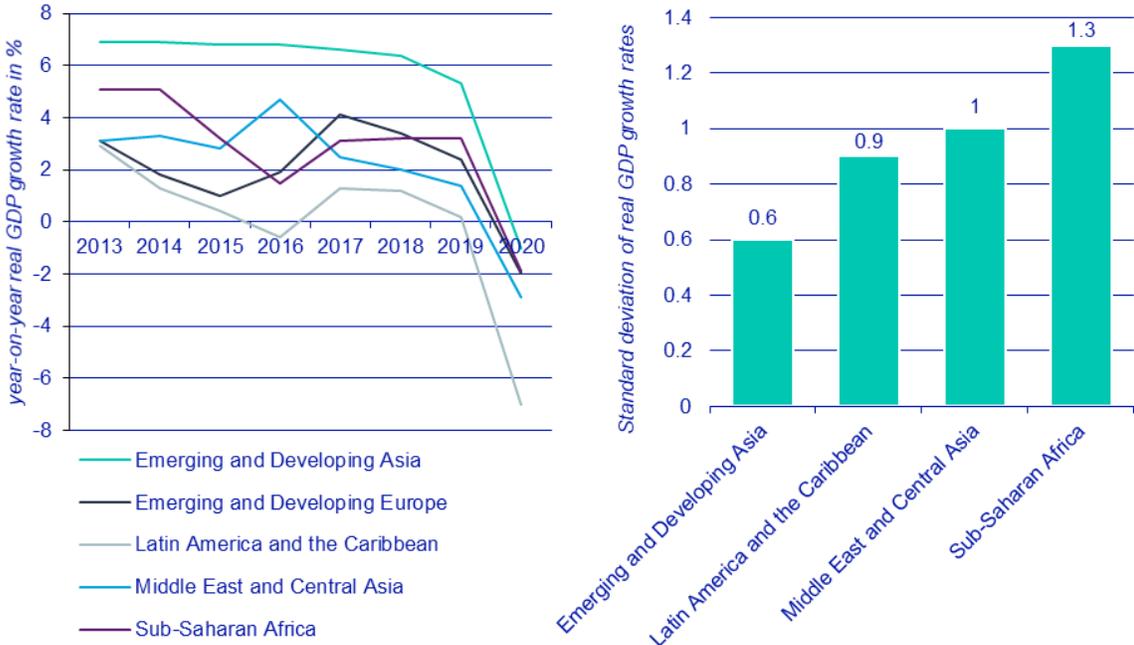
Secondly, projects might be exposed to **(b) inflation risk**. A mitigant are inflation-linked PPAs, as long as the judicial system and host country institutions are deemed sound enough to address and enforce sponsor claims in case public authorities fail to correctly adjust the PPA tariff.

A third macroeconomic risk factor is **(c) GDP growth volatility**, e.g. due to external shocks. Figure 34 depicts the *nominal year-on-year growth rate* of Sub-Saharan Africa vs. other

⁷³ Some SSA governments *peg*, a mechanism to manage the exchange rate to hover around a pre-determined and communicated target value, their currency to a foreign hard currency, typically the US Dollar. Nigeria is an example. While a peg largely mitigates foreign exchange rate fluctuation risk, it is a monetary policy instrument and thereby at the discretion of the respective government. Consequently, it may be revoked throughout the project lifetime. Sponsors and lenders will therefore seek mitigations, like *grandfathering* conditions in the PPA or conditional foreign exchange rate hedges.

Emerging Market regions (left) and its standard deviation (right). Countries in SSA exhibit the highest GDP growth volatility. The *IMF* reckons, that this is due to (i) the *dependency on commodity exports*, (ii) the *limited fiscal leeway* to stabilise the economy in downturns, (iii) *political instability* and *lack of good governance*, (iv) still significant *reliance on the agricultural sector*, which in turn is prone to increasing extreme weather events, and (v) an *inadequate private and public health infrastructure* susceptible to shocks, like the COVID-19 pandemic (cf. IMF 2021a).

Figure 34: GDP growth volatility in SSA



Source: IMF 2021a

There are two things to note on this. *Firstly*, any country is subject to GDP growth volatility which might impact a project endeavour. However, the higher volatility compared to other jurisdictions is idiosyncratic to SSA. *Secondly*, this is a macroeconomic perspective. A recession might not necessarily impact a project on the micro level, though renewable energy projects will likely be indirectly affected due to their reliance on long-term PPAs with state-owned entities. When government budgets are stretched and payment arrears accumulate⁷⁴, PPA payments come under pressure. The diagram on the right-hand side of Figure

⁷⁴ Particularly in Emerging Market countries with weak governance frameworks a vicious downward cycle may kick in. The external shock lowers government revenues (lower commodity export revenues, etc.), potentially triggering credit rating downgrades, which increases borrowing costs (usually elevated in recessions anyhow) and limits the already minimal fiscal leeway even more (i.e. to fund

17 in Chapter 4 impressively demonstrates this correlation between GDP growth volatility, financial market stress and Project Finance loan defaults.⁷⁵

One risk mitigant to address GDP growth volatility are *stricter covenants* (e.g. higher *lock-up* and *debt sculpting DSCRs*, a forward-looking *DSRA*, and a *lower gearing*). However, these can be difficult to implement in competitive bidding processes, like public project tenders⁷⁶. Another effective option is the *procurement of political and commercial risk cover* (see next chapter).

4.4.3. Lack of direct lending, insurance, and guarantee market support

As discussed in Chapter 4.4.1, risk cover providers are essential for renewable energy Project Finance transactions in SSA (cf. Sorge 2004, Mayer 2018). Broadly speaking three categories should thereby be distinguished.

(i) Public multilateral organisations, like DFIs and specialised guarantee agencies. (ii) Public bilateral organisations, like ECAs and NDBs. (iii) Private organisations, particularly private risk insurers (PRIs). Figure 35 gives examples for each type⁷⁷ with relevance for SSA and indicates their respective credit rating.⁷⁸

short-term unemployment benefits like the '*Kurzarbeitergeld*' in Germany). At the same time, unemployment will rise, straining government budgets further (lower tax revenues) and making payments for essential services (utility bills, etc.) less likely (payment and revenue collection discipline in SSA is anyhow comparatively low due to weak corporate and institutional governance). This also negatively impacts state budgets (lower revenues for SOEs). Additionally, most SSA countries are at a medium to high risk of debt distress from the outset.

⁷⁵ *Capital account openness restrictions* is another macroeconomic risk factor and could have been discussed in this chapter. However, the author decided to raise it in the political risk section in Chapter 4.2.2.

⁷⁶ Stricter covenants essentially lower the leverage and thereby increase the project LCOE, which puts the respective bidder at a competitive disadvantage.

⁷⁷ While the number of multilateral DFIs active in SSA is limited, there are numerous ECAs, NDBs and PRIs. Therefore, only a selection of entities is depicted for illustration purposes.

⁷⁸ In case multiple and differing ratings were available by the three main international rating agencies, *Fitch*, *Moody's* and *Standard & Poor's*, the best rating was used.

Figure 35: Public and private direct lending and risk cover providers for SSA

Category	Sub-category	Name	Country	Credit Rating
Public multilateral organisations (DFIs)	MDBs	AfDB	Various	AAA
		Development Bank of Southern Africa	"	BB-
		EIB	"	AAA
		IBRD & IFC (WBG)	"	AAA
	Guarantee agency	Africa Trade Insurance	"	A
		GuarantCo (PIDA)	"	AA
		MIGA (WBG)	"	AAA
	Trade & Development Bank	"	BB+	
Public bilateral organisations	ECAs	BPIAE	France	AA
		Euler Hermes	Germany	AAA
		UK Export Finance	UK	AAA
	NDBs	KfW	Germany	AAA
		Cassa Depositi e Prestiti	Italy	BBB-
		China Development Bank	China	A+
Private organisations	PRIs	AXA XL	US	AA-
		Chubb / Sovereign	UK	AA

Source: Bloomberg, own knowledge

Except for the *Africa Trade Insurance*, *Cassa Depositi e Prestiti*, and the *Trade & Development Bank*⁷⁹, all entities have a substantially better credit rating than the SSA countries. Their involvement, which comes in different shapes and forms, therefore implies a significant project credit rating uplift.⁸⁰

Firstly (a), some of these entities directly provide funds to finance a project, the so-called *direct lending*. This type of financing is typically highly attractive, meaning long tenors and low interest rates, due to the political mandate of public institutions (cf. AfDB 2020). As this thesis is only interested in additional, private sector Project Finance debt, this aspect is only relevant due to its implicit guarantee (cf. Sorge 2004). In case public DFIs and private commercial lenders finance a project alongside each other, loan documents will stipulate cross-

⁷⁹ With respective credit ratings of *BB+* and *BB-*, the *Trade & Development Bank (TDB)* and *Development Bank of Southern Africa (DBSA)* are unlikely to provide any meaningful rating uplift to financial institutions on a stand-alone basis. However, institutions like *TDB* and *DBSA* may seek re-insurance from PRIs, which - if cut-through language is agreed in the contractual documentation - may allow an implicit rating upgrade (cf. Mayer 2018).

⁸⁰ For further background, CEPA outlines the key difference between PPAs and project remuneration through national laws (cf. CEPA 2014, pp. 17-18). Contrary to laws, PPAs create a contractual right due to the bilateral contract between the project company and the off-taker, which in turn allows effective insurance cover as the obligor of the payment flows is clearly defined.

default clauses between the respective financing facilities. As DFIs are backed by numerous, if not all, OECD, high-income, developed market economies⁸¹, which act as lenders of last resort to SSA countries in times of market turmoil and financial distress, host countries will avoid defaulting on DFI-financed facilities as it incurs political and financial cost. Thereby, they implicitly also avoid defaulting on commercial bank tranches (cf. CEPA 2014, Mayer 2018).

Secondly (b), the mentioned entities may provide partial or full explicit insurance or guarantee cover. While there are differences between the two, both essentially secure lenders against non-payment of the borrower.⁸²

Insurances and guarantees may be differentiated according to their (i) *tenor*, (ii) *risk premia*, (iii) *cover ratio* and (iv) the *covered risk events*. Figure 36 outlines the variety of insurance and guarantee product parameters in greater detail.

