

LESSONS LEARNT

SOUTH AFRICA

CLEAN CAPTIVE INSTALLATIONS FOR INDUSTRIAL CLIENTS IN SUB-SAHARA AFRICA

LESSONS LEARNT FROM THE IMPLEMENTATION OF PILOT PROJECT IN SOUTH AFRICA

JULY 2023



ACKNOWLEDGMENTS

This document is produced jointly by the United Nations Environment Programme (UNEP) and the Frankfurt School-UNEP Collaborating Centre for Climate & Sustainable Energy Finance (FS-UNEP). The document is based on UNEP's and FS-UNEP's published material, experience and lessons learned from the existing pilot projects developed under the CICSA project. UNEP and FS-UNEP would like to thank the Steering Committee for their guidance and all of the authors and reviewers for their respective contributions.

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INTRODUCTION

The Clean Captive Installations for Industrial Clients in Sub-Sahara Africa (CICSA) project currently developed in Kenya, Ghana, Nigeria, and South Africa, has been running since 2019 aiming to demonstrate the economic and financial viability of clean captive energy installations for industries and to enhance their adoption in the four African partner countries and beyond to the entire continent. Captive energy installations are electricity generation facilities that are used and sometimes also managed by commercial or industrial energy users for their own energy consumption. Captive power plants can be operated off-grid or can be connected to the grid.

Renewable energy captive installations alleviate the pressure to generate electricity from national grids and reduce commercial & industrial clients' needs to rely on private supplementary fossil-fueled generators, which are expensive to run. These clean captive installations are frequently referred to as the second generation of renewable energy business models, as they do not rely on national governments' incentivizing policies to enhance the deployment of clean energy technologies.

The CICSA project is funded by the International Climate Initiative (IKI) of Germany. The Federal Ministry for Economic Affairs and Climate Action (BMWK) supports this initiative based on a decision adopted by the German Bundestag. The implementing team of the project comprises the United Nations Environment Programme (UNEP) in partnership with its collaborating centre at Frankfurt School of Finance & Management (Frankfurt School), together with locally hired consultants who provide local market and captive power expertise.

THE PROJECT

The project's activities fall under four components:

Component 1	Baseline studies and awareness raising
Component 2	Economic and financial tools and assessments
Component 3	Realization of one pilot project per country
Component 4	Knowledge dissemination and outreach.



autonomy from the grid supply



reliable electricity supply



energy cost savings

Since the project's launch, scoping missions, country reports, awareness raising, calls for proposals, and a selection process for candidates have been held, among other activities, in Kenya, Ghana, Nigeria and South Africa.

Under component 1, scoping missions were held in partner countries to meet with key public stakeholders and to build and strengthen awareness raising of clean captive installations for the commercial and industrial sector. The collected stakeholders' views included gaps and needs of the sector, current trends and potential synergies between stakeholder activities and the project. The scoping mission in South Africa was held between 04-08 November 2019.

The project has published country studies on clean captive installations markets in the four partner countries Kenya, Ghana, Nigeria and South Africa. The reports dive into each country's electricity market, policy and regulatory framework, tariffs and market potential for clean captive installations, with a strong focus on finance.

Under component 2, economic and financial tools for assessing suitable financing structures of clean captive installations have been developed and published.

Under component 3, open calls for proposals and country studies were launched through dedicated webinars in partner countries. A framework document was presented and published explaining the application process, eligibility criteria, selection criteria and timelines. For South Africa, the call for proposals ended on 23 August 2021.

During the selection process, an evaluation committee reviewed, scored, and shortlisted the projects for the open call for proposal for pilot projects in partner countries. The selection involved a thorough due diligence process.

A total of six pilot projects received grant funding from CICS. For South Africa, Sola Assets was selected. Once pilot projects became operational, the financial and economic viability was monitored and proven.

All documents and resources related to Components 1-3 can be found on the project website (<https://www.captiverenewables-africa.org/>).

This publication is part of Component 4 and serves for knowledge dissemination and outreach. This report series condenses the results of the project in the four partner countries and includes one case study per country.

The project's direct outcome is to support private industrial and financial sector stakeholders in developing successful pilot projects, demonstrating the captive renewable energy business model, and raising peer awareness in the partner countries. The tools developed during the lifetime of the project, and the results of the pilot projects are disseminated to encourage replication of the captive clean energy generation installations business model in the partner countries (intermediate state) and beyond, to other countries of the region. The successful

replication of the captive renewable energy business model in various industries and the availability of financing options in the partner countries are expected to result in decreased industrial greenhouse gas (GHG) emissions and enhanced economic development due to more affordable and reliable energy supply. This will ultimately lead the partner countries to advance towards a low-emission development pathway. The ease of replication, combined with the wide applicability of the business models across selected countries and the region, is expected to drive large-scale replication of the model.

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SUPPORTED PILOT PROJECT IN SOUTH AFRICA

Pilot projects that have received financial support have played a crucial role in demonstrating the economic and financial viability of captive solar PV installations. CICSA has provided financial support in the form of results-based grants to six pilots, including one in South Africa. These grants have shared the costs of one of the following types of solar PV installations:

1. **Transaction costs** including advisory services attributable to a captive solar PV plant at a site with a total installed capacity not exceeding 1 MWp (Type 1 project); or
2. Costs associated with creating a **financing vehicle or a financing instrument** dedicated to captive solar PV projects (Type 2 project); or
3. **Capacity building, trainings or certification initiatives** of scope, with a specific focus on captive solar PV financing (Type 3 project).

In South Africa, following a competitive call for proposal, the following pilot was selected:

SOLA Assets: Under type 2 grant funding (financing vehicle/instrument) SOLA Assets (SOLA) was supported for optimization if its existing South African solar fund called the Orionis Group. The fund was set-up in 2019 as a financing vehicle to support the development, financing, construction, and operation of C&I solar projects. Over the years, as more and more projects were added in the fund, the fund structure increased in complexity which resulted in issues like tax leakage, administrative inefficiency and increased costs. The grant funding was used to engage advisors and experts who reviewed the current structure of the fund and provided recommendations on improving its efficiency and profitability.