Figure 36: Insurance and guarantee product parameters

Parameter	Comment
Project stage	Transactions bear a significantly different credit risk profile pre- and post-completion. Some entities will cover the complete lifecycle of the project, potentially ratcheting the cover ratios, while others will only provide cover for one or the other.
Tenor	Significant variation between entities and transactions. In a best case scenario the total tenor of the loan facility is covered.
Risk premia	Mainly determined by the project risk assessment performed by the respective cover provider. Public entities tend to charge lower premia than private organisations. Their premium rates also tend to be more stable, especially in market stress situations. Amongst a cover provider group, i.e. DFIs, ECAs, and PRIs, risk premia vary but tend to cluster within a relatively narrow range.
Cover ratio	Significant variation between cover provider groups and within each group. Some entities will provide up to 100% risk cover for political and commercial risks, essentially taking on the full project credit risk, while others will cap their indemnity at significantly lower values, i.e. 60%.
Covered risks	<p>Risks are categorised as either political or commercial, which include non-payment due to the following reasons:</p> <ul style="list-style-type: none"> • <u>Political</u>: currency inconvertibility and transfer restrictions; expropriation, war, terrorism and civil disturbance; breach of contract (i.e. PPA) • <u>Commercial</u>: insolvency; default of the borrower due to other non-political events, i.e. unavailability of feedstock and liquidity constraints <p>Some entities will only cover political risks, i.e. MIGA, while others will cover both risk categories, i.e. UK Export Finance. The cover ratios may be differentiated.</p>

Source: MIGA 2015, own knowledge

⁸¹ This is also the reason for their excellent credit ratings. See for example *Mistry* (1995).

⁸² The major difference from a credit risk perspective is the following: Guarantees are *secondary*, that is, they sit alongside the separate contractual relationship between the lender and the borrower, while an insurance is *primary*, which means that the claim exists regardless of this relationship (cf. Ng 2010). To avoid confusion and as the difference is a technical detail, guarantees and insurances are being used synonymously throughout the remainder of the thesis.

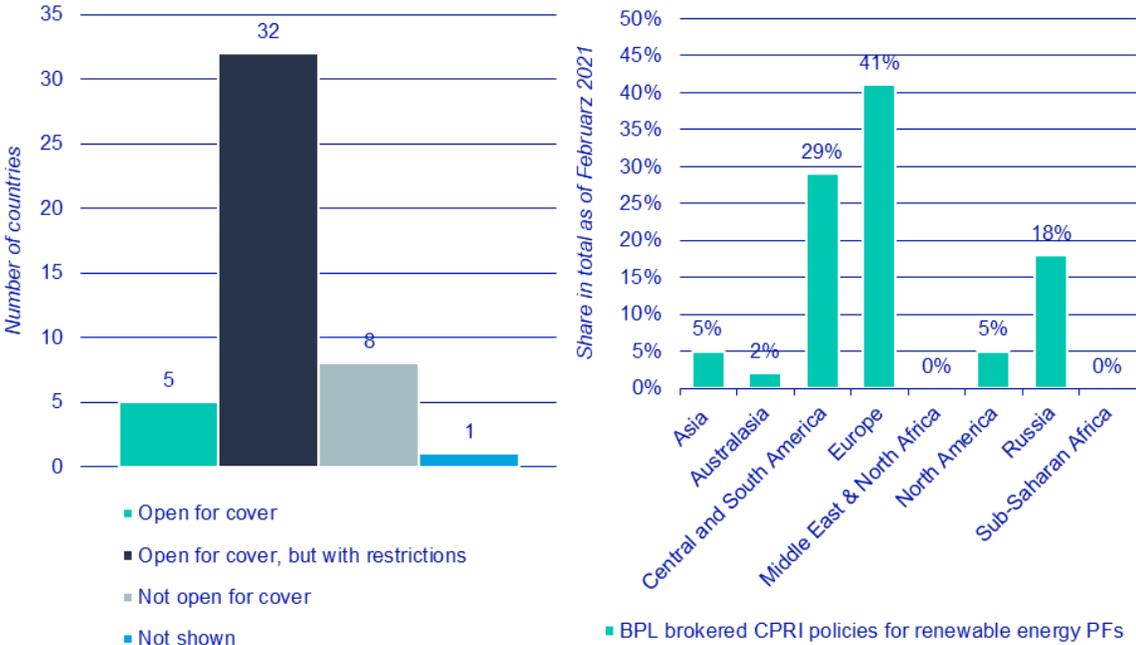
To receive risk cover support, three conditions need to be fulfilled. *Firstly, (a)* risk cover needs to be available for renewable energy Project Finance transactions in the respective country. *Secondly, (b)* the project needs to be acceptable to the cover provider. *Thirdly, (c)* the level of support needs to be sufficient to ensure bankability.

While it would exceed the scope of this thesis to comprehensively analyse each risk cover provider, their respective products, and their risk appetite for renewable energy Project finance transactions in SSA, the following figures and considerations give an indication of the difficulty to receive appropriate support.

For **(a)**, selected datapoints illustrate the status quo. The left side of Figure 37 depicts the count of SSA countries, in which *OeKB*, the Austrian ECA, is currently open for business, subject to a single transaction due diligence (cf. *OeKB* 2021). At this point in time, - without restrictions - it is only *open for cover* for 5 out of the 46 countries in SSA. Another example for prevailing constraints is the cover policy of *Euler Hermes*, the German ECA. It typically provides 95% risk cover for eligible loan amounts in Project Finance transactions but has lowered the cover ratio for African countries that are not part of the *G20 Compact for Africa* initiative to 90%.⁸³ Only 12 countries have joined the initiative to date. The right side depicts *Credit and Political Risk Insurance (CPRI)* policies brokered by *BPL*, a major international credit and political risk insurance brokerage firm, for Project Finance renewable energy transactions worldwide as of February 2021. At that point in time, not a single policy had been underwritten in SSA. PRI appetite may also dry out suddenly and quickly, which is particularly troublesome in long-lead Project Finance transactions (cf. *BPL* 2021, Mayer 2018).

⁸³ The *Initiative* was launched in 2017 during the German *G20 Presidency* to promote private investment in Africa. It is generally open to all African countries.

Figure 37: Selected examples of ECA and PRI risk cover availability for SSA



Source: BPL 2021, OeKB 2021

On (b), it should be noted that cover providers perform their own independent case-by-case bankability and credit assessment, with guidance and support from the arranging bank, as they take on substantial project credit risk. It is not uncommon that support is rejected due to a questionable credit risk profile. BPL for example notes that “underwriters have tightened their criteria, meaning it has been challenging to secure support from insurers for transactions with private obligors” (BPL 2021, p. 6).

For (c), Figure 38 outlines risk cover limitations for selected institutions. These are interdependent with the aforementioned project due diligence, which may impact the parameters. For example, cover providers may decide to reduce their typical cover ratio at their sole discretion on a project-by-project basis.

Figure 38: Selected examples of limitations to DFI, ECA, and PRI risk cover provision

Entity	Limitations
MIGA (DFI)	Only covers political risk events. Tenors are capped at 15 years, but may be extended to 20 years if justified by the underlying project. Cover ratio is typically 95%, though it may be increased in exceptional cases.
Euler Hermes (ECA)	ECAs, incl. Euler Hermes, have minimum requirements for project equipment and supplies from their home country. Furthermore, as per the OECD Consensus - a gentleman's agreement between major OECD ECAs - a maximum of 85% of the eligible project contract amount may receive ECA political and commercial risk insurance cover. This consensus also restricts the maximum repayment tenor to a <i>Weighted Average Loan Life (WALL)</i> of 7.25 years (this tenor may in some instances not cover the full lifetime of the project). Cover ratio can be up to 95% for political and commercial risks.
Chubb (PRI)	Unlikely to agree to tenors exceeding 15 years in SSA. Typically covers political and commercial risks with a maximum cover ratio of 95% and will only take pre-completion risk in exceptional circumstances.

Source: MIGA 2015, own knowledge

The literature is unambiguous that guarantee provision is insufficient and a bottleneck to project implementation in SSA.

For DFI guarantees, CEPA notes that their obtainment is viewed by market participants as “*onerous and bureaucratic*” (CEPA 2014, p. vi). They also require a *counter-guarantee* by the host country, which is not always granted, and may lower the *concessional financing envelope* available to the respective SSA government. Lastly, their quantum is seen to fall short of requirements.

For PRIs, Mayer notes, that there is currently “*a lack of provision and purchase of PRI in fragile states*” (Mayer 2018, p. 18).⁸⁴ She gives various reasons why their provision is both “*minimal and expensive*” in Emerging Market jurisdictions (Mayer 2018, p. 8).

Firstly, private insurers take a more cautious view on project risks than public cover providers due to the lack of project data, particularly on defaults. *Secondly*, risk events tend to be more erratic and are essentially unpredictable. This requires insurers to maintain large equity cushions for these policies to absorb potential claims. *Thirdly*, PRIs require detailed country knowledge to adjust insurance policies to their credit risk appetite. This is difficult and costly to obtain. *Lastly*, agreeing on the policy language, in particular the definition of *instances for pay-out* and *claim crystallisation points*⁸⁵, impedes PRI usage in case comprehensive cover⁸⁶ is unavailable (cf. CEPA 2014, Mayer 2018).

⁸⁴ A significant number of SSA countries are considered *fragile*. Her findings and the cited literature also allow conclusions for non-fragile, though nonetheless badly governed countries with weak credit ratings. This applies to most SSA countries.

⁸⁵ The *crystallization point* of an insurance policy is the moment in time at which the claim is agreed to have arisen.

⁸⁶ *Comprehensive cover* insures for commercial and political risks *comprehensively*, so not only for certain defined risk events. These are *catch-all* insurances that cover non-payment.

In summary, attaining sufficient risk cover is usually not straight forward, as it (i) might not be offered at all or (ii) may be inadequate (tenor, cover ratio, covered risks).

4.4.4. Inability to determine project risk allocations

In Project Finance, each project risk should be assigned to the participant that is best able to manage it. As *Sorge* notes, this is key for project success as “*coordination failures, conflicts of interest and free-riding by any project participant can have significant costs*” (*Sorge* 2004, p. 94).

While this is the basic principle, in reality, risks are not clear cut. There are often shades of grey and a single risk factor is regularly borne by various counterparties to differing degrees. Each project party will thereby review and assess the transaction from a different angle. Though interests between some stakeholders may be aligned for a specific risk factor, other parties will be on the opposing side.

An example is a *sovereign payment guarantee* for a PPA. Sponsors and lenders benefit, while the host country raises its external debt burden thereby increasing its risk of debt distress.

Overall, a party’s risk-taking needs to stay within the boundaries of its risk appetite. As hundreds of project parameters need to be negotiated and agreed, an alignment can be challenging.