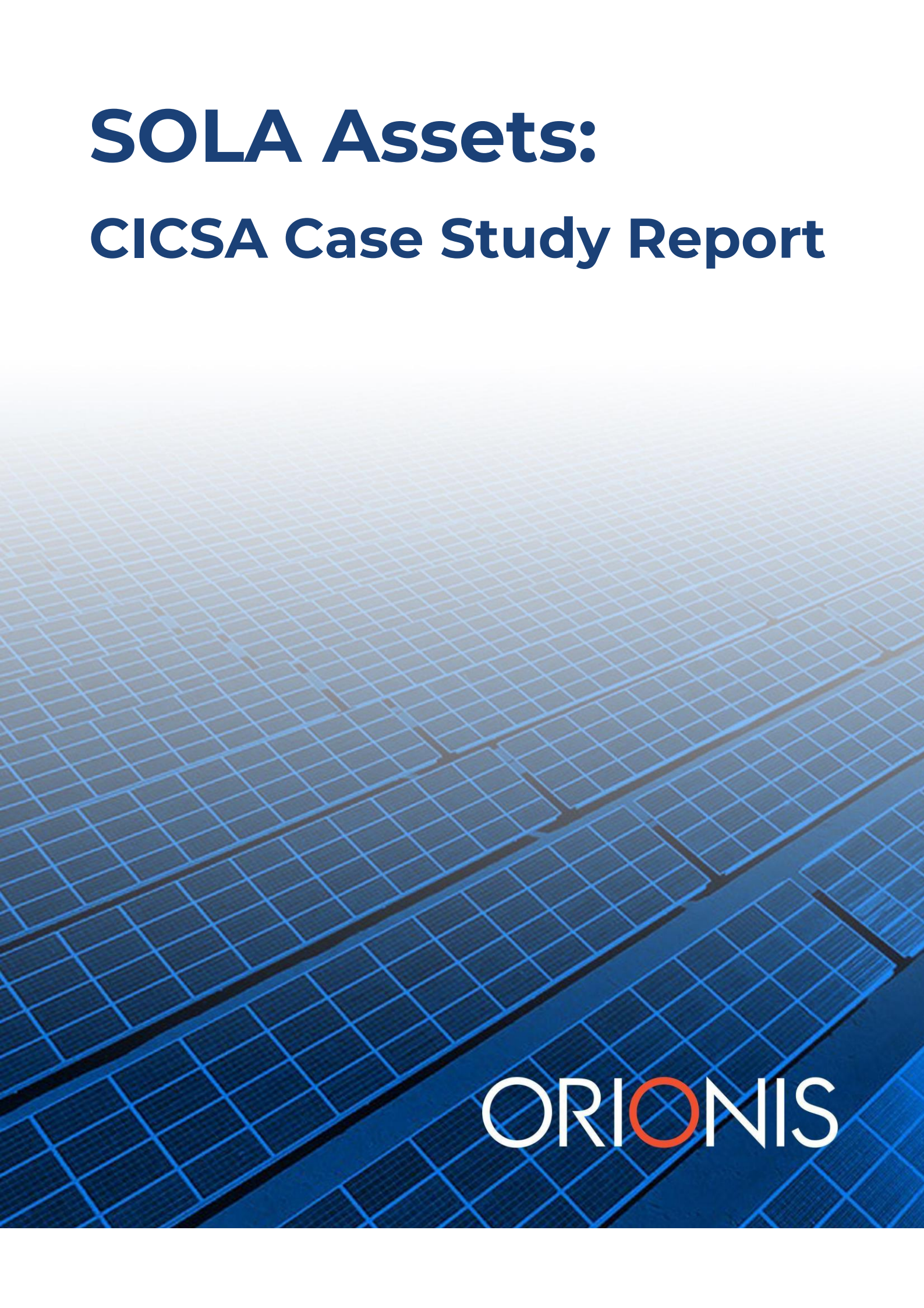
SOLA Assets is part of SOLA Group which is a vertically integrated Independent Power Producer (IPP). The Group has two divisions: SOLA Assets, which handles development, financing, and asset management, and SOLA Build, responsible for Engineering, Procurement, and Construction (EPC) as well as Operations and Maintenance (O&M) services.

The next section includes a detailed case study, prepared by SOLA Assets and their advisors, that also outlines the lessons learnt through the procurement of advisory work. Project developers may face challenges in establishing or managing complex funding structures. The case study elaborates on SOLA's experience in setting-up of the Orionis Group and insights from the advisors on how to optimize its complex structure.

CICSA has been actively promoting the use of renewable energy in South Africa's commercial and industrial sectors by offering financing and technical assistance. Solar energy is being utilized for various applications, such as powering production equipment, lighting, and cooling systems. This case study helps in establishing the business case for clean captive installations which can be demonstrated through management of innovative funding structures.

SOLA Assets:

CICSA Case Study Report



ORIONIS

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Introduction

The Clean Captive Installations for Industrial Clients in Sub-Saharan Africa (CICSA) project currently operating in Kenya, Ghana, Nigeria, and South Africa, has been running since 2019 aiming to demonstrate the economic and financial viability of clean captive energy installations for industries and to enhance their adoption in the four African partner countries and beyond to the entire continent.

The CICSA project is funded by the International Climate Initiative of Germany. The Federal Ministry for Economic Affairs and Climate Action supports this initiative based on a decision adopted by the German Bundestag. The implementing team of the project comprises the United Nations Environment Programme in partnership with its collaborating centre at Frankfurt School of Finance & Management, together with locally hired consultants who provide local market and captive power expertise.

SOLA Assets applied for grant funding under the CICSA project to optimise an existing South African solar fund called the Orionis Group. The grant funding was needed to engage professional advisers who reviewed the current structure and provided recommendations to enhance the overall efficiency and profitability of the funding structure. This report aims to share the lessons learnt from establishing the Orionis Group and the insights from the professional advisers to assist other clean captive energy project funders in establishing their own solar funding structure.

Background: Outline of Orionis and Restructure



The Orionis Group operates within the South African market, which provides its own unique set of challenges and opportunities. The country is in an energy crisis, desperately needing new and clean electricity generation capacity in a highly regulated environment while also needing to address the historic injustices of Apartheid.

Electricity Supply

South Africa's electricity generation, transmission and distribution is controlled and provided by a state-owned enterprise, Eskom Holdings. Faced with the inability to produce sufficient electricity supply to meet South Africa's electricity demand, in 2007 Eskom instituted a mechanism, dubbed "loadshedding", to curb demand as well as to protect the national electricity grid from collapse. Under loadshedding, Eskom is able to periodically turn off selected elements of the grid, thereby plunging its consumers into periodic blackouts.

Regulatory Environment

South Africa's electricity market, comprising Eskom and all electricity consumers, is regulated by the National Energy Regulator of South Africa (NERSA). NERSA, under the Electricity Regulation Act, 2006 (Act No. 4 of 2006) (ERA), oversees the i) issuing of generation licences, ii) setting and/or approving of national electricity tariffs, iii) compliance, and other functions.

Until June 2021, as mandated by the ERA, to connect an electricity-generating device to the national grid, whether in front of or behind the meter, an Independent Power Producer (IPP) needed to apply for and obtain a Generation Licence from NERSA for any project over 1MW in size. These licences were burdensome to get due to strict requirements including the need to prove the generation facility fitted in with the country's Integrated Resource Plan. As the electricity crisis grew, the government provided some relief to IPPs and consumers by increasing the generation licence requirement to >100MW. This meant projects

100MW and smaller were exempt from having to obtain a Generation Licence and project owners merely had to register the generation facility with a governing authority.

Black Economic Empowerment

South Africa instituted a sweeping economic reform policy, Black Economic Empowerment (BEE), via the Broad-based Black Economic Empowerment Act (B-BBEE) Act, No. 53 of 2003. BEE as a policy aims to facilitate broader economic participation by Black people (as defined) in an attempt to redress the severe inequality evident post the dissolution of the Apartheid regime. BEE policies incentivise, among other things, the employment of previously disadvantaged people as well as the transference of wealth via corporate ownership mechanisms. By requiring certain BEE levels of their suppliers, corporates contribute to the broader objective of economic transformation and empowerment. The policy encourages the inclusion of historically disadvantaged individuals and promotes the growth of Black-owned and controlled businesses. The intention is to create a more equitable and inclusive business environment by providing opportunities and access to resources for marginalised groups.

Background to SOLA Group

SOLA Group, a South African solar photovoltaic (PV) and battery storage specialist, has been operating since 2008. Initially, SOLA achieved success in government procurement through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)¹. However, the company later shifted its focus to serving Commercial and Industrial (C&I) clients, building a substantial client base and establishing a strong reputation for successfully concluding Power Purchase Agreements (PPAs) and achieving Financial Close (FC) for projects of various sizes.

SOLA Group holds the leading position in South Africa's market for financed solar solutions and PPAs for C&I customers (off-takers). The company has specialised skills and extensive experience in negotiating large corporate energy transactions.

As a vertically integrated Independent Power Producer (IPP), SOLA is 100% South African-owned and encompasses expertise across all key project workstreams. The company operates through two divisions: **SOLA Assets**, which handles development, financing, and asset management, and **SOLA Build**, responsible for Engineering, Procurement, and Construction (EPC) as well as Operations and Maintenance (O&M) services.

Background to Orionis Group

Orionis Group (Orionis, the Group) was established in 2019 as a funding vehicle to support the development, financing, construction, and operation of C&I solar projects by the SOLA Group. Orionis has amassed an operational portfolio of 16 projects (totalling 37 MWs) of rooftop and ground-mounted solar projects, with an additional 8.3 MWs awarded and currently in development, representing a total constructed capital cost exceeding ZAR 500 million. These solar projects are underpinned by long-term PPAs with a duration of up to 20 years. The client base is diverse, comprising reputable corporate and industrial blue-chip companies, including multinational food and beverage manufacturers, retailers and pharmaceutical manufacturers. To date, various shareholders have invested approximately ZAR 415 million (approximately USD 23 million) of equity capital in Orionis Group. Around half of this capital has been returned to shareholders through refinancing arrangements.

¹ The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) is an initiative launched by the South African government in 2011. It is intended to drive private sector investment in increasing renewable energy production, allowing the country to diversify its energy mix and increase capacity in the grid.

SOLA Assets, the developer of the C&I solar project portfolio and a founding shareholder of the Orionis Group, faced a capital shortfall required to be able to fully finance the development and construction of the assets. To address this, SOLA Assets entered into a partnership with the Old Mutual Group, which provided equity capital to fund the investment opportunities. As new projects emerged, they were presented to the Orionis Investment Committee for approval. Both Old Mutual and SOLA Assets had funding rights to participate in these projects. However, SOLA's limited availability of funding capital resulted in it contributing a relatively small amount of equity capital. Today, SOLA holds rights to only a small minority stake in the total economic value of the equity, despite investing over four years of effort in sourcing, developing and constructing 37 MWs of C&I solar projects.

Orionis Group Impact to Date

From inception (2019) to March 2023, the Orionis Group has had the following impact:

Clean Energy Generated	102 344 MWh	Permanent Jobs Created	10
		of which Black employees	9
CO2 Savings	96 447 tonnes	Water savings	144 305 kilolitres

Background to the Orionis Optimisation Plan

Since its establishment, SOLA Assets, as the administrator of the Orionis Group, has gained significant expertise in the corporate and funding structure, as well as the operations and performance of Orionis' solar PV portfolio. This intellectual capital has enabled SOLA Assets to identify and address various challenges across these elements, including:

- Orionis Group uses an excessively complex funding structure, resulting in imperfect pass-through of capital costs and tax leakage.
- The corporate structure of Orionis Group, consisting of two holding companies (Hold Cos) and four operating companies (Operating Cos), is administratively burdensome, inefficient, and costly.
- Ongoing flaws in the underlying components have affected the performance of certain assets, and there is limited legal recourse against the original equipment manufacturers (OEMs).
- Despite being in the early operational stages, the performance of several assets does not align with long-term design assumptions.
- Unforeseen operational requirements, such as vegetation control and additional security measures and audit fees, were not always initially accounted for in the budget or contracts with the companies providing O&M services.

To optimise the shareholder returns in the Orionis Group, and to increase the efficiency in the administration of the Group, SOLA Assets, with the assistance of the grant funding, has initiated an exercise to investigate the tax, BEE, legal, and financial complexities and shortfalls. This includes consulting professional advisers to review the current structure, address the associated issues, and propose suitable interventions to enhance its efficiency. This report provides a summary of the lessons learnt so far in establishing and operating the Orionis Group, along with the future direction for the funding vehicle.

Lessons learnt from the establishment of Orionis Group



Orionis Financing Structure

Corporate Structure

Project finance is a specialised financing technique used to fund large-scale, long-term projects. It involves the creation of a separate legal and financial structure for each project where the project's assets and cash flows serve as the primary source of repayment for the financing. Unlike traditional corporate financing, project finance relies heavily on the project's future revenue streams and collateral, rather than the creditworthiness of the project sponsor. This approach enables investors and lenders to independently assess the risks and returns associated with a specific project. Project finance is commonly used in energy projects due to the high upfront capital required. The transaction costs on project finance deals are also typically much higher than other financing techniques due to the extensive due diligence required by capital providers.