The inability to allocate project risk expresses itself either in (i) an *outright cancellation* of the transaction or (ii) a *significant delay*. In the former case, project parties can simply not reach an agreement. In the latter case, the transaction undergoes structural adjustments to accommodate all participants. A failure or postponement may thereby be triggered by any project party (cf. IMF 2021a, OECD 2020).

5. Mitigation options to facilitate project success

To mitigate the diverse bankability challenges that have been discussed in the preceding core section of the thesis, the literature outlines a variety of options that could improve the project success rate in SSA. These are summarised in this chapter and are structured by the responsible counterparty for the implementation of the respective measure.

While the options are described on a *stand-alone basis*, they are most effective *in combination*. For example, facilitating the access to project preparation funds will be ineffective if capabilities by local authorities remain weak.

Most courses of action are concrete short- to medium-term measures. Broader, more structural political, economic, environmental, and social improvements through gradual development will have the most meaningful and lasting positive effect on the implementation of renewable energy Project Finance transactions in SSA. However, these changes take time and are difficult to influence.

5.1. Improvement of host country and project conditions

The majority of mitigation options fall into the scope of the host country government and its institutions. Some items are thereby structural changes that take considerable time and effort, while others are quick fixes that can be implemented immediately.

Firstly (1), host countries need to demonstrate a willingness to cooperate and to host projects backed by foreign sponsors. This requires strong political commitment from the top and a collaborative attitude towards investors. These items are driven by the country's leadership and political culture. While numerous factors are at play in shaping it, a couple of measures may help institutionalise clear top-level guidance.

One (a) is the implementation of an *integrated infrastructure planning process* comprising the publication of mid- to long-term *NDPs* and *project priority lists*. *Another one (b)* is the adoption of *cooperative principles* that government entities sign up to (cf. AFC & BCG 2017, Moser, Nealer & Runde 2016). Most importantly, these should aspire to treat foreign private investors and financial institutions as a *source of expertise* not just as funding providers and to *accept the requirement for decent returns* (cf. AFC & BCG 2017, IMF 2021a). Though such planning and communication processes should foster cooperation, stability, and discipline, it may not fully mitigate the risk of lacking political support over the long operating lifetime of renewable energy assets (at least 15 years).

Secondly (2), capabilities of local authorities and their decision-making processes should be improved. The implementation of *specialised governmental units* that function as *one-stop shops* for sponsors and contractors of Project Finance transactions could serve as a powerful tool. If properly managed and mandated, this concept allows to address several identified challenges at once.

It would enable (i) the *recruitment and training of specialised staff*, (ii) *speed up capability build-up*, (iii) *improve the service to sponsors*, and (iv) *shorten the review and approval processes*. This unit could also (v) *perform difficult project development tasks*, which the government and its authorities are best able to manage, e.g. community engagement, relocation or compensation of *PAPs* in the project perimeter and participation by the local population. It could furthermore (vi) *adopt state-of-the-art public tendering and data disclosure practices* to ensure transparency along the entire project value chain from origination to preparation, implementation and finally operation. Over time, it could even (vii) *standardise pivotal project processes and documentation* in line with international standards, e.g. the terms of the PPA, thereby building a solid, tried and tested framework for transactions.⁸⁷ This also reduces information asymmetry between government entities and sponsors. Lastly, (viii) it could run *value-for-money* processes and ensure - through the parameters in key project contracts - that sponsors receive attractive but not excessive returns.

This *one-stop shop* concept could even be extended to the judicial system to offer stable, fair, and speedy court proceedings (cf. AFC & BCG 2017, CEPA 2014, IMF 2021a, Moser, Nealer & Runde 2016, ODI 2018, OECD 2020).

Thirdly (3), SSA governments should reallocate funds to less attractive asset classes to avoid *crowding out* private investments. As we have seen in Figure 17, the power production sector, which includes renewable energy assets, has been the prime sector for Project Finance activity over the past three decades worldwide (cf. CEPA 2014). Host countries should therefore channel governmental budgets and concessional financing into social infrastructure, like schooling and medical facilities, which are more complex to implement.

At the same time, governments do need to continue and even step-up *targeted* support to nudge projects towards realisation. This is not in conflict with budgetary constraints if it is

⁸⁷ The *IPP* and *Independent Water and Power Plant (IWPP)* schemes in the *Sultanate of Oman* are an excellent example, how an Emerging Market jurisdiction has built a well-regarded framework for Project Finance transactions that continues to attract significant sponsor and lender appetite even though the sovereign credit rating has dipped well below the investment-grade threshold (current rating is *B+*).

focussed and *marginal*⁸⁸ support. Examples are *free land allocation, tax incentives and stabilisation clauses* in transaction documents⁸⁹.

Fourthly (4), host countries should foster private sector confidence through sound macroeconomic policies. These should be carefully managed and governed by transparent policy guidelines.

An example are *capital flow restrictions*. The *IMF* points out that complete *capital flow liberalisation* may increase vulnerability to external shocks and is not suitable for all countries at all stages of their economic development (cf. *IMF* 2021a). Small, Emerging Market economies in SSA, may therefore uphold certain *capital transfer restrictions*, especially in times of market stress. Understandable, well communicated, and observed principles for amendments to the capital flow regulation are consequently key to price out *adverse selection*⁹⁰ by sponsors. Governments may also negotiate tailor-made exemptions for highly value-accretive transactions (cf. *IMF* 2021a, Mayer 2018).

Furthermore (5), governments should improve the general investment climate for sponsors to reduce the cost and risk of doing business. One example is the eradication of financial crime, in particular bribery and corruption. (i) A *public procurement code*, (ii) an *anti-corruption commission* and (iii) *effective incentive systems for public officials* could help address this topic.⁹¹ Social values, which are just as important in mitigating financial crime risk, are however difficult to influence, at least in the short-term (cf. *CEPA* 2014, Mayer 2018, *OECD* 2020).

Lastly (6), SSA host countries should *develop their domestic capital and debt markets*. External support in this regard comes for example from the *IFC*, which has launched the *Joint Capital Markets Program* for Emerging Markets in 2017. It supports the host country in developing the necessary legal and regulatory framework as well as an associated action plan (cf. *IFC* 2021). Another external catalyst is the *Currency Exchange Fund*, a private company,

⁸⁸ *Marginal* is to be understood in the *Economic Sciences* sense of the word, meaning measures that just tip the balance towards a positive outcome. In combination with the earlier mentioned *value-for-money* analysis a government could thereby optimise its *RoE* when supporting a project.

⁸⁹ These types of clauses specify how changes in law after the execution of the project documentation are treated and how they impact the rights and obligations of the sponsor under these documents (cf. Thomson Reuters 2021).

⁹⁰ In *Economics*, *adverse selection* describes a situation in which the seller has more information about a product, service, or project than the buyer. Due to this asymmetric information, the buyer will either not buy the product or will include a *margin of safety* in his bid.

⁹¹ The *IMF* gives a detailed overview of best practice measures to curb corruption. Examples are the requirement for public officials to report their wealth and the threat of actual prosecution for wrongdoing (cf. *IMF* 2016).

seed funded by 22 public and private investors, including the *IFC*, the *DEG* and the *EBRD*. It “provides over-the-counter derivatives to hedge the currency and interest rate mismatches that are created when international investors lend to financial institutions in developing countries in their local currencies” (OECD 2016, p. 1).

Main benefits for Project Finance transactions would be (i) the *capacity of domestic banks to provide local currency financing* and (ii) the *opening up of an additional exit route* for sponsors, e.g. through the sale of project company shares on the local stock market (cf. AFC & BCG 2017, CEPA 2014, Moser, Nealer & Runde 2016).

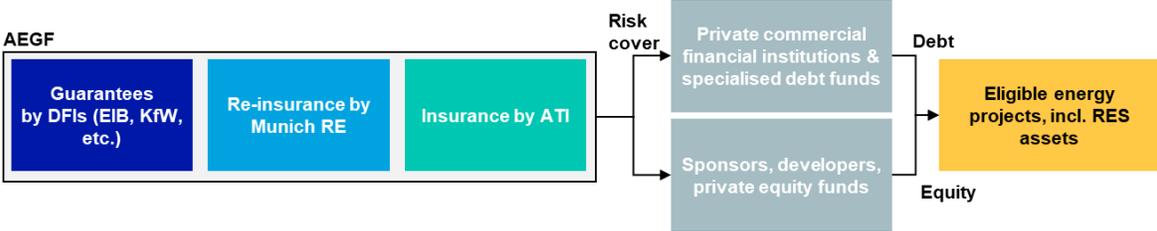
5.2. Enhanced support from risk cover providers

In general terms, the literature notes that DFIs, ECAs, and PRIs should (i) increase the scale of their capacity provision, (ii) facilitate access to their products, and (iii) adjust their cover policies (cf. AFC & BCG 2017, CEPA 2014, IMF 2021a, Moser, Nealer & Runde 2016, ODI 2018, OECD 2020).

On (i), the *Africa Energy Guarantee Facility (AEGF)*, is a noteworthy positive example (Figure 39). It is a risk-sharing platform that has been jointly set-up by the *European Investment Bank (EIB)*; a public multilateral DFI), the *African Trade Insurance Agency (ATI)*; a public- and privately owned multilateral DFI) and *Munich RE* (a private insurer). It leverages private insurance capital by re-insuring *ATI*, the insurance provider facing the borrower, through *Munich RE*, whose reinsurance is in turn guaranteed by various DFIs, like the *EIB* and the *Kreditanstalt für Wiederaufbau (KfW)*; Germany’s NDB).

It (a) provides political risk insurance for Project Finance transactions, (b) is explicitly focussed on the sustainable energy sector, which comprises renewable energy assets, and (c) does not require a sovereign counter-guarantee (cf. AEGF 2019).

Figure 39: Structure of the African Energy Guarantee Facility



Source: AEGF 2019

ECAs could also embrace this concept and provide reinsurance to the PRI market. They could also co-insure with private insurers. This would allow to leverage private insurance capital for transactions with weak credit profiles and long tenors on a large scale.

PRIs on their part should actively seek re-insurance to increase their capacity, not only from DFIs and ECAs, but also from *climate trust funds* that are administered by MDBs. Though the scopes and strategies of these funds are diverse, all of them intend to leverage *impact investment capital*⁹² by providing funding or insurance cover. To stretch the available capital sources, Mayer suggests using shorter tenors on a rolling basis, e.g. an initial 6-year tenor annually renewed for a total period of 12 years (cf. Mayer 2018, p. 15). This lowers the initial guarantee volume per project while reducing the transactional credit risk.⁹³

On (ii), *firstly*, DFIs should ramp up their *Project Preparation Facility* programmes. As noted in Chapter 4.1.4, the current volume and scope is insufficient to have a noticeable positive impact on the number of bankable projects. *Collier & Mayer* go a step further by suggesting DFIs to sponsor project development themselves. They would be assigned defined project rights *ab initio* and would be remunerated through the takeout by private sponsors at a later stage (cf. Collier & Mayer 2014, p. 4).

Secondly, all risk cover providers should improve the dissemination of information about their products, especially amongst local and international developers.

Thirdly, aside improved general marketing activity, accompanying transparency measures, like project information platforms, should be strengthened. A positive example is the *AUDA-NEPAD*⁹⁴ *database*. Its publicly available, well maintained transaction information allows sponsors to form a better view of country track records, required documents and potential implementation bottlenecks (cf. CEPA 2014, Moser, Nealer & Runde 2016, Mayer 2018).

On (iii), *firstly*, the scope of some insurance policies should be broadened. *Moser, Nealer & Runde* mention *regulatory risk guarantees*, which address changes in regulation, e.g. the revocation of licenses and permits, and *construction risk guarantees*, which would cover risk factors related to the successful completion of the project, e.g. delays in the project timeline (cf. Moser, Nealer & Runde 2016, p. 21).⁹⁵

⁹² This is capital managed by funds that intend to generate a positive environmental and social impact aside financial returns.

⁹³ This concept is of course only value-accretive, if the fixed-termed, but rolling risk cover reduces the implied credit risk over-proportionally. If the cover is only recognised for the minimum contractually binding tenor, this structure offers no advantage.

⁹⁴ This is the development agency of the *African Union*.

⁹⁵ As previously discussed, some insurance policies are *comprehensive* and therefore already cover the mentioned risk events. However, others, i.e. MIGA's political risk insurance, currently only cover specific events.

Secondly, ECAs should strengthen their focus on the development impact of their guarantee support. As entities owned or backed by *Developed Market* governments, they should underpin the front-running *sustainability agenda* of their home countries.

However currently, no favourable terms, e.g. lower risk cover premia or higher cover ratios, are available for transactions fostering *sustainable economic development*. While some ECAs have recently vowed to phase out support for environmentally harmful activities, like oil exploration, a renewable energy asset is currently treated no different than any other conventional power generation project.

This aspect should also feed into the so-called *OECD Consensus*, the rulebook agreed between OECD ECAs to regulate support for their home market exporters to level the playing field amongst countries (cf. CEPA 2014, Mayer 2018).⁹⁶

Thirdly, PRIs should sharpen *risk crystallisation language* in their insurance policies to identify the occurrence of a claim more clearly and speedily. Another improvement in PRI's product offering could be *delayed payment liquidity facility cover*.

In SSA, sponsors regularly cite liquidity constraints due to overdue payments by government-owned off-takers as a significant project risk. While the underlying project is operational and profitable, these cash flow bottlenecks can trigger unnecessary defaults. By providing cover for these type of financing facilities, private insurers could improve the odds of project success.

Fourthly, linkage between *bilateral investment treaties (BIT)* and PRI provision should be improved (cf. Mayer 2018, p. 17). BITs determine the terms and conditions for private sector investment by private entities from one country in another country. These treaties typically comprise fair and equitable treatment provisions and protection from political risk events like expropriation. Furthermore, BITs typically allow for alternative dispute resolution mechanisms, like international arbitration proceedings, in case contractual investor rights have been violated.⁹⁷ They can therefore help to ease PRIs *moral hazard* and *adverse selection* concerns⁹⁸, which tend to suppress their risk appetite.

⁹⁶ The prime purpose of ECAs is the support of their respective export industries by providing risk cover to suppliers and buyers.

⁹⁷ There is a system governing these *investor-state dispute settlements*. Details can be found in a working paper by the *OECD* (2012).

⁹⁸ PRIs prefer their participation not to be disclosed as the knowledge of risk insurance cover may entice negligent or even reckless behaviour on behalf of contractors and government entities, most importantly by the off-taker (moral hazard). Insurers are also at an information disadvantage to other

5.3. Adjustments in the investment approach of sponsors

In terms of the improvement potential for investors, the literature focuses on the early-stage development and project preparation stages (cf. AFC & BCG 2017, OECD 2020).

Firstly, it is proposed that investors get involved in the project development at an even earlier stage than is currently the case. On the one hand, this could indeed increase project success rates, on the other hand it incurs higher development costs and the risk of financial write-offs in case the wrong projects are chosen.

However, there are a couple of reasonable options for early involvement that contain the risk of financial loss. *One option* (i) are success-based cooperation agreements with local development companies combined with a more thorough screening and filtering process to increase the odds of selecting a successful project. *Another option* (ii) is the set-up of local project development operations in selected countries. This should improve project success probabilities even more, though the trade-off are higher development costs vis-à-vis option (i). A country needs to exhibit a healthy project pipeline and a decent track record of project implementation to warrant such an investment.

Though not under sponsors' control, the governmental *one-stop shop concept* mentioned in Chapter 5.1 could also help in identifying the right transactions.

Secondly, sponsors and their financial advisors should involve risk mitigation parties early in the project development. This allows to consider requirements by risk cover providers in the preliminary design and structuring phase, thereby avoiding lengthy adjustment loops to ensure bankability (see Chapter 1.2 for a recap).

project parties, including the project company itself (adverse selection). Being able to effectively seek arbitration helps to contain these risks (cf. CEPA 2014).

6. Summary of risk factors and mitigation options

In the preceding analysis, a variety of root causes have been identified that impede the bankability of renewable energy Project Finance transactions in SSA. They span (i) different *project phases*, (ii) the *appetite, performance, and capabilities* of the *main project parties* (sponsors, contractors, lenders, and host governments), and (iii) different *types of risk* (reputational, political and credit risk).

It is impossible to determine the relative importance of each factor in a scientifically accurate and reliable way. Based on the *prominence in the reviewed literature* and *anecdotal evidence* from implemented, cancelled or on-going projects, Figure 40 gives a cautious indication on the significance of the different factors. Highly impeding aspects have been highlighted with a *red outlining*, while impactful but less relevant challenges are delineated in *yellow*.

The *lack of sponsor and investor appetite* stands out. It is the *nucleus* of any successful renewable energy Project Finance transaction and is impacted by most other discussed challenges. Low *institutional capabilities*, cumbersome *E&S requirements*, elevated *off-taker credit risk* and questionable *exit options*, often lead to the perception that the transactional risk-return profile is unattractive. The result is that many projects are not even pursued.

At the subsequent development stage, the *lack in development and institutional capabilities* regularly chokes further project progress. As sound project preparation is key, transactions are either unable to secure financing or run into significant delays. Both aspects are impacted by the *instable political conditions* in many SSA countries, which impedes the implementation of transactions further.

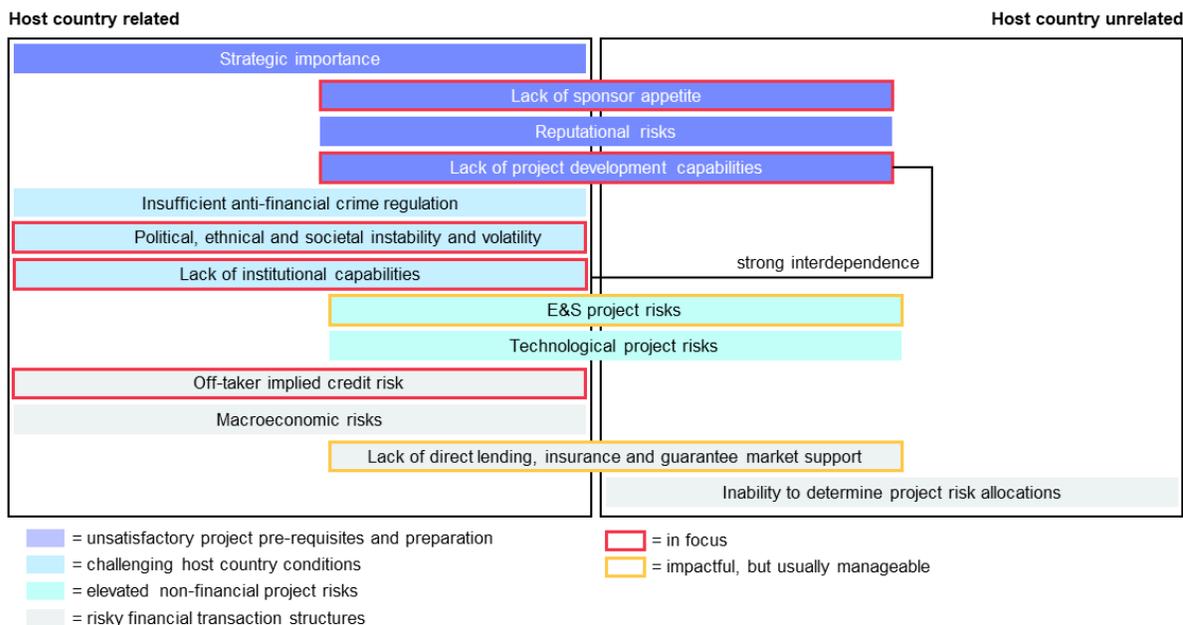
Lastly, driven by macroeconomic policies, general economic developments and the institutional governance, *off-taker credit risk* is predominantly weak, challenging the risk appetite of private financial institutions.

While *E&S project risks* and the *lack of direct lending, insurance and guarantee market support* are also important, they tend to be factors that complicate and delay transaction implementation, rather than leading to an outright cancellation.

Figure 40 has also been arranged to highlight another finding. Most identified bankability challenges are *related* to the host country conditions and policies. While some are entirely within the realm of the respective sovereign, other items straddle both worlds and are partially determined by host country conditions and partially by external factors.

An example is the management and mitigation of E&S project risks. Ultimately, it is the sponsors' responsibility, but the process is heavily impacted by the capabilities of the host countries' institutions.

Figure 40: Bankability challenges in summary



Source: own considerations

The subsequent analysis of mitigation options revealed that suitable measures are available to address these bankability challenges. Figure 41 summarises the discussed measures and gives an assessment of (i) the *ease of their implementation*, (ii) the *parties who are predominantly responsible* for their implementation, and (iii) the *timeline* for their implementation.⁹⁹ A few observations are noteworthy.