The Orionis Group was established using project finance principles, specifically employing Special Purpose Vehicles (SPVs) for individual projects and, in some cases, relying on non-recourse debt financing directly provided to the projects rather than the sponsors. Typically, each project would have its own SPV, but due to the relatively low capital outlay for Orionis' projects (and subsequently low administration fees), managing 16+ SPVs would be impractical. As a solution, the initial portfolio of assets was consolidated into a single SPV called **SPV2**. Shortly after the establishment of Orionis, a major portfolio of seven projects was secured for a client who required a specific B-BBEE level to be maintained by the contracting SPV. Since SPV2 did not meet the empowerment criteria, a new empowered SPV, named **SPV3**, was established to satisfy the client's requirements.

Furthermore, multinational corporations that had minimum B-BBEE level requirements contracted two other significant assets within the portfolio. Given the size of these assets and their substantial solar revenue (exceeding ZAR 50 million per year), more stringent B-BBEE codes applied, necessitating direct Black shareholding in the SPVs. As each project had different Black shareholding requirements, separate SPVs had to be created.

One deviation from the standard project finance approach with Orionis was the lack of debt financing for certain projects during the construction phase. Typically, debt capital is used for construction, with solar projects having an average leverage of 70-80%. However, due to the small size of Orionis' initial projects, the high cost of transactions and technical due diligence often made it unfeasible to secure debt financing before commercial operations. Instead, these projects could only be refinanced once they were operational and were consolidated and cross-collateralised into a portfolio of multiple assets to justify the costs. Consequently, Orionis had a mix of both debt-financed (SPV2 portfolio) and equity-financed (SPV1 portfolio) projects, leading to the establishment of two holding companies (HoldCo and DebtCo) which sat above each SPV: **Orionis DebtCo** (housing debt-financed SPVs) and **Orionis HoldCo** (housing equity-financed SPVs). This separation ensured that cash flows from projects not yet funded by debt would not be cross-collateralised to repay debt obligations and would therefore be unencumbered to repay shareholder equity.

As a result of accommodating different B-BBEE requirements and avoiding cross-collateralisation of cash flows, the Orionis Group structure now comprises four project SPVs (in yellow in the organogram to the right) and two HoldCos (green in the organogram). In total, there are six companies to maintain a portfolio of ~ZAR 500 million in capital. The group structure is illustrated in the organogram to the right.

With this in mind, a key optimisation strategy that SOLA Assets investigated was the simplification of the structure by reducing the number of companies within the Orionis Group as far as possible.

Equity Instruments

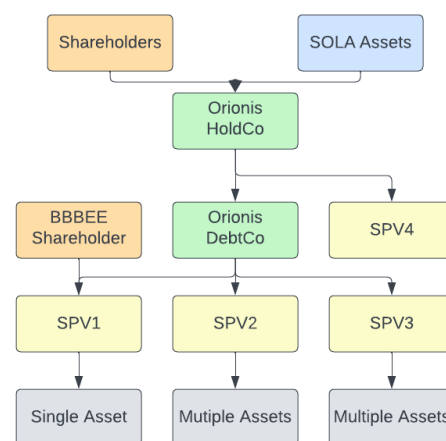
Within Orionis, there are equity investors of different natures that are subject to different tax treatments, resulting in some facing higher taxes on shareholder loans compared to others. To address this, SOLA Assets introduced two funding options: shareholder loans and preference shares. Both options had the same return requirements, but the key difference was the tax treatment of the interest paid by Orionis on shareholder loans, which was tax-deductible in Orionis' hands, whereas preference share dividends do not offer the same tax shield advantages. However, the reverse was the case for shareholders: interest earned on shareholder loans would be taxable for the shareholders, while preference shares (assuming the shareholder is a South African company) would not be subject to tax for the shareholder. Shareholders who lacked sufficient tax losses or cash flow to cover interest payments would typically choose preference shares.

Furthermore, a profit-sharing mechanism was incorporated into the equity instruments of the top HoldCo, Orionis Holdings, known as the B-Share. SOLA Assets was the sole holder of the B-Shares. Available project proceeds followed a specific cash flow waterfall, settling current and accrued interest as well as preference share dividends, before distributing to the remaining funds based on a sharing ratio between the A instruments (being the funding instruments) and B instruments (being the non-funding profit sharing instrument). The sharing ratio was determined on a project-by-project basis, allowing for flexibility and competitiveness, particularly in highly competitive tender situations. This mechanism aimed to align the administrator's interests with maximising project performance and shareholder returns.

Due to the nature of the project sharing waterfall, cash flows due to SOLA Assets via the B shareholding would typically only materialise around year seven onwards once there was sufficient cash flow to pay down the required return of the shareholder loans and preference shares. However, what would also happen was that as more projects were added to the development of Orionis this would further delay the materialisation of the B shares as there was now a greater portion of shareholder loans and preference shares to service. This meant that while the B shares did hold long-term value for SOLA Assets, they were not providing any immediate benefit to SOLA Assets. Furthermore, while SOLA Assets has tried to raise lending facilities using the B class shares as collateral, the complexity of the instrument has made it difficult for potential funders to understand.

The B-Share profit share mechanism was introduced to simplify the process for allocating risk across small projects and ensuring, from an external shareholder's standpoint, that SOLA be incentivised to manage the performance of the projects for the long-term and not just earn development premiums and EPC margins at the start of the project life cycle.

Lesson learnt: Introducing multiple share instruments, each with their own rights and obligations, introduces complexity, an increased administrative burden, and is expensive to set up or unwind. A



complex share structure requires skilled individuals to interpret and execute on and should only be introduced if the quantum of investment is large enough to warrant. Even then, practical implications need to be weighed against the idealistic expectations

Debt Instruments

The majority of projects within the Orionis portfolio have been refinanced with senior debt provided by Nedbank Limited. Orionis Fund (**DebtCo**) signed a Common Terms Agreement with Nedbank in 2019 for a ZAR 350 million credit line that has been used to refinance equity capital utilised for the construction of solar assets. DebtCo has drawn down three tranches under the Nedbank facility, one per each SPV subsidiary of DebtCo, which necessitated the need for three separate Facility Agreements each with their own lending terms based on the creditworthiness of the off-taker of the PPAs under the relevant SPV. Each tranche also underwent, at significant cost, its own technical due diligence processes of the underlying assets and the requisite securitisation process to encumber the underlying assets in favour of the lender.

Lesson learnt: Due to the need for multiple tranches of funding arising from the different timing requirements for debt funding in each of the SPVs, having a single overarching Common Terms Agreement was essential. This upfront negotiation of this single agreement, which oversees all tranches and facilities extended under the credit line, consolidated and reduced the overall legal-related transaction costs which are typically very expensive in project finance. There was little room for optimising other transaction costs, such as technical due diligence costs, through a similar process as these are project-specific costs.

Case Study

Corporate and Funding Structure

Operating and Consolidation Models for Share Valuation

The Orionis portfolio consists of multiple projects, each with its own PPA starting tariff, tariff escalations and contract tenures. To calculate these starting tariffs, SOLA developed in-house project finance models. These project finance models would also form the basis of the investment decision. As the portfolio grew in size and complexity, the models used also became more convoluted. This resulted in a range of financial models with different structures, making it challenging to consolidate and report on portfolio performance.

Additionally, the administrator of the projects, SOLA Assets, needed to compare actual performance with the base case model agreed at financial close to track the financial performance and health of the asset. Ideally, the administrator should be able to incorporate the management accounts of the SPVs into the model to track monthly progress. Typically, however, project finance models are not designed to easily integrate accounting data into a dynamic Excel model.

A further complication arose with the structure of the Orionis Group, where solar assets are approved on a stand-alone basis but are then housed in an SPV with multiple other solar assets. Each investment was approved based on its own assumptions and return requirements. However, due to the consolidation of projects into one SPV, management accounts are available at an SPV level and not on a per-project level, resulting in a disconnect between the data available (SPV-level management accounts) and the data required as inputs into the individual project financial models. Because the financial models had iterated and were each based on unique investment criteria, consolidating the individual solar asset financial models into a single SPV or portfolio financial model was extremely complex.

To address the above complex financial modelling issues, SOLA Assets hired a financial adviser to create two models. The first was an operational model that would consolidate the individual financial models at an SPV-level, link with the management accounts of the relevant SPV and allow the administrator to easily

assess the performance of the SPV against the investment base cases. The second was a consolidated model that would bring together the various operational models to indicate the performance of the portfolio. There was complexity in determining how far up the structure the data consolidation should occur, as different stakeholders had different reporting requirements. Consequently, a consolidation model was developed to cater to both Orionis Holdings (for reporting to shareholders) and Orionis Fund (for reporting to the debt provider), ensuring accurate and appropriate data consolidation at each level.

The other key reason the consolidation model was required was to enable shareholders to get an accurate and dynamic valuation of the various equity instruments of Orionis, including calculating an accurate net present value of the cash flows due to SOLA Assets via the B-Share. The valuation received will form the basis of negotiations between the holders of the various equity instruments.

LESSON LEARNT: It is important to ensure that the base case model used is designed in a way that can effectively incorporate actual operational data and generate key information necessary for any upstream consolidation. This ensures that the model remains adaptable to the changing needs of the projects and enables accurate reporting and consolidation processes.

LESSON LEARNT: When designing the structure of an investment vehicle, it is important to be cognisant of the operational requirements. A structure may be attractive for theoretically providing the most optimal tax, financing or B-BBEE advantages, but the actual execution and administration of the structure must be considered from the perspective of the ability to carry out the investment as approved. Data input/output, technical skill and time requirements are some elements that should be considered.

Consolidation of Equity Instruments

Since 2019, it has become clear that the Orionis equity instruments are unnecessarily complex and burdensome to administer. Furthermore, any third-party investor interested in purchasing equity in Orionis (or Orions in its entirety) may be put off by the complex nature of the structure and the difficulty in valuing the various instruments. Whilst the equity capital structure was initially fit for purpose the following further shortfalls have been identified:

- Unequal performance of projects early in the portfolio lifecycle means that later, better-performing projects will produce reduced returns to SOLA via the B-Share mechanism, as there is a need to make up lost returns from performance shortfalls and deferrals on the earlier projects. This creates a disincentive for SOLA to continue to invest through Orionis and means that external shareholders would lose out on the learning effect of SOLA being able to manage project development and risk more effectively.
- Return rates on the A instruments, which are fixed, have not tracked with recent market movements in reduced equity return expectations for the same level of risk.
- The complicated cash flow waterfall means that there is limited capacity to realise value through a sale of the Orionis Group that would retain this waterfall mechanism.
- Equity is constantly required to be revalued by the Orionis board of directors and approved by its shareholders prior to each funding call.
- Each project, subject to a unique A- and B-Share sharing mechanism as determined during the investment approval process, has different return profiles and a separate Priority of Payments to shareholders. Aggregating this information and tracking the returns upstream to Orionis Holdings is highly administrative and intertwined with the other projects' cash flows.
- The complexity of the Orionis Holdings share capital structure also creates a higher likelihood of disputes arising and differing interpretations of the constitutional documents between shareholders.

Potential strategies to resolve the above shortfalls would be to i) convert B-Shares to A instruments to eliminate the valuation complexities and disincentives introduced, ii) liquidate the B-Shares, or iii) one of the shareholders should buy out the others so as to simplify equity returns across the different share instruments. From initial discussions with the panel of professional advisers appointed by SOLA Assets for this project, it became apparent that the key aspect that would dictate any consolidation or simplification of the instruments would be tax considerations. The tax adviser's review confirmed that there were mechanisms that could be employed to simplify the equity structure, but that there will likely be tax leakage incurred as well as high legal transaction costs. There were further concerns raised that some of the mechanisms were more punitive on some shareholders than others due to the nature of the share instruments and the investment bodies.

The legal adviser's report identified that the above strategies are legally implementable but specified that the relevant legal processes need to be followed, approvals obtained and regulatory requirements met. The most notable finding is that, due to the voting rights assigned to various shareholders and that no one shareholder holds voting rights of 75% or greater, all holders of voting rights would have to vote in favour of the transaction. Each of the aforementioned shortfalls would need to be negotiated and settled to obtain the required 100% shareholder assent to proceed with any transaction.

LESSON LEARNT: When designing the funding structure and constitutional documents of an entity and where practicable, principles for valuation, dispute resolution, corporate transactions, shareholder protections, and other potentially contentious events that may arise should be well defined in the constitutional documents. These documents should pre-determine the foundation for any conflict resolution and the relevant conversations that may arise. Further elements to be considered in the design of the funding structure include the tax considerations for the equity providers, the “user-friendliness”/interpretability of the structure, the ease of administration and procedural requirements of the structure (e.g. valuation & statutory), and the cost of execution.

Consolidation of Credit Lines

A key optimisation strategy considered by SOLA Assets for the Orionis portfolio is the consolidation of the three credit lines provided by Nedbank into DebtCo into a single facility on the same, ideally improved, terms. SOLA Assets appointed a financial adviser to look at three scenarios, specifically:

- 1) A simple consolidation of the three Nedbank facilities into a single facility of weighted average terms (i.e. no overall return improvement, just a simplification of debt facilities).
- 2) A single Nedbank facility to replace the three underlying Nedbank facilities but with better lending terms, (margin, tenor, debt ratios requirements, etc) which allow for more of the portfolio to be leveraged which would boost the overall return of shareholders.
- 3) A new credit facility which would refinance the existing debt as well as refinance several shareholder equity loans which are extended from shareholders down to the SPVs.