Firstly, most measures will take considerable implementation effort as they require alignment between multiple stakeholders, which - in some cases - have conflicting interests. As most measures involve the SSA host countries, their implementation also takes place in the context of the described, challenging host country conditions.

Secondly, several measures refer to the implementation of a *one-stop shop unit*, a sort of *Centre of Excellence* for Project Finance transactions in the respective host country, with a *far-reaching mandate* and *broad responsibilities*. In the opinion of the author, this is the single most effective concrete measure to address a variety of important challenges pertaining

⁹⁹ In case measures are mitigants for several different bankability challenges, they are listed multiple times.

to the development and implementation of renewable energy Project Finance transactions in SSA. However, to be effective, its set-up needs to be ambitious, precise, and diligent.

Thirdly, most measures may be implemented in the short- to medium-term. This assumes that the relevant stakeholders are jointly committed to the task.

Figure 41: Summary of bankability challenges and mitigation options

See next three pages

Category	Sub-category	Mitigation measures	Ease of implementation	Main responsible parties	Timeline for implementation
Unsatisfactory project pre-requisites and preparation		High-level political commitment	Low: broad involvement of political culture in the respective country	Senior political leadership, civil society (indirect)	Mid-term (2-3 years); necessity to build track record
	Strategic importance	Implement integrated infrastructure planning and cooperative principles	Medium: best practices available and may be implemented by technocrats with external DFI help	Senior staff at the respective Ministry of Finance (MoF) and/or Prime Minister's office	Short-term (within 1 year)
		Diversion of public funds to unattractive and complex sectors (to avoid the crowding out of private capital)	Low: alignment of lots of different conflicting interests required	Senior political leadership and MoF staff	Short-term (within 1 year)
		Targeted project support (i.e. tax incentives)	Low: needs require identification and legislative implementation	One-stop shop unit ⁽¹⁾ , MoF staff, and political legislative staff	Mid-term (2-3 years); necessity to build track record
	Reputational risks	One-stop shop government unit, which ensures standardisation of project processes and documentation in line with international standards	Low to medium: will require senior political support and legislative approval to implement, but may be driven by technocratic staff with external DFI support	One-stop shop unit	Short-term (within 1 year)
		State-of-the-art public tendering, procurement code, and data disclosure practices	Low to Medium: may be mainly driven by technocratic staff	One-stop shop unit	Short-term (within 1 year)
		Governmental E&S project risk management (see below)	Low to Medium: may be mainly driven by technocratic staff	One-stop shop unit	Short-term (within 1 year)
	Lack of sponsor appetite	Collaborative interaction and acceptance of fair investor returns	Low: partially through one-stop shop unit, but also requires shift in political sentiment	One-stop shop unit and political establishment	Short-term (within 1 year)
		Development of domestic debt and capital markets	Low: involves various different stakeholders and requires the implementation of complex regulation	MoF, capital markets authority, banking sector regulator	Long-term (3+ years)
	Lack of project development capabilities	Earlier project development engagement by sponsors	High: at the sole discretion of private sponsors	Sponsors	Short-term (within 1 year)

(1) If the one-stop shop unit is not implemented, responsibility for project support is scattered across various public entities. All measures described herein involving this unit will likely be more difficult to execute and implement then.

Category	Sub-category	Mitigation measures	Ease of implementation	Main responsible parties	Timeline for implementation
Challenging host country conditions	Insufficient anti-financial crime regulation	Political and societal culture One-stop shop unit	Low ; potential to influence is limited Low to medium : as per above; if correctly established, the transparency and reporting this unit should curb AFC	Political establishment and civil society One-stop shop unit	Long-term (3+ years) Short-term (within 1 year)
	Political, ethnical and societal instability and volatility	State-of-the-art public tendering, procurement code, and data disclosure practices Sound, predictable and well-communicated macroeconomic policies Clear political responsibility through one-stop shop concept	Low to Medium : as per above; may be mainly driven by technocratic staff Low to Medium : may be mainly driven by technocratic staff; external DFI support helps Low to Medium : as per above; may be mainly driven by technocratic staff	One-stop shop unit MoF One-stop shop unit	Short-term (within 1 year) Short-term (within 1 year) Short-term (within 1 year)
	Lack of institutional capabilities	One-stop shop government unit, which allows (i) the recruitment and training of specialised staff and (ii) the shortening of review and approval processes. Other benefits are mentioned above, like greater transparency and more standardisation. Implement a similar unit in the judicial system (special courts for international investors and PF transactions)	Low to Medium : as per above; may be mainly driven by technocratic staff Low : may be mainly driven by technocratic staff, however implementing the required decrees for its establishment is complex	One-stop shop unit Judicial one-stop shop unit	Short-term (within 1 year) Mid-term (2-3 years); will probably require implementation of the one-stop unit for project preparation and implementation first
	E&S project risks	Host governments to manage critical E&S processes (resettlements, etc.)	Medium : in case the one-stop shop unit is established it can be mandated to perform this task; it will take some time for the unit to be effective in this	One-stop shop unit	Mid-term (2-3 years)
	Technological project risks	Improvement of road and other transport infrastructure	Low ; potential to influence is limited	Political establishment; various technical ministries and contractors	Long-term (3+ years)

Elevated non-financial project risks

Category	Sub-category	Mitigation measures	Ease of implementation	Main responsible parties	Timeline for implementation
Risky financial transaction structures	Off-taker implied credit risk	Positive economic and political development Sound, predictable and well-communicated macroeconomic policies	Low: potential to influence is limited Low to Medium: as per above; may be mainly driven by technocratic staff; external DFI support helps	Political and economic establishment at large MoF	Long-term (3+ years) Short-term (within 1 year)
	Macroeconomic risks	Development of domestic debt and capital markets and sound macroeconomic policy-making Ramp-up of existing insurance and guarantee programmes and leverage of new facilities (like the AEGF)	Low: as per above; involves various different stakeholders and requires the implementation of complex regulation Medium to High: donor support is available and programmes are generally in place, however the underlying negotiations can be lengthy and complex	MoF, capital markets authority, banking sector regulator Host and donor governments, DFIs, ECAs, and PRIs	Long-term (3+ years) Mid-term (2-3 years)
		Better dissemination of information about the availability and suitability of these insurance and guarantee programmes	High: can be linked to the establishment of the one-stop units; increase in marketing efforts (conference attendance, etc.)	Party responsible for the respective programme	Short-term (within 1 year)
		DFI, ECA and climate trust fund co- and re-insurance to PRIs	Medium to High: pilot programmes like the AEGF are in place though decision-making in DFIs and ECAs can be slow	DFIs, ECAs, and PRIs	Mid-term (2-3 years)
		Favourable terms for projects with a positive development impact (like renewable energy assets)	Medium: strong momentum for sustainable development, however lengthy alignment processes are required	DFIs (partially implemented), ECAs and PRIs	Mid-term (2-3 years)
		Improvements in insurance policies (delayed payment liquidity facilities, sharpened crystallisation language)	High: at the sole discretion of PRIs	PRIs	Short-term (within 1 year)
		Stronger linkage between BITs and PRI provision	Medium: requires joint effort by PRIs and the two involved governments for the respective BIT	PRIs and respective BIT governments	Mid-term (2-3 years)
		One-stop shop unit to determine fair risk-allocation	Low to medium: as per above; unit will need to gain some transaction experience to be proficient in this	One-stop shop unit in collaboration with the other main project parties (Sponsors, etc.)	Mid-term (2-3 years)
		Inability to determine project risk allocations			

Source: own considerations

Though the challenges are daunting, the RES PF success rate may be improved if the right measures are addressed in a timely and committed manner. This thesis has extracted promising mitigation options mentioned in the pertinent literature, complemented by the author's own considerations.

7. Conclusion

To achieve full electrification by 2030, as stipulated in *SDG 7*, while not violating other *SDGs*, countries in SSA need to *quintuple* their power output from renewable energy sources in less than 10 years.

Project Finance has successfully attracted private capital for renewable energy assets in many Developed and Emerging Market jurisdictions over the past decades. However, it has failed to play a significant role in SSA.

This is neither due to the *lack of theoretical renewable energy potential*, which is vast, nor due to the *lack of electricity demand growth* and *the general availability of private capital*. It rather results from a variety of impediments that render most projects in the region non-bankable.

These stem from (i) *poor project preparation*, (ii) *challenging host country conditions*, (iii) *greater difficulty in managing non-financial risk factors*, and (iv) *riskier financial transaction structures*. These factors and their underlying constituents are *highly interdependent* and project failures are therefore often *multi-causal*.

Various mitigation options are available to address these bankability challenges. Some of them require more structural adjustments and will take time to implement, while others are *quick fixes* that may already have a positive impact in the short-term.

They too, are interdependent and most effective in combination. A concerted, joint effort by relevant stakeholders to identify and act upon their potential contribution to improving the success rate of renewable energy Project Finance transactions in SSA is therefore required. This is the most difficult part of all.

A long road lies ahead of SSA countries to provide access to affordable and - to a significant extend - green electricity to its entire population by 2030. The stakes are high, and the time is pressing. Leadership, guidance, and drive need to come from their national governments and regional MDBs. No one else will do it for them.

References

(AEGF 2019)

The African Energy Guarantee Facility - Improving Green Energy Investment

African Energy Guarantee Facility

Available on the internet at:

https://www.ati-aca.org/wp-content/uploads/2019/03/AP_EIB_AEGF_FLYER_A4_2018_Hyperlink.pdf

[accessed on 20 Sep 2021]

(AFC & BCG 2017)

Infrastructure financing in Sub-Saharan Africa - best practices from ten years in the field

Africa Finance Corporation (Gravito, L. / Haddon, J.), Boston Consulting (Alli, A. / Usanase, A.)

Available on the internet at:

<https://www.norfund.no/archive/Bilder/Ansatte/BCG-Report-Africa-May-2017%20%28ID%20243128%29.pdf>

[accessed on 26 Jul 2021]

(AFD 2021)

Project Preparation Funds

Agence Francaise de Développement

Available on the internet at:

<https://www.afd.fr/en/project-preparation-funds>

[accessed on 26 Jul 2021]

(AfDB 2021a)

African Economic Outlook 2021 - From Debt Resolution to Growth: The Road Ahead for Africa

African Development Bank Group

Available on the internet at:

https://www.afdb.org/sites/default/files/documents/publications/afdb21-01_aeo_main_english_complete_0223.pdf?e=1&page=1&embedInfo=theme,293042,151b26,ffffff,ffe358,ffffff

[accessed on 22 Aug 2021]

(AfDB 2021b)

Annual Report 2020

African Development Bank Group

Available on the internet at:

<https://www.afdb.org/en/documents/annual-report-2020>

[accessed on 15 Aug 2021]

(AfDB 2015)

Lake Turkana Wind Power Project: The largest wind farm project in Africa

African Development Bank Group

Available on the internet at:

<https://www.afdb.org/en/projects-and-operations/selected-projects/lake-turkana-wind-power-project-the-largest-wind-farm-project-in-africa-143>

[accessed on 20 Aug 2021]

(Africa50 2019)

Annual Report 2019

Available on the internet at:

https://www.africa50.com/fileadmin/uploads/africa50/Photos/Annual_Report/AF-RICA50_ANNUAL_REPORT_2019_ENGLISH.pdf

[accessed on 20 Aug 2021]

(AVCA 2021)

2021 African Private Equity Industry Survey

African Private Equity and Venture Capital Association

Available on the internet at:

<https://www.ativ.org.tn/wp-content/uploads/2021/04/avca-private-equity-industry-survey-2021.pdf>

[accessed on 2 Aug 2021]

(Baker & Wlokas 2015)

South Africa's renewable energy procurement: A new frontier?

Baker, L. / Wlokas, H. L.

Cape Town

Available on the internet at:

https://open.uct.ac.za/bitstream/handle/11427/13566/15-Baker-Wlokas-RE_frontend.pdf?sequence=1&isAllowed=y

[accessed on 10 Sep 2021]

(BankTrack 2021)

Urgent call not to finance the East African Crude Oil Pipeline

BankTrack and 262 other civil society organisations

Available on the internet at:

https://www.banktrack.org/download/open_letter_from_over_260_civil_society_organisations_to_banks_on_eacop/210301_eacop_open_letter_to_banks_2.pdf

[accessed on 9 Aug 2021]

(BioG 2020)

Basel AML Index: 9th Public Edition - ranking money laundering and terrorist financing risks around the world

Basel Institute on Governance

Available on the internet at:

https://baselgovernance.org/sites/default/files/2020-07/basel_aml_index_2020_web.pdf

[accessed on 17 Aug 2021]

(Beck et al. 2017)

Financing Africa: through the crisis and beyond – executive summary

Beck, T. / Maimbo, S. M. / Faye, I. / Triki, T.

Available on the internet at:

<https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Executive%20Summary%20English.pdf>

[accessed on 7 Sep 2021]

(BHRRC 2016)

Kenya: Report by Danwatch reveals negative impacts of Lake Turkana Wind Project on indigenous community rights

Business & Human Rights Resource Centre

Available on the internet at:

<https://www.business-humanrights.org/en/latest-news/kenya-report-by-danwatch-reveals-negative-impacts-of-lake-turkana-wind-project-on-indigenous-community-rights/>

[accessed on 30 Aug 2021]

(BPL 2021)

Market Insight 2021 – Credit and Political Risk Insurance

Berry Palmer & Lyle Ltd.

Available on the internet at:

<https://bpl-global.com/wp-content/uploads/2021/02/BPL-Global-Market-Insight-2021.pdf>

[accessed on 30 Oct 2021]

(Bruns, Burke & Stern 2017)

The Impact of Electricity on Economic Development: A Macroeconomic Perspective

Bruns, S. B. / Burke, P. J. / Stern, D. I.

Available on the internet at:

https://assets.publishing.service.gov.uk/media/5a250f5ce5274a750b825355/Theme_1_Paper_1_David_Stern.pdf

[accessed on 26 Jul 2021]

(CEPA 2014)

Policy risk in renewable energy investments in developing countries

Cambridge Economic Policy Associates

Available on the internet at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/380928/DECC_PRI_FINAL.pdf

[accessed on 5 Sep 2021]

(Chimhowu, Hulme & Munro 2019)

The 'New' national development planning and global development goals - Processes and partnerships

Chimhowu, A. O. / Hulme, D. / Munro, L. T.

World Development, 120, pp. 76-89, 2019

Available on the internet at:

<https://reader.elsevier.com/reader/sd/pii/S0305750X19300713?to-ken=1B8B39B3ED3E92E095D388440408ED8B7E23FB4886AAF4FFF16605292337FA4E5AA3F98BC31BD84E6FAED569C4BA9CBF&originRegion=eu-west-1&originCreation=20211119085059>

[accessed on 15 Aug 2021]

(Collier & Mayer 2014a)

Unlocking Private Finance for African Infrastructure

Collier, P. / Mayer, C.

Available on the internet at:

<https://novafrica.org/wp-content/uploads/2015/06/Paul-Collier.pdf>

[accessed on 25 Aug 2021]

(Collier & Mayer 2014b)

Infrastructure in Africa: A new agenda

Collier, P. / Mayer, C.

Paris

Available on the internet at:

<https://www.oecd.org/daf/inv/investment-policy/2014-AfDB-OECD-Seminar-paper-Collier-Mayer.pdf>

[accessed on 25 Aug 2021]

(CPI 2013)

Mapping the World Bank Group Risk Mitigation Instruments for Climate Change

Climate Policy Initiative (Micale, V. / Frisari, G. / Mazza, F.)

Available on the internet at:

<https://climatepolicyinitiative.org/wp-content/uploads/2013/09/World-Bank-Group-Risk-Mitigation-Instruments-for-Climate-Change-Brief1.pdf>

[accessed on 20 Sep 2021]

(C-Power 2021)

Financing structure

C-Power (Thornton Bank offshore wind farm project company)

Available on the internet at:

<http://www.c-power.be/index.php/project-phase-2-3/financing-structure>

[accessed on 1 Oct 2021]

(Davis 2003)

Project Finance: Practical Case Studies - Second Edition - Volume 1 - Power and Water

Euromoney Books (Davis, H. A.)

Available on the internet at:

http://www.untag-smd.ac.id/files/Perpustakaan_Digital_1/FINANCE%20Project%20Finance%20-%20Practical%20Case%20Studies%20Vol%20I,%202nd%20Ed_1855648458.pdf

[accessed on 22 Aug 2021]

(DEG 2016)

Finanzierung von Machbarkeitsstudien - Überblick

Deutsche Entwicklungsgesellschaft

Köln

Available on the internet at:

https://www.deginvest.de/DEG-Dokumente/Unsere-L%C3%B6sungen/F%C3%B6rderprogramme/Finanzierung-von-Machbarkeitsstudien_%C3%9Cberblick_2016_10.pdf

[accessed on 12 Aug 2021]

(Deloitte 2019)

2018 Deloitte Africa Private Equity Confidence Survey

Deloitte Consulting

Available on the internet at:

https://www2.deloitte.com/content/dam/Deloitte/za/Documents/finance/za_Deloitte-Africa-Private-Equity-Confidence-Survey-2018.pdf

[accessed on 10 Aug 2021]

(Dentons 2013)

A Guide to Project Finance

Dentons law firm

Available on the internet at:

<https://www.dentons.com/~/-/media/6a199894417f4877adea73a76caac1a5.ashx>

[accessed on 28 Jul 2021]

(Deutsche Bank 2017)

Reputational Risk Management

Deutsche Bank AG

Available on the internet at:

<https://annualreport.deutsche-bank.com/2017/ar/risk-report/risk-and-capital-management/reputational-risk-management.html>

[accessed on 8 Aug 2021]

(de Féllgonde & Maury 2019)

African logistics - time for revolution

de Féllgonde, A. / Maury, F.

Available on the internet at:

https://www.theafricaceoforum.com/wp-content/uploads/2019/12/2019-African-Logistics_Report_ACF-Okan_EN.pdf

[accessed on 8 Sep 2021]

(EIB 2018)

Energy Finance in Sub-Saharan Africa

European Investment Bank

Available on the internet at:

https://www.eib.org/attachments/country/energy_finance_in_sub_saharan_africa_en.pdf

[accessed on 6 Aug 2021]

(EPA 2021)

The Equator Principles

Equator Principles Association

Available on the internet at:

<https://equator-principles.com/>

[accessed on 2 Oct 2021]

(FS-UNEP 2020)

Global Trends in Renewable Energy Investment 2020

Frankfurt School and United Nations Environment Programme Collaborating Centre for Climate & Sustainable Energy Finance

Available on the internet at:

https://www.fs-unep-centre.org/wp-content/uploads/2020/06/GTR_2020.pdf

[accessed on 28 Jul 2021]

(Garnelo-Gomez et al. 2017)

Corporate reputation past and future: a review and integration of existing literature and a framework for future research

Garnelo-Gomez, I. / Hillenbrand, C. / Money, K. / Pain., S. / Saraeva, A.

Corporate Reputation Review, 20 (3-4), pp. 193-211, 2017

Available on the internet at:

https://centaur.reading.ac.uk/72946/5/EDITED_SHORTENED_%20AND%20REVISED_%20V8_%2027_08_2017%20Past-Present%20of%20Reputation%20CRR.pdf

[accessed on 3 Sep 2021]

(GIH 2019)

Leading Practices in Governmental Processes Facilitating Infrastructure Project Preparation

Global Infrastructure Hub

Available on the internet at:

https://cdn.gihub.org/umbraco/media/2344/gih_project-preparation_full-document_final_art_web.pdf

[accessed on 29 Jul 2021]

(GIZ, IRENA & KfW 2020)

The Renewable Energy Transition in Africa - Powering Access, Resilience and Prosperity
Gesellschaft für Internationale Zusammenarbeit, International Renewable Energy Agency,
Kreditanstalt für Wiederaufbau

Available on the internet at:

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/March/Renewable_Energy_Transition_Africa_2021.pdf

[accessed on 15 Sep 2021]

(Green Giraffe 2021)

Kiamariga

Green Giraffe Financial Advisory Services

Available on the internet at:

<https://green-giraffe.eu/project/kiamariga/>

[accessed on 24 Aug 2021]

(GTR 2021)

Macron pushes East African oil pipeline as French banks shun project

Global Trade Review News Agency

Available on the internet at:

<https://www.gtreview.com/news/africa/macron-pushes-east-african-oil-pipeline-as-french-banks-shun-project/>

[accessed on 27 Aug 2021]

(ICA 2018)

Infrastructure Financing Trends in Africa – 2018

International Cooperative Alliance

Available on the internet at:

https://www.icafrica.org/fileadmin/documents/IFT_2018/ICA_Infrastructure_Financing_Trends_in_Africa_-_2018_Final_En.pdf