The financial adviser suggested that the first step to consolidating the credit lines would be to investigate and assess the relative credit quality of the SPVs sitting beneath DebtCo. This would enable SOLA Assets to identify if there were any benefits to introducing supplemental financing directly into the SPV, rather than at DebtCo level, to increase returns or to provide direct relief for underperforming assets. The memorandum did not elaborate further on this.

The financial adviser's analysis indicated that there is potential to increase the debt raised against the already-levered assets by up to 33% and that further debt could be raised on the currently unlevered assets. The financial adviser provided the following reasons for the upside in the existing debt facility amounts:

- The existing debt terms reflect both the historical credit risk profile of SOLA as much as the underlying Orionis business:

- Smaller scale projects were being developed on an individual basis meaning that there was limited capacity or appetite from commercial lenders for a formal project finance structure.
- SOLA had a relatively limited operational track record at the time.
- Certain debt-funded projects were being developed or constructed at the time of financing and funding providers needed to be compensated for the higher risk taken by funding most or all of the capital costs at the early stage.
- The success of SOLA both within and outside of Orionis has meant that the above no longer holds true moving forward:
 - SOLA has a track record of successfully funding projects on a utility scale using conventional limited recourse project finance. SOLA's risk profile with lenders has improved, as has its importance as a potential source of future business.
 - Orionis now has 15 operational projects below DebtCo worth approximately ZAR 375 million which could stand as collective security for a more conventional form of limited recourse funding.
- DebtCo has relatively low leverage for an operational portfolio.

The debt financing strategy also relies on the stage of the business cycle that Orionis is in, considering whether there are plans to continue growing the portfolio of assets or whether the portfolio is in a “steady state”. Should Orionis have plans to expand the portfolio, optionality should be built into the debt package that allows for further drawdowns at either the construction phase or commercial operations date. These further drawdowns can be done via a “bolt-on” facility which then proportionally shares in the debt security package.

LESSON LEARNT: A benefit of having consolidated multiple solar assets with multiple off-takers in one company or fund enables the “portfolio” effect. i.e. the credit risk of any one off-taker is diluted through a diversified portfolio of off-takers. Similarly, the operating risk of any of the assets (e.g. technical faults) is diluted through the cross-collateralisation of assets. This provides lenders with a level of risk mitigation, allowing for lower debt margins to compensate for the reduced risk. Furthermore, solar projects which are too small to raise traditional project finance due to prohibitive transaction costs can be consolidated into a portfolio and the transaction costs shared.

LESSON LEARNT: Having a succinct and clear investment thesis, whether for debt or equity providers, is key for attracting financiers. In the case of a portfolio of multiple projects, having a consolidated financial model as the foundation for this thesis and being able to communicate the overall strength of the portfolio effect is key.

Operating Performance

Troublesome Assets

The Orionis portfolio has encountered some difficulties with equipment performance, particularly related to a specific make and model of inverters used across a few projects. These inverters experienced ongoing performance issues during warmer months, resulting in error messages despite operating within their design limits. As a consequence, the inverters produced less energy than their rated capacity, negatively impacting the overall system output and therefore the revenue generated by the project. The inverter manufacturer was notified, and they implemented certain interventions that temporarily resolved the errors. However, the errors would reappear after a short period of time. Additionally, it was discovered that the warranty attached to these inverters did not favour the customer, as it only allowed for repairs rather than full replacements for ongoing errors.



Upon thorough examination of the construction contract, it became apparent that Orionis had limited recourse against the contractor for these ongoing issues. To address this situation and improve the performance of the inverters, Orionis has appointed a qualified technical adviser. The adviser will conduct an independent review of the root cause analysis of the inverter errors and provide guidance on whether Orionis is taking all necessary steps to enhance the performance of these inverters.

LESSON LEARNT: This case underscores the importance of conducting proper due diligence on equipment suppliers. It is crucial to consider their track record, local presence, and the key terms of warranty claims. Furthermore, stronger clauses should be negotiated within the construction contract, providing the customer with greater protection against faulty equipment supplied by the contractor which is not remediated to the customer's satisfaction. By implementing these measures, future projects can mitigate risks associated with troublesome components and ensure improved performance.

Security Issues

In the Orionis portfolio, there is a larger ground mount project located south of Johannesburg, adjacent to the off-taker premises. During the development phase, SOLA, which had no prior experience in the area, was not fully aware of the security situation in that specific location. However, during the negotiation phase, the off-taker, being more familiar with the area due to their years of operation there, insisted on providing the security infrastructure for the project. SOLA's responsibility was solely to provide the solar infrastructure.

Despite the security infrastructure installed by the off-taker, there have been numerous security incidents during both the construction and operation phases. Criminals have taken advantage of vulnerabilities in the security systems, resulting in the theft of several panels, monitors, cables and batteries from the site. To address this issue, multiple security experts have been hired to assess the existing infrastructure and suggest improvements. However, since security was the off-taker's obligation, negotiations have been necessary to allocate the costs for these improvements, which further delayed the resolution of security issues.

Ideally, it would have been more efficient if SOLA, as the party owning and operating the project, had been responsible for installing the security infrastructure. This would have ensured that the obligations for security improvements were not divided between multiple parties. By having a single entity accountable

for both the installation and operation of the infrastructure, it would be easier to address security concerns promptly and streamline the decision-making process.

LESSON LEARNT: It is crucial to thoroughly evaluate the security situation and risks associated with a project's location during the planning and development stages. Collaboration between the off-taker and the project developer is essential to determine the most effective and comprehensive security measures for the site. This proactive approach can help mitigate security incidents and minimise the associated costs and delays.

Yield Assessments

For a typical solar project, a P50 yield analysis is undertaken to provide a yield figure for the financial model. 'P50 solar yield' refers to the estimated average or expected energy output of a solar PV system over a given period, typically on an annual basis. It represents the median or 50th percentile of the predicted energy production based on years worth of satellite irradiance data.

When planning and assessing the financial viability of solar projects, various factors such as solar resource availability, panel efficiency, shading, and system losses are considered.

These factors contribute to the uncertainty in estimating the actual energy output of a solar PV system. To account for this uncertainty, a range of potential energy outputs is generated through statistical modelling. The P50 value represents the midpoint or most likely outcome within this range.

In summary, P50 solar yield represents the median or average expected energy production of a solar PV system, considering various factors and uncertainties. Therefore in any given year, the solar yield could be upwards of 10% variance from the modelled yield.