[accessed on 2 Aug 2021]

(ICC 2021)

Sustainability in Export Finance

International Chamber of Commerce

Available on the internet at:

<https://www.iccgermany.de/wp-content/uploads/2021/09/ICC-Sustainability-in-Export-Finance-White-Paper-22-September-2021.pdf>

[accessed on 7 Sep 2021]

(IEA 2020)

World Energy Outlook 2020

International Energy Agency

Available on the internet at:

<https://www.iea.org/reports/world-energy-outlook-2020>

[accessed on 26 Jul 2021]

(IEA 2019a)

Africa Energy Outlook 2019 – World Energy Outlook Special Report

International Energy Agency

Available on the internet at:

<https://iea.blob.core.windows.net/assets/98909c1b-aabc-4797-9926-35307b418cdb/WEO2019-free.pdf>

[accessed on 26 Jul 2021]

(IEA 2019b)

Understanding the World Energy Outlook scenarios

International Energy Agency

Available on the internet at:

<https://www.iea.org/commentaries/understanding-the-world-energy-outlook-scenarios>

[accessed on 20 Aug 2021]

(IFC 2021)

J-CAP: Helping countries realize the benefits of strong capital markets

International Finance Corporation, World Bank Group

Available on the internet at:

<https://www.ifc.org/wps/wcm/connect/4924b6e6-38a6-48a5-8631-ce3e0d890fd9/About+J-CAP++Brochure.pdf?MOD=AJPERES&CVID=n6Fb4nm&ContentCache=NONE&CACHE=NONE>

[accessed on 9 Oct 2021]

(IFC 2018)

IFC SME Ventures - Investing in Private Equity in Sub-Saharan African Fragile and Conflict-Affected Situations

International Finance Corporation, World Bank Group

Available on the internet at:

<https://www.ifc.org/wps/wcm/connect/2c6289c3-df5e-4f90-b910-2a04e1000922/IFC+SME+Ventures+Final+low+res+30+Nov+2018.pdf?MOD=AJPERES&CVID=mtQwg2S>

[accessed on 8 Aug 2021]

(IFC 2012)

IFC Performance Standards on Environmental and Social Sustainability

International Finance Corporation, World Bank Group

Available on the internet at:

https://www.ifc.org/wps/wcm/connect/c02c2e86-e6cd-4b55-95a2-b3395d204279/IFC_Performance_Standards.pdf?MOD=AJPERES&CVID=kTjHBzk

[accessed on 12 Sep 2021]

(IMF 2021a)

Private Finance for Development - Wishful Thinking or Thinking Out of the Box?

International Monetary Fund (Eyraud, L. / Devine, H. / Alva, A. P. / Selim, H. / Sharma, P. / Wocken, L.)

Available on the internet at:

<https://www.imf.org/-/media/Files/Publications/DP/2021/English/PFDWTTTOBEA.aspx>

[accessed on 2 Aug 2021]

(IMF 2021b)

Regional Economic Outlook: Sub-Saharan Africa - Navigating a Long Pandemic

International Monetary Fund

Available on the internet at:

<https://www.imf.org/-/media/Files/Publications/REO/AFR/2021/October/English/text.ashx>

[accessed on 10 Sep 2021]

(IMF 2020)

Public sector debt definitions and reporting in low-income developing countries - executive summary

International Monetary Fund, World Bank Group

Available on the internet at:

<https://www.imf.org/~/-/media/Files/Publications/PP/2020/English/PPEA2020005.ashx>

[accessed on 15 Sep 2021]

(IMF 2016)

Corruption: Costs and Mitigating Strategies

International Monetary Fund

Available on the internet at:

<https://www.imf.org/external/pubs/ft/sdn/2016/sdn1605.pdf>

[accessed on 22 Aug 2021]

(IMF 2014)

Government Finance Statistics Manual 2014

International Monetary Fund

Available on the internet at:

<https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf>

[accessed on 15 Sep 2021]

(IRENA 2021)

Renewable Capacity Statistics 2021

International Renewable Energy Agency

Available on the internet at:

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Apr/IRENA_RE_Capacity_Statistics_2021.pdf

[accessed on 28 Jul 2021]

(IRENA 2016)

Renewable Energy Market Analysis - the GCC Region

International Renewable Energy Agency

Available on the internet at:

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_Market_GCC_2016.pdf

[accessed on 7 Aug 2021]

(IRENA 2015)

Africa 2030: Roadmap for a renewable energy future

International Renewable Energy Agency

Available on the internet at:

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_Africa_2030_REmap_2015_low-res.pdf

[accessed on 2 Aug 2021]

(IRENA 2014)

Estimating the Renewable Energy Potential in Africa - a GIS-based approach

International Renewable Energy Agency

Available on the internet at:

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2014/IRENA_Africa_Resource_Potential_Aug2014.pdf

[accessed on 10 Aug 2021]

(ISS 2020)

Kenya's ambitious wind turbines battle community land crosswinds

Institute for Security Studies

Available on the internet at:

<https://issafrica.org/iss-today/kenyas-ambitious-wind-turbines-battle-community-land-crosswinds>

[accessed on 7 Sep 2021]

(Klagge & Nweke-Eze 2020)

Financing large-scale renewable-energy projects in Kenya: investor types, international connections, and financialization

Klagge, B. / Nweke-Eze, C.

Geografiska Annaler: Series B, Human Geography, 102:1, pp. 61-83, 2020

Available on the internet at:

<https://www.tandfonline.com/doi/pdf/10.1080/04353684.2020.1729662?needAccess=true>

[accessed on 25 Aug 2021]

(Kortekaas 2015)

Infrastructure Finance in the Developing World - Infrastructure Pipeline and Need for Robust Project Preparation

Kortekaas, B.

Available on the internet at:

<https://www.g24.org/wp-content/uploads/2016/05/MARGGK-WP04.pdf>

[accessed on 15 Aug 2021]

(KPMG 2021)

Emerging Trends in Infrastructure

KPMG

Available on the internet at:

<https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/01/emerging-trends-in-infrastructure.pdf>

[accessed on 2 Aug 2021]

(Kyckr 2021)

44 Lessons From 44 AML Fines in 2021

Kyckr Advisory Services

Available on the internet at:

<https://www.kyckr.com/lessons-from-aml-bank-fines-in-q1-q2-2021/>

[accessed on 20 Aug 2021]

(Linklaters 2018)

Linklaters advise lenders of Formosa 1: the first offshore wind farm project in Taiwan

Linklaters law firm

Available on the internet at:

<https://www.linklaters.com/en/about-us/news-and-deals/deals/2018/june/linklaters-advise-lenders-of-formosa-1>

[accessed on 15 Sep 2021]

(Marsh 2021)

Political risk map 2021

Marsh Insurance Company

Available on the internet at:

<https://www.marsh.com/uk/services/political-risk/insights/political-risk-map-2021-update.html>

[accessed on 7 Aug 2021]

(Mayer 2018)

Political risk insurance and its effectiveness in supporting private sector investment in fragile states

Mayer, H.

Available on the internet at:

<https://www.theigc.org/wp-content/uploads/2018/05/Political-risk-insurance.pdf>

[accessed on 28 Aug 2021]

(McK 2020)

Solving Africa's infrastructure paradox

McKinsey & Company

Available on the internet at:

<https://www.mckinsey.com/business-functions/operations/our-insights/solving-africas-infrastructure-paradox>

[accessed on 26 Jul 2021]

(McK 2015)

Brighter Africa – The growth potential of the sub-Saharan electricity sector

McKinsey & Company (Castellano, A. / Kendall, A. / Nikomarov, M. / Swemmer, T.)

Available on the internet at:

https://www.mckinsey.com/~media/McKinsey/dotcom/client_service/EPNG/PDFs/Brighter_Africa-The_growth_potential_of_the_sub-Saharan_electricity_sector.ashx

[accessed on 20 Aug 2021]

(Mercer 2018)

Investment in African infrastructure – challenges and opportunities

Mercer Consulting

Available on the internet at:

<https://www.marshmclennan.com/content/dam/mmc-web/insights/publications/2018/dec/innovations-in-infrastructure/Investment-in-African-Infrastructure/gi-2018-wealth-investment-opportunities-in-african-infrastructure-full-report-merc.pdf>

[accessed on 2 Aug 2021]

(MIGA 2015)

Investment Guarantee Guide

Multilateral Investment Guarantee Agency, World Bank Group

Available on the internet at:

<https://www.miga.org/sites/default/files/2018-06/MIGA%20products.pdf>

[accessed on 10 Sep 2021]

(Mistry 1995)

Multilateral Development Banks – An assessment of their Financial Structures, Policies, and Practices

Mistry, P. S.

Available on the internet at:

http://www.fondad.org/product_books/pdf_download/23/MDBs-BookComplete.pdf

[accessed on 15 Sep 2021]

(MCC 2021)

Where we work

Millennium Challenge Corporation

Available on the internet at:

<https://www.mcc.gov/where-we-work>

[accessed on 7 Aug 2021]

Moody's 2021

Rating scale and Definitions

Moody's investors service

Available on the internet at:

https://www.moodys.com/sites/products/productattachments/ap075378_1_1408_ki.pdf

[accessed on 17 Aug 2021]

(Moody's 2019)

Default and recovery rates for project finance bank loans, 1983-2017

Moody's investors service

Davison, A. / Heitmann, K. / Mulvaney, M. / Sabatelle, AJ / Winrow, W.

London and New York

(Moser, Nealer & Runde 2016)

Barriers to Bankable Infrastructure

Moser, H. / Nealer, E. / Runde, D. F.

Lanham, Boulder, New York, and London

Available on the internet at:

https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/160308_Moser_BarriersBankableInfrastructure_Web.pdf

[accessed on 7 Aug 2021]

(Mo Ibrahim Foundation 2020)

2020 Ibrahim Index of African Governance – Index Report

Mo Ibrahim Foundation

Available on the internet at:

<https://mo.ibrahim.foundation/sites/default/files/2020-11/2020-index-report.pdf>

[accessed on 5 Sep 2021]

(Mukherjee & Roy 2017)

Feasibility Studies and Important Aspect of Project Management

Mukherjee, M. / Roy, S.

International Journal of Advanced Engineering and Management, Vol. 2, No. 4, pp. 98-100, 2017

Available on the internet at:

<https://ijoemorg.files.wordpress.com/2017/04/ijoem25momin.pdf>

[accessed on 10 Aug 2021]

(Ng 2010)

Credit default swaps, guarantees and insurance policies: same effect, different treatment?

Ng, L.

Available on the internet at:

https://www.sidley.com/~media/files/publications/2010/12/credit-default-swaps-guarantees-and-insurance-po___/files/view-article/fileattachment/jnl-of-intl-banking-and-finance-law-jibfl-l-ng-a___.pdf

[accessed on 15 Sep 2021]

(ODI 2018)

Private infrastructure finance for developing countries - Five challenges, five solutions

Overseas Development Institute

Available on the internet at:

<https://cdn.odi.org/media/documents/12365.pdf>

[accessed on 20 Aug 2021]

(OECD 2020)

Quality Infrastructure in 21st Century Africa

Organisation for Economic Co-operation and Development

Available on the internet at:

<https://www.oecd.org/dev/Africa-Quality-infrastructure-21st-century.pdf>

[accessed on 2 Aug 2021]

(OECD 2016)

Currency Exchange Fund (TCX), TCX Investment Management Company BV

Organisation for Economic Co-operation and Development

Available on the internet at:

<https://www.oecd.org/dac/peer-reviews/Currency-Exchange-Fund.pdf>

[accessed on 10 Oct 2021]

(OECD 2012)

Investor-State Dispute Settlement

Organisation for Economic Co-operation and Development

Available on the internet at:

https://www.oecd.org/investment/investment-policy/WP-2012_3.pdf

[accessed on 2 Sep 2021]

(OeKB 2021)

Deckungsrichtlinien für Projektgeschäfte, Investitionsgüterlieferungen und Beteiligungen

Oesterreichische Kontrollbank AG

Available on the internet at:

<https://www.oekb.at/dam/jcr:64417ebe-d4e1-42e9-861a-c5b23e50a9cc/Deckungsrichtlinien.pdf>

[accessed on 20 Sep 2021]

(OIES 2021)

A critical assessment of learning curves for solar and wind power technologies

The Oxford Institute for Energy Studies

Available on the internet at:

<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2021/02/A-critical-assessment-of-learning-curves-for-solar-and-wind-power-technologies-EL-43.pdf>

[accessed on 25 Sep 2021]

(Oji, Soumonni & Ojah 2016)

Financing renewable energy projects for sustainable economic development in Africa

Oji, C. / Soumonni, O. / Ojah, K.

Energy Procedia 93, pp. 113-119, 2016

Available on the internet at:

<https://core.ac.uk/download/pdf/81138493.pdf>

[accessed on 15 Aug 2021]

(OoEE&RE 2021)

Wind Turbines: the Bigger, the Better

Office of Energy Efficiency & Renewable Energy

Available on the internet at:

<https://www.energy.gov/eere/articles/wind-turbines-bigger-better>

[accessed on 7 Sep 2021]

(Pohl & Zaby 2019)

The Management of Reputational Risks in Banks: Findings from Germany and Switzerland

Pohl, M. / Zaby, S.

Available on the internet at:

<https://journals.sagepub.com/doi/full/10.1177/2158244019861479>

[accessed on 7 Aug 2021]

(PV Magazine 2019)

Nigeria aims to lower solar electricity tariffs agreed three years ago

Available on the internet at:

<https://www.pv-magazine.com/2019/07/26/nigeria-aims-to-lower-solar-electricity-tariffs-agreed-three-years-ago/>

[accessed on 20 Sep 2021]

(PWC 2017)

Global infrastructure investment - The role of private capital in the delivery of essential assets and services

PricewaterhouseCoopers

Available on the internet at:

<https://www.pwc.com/gx/en/industries/assets/pwc-giia-global-infrastructure-investment-2017-web.pdf>

[accessed on 7 Aug 2021]

(Quantum Global 2018)

Financing Green Energy Infrastructure in Africa: Case Studies of Large- and Small-scale Renewable Energy Projects

Quantum Global Consulting

Available on the internet at:

http://quantumglobalgroup.com/wp-content/uploads/2018/03/GreenEnergy_Jeremy-Wakeford.pdf

[accessed on 25 Aug 2021]

(REN21 2020)

Renewables 2020 - Global Status Report

REN 21 think tank

Available on the internet at:

https://www.ren21.net/wp-content/uploads/2019/05/gsr_2020_full_report_en.pdf

[accessed on 17 Aug 2021]

(Reuters 2021)

Kenya cancels power purchase negotiations, replaces energy minister

Reuters News Agency

Available on the internet at:

<https://www.reuters.com/world/africa/kenya-cancels-power-purchase-negotiations-replaces-energy-minister-2021-09-29/>

[accessed on 2 Oct 2021]

(Short 2000)

Export Credit Agencies, Project Finance, and Commercial Risk: Whose Risk is it, Anyway?

Short, R.

Fordham International Law Journal

Available on the internet at:

<https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1766&context=ilj>

[accessed on 10 Aug 2021]

(Sorge 2004)

The nature of credit risk in project finance

Bank for International Settlements (Sorge, M.)

Available on the internet at:

https://www.bis.org/publ/qtrpdf/r_qt0412h.pdf

[accessed on 2 Sep 2021]

(The Lab 2014)

Long Term Cross-Currency Swap

The Global Innovation Lab for Climate Finance

Available on the internet at:

<https://www.climatepolicyinitiative.org/wp-content/uploads/2015/02/Long-Term-Cross-Currency-Swap-Phase-2-Analysis-Summary.pdf>

[accessed on 7 Sep 2021]

(ThinkGeoEnergy 2017)

Corbetti geothermal project resolving issues with Government of Ethiopia

ThinkGeoEnergy News Agency

Available on the internet at:

<https://www.thinkgeoenergy.com/corbetti-geothermal-project-resolving-issues-with-government-of-ethiopia/>

[accessed on 2 Oct 2021]

(TI 2020)

Corruption Perceptions Index

Transparency International

Available on the internet at:

<https://www.transparency.org/en/cpi/2020/index/nzl>

[accessed on 30 Aug 2021]

(Thomson Reuters 2021)

Glossary - Stabilization Clause

Thomson Reuters Practical Law

Available on the internet at:

[https://uk.practicallaw.thomsonreuters.com/1-501-6477?transitionType=Default&context-Data=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/1-501-6477?transitionType=Default&context-Data=(sc.Default)&firstPage=true)

[accessed on 10 Oct 2021]

(UNECE 2017)

Global Tracking Framework: UNECE Progress in Sustainable Energy

United Nations Economic Commission for Europe

New York and Geneva

Available on the internet at:

https://trackingsdg7.esmap.org/data/files/download-documents/unece_regional_gtf_2017_report.pdf

[accessed on 28 Jul 2021]

(US TDA 2020)

Call for Initial Proposals – Sub-Saharan Africa

United States Trade and Development Agency

Available on the internet at:

https://ustda.gov/wp-content/uploads/USTDA-SSA-Proposal-Window_FINAL.pdf

[accessed on 5 Aug 2021]

(WBG 2021a)

Sub-Saharan Africa

World Bank Group

Available on the internet at:

<https://data.worldbank.org/country/ZG>

[accessed on 7 Aug 2021]

(WBG 2021b)

Africa's Transport Infrastructure - Mainstreaming Maintenance and Management

World Bank Group

Available on the internet at:

<https://elibrary.worldbank.org/doi/pdf/10.1596/978-0-8213-8456-5>

[accessed on 2 Sep 2021]

(WBG 2021c)

CPIA Africa

World Bank Group

Available on the internet at:

<https://elibrary.worldbank.org/doi/pdf/10.1596/978-0-8213-8456-5>

[accessed on 20 Aug 2021]

(WBG 2020)

Doing Business 2020 - Comparing Business Regulation in 190 Economies

Available on the internet at:

<https://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf>

[accessed on 2 Sep 2021]

(WEO 2019)

The Sub-Saharan Africa Risks Landscape

World Economic Forum

Available on the internet at:

https://www3.weforum.org/docs/WEF_The_Sub-Saharan_Africa_Risks_Landscape_report.pdf

[accessed on 10 Aug 2021]

In addition to these sources, I used transaction data from the IJ Global, the Inframation and the WBG Private Participation in Infrastructure (PPI) databases and foreign exchange data from Bloomberg.

Appendix

Assessment criteria of the Millennium Challenge Corporation

Economic freedom		Investing in people	Ruling justly
Access to Credit Indicator	Child Health Indicator		Civil Liberties Indicator
Business Start-up Indicator	Girls' Primary Education Completion Rate Indicator		Control of Corruption Indicator
Fiscal Policy Indicator	Girls' Secondary Education Enrolment Ratio Indicator		Freedom of Information Indicator
Gender in the Economy Indicator	Health Expenditures Indicator		Government Effectiveness Indicator
Inflation Indicator	Immunization Rates Indicator		Political Rights Indicator
Land Rights and Access Indicator	Natural Resource Protection		Rule of Law Indicator
Trade Policy Indicator	Primary Education Expenditures Indicator		

Sub-indicators for the category 'Safety and the rule of law' of the Mo Ibrahim Index

Safety and the rule of law			
Rule of law	Transparency & Accountability	Personal Safety	National Security
Independence of the judiciary	Access to public & legislative information	Perception of personal safety	Absence of government involvement in armed conflict
Independence & transparency of the judicial system	Access to records of state-owned companies	Reliability of police services	Absence of domestic armed conflict or risk of conflict
Access to justice	Accountability of government & public employees	Absence of social unrest	Absence of violence by non-state actors
Property rights	Sanctions for abuse of office	Absence of crime	Absence of cross-border tensions
Mechanisms for orderly transfers of power	Absence of corruption in government branches	Absence of government violence against civilians	Absence of internally displaced persons
Absence of multilateral sanctions	Absence of corruption in the public sector	Absence of human trafficking	Absence of refugees
	Absence of corruption in the private sector		
	Absence of favouritism		
	Anti-corruption mechanisms		

Source: Mo Ibrahim Foundation 2020

Criteria of the 'Doing Business' survey of the WBG

WBG Doing Business survey criteria

Starting a business

Dealing with construction permits

Getting electricity

Registering property

Getting credit

Protecting minority investors

Paying taxes

Trading across borders

Enforcing contracts

Resolving insolvency

Source: WBG 2020

Affidavit

„Ich versichere, dass ich diese Masterarbeit selbstständig und nur unter Verwendung der angegebenen Quellen und Hilfsmittel angefertigt und die den benutzten Quellen wörtlich oder inhaltlich entnommenen Stellen als solche kenntlich gemacht habe.“



Dubai, 28 November 2021

Thomas van Lith