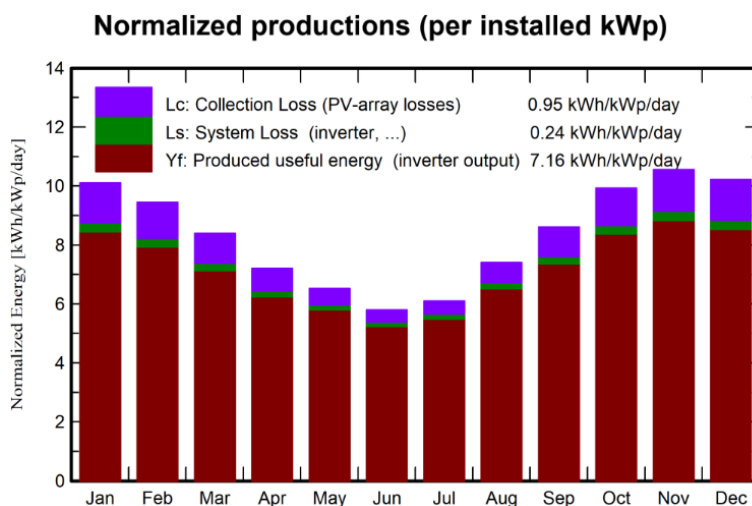
In the case of the Orionis portfolio, it has been observed that the average yield over its five-year lifespan has trended below the P50 yields used in the underlying models. Further investigations have also revealed that, in some instances, real-time satellite data indicated higher yields compared to onsite sensors. This difference is likely due to particulate matter, undetectable by the satellite, which affects the amount of irradiance reaching the Earth's surface in specific areas. It has also been noted that assets experiencing this variance tend to be located in industrial zones, suggesting that pollutants, not typically accounted for in P50 analysis, may be the cause.

LESSON LEARNT: Ensure that professional independent yield analysis is done taking into account any potential particulate in the microclimate due to pollution etc. (ideally with additional on-the-ground measurements) and ensure that the project still has sufficient cash flows in periods that are within the standard deviation of the P50 yield analysis.

Administration

Consolidation of Companies and Related Project Agreements

Through the optimisation project, SOLA is looking to reduce the number of companies in the Group from six to a minimum of three, one HoldCo and two SPVS, to ease the administrative burden and costs involved in maintaining a company. This would ultimately require corporate action, via the cession, assignment, delegation or otherwise of assets, loan accounts, contracts, etc, from the companies that would be wound



up. There are multiple considerations when looking at a transaction of this kind, including tax consequences, legal and statutory limitations, B-BBEE requirements and financial implications. The South African Income Tax Act has specific provisions which deal with transactions of this nature and it was vital that the optimisation could be executed in a tax-efficient manner so as not to erode shareholder returns.

SOLA Assets employed a tax adviser who identified that the transaction was viable but that there would be adverse tax consequences. In the transferring companies (i.e. being wound up), a current tax liability would arise upon the transfer of assets. The adverse tax requirements were due to a change in tax legislation which impacts the current financial year, and would not have applied had the transaction been executed in a prior financial year. Whilst there were still ways in which the transaction could be effected in a tax-efficient manner, there was inevitably going to be a current tax liability which arose, which would impact shareholder returns.

The financial adviser identified the benefits of the consolidation of the Group companies as being:

- Increased benefit for the BEE shareholder in terms of having ownership over multiple projects, rather than having ownership of only one asset. This diversifies the asset pool, reducing the operational and financial risks associated with single-project ownership.
- The reinstatement of existing long-term tax write-offs to protect shareholder returns in the long run.

It was further identified that the consolidation would have benefits in the consolidation of multiple debt facilities into one, as detailed above, through ease of securitisation.

Offsetting these benefits, the following challenges would also be encountered:

- Immediate, material tax payments become due, as highlighted by the tax adviser.
- Any long-term positive tax write-off implications are contingent on multiple events occurring in the future and there was therefore no certainty that they would be realised.
- Unintended cash flow implications for the existing Orionis shareholders as they would be required to forego or subordinate some shareholder cash flows in favour of the BEE shareholder.
- The BEE shareholder may object to the terms of the restructuring, including the valuation of their stake in the old versus the new regime.
- There would be a need to reword the equity documents of the various companies to detail the relationship between the BEE shareholder and the existing shareholders, which could lead to protracted legal negotiations and related costs.

The legal due diligence report identified that consideration is to be paid to contractual prohibitions on the ability to assign rights and obligations under the PPAs, NERSA Generation Licences, lending agreements and other contracts within the SPVs. Due to the securitisation of the asset portfolios in the SPVs, an assignment of the assets and security documents in the security pool would likely not suffice and the relevant debt facilities would likely need to be settled and refinanced with a new security pool being established. This would result in further negotiations and transaction costs. Lastly, depending on the nature of the restructuring pursued, regulatory approval from Competition Authorities may be required.

Ultimately, the various advisers' feedback was that the proposed consolidation of the companies in Orionis was technically plausible, but the execution of the transaction was going to be prohibitively expensive and was subject to major inherent risks. The costs of the reorganisation outweigh the benefits.

LESSON LEARNT: The tax advice was clear that reducing the number of SPVs in the structure would have negatively affected the shareholder returns due to tax becoming immediately payable and the loss of tax losses that could be used to set off future profits. So in this case it was not helpful to retrospectively unbundle the SPVs. However, in future, project sponsors should avoid opening unnecessary SPVs unless there is a legal or regulatory requirement, as once they are set up they are difficult to merge or restructure.

Shortfalls in Contracts

One of the key features of the Orionis structure is the use of template agreements for projects, specifically the EPC and O&M agreements. These templates offer advantages such as reduced transaction costs and uniformity of services across the portfolio. However, it became apparent that in some cases using a template agreement from one project may not be the most suitable approach for another project.

For instance, an O&M agreement template that had been successfully tested on rooftop solar projects was used for a smaller ground mount project. However, during the operational phase, deficiencies in services specific to ground-mounted panels became apparent, particularly related to vegetation control and on-site security, both services which are not typical for a project installed on a rooftop. These services had also not been adequately discussed or clarified during the negotiation phase with the off-taker, leading to ambiguity regarding the responsibility for these obligations.

As a result, negotiations had to be initiated retroactively to address these issues, causing difficulties and delays in implementing vegetation control and security measures. These challenges ultimately put the projects at risk. This situation highlights the need to treat each project as unique and to avoid using off-the-shelf agreements without making project-specific adjustments.



LESSON LEARNT: During the negotiation and project development phase, it is crucial to create a detailed scope of services that covers all aspects of both the construction and operation of the solar asset. This should include clearly defined obligations for both parties involved. Furthermore, any obligations of the seller should be explicitly outlined in the construction and operations contracts to ensure that there are no gaps in services and to avoid any ambiguity or misunderstandings. By taking these measures, project-specific requirements and obligations can be properly addressed, mitigating risks and ensuring smoother project execution. It emphasises the importance of customised agreements that are tailored to the unique characteristics and needs of each individual project.

B-BBEE and SED Elements

Many of the organisations that contract clean electricity from projects in the Orionis Group are either large local corporations or multinational clients. In line with other companies in South Africa, several of these corporate off-takers required a certain BEE level of their suppliers to be met, usually between Level 2 to Level 4 (with Level 1 being the highest). And as already mentioned, certain SPVs required direct Black shareholding to ensure the required minimum BEE level was met and maintained. Since the optimisation plan included a potential consolidation of SPVs, it was vital that the BEE levels of SPVs were maintained (or improved).

A BEE adviser was appointed to review the proposed new structures, which included a consolidation of SPVs. The consolidated SPV would need to meet the highest BEE Level to ensure it remained compliant. The BEE adviser reviewed various elements of the scorecard and provided recommendations to get the SPV to the required level 2 for each element.

This included a review of the below elements:

1. Ownership

2. Management control
3. Skills development
4. Enterprise and supplier development (which includes procurement)
5. Socio-economic development (SED)

With a few easily administered interventions in each of the above categories, the adviser confirmed that the projects would be able to reach and maintain a Level 2, albeit by a slim margin, meaning that the optimisation plan could work from the perspective of B-BBEE. However, since it became apparent that due to the challenges identified under Consolidation of Companies and Related Project Agreements it would not be advisable to consolidate the SPVs, and that the existing B-BBEE structures were compliant with contractual requirements, there was no further action or intervention required.

LESSON LEARNT: Under the previously proposed consolidated corporate structure (which was not pursued due to the cost-benefit trade off) it would be possible to further empower the consolidated SPV to a BEE Level 2 by introducing a few key interventions. These interventions include ensuring that there is sufficient Black and Female representation on the Board of Directors and in senior management, prioritising procurement from B-BBEE-accredited suppliers, and spending sufficient quantum on both skills development and socio-economic development. For future projects, the long-term nature of B-BBEE requirements should be considered to ensure easier consolidation of projects into fewer SPVs, for example, setting up SPVs per BEE level and housing all projects that require a certain level of BEE in the same SPV as other projects that require the same BEE level.

Conclusion and Next Steps

As has been demonstrated, there have been some key lessons learnt in the establishment and proposed optimisation of the Orionis Group. The lessons can be summarised as follows:

1. Reduce transaction costs by having a single overarching financing agreement which allows for funding to be drawn down on over different projects and time periods.
2. Use a base case model that can incorporate operational data effectively, enabling accurate reporting, consolidation, and adaptability to the changing needs of projects.
3. When designing a fund structure, it is crucial to consider operational requirements, including data input/output, technical skills, and time constraints, in addition to the theoretical advantages of tax, financing, or BEE, to ensure successful execution and administration of investments.
4. It is beneficial to establish well-defined principles in the constitutional documents of an entity for valuation, dispute resolution, corporate transactions, shareholder protections, and potential conflicts to provide a foundation for addressing conflicts and facilitating relevant conversations.
5. Conduct thorough due diligence on equipment suppliers, negotiate stronger performance clauses in construction contracts, and implement measures to mitigate risks and ensure improved performance of assets in future projects.
6. Thorough evaluation of security risks, collaborative planning, and effective security measures during the project development phase can mitigate security incidents, minimise costs, and prevent delays.
7. Conduct professional independent yield analysis, considering potential particulate in the microclimate and incorporating on-the-ground measurements wherever possible.
8. Avoid opening unnecessary SPVs unless there is a legal or regulatory requirement, as once they are set up they are difficult to merge or restructure.
9. In the negotiation and project development phase, it is essential to create a detailed scope of services that covers construction and operation, clearly defining obligations for both parties.

10. Consider the long-term nature of BEE requirements when consolidating projects into fewer SPV, such as grouping projects of the same BEE level in a single SPV to simplify consolidation and compliance.

Based on the above learnings, the next steps for the Orionis Group will be to implement the learnings from the advisory work detailed above and:

- Simplify the equity instruments and profit-sharing mechanism at the HoldCo level including updating the corporate and shareholder agreements. Such simplification can be achieved through either liquidating the B-Shares and paying out the B-Share shareholder, or by converting the B-Shares to A Instruments to the value of the B-Shares. The intention is to align all stakeholders' interests and to increase the user-friendliness of the structure for the potential of an eventual equity sale
- Consolidate the current outstanding debt facilities into a single facility under an iteration of the existing debt and security documents.
- Raise new debt through the existing debt structure on unlevered assets and improve the overall leverage and shareholder return of the portfolio. This will be facilitated by the new consolidated financial model which can stress the portfolio's cash flows to identify the quantum of debt that the portfolio can service. As identified earlier, this could result in an increase in debt capital employed in the Group, with the additional debt capital raised being equal to ~50% of current equity capital invested in the Group being returned to the equity providers of Orionis.
- Have an independent technical review of equipment issues experienced to determine root cause analysis and related remedy plan. This will assist with making informed and accurate forecasts about future cash flows to be generated by the portfolio.
- Ensure the template EPC and O&M agreements for the new projects to be built will cater for all project-specific concerns (security, vegetation control, etc.) and amend existing O&M agreements wherever necessary.
- No change to the corporate structure will be enacted and therefore no changes to the current BEE structures within the portfolio are required.

The plan is to complete all of the optimisation steps before the end of 2023.

The clear and concise optimisation strategy above would not have been formulated without the use of the grant funding from CICSAs project to fund the professional advisers. The grant support has played a pivotal role in enabling SOLA Assets to access the expertise and guidance necessary to develop and implement an effective optimisation strategy. As can be seen with the assistance of these advisers, SOLA Assets has been able to identify numerous opportunities for improvement, and to enhance operational efficiency and streamline processes. The grant-funded optimisation plan has not only empowered SOLA Assets to achieve its objectives but has also positioned the Orionis Group for sustained success in the long term. SOLA Assets and the Orionis Group shareholders are grateful for the CICSAs commitment to the Group's mission and vision for expanding access to clean renewable energy for industrial clients.

List of advisers who contributed to this report

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Tax Adviser	Moore South Africa
B-BBEE Adviser	Stimela Consulting
Legal Adviser	Cliffe Dekker Hofmeyr
Security Adviser	C & C Security Solutions

Financial Modeller	Peppertree Capital
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